

# Determinants of Cross Border Informal Trade: the case of Benin

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## Preliminary Version

### Abstract

This paper exploits a rich survey on informal cross border trade in Benin (named ECENE), conducted by the National Institute of Statistics in 2011, to study the determinants of informal versus formal trade. We concentrate on export and re-exports of Benin to its neighboring countries. We first show that goods traded formally and informally are very different: the overlap between the two types of trade is very thin, suggesting the existence of two separated channels of trade, with agricultural products mainly traded informally. Second we show that goods facing higher tariffs or an import ban explain, as expected, the choice of informality. Finally, we find that trade policies are not the only determinant of informality. Using an indicator of a product's time sensitivity, we find that this variable also contributes to explain the probability of informal trade, in the case of agricultural products, suggesting that informal trade facilitation through the payment of acceleration fees might also play an important role.

**Keywords:** Smuggling, International trade, Trade policy, Time sensitiveness.

## 1 Introduction

Informal trade is pervasive in Africa, with important implications on the functioning of its economies. The evasion of customs duties is a serious concern for many African countries, for which tariffs account for a sizeable share of public receipts (Jean and Mitaritonna, 2010). Moreover, informal cross border trade is also crucial to understand why, the level of intra-Africa trade is low by world standards. While the share of in-trade reached 40% in North America and 63% in Western Europe since mid-2000s, it was estimated at only 10 to 12% in Africa (UNECA, 2015).

On the empirical side, informal trade is inherently difficult to measure. Following the initial idea of Bhagwati (Bhagwati, 1964, 1967), several recent papers have analysed smuggling using mirror data that is, matching importer and exporter

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reported bilateral trade flows. If the source country's reported exports exceed the destination country's reported imports, smuggling can be inferred (Fisman and Wei, 2004; Javorcik and Narciso, 2008; Mishra et al., 2008; Jean and Mitaritonna, 2010; Bouet and Roy, 2012).

Intra-African smuggling, however, cannot be fully apprehended with mirror data, since official trade statistics from both the exporting and importing country fail to record cross-border trade. For instance the recorded trade between Benin and Nigeria is very small.

In this study we exploit a rich survey on informal cross border trade in Benin (named ECENE), conducted by the National Institute of Statistics in 2011, to study the determinants of informal trade compared to formal one. We concentrate on export and re-exports of Benin its neighboring countries. As main source of formal trade we use the COMTRADE database, considering the declaration of Benin versus the same destinations in 2011.<sup>1</sup>

Macroeconomic researches trying to determine the level of informal trade and its determinant (Ayadi et al., 2013; Golub and Mbaye, 2009; Golub, 2012) identify the good smuggled, gather data on their prices across borders and checked whether the price difference observed come from the tariffs, taxes or ban applied in the countries trading informally.

In this paper we also look as main determinants at trade policies variables, such as tariffs applied by importers or bans imposed by Nigeria, and time sensitiveness.

We first show that the two forms of trade are very different: the overlap between goods appearing in each of the databases is very thin, suggesting the existence of two separated channels of trade, with agricultural products mainly traded informally. Second we show that goods facing higher tariffs explain, as expected, the the choice of informality. However tariffs do not play anymore a relevant role in goods facing an import ban in Nigeria, in this case the ban becomes the main significant variable. Finally, we find that trade policies are not the only determinant of informality. Using an indicator of a product's time sensitivity, we find that this variable also contributes to explain the probability of informal trade, in the case of agricultural products, suggesting that informal trade facilitation through the payment of acceleration fees might also play an important role.

The remaining of this paper is organized as follows: in section 2 we remind the context in which the informal trade relations have grown in Benin. In section 3 we describe the informal and formal Benin's bilateral trade patterns. In section 4 we present the empirical strategy used to look at the main determinants of informal trade flows and we present the results. Section 6 concludes.

## 2 Entrepot trade in Benin: context

Benin is a French-speaking country in West Africa with a population of 10 million. It started to be an *Entrepot* economy at the end of the 1960's (Igue and Soule, 1992).

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<sup>1</sup>It has to be noticed that the COMTRADE UN database is not deprived of problems. The quality of the data depends on the reliability of the reports made by custom agencies. In addition value reported can be subjected to under invoicing and the nature of the products to mis-classification

Lacking natural resources and an industrial basis, but benefiting from a good access to the Atlantic Ocean through the port of Cotonou, the country positioned itself as a hub for trade flows to its landlocked neighboring countries, Burkina Faso and Niger, as well as to Nigeria, its giant neighbor country (170 million inhabitants).

In the case of Nigeria, rather than the access to the ocean, other factors have contributed to make trade with Benin attractive. Among these were the political turmoil associated with the Biafra war between 1967 and 1970, the increase of oil revenues in Nigeria after 1974, and, importantly, the protectionist trade policy in this country. Nigeria adopted an import substitution strategy of industrialization soon after its independence, with a concomitant high level of tariffs, as well as a list of import prohibitions for various goods. Despite the country's adoption of a structural adjustment program in 1986 (in theory implying a more open trade policy), the participation to the World Trade Organization from its start in 1995, the participation to the Economic Community of West African States (ECOWAS), and the adoption of ECOWAS common external tariffs in 2005, a number of import bans are still in place to this date (Volker, 2010). By contrast, Benin adopted an open trade policy after 1989. Therefore, trade protection levels in the two countries differ widely. Numerous consumption goods, such as edible oil or poultry meat, are banned for import in Nigeria, while facing no or low tariffs in Benin.

This situation has led to the development of trade between Benin and Nigeria on a large scale. This trade involves imports from third countries, which are imported into Benin at the port of Cotonou, before crossing the land border to Nigeria, as well as products of Benin, or of other West African countries. A large part of this trade is informal, i.e. illegal and unrecorded (Raballand and Mjekiqi, 2010).

As the map in figure 1 shows, the port of Cotonou is close to Lagos and to the south-western region of Nigeria, where a large part of economic activity concentrates. Qualitative accounts show how goods are transported through various routes, crossing the Benin-Nigeria border at several points along the border. An important part of the trade also transits through Niger, to reach the large market of Kano in north-west Nigeria (Walther, 2015).

Having goods transit through Cotonou may involve only a small increase in distance, and this may be compensated by gains in cost and time associated with this route. Similarly, exporting goods from Benin to Nigeria may involve a choice between a formal, or legal route, and an informal one. Different protection levels clearly create incentives for smuggling. In addition, case studies on the case of Benin (Bako-Arifari, 2001; ?) suggest that weak enforcement at government agency levels, as well as the slowness of custom procedures, could also play a role. In the following sections, we study some of these determinants of the choice of informal trade, using data for both formal and informal trade flows.

## 3 Data and descriptive statistics

### 3.1 Data

In order to study the determinants of informal trade compared to formal one in Benin, we use different sources of data. For informal (not recorded) trade we use



Figure 1: Map of Benin and its neighbours

the ECENE survey, which has been conducted by the national institute of statistics of Benin in 2011. Its objective has been to quantify informal trade at Benin borders. To realize this, 171 border crossing passages identified as actively used by smugglers were surveyed in the month of September 2011. Information through questionnaire addressed to informal traders were gathered on the nature, quantity and the value of smuggled goods. The ECENE survey contains information at a very detail level of products (HS10) crossing the Benin borders in different ways: export, re-exports, import and transit. 8883 border crossings were recorded and 10415 flow of goods identified (INSAE, 2011). In this first part of our research we concentrate on export and re-exports of Benin to Togo, Niger and Nigeria, the three destinations with the largest frequency of informal trade exchanges. We are aware that the largest part of trade activities of Benin is done by transit however at the moment we do not have any information on the transit activity registered by customs in Benin in 2011. Formal trade (or registered trade) is recorded in the COMTRADE UN trade database. Data is available in both databases for the year 2011. However, COMTRADE contains flows only at the country level using the HS6 Rev3 nomenclature. For the sake of comparison, the full ECENE database has been aggregated accordingly.

For trade policies measures, we use the MFN tariffs as well as the preferential tariffs by HS6 product applied by the different Benin's neighboring countries for the year 2011. Tariffs have been provided by the customs of each country. An important work has been done to reconstruct a complete database of Nigerian Bans at the product level for the year 2011, using documents published by Nigeria's minister of Finance and WTO reports. At the end of the nineties, the government of Nigeria had a plan to phase out import bans. 23 products were facing bans in 1998, and a number of these were replaced by high tariffs between 1999 and 2001. However, the trend reversed in 2002(WTO, 2005). 218 products (HS4) had an import ban at the end of 2004. This prohibition list remained essentially unchanged until the end of 2008, when a number of products were removed from the list. This was in part a

consequence of Nigeria’s membership of ECOWAS, which required it to align with the group’s common external tariff. However, numerous products remained on the prohibition list after 2008, in a context where the implementation of the ECOWAS common tariff was subject to negotiations between Nigeria and other members, and was repeatedly delayed.

Finally the information for time sensitiveness at the HS4 level have been kindly provided by Hummels and Schaur Hummels and Schaur (2013).

### 3.2 Descriptive statistics by product in informal and formal trade

Table 1 provides some statistics by product recorded in the ECENE database, for re-export and export of Benin with its neighboring countries.

Table 1: ECENE Database - re-export and export by product (2011)

Agregation level	re-export : Nbr of products			export : Nbr of products		
	HS6	HS4	HS2	HS6	HS4	HS2
Destination						
Ghana	3 (0)	2	2	0 (0)	0	0
Niger	7 (1)	7	6	10 (9)	10	6
Nigeria	73 (26)	55	33	112 (59)	86	38
Togo	26 (4)	22	19	110 (48)	88	43
Burkina	1 (0)	1	1	2 (1)	2	2
Total	110 (31)	87	61	234 (117)	186	89

In parentheses the number of agricultural products, as defined by the WTO, excl. processed food.

Several points are worth highlighting. Firstly, the main countries to which Benin trade informally with are Nigeria, Togo and Niger. In the following we will focus on these three destinations. Secondly, from column 1 and column 4, we can notice that the distribution of products is balanced between agricultural and non-agricultural ones, in particular in the case of export. Finally, if we look at the number of products by the different aggregation level (HS6, HS4 or HS2), we can say that products are quite widespread across sectors.

The following relevant aspects emerge when comparing informal to formal trade, by destination (see table 2):

- the number of informal products are quite important, often more than formal ones. In particular agricultural products are more frequent in the ECENE database.
- the two types of trade seem to be complementary. Indeed, very few of the HS6 products are recorded in both databases, providing evidence of two separated channels of trade. For re-export there is only one product at the HS6 level, that is re-exported informally and formally to Togo (code 271019, which is oil) and also only one at the HS4 level (code 2710); while in the case of export we find 5 HS6 products exported in both ways to Nigeria and 11 to Togo, mainly industrial items.

Table 2: ECENE and COMTRADE by product (2011)

Destination	re-export			export		
	Nb HS6 ECENE	Nb HS6 COMTRADE	HS6 Common pdts	Nb HS6 ECENE	Nb HS6 COMTRADE	HS6 Common pdts
Niger	7 (1)	5 (0)	0	10 (9)	41 (3)	0
Nigeria	73 (26)	15 (0)	0	112 (59)	47 (5)	5(2)
Togo	26 (4)	19 (1)	1 (0)	110 (48)	89 (7)	11 (2)

In parentheses the number of agricultural products, as defined by the WTO, excl. processed food.

Table 3: ECENE and COMTRADE by product under a ban in Nigeria (2011)

Destination	re-export		export	
	Nb HS6 with a Ban2011 ECENE	Nb HS6 with a Ban2011 COMTRADE	Nb HS6 with a Ban2011 ECENE	Nb HS6 with a Ban2011 COMTRADE
Niger	1 (0)	0	3 (2)	13(0)
Nigeria	28 (8)	2 (0)	29(13)	12(4)
Togo	0	0	0	0

In parentheses the number of agricultural products, as defined by the WTO, excl. processed food.

Note: we consider that the ban imposed in Nigeria is not relevant in the case of Togo.

## 4 Regressions results. Trade policies as main determinants

In this part we measure the importance of trade policies measures as main determinants of informal cross-border trade, compared to formal one. We first perform a linear probability model, then as robustness check a probit model to test the impact of tariff and bans for a goods to appear in informal, rather than in formal trade. We treat separately the case of re-export and export, in subsection 4.1 and in subsection 4.2, respectively. Results we obtain at this stage are very similar for both cases. In both database we drop double observations at the HS6 level for any given destination. Moreover, as destinations we only consider Niger, Nigeria and Togo, the three destinations with the largest frequency of informal trade exchanges.

The dependent variable takes the value of 1 if the HS6 product is recorded as informal and 0 otherwise. As tariff we take the MFN in the case of re-export and the preferential tariff in the case of exports, that importers apply at the HS6 level.

Note that we define the *Ban2011* variable as an indicator being 1 for HS6 products for which a ban has been implemented in Nigeria in 2011 at least to one product within the HS6 category. We just leave the same value also for Niger, as it is well known that often goods under a ban in Nigeria are smuggled through Niger.

### 4.1 Results for re-export

In table 4 we use a linear probability model to test the impact of import bans and tariffs on the probability for a goods to appear in informal, rather than in formal trade, for re-export.

It is important to notice that in each regressions we control for destination fixed effects, and we introduce a dummy for agricultural products. The inclusion of such a dummy is dictated primarily by the fact that agricultural products in re-exports are exclusively registered in the ECENE database. From column 1 we can see that the effect of tariff are positive and significant in explaining the informality. The same in column 2 for Ban2011 alone. In column 3 the effect of Ban2011 disappears, because a collinearity problem. Indeed a product facing a ban is often subject to a low tariff, but in the case where there is a ban applied, tariff is not important anymore, as the ban is a prohibitive barrier. We introduce an interaction in column 4, which in fact confirms this;<sup>2</sup> the variable Ban2011 returns to be positive and statistically significant. From columns 5 to 7 we show results at country level. We can notice that tariff play a crucial role in the case of Togo, while in the case of Nigeria the variable ban is the main determinant, as well as when considering Niger and Nigeria.

When we perform a probit model results from the linear model still hold (see table 5).

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<sup>2</sup>Indeed the difference between the coefficient for tariff plus standard error and the coefficient of interaction minus standard error overlap

Table 4: Determinants of informal and formal trade: re-export. Linear model.

	Dep. variable:1 if Ecene , 0 if Comtrade						
	(1)	(2)	(3)	(4)	(5-Tgo)	(6-Nga)	(7- Ner and Nga)
MFN2011	2.618*** (0.455)		2.525*** (0.467)	3.424*** (0.539)	5.450*** (0.846)	2.474*** (0.677)	2.520*** (0.613)
Diff MFN	-2.545 (2.100)		-2.570 (2.095)	-2.979 (2.108)			-2.859 (2.135)
Ban2011		0.182** (0.071)	0.062 (0.079)	0.791*** (0.164)		0.658*** (0.193)	0.664*** (0.182)
MFN2011*Ban2011				-4.241*** (0.752)		-3.274*** (0.930)	-3.316*** (0.852)
Diff MFN*Ban2011				5.150 (2.556)			5.022 (2.543)
Agr Dummy	0.210*** (0.058)	0.261*** (0.060)	0.213*** (0.060)	0.296*** (0.059)	0.317** (0.135)		0.291*** (0.060)
Destination F..E	Yes	Yes	Yes	Yes			Yes
<i>N</i>	144	144	144	144	44	88	100
<i>R2</i>	0.304	0.158	0.306	0.376	0.446	0.281	0.322

Standard errors in parentheses. All regressions are clustered at the HS6 level.

Each specification includes a constant term.

Diff MFN measures by product the difference in tariff between Nigeria and Niger.The variable is always zero for Togo an Nigeria

\* p<0.1, \*\* p<0.05, \*\*\* p<0.001

Table 5: Determinants of informal and formal trade: re-export. Probit Model.

	Dep. variable:1 if Ecene , 0 if Comtrade			
	(1)	(2-Tgo)	(3-Nga)	(4- Ner and Nga)
MFN2011	13.138*** (2.779)	17.754*** (4.152)	10.411*** (3.611)	10.110*** (3.123)
Diff MFN	-9.491 (6.736)			-8.691 (6.539)
Ban2011	2.313*** (0.900)		2.075** (0.960)	2.040** (0.932)
MFN2011*Ban2011	-12.395** (5.200)		-9.795* (5.777)	-9.495* (5.482)
Diff MFN*Ban2011	(empty)			(empty)
Agr Dummy	1.743*** (0.461)	1.297** (0.606)		
Destination F..E	Yes			Yes
<i>N</i>	143	44	62	72
<i>PseudoR2</i>	0.374	0.376	0.235	0.250

Standard errors in parentheses. All regressions are clustered at the HS6 level.

Each specification includes a constant term.

Diff MFN measures by product the difference in tariff between Nigeria and Niger.The variable is always zero for Togo an Nigeria

\* p<0.1, \*\* p<0.05, \*\*\* p<0.001

## 4.2 Results for export

For sake of comparison with the re-export case, we first perform in column 1-column 4 regressions including an agriculture dummy. Then we also try regressions including HS2 fixed effects in column 5-column 8 see table 6.

The results are similar even if the magnitude of the results including product fixed effects is more attenuated than those with the dummy agriculture.

Table 6: Determinants of informal and formal trade: export. Linear model.

	Dep. variable: 1 if Ecene , 0 if Comtrade							
	(1)	Agr Dummy			(5)	HS2 FE		
		(2 - Tgo)	(3 Nga)	(4 -Ner and Nga )		(6-Tgo)	(7-Nga)	(8- Ner and Nga)
Bil Tariff	1.198*** (0.417)	1.684*** (0.613)	1.462** (0.584)	0.793* (0.476)	0.710* (0.362)	1.081* (2.165)	0.211 (0.482)	0.455 (0.005)
Diff MFN Bil	2.156 (0.428)	2.554*** (0.459)			1.125** (0.501)	2.165** (2.165)		
Ban2011	0.471** (0.194)		0.534*** (0.204)	0.454** (0.198)	0.253* (0.175)		-0.074 (0.235)	-0.111 (0.242)
Bil*Ban2011	-2.809*** (1.236)		-3.263*** (1.262)	-2.586** (1.358)	-1.607*** (0.934)		-0.318 (1.710)	-0.133 (1.605)
Diff MFN Bil*Ban2011	omitted				omitted			
Agr Dummy	0.417*** (0.047)	0.374*** (0.070)	0.389*** (0.056)	0.465*** (0.057)				
Destination F..E	Yes	Yes	Yes	Yes	Yes			Yes
HS2 F..E					Yes	Yes	Yes	Yes
N	409	199	159	210	409	199	159	210
R2	0.318	0.247	0.211	0.394	0.603	0.579	0.699	0.716

Standard errors in parentheses. All regressions are clustered at the HS6 level.

Each specification includes a constant term.

We apply to Niger the same structure of protection in Nigeria

\* p<0.1, \*\* p<0.05, \*\*\* p<0.001

Table 7: Determinants of informal and formal trade: export. Probit model.

	Dep. variable: 1 if Ecene , 0 if Comtrade							
	(1)	Agr Dummy			(5)	HS2 FE		
		(2 - Tgo)	(3 Nga)	(4 -Ner and Nga )		(6-Tgo)	(7-Nga)	(8- Ner and Nga)
Bil Tariff	4.411*** (1.392)	5.421*** (1.754)	5.005** (2.113)	3.146* (1.778)	3.603* (1.892)	5.074* (2.752)	6.516 (5.400)	2.565 (3.358)
Diff MFN Bil	7.167*** (1.500)	8.191*** (1.554)			5.031** (0.261)	12.994*** (4.012)		
Ban2011	1.996** (0.833)		2.263** (0.941)	2.217** (0.967)	1.556* (0.960)		-0.581 (1.682)	-0.973 (1.683)
Bil*Ban2011	-12.029*** (6.254)		-14.121*** (7.772)	-12.867** (7.966)	-9.243* (5.129)		-6.632 (10.739)	-0.520 (9.970)
Diff MFN Bil*Ban2011	omitted				omitted			
Agr Dummy	0.417*** (0.047)	1.267*** (0.260)	1.645*** (0.301)	1.930*** (0.315)				
Destination F..E	Yes	Yes	Yes	Yes	Yes			Yes
HS2 F..E					Yes	Yes	Yes	Yes
N	409	199	159	210	299	133	55	89
R2	0.280	0.210	0.211	0.362	0.420	0.318	0.159	0.374

Standard errors in parentheses. All regressions are clustered at the HS6 level.

Each specification includes a constant term.

We apply to Niger the same structure of protection in Nigeria

\* p<0.1, \*\* p<0.05, \*\*\* p<0.001

## 5 Regressions results. Looking for other determinants: time sensitivity

In this section we try to test whether informal trade facilitation through the payment of acceleration fees might also to have an importance. As a measure of time sensitivity we use estimation provided by Hummels and Schaur. The authors in their paper (Hummels and Schaur, 2013) estimated a model exporters' choice between fast, expensive air cargo and slow, cheap ocean cargo, which depends on the price elasticity of demand and the value that consumers attach to fast delivery. Using imports data for the US they provide rich variation in the premium paid for air shipping and in time lags for ocean transit to extract consumers' valuation of time. They estimate that each day in transit is equivalent to an ad-valorem tariff of 0.6 to 2.1 percent. Authors find a different effects for the two categories of products: fresh (perishable goods) and part and components. For perishable goods they find that a higher "fresh" share increases the use of air shipment, but does not significantly interact with transit days, suggesting that products such as "fresh fish" are so time sensitive that any delay longer than a few days ruins the product. The effect shows up entirely in a higher use of air shipment for all exporters, regardless of ocean transit time to the US. For parts and components instead and components share of trade for a given exporter-HS6 product results in a sharp increase in the time sensitivity of that trade. Comparing a product with zero component share to one that is 100 percent components raises time sensitivity by 60 percent.

Hummels and Schaur provided us with unpublished estimations of time sensitivity at the HS4 level. Unfortunately information are not always available for all the products in our database. In particular in the case of re-export we can test this determinant only for industrial products. Moreover the distribution of the indicator is very noisy, with some negative values. This is likely for two reasons, as suggested by authors. First, there is an issue of sampling or there are some products that have very low observation counts with very imprecise estimating values. As we do not have information on the number of observations by products or the standard deviation of the index of time sensitivity estimated, at this stage to deal with negative values we normalize the distribution of the index, subtracting from each observation the minimum value and dividing by the standard deviation. Moreover we drop the most extreme values.

In table 8 we show linear estimations for re-export (column 1 and 2) and export (column 5-10), including this measure of time sensitivity. As we can see in column 1, column 3 and column 6, estimations for trade policies variables do not change significantly when using only the sample of goods for which we have information on time sensitivity.

The measure of time sensitivity does not seem to be an important determinant of informal trade, when considering industrial products, while becomes positive when including agricultural products.

Table 8: Adding time sensitiveness. Linear model.

	re-export			export					
	(1 Industry)	(2 Industry)		(1 All)	(2 All)	(3 Industry)	(1 All)	(2 All)	(3 Industry)
MFN2011	3.546*** (0.659)	3.822*** (0.661)	Bil Tariff	1.420*** (0.463)	1.452*** (0.452)	1.720*** (0.530)	1.050*** (0.402)	1.195*** (0.413)	1.390*** (0.467)
Diff MFN	-2.810 (2.287)	-1.999 (2.338)	Diff MFN Bil	2.079*** (0.502)	2.117*** (0.485)	2.498*** (0.641)	1.708*** (0.610)	1.941*** (0.627)	2.214*** (0.776)
Ban2011	0.692*** (0.186)	0.748*** (0.186)	Ban2011	0.607** (0.305)	0.617** (0.298)	0.569* (0.452)	0.263 (0.256)	0.276 (0.259)	0.269 (0.285)
MFN2011*Ban2011	-3.458*** (0.956)	-3.740*** (0.961)	Bil*Ban2011	-3.660** (1.870)	-3.645** (1.809)	-3.087* (2.616)	-1.773 (1.432)	-1.719 (1.421)	-1.452 (1.831)
Diff MFN*Ban2011	5.519	4.606	Diff MFN Bil*Ban2011	omitted	omitted	omitted	omitted	omitted	omitted
Time sensitiveness		0.685 (0.704)	Time sensitiveness		0.088*** (0.030)	0.050 (0.88)		0.131* (0.088)	0.098 (0.992)
HS2 F.E.	No	No	HS2 F.E.	No	No	No	Yes	Yes	Yes
Dest. F.E.	Yes	Yes	Dest. F.E.	Yes	Yes	Yes	Yes	Yes	Yes
<i>N</i>	104	103	<i>N</i>	324	324	170	324	324	249
<i>R</i> <sup>2</sup>	0.312	0.332	<i>R</i> <sup>2</sup>	0.287	0.300	0.406	0.587	0.587	0.547

Standard errors in parentheses. All regressions are clustered at the HS6 level.

Each specification includes a constant term.

\* p<0.1, \*\* p<0.05, \*\*\* p<0.001

## 6 Conclusion

In this paper, we study the determinants of informal cross-border trade between Benin and its neighbors. We combine two exhaustive trade data sources, the ECENE database, for goods traded informally and the COMTRADE database, for goods exchanged formally. The ECENE database is a survey of informal transactions conducted by INSAE in Benin in 2011; the COMTRADE database gathers all formal international trade flows. We compare goods appearing in formal and informal transactions in 2011; we focus for now on export and re-export flows between Benin and its neighbors (mainly Togo, Nigeria, and Niger). As main determinants we look at trade policies variables, such as tariffs applied by importers or bans imposed by Nigeria.

We first show that these goods are very different: the overlap between goods appearing in each of the databases is very thin, suggesting the existence of two separated channels of trade. Second we show that goods facing higher tariffs explain, as expected, the the choice of informality. However tariffs do not play anymore a relevant role in goods facing an import ban in Nigeria, in this case the import ban becomes the main significant variable. Finally, we find that trade policies are not the only determinant of informality. Using an indicator of a product's time sensitivity, we find that this variable also contributes to explain the probability of informal trade, in the case of agricultural products, exported in majority through the informal channel, in particular concerning the agricultural goods, suggesting that informal trade facilitation through the payment of acceleration fees might also have an important role.

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