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Independence and trade: the specific effects of French colonialism

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Abstract

The consequences on international trade of colonial rule have received an increasing attention. This paper investigates the effect of independence on trade with a focus on former French colonies. Thanks to an original dataset including data on pre-independence bilateral trade for former French colonies, we obtain more accurate results on the effect of independence on bilateral trade patterns. We show that that independence reduces trade (imports and exports) with the former metropole and that this effect is mainly driven by former French colonies. We also show that, after independence, trade (imports and exports) of all former colonies increase with the rest of the world (other countries not belonging to the same empire).

Author Keywords: Trade; Decolonization; French Empire.

JEL classification codes: F10; F54.

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1 Introduction

Several studies highlight the consequences of colonial rule on bilateral trade. Mitchener and Weidenmier (2008) assess the contemporaneous effects on empire on trade over the period, 1870-1913. They show that belonging to an empire doubled trade relative to those countries that were not part of an empire. A country's prior colonial status is also shown to exert a still large and statistically significant positive effect on current bilateral trade (see e.g. Rose, 2000; Glick and Taylor, 2006).¹ This raises the question of the impact of decolonization on post-colonial trade. Head *et al.* (2010) investigate this issue using a worldwide data set over the period 1948-2006. They show that post-independence trade with the colonizer does not exhibit immediate significant changes, but that after several decades, the accumulated trade erosion is large and statistically significant. On average, trade between a colony and its colonizer is reduced by 65% after four decades. They obtain two other sobering results. Decolonization reduces trade between siblings, i.e. former parts of the same colonial empire, in a comparable extent. Independence also decreases trade of former colonies with the rest of the world.

This paper intends to answer two additional questions raised by the findings in Head *et al.* (2010). Do the effects of independence on trade patterns change according to the colonial power? Are exports and imports impacted in the same way? Indeed, the impact of independence on bilateral trade may change drastically across empires since they implemented very different colonial trade policies. In this respect, the liberal Great Britain is generally opposed to the protectionist France (see Mitchener and Weidenmier, 2009). Moreover, for several reasons, independence may have affected differently former colonies' exports and imports. First, colonies exported mainly homogeneous primary products to their metropole, whereas they imported manufactured goods from their colonial power. These imports ultimately reflect the slowly changing preference patterns of the whole society (Kleiman, 1976). Consequently, one can think that, after independence, imports may have been reoriented less easily than exports. Second, colonial trade policies also differed systematically between exports to and imports from the metropole (Bhattacharjea, 2004).

To gain some perspective on these questions, this article investigates the effect of independence on former colonies' exports and imports and allows to compare the consequences of independence for different empires. While some studies intend to assess the consequences of independence on former colonies' exports and imports in a comparative fashion, they only rely on descriptive statistics (Kleiman, 1976, 1977). To examine the consequences of independence on trade, we construct a new bilateral database of trade between 71 developing countries and 189 partner countries over

¹Rose (2000) shows in his benchmark results for 1990 that the colonial relationship raises bilateral trade by a factor of 5.75, everything else equal, while having had a common colonizer makes countries bilateral trade 80% larger. The positive and persistent effect of a common colonial history is related to similar institutions or surviving business networks.

the period 1948-2007. Most of our data are extracted from the International Monetary Fund's Direction of Trade Statistics (DOTS). But since the DOTS scarcely report data prior to colonies' independence, in particular for French colonies, we increase our database by gathering data from various official French sources on bilateral trade of former French colonies from 1948 to their independence. We are thus able to compare properly the impact of independence for former French colonies and for other former colonies, in particular the British ones.

Using a gravity model of trade and an original dataset including new colonial data for former French colonies, we first investigate the impact of independence on bilateral trade (exports and imports) of former colonies worldwide and investigate the specific impact of independence for former French colonies as compared to other former colonies. Finally, we explore the impact of independence over time and investigate the impact of independence on the dynamics of trade.

The paper is structured as follows. In section 2, we describe our data, introduce the empirical model and discuss some estimation issues. In section 3, we estimate the average impact of independence on former colonies' trade and compare the impact of independence for different former empires. In section 4, we investigate the impact of independence over time. Finally, we summarize our findings and add concluding remarks in section 5.

2 Data and empirical model

2.1 Trade data and descriptive evidence

In our sample we have data for bilateral trade of 71 reporting countries or federations of countries with 189 partner countries. These reporting countries or federations of countries include 13 former French colonies, 34 former British colonies, 11 former colonies from other colonizers² and 13 countries that became independent before 1945 or that have never been colonized (see Table 3 in appendix). The sample ranges from 1948 to 2007.

As mentioned in the introduction, the main database recording bilateral trade for a long period of time is the International Monetary Fund's Direction of Trade Statistics (DOTS). Even if it provides data on bilateral trade for a very large number of countries or entities since 1948, it has two major drawbacks. First, trade of some former colonies is not recorded in the DOTS before their independence. This is especially the case for former French and Belgian colonies. For instance, trade flows of the French Central and West African colonies are simply not included in the DOTS database even as part of the French imports or exports. Trade of other former

²Our sample includes former colonies from Belgium (Burundi, Congo and Rwanda), from the Netherlands (Indonesia, Surinam, the Netherlands Antilles) and from Portugal (Angola, Cape Verde, Guinea Bissau, Mozambique, Sao Tome and Principe).

colonies (in particular the British ones) are much more precisely recorded. Indeed, the DOTS dataset reports pre-independence trade data for all former British colonies, except for a few ones (Botswana, Kiribati, Saint Lucia, Lesotho, Malawi, Swaziland and Tonga). In contrast, only a few former French colonies have their trade recorded in the DOTS since 1948 (Cameroon, Madagascar, Algeria, Morocco, Tunisia, Vietnam, Laos and Cambodia).³ Second, when trade of former colonies is recorded, it is often recorded as zero. As noticed by Head *et al.* (2010), trade between France and Vietnam, Laos and Cambodia is recorded as zero in the DOTS between 1948 and 1953 or 1954 (the year of independence) and then becomes positive. These missing and ‘fake’ zeros may create serious estimation bias.

In order to improve the coverage of these data, we use mirror data. The DOTS database reports two values for the same flow (imports of country A from country B and exports of B to A). When imports data are missing or recorded as zero, we substitute imports data with the reverse flow (exports), whenever available. We add 10% to the export flow to adjust for the fact that exports are reported FOB and imports are recorded CIF, as in Head *et al.* (2010).

Secondly, we complement the DOTS data with bilateral trade data during the colonial era of former French colonies coming from three main sources:

- *Commerce extérieur des Etats d’Afrique et de Madagascar de 1949 à 1960*, Institut National de la Statistique et des Etudes Economiques (INSEE);
- *Annuaire statistique de l’Union Française d’Outre Mer*, Ministère de la France d’Outre-Mer (1938-1949);
- *Annuaire statistique des Territoires d’Outre Mer*, INSEE (1959, 1960, 1961);

During the colonial era, trade was generally reported for federations of colonial possessions, like the French Equatorial Africa (*Afrique Equatoriale Française*) which contained four territories: Gabon, Middle Congo (now the Republic of the Congo), Oubangui-Chari (now the Central African Republic) and Chad (see Table 3 in appendix). Thus, for these federations of colonies, we aggregated data for post-colonial trade (coming from the DOTS) and for every determinant of trade on the entire period of estimation.⁴

For former French colonies, there are 2,088 pre-independence (non-zero) imports flows in the DOTS database. As mentioned above, these DOTS observations concern only a few colonies (Cameroon, Algeria, Morocco, Madagascar and Tunisia). With new colonial data, we add 1,603

³The DOTS dataset reports some pre-independence trade data for only one Belgian former colony (the Democratic Republic of Congo), but for all former Dutch and Portuguese colonies included in our sample.

⁴For monadic determinants (such as population or GDP per capita), we simply computed the sum on individual countries belonging to the federation.

non-zero observations (some of which are already recorded in the DOTS database) and 999 pre-independence *new* observations (which are never recorded in the DOTS database), counting for 31% of the total of pre-independence imports data (3,211) of former French colonies. For exports, we add 1,274 pre-independence (non-zero) observations and 422 pre-independence *new* observations (which are never recorded in the DOTS database), representing about 16% of the total of pre-independence exports data (2,704) of former French colonies.

Thus, for some countries or federation of countries not recorded in the DOTS data such as the Ivory Coast or French West Africa, adding colonial data provides a clear improvement. This allows to estimate more accurately the impact of independence on trade for former French colonies and to compare independence effects across empires.

2.2 Baseline model and estimated equation

To investigate the role of independence on bilateral trade of the former colonies, we use a gravity model. The gravity model relates bilateral trade, T_{ijt} , (e.g. imports) between country i and country j at time t , to their economic sizes (Y_{it} and Y_{jt}), and bilateral trade costs (τ_{ijt}). The gravity equation can be written as:

$$T_{ijt} = \delta_0 (Y_{it})^{\delta_1} (Y_{jt})^{\delta_2} (\tau_{ijt})^{\delta_3}, \quad (1)$$

Trade costs (τ_{ijt}) are generally modeled as a function of some observable factors, including bilateral distance between trade partners, the existence of a common border or a common language, or regional trade agreements (RTA). We also introduce a set of indicators (*Indep*) related to past colonial ties.

$$\tau_{ijt} = dist_{ij}^{\gamma_1} \times \exp(border_{ij})^{\gamma_2} \times \exp(lang_{ij})^{\gamma_3} \times \exp(RTA_{ijt})^{\gamma_4} \times \exp(Indep_{ijt})^{\gamma_5}, \quad (2)$$

In our basic specification, we break up the set of indicators related to past colonial ties into three dummy variables:

$$Indep_{ijt} = \{Indep_COL_{ijt}, Indep_SIB_{ijt}, Indep_ROW_{ijt}\}$$

The first dummy variable is equal to 1 for relationships between former colonies and their colonizer for each year since independence and 0 otherwise. The second one (*Indep_SIB_{ijt}*) is equal to 1 for relationships between former colonies (siblings) for each year since independence and 0 otherwise⁵ and the third one (*Indep_ROW_{ijt}*) is equal to 1 for relationships between former

⁵We adopt a ‘restricted’ definition by granting that the *Indep_SIB_{ijt}* is equal to one when

colonies and the rest of the world for each year since independence and 0 otherwise.

Independence may increase bilateral trade costs with the former colonizer and other countries in the colonial empire (siblings) for several reasons. Independence may have deteriorated business networks as argued by Head *et al.* (2010). The “gradual retirement of business people who facilitated trade within the empire” could have induced a gradual decrease in bilateral trade relationships between the former colonizer and its former colonies (Head *et al.*, 2010, p.9). Independence may also have put an end to trade arrangements imposed on members of an empire. As a consequence, we expect independence to decrease trade with the former colonizer and other former colonies from the same empire. We also expect independence to increase trade of former colonies with the rest of the world since increasing trade costs with the former colonial power and the other former colonies may raise multilateral resistance indices (see Anderson and van Wincoop, 2003).

However, we also expect different independence effects depending on the identity of the colonial power. Indeed, colonial powers implemented different colonial trade policies in their colonies. In this respect, the liberal Great Britain is generally opposed to the protectionist France (see Mitchener and Weidenmier, 2009). France and most of its colonies adopted a customs union in 1892 (Mitchener and Weidenmier, 2008). Under this regime, colonies enjoyed free trade with France for most products while non-colonies were subject to tariffs. On the contrary, the British Empire generally favored free trade policies and trade of British colonies was open to all foreign countries at least until 1932 (see de Sousa and Lochard, 2012). After World War II, the difference between the two empires is less pronounced. In response to the Great Depression, Great Britain departed from free trade and instituted discriminatory tariffs and quotas against non-empire imports. These systems of imperial preferences continued after World War II. The other empires applied a wide array of trade policies towards their colonies. For instance, Belgian colonies had low to moderate tariffs, whereas Portugal adopted preferential tariffs systems with most of its colonies.

Trade preferences and agreements between the metropole and its colonies may certainly influence post-colonial trade patterns. In particular, as France was the most protectionist empire, we expect independence to reduce more drastically and more rapidly trade inside the former French empire. To investigate the impact of independence on trade according to the colonial power, we break up our set of indicators related to past colonial ties (*Indep_COL*, *Indep_SIB*, *Indep_ROW*) according to the metropole (France, Great Britain and other colonial empires, i.e. Portugal, Belgium and the Netherlands). For instance, the dummy *Indep_FRA* takes the value 1 for flows between France and its former colonies for each year since independence. The *Indep_SIB_FRA* and *Indep_ROW_FRA* dummies take the value 1 for trade between a former French colony and, the two trade partners obtain independence. For instance, for the trade relationship between two former French colonies, Cameroon (independent in 1960) and Djibouti (independent in 1977), the *Indep_SIB_{ijt}* dummy will be equal to one from 1977 onwards.

respectively, another former French colony (sibling) after independence and the rest of the world after independence.

Replacing the trade cost factor in equation (1), we obtain the estimated equation in its multiplicative form :

$$\begin{aligned}
 T_{ijt} &= GDPCap_{it}^{\beta_1} \times Pop_{it}^{\beta_2} \times GDPCap_{jt}^{\beta_3} \times Pop_{jt}^{\beta_4} \\
 &\times \exp(\beta_5 RTA_{ijt} + \beta_6 Indep_{ijt} + \alpha_{ij} + \lambda_t) \times \epsilon_{ijt},
 \end{aligned}
 \tag{3}$$

We proxy countries' economic size (Y) by GDP per capita and population to account for size and development effects. Bilateral *time-invariant* factors affecting trade, such as bilateral distance, common language or common border, are accounted by bilateral fixed effects (α_{ij}). We add a dummy variable to capture the effect of regional trade agreements (RTA) on trade. This dummy variable covers several free trade agreements or customs unions relevant for our reporting countries. All variables and data sources are described in appendix (Table 4). Our empirical model also includes time dummies (λ_t) which control for the general evolution of trade.

2.3 Estimation issues

Anderson and van Wincoop (2003) argue that typical gravity equations suffer from omitted variable bias due to multilateral resistance terms. These country specific indices account for the fact that “the more resistant to trade with all others a region is, the more it is pushed to trade with a given bilateral partner” (Anderson and van Wincoop, 2003). In panel empirical analysis, these multilateral resistance indices are generally taken into account by country-year fixed effects. However, this method is computationally burdensome and even impossible to apply in the case of large datasets including many countries and years. In our case, this method would imply adding more than 15,000 country-year dummies, which is practically unfeasible.⁶ We therefore adopt another solution which consists in using the fixed effects method of estimation. While this solution is not fully satisfactory notably because it amounts to consider that multilateral resistance terms are time-invariant, it has several advantages. It exploits the time series properties of the data. The effect of independence is thus estimated by comparing, within each pair of countries, the evolution of trade *before* and *after* independence. Moreover, it allows to control for every unobservable time-invariant country and country-pair characteristics that affect trade and that are potentially correlated with other determinants of trade.

A second estimation issue relates to potential simultaneity in the relationship between independence and trade. Indeed, it may be the case that a colonizer chooses to give independence because

⁶Another possible method to account for multilateral resistance indices is to use the ‘tetrad’ approach of Head *et al.* (2010), but the results are sensitive to the choice of the reference countries.

it does not expect any further gain from trade with its former colonies. In this case, the traditional estimators, such as the OLS estimator or even the fixed effects estimator, are biased. However, we argue that simultaneity is quite unlikely. The decolonization process is more related to political issues than to strictly economic and international trade issues. Indeed, the importance of the colonies in the trade of their metropole has been increasing rather than decreasing in the three or four decades before independence. Kleiman (1976) shows that the share of colonies in metropolitan countries' trade has doubled or even trebled between the late 1920's and the mid-1950's. Moreover, for the colonial powers, colonies, with a few exceptions (notably Algeria, Angola and Mozambique), accounted for a small part of their total trade (about 10%). Thus, "any potential gains of colonial trade could have been of only limited significance to them" (Kleiman, 1976, p. 478).

A third issue relates to the presence of zero trade in the dataset. Indeed, the most standard approach consists in estimating the gravity model in a logarithmic form, which amounts to drop zero values of the dependent variable (i.e. trade). In our dataset, we have 798,593 observations in total, of which 202,577 correspond to zero trade for imports (25%) and 218,775 for exports (27%). There are several ways to handle this problem. The first one is to simply drop the zero trade observations. However, this method will yield biased estimates if the zeros are not randomly distributed, which is quite likely.⁷ The second one is to use a Tobit estimator. However, this method is highly sensitive to the trade value used as the left censor value (see Head *et al*, 2010). A third solution consists in using a Poisson quasi-maximum likelihood (PQML) estimator. The PQML estimator incorporates the zeros and is robust to different patterns of heteroskedasticity (see Santos Silva and Tenreyro, 2006).⁸

These arguments extend to panel data. Among panel data models, the fixed effects Poisson estimator has strong robustness properties. In particular, it allows for arbitrary dependence between the fixed effects and the explanatory variables, as in the linear model. The only assumption required for the estimator to be consistent concerns the conditional mean of the dependent variable (see Wooldridge, 1999 and Wooldridge, 2002, ch. 19). Numerous recent papers provide supporting evidence for the PQML estimator or the fixed effects Poisson estimator (e.g. Siliverstovs and Schumacher, 2009; Westerlund and Wilhelmsson, 2011). Therefore, in our empirical estimations, we use the fixed effects Poisson estimator. Note that this estimator may also produce biased estimates if the zeros are not 'true' zeros (i.e. if trade flows are incorrectly recorded as zero trade flows). Head *et al.* (2010) report several cases in the DOTS database where there are zeros which should be indeed coded as missing. Thanks to the original data we gathered, we are able to solve partly

⁷Zero trade is more likely to occur for instance for small and distant countries (see Santos Silva and Tenreyro, 2006).

⁸Santos Silva and Tenreyro (2006) show that "heteroskedasticity is quantitatively and qualitatively important in the gravity equation, even when controlling for fixed effects" (p. 643) and that the log-linear gravity specification leads to inconsistent estimates in this case.

this issue since we can distinguish between ‘true’ zeros and missing trade for former French colonies.

In the next sections, we present our empirical results. First, we estimate the average effect of independence on former colonies’ trade (imports and exports) over the entire post-colonial period and compare the results for different empires (section 3). Second, we investigate the impact of independence over time (section 4).

3 The overall effect of independence on former colonies’ trade

Estimation results of equation (3) using the fixed effects Poisson estimator are reported in Table 1 for former colonies’ imports (column 1) and for former colonies’ exports (column 2). On the whole, our empirical model seems to work reasonably well. All control variables are significant and have the expected sign.

Results depicted in column 1 of Table 1 show that independence affects former colonies’ imports patterns. Independence implies a substitution of imports from rest of the world for imports from the metropole. More precisely, independence reduces imports from the metropole by 36% [= $(exp(-0.46) - 1) * 100$] and increases imports from the rest of the world by 118% [= $(exp(0.78) - 1) * 100$] in average over the whole post-colonial period.⁹ It is worth noting that we do not find any global impact of independence on imports from other former colonies (siblings). In order to check whether the inclusion of new pre-independence data affect our results, we estimate the same set of equations with the DOTS data only. Estimation results (see Table 5 in appendix) reveal that the effects of independence is generally lower when including new colonial data rather than the DOTS dataset only.¹⁰ This suggests that independence has a lower impact on former colonies’ imports when accounting more exhaustively for pre-independence trade.

Column 2 of Table 1 reports our estimation results for exports. Here again our empirical model seems to work reasonably well. All control variables are significant and intuitively signed. It is worth noting that in all cases, there is no significant impact of the RTA variable on exports. This may be due to the specialization of several former colonies in primary goods (which

⁹Note that in the Poisson regression model, the interpretation of the estimated coefficients is similar to the one in the standard log-linear model. Coefficients on variables in logarithmic form (such as the GDP per capita or the population) can be interpreted as elasticities and the impact of dummy variables is measured as the exponential of the coefficient minus one (see Winkelmann, 2003).

¹⁰For instance, the corresponding coefficient for the *Indep_COL* variable is -0.56 (significant at the 5% level) when estimated on the restricted DOTS dataset. Comprehensive results are reported in appendix.

are mostly non-traded intra-regionally). We also include a specific dummy variable for the ACP (Africa–Caribbean–Pacific) agreements. Indeed, the European Union offers trade preferences to a large number of African Caribbean and Pacific countries through the Cotonou agreement (previously Yaoundé and Lomé conventions). The ACP agreements are found to have no impact on former colonies’ exports. This is not surprising since many papers argue that these agreements do not have any significant impact on developing countries (Panagariya, 2002). Our results also indicate that independence affects former colonies’ exports in the same way as imports. Independence is found to reduce exports to the former colonizer, to increase exports to the rest of the world and to have no effect on exports to siblings on average over the whole post-colonial period. However, the coefficient estimates are larger than those for imports. More precisely, independence reduces exports from the metropole by 46% [= $(exp(-0.61) - 1) * 100$] and increases imports from the rest of the world by 252% [= $(exp(1.26) - 1) * 100$] (column 1). Even if such differences are probably not statistically significant, they are worth commenting on briefly. They could indicate that for former colonies, exports are easier to redirect than imports.

In Table 2 we test whether these first general conclusions hold for every empire. For the sake of clarity, we only report estimates for independence dummies.¹¹ Estimation results highlight that the effects of independence on bilateral imports and exports of former colonies are very sensitive to the identity of the colonial power.

For imports, we find very different impacts of independence on post-colonial trade patterns across empires. As regards the French empire, independence is found to reduce imports from France and from other former French colonies (siblings) by an amount that is statistically and economically significant. Our results indicate that, following independence, imports from France and imports from other former French colonies have decreased respectively by 52% [= $(exp(-0.75) - 1) * 100$] and 67% [= $(exp(-1.10) - 1) * 100$] on average over the entire post-independence period (column 1). Independence is also found to increase imports of former French colonies from the rest of the world by 85% [= $(exp(0.62) - 1) * 100$]. Thus, our result clearly suggest that, for these countries, independence implies a redirection of trade from the France and its empire to the rest of the world.

As regards the British empire, the consequences of independence on former colonies’ imports are drastically different. First, we find that independence has no effect on imports from Great Britain and from siblings. Indeed, the coefficients of *Indep_GBR* and *Indep_SIB_GBR* are not significant at the 10% level. At last, as in the case of former French colonies, we find that former British colonies’ imports from the rest of the world increase dramatically after independence. The average estimated effect for these countries is 110% [= $(exp(1.02) - 1) * 100$].

For the other empires (Belgian, Portuguese and Dutch empires), we find no impact of inde-

¹¹Coefficient estimates for control variables are very similar to that of Table 1 and are available upon request.

Table 1: The effect of independence on former colonies' trade

Trade flows	Imports (1)	Exports (2)
$\ln(\text{GDP per cap}_{it})$	1.03 ^a (0.08)	1.09 ^a (0.16)
$\ln(\text{GDP per cap}_{jt})$	1.26 ^a (0.11)	1.05 ^a (0.15)
$\ln(\text{Population}_{it})$	0.90 ^a (0.18)	1.17 ^a (0.24)
$\ln(\text{Population}_{jt})$	1.75 ^a (0.16)	1.65 ^a (0.27)
RTA_{ijt}	0.16 ^b (0.06)	0.08 (0.08)
ACP_EU_{ijt}		0.01 (0.12)
Indep_COL_{ijt}	-0.46 ^b (0.24)	-0.61 ^a (0.18)
Indep_SIB_{ijt}	0.05 (0.20)	-0.07 (0.12)
Indep_ROW_{ijt}	0.78 ^a (0.13)	1.26 ^a (0.20)
# of observations	293 909	295 475
Country-pair dummies	yes	yes
Year dummies	yes	yes

Notes: Fixed effects Poisson estimations. Standard errors clustered at the country-pair level in parentheses. ^a, ^b and ^c denote significance at the 1%, 5% and 10% level respectively. Year dummies estimates are not reported.

pendence on imports of former colonies from their colonizer, an increase in imports from the rest of the world and a (large) decrease in imports from siblings. However, we have to interpret these results with caution because the other empires' group gather very different situations and represent relatively few observations.¹²

Estimations results for exports also exhibit large differences across empires. For former French colonies, independence effects for exports are broadly similar to those found for imports. Indeed, our results indicate that, following independence, exports to France and exports to other former French colonies have decreased respectively by 45% [= $(\exp(-0.60) - 1) * 100$] and 67% [= $(\exp(-1.13) - 1) * 100$] on average over the entire post-independence period (column 2). Furthermore, following independence, exports of former French colonies to the rest of the world have been multiplied by more than 4 [= $(\exp(1.52))$]. Thus, for former French colonies, independence has also generated a redirection of exports from the former colonizer and from siblings to the rest of the world. The fact that the independence effect on exports to the rest of the world is greater than the corresponding effect on imports tends to confirm the hypothesis according to which exports are easier to reorient than imports.

For former British colonies, we find some evidence that independence leads to a decrease in exports to the metropole and an increase in exports to other (ROW) countries in average over the whole post-colonial period. The estimated effects are respectively -41% [= $(\exp(-0.54) - 1) * 100$] (with a p-value of 0.054) and +177% [= $(\exp(1.02) - 1) * 100$]. Thus, it seems that former British colonies have not imported less but have exported less to the UK after independence. One possible interpretation is that for the UK, colonies were perhaps more important as a supplier of raw materials than as an outlet for her manufactured goods (see Kleiman, 1976). As for imports, we also find that independence does not affect exports of British colonies with their siblings.

As regards other empires, independence seems to reduce exports to their metropole and to their former siblings and increase drastically exports to the rest of the world. But, here again these results should be interpreted cautiously.

On the whole, our results indicate that, following independence, trade (imports and exports) with the metropole and with siblings has decreased mainly for former French colonies (by about respectively 50% and 67% on average over the whole post-colonial period). For other empires, the evidence is less clear-cut. Indeed, as regards Great Britain and the other empires, we show that independence has no effect on exports to and imports from siblings. Nevertheless, whereas we find no effect of independence on imports from the metropole, our results tend to indicate that

¹²In particular, the *Indep_SIB_OTH* is equal to one for only 974 observations (on a total of 798,593). The estimation results for this variable depend mainly on (few) former Portuguese colonies.

independence reduces exports to the metropole. Finally, for every empire, we also show that trade (imports and exports) with other (ROW) countries has strongly increased following independence. This result contrasts sharply with the findings of Head *et al.* (2010) who show that independence has reduced trade of former colonies with the rest of the world. The specificity of independence effects on bilateral trade patterns in the case of the French empire is consistent with our previous discussion on French imperial preferences system. In the following section, we investigate in more details the effects of independence over time.

Table 2: The effect of independence on former colonies' trade by empire

Trade flows	Imports (1)	Exports (2)
Indep_FRA _{ijt}	-0.75 ^a (0.27)	-0.60 ^a (0.19)
Indep_SIB_FRA _{ijt}	-1.10 ^a (0.27)	-1.13 ^a (0.31)
Indep_ROW_FRA _{ijt}	0.62 ^b (0.26)	1.52 ^a (0.25)
Indep_GBR _{ijt}	-0.08 (0.20)	-0.54 ^c (0.28)
Indep_SIB_GBR _{ijt}	0.09 (0.21)	-0.05 (0.12)
Indep_ROW_GBR _{ijt}	1.02 ^a (0.15)	1.02 ^a (0.21)
Indep_OTH _{ijt}	-0.33 (0.43)	-0.80 ^c (0.44)
Indep_SIB_OTH _{ijt}	-2.78 ^a (0.43)	-2.80 ^a (0.44)
Indep_ROW_OTH _{ijt}	0.62 ^a (0.17)	1.38 ^a (0.37)
# of observations	293 909	295 475
Country-pair dummies	yes	yes
Year dummies	yes	yes

Notes: Fixed effects Poisson estimations. Standard errors clustered at the country-pair level in parentheses. Other coefficients (for the control variables) are not reported. ^a, ^b and ^c denote significance at the 1%, 5% and 10% level respectively. Year dummies estimates are not reported.

4 The effect of independence over time

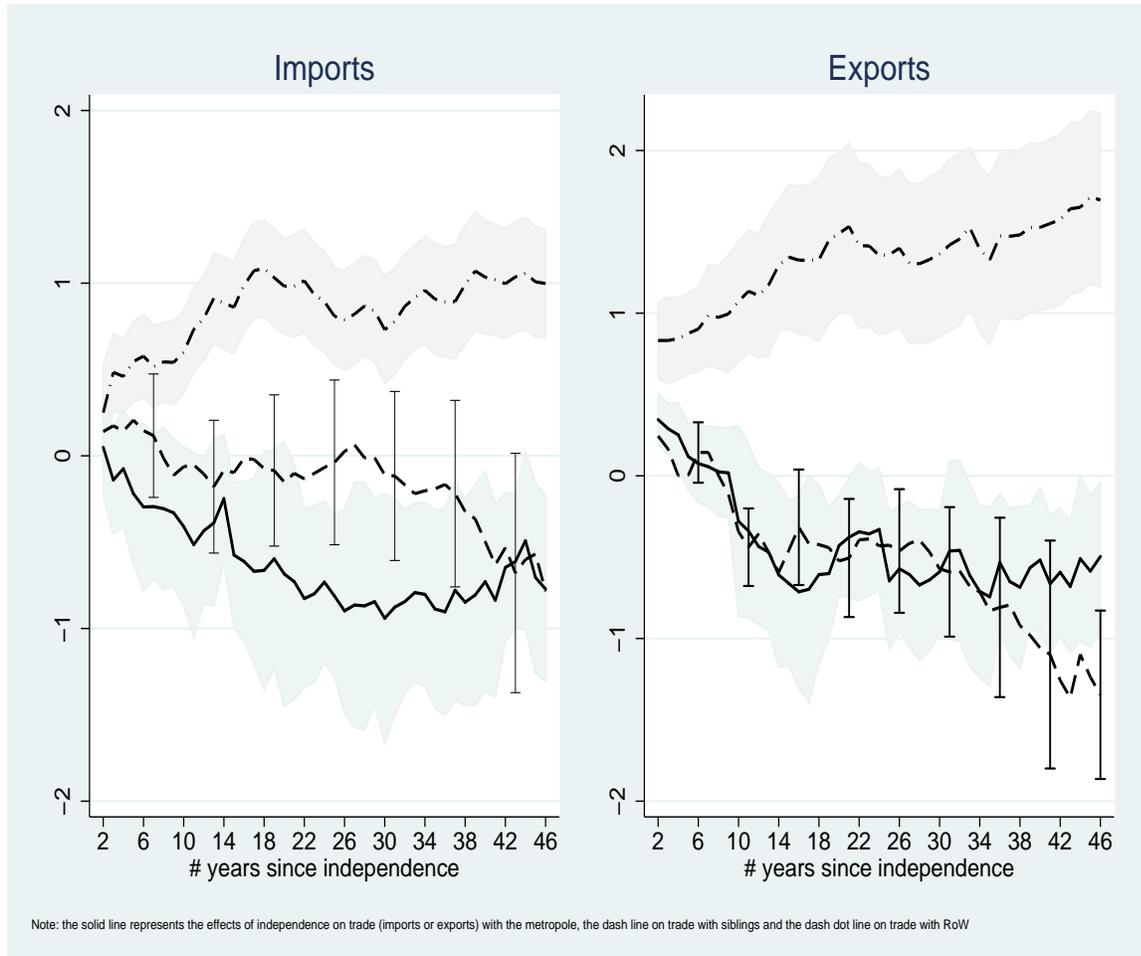
4.1 The overall timing of independence effects

So as to investigate the impact of independence over time, we break up our set of indicators related to past colonial ties (*Indep_COL*, *Indep_SIB*, *Indep_ROW*) into dummy variables denoting the number of years since at least one trade partner is independent (or the two partners in the case of siblings), up to a maximum we set at 45. For instance, the dummies *Indep_COL*₁ to *Indep_COL*₄₅ take the value 1 for flows between the colonial power and its former colonies for each year (1 to 45) since independence.

Figure 1 displays the effects of independence over time on imports and exports. As regards former colonies' imports, this figure presents three interesting points consistent with our previous results on the overall effects of independence. First, it confirms that independence has no significant effect on imports of former colonies with siblings. Secondly, it shows that independence increases former imports from the rest of the world from the first years of independence. Imports from the rest of the world increase gradually the first eighteen years following independence. They reach a peak 18 years after independence. After 18 years of independence, a former colony imports 191% more from the rest of the world. Thirdly, it reveals the gradual effect of independence on former colonies' imports from their metropole. Indeed, it clearly shows that independence has no significant impact on imports from the former metropole the first 15 years following independence. After 15 years of independence, a former colony imports 43% less from its former metropole. This effect reaches its maximum (-61%) 25 years after independence.

The results obtained for exports differ slightly. Indeed, as for imports, Figure 1 exhibits a large positive effect of independence on trade with the rest of the world. Nevertheless, the size of the effect is larger and increases gradually since independence. After 18 years of independence, a former colony exports 274% more to the rest of the world; after 45 years of independence the effect is in the region of 452%. Furthermore, Figure 1 shows that independence reduces progressively exports to siblings. Whereas, in the first decade of independence, there is no significant effect of independence on exports to siblings, after 10 years, a former colony exports 30% more with its former siblings; after four decades of independence the effect doubles (65%). Lastly, it also shows that independence has no immediate effect on trade with the former metropole. Indeed, Figure 1 indicates that 15 years after independence, exports of former colonies to their metropole do not change significantly. After 15 years of independence the accumulated trade erosion is about 45% which coincides more or less with its maximum level.

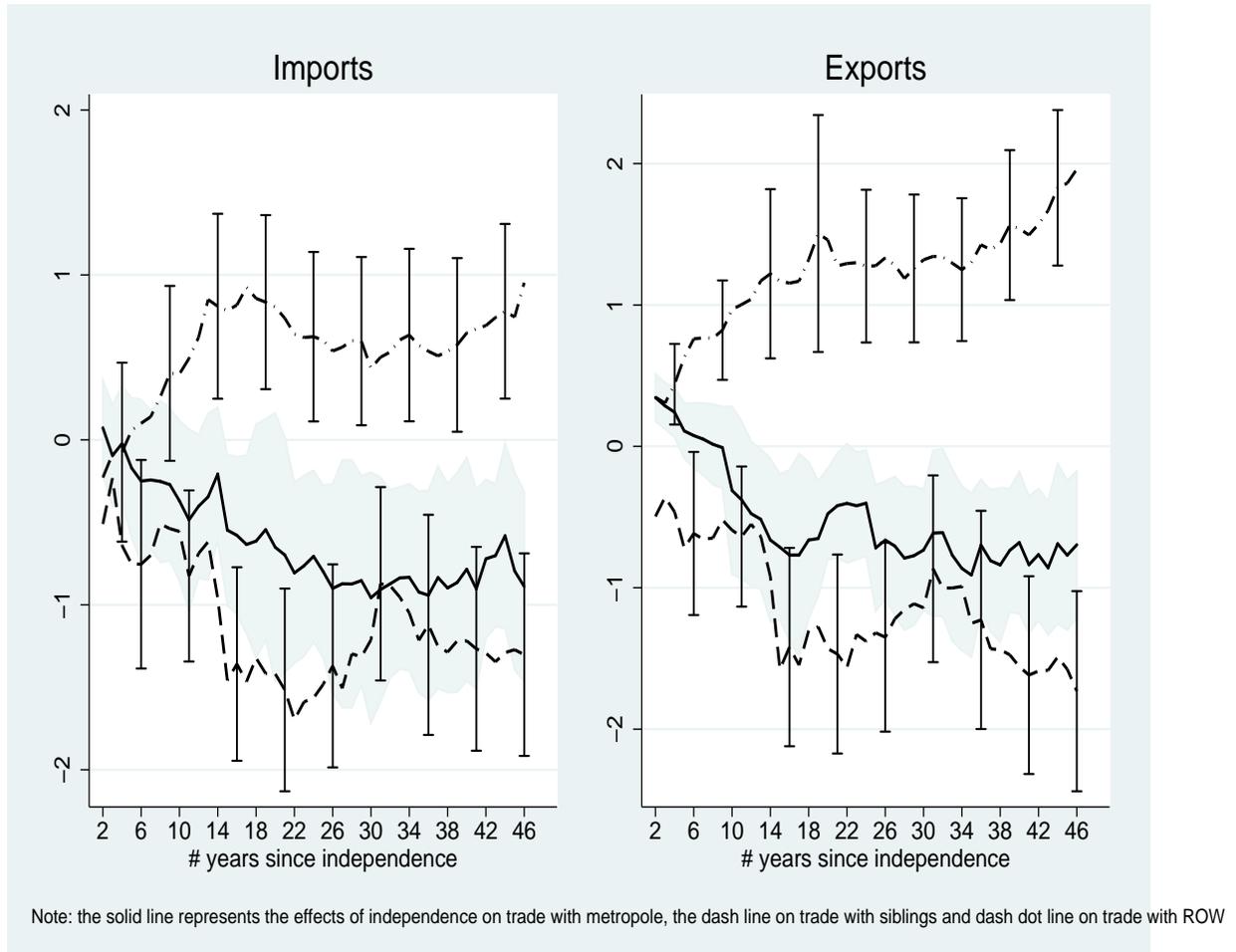
Figure 1: Effects of independence over time



4.2 The timing of independence effects for former French and British colonies

Figures 2 and 3 display the effects of independence over time according to the colonial power. The results depicted in these figures are consistent with our previous findings. They confirm that independence has more pronounced effects on post-colonial trade patterns for former French colonies than for former British colonies. This difference in post-colonial trade patterns is certainly due to the more protectionist trade policies applied by the French empire towards its colonies. Trade erosion for former French colonies appears also more quickly for exports than for imports.

Figure 2: Effects of independence for former French colonies

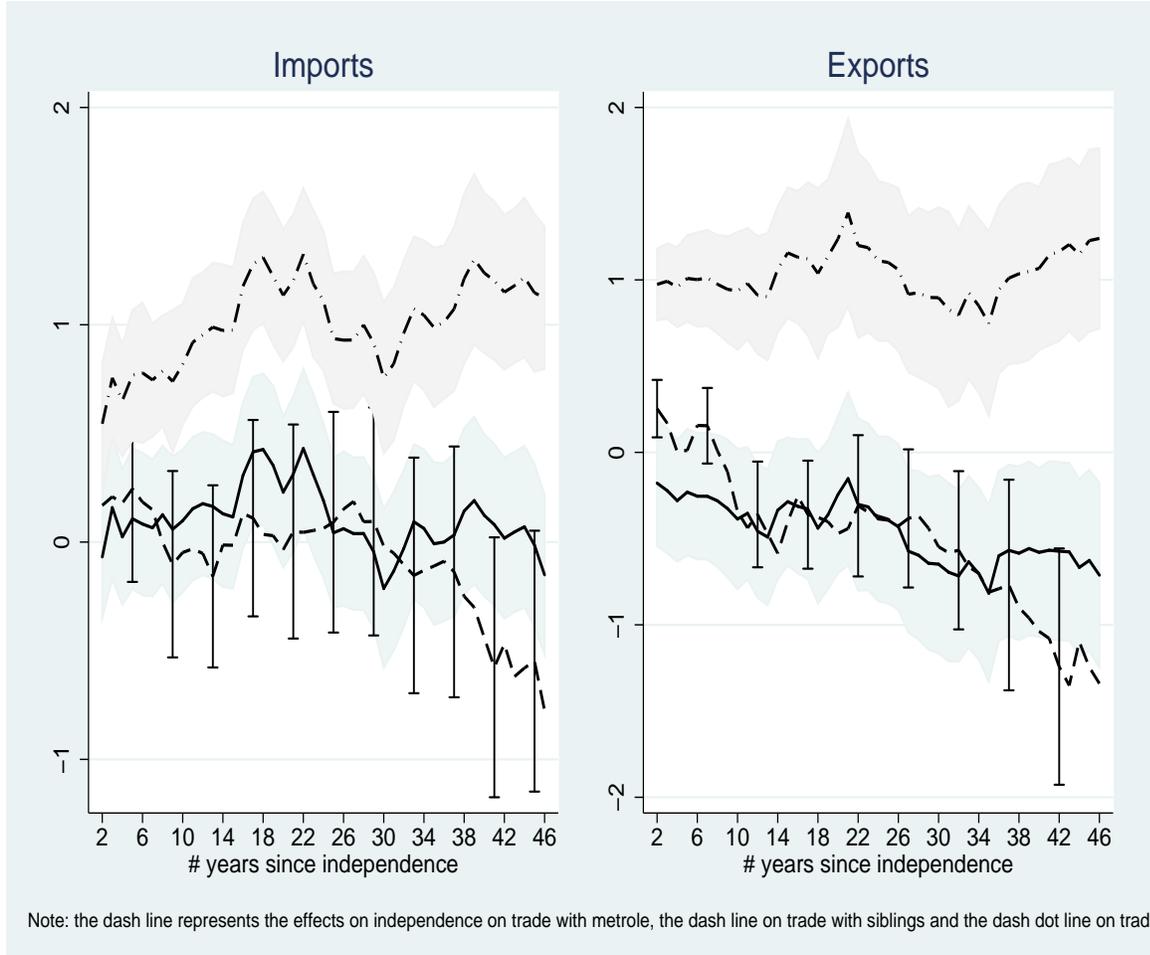


5 Conclusion

This paper investigates the consequences of independence on bilateral trade of former colonies with a focus on former French colonies. We obtain more accurate results as compared to the one obtained in the literature thanks to a new data set on colonial trade of former French colonies from 1948 to their independence and by estimating independence effects for each direction of the trade flows (imports and exports) and for each former empire.

Our study yields several sobering findings. First, we find that independence reduces trade (imports and exports) with the former metropole. However, this effect depends on the identity of the colonizer and is mainly driven by former French colonies. For these countries, trade (exports and imports) with the former metropole is reduced by about 50% on average over the whole post-

Figure 3: Effects of independence for former British colonies



colonial period as compared to pre-independence levels. We also find that former French colonies trade less with their siblings (other former French colonies) after independence (by about 65%). These effects are long-lasting but appear quite quickly after independence, in particular for exports. Trade erosion with the former metropole reaches its long-term value fifteen years after independence for former colonies' exports and twenty five years after independence for imports. We do not find similar trade erosion for former British colonies. Finally, we show that, after independence, trade (exports and imports) of all former colonies increase with the rest of the world (other countries not belonging to the same empire). To sum up some of our main results, for former French colonies, we find that independence induces a redirection of trade from the former metropole and from other former colonies to other countries, while for former British colonies we do not find any trade redirection. Some of our results contrast with the findings of Head *et al.* (2010) who use the DOTS

database on a larger sample of countries. Further research could complement the DOTS dataset for former British colonies with data on pre-independence trade coming from colonial sources.

Appendix

Table 3: List of reporting countries

Former French colonies	Former British Colonies	Other former colonies	Not colonized (in 1945)
French Equatorial Africa (Congo, Gabon, Chad, Central African Republic); French West Africa 1 (Senegal, Mali, Mauritania); French West Africa 2 (Niger, Benin, Burkina Faso, Guinea); Ivory Coast; Cameroon; Côte française des Somalis (Djibouti); Algeria; Indochina (Vietnam, Cambodia, Laos); Morocco; Madagascar; Syria; Togo; Tunisia; Vanuatu	Bahamas; Belize; Barbados; Botswana; Dominica; Fiji; Ghana; Gambia; Grenade; Guyana; India; Jamaica; Jordan; Kenya; Kiribati; Kuwait; Saint Lucia; Sri Lanka; Lesotho; Myanmar; Malawi; Malaysia; Nigeria; Pakistan; Sudan; Solomon Islands; Sierra Leone; Somalia; Swaziland; Tonga; Tanzania; Ugandan; Saint Vincent and the Grenadines; Vanuatu; Zambia; Zimbabwe	Somalia; Burundi; the Democratic Republic of the Congo; Rwanda; Philippines; Equatorial Guinea; Netherlands Antilles; Indonesia; Surinam; Angola; Cape Verde; Guinea Bissau; Mozambique; Sao Tome and Principe; Namibia	Afghanistan; Cuba; Dominican Republic; Egypt; Ethiopia; Haiti; Iran; Iraq; Lebanon; Liberia; Nepal; Oman; South Africa

Table 4: Data and variable definitions

T_{ijt}	Import and export data come from the IMF (DOTS database) and from other official French sources (see section 2.1). We converted colonial trade data recorded in French Franc in dollars using the exchange rate coming from the IMF (IFS database).
$GDP_{it/jt}$; $Pop_{it/jt}$	Current GDP per capita and population data come from the Historical Statistics for the World Economy provided by Angus Maddison (http://www.ggdc.net/maddison).
RTA_{ijt}	The Regional Trade Agreement dummy is computed using informations from the WTO. It covers several free trade agreements or customs unions relevant for our countries of interest. For instance, the COMESA (Common Market for Eastern and Southern Africa) (in force since 1994), the ECOWAS (Economic Community of West African States) (in force since 1993), the CAEMC (Central African Economic and Monetary Community) (in force since 1999) and the PAFTA (Pan-Arab Free Trade Area) (in force since 1998).

Table 5: The effect of independence on former colonies' trade with the DOTS dataset

Trade flows	Imports		Exports	
	(1)	(2)	(3)	(4)
$\ln(\text{GDP per cap}_{it})$	1.03 ^a (0.08)	1.03 ^a (0.08)	1.09 ^a (0.16)	1.09 ^a (0.16)
$\ln(\text{GDP per cap}_{jt})$	1.26 ^a (0.11)	1.26 ^a (0.11)	1.05 ^a (0.15)	1.05 ^a (0.15)
$\ln(\text{Population}_{it})$	0.90 ^a (0.18)	0.88 ^a (0.18)	1.18 ^a (0.24)	1.20 ^a (0.24)
$\ln(\text{Population}_{jt})$	1.74 ^a (0.16)	1.76 ^a (0.17)	1.65 ^a (0.27)	1.66 ^a (0.27)
RTA_{ijt}	0.16 ^b (0.06)	0.16 ^b (0.06)	0.08 (0.08)	0.08 (0.08)
ACP_EU_{ijt}			0.01 (0.13)	0.02 (0.13)
Indep_COL_{ijt}	-0.56 ^b (0.26)		-0.57 ^a (0.19)	
Indep_SIB_{ijt}	0.05 (0.21)		-0.07 (0.12)	
Indep_ROW_{ijt}	0.90 ^a (0.12)		1.27 ^a (0.20)	
Indep_FRA_{ijt}		-1.05 ^a (0.20)		-0.51 ^b (0.25)
$\text{Indep_SIB_FRA}_{ijt}$		-1.18 ^a (0.27)		-1.18 ^a (0.31)
$\text{Indep_ROW_FRA}_{ijt}$		1.16 ^a (0.18)		1.59 ^a (0.26)
Indep_GBR_{ijt}		-0.09 (0.20)		-0.55 ^c (0.28)
$\text{Indep_SIB_GBR}_{ijt}$		0.09 (0.21)		-0.06 (0.12)
$\text{Indep_ROW_GBR}_{ijt}$		1.01 ^a (0.21)		1.01 ^a (0.21)
Indep_OTH_{ijt}		-0.34 (0.43)		-0.80 ^c (0.43)
$\text{Indep_SIB_OTH}_{ijt}$		-2.78 ^a (0.43)		-2.79 ^a (0.44)
$\text{Indep_ROW_OTH}_{ijt}$		0.61 ^a (0.17)		1.38 ^a (0.37)
# of observations	292 367	292 367	294 708	294 708
Country-pair dummies	yes	yes	yes	yes
Year dummies	yes	yes	yes	yes

Notes: Fixed effects Poisson estimations. Standard errors clustered at the country-pair level in parentheses. ^a, ^b and ^c denote significance at the 1%, 5% and 10% level respectively. Year dummies estimates are not reported.

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