DOCUMENT

DE TRAVAIL

N° 526

TRADE NETWORKS AND COLONIAL TRADE SPILLOVERS

Antoine Berthou and Hélène Ehrhart

December 2014

DIRECTION GÉNÉRALE DES ÉTUDES ET DES RELATIONS INTERNATIONALES

DIRECTION GÉNÉRALE DES ÉTUDES ET DES RELATIONS INTERNATIONALES

TRADE NETWORKS AND COLONIAL TRADE SPILLOVERS

Antoine Berthou and Hélène Ehrhart

December 2014

Trade Networks and Colonial Trade Spillovers*

Antoine Berthou† Hélène Ehrhart‡

*We thank Thomas Chaney, Douglas Campbell, Luca de Benedictis, Jaime de Melo, Jose de Sousa, Lionel Fontagné, Samuel Guerineau, Thierry Mayer, Tony Venables, Vincent Vicard for insightful discussions and comments. We are also grateful to the participants of the Banque de France-CERDI seminar (May 2013), the ETSG conference (September 2013), the Leuven conference on economic networks (October 2013), the 5th conference on economics of Global interactions in Bari (September 2014). This article does not reflect the views of the Banque de France.

†Corresponding author. Banque de France. E-mail: antoine.berthou@banque-france.fr. Banque de France, 31 rue Croix des Petits Champs, 75001 Paris.

‡Banque de France. E-mail: ehrharthelene@gmail.com

Abstract

This paper provides new empirical evidence regarding the formation of international trade networks. We test whether trade experience in a given country can generate new trade opportunities with other countries, and investigate the role played by geographical and political factors. We address the issue of the endogeneity in the formation of trade networks by using the experience of ancient trade linkages between former colonies and their former colonizers (*colonial trade linkages*). We firstly show, using aggregate trade data, that former colonies have more trade with countries being geographically more proximate or having more trade with the former colonizer (*colonial trade spillovers*). We then show that the microeconomic dynamics of former colonies' exports and imports at the product level is significantly influenced by the geographical proximity between trade partners and the former colonizer, or their degree of economic integration. These results are consistent with the predictions from models of trade networks (Chaney, 2014). Overall, they confirm that the microeconomic dynamics of trade contribute to shape the cross-sectional distribution of aggregate trade flows across countries.

JEL classification: F14, F15

Keywords: International trade dynamics, networks formation, colonies.

Résumé

Cet article propose une analyse des réseaux du commerce international et de leur formation. Nous nous intéressons en particulier aux effets de l'expérience d'exportation ou d'importation sur la création de nouvelles relations commerciales, et au rôle joué par les facteurs géographiques et politiques. Afin de contrôler de l'endogénéité dans la formation de ces relations, notre approche empirique repose sur l'expérience des liens commerciaux coloniaux qui relient anciennes colonies et anciens colonisateurs. Nous montrons dans un premier temps, à partir de données agrégées du commerce, que les anciennes colonies françaises et britanniques commercent davantage avec des pays géographiquement proches des anciens pays colonisateurs, ou ayant une plus forte intensité du commerce avec ces pays. Nous montrons ensuite que la dynamique microéconomique du commerce au niveau des produits est influencée très significativement par la proximité géographique entre le partenaire commercial et l'ancien colonisateur, ou leur degré d'intégration économique. Ces résultats sont cohérents avec les prédictions du modèle théorique développé par Chaney (2014) sur la formation des réseaux de commerce. Ils confirment également que la dynamique du commerce au niveau microéconomique contribue à expliquer la distribution géographique des flux de commerce au niveau macroéconomique.

Classification JEL: F14, F15

Mots-clé: Dynamique du commerce international, formation des réseaux de commerce, colonies.

Non-technical summary

This paper provides new empirical evidence regarding the formation of international trade networks. Business networks are probably one of the most prominent forces shaping international trade flows. They contribute to explain the geographical distribution of trade across countries (Chaney, 2013, 2014), as well as the transmission of shocks across sectors and borders (Acemoglu *et al.*, 2012; di Giovanni and Levchenko, 2010; Johnson, 2012). Understanding better how these trade networks are formed, and their functioning, is therefore of a great interest for researchers and policy makers.

Our objective is to provide new empirical evidence regarding the formation of a trade network. Our strategy is guided by the theoretical work by Chaney (2014), which predicts that trade networks expand over time to more distant locations through the existing networks of trade partners. We test whether trade experience in a given country can generate new trade opportunities with other countries, and investigate the role played by geographical and political factors (contiguity of countries, geographical distance, or the degree of economic integration in particular).

In doing so, we need to deal with the endogeneity that characterizes the formation of networks. This problem has indeed been well identified in the social networks literature (Manski, 1993; Bramoullé *et al.*, 2009; Zenou and Topa, 2014). For instance, a trade linkage formed by two countries may contribute to the creation of new trade linkages, or in return result from the trade history of these two partners with third countries. In order to identify empirically how trade networks are formed, we therefore need to identify which are the links that were formed ex-ante, and how it affected trade with other countries ex-post.

We address this empirical issue by using the experience of ancient trade linkages between former colonies and their former colonizers (*colonial trade linkages*), which has been well established in the trade literature (Head *et al.*, 2010). Former colonies trade more with their former colonizer than with other countries, controlling for other factors. This empirical pattern has been attributed, beyond preferential trade policy or monetary agreements, to the existence of informal institutions taking the form of rules and practices facilitating business, some of them having survived consecutive to the decolonization process (Rauch, 2001; Head *et al.*, 2010). Given the strength and the stability of the colonial trade linkage until recent years, it is unlikely to result from other trade relations. We therefore use this linkage in order to explore the formation of trade networks consecutive to trade experience.

We firstly show, using aggregate trade data, that former colonies have more trade with countries being geographically more proximate or having more trade with the former colonizer (*colonial trade*

spillovers). We then show that the microeconomic dynamics of former colonies' exports and imports at the product level is significantly influenced by the geographical proximity between trade partners and the former colonizer, or their degree of economic integration. More precisely, trade experience of former colonies with the former colonizer increases the probability to trade similar good with the former colonizer's neighbors, or countries sharing a trade agreement with him. This mechanism is observed both on the export and import side. Furthermore, third countries' export experience into former colonizer's market also increases the probability of exporting to the former colony.

This paper contributes to the recent literature on trade dynamics (Albornoz *et al.*, 2012; Defever *et al.*, 2011; Nguyen, 2012), and the results that are presented are consistent with the predictions from models of trade networks (Chaney, 2014). We provide empirical evidence that the micro channels that govern the formation of trade networks can explain some empirical patterns in the geographical distribution of trade flows by countries, such as the importance of third EU countries in the total trade of former British and French former colonies.

1 Introduction

Business networks are probably one of the most prominent forces shaping international trade flows. They contribute to explain the geographical distribution of trade across countries (Chaney, 2013, 2014), as well as the transmission of shocks across sectors and borders (Acemoglu *et al.*, 2012; di Giovanni and Levchenko, 2010; Johnson, 2012). Understanding better how these trade networks are formed, and their functioning, is therefore of a great interest for researchers and policy makers.

Our objective is to provide new empirical evidence regarding the formation of a trade network. Our strategy is guided by the theoretical work by Chaney (2014), which predicts that trade networks expand over time to more distant locations through the existing networks of trade partners. We test in particular whether trade experience in a given country can generate new trade opportunities with other countries, and investigate the role played by geographical and political factors. On the empirical side, the challenge is to deal with the endogeneity of the trade links. Suppose the simple example of a three countries' network A, B and C. The trade experience of country A with country B could generate new trade opportunities with country C, but the A-B trade relation could itself result from the A-C linkage. This problem is similar to the *reflection problem* in the social networks literature (Manski, 1993; Bramoullé *et al.*, 2009; Zenou and Topa, 2014). The empirical analysis of the trade network formation therefore requires starting from a pair of countries having a well established trade relation, which is not itself endogenously determined by other trade relations.

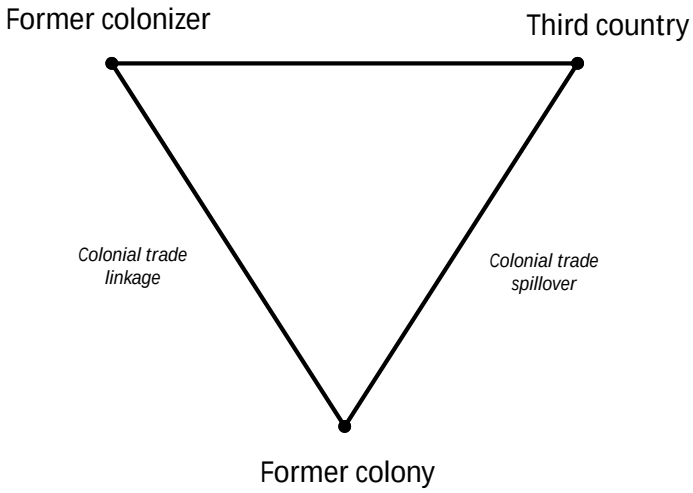
We make use of the experience of the preferential trade relations between former colonizers (France and the United Kingdom) and their former colonies (*colonial trade linkage*), which has been well established in the trade literature (Head *et al.*, 2010). Former colonies trade more with their former colonizer than with other countries, controlling for other gravity forces and multilateral resistance terms. This empirical pattern has been attributed, beyond preferential trade policy or monetary agreements, to the existence of informal institutions taking the form of rules and practices facilitating business, some of them having survived consecutive to the decolonization process (Rauch, 2001; Head *et al.*, 2010)[1]. Given the strength and the stability of the colonial trade linkage until recent years, it is unlikely to result from other trade relations. We therefore use this linkage in order to explore the formation of trade networks consecutive to trade experience.

Our empirical strategy focuses on French and British colonial empires. In doing so, we are

[1](Head *et al.*, 2010) provide empirical evidence of the erosion of colonial trade linkages. See also the work by Mitchener and Weidenmier (2008) about trade linkages within colonial empires. de Sousa and Lochard (2012) investigate the colonial legacy in terms of export performance of developing countries. More generally, a large number of works use the colonial relationship dummy as a control in gravity equation estimations, and find a robust positive and highly significant colonial trade linkage.

particularly interested in a network of countries depicted by Figure 1 below. We investigate whether colonial trade linkages generated some trade spillovers with third countries, and contributed to shape the geographical distribution of trade flows of British and French former colonies with other countries.

Figure 1: Colonial trade linkage and spillover



We firstly provide empirical evidence, using aggregate bilateral exports data for the period 1995-2007 for a large set of countries (BACI dataset), that former colonies of British and French colonial empires have more trade – exports or imports – with countries being geographically more proximate or having more trade with the former colonizer than other countries. This result is obtained from the estimation of a gravity equation, controlling in particular for different factors such as bilateral distance, trade policy, language or migrations that would directly affect the value of trade between country pairs, as well as for multilateral resistance terms that would influence former colonies' trade propensity with the rest of the world. Results overall confirm the presence of a colonial trade spillover, which affects the cross-sectional distribution of bilateral trade values of former colonies towards former colonizers' neighbors.

We then test for the presence of trade spillovers in relation to the colonial trade linkage. We are particularly interested in exploring how trade networks expand over time. Following the predictions from the model of endogenous trade networks by Chaney (2014), we expect that the development of trade networks is biased towards existing trade partners' neighbors. The empirical strategy relies on the estimation of a linear probability model, and uses information about bilateral exports

and imports values at the product-level. The key variable in this model is the export or import experience for a certain product in the colonizer's market; this variable is then interacted with various factors (geography, economic integration, language and the legal system) that link the trade partner with the former colonizer. The results indicate that trading with the former colonizer a certain product increases the probability of trading (exporting or importing) the same product with former colonizer's neighbors, or countries characterized by a high degree of economic integration with him (sharing the same currency, being part of the same customs union). We also find that the import probability of a former colony is increased when the third country previously exported the same product in the former colonizer's market.

These results are, overall, supportive of the model of trade networks by Chaney (2014). In this model, firms can expand in different markets through "direct search" or "remote search" in the presence of search frictions. With the latter, firms can search for new trade partners using their network of clients and suppliers, which allows them to expand their trade relations with more distant countries over time.[2] These results are also consistent with trade theories that emphasize the role played by learning or matching through trade experience in a foreign market (Albornoz *et al.*, 2012; Defever *et al.*, 2011; Nguyen, 2012). Both trade models with learning into exports market and the model of trade networks by Chaney (2014) predict that trade experience can generate a geographical spread of imports and exports.

Empirical evidence of such mechanisms has been produced mostly using firm-level data for single countries.[3] Chaney (2014) shows using French firm-level data that where the firm exports in the current year is partly determined by where it was exporting previously, and that geography plays a key role in the path of exports expansion of the firm. Albornoz *et al.* (2012) demonstrate that Argentinean exporters sequentially export into foreign markets, starting from neighboring countries.[4] Defever *et al.* (2011) use the end of multi-fibre agreements to predict Chinese firms' entry into EU, US and Canadian markets. They show that after entry, Chinese firms tend to expand towards markets that were geographically and culturally proximate from previous destinations. Morales *et al.* (2011) use a moments inequalities approach to predict the path of exports expansion

[2]This completes different works that have emphasized the role played by the matching process between suppliers and clients in international trade (Rauch and Watson, 2003; Eaton *et al.*, 2010; Araujo *et al.*, 2012; Aeberhardt *et al.*, 2012).

[3]These works complete previous empirical work using firm-level data showing results consistent with a high degree of uncertainty in international markets affecting the dynamics of exports after entry (Eaton *et al.*, 2008; Freund and Pierola, 2010; Berthou and Vicard, 2013). Using product-level trade data, Carrère and Strauss-Kahn (2012) show that previous export experience by developing countries into non-OECD markets, for a given product, raises export survival in OECD markets.

[4]Their result is consistent with previous evidence by Evenett and Venables (2002) showing a geographical spread of exports.

of firms into foreign markets by Chilean exporters. Their empirical structural model emphasizes the role played by *gravity* and *"extended" gravity* forces, the latter depending on the similarity between the destination, and countries where the firm exported previously. In our approach, we use exports data at the product level for several countries and consider all potential destinations in this data. We use the experience of the colonial trade linkage to explore how trade networks expand over time and space. We provide empirical evidence that the micro channels that govern the formation of trade networks can explain some empirical patterns in the geographical distribution of trade flows by countries, such as the importance of third EU countries in the total trade of former British and French former colonies.

Finally, our results are also consistent with the geographical concentration of production networks emphasized in recent works on global value chains (Johnson and Noguera, 2012a,b), as trading with companies located in the former colonizer's market may generate new trading opportunities with other members of the same production network.[5]

The paper is organized as follows. Section 2 presents the empirical methodology and the data used in our estimations. Evidence of a colonial trade spillover is presented in Section 3. In Section 4, we use the product detail of the bilateral exports data and provide evidence that the microeconomic dynamics of trade contribute to explain the existence of a colonial trade spillover. We also discuss the relevance of these results with respect to theoretical predictions. The last section concludes.

2 Colonial trade spillovers: aggregate evidence

2.1 A gravity-augmented model

We start by an estimation of a gravity equation. Our objective is to identify if the colonial trade linkage between former colonizers (France and the United Kingdom) and their former colonies generated some trade spillovers with third countries, which could have distorted the geographical distribution of trade values. We test in particular the role played by geographical distance between any given partner country and the former colonizer, or their trade intensity. Trade spillovers are indeed expected to be geographically concentrated in models of trade networks and models of

[5]There is anecdotal evidence that Renault car factories in Marocco use inputs from Renault factories, or suppliers, mainly located all over Europe. The new Renault factory in Tanger import inputs from Romania, Turkey and Spain, according to the director of Renault's new factory in Morocco. See the interview in "Jeune Afrique": http://www.jeuneafrique.com/Article/JA2667p064.xml0/france-maroc-mohammed-vi-interviewtunc-basegmez-renault-tanger-a-donne-du-travail-a-la-france.html. In Spain, Renault is producing motor engines (Valladolid), gearbox and transmission (Sevilla and Cacia) that can be used as inputs for the production of cars in Morocco. See the Renault annual report 2011. Besides, Valeo, one of the suppliers of Renault cars, is mainly located in Europe.

learning discussed in the introduction.

We estimate Equation 1 below, where Z={UK, FR} is the former colonizer.

$$\ln X_{ijt} = \beta_0 + \sum_{Z=FR,UK} \beta_{1Z} Col_i^Z \times Link_j^Z + \sum_{Z=FR,UK} \beta_{2Z} Col_j^Z \times Link_i^Z + \sum_{Z=FR,UK} \beta_{3Z} Colony_{ij}^Z + \mathbf{C}_{ijt}\Omega' + \kappa_{it} + \kappa_{jt} + \epsilon_{ijt} \quad (1)$$

X_{ijt} is the bilateral exports of country i to country j in year t. Colonial trade linkages are identified by introducing two dummy variables $Colony_{ij}^{UK}$ and $Colony_{ij}^{FR}$ taking the value 1 if the two partner countries had a colonial relationship in the past (were in a colonial relationship after 1945), and 0 otherwise. We provide the list of the former British and French colonies in Appendix Table 1.

We then introduce additional variables in order to assess the importance of colonial trade spillovers. In Equation 1, the variables Col_i^{UK} and Col_i^{FR} take the value 1 if the exporter is a former British or French colony. Variables Col_j^{UK} and Col_j^{FR} take the value 1 if the importer is a former British or French colony. These former colonies' dummy variables are then interacted with a *"Link"* ($Link_j^Z$ or $Link_i^Z$) variable that identifies the linkages (geographical distance or trade intensity) between the former colonizer and the partner country.[6] With this strategy, we can identify for instance pairs of countries where the exporter is a former French colony, and the destination is at a distance X from the former colonizer. Controlling for other gravity forces, the coefficient identifies if indeed former colonies have more trade with countries being less distant or having more trade with the former colonizer. Our main variables of interest are therefore $Col_i^Z * Link_j^Z$ and $Col_j^Z * Link_i^Z$ for each colonizer $Z = \{FR; UK\}$. Note that in the estimations where we include information about the linkages between the former colonizer and the partner country, the former colonizer is by construction excluded from the estimation.

C_{ijt} is a vector of bilateral trade costs that comprise the following bilateral-specific variables. $Distance_{ij}$ measures the geographical distance between i and j and the continuous 0- 1 variable $Religious\,Proximity_{ij}$ captures the common religion between the two countries. The stock of migrants from country i living in country j ($Migrants_{ijt}$) and those migrants from j living in i ($Migrants_{ijt}$) are also included. [7] A set of binary variables indicating that the two countries share a land border ($Contiguity_{ij}$), share common currencies ($Common\,Currency_{ijt}$), speak a common language ($Common\,Language_{ij}$), have a common legal system ($Common\,LegalOrigin_{ij}$), have a

[6]Trade intensity is measured as the total value of bilateral trade with colonizer Z divided by the real GDP of the third country

[7]Migrants have been found to foster international trade as they facilitate the transmission of information and diffuse their preferences (see Rauch and Trindade (2002) or Ehrhart *et al.* (2012) among others).

free trade agreement (FTA_{ijt}), have a common ex-colonizer ($Common\,Colonizer_{ij}$) and have been in a colonial relationship since 1945, except the French and British colonial empire that we treat separately, ($Colony_{ij}^{Other}$), are also included.

In this estimation, we control for multilateral resistance terms using country-year fixed effects.[8] κ_{it} and κ_{jt} are time-varying exporter and importer specific effects. To reduce the computational problem linked with an exceedingly large number of dummy variables, we rely on the *reg2hdfe* Stata command, developed by Guimaraes and Portugal (2010). This iterative method is discussed by Head and Mayer (2013). ϵ_{ijt} is the error term.

2.2 Data

The estimation uses annual data from 1995 to 2007 for all pairs of countries in the world. The trade data are from BACI, a dataset developed by the CEPII which provides bilateral values of exports at the HS 6-digit product disaggregation since 1995. It is constructed using COMTRADE data and an original procedure that reconciles the declarations of the exporter and the importer to extend considerably the number of countries for which trade data are available (Gaulier and Zignago, 2010). In this section, we aggregate the data along the country-pair-year dimension in order to focus on aggregate trade. To avoid the great trade collapse episode beginning in 2008, the last year of the analysis is 2007.

Data on GDP and trade costs are from the CEPII gravity dataset. We augment their regional trade agreement variable with three important agreements that shape the trade relationships between North and South countries. First, the Everything but Arms agreement, that entered into force in 2001, grants a duty-free access to imports of the EU of all products from less developed countries, except arms and ammunitions, without any quantitative restrictions. Second, the Cotonou Agreement entered into force in 2003 and is a partnership agreement between the EU countries and 79 countries from Africa, the Caribbean and the Pacific (ACP) based on trade cooperation. Last, the African Growth and Opportunity Act aims at increasing the bilateral trade between the USA and the eligible Sub-Saharan African countries. For measures of religious proximity, common official language and common ethnic language we rely on the variables constructed by Melitz and Toubal (2012). Data on the bilateral stock of migrants have been obtained from the World Bank Global Bilateral Migration Database. These data are only available every ten years, in 1990, 2000 and

[8] Previous papers quantifying the colonial trade linkage have relied on the estimation of a gravity equation, correcting for the multilateral trade resistance terms as emphasized by Anderson and van Wincoop (2003). Head *et al.* (2010) investigate the influence of the colonial trade linkage on bilateral trade flows using a method of ratios ("tetrads") to eliminate country-year fixed effects.

2010, thus to match our annual data we made the assumption that the stock of migrants recorded in a country in a year t remains constant over the period going from $t-4$ to $t+5$.

2.3 Evidence of trade spillovers on aggregate trade

Trade relations with countries of the European Union. In this section, we start by investigating if the colonial trade linkages between former colonizers and their former colonies also increased trade with other EU countries. These countries are indeed geographically close to former colonizers and also have more trade with them. Colonial trade linkages could have therefore generated some trade spillovers between former colonies and third EU countries. Here, we focus on the 15 countries that were, in 1995, members of the EU, namely Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Portugal, Spain, United Kingdom and the Netherlands.

We estimate Equation 1, with our two variables of interest being $ColEU_{ij}^{FR}$ and $ColEU_{ij}^{UK}$. The variable $ColEU_{ij}^{UK}$ takes the value 1 when the country-pair is constituted of an EU country, except United Kingdom, and a former British colony while the variable $ColEU_{ij}^{FR}$ is similarly built but for former French colonies instead of British ones. These two variables allow us to identify whether (or not) EU countries have a higher propensity to trade with former British and French colonies, relative to other countries.

The results are presented in Table 1. The first column shows the regression of exports on the colonial trade spillovers and various gravity characteristics. As established in the literature, we see that former colonies have a preferential trade relationship with their former colonizer. The coefficients associated with the two variables $Colony^{UK}$ and $Colony^{FR}$ are positive and significant at the 1% level. The coefficient implies that British and French former colonies have a level of trade with their former colonizer 3 (=exp(1,114)) to 5 (=exp(1,6)) times above what the gravity equation would otherwise predict in the absence of colonial trade linkage. These numbers are in line with different estimates by de Sousa and Lochard (2012) or Head *et al.* (2010).

We turn now to our variables of interest capturing the colonial trade spillovers i.e. specific trade relationships between former colonies and EU countries beyond traditional gravity factors. The estimated coefficient on the $ColEU_{ij}^{FR}$ and $ColEU_{ij}^{UK}$ dummy variables are positive and significant, which implies that EU countries have relatively more trade with British and French colonies than the rest of the world, controlling for other gravity forces. This result is consistent with the presence of colonial trade spillovers.

All of the gravity variables have the expected signs. The geographical distance between two trading partners lowers international trade whereas having a regional trade agreement, sharing a common ex-colonizer, a common language (both official and ethnic), a common currency, a common legal system and a common border increase the volume of exports between two countries.

In the subsequent columns, we progressively add several variables that could explain the importance of bilateral trade between former colonies and European Union countries. First, in column 2, we add a variable capturing religious proximity and see that the positive signs on the coefficients of the colonial trade spillover variables remain significant. Then adding in column 3 the stock of migrants, the coefficient capturing colonial trade spillovers remains positive and significant at the 1% level.

Thus, after controlling for numerous determinants of bilateral trade and for both importers and exporters multilateral trade resistance through time-varying country fixed effects, we find that the former French and British colonies still trade significantly more with countries that are close to their former colonizer, namely the European Union countries, than with other countries. The coefficients of the estimation reported in column (3) of the Table 1 imply that former French and British colonies trade (e.g. export and import) 1.4 (=exp(0.371)) to 1.5 (=exp(0,414)) times more with EU countries than what would be otherwise predicted by a gravity equation in the absence of such spillovers.

Head *et al.* (2010) document an erosion of the colonial trade linkage since independence between the former colonies and the ex-colonizer. They find that after 40 years, their bilateral trade contracted by about 65%. Whether these colonial trade spillovers should have increased or rather decreased over time remains however unclear. On the one hand, the erosion of the colonial trade linkage could have generated trade opportunities with third countries, especially since the colonial trade linkages before independence could have generated some trade diversion. Also, the deepening of European integration over time through a higher degree of standard harmonization or the introduction of the euro in 1999 may have also generated additional trade opportunities with European countries (see Frankel (2008)). On the other hand, the erosion of the colonial trade linkages could have also reduced opportunities to trade with third European countries, for example if exporting to France was generating opportunities to export to third European markets. In which case the decline of the colonial trade linkage could have been detrimental to colonial trade spillovers.

We analyze, in column 4, the evolution of the coefficient over three sub-periods: 1995-1999, 2000-2003 and 2004-2007. We interact our variables of interest with two dummy variables $d_{2000-03}$ and $d_{2004-07}$, which respectively take the value 1 for years in the period 2000-2003 and for years

Table 1: Colonial trade spillovers to European Union countries

VARIABLES	(1) $\ln(Exports_{ijt})$	(2) $\ln(Exports_{ijt})$	(3) $\ln(Exports_{ijt})$	(4) $\ln(Exports_{ijt})$
$ColEU_{ij}^{FR}$	0.366***	0.433***	0.371***	0.560***
	(0.025)	(0.025)	(0.028)	(0.041)
$ColEU_{ij}^{FR} \times d_{2000-03}$				-0.139**
				(0.060)
$ColEU_{ij}^{FR} \times d_{2004-07}$				-0.269***
				(0.060)
$ColEU_{ij}^{UK}$	0.412***	0.449***	0.414***	0.529***
	(0.020)	(0.020)	(0.022)	(0.032)
$ColEU_{ij}^{UK} \times d_{2000-03}$				-0.093**
				(0.046)
$ColEU_{ij}^{UK} \times d_{2004-07}$				-0.164***
				(0.046)
Colony_{ij}^{FR}	1.600***	1.698***	1.459***	1.699***
	(0.082)	(0.082)	(0.073)	(0.082)
Colony_{ij}^{UK}	1.114***	1.123***	0.821***	1.125***
	(0.063)	(0.064)	(0.060)	(0.064)
$\text{Colony}_{ij}^{Others}$	2.036***	2.094***	1.197***	2.092***
	(0.065)	(0.069)	(0.064)	(0.069)
Common colonizer	0.753***	0.779***	0.489***	0.779***
	(0.018)	(0.018)	(0.024)	(0.018)
Common off. language	0.481***	0.453***	0.290***	0.454***
	(0.021)	(0.023)	(0.027)	(0.023)
Common ethn. language	0.070***	0.022	-0.025	0.021
	(0.021)	(0.022)	(0.026)	(0.022)
FTA	0.468***	0.483***	0.246***	0.491***
	(0.015)	(0.015)	(0.017)	(0.016)
Distance (log)	-1.467***	-1.456***	-1.065***	-1.455***
	(0.007)	(0.007)	(0.009)	(0.007)
Contiguity	0.684***	0.525***	0.152***	0.524***
	(0.028)	(0.029)	(0.027)	(0.029)
Common legal origin	0.231***	0.215***	0.156***	0.215***
	(0.010)	(0.010)	(0.013)	(0.010)
Common currency	0.264***	0.282***	0.328***	0.273***
	(0.039)	(0.040)	(0.039)	(0.040)
Religious proximity		0.587***	0.318***	0.587***
		(0.021)	(0.026)	(0.021)
Migrants_ij (log)			0.121***	
			(0.003)	
Migrants_ji (log)			0.100***	
			(0.003)	
Country x year FE	yes	yes	yes	yes
Observations	281,439	253,837	124,478	253,837
R-squared	0.746	0.751	0.799	0.751

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

in the period 2004-2007 and zero otherwise. Estimation results conclude that there is an erosion in colonial trade spillovers over the period 1995-2007. Indeed, the coefficient of the two interactive variables $ColEU_{ij}^{Z} \times d_{2000-03}$ and $ColEU_{ij}^{Z} \times d_{2004-07}$ are negative and significant, the latter

being larger than the former. A decline over time in the coefficient on the colonial trade spillover variables can thus be observed. Importantly, since we control for importer-year and exporter-year fixed effects, our results are not driven by external factors such as the increased competition from low-wage countries that would affect market shares on former colonies into EU markets.

Trade intensity and geographic distance. We complete the previous findings by complementary estimations, considering trade intensity between the former colonizer and third countries or the geographic distance that separates them, as alternative variables to identify trade spillovers. These two variables are used by Chaney (2014) in his empirical investigation about trade networks. The estimated equation is Equation 1 above, where the *Link* variable corresponds either to trade intensity or geographical distance between third countries and the former colonizer.

The results are presented in Table 2. In the first column, we start our investigation about trade spillovers by considering as a linkage the trade intensity between the partner country and the former colonizer. We have four interaction terms, as we consider both former French and British colonies, and we also considers where the former colony is the exporter (i) or the importer (j). The coefficients on these interaction terms are always positive and highly significant, meaning that former colonies trade relatively more with third countries having a large trade intensity with the former colonizer (controlling for other traditional determinants in the gravity equation). The result holds for both former British colonies trading with third countries close to UK and former French colonies trading with third countries close to France. Importantly, these results indicate that the trade spillover in relation with trade intensity holds when we consider both exports and imports of the former colonies since the two variables are positive and significant. In column 2, we use the geographical distance as the proxy for the linkage between third countries and former colonizers. The results indicate that former colonies trade relatively less with third countries more distant from the former colonizer. Thus, as expected, the colonial trade spillover is more important for third countries having more trade with France or the UK in proportion of their GDP (column 1), or third countries being geographically more proximate from the former colonizers (column 2).

Table 2: Trade intensity and distance with former colonizer

	(1)	(2)
	$\ln(Exports_{ijt})$	
Link	Trade intensity	Distance
Col_j^{FR} x Link_i^{FR}	0.392***	-0.068***
	(0.127)	(0.014)
Col_i^{FR} x Link_j^{FR}	0.347***	-0.108***
	(0.115)	(0.014)
Col_j^{UK} x Link_i^{UK}	1.398***	-0.157***
	(0.236)	(0.012)
Col_i^{UK} x Link_j^{UK}	0.751***	-0.050***
	(0.238)	(0.012)
Colonies^{Others}	2.080***	2.090***
	(0.075)	(0.075)
Common colonizer	0.651***	0.753***
	(0.019)	(0.019)
Common off. language	0.405***	0.407***
	(0.024)	(0.024)
Common ethn. language	0.048**	0.042*
	(0.023)	(0.023)
FTA	0.533***	0.539***
	(0.016)	(0.016)
Distance (log)	-1.459***	-1.474***
	(0.007)	(0.007)
Contiguity	0.557***	0.535***
	(0.030)	(0.030)
Common legal origin	0.239***	0.250***
	(0.011)	(0.011)
Common currency	0.246***	0.247***
	(0.041)	(0.041)
Religious proximity	0.575***	0.552***
	(0.022)	(0.022)
Country x year FE	yes	yes
Observations	232,778	232,778
R-squared	0.745	0.745

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Robustness. Given the large prevalence of zero trade flows in our dataset, which are undefined when converted into logarithms, our estimations are based on a truncated sample where all the country-pairs that do not trade are not considered. To deal with this issue of zero trade flows and the issue of heteroscedasticity, we rely on the Poisson pseudo-maximum likelihood estimator identified by Silva and Tenreyro (2006) as an efficient estimator. Results appear unchanged and are presented in the Table 9 in the Appendix.

3 Trade dynamics and trade spillovers

3.1 Empirical strategy and data

In the previous section, we provided evidence that French and British former colonies tend to trade more (e.g. export more *and* import more) with countries being geographically proximate to (or having more trade with) the former colonizer, controlling for other gravity forces. We now test if the cross-sectional distribution of bilateral trade values of former colonies can be explained by the dynamics of product-level trade in the presence of a colonial trade linkage.

Our empirical strategy is motivated by the model of international trade networks introduced by Chaney (2014). The model predicts that successful trade experience in a market can bring new trade opportunities in markets being geographically close to the first market. Our objective here is to bring micro evidence for this theoretical channel, and illustrate how trade networks expand over time after export or import experience with the former colonizer. We firstly focus on the export experience of former colonies in the former colonizer's market. We then investigate the transmission channel consecutive to import experience from former colonizers. Finally, we test if the imports probability from any potential trade partner is influenced by the fact that the former colonizer also imported the same product from the same source country.

The empirical investigation focuses on the probability, for former colonies, of exporting a specific good to a destination, or importing this good from a specific country excluding the colonizer (e.g. France or the United Kingdom). The precise econometric model estimated will be precisely described below in the subsections presenting each test. The main variable of interest will be the interaction term between prior export or import experience, and the linkages between the former colonizer and third countries.

We test for the role of different linkages between the former colonizer and the trade partner country. We investigate the role played by geography, measured as the bilateral distance between the former colonizer and trade partners, or by a dummy variable identifying only the former colonizer's direct neighbors (Ireland in the case of the United Kingdom) to account for non-linearities. We also consider the possibility that regional integration (Regional Trade Agreements, common currency) amplifies colonial trade spillovers consecutive to a trade experience. As RTAs tend to shape regional business networks, we expect that they amplify trade spillovers. Successful exportation to one of the members of the customs union may also offer additional trade opportunities with different members

as they share similar norms for products.[9] This "learning" mechanism is consistent with the model of trade networks by Chaney (2014). Finally, the estimated equation controls for the possibility of transmission through other channels such as common language between the partner country and the colonizer, or the similarity of their legal systems.

We test for the existence of these trade linkages by making use of the detailed product-level trade data. We use the CEPII-BACI dataset, which reports bilateral trade flows at the 6-digits level of disaggregation of the Harmonized System (HS) international nomenclature of products. Given the very large size of the dataset, we aggregate this data at the 4-digits level of product disaggregation, which leaves us with more than 1,000 products exported by each country. For each country, we retain the top 500 products exported, and consider a matrix where each of these products can be exported to any of the destinations in the world where the country exported at least once over the period 1995-2007. The consequence of this exhaustive structure is that we are dealing with millions of observations in each estimation.

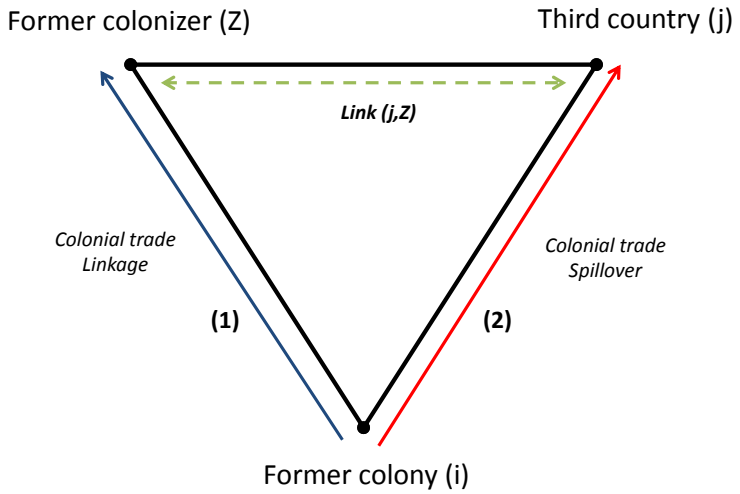
3.2 Estimation results

Former colonies' export experience in colonizer's market. We start by exploring the consequences of the export experience of former colonies into the former colonizer's market. The exact empirical relation we aim at identifying is illustrated in Figure 2: colonial trade linkages create opportunities for firms located in former colonies to export in former colonizer's market. This export experience may then generate export spillovers towards third countries if firms can learn about export opportunities in different markets or match with potential buyers of their products. We are mainly interested by the influence of the linkages between the destination country and the former colonizer on the extent of trade spillovers. We expect that the intensity of this trade spillover is correlated with covariates such as geography, economic integration, language or the legal system, summarized by the $Link_j^Z$ variable.

In the empirical specification, we consider the probability that a former British or French colony exports an HS4 product category in any destination country in the world excluding the former colonizer itself ($Trade_{ijkt} = 1 \mid i = ColZ \ ; \ j \neq Z$), where i is the country of origin being either French or British colonies, j the country of destination, k is the product, and t is time. As stated above, we retain for each exporting country the top 500 products that compose its total exports over the period of reference. A similar structure of exports is then applied for each potential destination in the world excluding the former colonizer, with a dependent variable taking the value

[9] See Cadot *et al.* (2012) for the influence of norms on North-South trade.

Figure 2: Colonial trade spillover: former colony's exports



1 if the product is exported and 0 otherwise. With this structure, we have a very large number of observations and zero trade flows, as only a small proportion of these products is exported in each destination. We estimate - separately for French and British former colonies' exports - the following equation using a linear probability model (OLS):

$$[Trade_{ijkt} = 1 \mid i = ColZ \ ; \ j \neq Z] =$$

$$\beta_0 + \beta_{1Z} Trade^{Z}_{ikt-n} + \beta_{2Z} Trade^{Z}_{ikt-n} \times Link^{Z}_{j} + \mathbf{C}_{ijt}\Omega' + \kappa_{it} + \kappa_{jt} + \epsilon_{ijkt} \quad (2)$$

Our main variable of interest is $Trade^{Z}_{ikt-n}$, which can take the value 1 if the exporter shipped product k to former colonizer Z in year t-1 or t-2, and 0 otherwise. We expect that the parameter β_{1Z} is estimated with a positive sign, as exporting goods in the former colonizer's market may create additional export opportunities towards third countries through learning or matching. The second variable of interest is $Trade^{Z}_{ikt-n} \times Link^{Z}_{j}$: the intensity of the colonial trade spillover is expected to be correlated with variable $Link^{Z}_{j}$ that is proxied with geographical distance between former colonizer and destination j, contiguity, RTA, common currency, common language and common legal system. We expect that shorter geographical distances, contiguity, RTA, common currency, common language, or common legal system increases the intensity of the colonial trade spillover. $\mathbf{C}_{ijt}$ is a vector of controls. The estimation controls for exporter-year fixed effects (κ_{it}) and importer-year fixed effects (κ_{jt}). ϵ_{ijkt} is the error term.

The empirical model is estimated using a linear probability model with OLS. This choice is guided by mainly two reasons. First, we are using a very large set of country-year fixed effects in a pannel with a very large number of observations (several millions), in which case a probit model cannot be estimated. Second, we are also using a variety of interaction terms, in which case standard methodologies do not allow to compute marginal effects in the case of probit models (Ai and Norton, 2003).

Estimation results are provided in Table 3, which reports the estimated parameters for our two main variables of interest : $Trade^{Z}_{ikt-n}$ and $Trade^{Z}_{ikt-n} \times Link^{Z}_{j}$.[10] In the first column of the table, the estimation only introduces the first of these two variables, e.g. export experience in former colonizer's market. The coefficient is positive and significant as expected: having an export experience in former colonizer's market increases the exports probability of the same product in any third destination by about 4.8% in the case of former French colonies, or by about 6% in the case of former British colonies.

Columns (2) to (7) of the Table report the results of estimations where the equation additionally includes interactions between export experience in the former colonizer's market and linkages between the former colonizer and third destinations such as geographical distance or RTAs ($Link^{Z}_{j}$). The results for French and British former colonies show that colonial trade spillovers are magnified for destinations characterized by shorter distances, contiguous destinations, or destinations being in a RTA with the former colonizer.[11] Language has an ambiguous effect: it amplifies trade spillovers in the case of French former colonies' exports to French-speaking countries; but has a weak and negative effect in the case of British former colonies' exports. Note that the estimation already controls for the fact that both the importer and the exporter share the same language, with a positive sign on the common language variable (unreported). This variable tends to wipe out most of the spillover effect related to language, as most former colonies have French or British as an official language. The common legal system variable has only a weak (and ambiguous effect) on the extent of these spillovers for the same reasons as language.

We complete this picture by introducing simultaneously the interaction terms between export experience and the $Link^{Z}_{j}$ variables in the estimated equation. With this strategy, we aim at identifying which of the geographical factors (distance, contiguity) and political factors (RTA, common currency) dominate. Results are presented in Table 4 below. In all estimations, the equation con-

[10] Other controls have the expected sign : negative impact of bilateral distance on export probability, positive effect of importer and exporter's GDP, common colonizer, common official language, ethnic language proximity, RTA, contiguity, and common currency. Results are available upon request.

[11] In the case of the United Kingdom, contiguity identifies only Ireland. Common currency is not reported as it identifies only Gibraltar.

Table 3: Export experience of former colony into former colonizer's market

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				$Link_j^Z$			
		Dist	Contig	RTA	Comcur	Comlang	Comleg
				French former colonies (5,320,900 obs.)			
$Trade_{ikt-n}^{FR}$	0.048^a	0.509^a	0.039^a	0.021^a	0.040^a	0.044^a	0.052^a
	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Trade_{ikt-n}^{FR} \times Link_j^{FR}$		-0.055^a	0.279^a	0.120^a	0.189^a	0.023^a	-0.008^a
		(0.000)	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)
				British former colonies (11,105,900 obs.)			
$Trade_{ikt-n}^{UK}$	0.060^a	0.526^a	0.059^a	0.030^a		0.063^a	0.058^a
	(0.000)	(0.002)	(000)	(0.000)		(0.000)	(0.000)
$Trade_{ikt-n}^{UK} \times Link_j^{UK}$		-0.055^a	0.144^a	0.139^a		-0.009^a	0.008^a
		(0.000)	(0.001)	(0.000)		(0.000)	(0.000)
Year dummies	yes	yes	yes	yes	yes	yes	yes
Exporter-year dummies	yes	yes	yes	yes	yes	yes	yes
Importer-year dummies	yes	yes	yes	yes	yes	yes	yes

Robust Standard errors, clustered by importer (colonies exports) or exporter (colonies imports), in parentheses. ^{c} significant at 10%; ^{b} significant at 5%; ^{a} significant at 1%. Sample: French and British former colonies as exporters and the rest of the world less former colonizer or importers; Products (k) : top 500 HS 4-digits products; Time period : 1995-2007. Other controls unreported: Common colonizer(ij), Comlang official (ij), Comlang ethno (ij), RTA (ijt), ln Dist (ij), Contiguity (ij), Legal origin (ij), Common Currency (ijt).

trols for the interactions of the trade experience variable with geographical distance and contiguity. The result presented in Column (1) shows that distance continues to play a significant role after controlling for the interaction term with contiguity, although the coefficient is reduced compared to the results presented in the previous table. The effect of contiguity also remains very significant, showing that colonial trade spillovers concentrate on countries being the immediate neighbors of the former colonizer (Ireland in the case of former British colonies). Interactions of the trade experience with RTA or common currency variables are subsequently introduced in the estimated equation; results are presented in Columns (2), (3) and (4) of Table 4. Both variables continue to play a significant role regarding the intensity of trade spillovers when the estimation controls for geographical factors. The increase in the probability of export related to export experience in former colonizer's market is magnified for destinations being in a trade agreement with the former colonizer or sharing the same currency.

As discussed previously, the presence of an RTA between the destination country and the former colonizer may enhance trade spillovers through different channels. Firstly, as trade agreements tend to foster trade flows between countries, it also promotes the development of business networks (Johnson and Noguera, 2012b). Exporting towards the former colonizer may therefore generate additional export opportunities within the same network of firms through a matching process.

Table 4: Export experience of former colony into former colonizer's market (2)

	(1)	(2)	(3)	(4)	(5)	(6)
		French colonies			British colonies	
$Trade^{Z}_{ikt-n}$	0.341^{a}	0.091^{a}	0.305^{a}	0.082^{a}	0.523^{a}	0.057^{a}
	(0.002)	(0.003)	(0.002)	(0.003)	(0.002)	(0.003)
$Trade^{Z}_{ikt-n} \times lnDist^{Z}_{j}$	-0.036^{a}	-0.008^{a}	-0.032^{a}	-0.007^{a}	-0.055^{a}	-0.003^{a}
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Trade^{Z}_{ikt-n} \times Contig^{Z}_{j}$	0.210^{a}	0.201^{a}	0.184^{a}	0.183^{a}	0.011^{a}	0.032^{a}
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
$Trade^{Z}_{ikt-n} \times RTA^{Z}_{j}$		0.079^{a}		0.074^{a}		0.134^{a}
		(0.001)		(0.001)		(0.001)
$Trade^{Z}_{ikt-n} \times Currency^{Z}_{j}$			0.067^{a}	0.047^{a}		
			(0.001)	(0.001)		
Number of observations	5,320,900	5,320,900	5,320,900	5,320,900	11,105,900	11,105,900
Year dummies	yes	yes	yes	yes	yes	yes
Exporter-year dummies	yes	yes	yes	yes	yes	yes
Importer-year dummies	yes	yes	yes	yes	yes	yes

Robust Standard errors, clustered by importer (colonies exports) or exporter (colonies imports), in parentheses. ^{c} significant at 10%; ^{b} significant at 5%; ^{a} significant at 1%. Sample: French and British former colonies as exporters and the rest of the world less former colonizer or importers; Products (k) : top 500 HS 4-digits products; Time period : 1995-2007. Other controls unreported: Common colonizer(ij), Comlang official (ij), Comlang ethno (ij), RTA (ijt), ln Dist (ij), Contiguity (ij), Legal origin (ij), Common Currency (ijt).

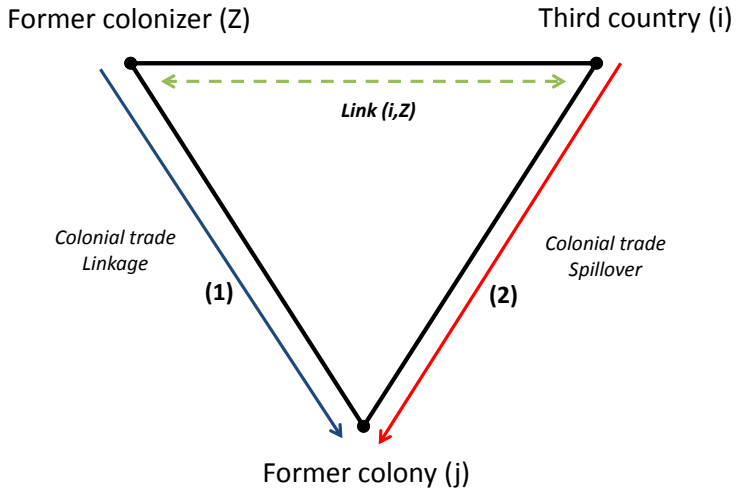
Secondly, exporting towards the former colonizer's market may require the adaptation of the product to norms, which are commonly shared with all countries being members of the same RTA (Cadot *et al.*, 2012). Exporting successfully to one of the members may therefore give access to other members' market. The first export experience would in this case allow the exporter to learn about the quality of its products and the profitability of export.

Controlling for RTA reduces considerably the coefficient on the interaction between export experience and geographical distance: the coefficient remains negative but looses economic significance. Contiguity however remains an important determinant of trade spillovers, even when the estimation controls for economic integration factors. Colums (4) and (6) of the Table report the estimation results when the estimated equation combines all these factors. It confirms that both geographical factors (contiguity) and economic integration factors (RTA, common currency) tend to amplify the trade spillovers related to the export experience of former colonies in the former colonizer's market.

Former colonies' import experience from colonizer's market. Does the import experience of the former colony from the former colonizer has an effect on imports from third countries? The import experience of the former colony from the former colonizer's market may indeed create the opportunity to meet new suppliers located in different countries. This particular channel is

illustrated in Figure 3. We expect that the trade spillovers are amplified by closer linkages between the former colonizer and the potential trade partner.

Figure 3: Colonial trade spillover: former colony's imports (2)



The empirical specification is similar to the preceding exercise and is presented in Equation 3. The dependent variable ($Trade_{ijkt} = 1 \mid j = ColZ \ ; \ i \neq Z$) is a dummy variable taking value 0 or 1 identifying imports by former colonies (j) from potential trade partners (i) excluding the former colonizer (Z). $Trade^{Z}_{jkt-n}$ is the main variable of interest; it identifies past import experience from the former colonizer in product k. The coefficient for this variable identifies trade spillovers for the same product. The coefficients on the interactions with the $Link^{Z}_{i}$ variables allow to estimate if the trade spillovers, if they are observed, are amplified by geographical proximity between the exporter and the colonizer, their degree of economic interaction, or by other linkages related to language or the legal system.

$$[Trade_{ijkt} = 1 \mid j = ColZ \ ; \ i \neq Z] =$$

$$\beta_0 + \beta_{1Z} Trade^{Z}_{jkt-n} + \beta_{2Z} Trade^{Z}_{jkt-n} \times Link^{Z}_{i} + \mathbf{C}_{ijt}\Omega' + \kappa_{it} + \kappa_{jt} + \epsilon_{ijt} \tag{3}$$

Estimation results are provided in Table 5. The coefficient on the $Trade^{Z}_{jkt-n}$ variable is positive and significant. This confirms the hypothesis that import experience from the former colonizer by the former colony, for a certain product k, creates additional import opportunities for the same product from third countries (close to 6% in the case of both former British and French

Table 5: Export experience of the former colonizer into former colony's market

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				$Link_j^Z$			
		Dist	Contig	RTA	Comcur	Comlang	Comleg
	French former colonies (5,492,500 obs.)						
$Trade_{jkt-n}^{FR}$	0.057^a	0.347^a	0.052^a	0.036^a	0.052^a	0.056^a	0.067^a
	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Trade_{jkt-n}^{FR} \times Link_i^{FR}$		-0.035^a	0.131^a	0.090^a	0.115^a	0.006^a	-0.022^a
		(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)
	British former colonies (11,073,400 obs.)						
$Trade_{jkt-n}^{UK}$	0.058^a	0.407^a	0.057^a	0.034^a		0.059^a	0.056^a
	(0.000)	(0.002)	(0.000)	(0.000)		(0.000)	(0.000)
$Trade_{jkt-n}^{UK} \times Link_i^{UK}$		-0.041^a	0.143^a	0.099^a		-0.005^a	0.005^a
		(0.000)	(0.002)	(0.000)		(0.000)	(0.000)
Year dummies	yes	yes	yes	yes	yes	yes	yes
Exporter-year dummies	yes	yes	yes	yes	yes	yes	yes
Importer-year dummies	yes	yes	yes	yes	yes	yes	yes

Robust Standard errors, clustered by importer (colonies exports) or exporter (colonies imports), in parentheses. ^{c} significant at 10%; ^{b} significant at 5%; ^{a} significant at 1%. Sample: French and British colonies (as exporters or importers) and the rest of the world; Products (k) : HS 4-digits products; Time period : 1995-2007. Other controls: Common colonizer(ij), Comlang official (ij), Comlang ethno (ij), RTA (ijt), ln Dist (ij), Contiguity (ij), Legal origin (ij), Common Currency (ijt).

colonies). Columns (2) to (7) then present the estimated coefficients for the interaction terms with the $Link_i^Z$ variables. Bilateral distance, contiguity or RTA interaction terms modify the extent of trade spillovers in the expected direction (e.g. more trade spillovers for neighbor counties or countries being more integrated with the colonizer). Common currency (being a member of the euro area) in the case of French former colonies has also the expected sign and reinforces trade spillovers. Language and the legal system, however, do not seem to play a very significant role.

Results combining all interaction terms in the estimated equation are provided in Table 6. The influence of bilateral distance on trade spillovers is weakened compared to baseline specifications as soon as the estimation controls for the interaction term between import experience and contiguity. The coefficient then looses economic significance as soon as the equation additionally controls for the fact that the exporter and the former colonizer are both members of the same RTA.

When all interaction terms are introduced into the same equation (columns 4 and 7 of Table 6), the results show that trade spillovers are mostly influenced by contiguity between the former colonizer and the exporter, the fact that they are members of the same RTA or that they share the same currency.

Third country's export experience in former colonizer's market. We now explore whether the probability of the former colony to import from any given country is influenced by the export

Table 6: Export experience of the former colonizer into former colony's market (2)

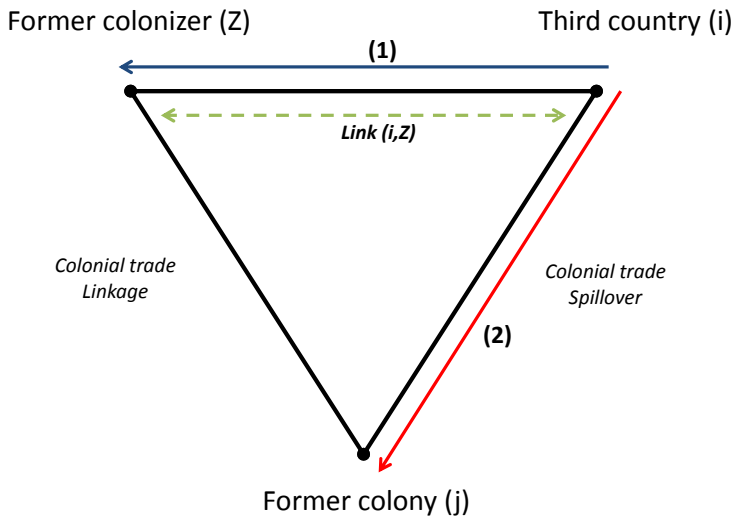
	(1)	(2)	(3)	(4)	(5)	(6)
	French colonies				British colonies	
$Trade^{Z}_{jkt-n}$	0.278^{a}	0.016^{a}	0.249^{a}	0.009^{b}	0.395^{a}	0.078^{a}
	(0.003)	(0.004)	(0.003)	(0.004)	(0.002)	(0.003)
$Trade^{Z}_{jkt-n} \times lnDist^{Z}_{i}$	-0.027^{a}	0.002^{a}	-0.023^{a}	0.003^{a}	-0.040^{a}	-0.005^{a}
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Trade^{Z}_{jkt-n} \times Contig^{Z}_{i}$	0.080^{a}	0.071^{a}	0.061^{a}	0.059^{a}	0.047^{a}	0.063^{a}
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)
$Trade^{Z}_{jkt-n} \times RTA^{Z}_{i}$		0.082^{a}		0.078^{a}		0.089^{a}
		(0.001)		(0.001)		(0.001)
$Trade^{Z}_{jkt-n} \times Comcur^{Z}_{i}$			0.055^{a}	0.035^{a}		
			(0.001)	(0.001)		
Number of observations	5,492,500	5,492,500	5,492,500	5,492,500	11,073,400	11,073,400
Year dummies	yes	yes	yes	yes	yes	yes
Exporter-year dummies	yes	yes	yes	yes	yes	yes
Importer-year dummies	yes	yes	yes	yes	yes	yes

Robust Standard errors, clustered by importer (colonies exports) or exporter (colonies imports), in parentheses. ^{c} significant at 10%; ^{b} significant at 5%; ^{a} significant at 1%. Sample: French and British colonies (as exporters or importers) and the rest of the world; Products (k) : HS 4-digits products; Time period : 1995-2007. Other controls: Common colonizer(ij), Comlang official (ij), Comlang ethno (ij), RTA (ijt), ln Dist (ij), Contiguity (ij), Legal origin (ij), Common Currency (ijt).

experience of the source country into former colonizer's market. This channel is illustrated in Figure 4. The first arrow corresponds to an export flow of a product from a third country (i) to the former colonizer (Z). The second arrow represents the impact of the first trade flow in terms of exports to the former colony (j). We are mainly interested in the influence of the linkages between the exporter and the former colonizer, measured as in the previous exercise as geographical factors (distance or contiguity), economic integration factors (RTA, common currency) or other socio-economic factors (language, legal system). Source countries being more integrated in the former colonizer's business network may benefit from additional trade opportunities with former colonies, through matching or learning. We therefore expect that the trade spillover is amplified by the degree of economic integration, and inversely related to geographical distance with the former colonizer.

In the empirical specification, we consider the probability that the former colony imports a good from any potential trade partner (excluding the former colonizer). The import probability is explained by the export experience of the trade partner into former colonizer's market (taking values 0 or 1), an interaction term with the linkages with the former colonizer, and controls. The exact empirical specification is detailed in Equation 4. The dependent variable ($Trade_{ijkt} = 1 \mid j = ColZ \ ; \ i \neq Z$) is a dummy that takes a value 1 when a trade flow is observed between the exporter (i) and the importer (j) for HS4 product k, and zero otherwise. This trade flow is explained by

Figure 4: Colonial trade spillover: former colony's imports (1)



the past experience of the third country into the former colonizer's market in the past two years ($Trade^{Z}_{ikt-n}$) and an interaction term with a set of covariates (distance, contiguity, RTA etc.) that link the third country to the former colonizer ($Link^{Z}_{i}$). The estimation controls additionally for a set of variables characterizing the pairs of countries in the dataset, and exporter-year and importer-year fixed effects. As in the previous section, the Equation 4 is estimated with a linear probability model (OLS).

$$[Trade_{ijkt} = 1 \mid j = ColZ \ ; \ i \neq Z] =$$

$$\beta_0 + \beta_{1Z} Trade^{Z}_{ikt-n} + \beta_{2Z} Trade^{Z}_{ikt-n} \times Link^{Z}_{i} + \mathbf{C}_{ijt}\Omega' + \kappa_{it} + \kappa_{jt} + \epsilon_{ijt} \tag{4}$$

Estimation results are provided in Table 7. Results presented in the first column confirm that the import probability by former British and French colonies' is increased when the exporter had past experience into former colonizer's market: +4.2% and 4.9% in the case of former French and British colonies respectively. Subsequent columns (2 to 7) of the table present estimation results when the past export experience into former colonizer's market is interacted with the $Link^{Z}_{i}$ variable. The results confirm that geography and the degree of economic integration are important determinants of trade spillovers. They are more important for exporters sharing a common border, an RTA or the same currency with the former colonizer. Geographical distance however does not play a significant role, and the effect concentrates on contiguous countries only. Sharing a common legal system or

Table 7: Export experience of third country into former colonizer's market

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
				$Link_j^Z$			
		Dist	Contig	RTA	Comcur	Comlang	Comleg
				French former colonies (5,492,500 obs.)			
$Trade_{ikt-n}^{FR}$	0.042^a	0.027^a	0.042^a	0.038^a	0.041^a	0.043^a	0.046^a
	(0.000)	(0.004)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$Trade_{ikt-n}^{FR} \times Link_i^{FR}$		0.002^a	0.558^a	0.038^a	0.178^a	-0.007^a	-0.008^a
		(0.000)	(0.029)	(0.001)	(0.007)	(0.001)	(0.001)
				British former colonies (11,073,400 obs.)			
$Trade_{ikt-n}^{UK}$	0.049^a	0.053^a	0.049^a	0.045^a		0.049^a	0.044^a
	(0.000)	(0.003)	(0.000)	(0.000)		(0.000)	(0.000)
$Trade_{ikt-n}^{UK} \times Link_i^{FR}$		-0.000	0.173^a	0.037^a		0.002^a	0.014^a
		(0.000)	(0.021)	(0.001)		(0.000)	(0.000)
Year dummies	yes	yes	yes	yes	yes	yes	yes
Exporter-year dummies	yes	yes	yes	yes	yes	yes	yes
Importer-year dummies	yes	yes	yes	yes	yes	yes	yes

Robust Standard errors, clustered by importer (colonies exports) or exporter (colonies imports), in parentheses. ^{c} significant at 10%; ^{b} significant at 5%; ^{a} significant at 1%. Sample: French and British colonies (as exporters or importers) and the rest of the world; Products (k) : HS 4-digits products; Time period : 1995-2007. Other controls: Common colonizer(ij), Comlang official (ij), Comlang ethno (ij), RTA (ijt), ln Dist (ij), Contiguity (ij), Legal origin (ij), Common Currency (ijt).

the same language with the former colonizer has only a weak and inconclusive effect on the extent of the spillover.

Table 8 completes this series of results by introducing simultaneously the interaction terms within the estimated equation. As in the previous estimations, the geographical distance between the destination and the exporting country has a negligeable impact on the trade spillovers in the various empirical specifications adopted (the coefficient on the interaction term between export experience in former colonizer's market and distance is positive most of the time, but small and not economically significant). The effect however of the export experience tends to concentrate on countries being contiguous to the former colonizer. Being in a RTA with the former colonizer, or sharing the same currency, amplifies the trade spillovers.

3.3 Discussion of the results

The results presented in this Section confirm that the dynamics of product-level trade contribute to explain the cross-sectional distribution of aggregate trade between former British or French colonies and potential trade partners.

Firstly, exporting to the former colonizer's market increases the probability of exporting the same good to the former colonizer's neighbors, or countries characterized by a high degree of economic

Table 8: Export experience of third country into former colonizer's market (2)

	(1)	(2)	(3)	(4)	(5)	(6)
		French colonies			British colonies	
$Trade^{Z}_{ikt-n}$	0.024^{a}	-0.089^{a}	0.016^{a}	-0.091^{a}	0.051^{a}	-0.095^{a}
	(0.004)	(0.005)	(0.004)	(0.005)	(0.003)	(0.004)
$Trade^{Z}_{ikt-n} \times lnDist^{Z}_{i}$	0.002^{a}	0.015^{a}	0.003^{a}	0.015^{a}	-0.000	0.016^{a}
	(0.000)	(0.001)	(0.000)	(0.001)	(0.000)	(0.000)
$Trade^{Z}_{ikt-n} \times Contig^{Z}_{i}$	0.562^{a}	0.542^{a}	0.507^{a}	0.497^{a}	0.172^{a}	0.167^{a}
	(0.029)	(0.029)	(0.029)	(0.029)	(0.021)	(0.021)
$Trade^{Z}_{ikt-n} \times RTA^{Z}_{i}$		0.052^{a}		0.050^{a}		0.053^{a}
		(0.001)		(0.001)		(0.001)
$Trade^{Z}_{ikt-n} \times Currency^{Z}_{i}$			0.171^{a}	0.141^{a}		
			(0.007)	(0.007)		
Number of observations	5,492,500	5,492,500	5,492,500	5,492,500	11,073,400	11,073,400
Year dummies	yes	yes	yes	yes	yes	yes
Exporter-year dummies	yes	yes	yes	yes	yes	yes
Importer-year dummies	yes	yes	yes	yes	yes	yes

Robust Standard errors, clustered by importer (colonies exports) or exporter (colonies imports), in parentheses. ^{c} significant at 10%; ^{b} significant at 5%; ^{a} significant at 1%. Sample: French and British colonies (as exporters or importers) and the rest of the world; Products (k) : HS 4-digits products; Time period : 1995-2007. Other controls: Common colonizer(ij), Comlang official (ij), Comlang ethno (ij), RTA (ijt), ln Dist (ij), Contiguity (ij), Legal origin (ij), Common Currency (ijt).

integration with him (sharing the same currency, being part of the same customs union). Secondly, similar result is obtained when considering import experience from the former colonizer rather than export experience. Thirdly, the export experience of third countries into former colonizers' market increases the import probability by former colonies for the same product, especially for exporters being contiguous or economically integrated with the former colonizer.

These three results are in line with theoretical predictions from the model of trade networks introduced by Chaney (2014). They are also consistent with the predictions from trade models that introduce some forms of learning into exports markets (Albornoz *et al.*, 2012; Defever *et al.*, 2011). In the context of the trade relation formed by former colonies and former colonizers, we are able to identify that trade networks expand over time through new trade connections with countries being geographically proximate to the former colonizer. This result contributes to explain why, in aggregate trade data, former colonies tend to trade more with former colonizers' neighbors than what a simple gravity equation would predict.

4 Conclusion

This paper explores empirically how trade networks are formed over time, and how the microeconomic trade dynamics associated with these networks contribute to explain the geographical distribution of aggregate trade flows at a point in time. Our empirical analysis relies on the experience of the colonial trade linkage, which identifies the trade relation between former colonies and their former colonizer. This trade relationship has long history and it is supported by formal and informal institutions and business networks. It is therefore unlikely to be affected by other trade relations. Using this preferential trade relation, we can observe how trade networks are formed, and how they influence aggregate trade patterns.

We firstly provide empirical evidence of the existence of a colonial trade spillover. We show in particular that former British and French colonies do trade more with third countries being geographically more proximate to the former colonizer, or trading more with this country. This result is obtained from the estimation of a gravity equation, controlling for country pair characteristics such as distance, language, migrations or trade policy that could possibly generate this result, and for multilateral resistance terms. This implies that the cross-sectional distribution of trade values of former colonies (both imports and exports) are biased towards former colonizers' neighbors.

This analysis of aggregate trade patterns is then completed by an examination of the product-level trade dynamics of former colonies. This approach is motivated by the model of trade networks by (Chaney, 2014). The results of the estimation of a linear probability model show that trade experience with the former colonizer generates subsequently a higher probability of trade – for similar product – with countries being geographically proximate or being economically more integrated with the former colonizer. The import probability by a former colony from a third country is also increased when this country had previously exported the same product in the former colonizer's market. This export experience tends to benefit more to former colonizers' neighbors, or countries being economically more integrated with the former colonizer (customs union or same currency).

These results confirm that the microeconomic dynamics of trade – in relation to the formation of trade networks – tend to shape the cross-sectional distribution of aggregate trade by former colonies. Future work may investigate more in details how these trade networks contribute to the diffusion of shocks across borders.

References

Acemoglu, D., Carvalho, V. M., Ozdaglar, A. and Tahbaz-Salehi, A. (2012), "The Network Origins of Aggregate Fluctuations", *Econometrica*, vol. 80 nº 5: pp. 1977–2016.

Aeberhardt, R., Buono, I. and Fadinger, H. (2012), "Learning, incomplete contracts and export dynamics: theory and evidence from French firms", Temi di discussione (Economic working papers) 883, Bank of Italy.

Ai, C. and Norton, E. C. (2003), "Interaction terms in logit and probit models", *Economics Letters*, vol. 80 nº 1: pp. 123–129.

Albornoz, F., Calvo Pardo, H. F., Corcos, G. and Ornelas, E. (2012), "Sequential exporting", *Journal of International Economics*, vol. 88 nº 1: pp. 17–31.

Anderson, J. E. and van Wincoop, E. (2003), "Gravity with Gravitas: A Solution to the Border Puzzle", *American Economic Review*, vol. 93 nº 1: pp. 170–192.

Araujo, L., Mion, G. and Ornelas, E. (2012), "Institutions and Export Dynamics", CEP Discussion Papers dp1118, Centre for Economic Performance, LSE.

Berthou, A. and Vicard, V. (2013), "Firms' Export Dynamics: Experience vs. Size", Mimeo.

Bramoullé, Y., Djebbari, H. and Fortin, B. (2009), "Identification of peer effects through social networks", *Journal of Econometrics*, vol. 150 nº 1: pp. 41–55.

Cadot, O., Disdier, A.-C. and Fontagné, L. (2012), "North-South Standards Harmonization and International Trade", CEPR Discussion Papers 8767.

Carrère, C. and Srauss-Kahn, V. (2012), "Exports Dynamics: Raising Developing Countries Exports Survival through Experience", Mimeo.

Chaney, T. (2013), "The Gravity Equation in International Trade: An Explanation", NBER Working Papers 19285.

Chaney, T. (2014), "The Network Structure of International Trade", *American Economic Review*, vol. 104 nº 11: pp. 3600–34.

Defever, F., Heid, B. and Larch, M. (2011), "Spatial Exporters", CEP Discussion Papers dp1100, Centre for Economic Performance, LSE.

Eaton, J., Eslava, M., Kugler, M. and Tybout, J. (2008), "The margins of entry into export markets: Evidence from Colombia", The Organization of Firms in a Global Economy, Cambridge, MA: Harvard University Press.

Eaton, J., Eslava, M., Krizan, C. J., Kugler, M. and Tybout, J. (2010), "A Search and Learning Model of Export Dynamics", Mimeo.

Ehrhart, H., Le Goff, M., Rocher, E. and Singh, R. J. (2012), "Does Migration Foster Exports? An African Perspective", CEPII Working Paper No. 2012-38.

Evenett, S. and Venables, A. (2002), "Export growth in developing countries: Market entry and bilateral trade flows", Mimeo.

Frankel, J. A. (2008), "The Estimated Effects of the Euro on Trade: Why Are They Below Historical Effects of Monetary Unions Among Smaller Countries?", NBER Working Papers 14542, National Bureau of Economic Research, Inc.

Freund, C. and Pierola, M. D. (2010), "Export entrepreneurs : evidence from Peru", Policy Research Working Paper Series 5407, The World Bank.

Gaulier, G. and Zignago, S. (2010), "BACI: International Trade Database at the Product-Level. The 1994-2007 Version", CEPII Working Paper No. 2010-23.

di Giovanni, J. and Levchenko, A. A. (2010), "Putting the Parts Together: Trade, Vertical Linkages, and Business Cycle Comovement", *American Economic Journal: Macroeconomics*, vol. 2 nº 2: pp. 95–124.

Guimaraes, P. and Portugal, P. (2010), "A simple feasible procedure to fit models with high-dimensional fixed effects", *Stata Journal*, vol. 10 nº 4: pp. 628–649.

Head, K. and Mayer, T. (2013), "Gravity Equations: Workhorse, Toolkit, and Cookbook", CEPR Discussion Paper No. 9322.

Head, K., Mayer, T. and Ries, J. (2010), "The erosion of colonial trade linkages after independence", *Journal of International Economics*, vol. 81 nº 1: pp. 1–14.

Johnson, R. C. (2012), "Trade in Intermediate Inputs and Business Cycle Comovement", NBER Working Papers 18240.

Johnson, R. C. and Noguera, G. (2012a), "Accounting for intermediates: Production sharing and trade in value added", *Journal of International Economics*, vol. 86 nº 2: pp. 224–236.

Johnson, R. C. and Noguera, G. (2012b), "Proximity and Production Fragmentation", *American Economic Review*, vol. 102 nº 3: pp. 407–11.

Manski, C. F. (1993), "Identification of Endogenous Social Effects: The Reflection Problem", *Review of Economic Studies*, vol. 60 nº 3: pp. 531–42.

Melitz, J. and Toubal, F. (2012), "Native language, spoken language, translation and trade", CEPR Discussion Paper No. 8994.

Mitchener, K. J. and Weidenmier, M. (2008), "Trade and Empire", *The Economic Journal*, vol. 118: pp. 1805–1834.

Morales, E., Sheu, G. and Zahler, A. (2011), "Gravity and extended gravity: estimating a structural model of export entry", MPRA Paper 30311.

Nguyen, D. X. (2012), "Demand Uncertainty: Exporting Delays and Exporting Failures", *Journal of International Economics*, vol. 86.

Rauch, J. E. (2001), "Business and Social Networks in International Trade", *Journal of Economic Literature*, vol. 39 nº 4: pp. 1177–1203.

Rauch, J. E. and Trindade, V. (2002), "Ethnic Chinese Networks In International Trade", *The Review of Economics and Statistics*, vol. 84 nº 1: pp. 116–130.

Rauch, J. E. and Watson, J. (2003), "Starting small in an unfamiliar environment", *International Journal of Industrial Organization*, vol. 21 nº 7: pp. 1021–1042.

Silva, J. M. C. S. and Tenreyro, S. (2006), "The Log of Gravity", *The Review of Economics and Statistics*, vol. 88 nº 4: pp. 641–658.

de Sousa, J. and Lochard, J. (2012), "Trade and Colonial Status", *Journal of African Economies*, vol. 21 nº 3: pp. 409–439.

Zenou, Y. and Topa, G. (2014), "Neighborhood and network effects", CEPR discussion paper n. 10126.

5 Appendix

Appendix A: List of former British and French former colonies (after 1945) used in the estimations

- Former French colonies: Algeria, Benin, Burkina Faso, Cambodia, Cameroon, Central African Republic, Chad, Comoros, Congo, Cote d'Ivoire, Djibouti, Gabon, Guinea, Laos, Madagascar, Mali, Mauritania, Morocco, New Caledonia, Niger, French Polynesia, Senegal, Syrian Arab Republic, Togo, Tunisia, Vanuatu, Vietnam.

- Former English colonies: Antigua and Barbuda, Bahamas, Bahrain, Bangladesh, Barbados, Belize, Bermuda, Brunei, Cayman Islands, Cyprus, Dominica, Eritrea, Fiji, Gambia, Ghana, Grenada, Guyana, Hong Kong, India, Israel, Jamaica, Jordan, Kenya, Kiribati, Kuwait, Malawi, Malaysia, Maldives, Malta, Mauritius, Nigeria, Pakistan, Qatar, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Seychelles, Sierra Leone, Singapore, Solomon Islands, Sri Lanka, Sudan, Tanzania, Tonga, Trinidad and Tobaggo, Tuvalu, Uganda,United Arab Emirates, Vanuatu, Yemen, Zambia, Zimbabwe.

Table 9: Robustness Trade intensity and distance with former colonizer

VARIABLES	(1) $Exports_{ijt}$ ppml	(2) $Exports_{ijt}$ ppml
Col_j^{FR} x Trade $intensity_i^{FR}$		0.992***
		(0.133)
Col_i^{FR} x Trade $intensity_j^{FR}$		0.413***
		(0.149)
Col_j^{UK} x Trade $intensity_i^{UK}$		0.984***
		(0.368)
Col_i^{UK} x Trade $intensity_j^{UK}$		0.125
		(0.605)
Col_j^{FR} * $Distance_i^{FR}$	-0.032**	
	(0.016)	
Col_i^{FR} * $Distance_j^{FR}$	-0.112***	
	(0.033)	
Col_j^{UK} * $Distance_i^{UK}$	-0.117***	
	(0.016)	
Col_i^{UK} * $Distance_j^{UK}$	0.023	
	(0.023)	
Trade $intensity_j^{UK}$		4.456***
		(0.596)
Trade $intensity_i^{UK}$		3.149***
		(0.642)
Trade $intensity_j^{FR}$		0.250*
		(0.134)
Trade $intensity_i^{FR}$		0.506***
		(0.173)
GDP_i (log)	0.656***	0.687***
	(0.045)	(0.045)
GDP_j (log)	0.687***	0.718***
	(0.045)	(0.045)
$Colonies_{ij}^{others}$	-0.277***	-0.268***
	(0.093)	(0.092)
Common colonizer	0.272***	0.218***
	(0.048)	(0.043)
Common off. language	-0.226***	-0.228***
	(0.033)	(0.033)
Common ethn. language	0.269***	0.270***
	(0.034)	(0.034)
FTA	0.393***	0.390***
	(0.024)	(0.024)
Distance (log)	-0.747***	-0.744***
	(0.013)	(0.013)
Contiguity	0.426***	0.427***
	(0.024)	(0.024)
Common legal origin	0.263***	0.263***
	(0.015)	(0.015)
Common currency	-0.099***	-0.119***
	(0.032)	(0.032)
Religious proximity	0.134***	0.127***
	(0.034)	(0.034)
Constant	-16.710***	-18.427***
	(1.226)	(1.261)
Year dummies	yes	yes
Country FE	yes	yes
Observations	274,803	274,803
R-squared	0.913	0.913

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Documents de Travail

510. G. Bazot, M. D. Bordo and E. Monnet, "The Price of Stability. The balance sheet policy of the Banque de France and the Gold Standard (1880-1914) ," October 2014

511. K. Istrefi and A. Piloiu, "Economic Policy Uncertainty and Inflation Expectations," October 2014

512. C. Jardet and A. Monks, "Euro Area monetary policy shocks: impact on financial asset prices during the crisis?," October 2014

513. J. Dugast and T. Foucault, "False News, Informational Efficiency, and Price Reversals," October 2014

514. G. Cette, J. Lopez and J. Mairesse, "Product and Labor Market Regulations, Production Prices, Wages and Productivity," October 2014

515. L. Ferrara and C. Marsilli, "Nowcasting global economic growth: A factor-augmented mixed-frequency approach," October 2014

516. F. Langot and M. Lemoine, "Strategic fiscal revaluation or devaluation: why does the labor wedge matter? ," October 2014

517. J.-P. Renne, "Fixed-Income Pricing in a Non-Linear Interest-Rate Model," October 2014

518. J.-P. Renne, "Options Embedded in ECB Targeted Refinancing Operations," October 2014

519. A. Penalver, "Pre-crisis credit standards: monetary policy or the savings glut?," November 2014

520. C. Marsilli, "Variable Selection in Predictive MIDAS Models," November 2014

521. P. Lopez, "The Term Structure of the Welfare Cost of Uncertainty," November 2014

522. F. Ferroni and B. Klaus, "Euro Area business cycles in turbulent times: convergence or decoupling? ," November 2014

523. F. Bec and A. De Gaye, "How do oil price forecast errors impact inflation forecast errors? An empirical analysis from French and US inflation forecasts," November 2014

524. P. Andrade, R. Crump, S. Eusepi and E. Moench, "Fundamental Disagreement," November 2014

525. P. Antipa, "How Fiscal Policy Affects the Price Level: Britain's First Experience with Paper Money," November 2014

526. A. Berthou and H. Ehrhart, "Trade networks and colonial trade spillovers," December 2014

Pour accéder à la liste complète des Documents de Travail publiés par la Banque de France veuillez consulter le site : www.banque-france.fr

For a complete list of Working Papers published by the Banque de France, please visit the website: www.banque-france.fr

Pour tous commentaires ou demandes sur les Documents de Travail, contacter la bibliothèque de la Direction Générale des Études et des Relations Internationales à l'adresse suivante :

For any comment or enquiries on the Working Papers, contact the library of the Directorate General Economics and International Relations at the following address :

BANQUE DE FRANCE
49- 1404 Labolog
75049 Paris Cedex 01
tél : 0033 (0)1 42 97 77 24 ou 01 42 92 63 40 ou 48 90 ou 69 81
email : 1404-ut@banque-france.fr