

Focus:

French Trade in the 18th Century: Inflation and Revolution

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The French Revolution of 1789 was preceded by a crop failure crisis that played a decisive role in triggering the revolution (Labrousse, 1944). Although this crisis was one of the most severe of the French Old Regime, its demographic repercussions were very limited compared with the impacts of the 1693-94 and 1709-10 crises, which claimed approximately two million lives each, but did not have such radical political repercussions. Alexis de Tocqueville pointed in his day to a “paradox of growing dissatisfaction”, arguing that the political impacts of the difficulties of 1789 were greater because they were preceded by a prosperous period (Daudin, 2005).

However, this prosperity does not show up in the indices of real wages, which stagnated in the decades prior to the French Revolution (Ridolfi, 2019). Is this the right indicator? Real wages provide information on the situation of the urban working class, who spent most of their budget on food. They say nothing about the effect of industry- and foreign trade-related economic change on the urban middle classes or the peasant classes.

This article contributes to research into other signs of economic change. It examines international trade price trends, since international trade was the most buoyant part of the French economy in the 18th century. It hence contributes to the literature on the economic causes of the French Revolution (Weir, 1991). Following a presentation of the database and the construction of our indices, we explore market integration trends, variations in terms of trade, and observed structural price differences.

The project data, code and charts are available in a directory at: https://github.com/edouardpignede/Dialogue_62_072021 cited in the body of this article.

Database

We use the TOFLIT18 database, already presented in DIALOGUE (Daudin, Ponton and Vidal, 2016; Daudin, 2019). In 1713, the Bureau of the Balance of Trade (Bureau de la Balance du Commerce) was set up to collect exhaustive information on foreign trade, an appreciable advantage in negotiations with trade partners. Its methods remained fairly stable through to the beginning of the Restoration. The documents it has left us

paint an overall picture of French trade in the 18th century (Charles and Daudin, 2011, 2015). A hypotheses blog is available with details on the project at: <https://toflit18.hypotheses.org/>. A data exploration tool is also available at: <https://toflit18.medialab.sciences-po.fr/>.

This database offers a unique window on the French economy in the 18th century, port by port. Despite the destruction of a large part of the archives of the General Farm (Ferme Générale), the institution in charge of collecting customs duties at the time, the main French chambers of commerce kept the local component of the Bureau's statistics: data on unit values and quantities for all merchandise traded in the customs regions during the 1716-1780 period. Similar local data also exist for 1789 (more details on the data available at regional level can be accessed at: <http://toflit18.medialab.sciences-po.fr/#/exploration/meta?model=region>).

The reliability of the unit values contained in these sources is debatable, since they present much more inertia than the real prices measured at the level of the local markets. However, they do coincide with their medium-term trends. So although they cannot be used to identify short-term variations, they are reliable enough for use to study the changes in which we are interested here.

Construction of the price indices

We used these sources to construct import and export price indices for each of the ports where we had a sufficient number of years available: Marseille, Bordeaux, Nantes, La Rochelle and Bayonne. The sources are neither continuous nor homogeneous. In particular, product designations are not stable. We therefore constructed these indices using the repeat-sales method rather than the more usual chained sales method following substantial harmonisation work on product names.

The repeat-sales method is generally used to calculate real estate price indices and to analyse price variations for works of art. It has the advantage of ease of use in cases where products are not traded every year. It captures all products sold at least twice during the study period. This dispenses with the need to have continuous price series for a given good (Statistical Office of the European Communities et al., 2013).

The index is obtained by calculating a regression on all pairs of transactions for a given good during the period. In our case, the following equation was estimated:

$$\ln\left(\frac{p_n^t}{p_n^s}\right) = \sum_{t=1717}^{T=1789} \beta^t D^t - \sum_{s=1716}^{S=1788} \beta^s D^s + \varepsilon_n^{t,s}$$

where D^x is the vector of variables equal to 1 for a sale of product (x) and equal to 0 otherwise, p is the vector of prices for the n products considered, β^t is the estimated coefficient, and $\varepsilon_n^{t,s}$ is the error term.

This method is very similar to that used in (Pfister, 2017; Ridolfi, 2019) to calculate wage indices, where the equivalent equation estimated is:

$$p_n^t = \sum_{t=1716}^{T=1789} \beta^t I^t + \sum_n^N v^n J^n + \varepsilon_n^t$$

where I^t are the year dummy variables and J^n are the product dummy variables.

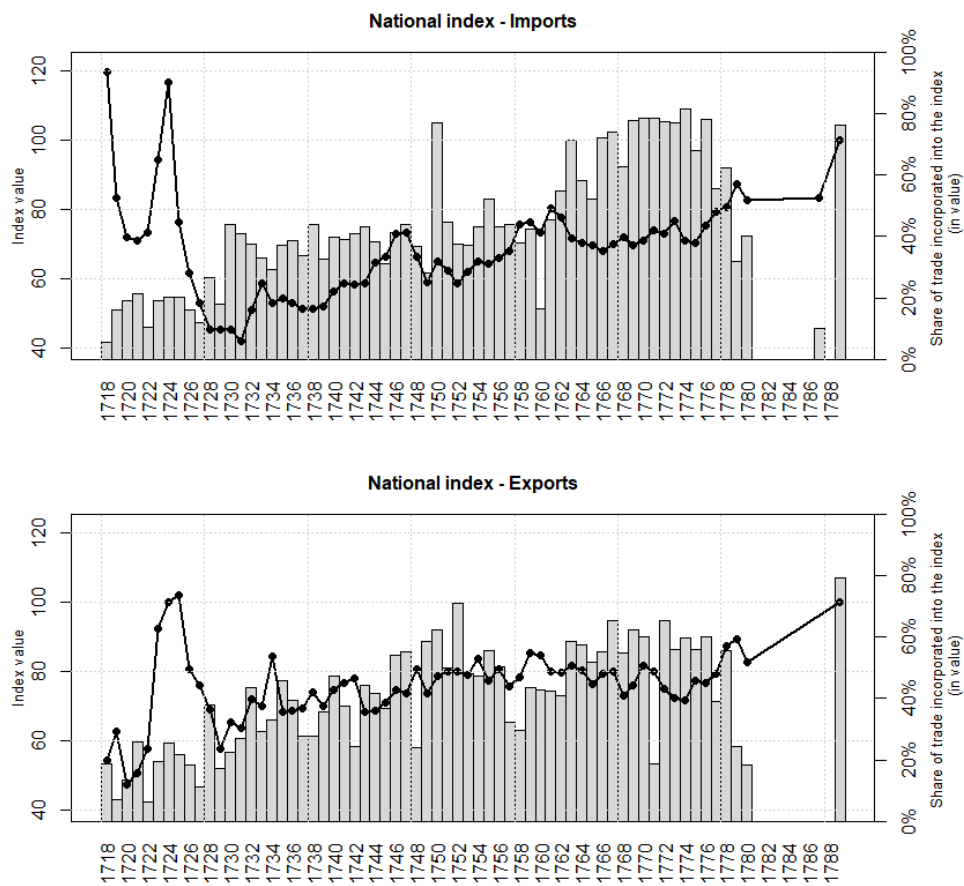
In both cases, the index is equal to: $Index_t = 100 * exp(\beta_t)$. The index is defined for each year when at least one product appears as having been involved in two or more transactions. We normalised it to 100 in 1789, the year in which data were kept for all the ports of study.

Outliers had to be excluded due to errors in units of measurement and conversions. In addition, the equation was weighted by the share of the traded product's value in trade (on average over the entire period) to accord greater weight to dominant trade products. Other indices were considered, including the exclusion of merchandise with overly strong price variations, the restriction of the index to staple goods and restriction to products traded over 20 times. An analysis of the systematic correlations and stability of the indices was conducted to choose between these different indices (Directory: Indices_villes/Correlations_systematiques).

We calculated indices for imports and exports: by port and at national level, by sector, by primary commodities and manufactured products, and by partners: Europe and the Mediterranean, and the rest of the world. The national index was calculated (Figure 1) from the combination of the data on all the ports, considering that each port's products were different even if they bore the same name. For example, woollen sheets exported from Marseille were probably not the same as those exported from Nantes.

The national index shows that, following an unstable period due to monetary turmoil (the metal value of money stabilised in 1726 for two centuries), import and export prices rose over the century.

Figure 1: Value of the import (top) and export (bottom) price indices for all ports from 1718 to 1789.



The left-hand axis concerns the share of total French trade (land and sea) included in the construction of the index (in value).

Market integration

We used these sources to construct import and export price indices for each of the ports where we had a sufficient number of years available: Marseille, Bordeaux, Nantes, La Rochelle and Bayonne. The sources are neither continuous nor homogeneous. In particular, product designations are not stable. We therefore constructed these indices using the repeat-sales method rather than the more usual chained sales method following substantial harmonisation work on product names.

In his analysis of the economic origins of the French Revolution, Weir (1991) discusses market expansion and the “penetration of capitalism” in

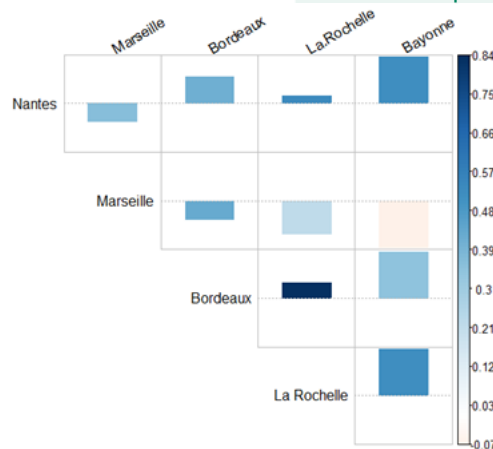
rural areas. He argues that, by becoming more integrated, the markets drove a sharp rise in landowners' incomes from the land. This increase contrasted with stagnation in farm labour earnings.

Our local price indices provide information on market integration. Two markets are considered to be perfectly integrated when the difference in price for a given commodity is at most equal to the cost of transactions from one market to the next. Given the absence of hierarchy between the different markets, a correlation analysis can be conducted to check whether this is the case for the ports studied (Federico, 2012).

Differences in price index variations between markets may be due to: a) differences in market structure, where products traded are not the same from one market to the next, or b) differences in price for the products traded due to variations in transaction costs or a low level of market integration.

Very little correlation can be observed between export prices (Directory: Indices_villes/Correlation_indices). This is easily explained: the majority of products sold for export were regional products, which differed from one port to the next. Imports, however, present a strong price correlation (Directory: Indices_villes/Correlation_indices and Figure 2), which is a sign of good geographical market integration in the 18th century.

Figure 2: Growth in correlations between each port's indices.



The colour corresponds to the level of correlation between the indices from 1750 to 1789. Rectangle size is equal the percentage variation in the correlation coefficient from the 1718-1760 period to the 1750-1789 period (the horizontal line corresponds to 0 and rectangles are between -100% and +100%). The rectangle has been truncated for Bayonne, where the values were over 100%.

Figure 2 also shows the growth in correlations between the different ports' import indices. A slight increase can be observed in these correlations, in particular for the west coast ports (Nantes, Bordeaux, La Rochelle and Bayonne). This is a sign, albeit somewhat tenuous, of market deepening.

The increase in market integration in the 18th century ties in with the theory of the French economy's Smithian growth over this period (Weir, 1991). As observed by Morineau (1971), 18th century France made no remarkable technological progress and agricultural yields stagnated over the century. Economic growth and productivity gains would therefore have been due to market expansion, a better division of labour and regional specialisation.

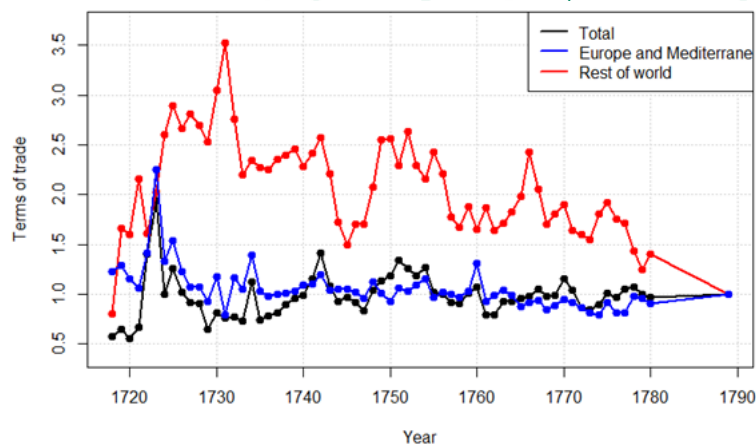
Nevertheless, our findings are not conclusive and we do not observe any massive increase in market integration in our price indices.

Terms of trade

Terms of trade are defined as the ratio of export price index to import price index.

France's terms of trade deteriorated during the 18th century (Figure 3). Import prices rose faster than export prices. This phenomenon can also be seen in the local indices of Bordeaux, Nantes and La Rochelle (Directory: Indice_villes/Termes_echange/Port). It concerned as much agricultural produce as manufactured products (Directory: Indice_villes/Termes_echange/Composition).

Figure 3: Terms of trade trends from 1718 to 1789, calculated from total index data (see Figure 1) and decomposed by trade partner origin (Europe and the Mediterranean or rest of world).



At first glance, the deterioration in the terms of trade is bad news since, other things being equal, it indicates a drop in purchasing power for exports. This is what Singer (1950) and Prébisch (1950) analysed as an obstacle to the development of countries specialised in primary commodities, whose terms of trade tended to deteriorate vis-à-vis more industrialised countries. Given the inelasticity of demand for the goods they exported, they could not offset the drop in their prices by expanding their market.

Eighteenth-century France was not an exporter of primary commodities. Its exports grew. It was therefore more in the situation presented by Williamson (2013) for the 19th century. The deterioration in the Western countries' terms of trade therefore corresponded to a productivity gain. The symmetrical improvement in the terms of trade of the Southern countries that imported Western industrial goods, far from being good news, pushed them to specialise in primary commodities. This led to their deindustrialisation and increased vulnerability to price volatility and redistribution conflicts, mainly to the benefit of rent, which are characteristic of primary commodities.

This interpretation is supported by the fact that the deterioration in France's terms of trade was smaller with the European and Mediterranean countries than with countries in the rest of the world, essentially the French West Indies. A regression of index values at port level by trade partner origin (Table 1) found that the colonised territories' import prices rose 30% (0.34/1.1) faster than those of Europe and the Mediterranean. In addition, the prices of exports to the rest of the world remained stable whereas the prices of exports to Europe and the Mediterranean increased by 0.6% on average per year. These results are significant at the 1% level.

The observed deterioration in the terms of trade compared with the rest of the world can be interpreted as a sign of health for the French economy.

Table 1: Result of the regression of the log of the indices by trade partner origin (Europe and Mediterranean or rest of world).

	log(Imports)		log(Exports)	
	Coefficient	P-value	Coefficient	P-value
Constant	- 14 *	(0.012)	- 6.1	(0.143)
Year (Europe and Mediterranean - default)	0.011 ***	(0.001)	0.006 *	(0.011)
Rest of world	- 6.1 **	(0.003)	10.8 ***	(10 ⁻⁸)
Year * Rest of world	0.0034 **	(0.004)	- 0.0061 ***	(10 ⁻⁸)
Port fixed effects	Oui		Oui	
Trends specific to each port	Oui		Oui	
No. of observations	127		156	
R ²	0.5		0.6	
F – statistic	44.3		62.22	

Significance level: * = 0.05, ** = 0.01 and *** = 0.001.

Structural changes

This is confirmed by the examination of the different sectors' price indices. We differentiated between manufactured products, primary commodities from the colonies and primary commodities from Europe. A regression of the indices by their production sector found that manufactured product prices rose 0.3% on average per year, while primary commodity prices rose 0.7% per year for the colonies and 1% per year for Europe and the Mediterranean (Table 2). These growth differences are significant at the 0.1% level. An F-test bore out the significance of the difference between the coefficients (P-value = 0.0007).

Assuming that these growth differences are due essentially to growth in supply, they point to higher growth in productivity in industry and lower growth in productivity in agriculture, especially European agriculture.

This paints a picture of a modernising economy, albeit still under Malthusian pressure. There was no revolution in French agriculture in the 18th century. Despite the emergence of the physiocrats, agricultural yields grew little over the period and, aside from in a few départements in the north of France, yields were low, characteristically of rudimentary farming (Morineau, 1968). Agricultural progress came one small step at a time: an increase in farmed surface areas by means of clearance for cultivation, integration of the agricultural markets and the appearance of new crops (maize and potatoes) raised production, thereby offsetting demographic growth (Becchia, 2019). Meanwhile, landowners' rents rose sharply, exacerbating the inequalities. This Malthusian pressure was not so strong for the French West Indies, which still had virgin lands when the French

Atlantic fell after 1792. On the side of industry, the sector posted strong growth and large productivity gains due to the expansion of the national markets, their greater integration and the start of mechanisation (Becchia, 2019). Here again, these developments largely benefited the entrepreneurs and merchants, but were of little benefit to the workers.

Table 2: Result of the regression of the indices by production sector (Manufactures, Primary commodities - colonies and Primary commodities - Europe).

	Log of price indices	
	Coefficient	P-value
Constant	-0.3	(0.934)
Year (Manufactures - default)	0.003	(0.198)
Primary commodities (colonies)	-7.7 ***	(10 ⁻⁴)
Primary commodities (Europe)	-13 ***	(10 ⁻¹²)
Primary commodities (colonies) * Year	0.004 ***	(10 ⁻⁴)
Primary commodities (Europe) * Year	0.008 ***	(10 ⁻¹²)
Exports	0.08	(10 ⁻⁶)
Port fixed effects	Oui	
Trends specific to each port	Oui	
No. of observations	414	
R ²	0.5	
F – statistic	112.4	

Significance level: * = 0.05. ** = 0.01 and *** = 0.001.

Conclusion

The examination of the international trade price indices paints a picture of the modernisation of the French economy in the 18th century: signs of market integration, deterioration in the terms of trade consistent with relative economic progress, and larger productivity gains in industry than in agriculture in a situation of definite Malthusian pressure, albeit not as strong in the French West Indies. These results corroborate the theories of a fast-growing French industrial sector, driven by progress on the domestic and foreign markets, and an agricultural sector that managed, to a lesser extent and mainly due to the increase in trade, to raise its production in the face of demographic pressure.

This economic prosperity was of no benefit to the majority of the workers. On the supply side, the cost of a “poor person’s” basket containing mainly European agricultural produce rose more sharply than the cost of a “rich person’s” basket with its larger share of products from industry (textiles, furniture and crockery). On the demand side, landowners, merchants and entrepreneurs grew much richer while real wages stagnated.

However, this unequal prosperity did not go far enough for French industry to embark serenely on free trade with the United Kingdom following the Eden Treaty of 1786. The drop in relative industrial export prices was slow to materialise. Free trade contributed to a serious economic and social crisis in French industry, especially in the textile sector and particularly in the cotton industry, technologically far behind its cross-Channel neighbour. In 1788 and 1789, this crisis worsened as Malthusian realities hit home following two disastrous harvests caused by adverse weather conditions (Waldinger, 2013). Like Tocqueville, it could be said that the political impacts of this dual crisis were so much greater because it occurred in a general context of progress.

Guillaume Daudin and Edouard Pignède¹

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Cover image: Vue du port de La Rochelle, by J. Vernet at the Musée du Nouveau Monde in La Rochelle (Charente-Maritime - France).

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