

Not “easy to win”: The British war on French trade, 1716-1822*

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Abstract

International trade is one of the main issues at stake in the rivalry between powers. The British war on French trade from the War of Austrian Succession to the fall of Napoleon gives us a lesson on how to win it when outright destruction is not an option. We suggest a measure of the achievements of a war on French trade. We present the policies implemented by Britain to wage it: establishment of naval supremacy, overseas territorial capture, predation on French ships and extension of this predation to neutral carriers. We show that long term success implied a durable change in the structure of French trade. Finally, we compute that, compared to loses inflicted on the French economy, waging this war on trade was a costly endeavor.

1 Introduction

Savez-vous Messieurs ce qu'est une bataille navale ? On se rencontre, on se salue, on se canonne et la mer n'en reste pas moins salée.

Maurepas, Navy Minister of Louis xv,

1718-1748

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- 1) The link between war and trade is an important question, as long-term crippling of enemy's international trade is a strategic war aim.
- 2) There is some debate on whether war is a good way to reduce the long-term international trade of a country. There is little study on the mechanism through which wars affect trade effectively
- 3) By studying one of the most important war on trade ever conducted, this paper shows that reducing trade is difficult, requires the use of multiple war measures and works through imposing structural changes on the enemy's trade structure, not simply by reducing its trade.

And so, outline... 1. What policies were implemented? 2. Impacting trade through war is difficult (loss function and cost/benefit analysis) 3. It works through imposing long-term structural change. 4. What policies are good for that?

That looks similar to what you are suggesting?

As a reminder, in my latest presentation:

- 1) Renewed interest in trade wars («Trade wars are good, and easy to win » Trump 2018) – The eighteenth century knows something about trade wars (under a different form) Did Britain succeed? At what cost? How? This is a single event, so do not expect causality to be clearly proven – But these data have never been put together before, and they provide insight
- 2) Why do we care? – Important to understand the effect of wars in general – Important to understand the globalization/deglobalization cycle from 1490s to 1820s – Important to understand (and contrast) the geopolitical history of the 18th and 19th century – Trade wars coming a gain at the forefront
- 3) Our hypothesis: – It was a difficult and costly endeavour – It succeeded because the French cooperated through the Continental system (including the fight against neutral shipping) – The key factor was not to reduce the level of trade, but to force its structural change

A recent call to "unleash" US privateers against the Chinese merchant fleet (Cancian and Schwartz, 2020) reminds us that maritime war on trade is an integral part of great power rivalry. Indeed, Alfred T. Mahan, a hugely influential naval thinker, argued that the nineteenth-century British preeminence was the product of naval dominance from the eighteenth century (Mahan, 2004, 2016a,b). Attacking and protecting trade are often major military activities, such as during US Civil War, World War I and World War II (both in the Atlantic and the Pacific). Belligerents often succeed in reducing each other's trade. Sometimes, attacks on trade arguably achieve militarily decisive results, such as the blockade of Japanese Home Islands during World War II, sometimes less so, such as the blockades of Germany during World War I and World War II or the submarine campaigns by Germany. Long term changes in relative economic fortunes are more elusive. The relative economic decline of Britain compared to Germany suffered only a momentary setback because of World War I. Germany and Japan transformed themselves into prosperous export powers a few decades after their decisive military defeat in 1945. Yet Britain seems to have achieved this very goal in the seventeenth century versus the Dutch and in the long eighteenth century versus the French. These feats have inspired generations of naval strategists such as Mahan. This paper examines how the latter one happened.

Eighteenth-century Britons were, according to their books, much more preoccupied with war with France than with the Industrial Revolution (figure 1). How was mercantilist warfare (Conti, 2017) effective in its own terms, by crippling trade of defeated powers? Our paper explores the Anglo-French experience during the eighteenth century and contributes to disentangle the effects of all the strategies implemented to curtail enemy's trade. Jefferson (1823) famously noticed that European nations *were nations of eternal war*. Indeed, from 1700 to 1825, two years out of three experienced conflict between major European powers (Roser, 2016). Rivalry between Great-Britain and France was central, so much as the period between 1688 to 1815 was called the « Second Hundred Years

War ». War has many causes. Yet, especially after the death of Louis XIV, it cannot be denied that mercantile rivalry was an important motivation of French wars (Brewer, 2002; Crouzet, 2008; Davis and Engerman, 2006; Tracy, 1991; Wallerstein, 1980). Each nation was jealous of the other's commercial success. The British believed war was a good way to curtail French trade. The French partly agreed but were more wary of wars because they did not have much naval success. Here is the long list of wars between France and Britain after the death of Louis XIV: War of the Polish Succession (1733–1738) (little naval hostilities), War of the Austrian Succession (1740–1748, where naval hostilities started in 1744), Seven Years' War (1756–1763), War of American independence (1775–1783, where French involvement started in 1778), French Revolutionary Wars (1792–1802) and Napoleonic Wars (1803–1815). These wars were very costly to United Kingdom (Baugh, 1965; Brewer, 2002; Neal, 1977) Yet, not all of these conflicts achieved their goal effectively. Looking at figure 2, it is clear that French trade, despite a visible decrease in wartime, was recovering quite fast, at least until the end of the eighteenth century. The only big exception was the period following the Continental Blockade, when the increase in trade started in the beginning of the century was brought to an end, while British trade maintained its steady growth. Less visibly so, but as a result of some more in-depth analysis, Seven Years War also shows a similar pattern; it caused a bigger and longer-lasting effect than other similar wars.

What were the common elements between these two wars, that made them so much more disruptive for trade? In what did they differ from the conflicts throughout the rest of the century? With this paper, we aim to uncover the strategies and the characteristics that made mercantilist war effective. This is important to understand the effect of wars in general, the geopolitical history of the eighteenth and nineteenth century and the globalization/deglobalization cycle from the 1490s to the 1840s.

to be re-written at some point

Contrast the interest of the British merchants and the interest of the state as large

Discuss political cost of Neutral policy (Spain 1760, US 1812, League of armed Neutrality)

Discuss the fact that mercantile interests were not important enough to push to peace)

2 Literature

This paper bridges two different literature - the economic literature concerned with the relationship between war and trade and the historical literature, which focuses on trade wars.

As for the former, much has been written on both possible implications; the impact of trade on wars and that of wars on trade. Nonetheless, conclusions vary substantially. The so called “liberal” strand

of the literature concerned with the impact of trade on war posits that it promotes peace since it is a better method of expansion than wars (Doyle, 1997; Oneal and Russet, 1997; Polacheck, 1980). On the other hand, the “realist” standpoint claims that there is no impact of trade on wars and, if any, that is a positive one. Countries in fact will be pushed to move war to maintain trade supremacy (Buzan, 1984; Levy, 1990; Ripsman and Blanchard, 1996).¹ The existence per-se of the two different literatures reveals an obvious endogeneity problem, that might bias the estimate. An alternative approach by Martin et al. (2008) attempts to tackle this simultaneity bias using a game theory model. They show how the likelihood of war for countries involved in multilateral trade agreements is higher than for those in bilateral ones. They explain it as a consequence of a reduced bilateral dependence and opportunity costs. Using a similar method, ? reaffirms the centrality of opportunity cost in discouraging war and the inverse relation between war and trade. Further in this direction, with mixed results but a similar approach, ?, ?, ? and ? model trade and conflict simultaneously. ? find no impact of trade on war once pre-existing political relations are accounted for, ? and ? posit that trade does promote peace, while ? on the other hand claims that the post-World War II international trade boom demonstrates that trade increases conflict. In a subsequent paper ? find that trade openness increases the risk of low intensity conflicts but decreases the risk of high-intensity conflicts. ? find that

for more recent literature review see ?. Possibly very relevant for us: ?

The reverse implication - the effect of war on trade - has not been less studied. In this respect, however, there is a general agreement on the sign of the effect - the impact is mostly found to be negative - and the debate focuses more on its size and persistence. Levy and Barbieri (2004) find a mild and temporary impact on the trade with adversary country, using a panel of dyads between 1870 and 1992. ? shows large and positive impact of peace on trade for all kinds of conflicts. Anderton and Carter (2001) distinguish between conflicts with major and minor power and observe significant pre and post war effects only in the former case. Along similar lines, Rahman (2010) shows that conflicts with a major naval power are particularly disruptive. Glick and Taylor (2010) venture to quantify the effects of the two World Wars not just in terms forgone trade but also lost human capital. Their conclusion is that the negative effects extend to neutral countries and can persist up to ten years.

More recent literature: ?

Some literature of trade wars, not just wars

¹McMillan (1997) provides an extensive review of these two competing strands.

The close examination of the mercantilist rivalry between Britain and France clarifies the channels through which a naval power can do long-term damage one's trade.

The aim of this paper is [to write up] Roadmap [to write up]

3 Measuring the achievements of trade wars

In this section we start by providing a brief summary of the historical setting we are analysing. We give an overview of the standard practices in trade wars at the time, which we analyse more detail in section 4. We then define a measure, which we call loss function, to illustrate the disruption in French trade due to wars. We reckon this is an approximate measure (see section 6) however it provides a first idea of which wars were more disruptive and the length of their effects.

3.1 Historical background

The eighteen century was a period of “eternal wars”. Two out of three years experienced a conflict and the main protagonists were always the French and the British. *A priori*, the Anglo-French Wars were destructive for trade. Both sides used “direct” and “indirect” means to capture or destroy their enemy’s merchant shipping. In fact, along with deploying the navy for this purpose, they were also allowing predation by private actors called privateers. These actors could either be private men-of-war, whose main aim was the capture of ships, or merchant vessels, that would have been happy to capture enemy ships if the occasion were to arise. The role of privateers depended on the attractiveness of alternative profit-making activities (Hillmann and Gathmann, 2011; Villiers, 2002, p. 673) - i.e. on the degree to which regular trade was endangered - but their impact on the French merchant fleet was especially strong during the War of American Independence (see table 1 “Impact of British privateering on French trade” in Hillmann and Gathmann (2011), Figure 10 and Figure 11). Together with the threat to cargo, captivity for sailors also represented a problem. Even though they were liberated at peace time (and sometime earlier through exchange of prisoners), mortality in British prisons was such that their capture represented a long-term loss for the French navy and merchant fleet (Le Goff, 1998). Clearly merchants were reticent to trade in these settings and a first solution was to rely on insurance. Forgone profits however could not be insured (Ducoin (1993), p 160, Villiers (2002), Butel (1973), p. 690-720) and sometimes insurance rates were increasing so much that shipping was discouraged altogether. As a consequence, the standard response was ultimately, in the eighteenth century like in the twentieth century, to organize convoys protected by military warships (Villiers, 2002, p. 393, 407, 448, 641). Despite the misgivings of merchants that

saw their commercial liberty curtailed, convoys were a good solution, as long as the French navy was powerful enough to defend the merchants vessels. This, however, was no longer the case during the Seven Year War or the Revolution and Napoleonic Wars, as the British became better at organizing the blockade of French ports (more details on the British blockade is reported in appendix B.1). Another solution was to rely on neutral shipping. Neutral carriers were somewhat protected from British predation on the sea and, when possible, French merchants hid their cargo ownership behind a neutral partner or moved to neutral countries and operated from there altogether (Marzagalli, 2016). This happened to the extent that historians have even reflected that war periods might have been necessary to the functioning of the *Exclusif Colonial*, i.e. the theoretical monopoly of French merchants on French colonial trade (Lespagnol, 1997; Marzagalli, 2016; Morineau, 1997).² Again, this was a viable solution only as long as the British and the French accepted the possibility of the other benefiting from trade with neutral partners. This was no longer the case during the Seven Years War and the Continental Blockade, when more and more severe measure towards neutral countries were introduced.

What do we want to say with this section?

3.2 Loss function

In the preceding section we explained the main tools used to hinder the enemy's trade in war time. We provide here our approximate measure of loss for French trade. Our data come from the *Bureau de la Balance du Commerce*.³ We construct the loss function as the difference between predicted trade value in the absence of war and the actual value of trade, divided by the predicted trade value:

$$\text{Loss} = \frac{\text{Expected value based on past peace trend} - \text{Observed value}}{\text{Expected value based on past peace trend}} \quad (1)$$

Figure 5 shows the annual loss function and the mean loss function by peace and war period for France. The green line shows observed trade versus trade predicted based on all preceding peace periods, whereas the yellow line shows the comparison with the prediction based one preceding

²The argument rests on the large peace time trade imbalances between France and its Northern European clients for colonial goods that could have been balanced by large service income of Northern European merchants during war time as they, as neutrals, provided shipping and various trade services to the French empire. The quality of the available balance of payment data is not good enough to test that hypothesis. Along these lines, Juhász (2018) finds that regions of the French Empire which were protected from trade with the British during the Continental Blockade increased capacity in mechanized cotton spinning to a larger extent than regions which remained more exposed to trade.

³see appendix B for more detail on the data

peace period only (“memoryless loss”).⁴ This graph suggests that the most successful wars from the point of view of Britain were the Revolutionary & Napoleonic War and the Seven Years War. The loss function is substantially higher during these conflicts (more than 40% and 60% respectively for loss and memoryless loss respectively) than during the Austrian Succession War and the American Revolutionary War (respectively 20% and 30%). Furthermore, for the Revolutionary & Napoleonic War and the Seven Years War, the loss stays positive also after the end of the conflicts, meaning the effects were long lasting, whereas it becomes negative after the Austrian Succession War and the American Revolutionary War. This implies that the disruption of French trade lasted through peacetime for these two wars. The right-hand panel in this figure reaffirms the point. We observe, in fact, that post-Seven Years War loss (during peace) is roughly comparable to the war-time loss during the American Revolutionary War altogether. Though approximate, this loss function gives a first idea of the question we want to answer in this paper. Certain wars were more disruptive than other, as the loss function shows. What we intend to do in the rest of the paper is to find the best explanation that matches the trend of the loss function.

For the sake of comparison, we also compute the loss function for Great Britain (figure 6). We observe here that losses are much less significant than for France for the overall period. In particular, the loss function is negative - which suggests an increased trade with respect to peace time - between 1756 and 1778 and after 1781 - at least while using all past period to predict the trend.

Altogether the loss function for the two countries suggests that Britain was not systemically successful in curtailing French trade, however British trade was never as affected by wars in general.

4 War-time strategies to fight enemy’s trade

Mahan believed in decisive battles and Blockade, not in the attack of ennemy's trade. The *Jeune école* believed attack on trade could be efficient (e.g. U-boats)

In section 3.2 we construct a loss function to quantify French trade losses throughout the period. In this section we study the link between this loss function and the most common strategies used by Britain to curtail French trade. We aim to identify the channels used by the British to disrupt French trade and disentangle their success. In order to do so, we create a quantitative measure, to assess their efficacy and compare it more easily to the loss function.

Better? More understandable?

⁴We exclude 1792 from the computation of peace time trends when we take into account only the preceding peace period. Its value, in an era of inflation, is doubtful and there are very limited peace years with data available from 1784 to 1792: only 4 (including 1792). Including it increases the past peace time trend for the pre-1815 period from 1.4 p.c. to 2.9 p.c. Including it does not change much when computing the peace trend based on all past peace periods: it stays at 2.65 p.c.)

We examine in detail the following four possible channels: 1) ship building and alliance making 2) capture of colonies 3) predation on shipping 4) predation on neutral.

I think capture of colonies should go first as it the first comment everybody makes? What do you think? Not a strong position on this

4.1 Ship building and alliance making

British ships were doing the concrete activity of blockading French ports and capturing French ships. This was easier to do if French warships could not interfere because of unfavourable odds. Naval superiority is thus the primary input into the British war on trade. As a measure of the superiority of the British navy over its enemies we compare the number of warships available to Great Britain and its allies with the number of warships available to France and its allies thanks to the data in Modelska and Thompson (1988). A complete discussion of what we classify as ally or enemy during each war is provided in appendix B.2.

Figure 12 reports the ratio between the number of warships of France and Great Britain, France and its allies and Britain and its allies, France its allies and neutral countries and Britain and its allies (co-belligerants are treated as allies). The most favourable war for France, its allies and neutral countries was the Seven Years War. In this war, the number of neutral warships or ships on the French side was more than twice the number of ships on British side. During the American Revolutionary War and the Napoleonic Wars the ratio is lower, even though there are some spikes, which bring it again close to one, depending on shifting alliances (eg both Spain and Russia were neutral in 1795, the Ottoman Empire became neutral in 1802, etc.). The least favourable of all wars was the Austrian Succession War, as the Dutch and the Russians were then allied to Britain.

As we saw in section 3.2, the most disruptive wars were the Seven Years War and the Revolutionary & Napoleonic Wars. A correlation between the loss function and the ratio of warships reveals no significant link between these two phenomena, both considering only war years and using a discounted running sum which also includes peace years.⁵

Ok?

Hence, at first approximation, naval superiority alone cannot explain the success of the British trade wars over the French.

We are aware that this could be due to the fact that our proxy for naval superiority is too coarse a measure. For example, the French navy advantage during the Seven Years war is explained by the fact that Russia and Sweden were allied to France. Yet, there was no common naval action with

⁵the discounted running sum is defined as $\sum_{t=1}^N value * e^{N-t}$

France and limited French shipping in the Baltic that could be protected by Russia or Sweden (the Russian Black Sea fleet was created in 1783, after the Seven Years war). Furthermore, the British Navy did not enter the Baltic during the war. Still, the existence of the Russian and Swedish fleet had to be taken into account by the British navy. These difficulties suggest it might be wise move the focus from the inputs of naval superiority to its outputs: the capture of territories and destruction of trade.

4.2 Capture of colonies

West Indian French colonies were major sources of sugar, coffee and other colonial goods whose imports and re-exports were the most dynamic part of French trade. They were also important markets for French products, hence the loss of these colonies was bound to be disruptive. As a consequence, the British steadily tried to erode the French colonial empire. Guadeloupe was taken by the British in 1759, given back in late 1763; taken again in 1810, given back in 1816. Maurice was taken in 1811. Réunion and the Indian trade posts were taken in 1811, given back in 1815. French Guyana was taken in 1810 and given back in 1817. Tobago was taken in 1793. Martinique was taken if 1794 and given back in 1815. Saint-Domingue is a special case: It revolted in 1793, was partly integrated back to the French trade network in 1796 and gained its independence in 1805. To quantify the loss of colonies, we proxy the importance of each territory by its share in French colonial imports in 1788, when French empire was at its maximum (neglecting Canada which was not a major source of trade products). The variable is set at 1 in 1788 and gets reduced by an amount proportional to the share of trade whenever a colony is lost.

Assigning colonial supremacy over Saint Domingue requires additional explanations as it experienced a complex transition to independence. The revolt of the slaves in Haiti was a long and bloody episode and sugar production was lost to France well before independence was ultimately acquired. We have coded it as “lost” between 1793 and 1795, when the revolt started, and production was mostly destroyed or fields burnt. In 1796, order was partly restored and a portion of the plantation was being cultivated normally - so we consider it again as a colony - but ultimately in 1805 Haiti became independent and the production was lost completely.

In 1814, the *Restauration* attempted to re-create the late eighteenth century colonial system. This included the re-establishment of the *Exclusif* and reconquest of Saint-Domingue or the establishment of some substitute colony (Todd, 2011). In a secret clause of the 1814 peace treaty, Great-Britain pledged not to hinder the re-instauration of French sovereignty on Saint-Domingue (Schefer, 1907). Yet, France never managed to re-create its “first” empire, and the economic loss was not recouped.

Figure 13 shows the evolution of the colony loss measure. According to this measure, the colonial loss of the Seven Years War were minimal (Canada was not an important trade partner for France). In contrast, a large part of the French Empire was gradually lost in the Revolutionary & Napoleonic Wars.

We argue that, despite the weight of colony loss for French trade, and Saint Domingue in particular, this was not enough to make a successful trade war. As for the case of naval supremacy, we compute a correlation between the loss function and the measure for colonial empire. Considering only war years, the correlation is negative and significant, around 30%. If we consider cumulative discounted losses, it is still significant but it drops to below 4%. As a consequence we conclude that, as far as it is possible to quantify, colony loss explains only partly the fluctuations in the loss function, and also other factors are at play.

Good?

4.3 Predation on French shipping

Most of French international trade was conducted by sea (see Figure 4). Hence a direct way to affect French trade was to impair French sea trade. Great Britain had three ways of directly affecting French sea trade: outright destruction of merchant vessels, ransoming, and prize taking.

The destruction of merchant vessels could be direct or indirect. Dangers linked to potential capture by the British led French merchant ships to take more navigational risks, such as sailing off-season to escape them. This was likely to lead to more shipwrecks due to weather or sailing through dangerous waters, which we define “indirect” way of destruction. We have little information on the size of this effects.

use insurance rates in Ducoin ?

Direct destruction of merchant vessels by the British Navy and privateers was rare as it was not a gainful activity.

Ransoming implied coercing a merchant vessel into paying a ransom to the privateer or the Navy ship. However, it left the door open to abuse. This induced the British government to limit it more and more drastically from 1744, and forbade it altogether by the time of American Revolutionary war (see Hillmann and Gathmann, 2011, p. 734).

Prize taking was much easier to monitor by the British state. French vessels were threatened into submission. Once captured, the French vessel was brought back along with some members of its crew to a British port. The captors had to demonstrate “the prize was lawful and the rights of neutral

and allied ships engaged in legal trade had not been harmed” (see Hillmann and Gathmann, 2011, p. 734) in front of the High Court of Admiralty if the captor was a civilian ship. The procedure was different but similar for captures by the British Navy. This procedure led to a paper trail that deemed or not the prizes as “fair”.

Because direct destruction was rare and ransoming was limited, the overall value of prizes captured by the British navy and privateers provides a good measure of the pressure war-time predation exerted on trade. From Hillmann and Gathmann (2011) we get an estimate of about 11.5% of French merchant ships intercepted by British privateers, for a total of 4 percent of the value of French overseas trade during the War of Austrian Succession, the Seven Years War and the War of American Independence. Thanks to additional data provided by Henning Hillmann (These data come mainly from records at the PRO High Court of the Admiralty archives and underlying Hillmann and Gathmann (2011) we can compute approximately the number and the nationality of prizes captured by privateers up to 1809). For prizes captured by the British navy, we use data from Starkey (1990) and Benjamin (2009). The former provides the number of prizes condemned as legal by the High Court of the Admiralty in London, both from privateers and the Royal Navy from 1702 to 1785, while the latter provides the annual number of prizes taken by the Royal Navy from 1793 to 1815 from the sample gathered, but not published, by Hill (1998). Data from these sources are summarised in figure 10.

The share of privateering activity was very significant until the War of American Independence but became marginal during the Revolutionary & Napoleonic Wars. According to Hillmann and Gathmann (2011), this can be explained by the development of other war-time trade profit opportunities that made privateering a less interesting alternative for British merchants. The total number of prizes however, remained high until 1813, suggesting that the British navy compensated for the lack of privateers actions and kept the threat of predation high. In 1813 the total number of prizes declines abruptly. This does not necessarily mean that probability of capture became smaller but could be due to a smaller number of French ships sailing altogether. Another measure of the pressure British exercised on French trade comes from English and British trade statistics on the value of prize goods imported in Great Britain up to 1800 (see figure 11). Unfortunately we could not gather data on the Blockade period. Still, the numbers are very telling, especially when we look at the value of prizes as shares of total trade.

In fact, at its peak, the value of prizes captured gets to 10% of the value of total French trade. What’s more, this happens during the War of American Independence, while during the Revolutionary War it gets as low as 3%.

. This is relevant when compared to our loss function, which reveals an inverse trend. Once again in fact a correlation between loss function and value of prizes imported by the British is either insignificant or close to zero. Neither an increase in number nor in value of prizes taken by the Royal Navy or privateers during this period seem to explain the variations in the loss function.

4.4 Predation on neutral shipping

The role of neutrals in wars, and especially during wars on trade, is very important. On the one hand they were the only ones who could provide goods that were not otherwise available due to the war (Hedberg and Karlsson, 2015). On the other hand, they were an expedient for merchants who hid their cargoes as neutral cargo and could continue to trade (see Carrière, 1973; Schnakenbourg, 2013, 2015). It was well accepted by international law that enemy cargo and contraband (e.g. weapons and munitions) could be seized. The difficulty was how to define and identify enemy cargo and contraband.

British policy regarding neutral trade varied. During the War of Austrian Succession, shipping between a non-belligerent country and a non-blockaded port in France was allowed by the rule of war, provided that both the ship and the goods belonged to neutral merchants. Shipping to “closely blockaded” ports on the other hand could be seized (Schnakenbourg, 2013, p. 112). The true nationality of the cargo, however, was difficult to ascertain, as neutral ships would not yield to inspection, especially when they were escorted by neutral warships. They had claimed from the seventeenth century the “right of convoys”, that is “immunity from search for neutral merchant vessels sailing under the convoy of a warship of the neutral” (The Editors of Encyclopaedia Britannica, 2014).

This left the door open to trade under neutral flag, especially for French merchants. During the second half of the eighteenth century, Great Britain decided to close off these ways for French trade to continue. In 1756, during Seven Years War, the British introduced the *Doctrine of Continuous Voyage* along with the *Rule of War of 1756*. They stated that the very beginning of the journey and the very end should be taken into account to determine the nationality of the cargo. They also claimed the right to seize neutral shipping to look for contraband and exercised it, as figure 14 shows.

Moreover, they forbid neutrals, in time of war, to enjoy a trade from which they were barred in time of peace. As the French colonies were under the regime of the *Exclusif* (Tarrade, 1972), and that all

their trade had to be conducted by French ships, that basically barred neutrals from trading with the French colonies. This had a considerable impact on French trade, which was heavily relying on Dutch ships to transport colonial goods. It also created great discontent among neutral countries, whose loss function is nearly as high as that of a belligerent countries, as shown in figures 15 and 16.

Makes more sense?

. These figures show the loss function, as explained in section 3.2, for countries grouped by war status⁶ and provide evidence of how neutral countries, during the Seven Years Wars and the subsequent years, had losses sometimes higher than foes (this is the case for imports). As a consequence, on the eve of the American Independence War, Russia, Denmark and Sweden funded the *League of Armed Neutrality* to protect their interest against the threat of new losses. Their claim was that neutral ships travelling under the protection of neutral warships were not to be inspected as the absence of “enemy cargo” was guaranteed by the neutral sovereign (Schnakenbourg, 2013, p. 121-125). This experiment however did not have a long lasting success and it was finally put to an end in 1783 with the treaty of Paris⁷ (Griffiths, 1971). Nonetheless, France remained active at protecting the rights of neutral shipping, as it saw it as a means to continue its trade during war years (Schnakenbourg, 2013, p. 129). This came to the extent that in 1784, France gave the West Indies island of St. Barthelemy to Sweden partly to encourage neutral trade during wars (Schnakenbourg, 2013, p. 326). However this attitude changed during the Revolutionary & Napoleonic wars.

In 1793, with the outburst of the French Revolution and, subsequently, the Revolutionary Wars, most British goods were prohibited in France. As a response, the British adopted a policy of blockading the whole coast of France from afar. France initially gave access to its colonies to neutral shipping and encouraged neutral trade. Britain took action against neutrals and France found neutral shipping too compliant to British demands (e.g. the 1794 Jay treaty was an important point of conflict between France and the United States). Tensions between France and the neutrals multiplied up to the acme of the Quasi-War between France and the United States from 1798 to 1800 (Marzagalli, 2015, pp. 106-118). From 1800 however, Bonaparte reconciled France with the neutrals and encouraged the formation of the *Second League of Armed Neutrality*, between Denmark, Sweden, Russia and Prussia. The league attempted to protect their rights mainly against Britain. No later than 1801, though, the British blockaded them (with the exception of Prussia) and bombed Copenhagen to end the League for good.

⁶more on the grouping by war status to be found in appendix B.2

⁷The number of vessels Russia, Denmark and Sweden owned combined were still less than the entire British navy, therefore this league was bound to be weak from the very beginning.

The situation deteriorated further for the neutrals in the subsequent years. In 1806 Napoleon enacted the Berlin decree, that provided the basic structure of the Continental System. The provisions of the Berlin Decree included: (1) prohibition of all trade with the British; (2) all British subjects in French-occupied areas were prisoners of war and their property was “fair prize”; (3) all trade in British goods was prohibited and all goods from England and her colonies were “fair prize” (and one-half their value was to be used to indemnify French merchants for losses to the British); and (4) no ships coming from the ports of Britain or its colonies would be permitted to use any port on the Continent (Davis and Engerman, 2006). Britain responded to this policy with a related Order in Council, which required that neutral vessels call at a British port before proceeding to the continent. The Napoleonic Milan Decree (1807) declared that all neutral shipping using British ports or paying British tariffs were to be regarded as British and seized. This clearly created an unsustainable situation where all countries were barred from trading with either French or Britain and a war started that engulfed the whole of Europe (see figure 3). The situation started to unravel only around 1810, when Russia pulled out of the Continental Blockade, pushing Napoleon to attempt an invasion, which ultimately led to his final defeat, and put an end to the Blockade System and to the threat for neutral trade.

It has to be noted here that the United States had become a new powerful actor in international trade (Cuenca-Esteban, 2014). Considering the size and dynamism of their economy, they were not as easy to dismiss as other small neutral trading nations when peace returned. Therefore, when both France and Britain threatened their trade, they attempted to fight back, as during the Quasi-War. They first enacted, in 1807, an Embargo Act directed against trade with both France and Britain, which was followed by the Non-Intercourse Act of 1809, and finally, after failure of both provisions, by a war against Britain (1812-1814). Despite their size and newly gained role, however, they had no better luck than France in the war, which was ultimately won by the British. Nonetheless, losses were substantial on both sides.⁸

We want to relate these events with the loss function. We acknowledge there is no one-to-one relation with the policy adopted towards neutral trade however we claim that the higher losses were experienced when neutral trade was mostly reduced. The mechanism we want to justify is the following. French merchants continued trading under neutral flag, even in war time, which explains the limited loss in the first half of the century. When British understood the trick, they started seizing neutral ships and effectively curtailing trade in war time.

Maybe separate the peace-time consequences and the war-time consequences? Or use this as transition even more than you already do?

⁸less than 10 Million US\$ in 1820 vs. 40 Million US\$ in 1807, (North, 1960, tables A-4 and B-2)

They did so to the extent that, even when peace was restored, French trade could not go back to its initial level. In section 5 we explain and quantify how the structure of trade was changed permanently.

5 Peace-time consequences

In this section we exploit statistical tools to investigate whether the secret of an effective trade war was to force the enemy into restructuring its trade permanently. We consider the structure of trade in terms of goods, trade partners and French custom regions.

In terms of the former, we use an adapted version of the SITC classification, which is reported in table 8 in the appendix.⁹ As per what concerns trade partners, we have grouped countries into 9 different destinations, which are reported in table 9, also in appendix. Finally, for French custom regions we consider all the XX ports the goods were shipped from, which we also report in appendix in table XX.

I wanted to make a clarifying table – 18 see table 18

We test this hypothesis using different linear regressions of a loss function on the share of trade of each of these categories, i.e. SITC, trade partners and French trade regions. We run individual regressions because of collinearity of the explanatory variables (which are share, therefore highly correlated) and the little number of observations, which compromises the individual estimation of each coefficient. Tables 2 and 3 show that, even when controlling for a time trend and the contemporaneous effect of war, the changing level of total French trade losses is associated with changes in the industrial structure of trade: reduction in the export share of plantation foodstuffs, crude materials and increase in the export share of leather, wood and paper products, wool and silk threads and fabrics, and other industrial products). Changes in the import structure are less clear, but again higher losses are associated with higher share of leather, wood and paper products and wool and silk threads and fabrics and other industrial products and lower imports of cotton threads and fabrics. This does not establish causality. Yet, the most plausible channel explaining these findings is that “successful” wars (from the British point of view) forced the structure of French trade to adapt. These adaptations were difficult to reverse after the wars and French trade was durably locked into a less dynamic structure.

Tables 4 and 5 show similar changes in the partner share of French trade. The share of exports to Germany, Switzerland, Spain and Portugal increased when French trade was reduced, as the share

⁹More on how this SITC18 classification is defined is available here

of imports from Spain, Portugal and Italy. Again, this suggests that wars forced French trade to develop its links with close eastern and southern neighbours, further away from the British influence.

Tables 6 and 7 show similar changes in the regional share of French trade up to 1789. Even if the pattern is clearer for imports than for exports, it seems that landlocked regions (Bourgogne, Châlons, Lyon and Saint-Quentin), secondary coastal regions (Amiens, Bayonne, Caen and Rennes), and Marseille have a larger share of trade when French trade is reduced. While large Atlantic ports (Bordeaux and Nantes) have a smaller share of trade.

6 Can we do a cost-benefit analysis?

In a cost-benefit analysis of the efficiency of the British war on French trade, the reduction of French trade would be a good place to start. The cost for the French economy however cannot be identified to lost trade per-se. It is rather the loss of economic activity entailed by the reduction in trade. What were the decrease in wages and profits, both for French actors of trade and French producer? This is a tricky question. Daudin (2005) (p. 408) evaluate the income of French actor at 38.5% of the value of intercontinental trade (i.e. trade with Africa, America and Asia, minus Mediterranean trade) and 27.5-35% of the total value of trade. Intercontinental trade was more affected by the British war on French trade, so maybe we should favour the higher estimate (35%). Of course, at least part of the workers, entrepreneurs and capital could find alternative use and did not stand completely idle after the reduction of trade. Daudin (2005), p. 421, estimate the net loss was 40% of the value of the production, or 14% of the value of trade (i.e. $0.4 \times 0.35 = 0.14$). To put it in another way, a 100 livres tournois decline in the value of French trade forced workers, entrepreneurs, capitalists earning 35 livres tournois to find another employment for their labour and their capital. This other occupation only yielded an income of 21 livres tournois ($35 \times (1 - 0.4) = 21$). Hence a decline of 100 livres tournois in French trade induced a loss of 14 livres tournois for French GDP ($21 - 35 = -14$).

This number is highly uncertain. Daudin (2005) argues we should take into account the dynamic effect of this income loss through lost savings and investments. This means that we can include in French losses also the expenditures on military Navy, - as one of its main goal was to protect trade¹⁰ - and the destruction or capture of French ships. This is tentatively possible thanks to information on French prizes captured both by the British Navy and British privateers, discussed in section 4.3.

Finally, we are left to estimate the amount paid by the British to reduce French trade. Again, that is probably not possible to compute. A good place to start, though, is the budget of the British

¹⁰See appendix B.5

Navy. Mitchell (1988), pp. 570-587, provides the net expenditures up to 1801 (1800 is incomplete) and the gross ones from 1802. Figure 7 presents these data. Except for the War of the American Independence, the French Navy budget was always smaller than the British one. The total value of prizes was rather small, except during the early Seven Years War.¹¹ Figure 9 compares the cumulative British expenditures and French losses. A value less than one means that the war on trade is costing more resources to the British than to the French (neglecting the value of French prizes). The result depends on the hypothesis one makes about the existence of alternative employment opportunities for French production factors pushed out of trade. The “no alternative occupation” hypothesis is the most favourable to the trade war policy, as it assumes that French labour and French capital invested in trade just become unemployed when trade is reduced: hence French income losses are 35% of French trade losses. The “alternative occupation” hypothesis is probably more reasonable and assumes that French labour and capital find alternative, less remunerating, employment: hence French income losses are 14% of French trade losses.

7 Conclusion

In this paper we have analysed the effects of different conflicts on French trade in the eighteenth century. We have first created a loss measure by comparing the amount of trade that would have taken place in the absence of conflicts with the observed trade. We have done so both by using all the preceding peace periods to compute expected trade and just the period immediately before the conflict. From this computation we have observed mainly two things; first that the main losses were during the Seven Years War and the Revolutionary Wars-Continental Blockade, second that only as a consequence of these two conflicts there were long lasting effects. This leads us to think that there must have been a common factor that made these two wars so disruptive. We analyse several cases. Naval supremacy is a possible explanation and for this reason we construct a measure to account for it. We take the ratio first of France and Great Britain’s number of warships, then that of France and Great Britain including their allies, and finally France with neutral countries and Great Britain including their allies. Contrary to our expectations, we find rather a positive relation, meaning that an increase in the number of warship was linked to a bigger loss in trade. This can possibly be explained by the fact that countries were investing in their navies in the attempt to protect their trade or to fight wars. However, this does not seem to explain the loss in trade per-se. Another option was the loss of colonies. Especially towards the end of the century, France lost some of its

¹¹Prizes are pretty important in the cost/benefit analysis during the Seven Years War, partly because of the success of the British predation of French trade before the official declaration of war, but they loose their importance in the latter part of the period.

richest colonies, which had a consequence on their imports. We have created a measure to account for the colonies loss, weighted for the share of trade those colonies accounted for. We find in this case little more correlation with the loss function, however this does still not entirely explain the losses of the Seven Years War, nor the fluctuations in this measure seem to be related to the loss in the Blockade period. Finally, we have investigated the policy towards neutral countries, which had been changing throughout the century. We find that, whenever the policy with respect to trade with neutral countries were looser, war losses were limited and commerce could recover its pre-war level very quickly, even outperform it. On the other hand, when the British started blockading neutral countries as well, French trade experienced a massive drop and a long convalescence.

We conclude that, even if all these factors probably were contributing to the loss in trade during conflicts, the turning point was strictly related to policy towards neutral countries. British could efficiently curtail French trade only by blockading neutral countries.

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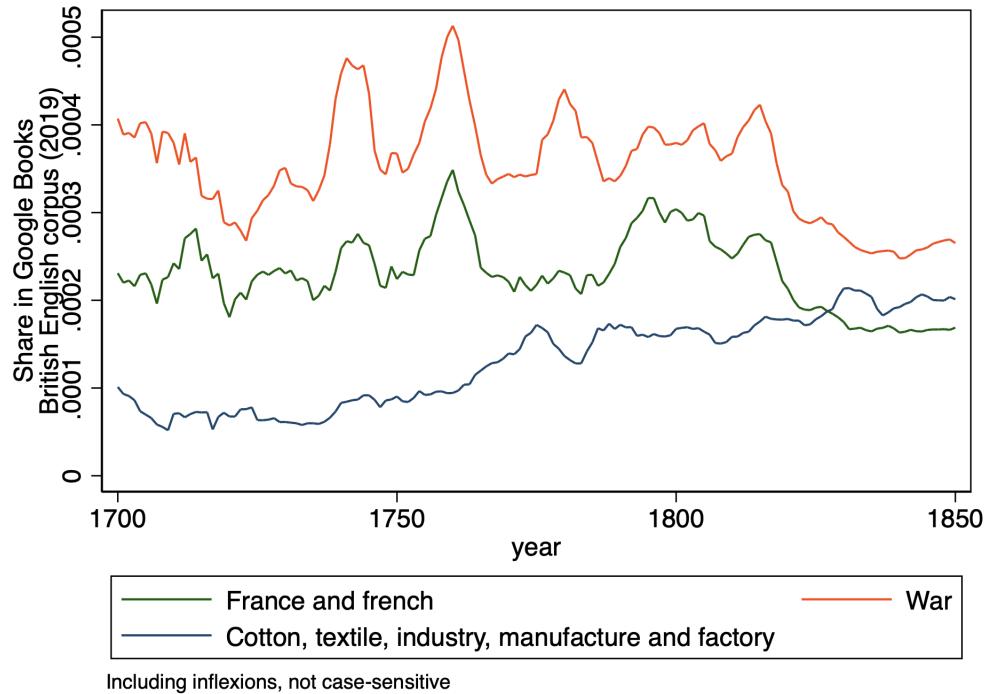
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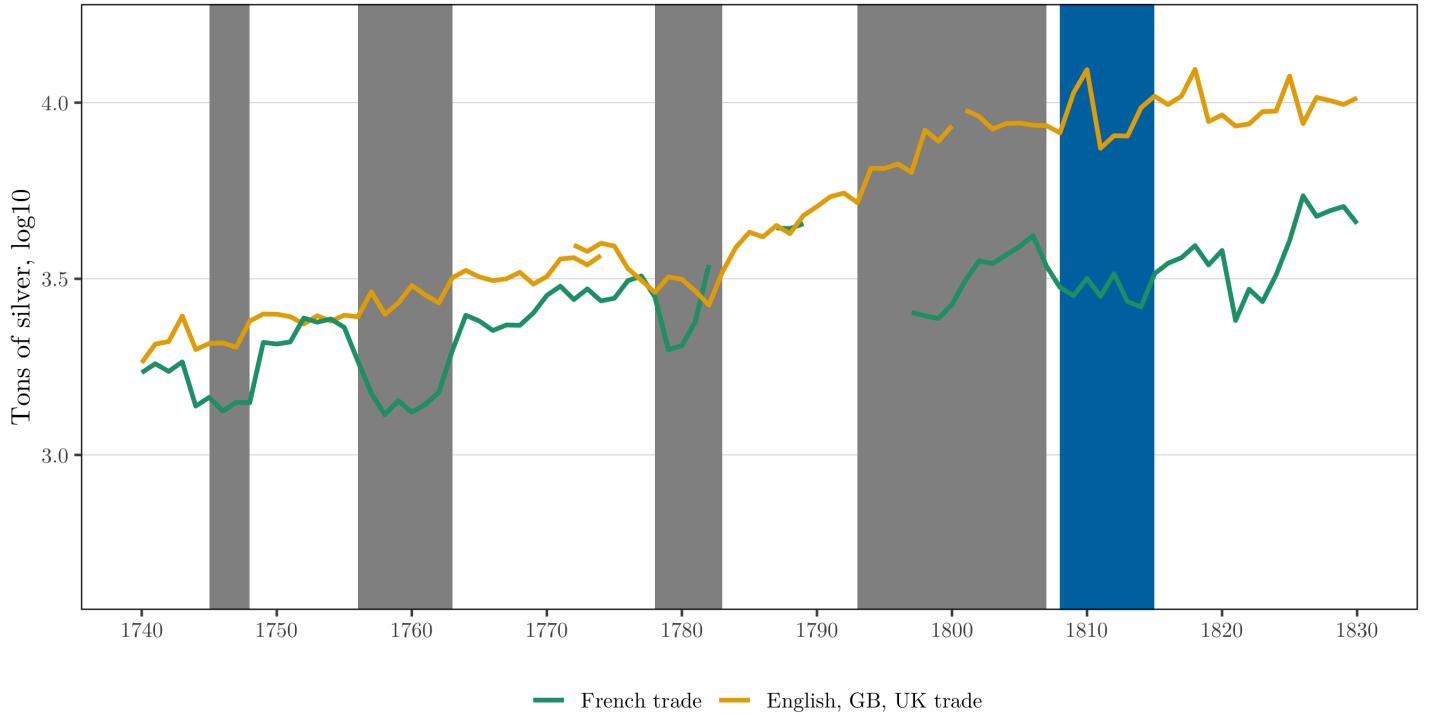
All graphs should be self-contained

Figure 1: What were eighteenth-century Britons preoccupied by?



Source: <https://books.google.com/ngrams>

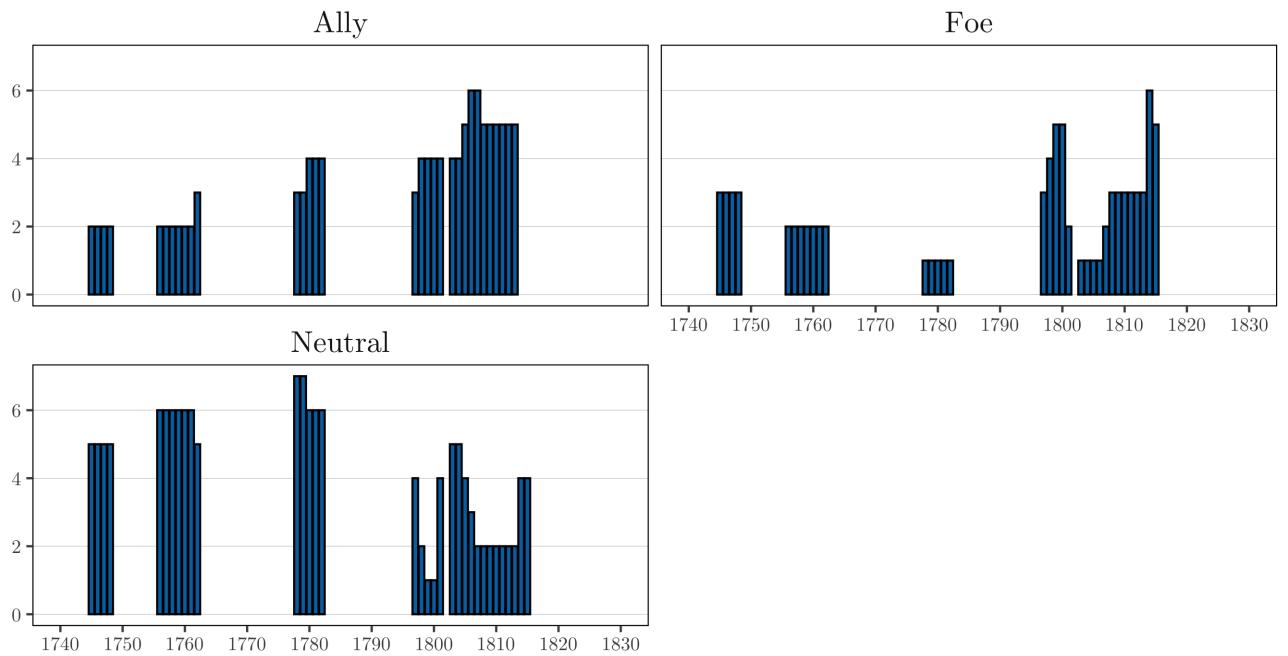
Figure 2: French, British trade and Anglo-French wars



The lines represent the value of trade for France and Britain in tons of silver (log scale). The shading in grey corresponds to the war periods, the shading in blue to the Continental Blockade.

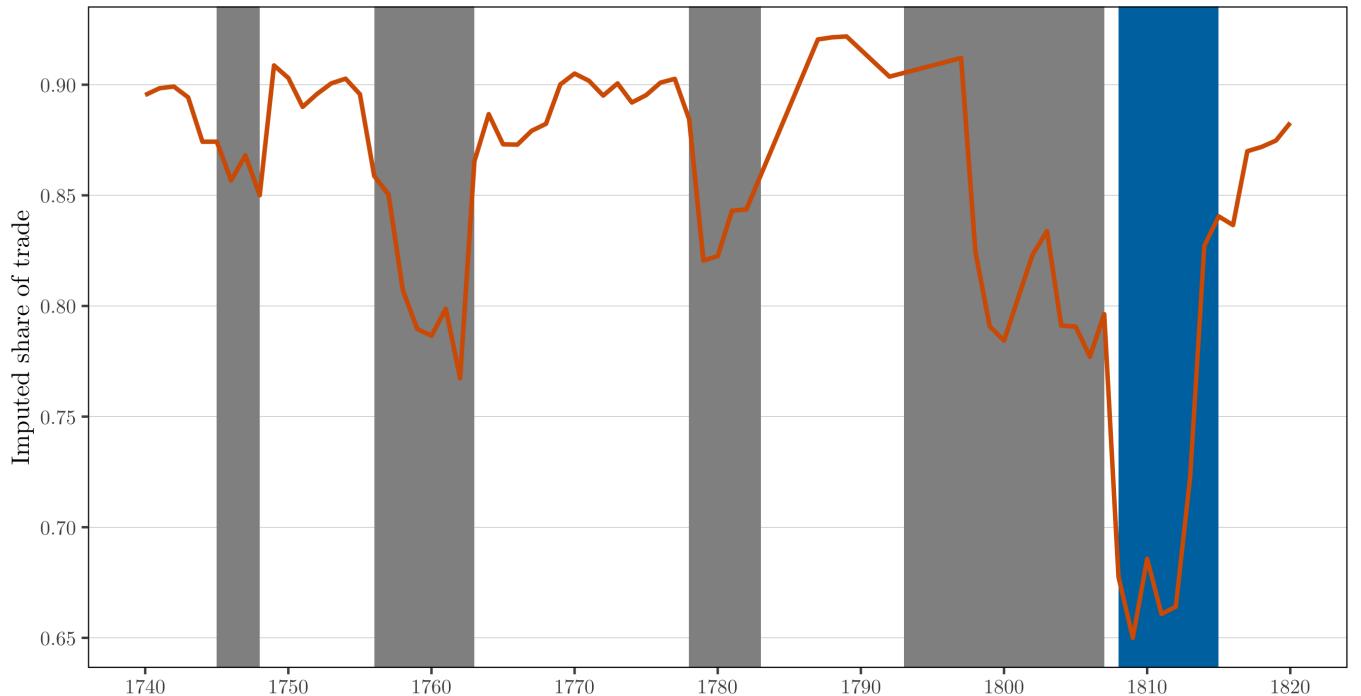
Source: French trade up to 1821: Daudin et al. (2020). French trade 1822-1840: Federico and Tena-Junguito (2016) / Dedinger and Girard (2017), England/British trade up to 1800: Deane and Cole (1969). UK trade from 1801 to 1840: Federico and Tena-Junguito (2016) / Dedinger and Girard (2017), Livre tournois silver value: de Wailly (1857) and Hoffman et al. (2000); Pound sterling silver value: ? and Jastram (1981).

Figure 3: Number of protagonists



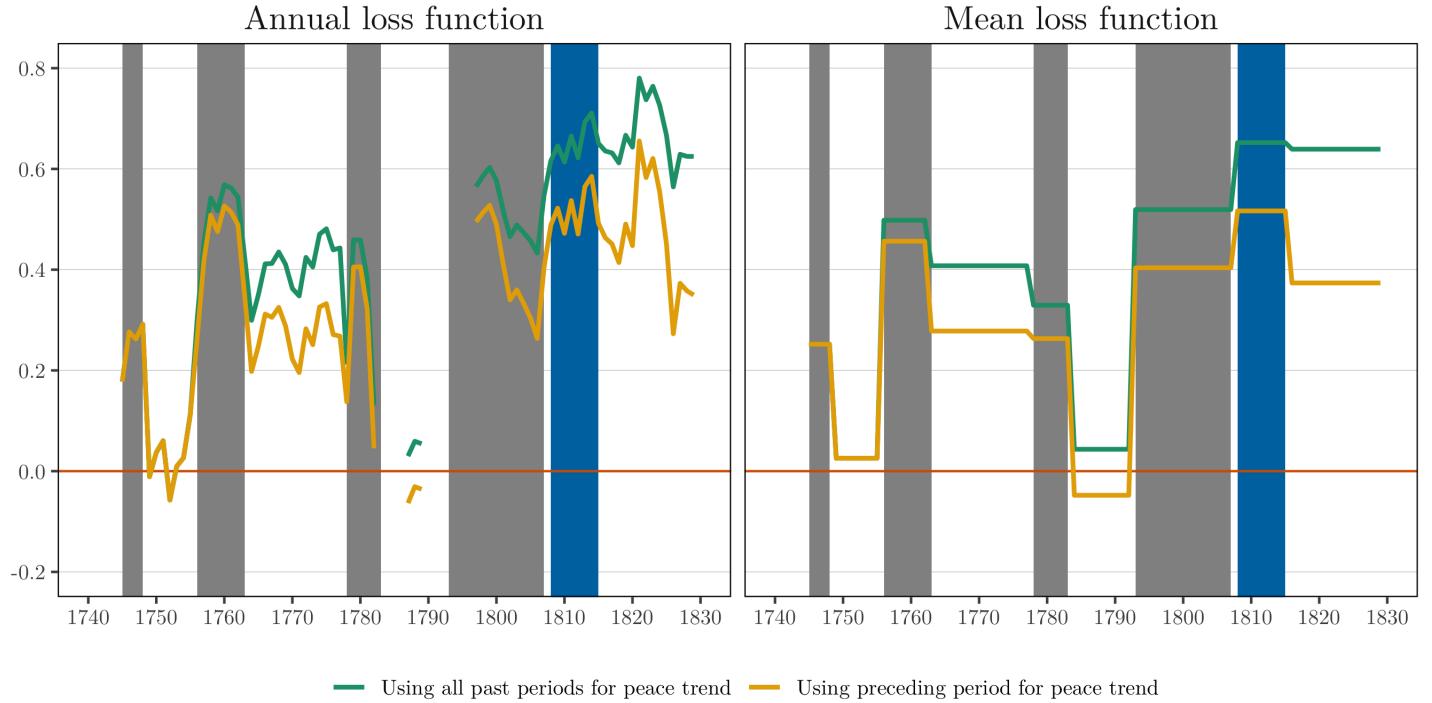
Number of protagonist by war status for each war in the period 1740 to 1830.

Figure 4: Share of French trade conducted by sea



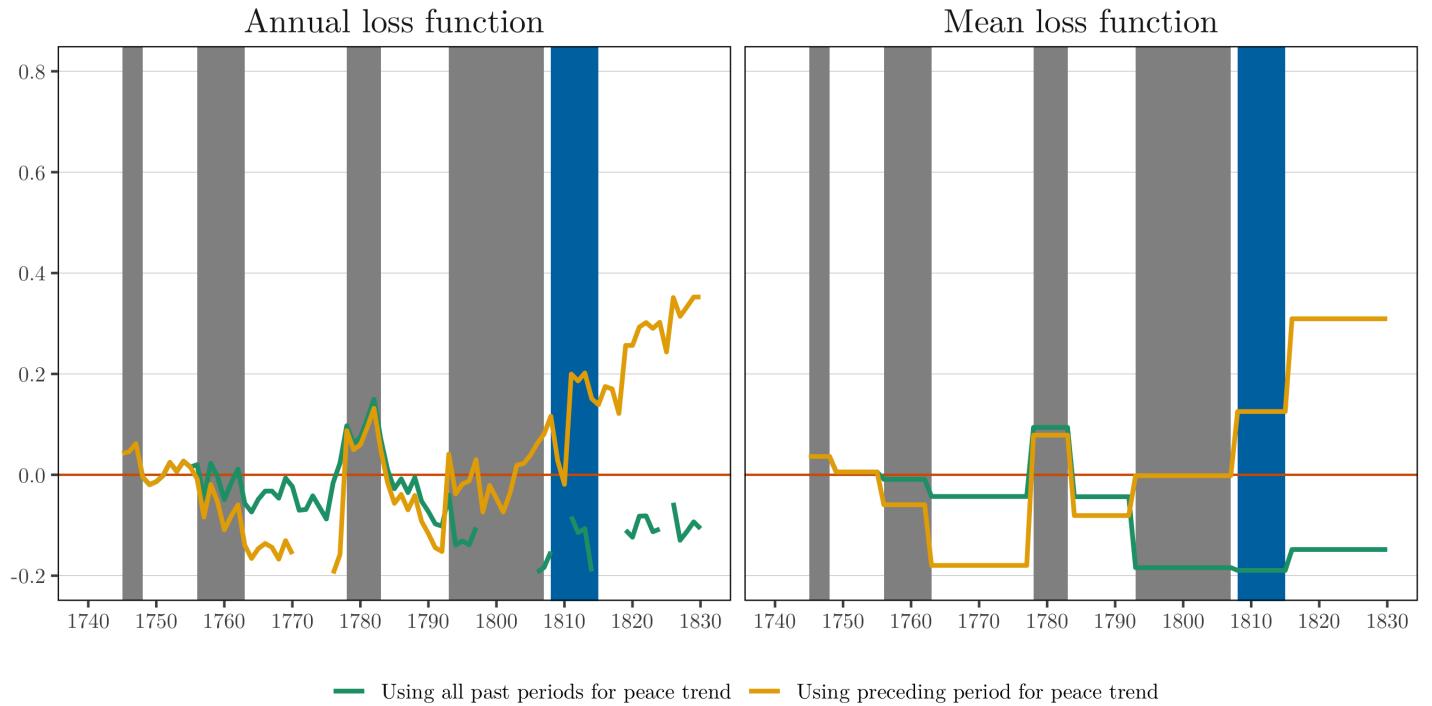
Share of imports in French trade conducted by sea. Source: TOFLIT and 1792 data on the share of sea trade per country in AN F/12/1834 B

Figure 5: Annual and Mean Loss Function - France



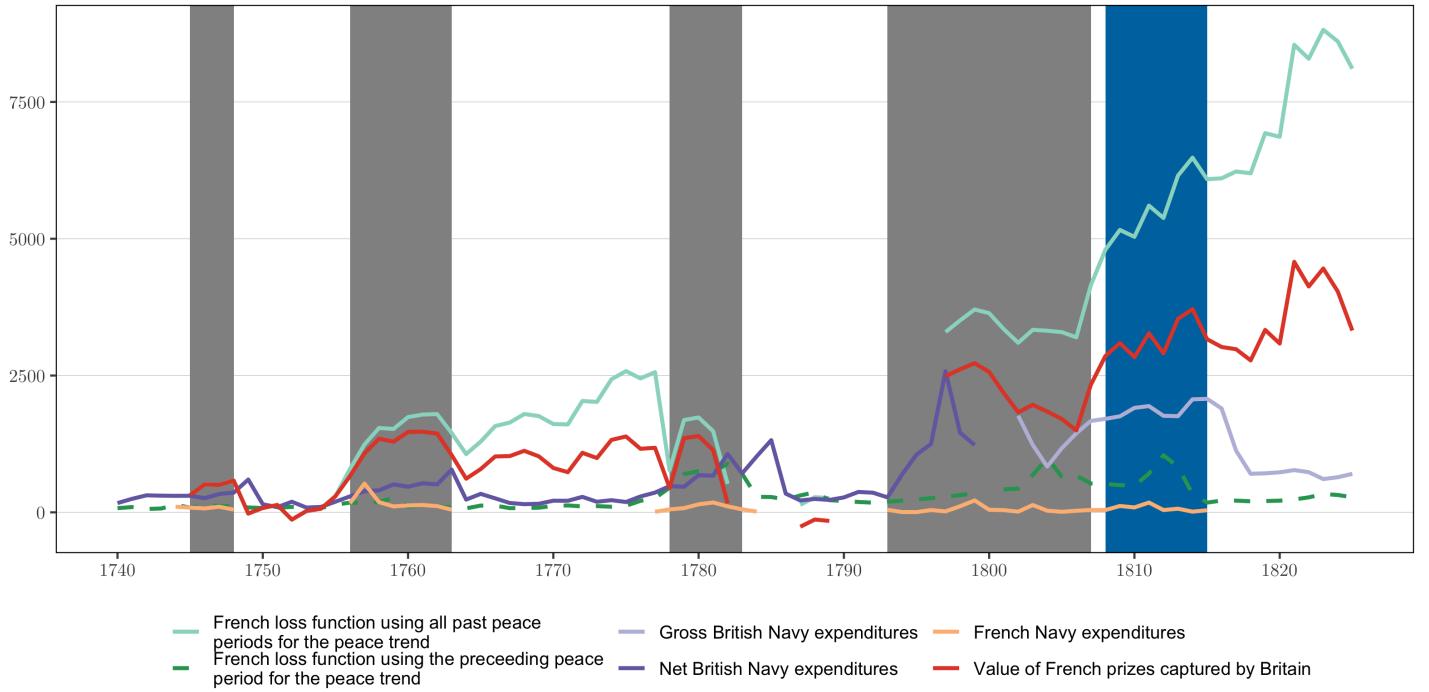
Left panel: annual loss function for France computed using all preceding periods in green and only one preceding period in yellow. Right panel: mean loss function for France over each war and peace period, computed using all preceding periods in green and only one preceding period in yellow.

Figure 6: Annual and Mean Loss Function - GB



Left panel: annual loss function for Great Britain computed using all preceding periods in green and only one preceding period in yellow. Right panel: mean loss function for Great Britain over each war and peace period, computed using all preceding periods in green and only one preceding period in yellow.

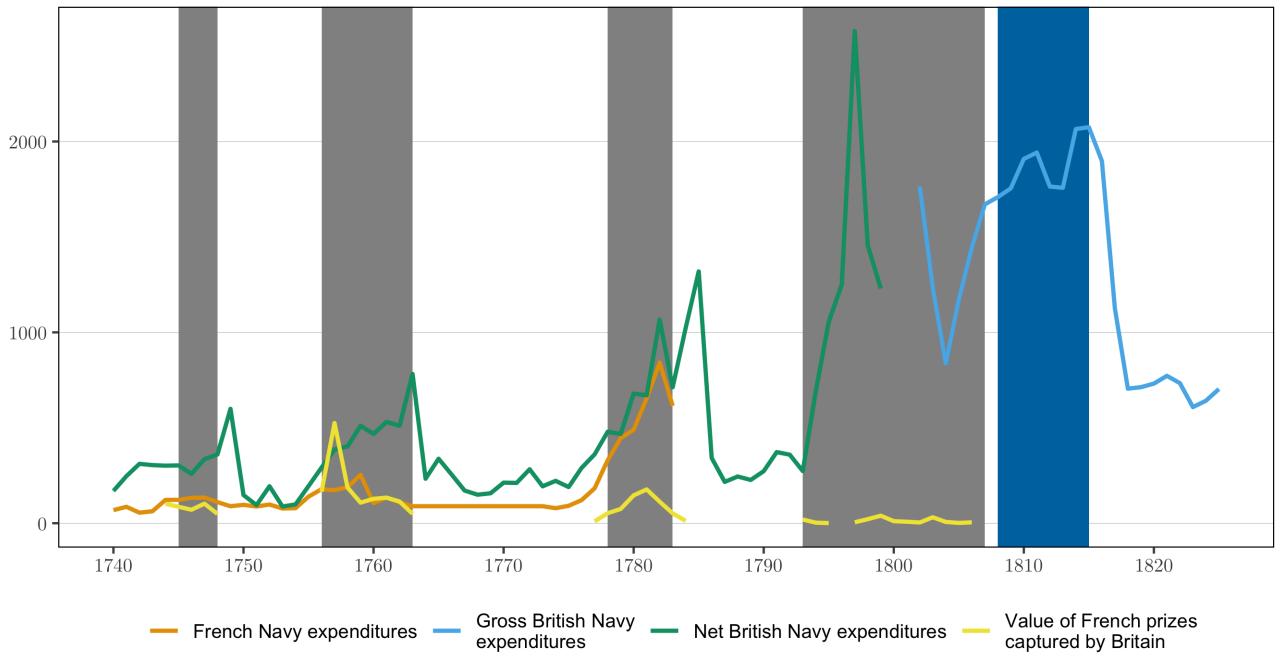
Figure 7: British Navy budget and French trade losses



This graph shows the comparison of French losses with British expenditures to cause these losses. Gross expenses are total expensive of the British Navy for the trade war. Net expenses are meant of the British Navy net of their budget. The loss function is reported both using all past peace period to impute the trend and just one preceding period.

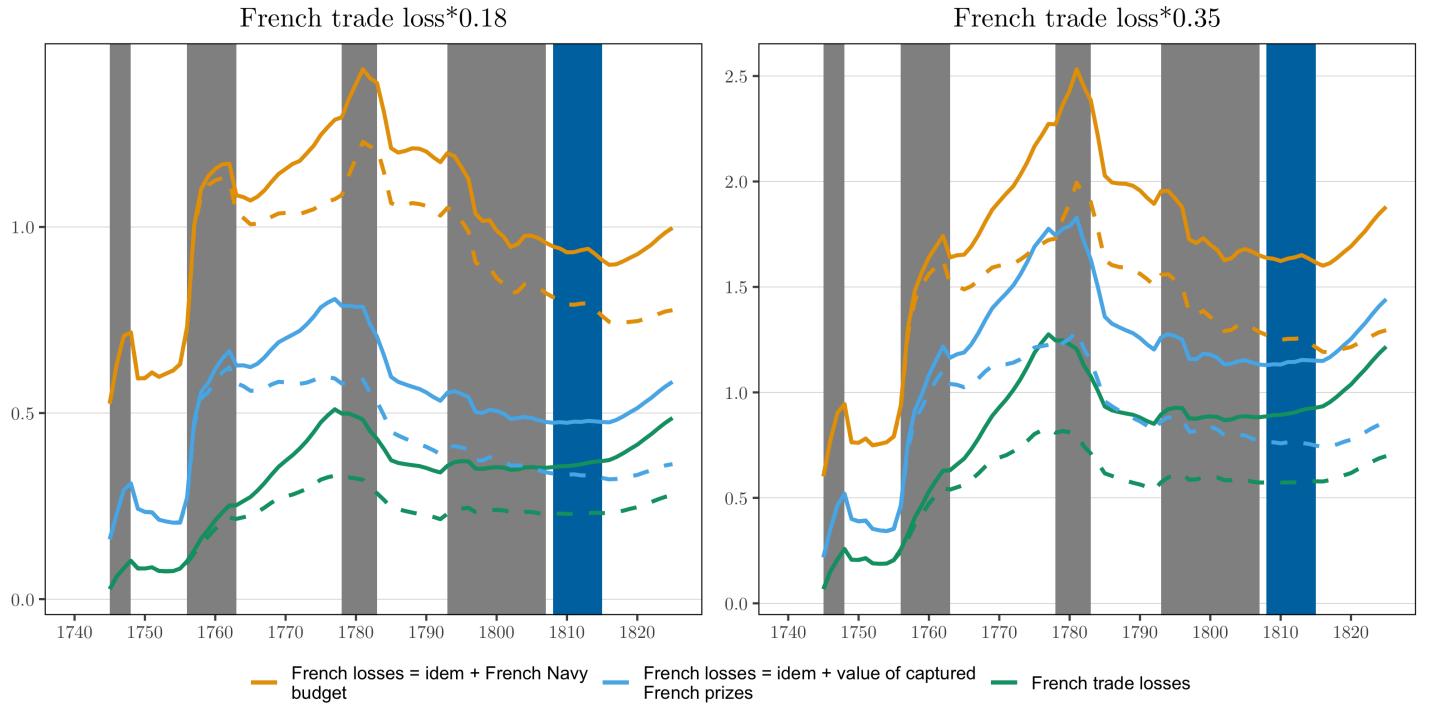
Source: See text and Mitchell (1988), pp. 570-587

Figure 8: Costs and benefits



This figure is a zoomed-in picture of figure 7. Therefore gross expenses are total expensive of the British Navy for the trade war. Net expenses are meant of the British Navy net of their budget.

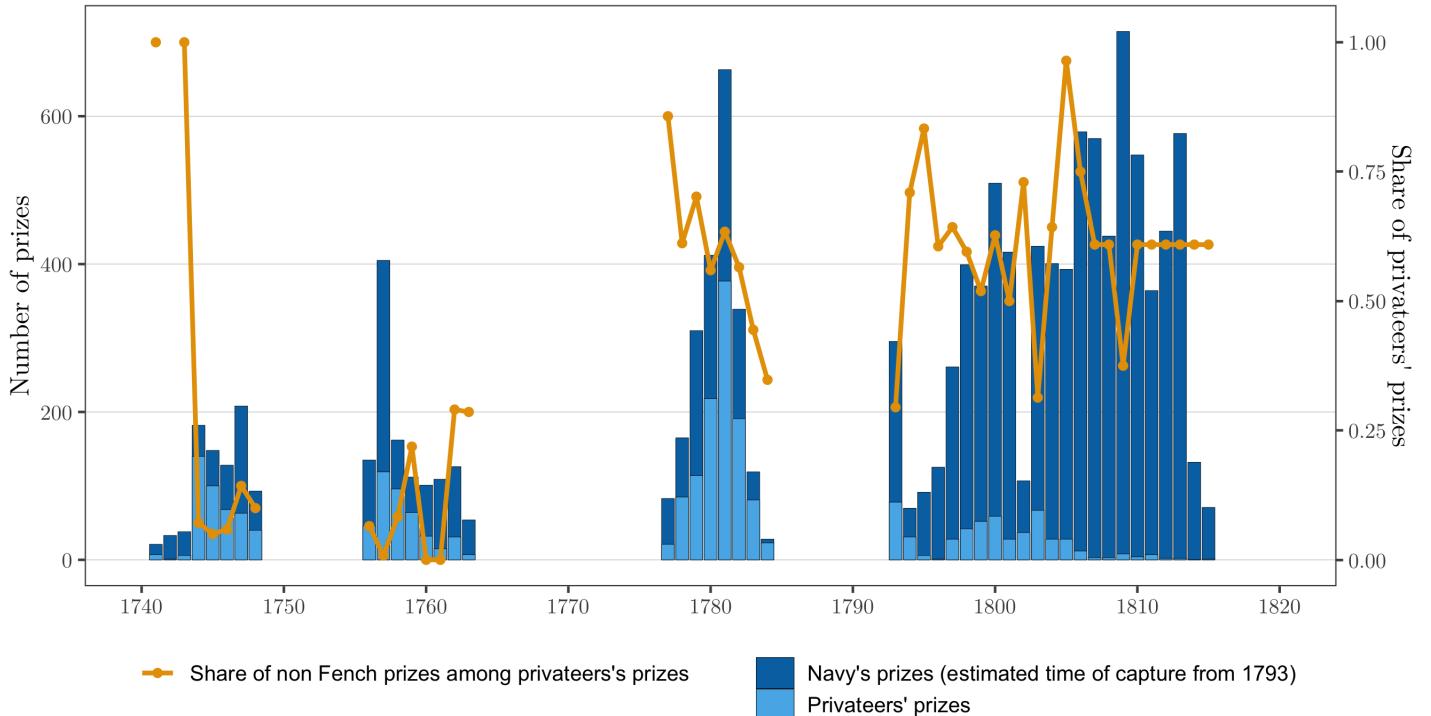
Figure 9: Ratio between French trade losses and the British Navy budget, high and low hypothesis



This graph shows French trade losses (green line), to which we added the value of captured French prizes (blue line), to which we then add also the French Navy budget (orange line). The solid line represents the loss function using one preceding peace period for the peace trend while the dashed line represents the loss function using all preceding peace period for the peace trend.

Source: See text and Mitchell (1988), pp. 570-587. For these graphs, French trade loss are assumed to be nil for 1783-1786, 1790-1791 and at the 1797 level for 1793-1796.

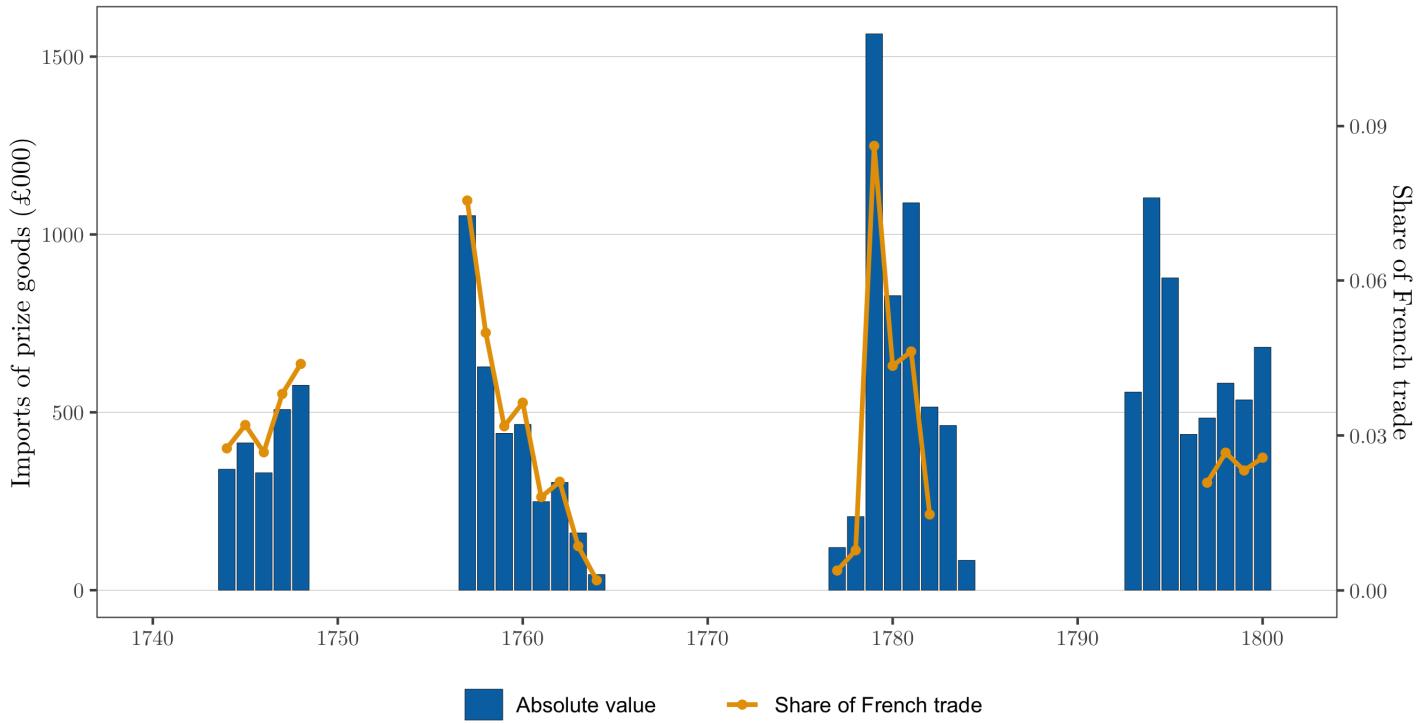
Figure 10: Ships captured by Great-Britain



The bars depict the total number of French prizes taken by capturer type (Navy or privateers, left y-axis). The line shows the percentage of non-French prizes out of all prizes captured by Great Britain (right y-axis). It is relevant in the context of predation of French shipping as these non-French prizes might be actually French owned, or carrying French cargo, or supplying France.

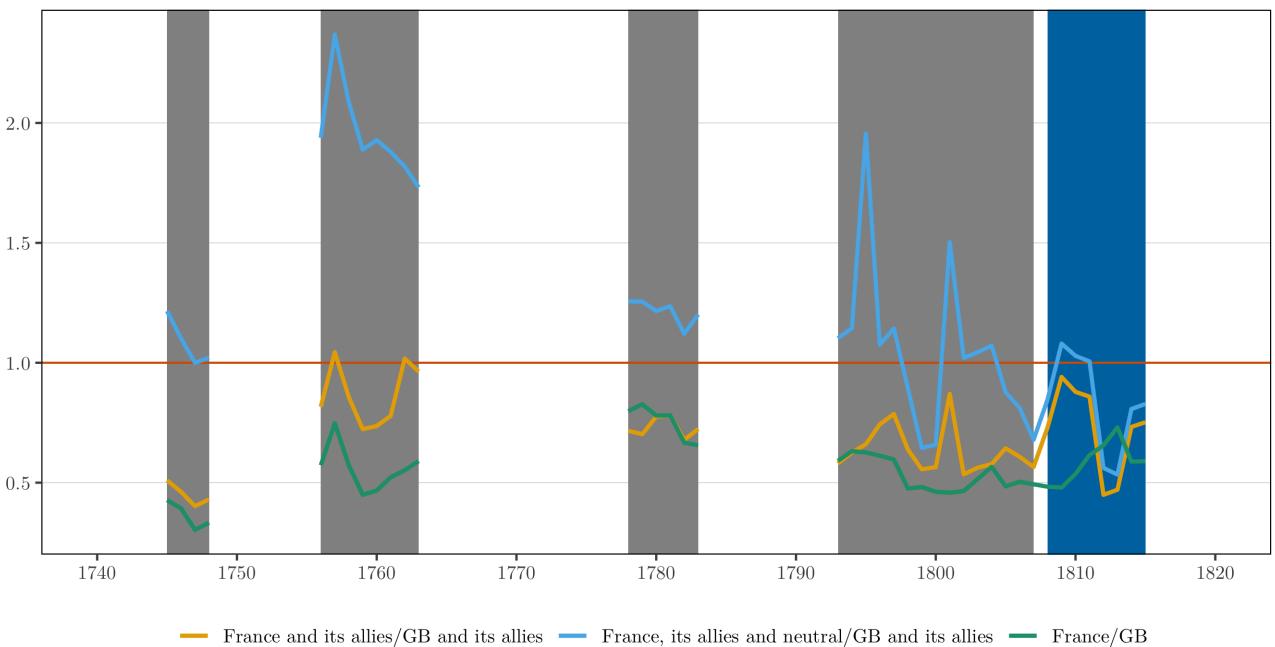
Source: For privateers and before 1785 for the Royal Navy, Hillmann and Gathmann (2011); Starkey (1990). For post-1793 Royal Navy prizes, we use the data on the value of Navy Prizes from Benjamin (2009), based on Hill (1998).

Figure 11: Prize goods imports in Great-Britain



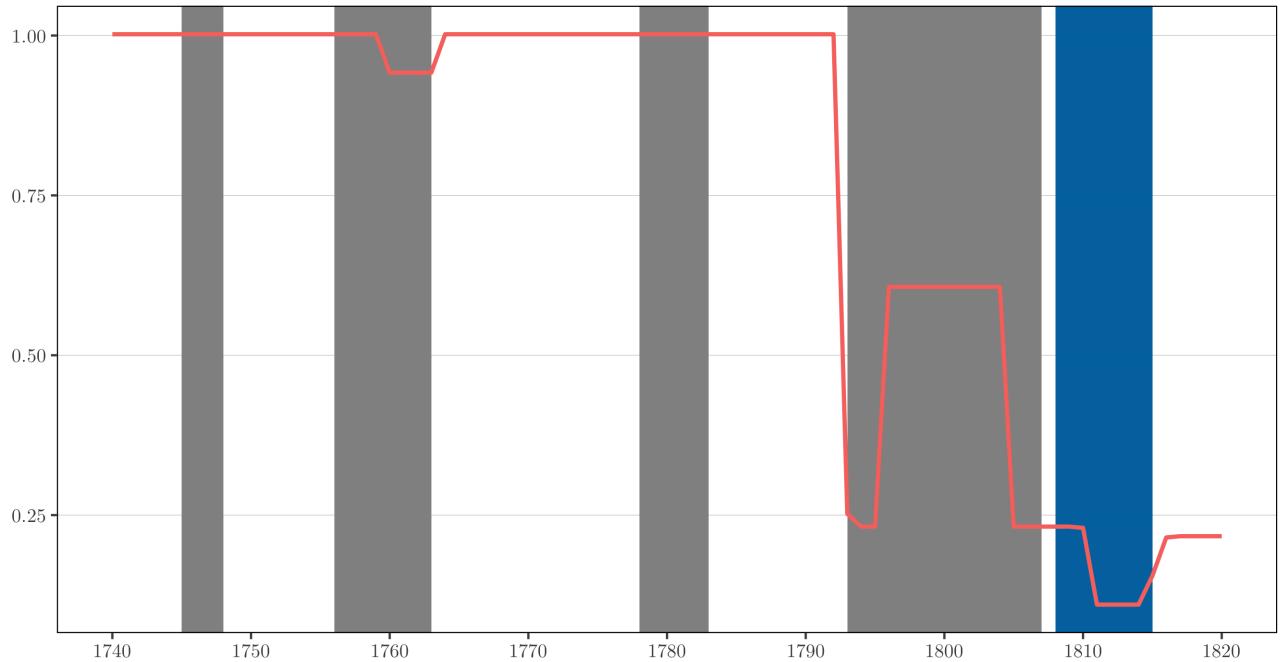
The bars show the absolute value of prize goods imports in Great Britain in pounds. The yellow line shows the percentage of the value of the prizes captured by Great Britain on total French trade. Source: Ashton (1960)

Figure 12: Naval Supremacy Ratio



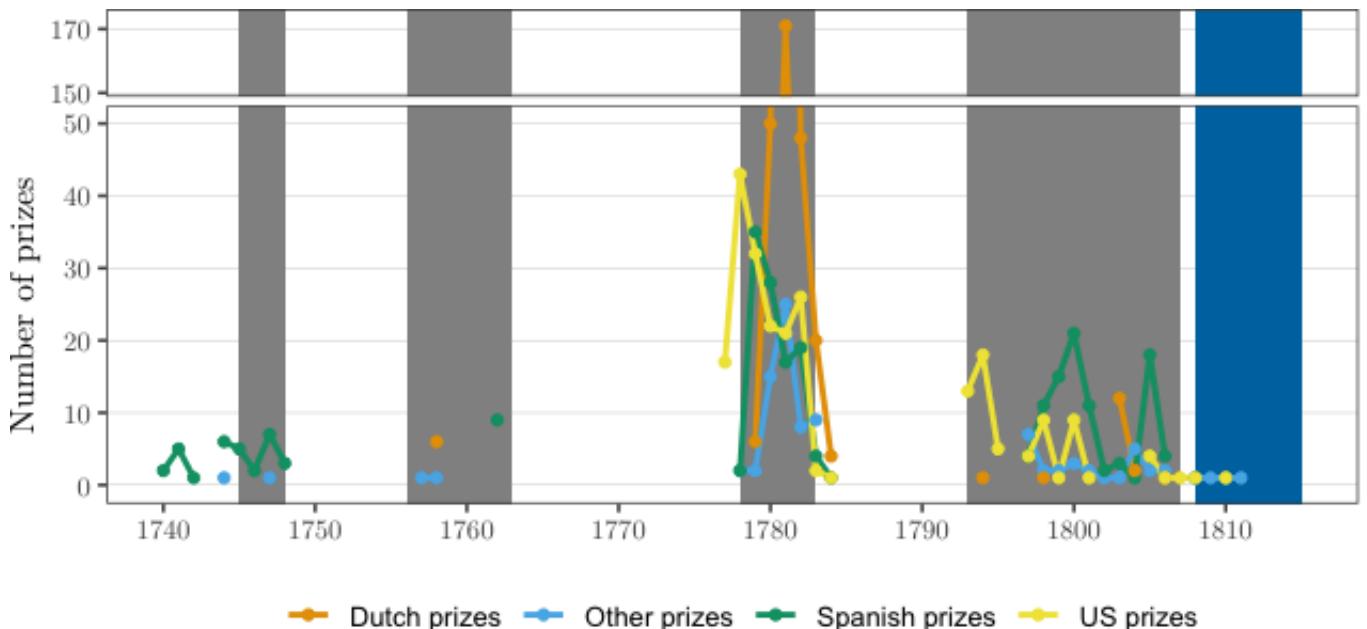
This graph shows the ratio of the French and British Navy. The green line only shows the ration between the two navy, the yellow line takes into account French navy + navy of French allies over British navy + navy of British allies, the green line takes into account French navy + navy of French allies + navy of neutral countries over British navy + navy of British allies.

Figure 13: Colonial empire loss



The line shows the proportion of French colonial empire as of 1740 owned at each subsequent period. Clearly it is equal 1 in 1740 and it gets reduced proportionally to the share of trade represented by the colony lost at each period.

Figure 14: Nationality of non-French British prizes



Source: For privateers and before 1785 for the Royal Navy, Starkey (1990) and Hillmann and Gathmann (2011). For post-1793 Royal Navy prizes, we use the data on the value of Navy Prizes from Benjamin (2009), based on Hill (1998). The peak in 1781 comes from the beginning of the 4th Anglo-Dutch War.

Figure 15: Trade loss by war status - Total trade



This figure shows the average loss over of total trade by war status over the war period, computed as explained in section 3.2.

Source: This figure is constructed by computing the mean country-specific trade loss function by war status based on all preceding peace periods. We have both a trade-weighted measure and a non-trade weighted measure, where we had to exclude *Empereur* after 1794, because of a territorial change- trade was mainly with current Belgium before 1794 and mainly with Austria after 1794 - and *Hollande* after 1814 as it included current day Belgium from 1815. The negative trade loss number for trade with foes in 1787-1789 can be explained by the large effect of the Eden treaty.

Figure 16: Trade loss by war status



This figure shows the average loss over of imports and exports separately by war status over the war period, computed as explained in section 3.2.

Source: This figure is constructed by computing the mean country-specific trade loss function by war status based on all preceding peace periods. We have both a trade-weighted measure and a non-trade weighted measure, where we had to exclude *Empereur* after 1794, because of a territorial change- trade was mainly with current Belgium before 1794 and mainly with Austria after 1794 - and *Hollande* after 1814 as it included current day Belgium from 1815. The negative trade loss number for trade with foes in 1787-1789 can be explained by the large effect of the Eden treaty.

Figure 17: Directed acyclical graphs (DAG) of causality between war and peacetime losses (Pearl (2000); Pearl and Mackenzie (2018); Schneider (2020))

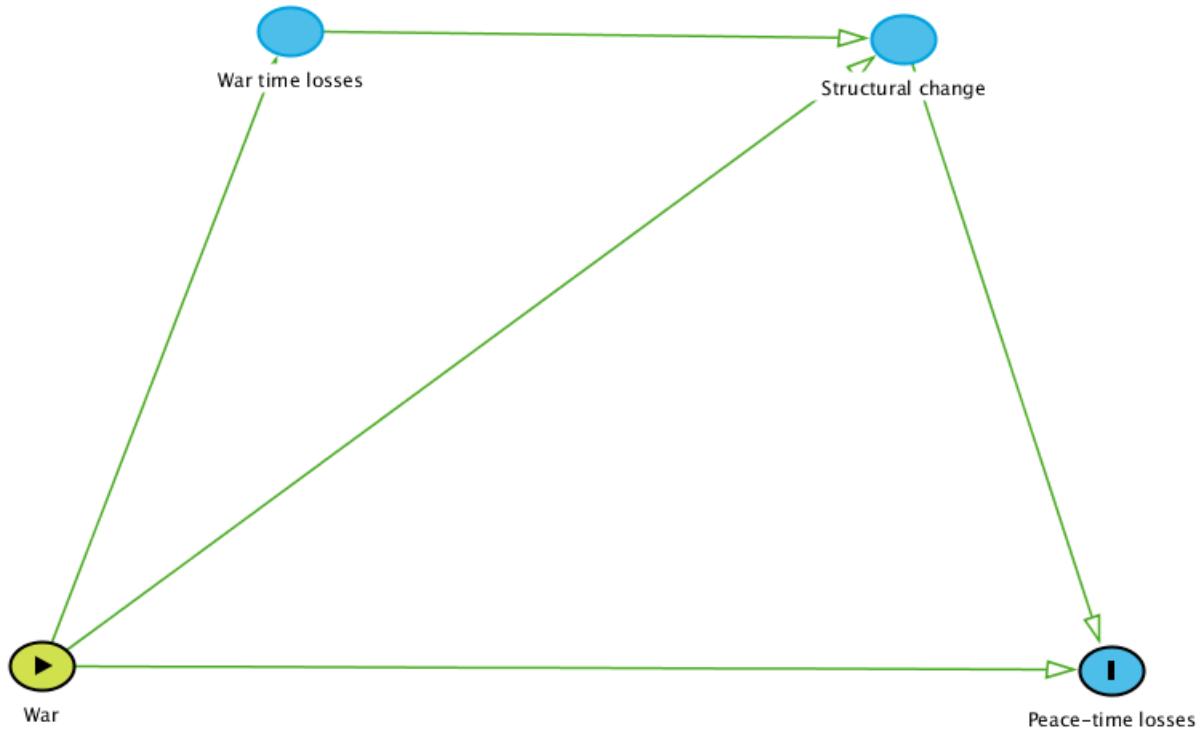
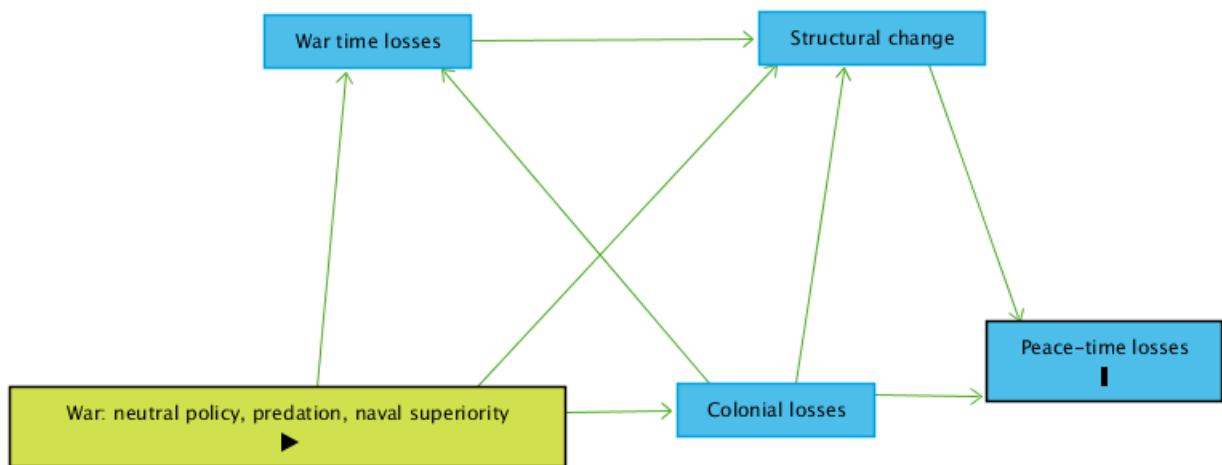


Figure 18: Directed acyclical graphs (DAG) of causality between war and peacetime losses (Pearl (2000); Pearl and Mackenzie (2018); Schneider (2020))



War time losses —————→ Structural change

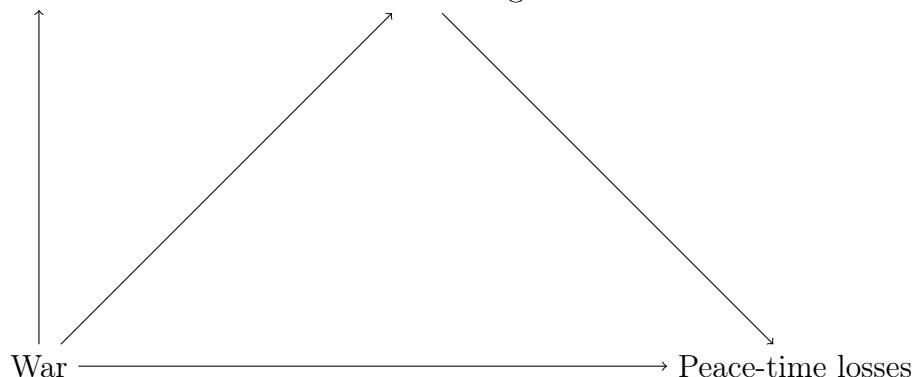


Table 1: Summary of war status for trade partners, 1792-1815

Country	Foe	Neutral	Ally
Allemagne	1792-1800 1814-1815	1801-1804	1805-1813
Angleterre	1793-1815	1792	
Espagne	1793-1794 1808-1815	1792 1795	1796-1807
Empereur	1792-1800 1805 1809 1813-1815	1801-1804 1806-1808	1810-1812
États-Unis	1798-1800	1792-1797 1801-1815	
Hollande	1793-1794 1814-1815	1792	1795-1813
Italie	1792-1796 1814-1815		1797-1813
Levant	1798-1801	1792-1797 1802-1815	
Nord		1792-1807 1814-1815	1808-1813
Outre-mers			1792-1815
Portugal	1793-1797 1799-1800 1807-1815	1792 1798 1801-1806	
Suisse		1792-1797 1814-1815	1798-1813

Table 2: Regression of the various the loss functions on the log of sectorial shares of exports (N=54)

	Other foodstuff	Plantation foodstuff	Drinks and tobacco	Crude material	Oils	Chemical products	Leather wood and paper products	Other threads and fabric	Wool threads and fabrics	Silk threads and fabrics	Cotton threads and fabrics	Other industrial products
loss	-0.608*	-2.712*	0.223	-0.746**	-0.231	-0.317	0.554*	0.140	0.689**	1.313***	-0.622	0.861**
	(-2.51)	(-2.40)	(0.97)	(-2.78)	(-0.66)	(-0.92)	(2.47)	(0.56)	(3.22)	(7.49)	(-1.59)	(3.50)
war	0.192**	-1.005**	0.190**	-0.101	0.395***	-0.175	0.221**	0.265***	0.057	0.065	-0.338**	-0.134
	(2.76)	(-3.09)	(2.87)	(-1.30)	(3.92)	(-1.78)	(3.44)	(3.72)	(0.94)	(1.28)	(-3.00)	(-1.89)
year	0.015***	-0.046***	0.008***	0.022***	0.019***	-0.004	0.008***	-0.011***	-0.019***	0.002	0.020***	0.002
	(7.67)	(-4.97)	(4.02)	(10.19)	(6.54)	(-1.47)	(4.17)	(-5.27)	(-10.96)	(1.43)	(6.35)	(0.92)
loss_nm	-0.513*	-3.005*	0.219	-0.704*	-0.233	-0.317	0.683**	0.224	0.783***	1.322***	-0.444	1.009***
	(-2.05)	(-2.65)	(0.94)	(-2.55)	(-0.65)	(-0.91)	(3.10)	(0.89)	(3.72)	(7.36)	(-1.10)	(4.22)
war	0.203**	-0.853*	0.182*	-0.077	0.405***	-0.163	0.180**	0.247**	0.016	0.010	-0.339**	-0.190*
	(2.69)	(-2.50)	(2.58)	(-0.92)	(3.77)	(-1.55)	(2.72)	(3.28)	(0.25)	(0.19)	(-2.79)	(-2.64)
year	0.014***	-0.050***	0.008***	0.021***	0.018***	-0.005	0.008***	-0.011***	-0.018***	0.004**	0.019***	0.003
	(7.82)	(-6.24)	(4.87)	(10.82)	(7.36)	(-1.91)	(5.25)	(-6.13)	(-12.39)	(3.43)	(6.57)	(1.66)
ln(loss)	-0.154**	-0.315	0.053	-0.191**	-0.057	-0.025	0.094	0.039	0.120*	0.245***	-0.260**	0.101
	(-2.99)	(-1.23)	(1.06)	(-3.37)	(-0.75)	(-0.33)	(1.88)	(0.72)	(2.50)	(5.64)	(-3.29)	(1.74)
war	0.203**	-1.134**	0.188**	-0.086	0.399***	-0.196	0.233***	0.261***	0.071	0.082	-0.277*	-0.093
	(2.99)	(-3.34)	(2.83)	(-1.14)	(3.95)	(-1.97)	(3.53)	(3.66)	(1.11)	(1.42)	(-2.64)	(-1.21)
year	0.014***	-0.056***	0.008***	0.021***	0.018***	-0.005*	0.009***	-0.011***	-0.017***	0.005***	0.021***	0.005**
ε	(8.71)	(-6.82)	(4.97)	(11.79)	(7.55)	(-2.28)	(5.75)	(-6.12)	(-11.20)	(3.83)	(8.38)	(2.68)
ln(loss_nm)	-0.115*	-0.453*	0.049	-0.168**	-0.035	-0.031	0.118**	0.057	0.132**	0.246***	-0.186*	0.144**
	(-2.49)	(-2.07)	(1.11)	(-3.37)	(-0.52)	(-0.47)	(2.81)	(1.22)	(3.24)	(7.18)	(-2.59)	(2.97)
war	0.209**	-0.972**	0.180*	-0.062	0.395***	-0.187	0.197**	0.240**	0.038	0.031	-0.274*	-0.144
	(2.88)	(-2.84)	(2.61)	(-0.79)	(3.76)	(-1.81)	(2.99)	(3.28)	(0.59)	(0.57)	(-2.43)	(-1.90)
year	0.014***	-0.054***	0.008***	0.021***	0.018***	-0.005*	0.009***	-0.011***	-0.017***	0.006***	0.020***	0.005**
	(8.43)	(-7.16)	(5.33)	(12.05)	(7.75)	(-2.37)	(6.14)	(-6.64)	(-12.24)	(4.81)	(7.89)	(2.68)

Source: The log of "negative" losses is replaced by the log of the minimum loss in the data

Table 3: Regression the loss functions on the log of the sectorial shares of imports(N=54)

	Other foodstuff	Plantation foodstuff	Drinks and tobacco	Crude material	Oils	Chemical products	Leather wood and paper products	Other threads and fabric	Wool threads and fabrics	Silk threads and fabrics	Cotton threads and fabrics	Other industrial products
loss	0.101 (0.22)	-2.352** (-3.04)	-0.402 (-0.56)	-0.106 (-0.39)	0.869 (1.93)	0.373 (1.38)	2.019*** (4.27)	0.834 (1.62)	1.281 (1.89)	3.422** (3.14)	-3.807* (-2.58)	1.069** (3.11)
war	-0.146 (-1.09)	-0.041 (-0.19)	0.250 (1.20)	0.310*** (3.98)	-0.354** (-2.74)	0.176* (2.26)	-0.245 (-1.80)	-0.139 (-0.94)	0.171 (0.66)	-1.148*** (-3.66)	1.268** (2.92)	-0.180 (-1.82)
year	-0.002 (-0.57)	0.006 (0.99)	0.001 (0.09)	0.007** (3.14)	-0.000 (-0.12)	-0.004 (-1.91)	-0.011** (-2.82)	-0.003 (-0.61)	-0.064*** (-9.62)	-0.050*** (-5.58)	-0.017 (-1.38)	-0.007* (-2.51)
loss_nm	-0.230 (-0.49)	-2.894*** (-3.86)	-0.379 (-0.52)	-0.022 (-0.08)	1.099* (2.46)	0.371 (1.35)	2.136*** (4.53)	1.051* (2.04)	1.120 (1.53)	4.242*** (4.04)	-4.230** (-2.86)	1.210*** (3.56)
war	-0.103 (-0.72)	0.132 (0.59)	0.262 (1.19)	0.302*** (3.64)	-0.423** (-3.14)	0.161 (1.94)	-0.343* (-2.42)	-0.204 (-1.32)	0.140 (0.49)	-1.405*** (-4.45)	1.486** (3.27)	-0.244* (-2.38)
year	-0.001 (-0.22)	0.004 (0.81)	-0.000 (-0.06)	0.006** (3.33)	0.000 (0.06)	-0.004 (-1.85)	-0.008* (-2.35)	-0.002 (-0.54)	-0.061*** (-9.80)	-0.047*** (-6.38)	-0.022* (-2.07)	-0.006* (-2.40)
ln(loss)	0.058 (0.57)	-0.268 (-1.49)	0.014 (0.09)	-0.073 (-1.26)	0.174 (1.76)	0.083 (1.41)	0.314** (2.80)	0.018 (0.16)	0.274 (1.93)	0.321 (1.25)	-0.474 (-1.41)	0.125 (1.57)
war	-0.164 (-1.22)	-0.156 (-0.65)	0.201 (0.96)	0.334*** (4.35)	-0.348* (-2.67)	0.175* (2.23)	-0.187 (-1.26)	-0.061 (-0.40)	0.180 (0.71)	-0.948** (-2.79)	1.111* (2.43)	-0.130 (-1.22)
year	-0.003 (-0.80)	-0.002 (-0.43)	-0.002 (-0.39)	0.008*** (4.07)	0.002 (0.49)	-0.004 (-1.87)	-0.005 (-1.33)	0.002 (0.49)	-0.061*** (-10.67)	-0.036*** (-4.38)	-0.030** (-2.73)	-0.003 (-1.23)
ln(loss_nm)	-0.001 (-0.01)	-0.334* (-2.17)	-0.040 (-0.29)	-0.023 (-0.45)	0.179* (2.10)	0.079 (1.53)	0.351*** (3.77)	0.049 (0.48)	0.210 (1.64)	0.401 (1.82)	-0.541 (-1.86)	0.151* (2.20)
war	-0.135 (-0.97)	-0.054 (-0.22)	0.235 (1.09)	0.315*** (3.89)	-0.389** (-2.91)	0.160 (1.98)	-0.278 (-1.91)	-0.086 (-0.55)	0.172 (0.64)	-1.071** (-3.09)	1.258** (2.69)	-0.174 (-1.62)
year	-0.002 (-0.52)	-0.002 (-0.35)	-0.001 (-0.24)	0.007*** (3.74)	0.002 (0.58)	-0.003 (-1.87)	-0.005 (-1.51)	0.001 (0.39)	-0.059*** (-10.64)	-0.037*** (-4.79)	-0.030** (-2.88)	-0.003 (-1.41)

Source: The log of "negative" losses is replaces by the log of the minimum loss in the data

Table 4: Regression the loss functions on the log of the geography of exports(N=66)

	Germany and Switzerland by land	Iberia	Italy	Low Countries	North of Holland by sea	Overseas N=62	United Kingdom	United States N=33
loss	0.976*** (4.16)	0.605* (2.52)	0.234 (1.15)	-0.045 (-0.16)	-0.737 (-1.77)	-0.192 (-0.29)	-0.348 (-0.32)	1.473 (0.75)
war	0.468*** (6.29)	0.033 (0.43)	0.008 (0.12)	0.031 (0.34)	-0.301* (-2.29)	-1.063*** (-5.03)	-1.437*** (-4.03)	0.014 (0.03)
year	0.002 (1.23)	-0.009*** (-4.62)	-0.003 (-1.55)	0.001 (0.49)	-0.001 (-0.19)	-0.033*** (-5.93)	0.017 (1.82)	0.034 (1.08)
loss_nm	1.087*** (4.42)	0.749** (2.99)	0.234 (1.08)	-0.033 (-0.11)	-0.932* (-2.13)	-0.426 (-0.60)	-0.293 (-0.25)	0.732 (0.42)
war	0.411*** (5.21)	-0.016 (-0.19)	-0.001 (-0.02)	0.030 (0.31)	-0.240 (-1.71)	-1.015*** (-4.48)	-1.434*** (-3.75)	0.138 (0.24)
year	0.004* (2.44)	-0.009*** (-5.04)	-0.002 (-1.47)	0.001 (0.51)	-0.001 (-0.50)	-0.033*** (-6.82)	0.016 (1.99)	0.045 (1.80)
ln(loss)	0.107* (2.48)	0.054 (1.27)	0.011 (0.32)	0.022 (0.45)	-0.010 (-0.14)	0.083 (0.74)	-0.132 (-0.71)	0.731 (1.70)
war	0.517*** (6.47)	0.073 (0.92)	0.031 (0.47)	0.008 (0.09)	-0.393** (-2.92)	-1.154*** (-5.50)	-1.379*** (-3.89)	-0.357 (-0.63)
year	0.006** (3.23)	-0.007*** (-3.95)	-0.002 (-1.06)	0.000 (0.23)	-0.005 (-1.56)	-0.036*** (-7.67)	0.018* (2.26)	0.022 (0.89)
ln(loss_nm)	0.139*** (4.24)	0.085* (2.52)	0.020 (0.71)	-0.009 (-0.22)	-0.058 (-0.98)	-0.028 (-0.30)	-0.104 (-0.68)	0.434 (1.83)
war	0.447*** (5.88)	0.021 (0.27)	0.017 (0.25)	0.035 (0.37)	-0.337* (-2.45)	-1.059*** (-4.88)	-1.369*** (-3.75)	-0.413 (-0.73)
year	0.006*** (3.81)	-0.007*** (-4.63)	-0.002 (-1.23)	0.001 (0.58)	-0.004 (-1.45)	-0.034*** (-7.82)	0.017* (2.31)	0.025 (1.16)

Source: The log of "negative" losses is replaced by the log of the minimum loss in the data

Table 5: Regression the loss functions on the log of the geography of imports(N=66)

	Germany and Switzerland by land	Iberia	Italy	Low Countries	North of Holland by sea	Overseas N=62	United Kingdom	United States N=33
loss	0.537 (1.39)	0.753** (3.10)	0.677* (2.56)	0.270 (0.76)	-0.089 (-0.15)	-0.378 (-0.47)	0.234 (0.29)	-1.910 (-1.19)
war	0.797*** (6.50)	0.206** (2.68)	0.159 (1.89)	0.342** (3.04)	-0.186 (-0.95)	-1.294*** (-5.10)	-0.518 (-1.90)	0.402 (0.87)
year	0.013*** (3.99)	-0.006** (-2.77)	-0.003 (-1.30)	-0.004 (-1.24)	0.001 (0.19)	-0.030*** (-4.39)	0.011 (1.57)	0.074** (2.93)
loss_nm	0.700 (1.72)	0.895*** (3.54)	0.818** (2.95)	0.440 (1.18)	0.087 (0.13)	-0.954 (-1.13)	0.566 (0.66)	-2.025 (-1.44)
war	0.749*** (5.72)	0.153 (1.88)	0.108 (1.22)	0.302* (2.52)	-0.213 (-1.02)	-1.179*** (-4.36)	-0.588* (-2.01)	0.473 (1.03)
year	0.014*** (4.86)	-0.005** (-2.66)	-0.002 (-1.05)	-0.004 (-1.47)	0.000 (0.03)	-0.028*** (-4.92)	0.010 (1.68)	0.071** (3.50)
ln(loss)	0.001 (0.01)	0.086 (1.99)	0.056 (1.20)	0.038 (0.62)	0.023 (0.22)	0.089 (0.65)	-0.170 (-1.28)	-0.093 (-0.25)
war	0.870*** (7.01)	0.241** (3.02)	0.206* (2.37)	0.349** (3.12)	-0.216 (-1.11)	-1.414*** (-5.60)	-0.336 (-1.26)	0.122 (0.25)
year	0.016*** (5.77)	-0.003 (-1.74)	-0.000 (-0.09)	-0.003 (-1.17)	-0.000 (-0.01)	-0.034*** (-5.94)	0.017** (2.78)	0.052* (2.50)
ln(loss_nm)	0.080 (1.47)	0.104** (3.04)	0.059 (1.55)	0.050 (1.01)	0.034 (0.39)	-0.045 (-0.40)	-0.106 (-0.96)	-0.019 (-0.09)
war	0.782*** (6.22)	0.194* (2.44)	0.185* (2.08)	0.324** (2.81)	-0.235 (-1.17)	-1.295*** (-4.96)	-0.360 (-1.31)	0.071 (0.14)
year	0.015*** (5.88)	-0.003 (-1.89)	0.000 (0.03)	-0.003 (-1.29)	-0.000 (-0.03)	-0.031*** (-5.96)	0.014* (2.65)	0.049* (2.62)

Source: The log of "negative" losses is replaced by the log of the minimum loss in the data

Table 6: Regression of the various the loss functions on the log of regional shares of exports (up to 1789)

	Amiens N=14	Bayonne N=35	Bordeaux N=37	Bourgogne N=14	Caen N=17	Châlons N=14	Lyon N=15	Marseille N=33	Nantes N=33	Rennes N=33	Saint-Quentin N=14
loss	1.266 (2.21)	0.342 (1.14)	-0.433 (-1.76)	-1.342** (-3.33)	-0.058 (-0.04)	-0.043 (-0.08)	1.721** (4.38)	-0.297 (-1.49)	-1.293* (-2.41)	0.321 (0.65)	8.557** (4.08)
war	0.084 (0.46)	0.608*** (5.86)	-0.207* (-2.47)	0.035 (0.27)	-1.063 (-2.00)	0.024 (0.13)	0.330* (2.44)	-0.222** (-3.33)	-0.315 (-1.90)	0.074 (0.44)	0.764 (1.14)
year	-0.014 (-1.71)	-0.014** (-3.21)	0.021*** (5.56)	0.046*** (7.79)	0.042 (1.69)	-0.023* (-2.86)	-0.023** (-3.81)	-0.006* (-2.11)	0.014 (1.62)	-0.019* (-2.58)	-0.150*** (-4.90)
loss_nm	1.441 (2.14)	0.538 (1.56)	-0.489 (-1.71)	-1.438* (-2.83)	-0.513 (-0.27)	-0.094 (-0.14)	2.015** (4.31)	-0.428 (-1.89)	-1.695** (-2.87)	0.412 (0.71)	9.321** (3.48)
war	-0.025 (-0.13)	0.551*** (4.77)	-0.181 (-1.92)	0.139 (0.92)	-1.013 (-1.80)	0.033 (0.17)	0.176 (1.19)	-0.185* (-2.54)	-0.180 (-0.99)	0.042 (0.22)	0.082 (0.10)
year	-0.010 (-1.28)	-0.014** (-3.48)	0.019*** (5.77)	0.041*** (6.94)	0.043 (1.85)	-0.023* (-3.08)	-0.017** (-3.12)	-0.007* (-2.63)	0.011 (1.48)	-0.018* (-2.69)	-0.121** (-3.86)
ln(loss)	0.156 (1.72)	0.048 (1.08)	-0.072 (-1.93)	-0.194* (-3.15)	0.056 (0.23)	0.045 (0.55)	0.186* (2.52)	-0.011 (-0.35)	-0.076 (-0.92)	-0.008 (-0.11)	1.075* (2.86)
war	0.086 (0.44)	0.616*** (6.06)	-0.201* (-2.42)	0.045 (0.34)	-1.081 (-2.02)	-0.000 (-0.00)	0.348 (1.94)	-0.259*** (-3.77)	-0.469* (-2.73)	0.143 (0.88)	0.774 (0.95)
year	-0.015 (-1.56)	-0.014** (-3.14)	0.021*** (5.68)	0.048*** (7.51)	0.039 (1.50)	-0.026* (-3.07)	-0.022* (-2.60)	-0.008* (-2.63)	0.006 (0.60)	-0.017* (-2.08)	-0.153** (-3.95)
of	ln(loss_nm) (2.39)	0.164* (0.50)	-0.061 (-1.78)	-0.180** (-4.11)	0.034 (0.17)	-0.002 (-0.02)	0.201** (3.90)	-0.029 (-1.05)	-0.091 (-1.06)	0.035 (0.51)	1.063** (4.21)
war	0.001 (0.00)	0.647*** (6.17)	-0.204* (-2.42)	0.130 (1.08)	-1.090 (-1.98)	0.023 (0.12)	0.239 (1.57)	-0.234** (-3.41)	-0.438* (-2.42)	0.090 (0.54)	0.245 (0.35)
year	-0.010 (-1.27)	-0.012** (-3.01)	0.019*** (5.83)	0.041*** (8.49)	0.041 (1.78)	-0.024* (-3.12)	-0.016* (-2.80)	-0.008** (-2.90)	0.005 (0.61)	-0.018* (-2.61)	-0.117** (-4.23)

Source: The log of "negative" losses is replaced by the log of the minimum loss in the data. Results for Charleville, Flandres, La Rochelle, Langres, Montpellier, Narbonne and Rouen are not statistically significant and are not shown

Table 7: Regression the loss functions on the log of the regional shares of imports (up to 1789)

	Amiens N=14	Bayonne N=35	Bordeaux N=37	Bourgogne N=14	Caen N=17	Châlons N=14	Lyon N=15	Marseille N=33	Nantes N=33	Rennes N=33	Saint-Quentin N=14
loss	4.675*** (4.61)	1.906*** (4.04)	-1.324* (-2.62)	0.901 (1.45)	6.845*** (4.45)	6.412** (4.29)	-2.143 (-1.62)	0.659** (3.03)	-2.399*** (-4.38)	1.807* (2.59)	5.254** (3.79)
war	0.199 (0.61)	0.205 (1.20)	-0.049 (-0.28)	0.770*** (5.94)	0.112 (0.23)	0.918 (1.92)	1.674** (3.96)	-0.170* (-2.37)	-0.433** (-2.80)	-0.132 (-0.54)	1.089* (2.46)
year	-0.065** (-4.38)	-0.053*** (-6.95)	0.033*** (4.35)	0.029* (2.97)	-0.087** (-3.81)	-0.105*** (-4.81)	-0.010 (-0.54)	-0.009** (-2.78)	0.022* (2.66)	0.012 (1.09)	-0.124*** (-6.14)
loss_nm	5.125** (3.90)	2.296*** (4.19)	-1.831** (-3.28)	1.388* (2.50)	7.692** (4.00)	7.193** (3.89)	-1.593 (-0.96)	0.783** (3.11)	-2.800*** (-4.80)	1.937* (2.33)	6.016** (3.65)
war	-0.178 (-0.45)	0.040 (0.21)	0.105 (0.57)	0.661*** (5.67)	-0.478 (-0.84)	0.380 (0.69)	1.749** (3.53)	-0.217* (-2.72)	-0.251 (-1.48)	-0.229 (-0.81)	0.633 (1.28)
year	-0.049** (-3.19)	-0.046*** (-6.73)	0.030*** (4.65)	0.030** (4.51)	-0.064* (-2.82)	-0.084** (-3.87)	-0.019 (-1.01)	-0.007* (-2.39)	0.015* (2.06)	0.019 (1.87)	-0.107*** (-5.54)
ln(loss)	0.594* (3.16)	0.275*** (3.73)	-0.111 (-1.34)	0.015 (0.18)	0.780* (2.55)	0.759* (2.65)	-0.447* (-2.64)	0.084* (2.36)	-0.231* (-2.32)	0.173 (1.54)	0.592* (2.27)
war	0.201 (0.49)	0.283 (1.70)	-0.163 (-0.87)	0.755*** (5.27)	0.120 (0.18)	0.948 (1.53)	1.757*** (4.78)	-0.149 (-1.98)	-0.583** (-3.22)	0.017 (0.07)	1.128 (2.00)
year	-0.067** (-3.47)	-0.056*** (-6.68)	0.028** (3.41)	0.039** (3.85)	-0.084* (-2.66)	-0.105** (-3.57)	-0.001 (-0.03)	-0.008* (-2.34)	0.014 (1.38)	0.015 (1.21)	-0.123** (-4.57)
ln(loss_nm)	0.561** (4.30)	0.307*** (5.28)	-0.103 (-1.35)	0.078 (0.94)	0.738** (3.26)	0.765** (3.96)	-0.307 (-1.98)	0.078* (2.44)	-0.250* (-2.49)	0.175 (1.72)	0.617** (3.42)
war	-0.065 (-0.18)	0.178 (1.20)	-0.158 (-0.84)	0.729*** (5.21)	-0.208 (-0.34)	0.560 (1.06)	1.844** (4.35)	-0.155* (-2.05)	-0.522* (-2.75)	-0.020 (-0.08)	0.806 (1.63)
year	-0.047** (-3.26)	-0.050*** (-7.88)	0.026** (3.51)	0.035** (4.00)	-0.059* (-2.34)	-0.080** (-3.77)	-0.018 (-1.05)	-0.006 (-1.97)	0.012 (1.27)	0.020 (1.79)	-0.103*** (-5.22)

Source: The log of "negative" losses is replaced by the log of the minimum loss in the data. Results for Charleville, Flandres, La Rochelle, Langres, Montpellier, Narbonne and Rouen are not statistically significant and are not shown

A MANOVA test

Table 8: SITC18 Classification

Other foodstuff and live animals	Chemical products	Other
Cotton threads and fabrics	Other industrial products	Oils
Crude materials, inedible, except com	Other threads and fabrics	Wool threads and fabrics
Leather, wood and paper products	Drinks and tobacco	Plantation foodstuff
Silk threads and fabrics		

Table 9: Country Classification

Italy	United Kingdom
Spain	Holland (including Belgium and Habsburg Monarchy)
Germany (including Switzerland)	Ottoman Empire
Spain (including Portugal)	United States
Baltic, Scandinavia and Russia	

Table 10: Multivariate Analisys of Variance - by SITC

	Exports 1	Exports 0	Imports 1	Imports 0	X I 1	X I 0
peace war	0	0	0	0	0	0
seven peace1764 1777	.01	.01	.03	.02	.01	.01
peace1764 1777 indep	.16	.02	.45	.22	.29	.35
rev block	.06	.03	.01	0	.03	.05
peace1816 1840 block	.86	.52	.69	.09	.91	.37
peace1749 1755 peace1764 1777	.35	.27	.77	.39	.74	.29
peace1764 1777 peace1784 1792	.66	.11	.56	.16	.64	.1

Table 11: Multivariate Analisys of Variance - by geography

	Exports 1	Exports 0	Imports 1	Imports 0	X I 1	X I 0
peace war	0	0	0	0	0	0
seven peace1764 1777	0	0	0	0	0	0
peace1764 1777 indep	0	0	0	0	0	0
rev block	.02	.02	.02	.01	.03	.01
peace1816 1840 block	.07	.09	.12	.21	.08	.12
peace1749 1755 peace1764 1777	.01	.01	.01	.01	.12	.12
peace1764 1777 peace1784 1792	0	0	0	0	0	0
peace1784 1792 peace1816 1840	.53	.73	.55	.76	.73	.75

Table 12: Multivariate Analisys of Variance - by aggregate SITC

	Exports 1	Exports 0	Imports 1	Imports 0	X I 1	X I 0
peace war	0	0	0	0	0	.03
seven peace1764 1777	0	.01	0	.01	0	.01
peace1764 1777 indep	.14	.15	.04	.04	.13	.03
rev block	0	0	0	0	.01	.02
peace1816 1840 block	.15	.07	.02	.01	.03	.03
peace1749 1755 peace1764 1777	0	.01	.01	0	.05	.05
peace1764 1777 peace1784 1792	0	0	.01	.02	.01	0
peace1784 1792 peace1816 1840	.65	.12	.44	.02	.44	.08

Figure 19: Change in composition of trade

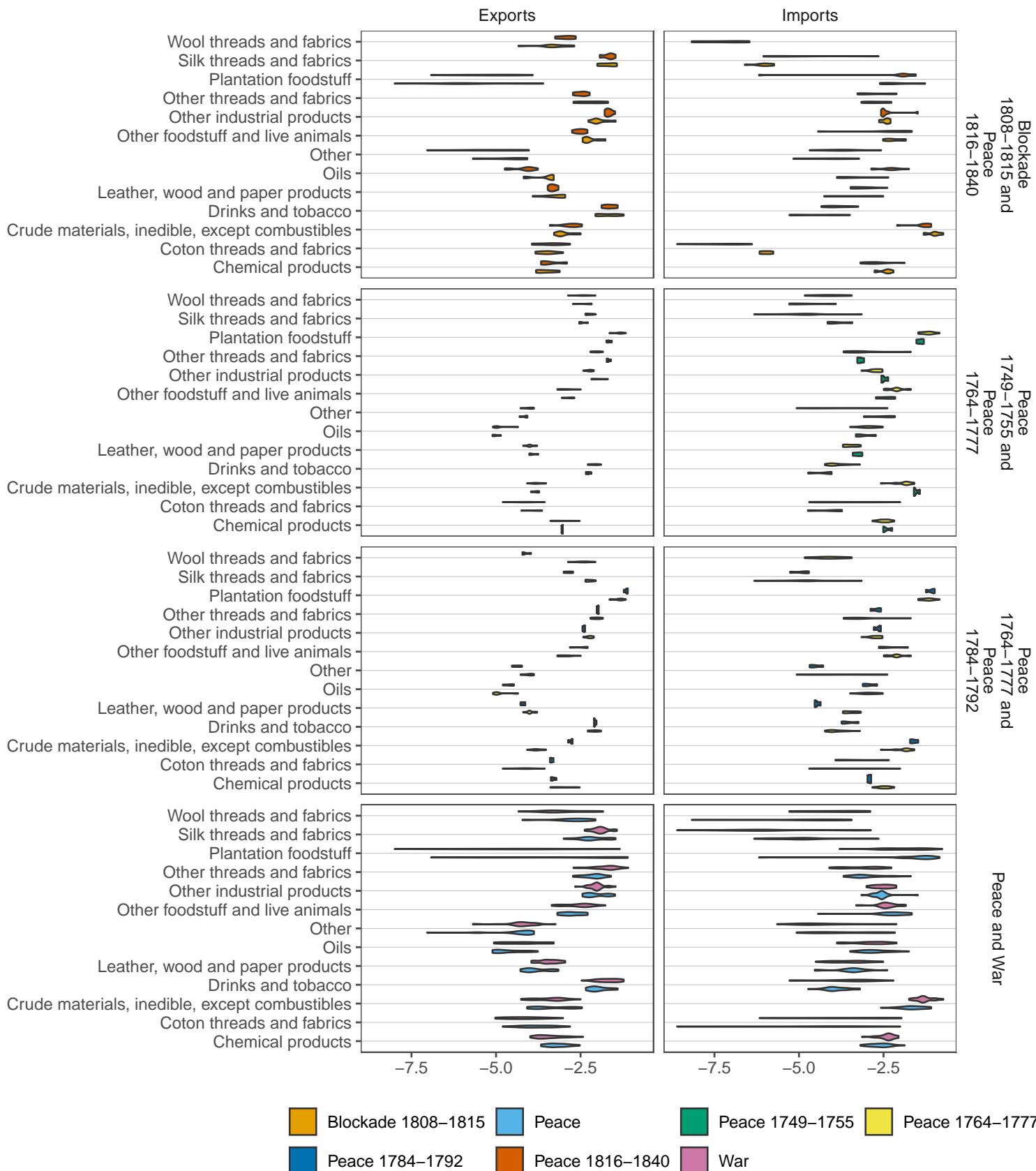


Figure 20: Change in composition of trade

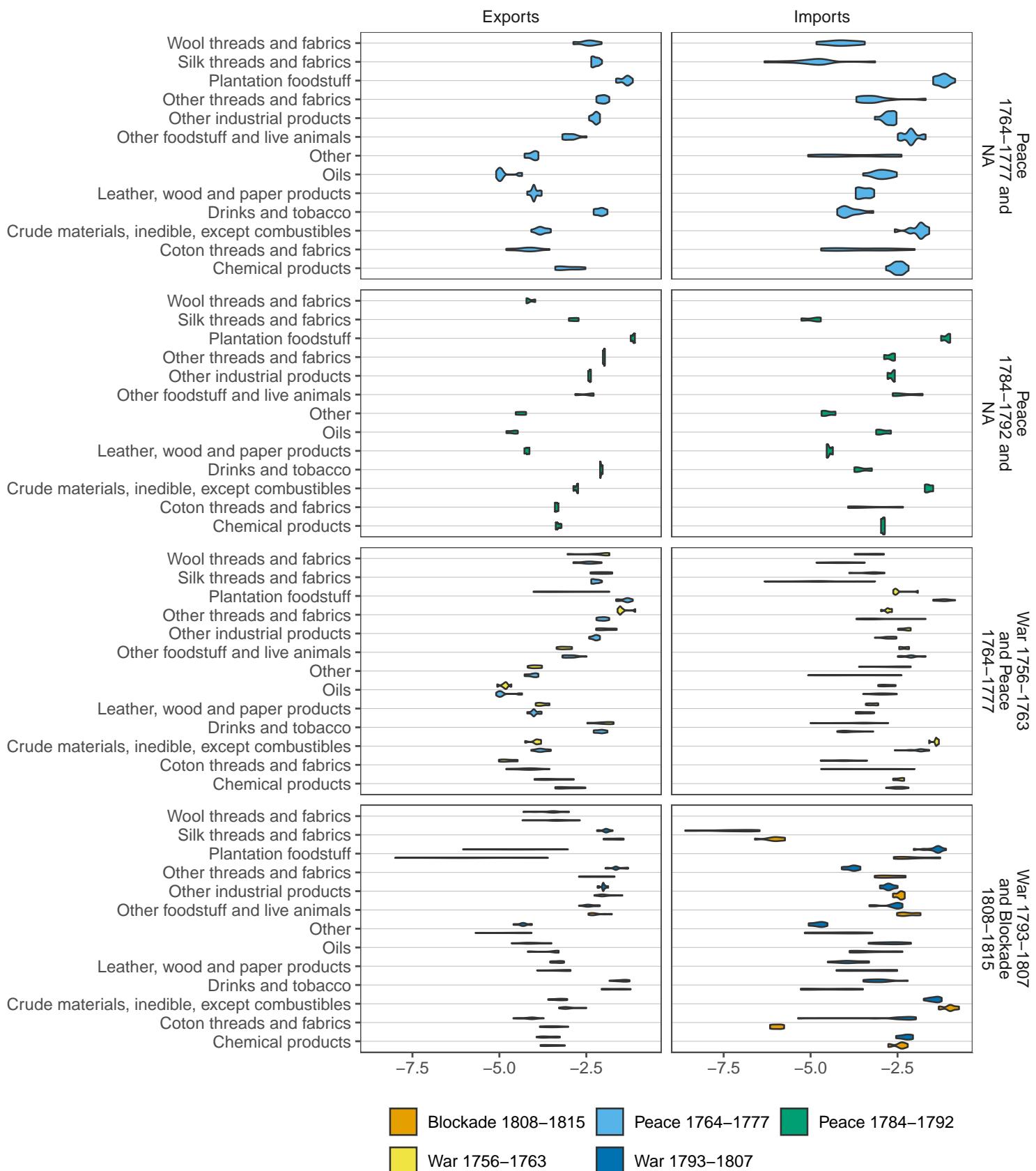


Figure 21: Change in composition of trade - Without plantation foodstuff

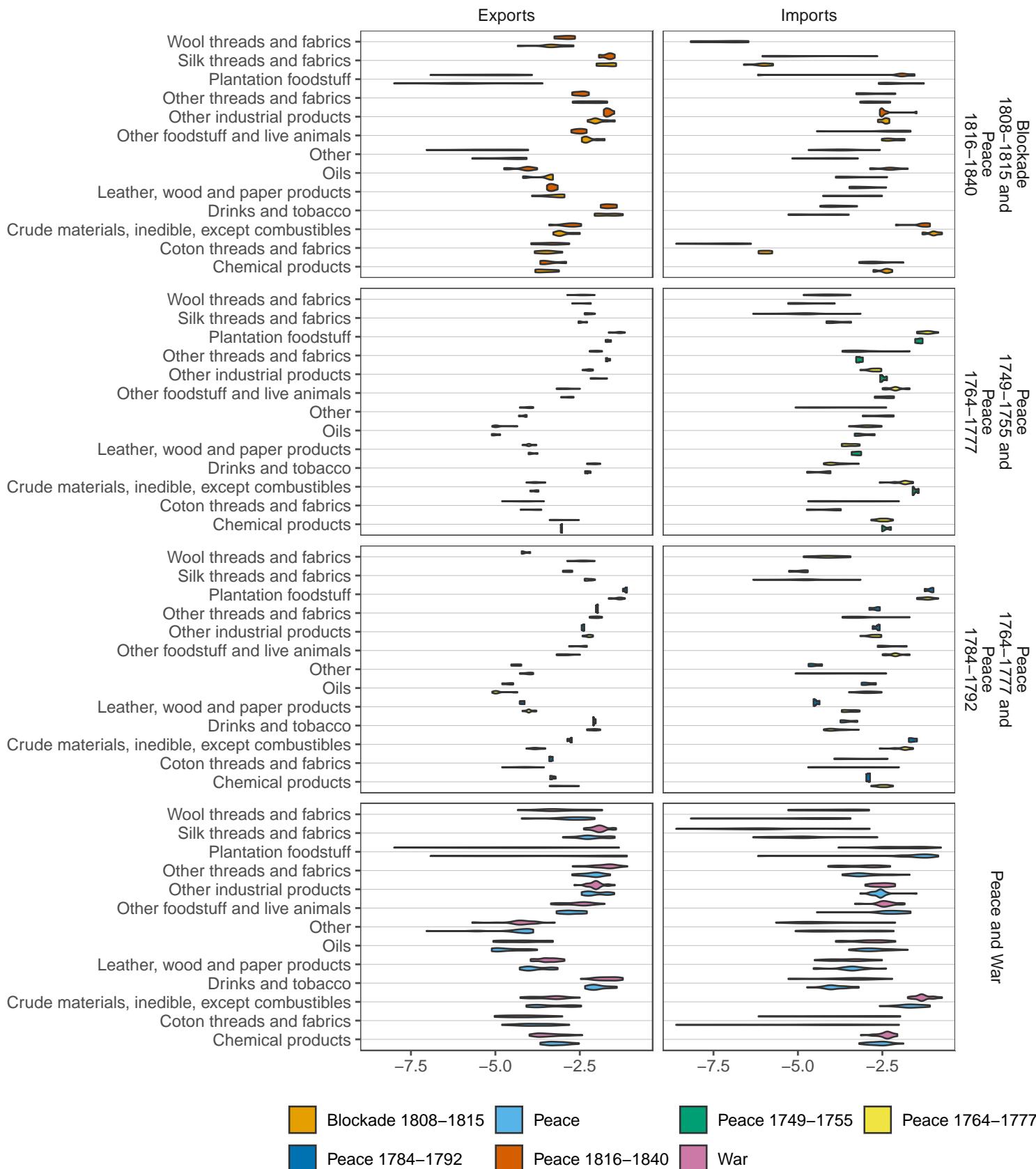


Figure 22: Change in composition of trade - Without plantation foodstuff

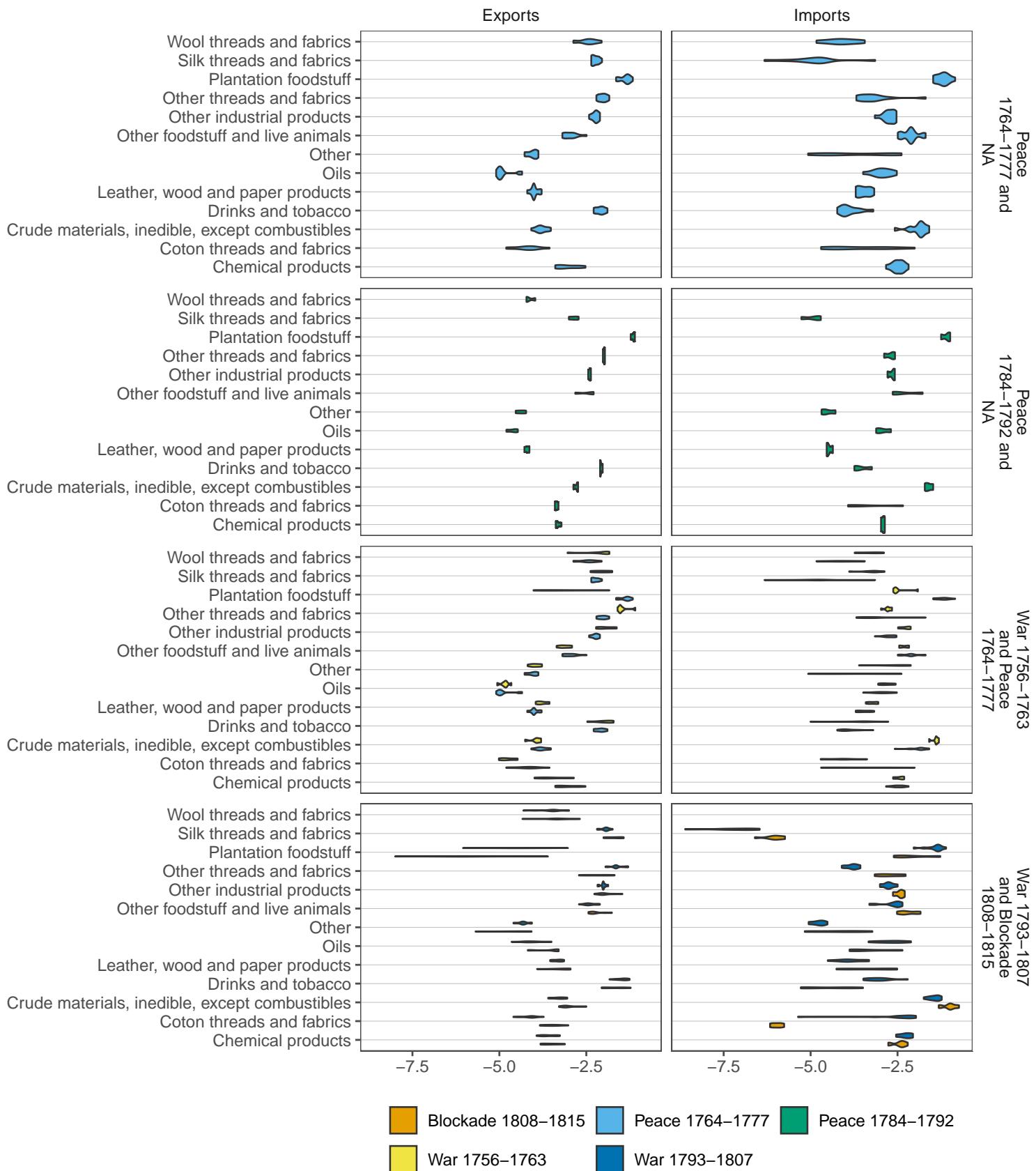


Figure 23: Change in geography of trade

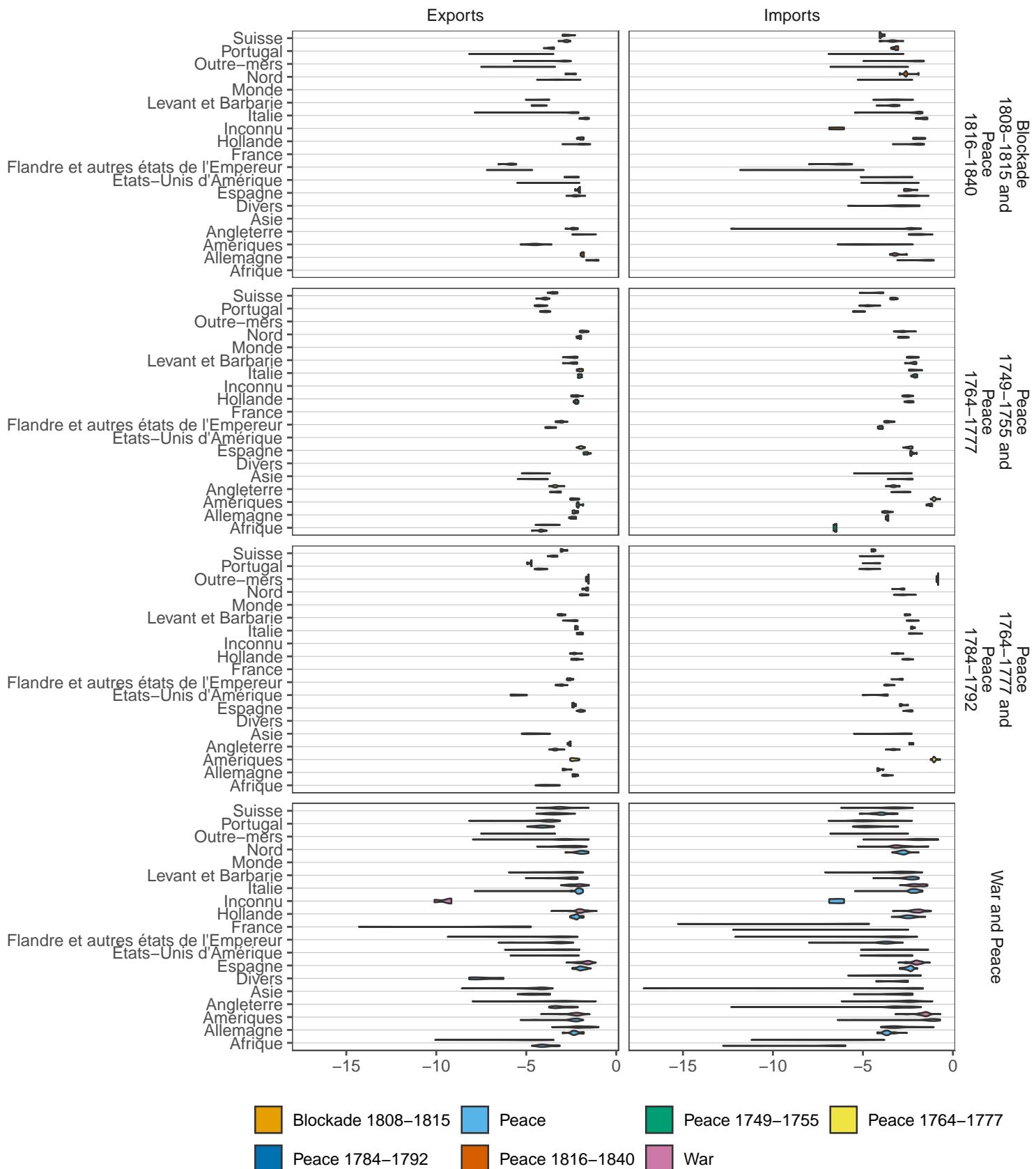


Figure 24: Change in geography of trade

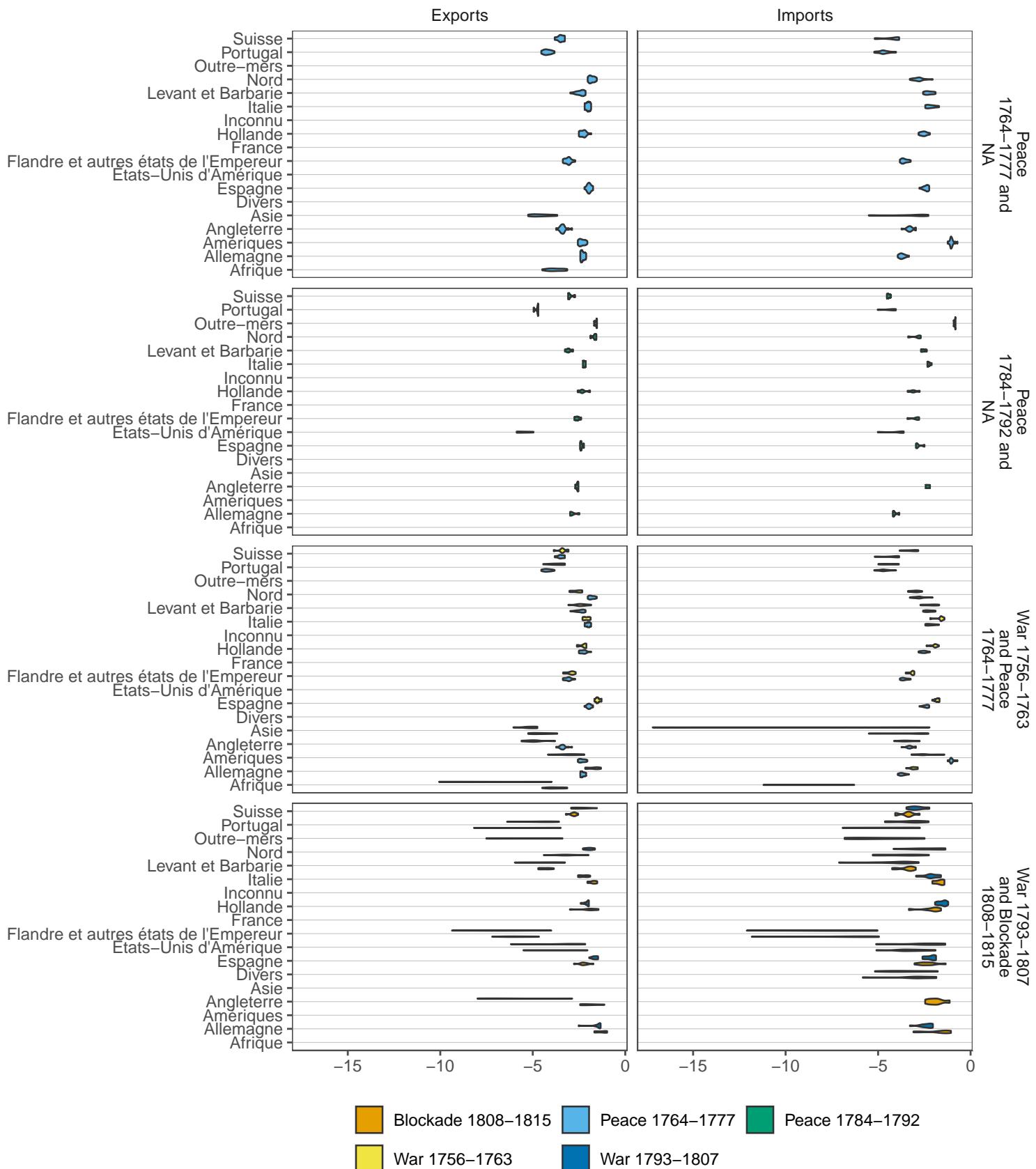


Figure 25: Change in geography of trade - Without plantation foodstuff

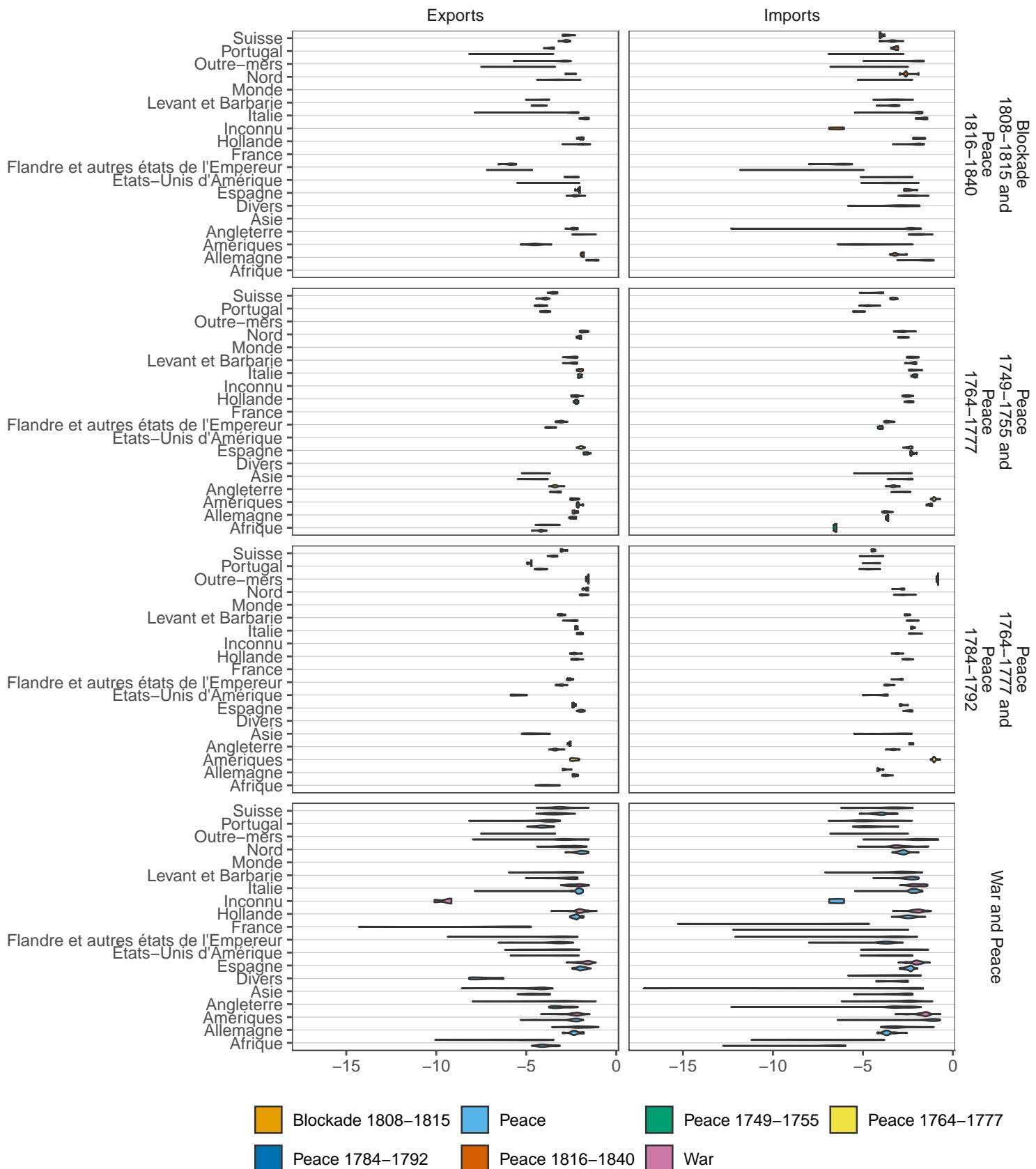
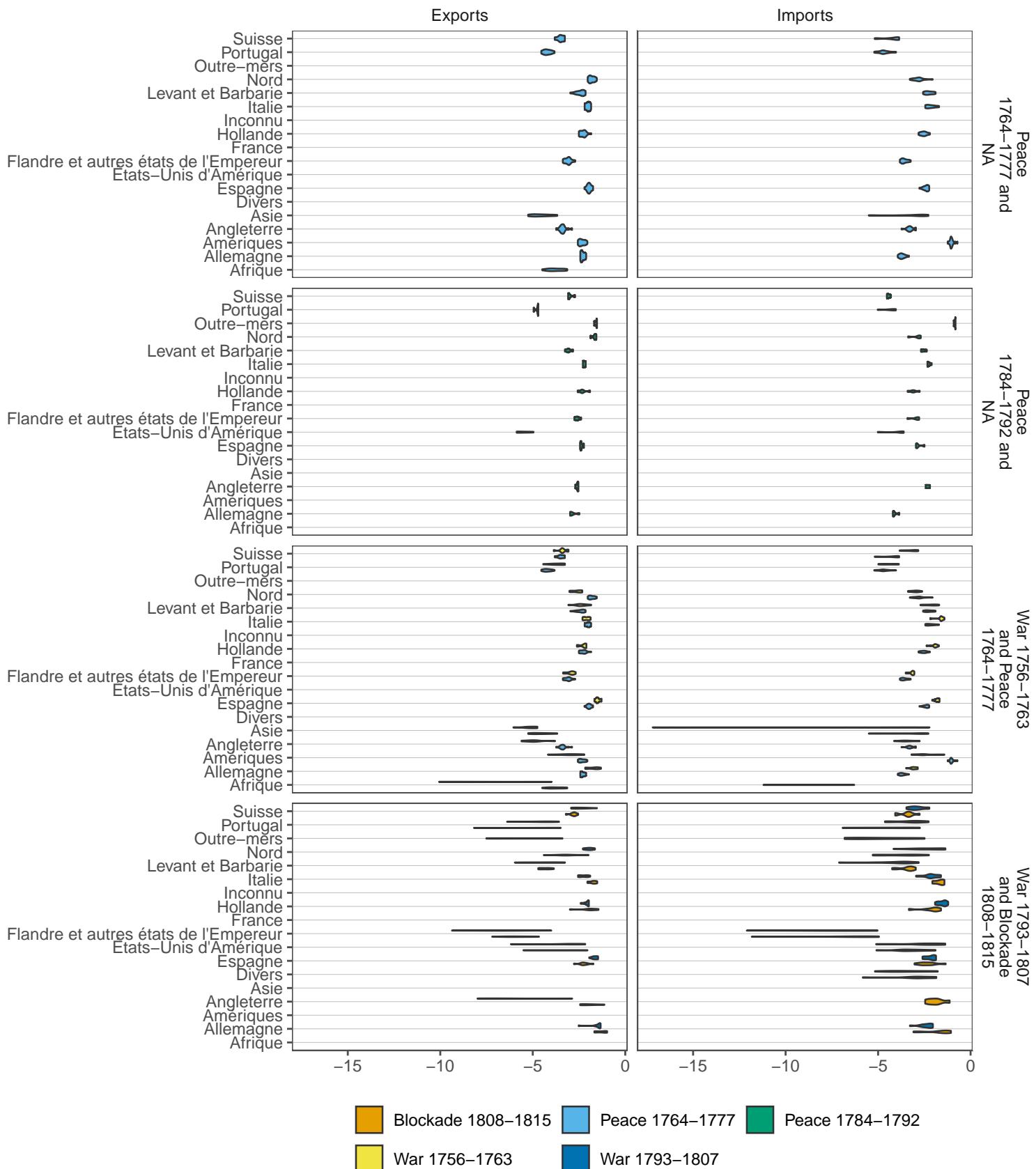


Figure 26: Change in geography of trade - Without plantation foodstuff



B Data and sources

We use data from the TOFLIT18 project (see here). They come from the archives of the French *Bureau de la Balance du Commerce* and, subsequently, the *Bureau des archives du commerce*. This institution was created in 1713, after the Treaty of Utrecht, which followed the Spanish Succession War. While discussing a trade treaty with the British, the French negotiators were positively impressed by the detailed knowledge shown on trade flows by their counterparts, and they convinced the government of the necessity of creating an institution that would keep track of exports and imports from and to France (Charles and Daudin, 2011)¹². Starting with the year 1716, local *bureaux des fermes* sent their trade records to the *Bureau* in Paris. The *Bureau* would then compute aggregate yearly figures for each *direction* (port) and then send them back to the local Chamber of Commerce, so that they could add the values up to 1780. A mix of local and central source survive from this process. Unfortunately the “local sources” mostly did not survive; what we have left are parts of the centralised records. From 1781 to 1791, the work methods of the *Bureau* changed and a number of years of trade have left little record (1783-1786, 1790-1791). In 1792, through a decree of the National Assembly, the *Bureau de la Balance du commerce* was abolished and replaced by the *Bureau des archives du commerce*. We have some data on 1792 trade, but trade collection properly started again in 1797, so that we are missing information on 1793-1796.

The data which survived come from different sources. The two most exhaustive ones are the *Objet Général* and the *Résumé*, which contain trade by product and by partner. The former is available for the years between 1754 and 1780 and between 1782 and 1788. There are some missing years, especially in the period between 1761 and 1767, however starting from 1771 it also contains information on quantities and/or unit prices. The latter is available between 1787 and 1789 and between 1797 and 1821. It does not include quantities, only values, and the classification of goods it uses is less precise than the one from the *Objet Général*. Lesser complete sources are Local sources and the *Tableau Général*. Local data are available from 1716 to 1780 and in 1789, which allows for partial reconstruction of total trade. The *Tableau Général* exists in the French archives that provides French bilateral trade, though not broken down by product (Romano (1957)).

All sources provide the value of trade in the current French currency. This is the *livre tournois* up to 1795 and the *franc* afterward. The value of the *livre* was fluctuating in the early eighteenth century. In 1726, its value was fixed at a value of 4.505 grams of fine silver (de Wailly, 1857). Because of the monetary crisis during the revolution, we use data extracted from published appreciation tables to fix the value of the *livre* at 2.9 grams of silver in 1792 (Hoffman et al. (2000)). The French *franc*

¹²Charles and Daudin (2011), in their paper, provide the complete history of the *Bureau*.

contained 4.5 grams of fine silver. We convert the trade flows in fine silver; obviously, this does not solve the inflation issue, but we argue that inflation in terms of silver was relatively limited during that period.

Citation here? – GD Yes, we need to have a deep long conversation about inflation (including how it changes the loss function. Still mulling this one.).

B.1 Blockade

There were essentially two possible types of blockades (Corbett, 1911); the open and the closed blockade. The former consisted of keeping the ships at port, but ready to sail, as soon as the enemy fleet left its harbour. This technique was much less straining for men and ships, but less efficient when it came to blockading. On the other hand, the closed blockade consisted of keeping the rival fleet blocked in its own port, impeding it from exiting. This was much more of an efficient technique, however, the maintenance of both ships and men at sea for such a long time was a substantial issue. By the end of eighteenth century, the British had implemented a very efficient system of resupply, in which supply ships delivered victuals to the fleet at sea, thus allowing it not to return at port regularly for supplies. Also, they were being very careful to provide a balanced diet against scurvy, which passed from being a major issue for sailors, to accounting for only 2 per cent of British naval patients between 1795 and 1800 (Rodger, 2005). On top of this, Britain had started to coat their ships with copper, to fight the issue of barnacles, oysters and the shipworm, which were seriously hindering the speed and the security of their vessels. This dramatically reduced the possibility of avoiding the blockade and allowed Britain to impede unwanted trade more efficiently. One would think that the number of ships captured declined as not many ships tried to run the blockade, but that is not confirmed by data on prizes Benjamin (2009).

B.2 Historical summary and classification of country grouping

In this section we provide a brief overview of the main wars that took place in Europe in the period of analysis and we explain how we classify the belligerent status (compared to France) of the country grouping at stake. As a general rule, we consider *Outre-mers* as ally and *Levant* as neutral.

In 1733, the king of Poland August II, died heirless and his succession soon became a conflict at European level. France, Prussia and Spain were trying to limit the desire of expansion of the Habsburg monarchy in Poland. Britain stayed neutral and the war saw an end in 1738, with the recognition of August III as king of Poland, as the Habsburgs had wished. In the country classification we used, the ally countries were *Espagne* and the foe was *Empereur* and *Allemagne* (as Lorraine and West Germany were at that point mostly controlled by the Habsburg). It was a land conflict,

as opposed to the naval conflicts that followed.

No longer than two years later, a very similar event occurred as a consequence of the death of Charles IV. The Habsburg emperor had not died heirless, however his only heir was a woman; Maria Theresa of Austria. France, Prussia and the Electorate of Bavaria used the pretext that she was ineligible to succeed to her father, to challenge, once again, the Habsburg power. Maria Theresa was supported by the Kingdom of Great Britain and the Dutch Republic as well as the Kingdom of Sardinia and the Electorate of Saxony. This conflict, which was born as a succession issue, soon extended to the New World and became a competition between the French and the British for the control of American colonies. It ended in 1748 with the Treaty of Aix la Chapelle, where France gave back most the territories it had conquered during the war. Ally country in this case was *Espagne* and foes were *Angleterre* and *Empereur*.

Roughly until the end of the Austrian Succession war, a sort of geopolitical and economic equilibrium between France and British colonies on the North American mainland had prevailed. That was broken as a consequence of an uneven population growth (Findlay and O'rourke, 2009). This set the stage to the following war; the Seven Years War, or French and Indian War, which, as the name suggests, was a world-wide conflict. As opposed to the previous wars, this was a decisive triumph of Britain over France, which was forced to give up Canada, Cape Breton Island and Grenada, recognized the Mississippi River as the Eastern boundary of its possessions in North American, then ceded those possession to Spain. France also lost enough influence in its colonies to lead to the end of French colonial ambition in India and, subsequently, to the dissolution of the first Compagnies des Indes (Riley, 1986). French allies in this war were *Allemagne*¹³, *Empereur*, and *Espagne* for 1762. Foes were *Angleterre*, and *Portugal*.

At the end of the Seven Years War, with the victory of Britain and the subsequent departure of the French, the American colonies, no longer feeling the threat of the French presence on the continent, soon started demanding independence from Great Britain¹⁴. In 1775 they rebelled against British control over their trade and in 1776 they declared independence. France, still feeling the humiliation subsequent to the Seven Year War, in 1778 entered the fray on the colonies' side, soon followed by Spain. Spanish and French ¹⁵ fleet together outnumbered the British Navy and were able to force Britain to surrender and end the war with the Treaty of Versailles in 1783. In this setting, ally were

¹³As mentioned in section ??, *Allemagne* was mainly Alsace, Lorraine and Western Germany, which were allied to France. Our assumption is that "Prussia" is sea trade through the Baltic, i.e. a minor portion of *North*, which, however we code as neutral, since it was dominated by Hamburg - despite the fact that Russia and Sweden were allied to France for most of the war.

¹⁴The French chief minister, the duc de Choiseul, made a prediction to the effect that with no French presence on the continent to threaten them any longer, the American colonies would soon demand independence from Great Britain (Findlay and O'rourke, 2009). This prediction, as it turned out, was prescient.

¹⁵France had been investing in its Navy following the preceding defeat (Findlay and O'rourke, 2009).

there *Espagne*, *Etats-Unis*, and *Hollande* from 1780; foe was only *Angleterre*.

At the end of the war, despite the victory obtained, French finances were suffering to the extent that Calonne, the finance minister at the time, was forced to the summoning of the Estates-Generales in 1789, which then led to the start of the French Revolution. This event was followed by a larger conflagration with respect to previous mercanilist wars, into which an ideological dimension had been injected (O'Rourke, 2006). In 1792 France declared war on Austria and Prussia, and the following year to Great Britain. The subsequent conflict lasted for nearly thirty years, with only two brief interruption between 1802 and 1803 (Peace of Amiens) and between 1814 and 1815. Almost immediately, France banned the import of all British goods; Britain responded by blockading French coasts and impeding French ships to exit the port. From the very beginning, this created a big problem for neutral countries, which wished to continue trade with both belligerent actors. As a consequence, a second League of Armed Neutrality was created, in which Russia, Prussia, Denmark and Sweden took part. This alliance was not long-lasting, as Britain responded with a ban on trade with the league, and bombed Copenhagen, thus ending this agreement. This conflict ultimately ended with Napoleon's disastrous invasion of Russia in 1812, which was followed by the invasion of France in 1814 and a subsequent peace treaty signed in Ghent. The two main players of this conflict were, of course, Britain and France. However, because of the victories and defeats of one and the other, sides of other countries changed continuously and it was harder to code in our country classification. Table 1 reports our choices of the position of all countries in all wars throughout the century. *Allemagne* was mainly aligned with Austria till 1800: so it was a foe between 1792 and 1800, neutral between Campo Formio became an ally in 1805 (till 1813), and then became again a foe after the battle of Leipzig to France. *Angleterre* was an enemy all throughout. *Espagne* fought France for the period 1793 and 1794, she became then an ally until 1807 (with the exception of 1795, in which she was neutral), and then again an enemy from 1808 onwards. *Empereur* is Austria, whose position was easy to adjudicate. It was a foe until Campo Formio (June 1801), neutral till the Third Coalition (1805), then a foe in 1805, to become neutral again in 1806 until 1808. Lastly, after one more year of neutrality in 1809, she became an ally starting from 1810, and declared war again in 1813. *États Unis* was always neutral throughout the war, except for the un-declared war between 1798 and 1800 and it co-belligerance against the United Kingdom from 1812 to 1814. We classify them as "Allies" during this period of co-belligerence. *Hollande* fought France till 1794 and was then aligned to it till late 1813, when William-Frederik of Orange-Nassau took power. *Italy* was briefly a foe until 1796, then neutral until 1813, and then again a foe starting 1814. *Levant* stayed out of the war, except when the French invaded Egypt from 1798 to 1801. Concerning *Nord*, Sweden

and Russia were alternatively neutral, foes or allies. Denmark was an ally. Yet, as the biggest share of trade was represented by Hamburg, whenever the component of *Nord* were not on the same side in a war, we code them all in the position of Hamburg. *Nord* was mainly neutral, except when it was occupied and then annexed by France from 1808 to 1813.¹⁶ *Outre-mers* mainly includes French colonies and we treat it as an ally throughout. *Portugal* was neutral until 1798 and then became a foe in 1802. It was again neutral for a short period between 1803 to 1806 and then became a foe starting from 1807. Finally, *Suisse* was neutral until 1797 and then an ally until 1813, and then neutral again in 1814.

Figure ?? sums up the data by showing the number of French allies, foes and neutral for each war and year of interest.

B.3 Trade partners

Trade partners are not consistently designed in the original data. For example, In the *Tableau Général* (from 1716 to 1782), the number of partners varies between 14 and 23 and between 16 and 26 in the *Résumé* (from 1787 to 1821). Often, partners are not single countries but rather groups of countries. Many destinations get broken down into smaller destinations in later periods or even disappear to be replaced by other smaller entities. To bypass this problem we have created a classification of countries, which is consistent for the whole period (such that we have nearly one observation for each group for each year). This classification identifies only twelve groups: *Allemagne*, *Angleterre*, *Espagne*, *Flandre et autres États de l'Empereur*, *Hollande*, *Portugal*, *Suisse*, *Levant*, *Italie*, *États-Unis*, *Outre-mers* and *Nord*. Many are self-explanatory, though it should be underlined that trade with *Angleterre*, *Portugal* and *Espagne* includes trade with all their controlled territories.

Outre-mers regroups all intercontinental French trade (mainly with French colonies) except for North Africa and the Ottoman Empire that are included (along with Greece) in *Levant*.

Nord designates trade north of the Low Countries. This region comprises Sweden, Denmark, Hanseatic ports (mainly Hamburg, Bremen, Lubeck and Danzig), Prussia and Russia¹⁷ (Charles and Daudin, 2018).

Italie was used as a geographical expression. The main French trade partners there were the Kingdom of Piedmont and Sardinia and Genoa. Still, minor flows were also directed to Milan, Naples, Venice, Tuscany, Papal States...

Flandre et autres États de l'Empereur (*Empereur* for short) is mainly modern Belgium before the Revolutionary and Napoleonic Wars and mainly Austria after it. At that point, modern Belgium is

¹⁶Obviously, we cannot proceed this way for the computation of naval supremacy, see *infra*.

¹⁷Trade with Denmark is identified separately from 1733, trade with Sweden from 1734 and trade with Russia from 1744. We always account for them together under *Nord*

annexed by *Hollande*.

Allemagne encompasses mainly Western Germany, including Alsace, Lorraine during the *Ancien Régime*.

We have not attempted to take into account the extensive territorial re-arrangements during the Revolutionary and Napoleonic Wars. The extension of France in the Low Countries, Germany and Italy changed the actual extent of the *Allemagne* and *Italie* partner.

B.4 MANOVA test

In order to test this we conduct a Multivariate Analysis of Variance (MANOVA), allowing for heterogeneous co-variances, using the affine-invariant modification by Krishnamoorthy and Yu (2004) of the test proposed by Nel and Van der Merwe (1986). The two mean vectors here are the 13- or 9-dimensional vectors whose components are the SITC or the country trade shares respectively and the groups are the war-peace periods or the pre-war and post-war peace periods. We do it for imports, exports and imports exports together and then excluding plantation foodstuff. Resulting p-values are reported in tables 10 and 11 and figures 19 to 26 show the distribution for each sitc and country in each period.

Considering a 5% threshold for rejecting the null hypothesis of equality of means, we observe from table 10 that there is undoubtedly a change in trade structure by products between war and peace periods overall. The p-value is zero, which implies that at least one sitc category (which is not necessarily Plantation foodstuff, because the p-value increases after removing it from the analysis) changes between the two periods. Narrowing down our analysis we proceed to observe the difference between trade structure in war and preceding or following peace periods. Both because of lack of data and of very short peace periods, the comparison is not always possible. We could only examine the difference between Seven Years Wars and the 1764-1777 peace, 1764-1777 peace and War of American Independence, French Revolutionary Wars and Continental Blockade and Continental Blockade and the 1816-1840 peace. In the first case we observe that we can reject the hypothesis that the two mean vectors are the same, i.e. at the end of the Seven Years War there was a clear shift in composition of trade. The only exception is for the case of aggregate imports and exports, including Plantation Foodstuff, where we fail to reject the null hypothesis, however individually on imports and exports the significance for rejection is quite high. Such dramatic change did not happen with the beginning of the War of American Independence, we observe in fact that the p-values are all above the 5% level, and even if they decrease upon eliminating Plantation Foodstuff, they remain above the threshold. Hence in this case we can say that the outburst of the conflict did not have consequences on French trading pattern. The same cannot be said for the difference between

French Revolutionary Wars and Continental Blockade, when there was once again a clear shift in composition of trade, which does not only depend on Plantation Foodstuff, i.e. the share of at least another category of the SITC classification changed significantly between the two periods. We also observe that the change was longer lasting. At the end of the Continental Blockade in fact, France does not seem to recover its pre-Blockade trade structure. This cannot only be due to the fact that it lost its main source of Plantation Foodstuff import and re-export, because even excluding this category the result is consistent.

B.5 French Budget

The French Navy budget is one of the better known of the Ancien Régime budgets. Unfortunately, it is still quite difficult to determine. We try to compute a serie from 1740. The canonical source is Legohérel (1965). An important printed source is Neuville (1898). Dull (1975); Villiers (2002) have useful insights. There is a long-term serie (1691-1782) probably coming from *La Cour des Comptes* in the Bibliothèque Nationale (*Nouvelles Acquisitions Françaises*, 5399). It is notoriously an under-estimation (Villiers (2002)). We exclude the source from 1740 to 1760 that is found in the *Archives Nationales* (G7 1830) because, according to Villiers (2002), it includes the colonial budget. For 1745 and 1748-1770, Neuville and Villiers provide numbers from the intendant du Trouset d'Héricourt that are plausible. We use them. They are 2.5 % higher than the BN source. So for 1740-1744, 1746 and 1747 we use the BN numbers multiplied by 1.025 For 1776-1783, Dull (1975)[p.348-350] has worked out that the "best" source comes from Castrie. We use them. They are 6% higher than the BN source. So for 1771-1775, we use the BN source multiplied by 1.06.

For 1783-1788, we use Pierre-Victor Malouët as reported by Villiers (2002). For 1789-1791, we use rough estimates by Charles-François Lebrun as reported in (Marion, 1914, p. 259 and 332). For 1801, we use Branda (2007),. We distribute the "imperial arrears" (i.e. the money still owned by the State at the fall of Napoleon that had not been affected to a budget year) over the years 1812-1814 on a pro-rata temporis basis. Finally, for 1816-1825, we use the official publications named “Compte Rendu... ...” (181, 1814, 1818; 182, 1826))

Better ? These are coming from the BNF

We try to determine what has been actually expended each year rather than each year's budget, as before the reform of 1822 these were not the same thing (see Kott (2019)). Finally, for 1793-1800, the lack of sources due the total disorganisation of French finances at the time leads us to simply assume a constant growth rate of the budget between the (quite uncertain) 1792 budget and the (much more reliable) 1801 budget.

The resulting series is used in the paper.

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Notes

- 1) The link between war and trade is an important question, as long-term crippling of enemy's international trade is a strategic war aim.
2) There is some debate on whether war is a good way to reduce the long-term international trade of a country. There is little study on the mechanism through which wars affect trade effectively
3) By studying one of the most important war on trade ever conducted, this paper shows that reducing trade is difficult, requires the use of multiple war measures and works through imposing structural changes on the enemy's trade structure, not simply by reducing its trade. 1
- And so, outline... 1. What policies were implemented? 2. Impacting trade through war is difficult (loss function and cost/benefit analysis) 3. It works through imposing long-term structural change. 4. What policies are good for that? 2
- That looks similar to what you are suggesting? 2

■ As a reminder, in my latest presentation:

1) Renewed interest in trade wars («Trade wars are good, and easy to win » Trump 2018)– The eighteenth century knows something about trade wars (under a different form) Did Britain succeed? At what cost? How? This is a single event, so do not expect causality to be clearly proven – But these data have never been put together before, and they provide insight	2
2) Why do we care? – Important to understand the effect of wars in general – Important to understand the globalization/deglobalization cycle from 1490s to 1820s – Important to understand (and contrast) the geopolitical history of the 18th and 19th century – Trade wars coming a gain at the forefront	
3) Our hypothesis: – It was a difficult and costly endeavour – It succeeded because the French cooperated through the Continental system (including the fight against neutral shipping) – The key factor was not to reduce the level of trade, but to force its structural change	
■ to be re-written at some point	3
■ Contrast the interest of the British merchants and the interest of the state as large	3
■ Discuss political cost of Neutral policy (Spain 1760, US 1812, League of armed Neutrality)	3
■ Discuss the fact that mercantile interests were not important enough to push to peace)	3
■ for more recent literature review see ?. Possibly very relevant for us: ?	4
■ More recent literature: ?	4
■ Some literature of trade wars, not just wars	4
■ What do we want to say with this section?	6
■ Mahan believed in decisive battles and Blockade, not in the attack of ennemy's trade. The <i>Jeune école</i> believed attack on trade could be efficient (e.g. U-boats)	7
■ Better? More understandable?	7
■ I think capture of colonies should go first as it the first comment everybody makes? What do you think? Not a strong position on this	8
■ Ok?	8
■ Good?	10
■ use insurance rates in Ducoin ?	10
■ Clearer ?	11
■ Citer Tracy plutôt ?	12
■ Makes more sense?	13
■ Maybe separate the peace-time consequences and the war-time consequences? Or use this as transition even more than you already do?	14
■ I wanted to make a clarifying table – 18 see table 18	15
■ All graphs should be self-contained	23
■ Citation here? – GD Yes, we need to have a deep long conversation about inflation (including how it changes the loss function. Still mulling this one.).	53
■ Better ? These are coming from the BNF	58