Trade Facilitation Without Trade Costs Reduction:

Evidence from a Border Reform in Malawi

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Abstract

This paper studies whether simplifying border procedures reduces trade costs enough to increase trade and change importer behavior. I study a coordinated border-management reform at Mwanza, Malawi's principal border post, using customs records and a survey of 850 traders. The reform reduced border agencies from 14 to 5 and introduced joint inspections. I estimate its effects using synthetic difference-in-differences. I find no detectable reduction in clearance time or change in shipment values, transaction frequency, or importer entry. Declarations increase sharply at Mwanza, but part of this increase reflects reallocation across offices, partly explained by a contemporaneous requirement to file declarations at the border rather than inland. Transport costs average 35.7 percent of shipment value, while monetary costs directly associated with border clearance account for about 6 percent. The results suggest that border reforms may have limited effects when the costs they target are small relative to other import costs. **JEL codes:** F13, F14, O18, O19

Keywords: trade facilitation, trade costs, border effects, synthetic difference-in-differences, Malawi

1. Introduction

Trade facilitation is a major component of trade policy. Governments and development banks support infrastructure upgrades, regulatory alignment, administrative simplification, and digitization on the premise that lower border-crossing costs will increase trade and firm

competitiveness. A key part of this agenda is the modernization of border-crossing processes through simpler procedures, improved customs systems, and better border infrastructure. The scale of these investments is substantial: donors disbursed approximately US$648 billion through the Aid for Trade initiative between 2006 and 2022. In Malawi alone, the World Bank committed approximately US$255 million to two major trade and transport facilitation projects between 2015 and 2025.

However, border clearance is only one component of the cost of moving goods. Importers also face transport, storage, brokerage, taxes, and other logistics costs. The effect of border reforms thus depends both on whether they change border-crossing conditions in practice and on how important the costs they target are relative to other trade costs. This paper studies whether simplifying border procedures reduces trade costs enough to increase trade and change importer behavior.

I study a border reform in Malawi, a landlocked country where trade relies heavily on road transport and border operations still rely on older infrastructure, legacy customs systems, and limited integration across agencies. I evaluate a Coordinated Border Management (CBM) pilot reform introduced in June 2023 at Mwanza, Malawi's principal border post with Mozambique. The reform sought to simplify border crossing by reducing the number of agencies operating at the border, reallocating responsibilities among them, introducing joint inspections and risk-based controls, connecting agencies to the customs database, and upgrading border facilities.

I address the main question in two steps. First, I measure how large the costs associated with border clearance are relative to other costs incurred by importers. Second, I estimate whether the reform reduces clearance times and changes trade behavior through shipment size, transaction frequency among existing importers, and importer entry.

I combine customs data with an original two-wave survey of 850 traders at five major border posts. I measure clearance times, shipment values, transaction frequency, and importer entry from customs records covering import declarations between January 2021

and January 2024. The trader survey measures the level and composition of import costs. I estimate the effects of the reform by comparing changes at Mwanza with those at other customs offices using synthetic difference-in-differences. GPS data on vehicle movements around Mwanza and other border posts provide complementary evidence on border-crossing times.

Two findings emerge. First, costs directly associated with border clearance are small relative to the overall cost of importing. Transport alone accounts for 35.7 percent of average shipment value. By comparison, monetary costs directly associated with border clearance account for about 6 percent. The composition of import costs therefore suggests that simplifying border procedures targets only one part of the overall costs faced by importers.

Second, I find no significant impact of the Coordinated Border Management pilot on clearance times or on underlying trade during the five months following implementation. I find no detectable adjustment along either the intensive or extensive margin, with no significant change in shipment values, transaction frequency, or importer entry.

Recorded declarations at Mwanza do rise sharply after the reform, but part of this increase appears to reflect reallocation across customs offices rather than new trader entry. About 440 additional declarations per month come from importers who had previously filed elsewhere. This reallocation can be partly explained by a filing directive introduced the same summer, which required import declarations to be filed at the border rather than inland. I show that similar reallocations occurred elsewhere in the country and that, once declarations are aggregated across border posts and their corresponding inland offices, the estimated increase at Mwanza becomes substantially smaller and is no longer statistically significant.

The paper makes three contributions. First, it contributes to work on the level and composition of trade costs in low-income countries by directly measuring the costs incurred by importers and distinguishing those associated with border clearance from transport and other costs (Teravaninthorn and Raballand, 2009; Sequeira and Djankov, 2014). This decomposition helps assess how much of traders' overall costs can plausibly be addressed by

trade facilitation interventions focusing on the border.

Second, the paper provides evidence on the impacts of a relatively low-technology step in border modernization: coordination across border agencies. Existing evaluations have studied reforms such as risk-based inspections (Fernandes et al., 2021) and electronic single windows (Carballo et al., 2016), often in more advanced settings, while coordination reforms in countries with older customs systems have received less attention.

Third, the paper focuses on importers, while much of the evidence on border delays and trade facilitation examines exports (Djankov et al., 2010; Volpe Martincus et al., 2015). Using importer-level administrative data, I distinguish changes in shipment size, transaction frequency, and importer entry from shifts in where existing importers file their declarations.

Taken together, the results suggest that the effects of border reform depend not only on whether procedures change, but also on the importance of the costs they target relative to other import costs.

The remainder of the paper is organized as follows. Section 2 reviews the literature on trade costs and border reform evaluation. Section 3 describes the institutional setting, the CBM pilot, the national filing directive, and the data. Section 4 documents the composition of import costs. Section 5 presents evidence on implementation, the empirical strategy, and the estimated effects of the reform. Section 6 concludes.

2. Related Literature

This paper relates to three strands of the trade and development literature. First, it builds on work on the level and composition of trade costs. Seminal work by Anderson and van Wincoop (2004) distinguish transport, border-related, and domestic distribution costs, while subsequent work shows that the costs of moving goods are particularly high in low-income countries. Atkin and Donaldson (2015) estimate substantially larger intra-national trade costs in Ethiopia and Nigeria than in the United States, and Freund and Rocha (2011) show that inland transit delays are an important constraint on African exports. Most closely

related, Teravaninthorn and Raballand (2009) document high trucking prices along Sub-Saharan African corridors. This paper provides direct evidence on the relative importance of transport, border-clearance, and other import costs in a landlocked African economy.

Second, the paper relates to evidence on border procedures and customs modernization. Using cross-country data on the time required to move goods from the factory gate to the port, Djankov et al. (2010) show that delays reduce trade, particularly for time-sensitive products. Firm-level evidence similarly links customs-processing times to trade outcomes: Volpe Martincus et al. (2015) find that longer customs-processing times reduce exports in Uruguay. Other studies evaluate specific modernization reforms. Fernandes et al. (2021) find that lower inspection rates increased imports in Albania, while Carballo et al. (2016) find that an electronic single window increased export activity in Costa Rica. Relative to these studies, I examine an earlier stage of border modernization: a relatively low-technology reform centered on coordination across agencies in a low-income, landlocked setting.

Third, the paper relates to work on how trade frictions shape importers' shipment decisions. Fixed and per-shipment trade costs can affect how frequently firms import and the size of individual shipments: Alessandria et al. (2010) show that fixed costs of international transactions lead importing firms to make relatively large, infrequent purchases and hold inventories between orders, while Hornok and Koren (2015) show that per-shipment trade costs affect shipment frequency and size. Motivated by this literature, I examine whether lower border frictions affect shipment size and frequency among existing importers, as well as entry by new importers.

3. Context and Data

3.1 Setting and the CBM reform

Malawi is a landlocked low-income country. Agriculture employs roughly 80 percent of the workforce (World Bank, 2018), and raw tobacco accounts for 45–70 percent of export

earnings (Observatory of Economic Complexity, 2023). Imports are three times the value of exports (World Bank, 2026). The country relies heavily on imports of fuel, fertilizer, and pharmaceuticals, while exports remain concentrated in a small number of agricultural products.

Malawi's main trade routes run through the regional ports of Beira and Nacala in Mozambique and Durban in South Africa. From these ports, goods travel 400–800 kilometers by road to reach the country. According to Raballand et al. (2012), transit from Durban to Blantyre takes more than two weeks on average. Around 90 percent of freight moves by road, and transport costs have historically exceeded 30 percent of the import bill. Mwanza, the border post studied here, lies on the Beira Corridor and handles the highest cargo volumes of any Malawian border post. It averages 435 declarations per month in the pre-reform period, about 8 percent of national declaration volume.

Border-crossing procedures add to these already long transit times, although Malawi's performance was broadly in line with regional peers. Before the reform, the World Bank's standardized measure of import border compliance in Malawi was approximately 96 hours. This was comparable to Tanzania (96 hours) and Zambia (108 hours), and substantially shorter than Zimbabwe (192 hours) and Burundi (264 hours) (World Bank, 2020). Malawi also performed better than these countries on the Logistics Performance Index customs dimension (World Bank, 2023).

Before the reform, clearing a consignment at Mwanza could involve up to fourteen border agencies, depending on the goods being imported. All traders had to clear customs, immigration, and the Malawi Bureau of Standards, which also collected fees. Additional agencies were involved for goods subject to specific standards and regulations. Food imports, for example, could require separate clearance from health and agricultural agencies. Each agency operated independently, requiring the trader or clearing agent to submit documentation in advance and at the border and to obtain clearance from each office separately before the consignment could proceed.

At the border, risk-based selectivity was rarely applied in practice. At Mwanza, 72.7 percent of declarations were assigned to the red lane, requiring full physical inspection. Physical inspection was therefore very common, regardless of compliance history or goods type. This is common at borders in low- and middle-income countries, where customs usually accounts for only about one-third of clearance time (McLinden et al., eds, 2011). The remainder is largely due to procedures carried out by other regulatory agencies.

The Coordinated Border Management reform targeted this administrative burden. It was implemented between June and August 2023 to reorganize how customs and other agencies managed the border-clearance process. The reform reduced the number of border agencies from fourteen to five and connected the remaining agencies to ASYCUDA World, UNCTAD's electronic customs management system used by Malawi. It also introduced pre-clearance document uploads, allowing agencies to begin reviewing documents before consignments arrived. Physical inspections were conducted jointly by a single team on behalf of all agencies, with less intervention for low-risk consignments. A single Malawi Revenue Authority (MRA) payment receipt replaced the previous agency-by-agency payment process.

A contemporaneous national filing directive is central to the empirical analysis. Before the reform, importers could file an IM7 warehousing declaration at the border and later submit the corresponding IM4 import-for-home-use declaration at an inland customs office. Because the customs system could not always link the two declarations reliably, this created scope for revenue leakage. The new directive required IM4 declarations to be filed at the point of entry. This mechanically shifted recorded declarations from inland customs offices to border posts, including Mwanza. Because the directive was introduced at the same time as the CBM, changes in declaration counts at Mwanza cannot be attributed to the CBM without accounting for this reallocation (Section 5.2).

3.2 Data

Trader survey. I collected two waves of survey data from traders active at five major border posts. The survey was designed to capture smaller traders who may be underrepresented in administrative customs records. Traders were recruited at border posts and through business associations and district councils. Recruitment targets were set to capture small, medium, and large traders, based on reported sales and traded value in the customs data.

The baseline survey was conducted between December 2021 and March 2022. Of 902 traders recruited, 850 completed the survey, including 204 at Mwanza. The endline, conducted between January and March 2024, re-interviewed 451 baseline traders. Pre-post comparisons use only traders observed in both waves. Attrition was not significantly associated with Mwanza status (Appendix Exhibit A1).

The survey records shipment value and frequency, time spent at the border, and the main costs associated with importing. These include transport costs, official fees and taxes, clearing-agent fees, and informal payments. Surveyed traders handle smaller shipments than those observed in the customs data. At Mwanza, mean shipment value was US$14,110 in the survey, compared with US$24,600 in the customs records.

Customs declarations. The MRA provided administrative data extracted from ASYCUDA World for 24 observed months between January 2021 and January 2024. Each declaration record contains information on the goods, including commodity code, declared value, entry point, origin, and taxes assessed; the import process, including selectivity lane and vehicle type; an anonymized importer identifier that can be tracked across declarations over time; and clearance timestamps. Coverage is incomplete because of extraction constraints at the Malawi Revenue Authority, with observations generally available for January, February, April, May, and September through December.

The office-level analysis uses IM4 declarations, the filing regime directly affected by the 2023 directive, and excludes IM7 warehousing declarations. Within this sample, the baseline analysis focuses on three outcomes: clearance time, recorded trade activity, and average

shipment value. Clearance time is defined as the number of days between the first submission of a declaration and the granting of clearance. This can be different than the experienced time at the border due to delay in clearance post arrival, or submission of the declaration pre-arrival. Recorded trade activity is measured by the number of declarations processed in each office-month, while average shipment value is the average declared value per declaration, winsorized at the 99th percentile to limit the influence of unusually large shipments. This administrative measure of clearance time differs from the survey measure of time physically spent at the border, which is based on traders' reported experience.

I complement these office-level outcomes with importer-level measures of transaction frequency and new importer activity. Using the anonymized importer identifier, I classify an importer as new only if it has not previously appeared anywhere in the customs data. An importer appearing for the first time at a particular office but previously observed at another office is thus treated as an existing importer. This distinction is important because the filing reform may change where an importer files without representing new trade.

Because the customs extract begins in January 2021, first appearance in the data cannot be interpreted as new importer activity during the initial months of the sample. The first 12 months are used to define prior importer activity and the new-importer classification begins in January 2022.

I define an importer's home office as the office accounting for more than 51 percent of its pre-reform declarations. A non-home filer is a previously observed importer filing at an office other than its home office. Importers with no such office have no home office and are considered non-home filers everywhere.

Panel B of Table 1 summarizes the customs data before the reform. Mwanza handled somewhat more declarations per month and higher-value shipments than other border posts. Clearance times were similar, averaging 7.4 days at Mwanza and 8.0 days elsewhere. Physical inspection was common across border posts: 72.7 percent of declarations at Mwanza and 79.3 percent elsewhere were assigned to the red lane.

As noted above, the 2023 filing directive changed where import declarations were recorded. Panel C thus focuses on IM4 declarations, the filing regime directly affected by the directive. It shows a sharp shift from inland customs offices to border posts in two of the major trade corridors: declarations increased at Mwanza and Dedza while falling at the closest inland offices, Blantyre and Lilongwe. Corridor totals rise much less than the border-post series. Declarations in the Mwanza–Blantyre corridor increase from 1,228 to 1,631 per month, compared with an increase at Mwanza alone from 435 to 1,459, and the Dedza–Lilongwe corridor total changes little (949 to 1,021).

GPS telematics. Finally, I use GPS data from a provider that tracks large freight operators across Southern and Eastern Africa. The data cover inbound trips to Malawi between January 2022 and December 2023 for which vehicle locations were recorded within a 30-kilometer buffer around each major border post. I use these data to measure the time trucks spend around the border and compare changes at Mwanza with other border posts before and after the reform.

The GPS data cover a relatively small sample of large freight operators. At Mwanza, the sample includes 263 inbound trips over two years, or about 11 trips per month. I therefore use these data as corroborating evidence rather than as a primary outcome. Appendix A.5 describes the construction of the measure and the empirical approach.

Table 1: Descriptive Statistics and National Policy Evidence

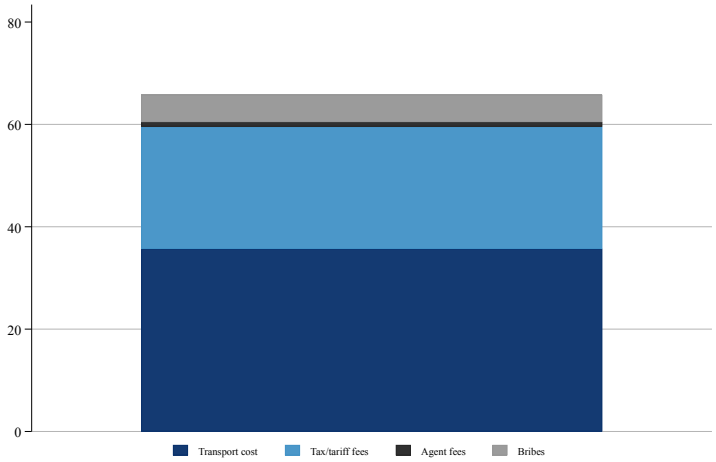
	Mwanza	Other posts
Panel A. Trader Survey (baseline, $N = 850$)		
Number of traders	204	646
Main border posts		
Mwanza (Mozambique)	204	
Dedza (Mozambique)		141
Songwe (Tanzania)		322
Mean import value per shipment (USD '000)	14.1	6.4
Mean time at border (days)	2.5	1.7
Panel B. Customs Declaration Panel (pre-reform, Jan 2021–May 2023)		
Total N declarations	7829	85622
Share of red-lane declarations (%)	72.7	79.3
Mean N declarations per office-month	434.9	353.8
Mean declaration value (USD '000)	24.6	17.8
Mean clearance time (days)	7.4	8.0
Panel C. National Filing Directive		
	Pre	Post
Average number of IM4 declarations per observed month		
Mwanza–Blantyre corridor		
Mwanza	434.9	1459.2
Blantyre	793.2	171.6
Corridor total	1228.1	1630.8
Dedza–Lilongwe corridor		
Dedza	315.9	987.6
Lilongwe	633.3	33.4
Corridor total	949.2	1021.0

Notes: Panel A uses the trader survey ($N = 850$); Panels B–C use ASYCUDA customs records, January 2021–January 2024. Pre-reform ends in May 2023; June–August 2023 is excluded. Post-reform: September 2023–January 2024. Panel C uses IM4 declarations only.

4. Breakdown of Trade Costs

Before evaluating the reform, I ask how large the costs it targets are. The trader survey asks about both the time and monetary costs of importing. Traders report a mean border time of 2.5 days at Mwanza and 1.7 days at other posts (Panel A of Table 1). Monetary costs are summarized in Figure 1.

Figure 1: Trade costs as a share of shipment value.



Notes: The figure reports mean costs as a share of shipment value. Cost components are winsorized at the 97.5th percentile. Costs not incurred by the trader are coded as zero; other missing values are excluded.

Figure 1 shows monetary costs as a share of shipment value. Transport is the largest component, averaging 35.7 percent of shipment value, in line with previous estimates for the region (Raballand et al., 2012). Taxes and tariffs account for another 23.9 percent. Costs more directly associated with border clearance are much smaller: informal payments account for 5.3 percent of shipment value and clearing-agent fees for 0.9 percent.

Transport costs include truck hire for freight and bus fares for small traders. Agent fees are payments to clearing agents who help traders navigate the clearance process. The CBM reform primarily targets costs associated with border processing rather than the much larger transport and tax components of import costs. The monetary costs most directly associated with border clearance therefore account for a relatively small share of the overall costs measured in the survey.[1]

To gauge the size of clearance time relative to the monetary costs, I use the estimates of Hummels and Schaur (2013) of the ad valorem cost of a day in transit. Following their

[1]Partial correlations of trade costs and border time with trader characteristics, border post, origin country, and goods type are reported in Appendix Exhibit A2. Conditional differences across border posts are generally small, with Mchinji recording significantly lower border time than Mwanza.

method, I estimate this cost for each four-digit HS product and match it to the customs data. For the median product imported at Mwanza, one additional day in transit is equivalent to an ad valorem trade cost of about 2.8 percent of shipment value. A one-day reduction in clearance time would therefore reduce the implied time cost by about 2.8 percent of shipment value, while border time would have to fall by about 13 days for these savings to equal average transport costs of 35.7 percent of shipment value.

5. Reform Evaluation

5.1 Evidence of implementation

Table 2: Evidence of Reform Implementation and Early Outcomes (Survey Evidence)

	Mwanza	Others	Difference
Part A. Evidence of Implementation			
A1. Reform Awareness (% traders answering yes)			
One Stop Border Post	0.61	0.54	0.07
	(0.49)	(0.50)	
Coordinated Border Management	0.31	0.13	0.17***
	(0.46)	(0.34)	
No interventions	0.34	0.44	-0.10*
	(0.48)	(0.50)	
A2. Observed Changes (% traders answering yes)			
Short waiting time	0.53	0.55	-0.02
	(0.50)	(0.50)	
Fewer officials	0.29	0.20	0.09
	(0.46)	(0.40)	
Joint inspection	0.38	0.24	0.13*
	(0.49)	(0.43)	
Physical changes	0.44	0.29	0.15*
	(0.50)	(0.46)	
Part B. Outcomes: Change from Baseline to Endline			
N officials interacted with	2.25***	3.44***	-1.19
	(5.17)	(4.95)	
Time at the border (days)	-0.41	0.12	-0.53
	(3.16)	(2.54)	
Trade costs (share of shipment value)	-0.45	-0.26**	-0.19
	(1.30)	(1.19)	
Shipment value (USD '000)	17.86***	3.39	14.47
	(75.75)	(46.66)	

Notes: Significance stars indicate whether the change (or difference-in-differences estimate) differs from zero. ***p<0.01, **p<0.05, *p<0.10.

Table 2 reports endline survey shares for awareness and procedural-change questions (Panel A). This provides evidence that the reform was implemented and visible to traders. The

survey covers three outcomes corresponding directly to important components of the reform: having noticed any change at all, greater coordination across agencies through joint inspections, and changes in infrastructure of the border post. CBM awareness is 17.4 percentage points higher at Mwanza than at other border posts (30.9 versus 13.4 percent). Traders at Mwanza are also 13.5 percentage points more likely to report joint inspections and 15.4 percentage points more likely to report physical changes at the border. Taken together, they indicate that the intervention altered procedures in ways that were observable to traders.

The same survey provides little evidence that these procedural changes translated into improvements in reported trade frictions over the period observed. Panel B compares changes in time and cost outcomes at Mwanza with those at other border posts over time. Reported time spent at the border, trade costs, and shipment value do not change significantly relative to comparison sites. The share of traders identifying Mwanza as their main border post also changes only modestly, from 24 to 20.8 percent. The survey therefore documents implementation of the reform, but no corresponding detectable short-run reduction in traders' reported time or monetary costs. The administrative data provide a complementary test of whether the reform affected clearance times and recorded trade activity.

5.2 Identification and empirical strategy

The reform was implemented at a single border post, Mwanza, with all other posts untreated by the CBM. Rollout ran from June to August 2023. I take September 2023-January 2024 as the post-reform period and exclude the June-August transition window, comparing against a pre-reform period ending in May 2023. The analysis therefore captures short run effects over the five months following implementation and does not speak to long run effects of the reform.

With one treated unit, I estimate treatment effects using the synthetic difference-in-

differences estimator of Arkhangelsky et al. (2021). The estimator constructs a synthetic Mwanza as a weighted combination of comparison offices and pre-treatment periods, chosen to reproduce Mwanza's pre-reform trajectory. Identification relies on the assumption that this synthetic control approximates the path Mwanza would have followed without the CBM. The baseline specification (Specification 1) uses all 13 offices. Inference relies on the placebo variance estimator of Arkhangelsky et al. (2021). Reassigning treatment to each untreated office in turn yields a distribution of placebo effects, whose variance provides a standard error, a 95% confidence interval, and a p-value. All outcomes are constructed from IM4 declarations (Section 3.2), so the panel tracks declarations that the directive affected.

The principal threat to identification is the contemporaneous national filing directive, which shifted IM4 declarations from inland customs offices to border posts during the summer the CBM took place. The concern is that the filing directive generated an office-specific shock that the weighting of post offices in the synthetic differences-in-differences would amplify. Because it increased recorded activity at border posts while reducing it at inland offices, post-reform differences between Mwanza and its synthetic control may capture the filing directive rather than the CBM reform.

Specification 2 addresses this concern by aggregating declarations within customs corridors, combining each border post with its corresponding inland customs office. In the treated corridor, I sum declarations at Mwanza and Blantyre into a single series; in the comparison corridor, I similarly combine Dedza and Lilongwe, while retaining the remaining offices individually in the donor pool. Because the filing directive reallocates declarations within these corridors, the effects inland and at the border should largely wash out in the corridor totals. A substantially smaller corridor-level effect would thus be consistent with reallocation rather than new trade.

Separately, I examine the intensive margin by testing whether previously observed importers increase their declaration frequency after the reform. This asks whether the rise in declarations reflects more transactions by importers already active in the customs data,

rather than changes in the set of importers or in where declarations are filed. Section 5.3 reports the corridor and importer-level results.

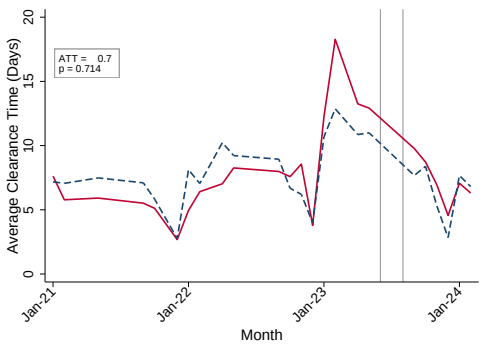
A second concern is differential pre-reform trends or anticipatory changes in filing behavior. Event-study estimates show no systematic divergence between Mwanza and the comparison offices before implementation; I report the full estimates in Appendix Exhibit A7.

Finally, if reductions in clearance time matter most for goods whose value is particularly sensitive to delay, effects may be concentrated in these products even when average effects are small. I therefore examine time-sensitive goods (Hummels and Schaur, 2013) and highly perishable agricultural and food products (Moïsé and Sorescu, 2021) separately in Section 5.5.

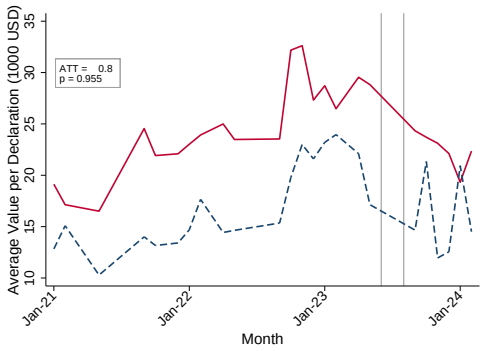
5.3 Main results

Figure 2 presents the observed and synthetic counterfactual trajectories for five main outcomes. I first report the two outcomes that capture the reform's direct effect on border processing, clearance time and average shipment value, and find no detectable effect on either. I then turn to declarations, which are the one outcome that appears to respond. The remaining panels and Table 3 examine the intensive margin and the composition of importers, to test whether the increase reflects more transactions by existing importers, new importers, or a shift in where existing importers file.

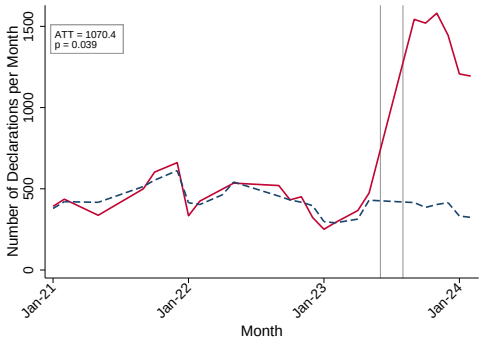
Figure 2: Synthetic Difference-in-Differences Trajectories: Observed Mwanza (solid line) vs. Synthetic Counterfactual (dashed line)



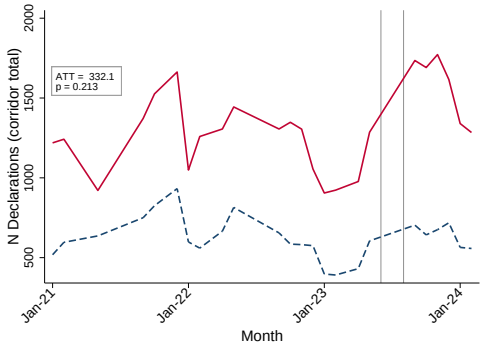
(a) Clearance time (days).



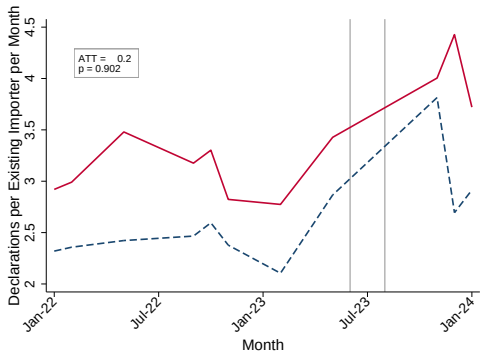
(b) Average shipment value (USD '000).



(c) Total declarations per month, Specification 1.



(d) Total declarations per month, Specification 2.



(e) Declarations per existing importer per month.

Notes: Vertical lines bracket the June–August 2023 implementation window. Panels (a)–(c) and (e) use Specification 1; Panel (d) uses Specification 2, aggregating Mwanza and Blantyre.

Panel (a) of Figure 2 shows average clearance time in days. The synthetic control tracks

Mwanza closely throughout the pre-reform period,[2] and the two series remain close post-reform, with no visible break after implementation. The estimated Average Treatment Effect on the Treated is 0.7 days, about 9 percent of Mwanza's pre-reform mean of 7.4 days, and is not statistically significant. The 95 percent confidence interval, from −2.9 to 4.2 days, rules out reductions in clearance time larger than about 2.9 days, or 39 percent of the pre-reform mean.

GPS data on large freight operators also suggest little to no impact of the intervention. Travel time in the crossing zone, within 10 kilometers of the Mwanza border post, relative to a control zone 10 to 20 kilometers from the post and to other border posts, shows no break at the start of the pilot (Appendix Exhibit A16). These estimates are noisy and rest on about 11 trips per month at Mwanza, so I treat them as corroborating evidence, not as a primary outcome.

Panel (b) of Figure 2 shows average shipment value. Mwanza remains above its synthetic counterfactual throughout the pre-reform period, but the gap is stable over time.[3] The gap does not change significantly after the reform. The estimated Average Treatment Effect on the Treated is about US$800 per declaration, 3 percent of Mwanza's pre-reform mean of US$24,600, and is not statistically significant. The 95 percent confidence interval, from −US$27,800 to US$29,400, is wide, so the data cannot rule out large changes in either direction. If the reform reduced fixed costs associated with each shipment, importers could respond by making smaller, more frequent shipments. There is no evidence of such a response in average shipment value; Panel (e) examines the corresponding frequency margin.

Panel (c) of Figure 2 shows the total number of declarations per month. Before the reform, the synthetic control remains about 200–400 declarations above Mwanza. After August 2023, declarations at Mwanza rise sharply to around 1,400–1,500 per month, while the synthetic control remains broadly unchanged. The estimated Average Treatment Effect

[2]The standard deviation of the gap between observed and synthetic Mwanza is about 26.7% of Mwanza's pre-reform mean clearance time.

[3]This difference in levels is not problematic for synthetic difference-in-differences, which allows for unit-specific level differences and seeks to balance pre-treatment outcome dynamics.

on the Treated is about 1,070 additional declarations per month, more than twice Mwanza's pre-reform monthly average of 435 declarations. The estimate is statistically significant at the 5 percent level.

Panel (d) of Figure 2 presents the corridor-level results from Specification 2. The estimated Average Treatment Effect on the Treated falls from about 1,070 declarations per month in Specification 1 to 332 in the corridor-level specification and is no longer statistically significant. This attenuation is consistent with much of the increase recorded at Mwanza being offset by a decline at Blantyre, suggesting a reallocation of declarations within the corridor rather than an increase in underlying trade.

The donor weights in Appendix Exhibit A3 also illustrate why the national filing directive matters for Specification 1: the synthetic counterfactual assigns substantial weight to offices that were themselves affected by the directive.

Panel (e) of Figure 2 examines the intensive margin using declarations per existing importer per month. If the CBM increased trade among firms already using the border, existing importers might transact more frequently. The estimated Average Treatment Effect on the Treated is 0.24 declarations per importer per month, or about 8 percent of the pre-reform mean, but is not statistically significant. The rise in declarations at Mwanza therefore does not appear to reflect more frequent transactions by existing importers.

5.4 Importer composition and filing location

If existing importers are not transacting more frequently, who accounts for the rise in declarations at Mwanza? Panel B of Table 3 examines how declarations shift between the border post and the inland office in the Mwanza–Blantyre corridor, separating existing and new importers. At Mwanza, declarations by existing importers increase from 361 to 1,280 per month, accounting for about 90 percent of the overall increase. Declarations by new importers rise much less, from 47 to 179. Switchers, existing importers previously observed only at other offices, account for 404 of the 919 additional declarations by existing importers.

Blantyre shows the opposite pattern: declarations by existing importers fall from 686 to 162 per month, while declarations by new importers fall from 86 to 9.

Table 3 shows who the additional Mwanza filers are and where they previously filed. Panel A repeats the contrast between the Specification 1 estimate of 1,070 additional declarations per month and the corridor-level Specification 2 estimate of 332, which is not statistically significant. It also reports declarations by non-home filers, existing importers filing away from their home office (Section 3.2). These increase by 441 declarations per month, and an average of about 135 additional importers file away from their home office each month.[4] Panel C shows where non-home filers came from: 52.2 percent of non-home filings at Mwanza come from importers whose pre-reform home office was Blantyre, as expected given the filing directive. A further 29.3 percent come from importers with no pre-reform home office. Declarations by new importers account for only 12.3 percent of Mwanza's post-reform declarations. The H&S time-sensitive subsample is shown alongside and is discussed in Section 5.5.

[4]Standard errors in Table 3 come from the placebo variance estimator, which approximates the distribution of placebo estimates as normal. With only 10 donor offices in Specification 2 (6 in the H&S subsample), the placebo distribution is small, and the significance stars may overstate precision. With 10 donors, the smallest attainable permutation p-value is $1/11 \approx 0.09$.

Table 3: Corridor Declaration Response and Importer Reallocation.

	All goods	H&S time-sensitive
Panel A. Declaration response (declarations/month, Sep 2023–Jan 2024)		
Total declarations, Specification 1	1070.4** (519.5)	460.4** (202.3)
Total declarations, Specification 2	332.1 (266.4)	214.1*** (16.2)
Non-home-filer declarations, Specification 2	441.3*** (94.5)	214.0*** (32.8)
Non-home filers, Specification 2 (importers/month)	134.8*** (35.8)	76.9*** (19.7)
New-importer declarations at Mwanza (% of Mwanza decl.)	896 (12.3%)	285 (8.1%)
N donors, Specification 2 (count)	10	6
Panel B. Importer composition, all goods (declarations per observed month)		
	Pre	Post
Mwanza		
Existing importers	361.2	1280.0
of which: switchers	28.1	431.8
New importers	47.2	179.2
Blantyre		
Existing importers	685.9	162.4
of which: switchers	31.0	5.6
New importers	86.0	9.2
	All goods	H&S time-sensitive
Panel C. Origin of non-home filings at Mwanza, % of declarations (Sep 2023–Jan 2024)		
Blantyre home office	52.2%	52.3%
No pre-reform home office	29.3%	30.7%

Notes: Standard errors from the placebo variance estimator in parentheses. Panel B is descriptive. Existing importers were observed before the reform; switchers were previously observed only at other offices. New importers have no prior declaration in the customs extract. Panel B uses January 2022–May 2023 to allow a 12-month look-back; the post-reform period is September 2023–January 2024.

The same filing reallocation appears in the Dedza–Lilongwe corridor. Declarations rise sharply at Dedza and fall at Lilongwe, while total declarations in the corridor increase by

only about 8 percent (Panel C of Table 1). By comparison, declarations in the Mwanza–Blantyre corridor increase by about 33 percent. The shift from inland offices to border posts is therefore not specific to Mwanza and is consistent with the national filing directive, but the larger increase in the Mwanza–Blantyre corridor leaves open the possibility that some trade was also reallocated toward Mwanza.

These patterns are consistent with the filing directive shifting where existing trade was recorded. Mwanza's increase is concentrated among existing importers, with no rise in their transaction frequency, while declarations by the same group fall sharply at the corresponding inland office, and the same shift appears in the untreated Dedza–Lilongwe corridor. Taken together, I interpret this as evidence of a reallocation of declarations across offices, at least partially due to the filing directive, rather than an increase in underlying trade.

5.5 Heterogeneity and robustness

Time-sensitive goods. Goods whose value falls quickly with time in transit should be more sensitive to border delays. I examine this using the Hummels and Schaur (2013) measure introduced in Section 4, classifying products at or above the median ad valorem time cost in the matched customs data as time-sensitive. As a narrower check, I use the high-perishability classification of Moïsé and Sorescu (2021).

The results for Hummels–Schaur goods are broadly similar to the main results (Appendix Exhibit A11). The estimated Average Treatment Effect on the Treated is not statistically significant for clearance time, average shipment value, or transaction frequency among existing importers. For declarations, the estimated Average Treatment Effect on the Treated at Mwanza is about 460 additional declarations per month. Once I aggregate Mwanza and Blantyre to account for the filing directive, the estimate falls to about 214 declarations per month (Appendix Exhibit A9). In contrast with the full sample, the corridor-level estimate remains positive.

These estimates need to be interpreted with some caution. The Hummels–Schaur

corridor specification has only six donor units, so inference is based on a small number of placebo estimates. I thus put more weight on the size and direction of the estimate than on conventional significance levels. The remaining positive effect could reflect incomplete reallocation within this narrower group of products, an increase in time-sensitive trade, or simply noise. The data do not allow me to distinguish between these explanations.

The OECD subsample is much smaller and has substantially worse pre-reform fit. I do not view these estimates as informative about heterogeneous effects. Appendix Exhibits A8, A12 and A10 report the sample sizes, fit diagnostics, and full results.

Pre-trends and anticipation. Outcomes at Mwanza may have started changing before the reform, either because of differential pre-trends or because traders anticipated the new rules, such that the observations in the period pre-reform would be contaminated. Event-study estimates using the randomization-inference approach of Hagemann (2025) show no systematic divergence between Mwanza and the comparison offices before implementation. I report the full estimates in Appendix Exhibit A7, and the corresponding estimates for the Hummels–Schaur and OECD subsamples in Appendix Exhibits A13 and A14.

6. Conclusion

This paper shows that the CBM, a low-tech administrative simplification pilot representing an early stage of border modernization, substantially changed border procedures at Mwanza. It reduced the number of agencies involved, introduced joint inspections, and connected agencies through ASYCUDA World, the customs database and processing software, and traders reported observing these changes. Yet over the five months following implementation, I find limited impacts of the pilot on key trade indicators: clearance time, average shipment value, transaction frequency, or importer entry.

Declarations recorded at Mwanza increased sharply after the reform, but the evidence points mainly to a reallocation of existing trade rather than an expansion of trade. The national filing directive mechanically shifted declarations from inland offices to border posts

and appears to account for an important share of this increase, although I cannot exclude that part of this reallocation also reflects traders shifting toward Mwanza in response to the changes in border procedures. Consistent with reallocation, once Mwanza and Blantyre are aggregated within the same corridor, the estimated increase becomes much smaller and is no longer statistically significant. Importer-level records point in the same direction: most of the increase at Mwanza comes from existing importers, including importers that had previously filed elsewhere, while declarations by existing importers fall sharply at Blantyre.

These results should be interpreted as short-run effects of a single pilot. The corridor specification is less precise and cannot distinguish a small increase in trade from no increase. For time-sensitive goods, the corridor-level estimate remains positive, although inference is based on a small donor pool. The evidence thus points to little detectable short-run change in underlying trade, rather than ruling out longer-run effects of the CBM.

The composition of trade costs helps interpret these results. Transport costs account for 35.7 percent of shipment value, while monetary costs directly associated with border clearance account for about 6 percent. The reform changed border procedures, but the costs it targeted represent only a small share of the overall cost of importing. This puts the limited response of trade behavior in perspective.

More broadly, the results suggest that the effects of border modernization depend on where the main frictions to trade lie. Border reforms may have limited effects when the costs they reduce are small relative to transport and other corridor-level costs. This points to a broader research agenda on identifying which components of trade costs are most binding for firms. Future work could examine how firms respond to reductions in different trade costs, and which frictions must be relaxed before shipment decisions, importer entry, and trade volumes respond.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author used VSCode and Claude in order to assist with coding, draft preparation and producing documentation. After using these tools, the author reviewed and edited the content as needed and takes full responsibility for the content of the published article.

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