

Rhine Trade in Slave-Based Commodities in the Eighteenth Century

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Abstract

German states became an increasingly important destination for slave-based commodities over the course of the eighteenth century. The River Rhine served as an artery for the re-exports of sugar, coffee, tobacco, and other tropical items from the Dutch Republic to the German hinterland. Although some estimates about the importance of this trade do exist, these are based upon scant data. This article presents a plausible scenario of this trade based on a variety of sources. It finds that the Rhine trade grew rapidly during and in the decade after the Seven Years' War (1756-1763), experienced sharp declines during the Fourth Anglo-Dutch War (1780-1784), after the Haitian Revolution (1793), and during the French Occupation – particularly under the Continental System (1806-1810) – to resume its steady growth in the nineteenth century. Moreover, much of this eighteenth-century growth was due to slave-produced commodities, which indicates that the Rhine became a crucial connection between the Caribbean plantation economies and globalizing German consumption patterns.

Prelude: The Sukkel family

On 7 April 1792, the Sukkel family was waiting to unload their boat at the *Keulse Waag* in Amsterdam amidst other ships coming from different German states via the Rhine. When the customs officers arrived to inspect their vessel, the family reacted aggressively and even became violent. Madam Sukkel hit one officer with a broomstick and together with her husband and children threw him off their boat, scaring off his

customs colleagues.¹ What this family wanted to hide from these officials and whether there were further repercussions remains unknown, but we do know what they carried up the Rhine from Amsterdam a year later. The cargo consisted primarily of different sorts of sugar. On board was also coffee from Java, from Suriname, and the relatively cheap coffee from Saint Domingue, in particular, which was in high demand. Tobacco from Virginia and Puerto Rico, rice, and pepper could be found among the cargo of this skipper family, too. Actually, a load of Dutch Edam cheese was the only item not from overseas. Most of these were colonial wares produced by enslaved persons on the other side of the Atlantic Ocean.² The ancestors of the Sukkels, for instance – had they been engaged in Rhine trade, too – would have carried a very different cargo. Dutch skippers had imported oak wood and Rhenish wine over the river for ages, in addition to bringing salt and fishery products to Germany.³ This ancient regional trade became thoroughly transformed over the eighteenth century, and it happened especially during the decades before the incident with the Sukkels.

Introduction

The Rhine as a gateway from the Dutch Republic to the German hinterland – comprising most of contemporary Germany except for the coastal towns like Hamburg and Bremen – is usually associated with emergence of the Ruhr industry over the course of the nineteenth century, but its origins lay further back in history with the eighteenth-century trade in commodities such as coffee, sugar, indigo, and tobacco. Likewise, literature on the Rhine trade almost exclusively focuses on later periods, while research on colonial commodities and literature on early modern trade and transport in general pay little attention to river trade.⁴ Nonetheless, it has been observed that German states became

1 Stadsarchief Amsterdam (hereafter SAA), Notarieel Archief access nr. 5075, inv.nr. 17979, attestatie, 7 april 1792.

2 SAA, Archief van de Commissarissen over de Vaart op den Rijn, access nr. 56, Waagboeken van schippers, inv.nr. 218, p. 91-101.

3 See also the description by Isaak Le long, *De last en lust der inwoonders aan de Rijnstroom* (Amsterdam 1735).

4 H.P.H. Nusteling, *De Rijnvaart in het tijdperk van stoom en steenkool 1831-1914* (Amsterdam 1974); J.H. Schawacht, *Schiffahrt und Güterverkehr zwischen den Häfen des Deutschen Niederrheins (insbesondere Köln) und Rotterdam vom ende des 18. bis zur Mitte des 19 Jahrhunderts (1794-1850/51)* (Cologne 1973); Laura Rischbieter and Mark Jacobs, 'A matter of location? Traders and manufacturers of coloni-

an increasingly important destination for Dutch re-exports. Johan de Vries found that colonial wares made up 70 percent of all exports from the Dutch Republic via the Sound and the Rhine by 1790.⁵ Jan de Vries and Ad van der Woude pointed out that in the eighteenth century the expanding shipping of colonial goods over the Rhine River to the German countries was one of the few growth sectors of the Dutch economy, when important sectors were stagnant or in decline and Dutch exports to the Baltic region suffered from growing competition. De Vries and Van der Woude see the growing importance of Dutch Rhine trade in the late eighteenth century as part of a reorientation of Dutch commercial economy from a Baltic-Mediterranean axis towards an Atlantic-German axis which remained important until well into the twentieth century.⁶

This article aims to further substantiate these observations by bringing together the scattered data on the content, volume, and value of the upstream Rhine trade in the eighteenth century. Using sources pertaining to different locations along the Rhine that were created independently of each other, I will argue that upstream Rhine trade grew substantially indeed both in volume and value, and I will provide more detail on when this growth took off and on the contents of this trade. From these findings, I will conclude that the growing quantities of the upstream Rhine trade is directly related to the booming Atlantic commerce, particularly with slave-based production and trade. The growth of this Rhine trade did not follow a linear slope but took off in the 1750s and 1760s, after which it stayed at this high level. Not only did the Dutch Rhine trade grow as part of a reorientation of the Dutch economy, but it was also an increase linked to the considerable growth of the Dutch plantations in Suriname and the Guyanas and particularly to the booming French slavery complex in the Caribbean during the same period.

This analysis thus links the economic debates about the reorientation of the Dutch economy over the course of the eighteenth century to the question of how the orientation to the Atlantic commerce con-

al goods in the nineteenth-century Rhine economy', in: Ralf Banken and Ben Wubs (eds), *The Rhine. A transnational economic history* (Baden-Baden 2017) 147-175; G.M. Greup, *De Rijnverbinding van Amsterdam en haar geschiedenis* (Amsterdam 1952) except for the first chapter which surveys the pre-history to 1815. A notable exception is G.P. van de Ven, *Aan de wieg van Rijkswaterstaat. Wordingsgeschiedenis van het Pannerdens Kanaal* (Zutphen 1976).

5 Joh. De Vries, *De economische achteruitgang der Republiek in de achttiende eeuw* (Amsterdam, second edition 1968) 38. De Vries mentions a share of colonial wares: 70 percent of all in and exports to German hinterland is colonial in 1790.

6 Jan de Vries and A.M. van der Woude. *The first modern economy. Success, failure, and perseverance of the Dutch economy, 1500-1815* (Cambridge 1997).

tributed to economic growth and structural change of northwestern Europe, not to mention how the Atlantic commerce might have been a factor in the Industrial Revolution, as Eric Williams has argued.⁷ Whatever the precise effects may have been, there is ample literature emphasizing the importance of Atlantic commerce for England, France, and the city-state of Hamburg.⁸ Moreover, as a result of their cliometric exercise, Acemoğlu, Johnson, and Robinson found a strong correlation between the growth of Atlantic commerce and economic growth in northwestern Europe.⁹

Nonetheless, a dwindling but still influential trend in historiography has maintained that European economic development had little to do with Atlantic trade and slave-based activities and had, rather, issued from internal dynamics.¹⁰ This article contributes to questioning this orientation by showing how crucial Atlantic slave-based commodities have been to the dynamics of the intra-European trade on the Rhine. By doing so, it contributes to a countermovement in historical research that not only provides evidence that Atlantic connections mattered to European economies but also (re)addresses the question of slavery's impact on European development more broadly, as previously described in the introduction of the special issue of *Slavery and*

7 Eric Williams, *Capitalism and slavery* (Chapel Hill/ London 1944, 1994) see 98-107, 209. See also discussion as described by Kenneth Morgan, *Slavery, Atlantic trade and the British economy 1660-1800*. (Cambridge 2000) 44-48. Barbara L. Solow, 'Caribbean slavery and British growth. The Eric Williams Hypothesis', *Journal of Development Economics* 17 (1985) 99-115. S.L. Engerman, 'The slave trade and British capital formation in the eighteenth century. A comment on the Williams thesis', *Business History Review* 46 (1972) 430-443.

8 Guillaume Daudin, *Commerce et prospérité. La France au XVIIIe siècle*, (Paris 2e ed. 2011); Ulrich Pfister, 'The quantitative development of Germany's international trade during the eighteenth and early nineteenth centuries', *Revue de l'OFCE* 140:4 (2015) 175-221. Victor Enthoven, 'An assessment of Dutch Transatlantic commerce', in: Johannes Postma and Victor Enthoven (eds), *Riches from Atlantic commerce* (Leiden 2003) 445; Joseph E. Inikori, *Africans and the Industrial Revolution in England. A study in international trade and economic development* (Cambridge 2002); Idem, 'Slavery and the development of industrial capitalism in England', *The Journal of Interdisciplinary History* 17: 4 (1987) 771-793; David Richardson, 'The slave trade, sugar, and British economic growth, 1748-1776', *The Journal of Interdisciplinary History* 17:4 (1987) 739-769.

9 Daron Acemoğlu, Simon Johnson, and James Robinson, 'The rise of Europe. Atlantic trade, institutional change, and economic growth', *American Economic Review* 95:3 (2005) 546-579.

10 E.g. Patrick O'Brien, 'European economic development. The contribution of the periphery', *The Economic History Review*, New Series 35:1 (1982): 1-18.; David S. Landes, *The unbound Prometheus. Technological change and industrial development in Western Europe from 1750 to the present* (Cambridge 1969) 36-37, mentions and discounts the importance of slavery; Pieter C. Emmer, 'The Dutch and the Atlantic challenge, 1600-1800', in: P.C. Emmer, O. Pétré-Grenouilleau and J.V. Roitman (eds), *A deus ex machina revisited. Atlantic colonial trade and European economic development* (Leiden / Boston 2006) 151-177.



Illustration 1 The Keulse water waag in Amsterdam by J.L. van Beek (source: City Archives Amsterdam <http://archieff.amsterdam/archief/10097/010097003963>.)

*Abolition.*¹¹ In the same issue, Brandon and Bosma showed that as much as 40 percent of the growth of the economy of Holland in the decades around 1770 can be traced back to Atlantic slavery.¹² These recent findings and arguments about the importance of slavery to Europe's most advanced economies, and that of the Dutch Republic in particular, also underscore the need to obtain a clearer picture of the eighteenth cen-

11 Tamira Combrink and Matthias van Rossum, 'Introduction. The impact of slavery on Europe – re-opening a debate', *Slavery & Abolition* 42:1 (2021) 1-14.

12 Pepijn Brandon and Ulbe Bosma, 'De betekenis van de Atlantische slavernij voor de Nederlandse economie in de tweede helft van de achttiende eeuw', *TSEG – The Low Countries Journal of Social and Economic History* 16:2 (2019) 5-46.

ture Rhine trade.¹³ Looking at the Rhine trade also means following through the forward linkages of slave-based production beyond the (narrow) national scope: it adds a German connection. Results may reveal that the Atlantic slave-based economy had a none too minor role in the development of European internal economic integration.

Data and sources

Obviously, not all colonial wares were produced by enslaved persons, but we may assume that the goods coming from the Americas to the Dutch Republic relied overwhelmingly on slave labour.¹⁴ This article defines an item as 'slave-based' when one or more segments of the commodity chain involved enslaved labour. Sugar in this period was almost entirely of Atlantic provenance and slave-based, and sugar from France's Saint Domingue dominated the Dutch and most of the German market.¹⁵ About 80 percent of the coffee came from Dutch and French slave-plantations, whereas another 20 percent was cultivated under forced conditions in Java's Preanger residency.¹⁶ Rice and indigo were mainly Atlantic and thus slave-based products in the eighteenth century.¹⁷ The provenance of tobacco is not always mentioned in the sources, but most of it was slave-based, since the importance of the

13 Felix Brahm and Eve Rosenhaft (eds), *Slavery hinterland. Transatlantic slavery and continental Europe, 1680-1850* (Woodbridge 2016); Combrink and Van Rossum, 'Introduction'.

14 See also Jan de Vries, 'The limits of globalization in the early modern world', *Economic History Review* 63:3 (2010) 710-733; Brandon and Bosma, 'De betekenis van de Atlantische slavernij'.

15 Tamira Combrink, 'From French harbours to German rivers. European distribution of sugar by the Dutch in the eighteenth century', in: Marguerite Martin and Maud Villeret (eds), *Le diffusion des produits ultramarine en l'Europe dans le XVIII^e siècle* (Rennes 2018) 39-56; J.P. van der Voort, *De Westindische plantages, 1720-1795. Financiën en handel* (Eindhoven 1973).

16 Jan Breman, *Mobilizing labour for the global coffee market. Profits from an unfree work regime in colonial Java* (Amsterdam 2015); W.G. Clarence Smith and S. Topik (eds), *The global coffee economy in Africa, Asia, and Latin America 1500-1989* (Cambridge 2003).

17 In the eighteenth-century French Caribbean, indigo dominated the European market (while the British market sourced some from North Carolina), see: Ghulam A Nadri, *The political economy of indigo in India, 1580-1930* (Leiden 2016), and Marguerite Martin, *Les marchés de l'indigo en France. Flux, acteurs, produits (XVII^e-XVIII^e siècles)*, unpublished PhD thesis Paris 1 2016. For rice, origins of Dutch imports are not well known, but clearly ships from North-America (Carolina) always contained large amounts of rice, and merchants involved in those trajectories sold rice (e.g. SAA 5075, invent. 9115, deed nr. 590, insinuatie bij Notaris Jan Ardinois, 10 juli 1733). Asian rice imports started to become substantial only much later. See Peter A. Coclanis, *The shadow of a dream. Economic life and death in the South Carolina low country, 1670-1920* (New York 1989), or more recent: Francisca Bray et al. (eds), *Rice. Global networks and new histories* (New York 2015).

local European tobacco declined once American slave-based Virginia tobacco conquered the European market and Dutch and German tobacco farmers returned to producing wheat.¹⁸ With regard to raw cotton arriving on the Dutch market, we may assume that it was slave-based to some extent. It came, for example, from the Dutch Guyanas, where planters were obliged to send it to Holland.¹⁹ Still, in the second half of eighteenth century most cotton in Europe came from Turkey, whereas cotton production in the southern U.S. only took off after the invention of the cotton gin in 1793.²⁰

In sum, the imports of colonial goods in the Dutch Republic were mainly slave-based and came from the Caribbean region, the Guyanas, Brazil, and North America. Still, there was an important category of 'other colonial' goods consisting of extra-European products obtained from Asia and Spanish America. In terms of value, the most important were the spices carried home by the VOC ships: the nutmeg and mace produced by slave labour on the Banda Islands, the cloves produced with compulsory labour in the Moluccas, the pepper that was cultivated under a variety of labour systems in Java and Sumatra, and cinnamon obtained through *corvée* labour in Sri Lanka.²¹ Furthermore, there were dyes like cochineal – mostly cultivated by indigenous labourers under Spanish colonial rule. Tea came from China in rather small volumes and was of marginal importance in terms of value.

A major handicap in reconstructing the Rhine trade in the eighteenth century is that toll registers were largely destroyed during the nineteenth century. Moreover, all early modern trade registers based on duties have reliability issues, which is also true for *Convoyen en Licenten*. Fraud with certain specific duties and thus cause for underregistration may have been rife, and this may have happened in particular with sugar. Export duties on raw sugar were very high in the Dutch Republic, so as to protect their own sugar industry. As a result, traders from Düsseldorf would try to list raw and semi-refined sugar as refined when

18 H.K. Roessingh, *Inlandse tabak. Expansie en contractie van een handelsgewas in de 17e en 18e eeuw in Nederland* (Wageningen 1976).

19 Alex van Stipriaan, *Surinaams contrast. Roofbouw en overleven in een Caraïbische plantagekolonie 1750-1863* (Leiden 1993) appendices.

20 Sven Beckert, *Empire of cotton, a global history* (New York/London 2014).

21 Matthias van Rossum and Merve Tosun, 'Corvée capitalism. The Dutch East India Company, labour regimes and (merchant) capitalism in early modern Asia', *Journal of Asian studies* 80:4 (2021) 911-932; N.R. Dewasiri, Peasant in transition. Agrarian society in Western Sri Lanka under Dutch rule, 1740-1800 (unpublished PhD thesis Leiden 2007); G.J. Knaap, *Kruidnagelen en Christenen. De Verenigde Oost-Indische Compagnie en de bevolking van Ambon 1656-1696*. (second revised print, Leiden 2004).

they bought French Atlantic sugar for their local sugar industry. Biases caused by fraud, smuggling, and other failures in registration are therefore unavoidable. However, since each source exhibits its own type of biases, we can eliminate the worst outliers by combining sources and thus arrive at a plausible scenario.²²

The most important available source is the *Convoyen en Licenten*, which were export duties to be paid regionally in the Netherlands. Various registries of these have survived, but there are only a few years for which a complete eighteenth century set remains. Statistics have been preserved for the region of Amsterdam and the region of 'De Maze', which included Rotterdam – the most important sea harbour at the time – as well as Dordrecht, Schiedam, Nijmegen, Lillo, and Breda. Together these two sets of statistics cover an estimated 80 percent of the exports of the Dutch Republic. Different segments of these *Convoyen en Licenten* lists have been published by various historians and archivists in the twentieth century.²³ One problem with these lists, however, is that commodities are listed in different measures: some in value and others in various measures of volume or weight.

Annual national totals of trade had to be calculated on the basis of conversions, adding price data and combining the two sets of *Convoyen en Licenten*. For this purpose, I used years or destinations for which both value and weight of a specific commodity's trade flows were provided by the *Convoyen en Licenten* (possibly an underestimation of values, as these had to be reported to customs). In addition, I applied the Posthumus prices (possibly an overestimation of value as these are bourse prices for commodities of good quality) and various sources on measures in order to convert almost all commodities listed to both value in guilders and weight in pounds.²⁴ This procedure results in an estimate of the share of slave-based commodities in the Rhine trade that is

22 Karwan Fatah-Black and Matthias van Rossum, 'De Nederlandse smokkelhandel, 1600-1800', *TSEG* 13:1 (2016).

23 *Convoyen en Licenten*, 1753 and 1784-1793, as published in the following four publications: P.J. Dobbelaar, 'Een statistiek van den in- en uitvoer van Rotterdam c. a. in 1753', *Economisch-Historisch Jaarboek* 7 (1921), L. van Nierop, 'Uit de bakermat der Amsterdamsche handelsstatistiek', *Amstelodamum* 13 and 15, appendices, (Amsterdam 1915 and 1917), Joh. de Vries, 'De statistiek van in- en uitvoer van de admiraliteit op de Maaze 1784-1793, II: de statistiek van uitvoer', *Economisch-Historisch Jaarboek* 60 (1965).

24 Mostly the web database 'De oude Nederlandse maten en gewichten', by Ritzo Holtman a.o. provided by the Meertens Institute on <https://mgw.meertens.knaw.nl>, which is based on J.M. Verhoeff, *De oude Nederlandse maten en gewichten* (Amsterdam 1982); W.C.H. Staring, *De binnen- en buitenlandse maten, gewichten en munten van vroeger en tegenwoordig, met hunne onderlinge vergelijkingen en herleidingen, benevens vele andere, dagelijks te pas komende opgaven en berekeningen* (Arnhem 1902).

both more detailed and more transparent than the ones made by Johan de Vries.²⁵

In addition to the *Convoyen en Licenten*, we have the ‘Schenkenschans Tol’. This is the Rhine toll booth at the Dutch side of the border near Emmerich. The registries are kept in Utrecht and have been largely preserved for the years 1651-1809. Since the *Convoyen en Licenten* were only preserved for a few years, this (almost) serial data on the Rhine trade is a great asset. Although neither quantities nor specific values of the cargoes were recorded in this toll, the amount paid by each ship passing is listed, and the annual revenues from the tolls were kept in a register.²⁶ I used a complete listing of these revenues – included in the master’s thesis by M.M. Verheul – for a trade proxy (similar to the way Van Zanden used the data provided by this masters’ thesis).²⁷ Since the toll ‘ordonnanties’ did survive as well, we know the various duties that were charged for specific items and how these duties changed over time.²⁸ The unit of taxation was sacks and barrels. Sugar and tobacco passed Schenkenschans as early as the seventeenth century, but coffee was only added to the list of taxed commodities in 1731.²⁹

The Schenkenschans’ revenue lists provide us with a unique and fairly reliable proxy for Rhine trade. The reliability of this proxy can moreover be validated by comparing it with another source, namely, the Cologne Crane Tax, which was used by Ulrich Pfister (see figure 2).³⁰

25 Joh. de Vries, ‘De problematiek der Duits-Nederlandse economische betrekkingen in de negentiende eeuw’, *Tijdschrift voor Geschiedenis* 78:1 (1965) 23-48, there 28. In this article, he breaks down in import and export the figure of total trade with German hinterland that he gives in: Joh. de Vries, *De economische achteruitgang der Republiek in de achttiende eeuw* (second edition, Amsterdam 1968) 38. The share of non-colonial products decreases from 6.8 to 6 million. Note that de Vries also mentions a share of colonial wares: 70 percent of all imports and exports to German hinterland is colonial in 1790.

26 Het Utrechts Archief, Archief van het Kapittel van Sint Marie te Utrecht 1108-1811, inv. nr. 221:1666, Registers of tolboeken van gelden, geheven te Schenkenschans, 1630-1631, 1651-1660, 1662, 1672-1673, 1674-1702, 1703-1712, 1713-1722, 1737-1742, 1749-1810.

27 M.M. Verheul, ‘Anderhalve eeuw Rijnvaart. Een kwantitatieve studie naar de Rijnhandel met het Duitse achterland op basis van de tolregisters van schenkenschans 1650-1800’, (unpublished thesis, Utrecht 1994); J.L. van Zanden and A. van Riel, *Nederland 1780-1914. Staat, instituties en economische ontwikkeling* (Amsterdam 2000) 31.

28 Het Utrechts Archief, Archief van het Kapittel van Sint Marie te Utrecht 1108-1811, inv. nr. 221:1643-1: Stukken betreffende de vergaderingen van het kapittel en de Gelderse Rekenkamer over het vaststellen van een nieuwe ordonnantie op ’s Kapittels tol te Schenkenschans, in overeenstemming met de wensen van de Staten van Gelderland, 1750-1759.

29 Het Utrechts Archief, Archief van het Kapittel van Sint Marie te Utrecht 1108-1811, inv. nr. 221:1637: Ordonnanties op de tol te Emmerik en Schenkenschans, 1617-1759.

30 Wilfried Paul Feldenkirchen, ‘Der Handel der Stadt Köln im 18. Jahrhundert (1700-1814)’ (unpublished PhD dissertation, Bonn 1975) 286-288; Pfister, ‘The quantitative development’, 175-221.

Both sources confirm independently of each other a strong upward trend from the mid-eighteenth century onwards, with a dip during the Fourth Anglo-Dutch War (1780-1784) and a serious depression starting after the Haitian Revolution of 1793. These findings are further corroborated by some more fragmented data from the *Groote Gelderse Tol* 1747, 1801-1806, and from the *A'damse waagboeken*, 1793-1800.³¹ Finally, the published letters from Emmerich by Scholz-Babies contain some statistics in letters written during the 1780-1783 period of the Fourth Anglo-Dutch War.³²

Increase of general exports via the Rhine

Again, Johan de Vries noted that the trade of the Amsterdam admiralty with the German hinterland exhibited a remarkable growth between 1753 and 1790, and also a surprisingly one-sided growth. Imports, he found, stagnated at more or less 5 to 5.3 million guilders but according to de Vries: 'It is the export that shows an astonishing growth from 11.5 million guilders in 1753 to 29.1 million in 1790.'³³ Although one can make some caveats about the exactness of these figures, there is no way to deny that Rhine exports by the Dutch Republic grew substantially.³⁴ The *Convoyen en Licenten* indicate that the Amsterdam exports to the Rhine region tripled in weight from 18 to 55 million pounds. The value of Rhine trade registered by the Amsterdam admiralty increased from 10 to 25 million guilders and, even when deflated, it still amounts to a doubling trade value from 10 to 20 million (1753) guilder etween 1753 and 1790.³⁵ We thus see a doubling in trade value and a tripling in trade

31 Counting commodities listed for several sample months of the *Groote Gelderse tollen te Arnhem* (1739, 1801) and of the *Amsterdam Waagboeken* (1793) offers an impression of what was traded and how this changed over time. Gelders Archief, Gelderse Rekenkamer, acces.nr, 0012, Rekeningen van Jasper Schulder, inv.nr. 2410, 1739. R.A.J. Dix (ed.), *De Grote Gelderse tol te Arnhem en IJseloord. Deel 1, 1801-1805* (Arnhem 1995). SAA, Archief van de Commissarissen over de Vaart op den Rijn, access nr. 56, Waagboeken van schippers, inv.nr. 218

32 M. Scholz-Babisch, *Quellen zur Geschichte des Klevischen Rheinzollwesens vom 11. bis 18 Jahrhundert* (Wiesbaden 1971) 1001-1012.

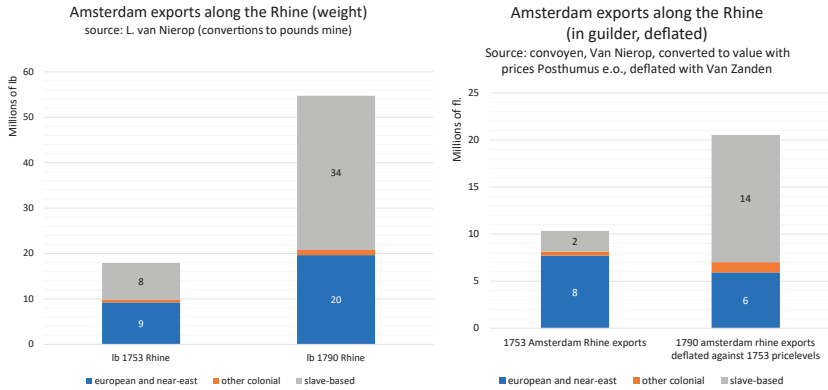
33 Quote from De Vries, 'De problematiek der Duits-Nederlandse economische betrekkingen', 28.

34 The values are calculated on the basis of quantity and 1790 prices, as given by N.W Posthumus, *Nederlandsche prijsgeschiedenis* (Leiden 1943). See: De Vries, *De economische achteruitgang*, 23 and 30; they are of course not corrected for smuggling.

35 Jan Luiten van Zanden, *The prices of the most important consumer goods, and indices of wages and the cost of living in the western part of the Netherlands, 1450-1800* (data supplied by Jan de Vries, Jan Pieter Smits and Arthur van Riel) datafile available, with tool, on <https://iisg.amsterdam/nl/onderzoek/>

volume of upstream Rhine trade between 1753 and 1790 as indicated in figure 1.

Figure 1 Amsterdam exports along the Rhine in weight and in guilders



Sources: L. van Nierop, *'Uit de bakermat der Amsterdamsche handelsstatistiek'*, Amstelodamum 13 (1915) 113 and appendices; Conversions are based on Verhoef (measures), Posthumus (prices), Van Zanden (inflation).³⁶

Peak years or real growth?

While we can be quite confident about the data for 1753 and 1790, these obviously do not present a trend. In order to fruitfully combine these data with data from the Schenkenschanse Tol and the Cologne Crane Tax, we first need to rule out that these years are possibly outliers. Fortunately, the statistics in the *Convoyen en Licenten* provide us with data for more years: for Amsterdam there is data for 1789 and 1791 and for Maze for 1784 to 1793, and both confirm that 1790 was not a peak year. The possibility that 1753 is an exceptional, low year cannot be discounted, based on the surrounding years from the *Convoyen en Licenten* listings; still, Dutch imports in those years do not show any dip, and

projecten/hpw/calculate.php (consulted 8 december 2021). Note that a price index based on the Rhine trade itself would perhaps in theory be more accurate, but in practice there are quite a few uncertainties in both the accuracy of prices and of quantities (which for some commodities are unknown and for others are based on various conversions) – so that a simpler option is preferable in terms of transparency, as well as to avoid spurious precision.

³⁶ Posthumus, *Nederlandsche prijsgeschiedenis*; Van Zanden, *The prices of the most important consumer goods*; web database 'De oude Nederlandse maten en gewichten'.

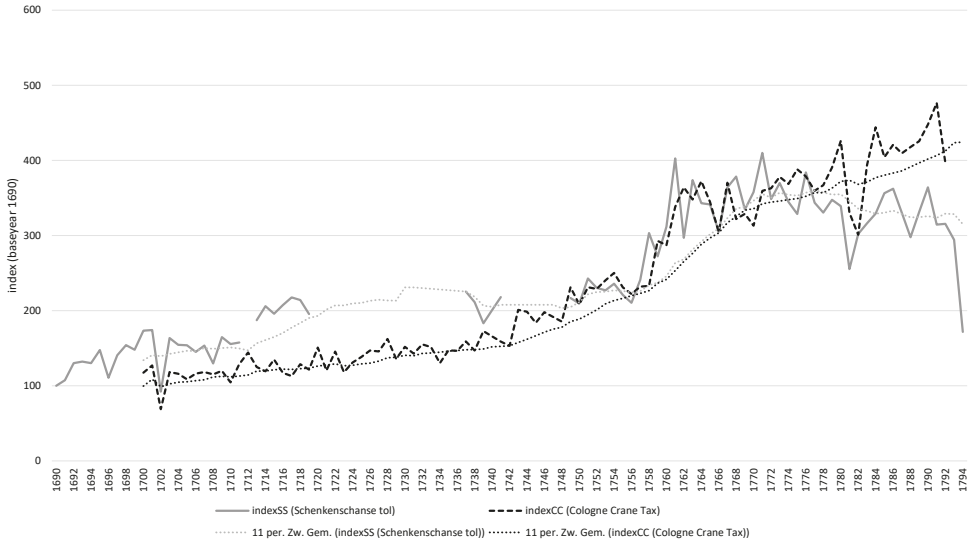
neither do particular political or economic circumstances suggest that there might be one.

While we can be confident about the aggregate growth, it was far from linear. The Schenkenschanse Tol revenues did not show a linear growth development between 1753 and 1790 (scenario a). It looks like Rhine trade increased especially fast between 1757 and 1770, as we can see below in figure 2. In this graph, I plotted the indices of the Schenkenschanse Tol revenues and the Cologne Crane Tax revenue. Both toll and tax revenues were originally given in guilders – the amount of the annual revenue was based on what ships paid at the toll or the crane at a particular moment. Therefore, both revenues are plotted with the base year 1690 to be made comparable, and for both a trendline is calculated showing the eleven-year moving average – in order to make visible the fact that trends were converging between roughly 1755 and 1770.

The first thing to note is that these toll revenues confirm the image of significant growth in Rhine trade between the years 1753 and 1790. In addition, the revenues of the Schenkenschanse Tol suggest a longer trend in the growth of Rhine trade since the late seventeenth century, which stabilizes between 1760 and 1780. This steady state is followed by a short dip in revenues during the Fourth English-Dutch War (1780-1784), which in itself is a sign that re-exports of seaborne commodities are a large part of the exports. In the decade after the war revenues recovered rapidly only to decline sharply again in 1794, just after the Haitian Revolution. Between 1801 and 1806, Rhine trade moved towards the 1785 level, until the next deep crash of 1807-1811, caused by the Continental System. From Hurlings we know that after 1811, Rhine trade recovered until 1816/1817, when the Rhine trade resumed its growth trend from the second half of the eighteenth century.³⁷ This rhythm already makes the relation with seaborne trade palpably clear.

Furthermore, both the development of the revenues of the Schenkenschanse Tol and the returns of the crane tax in Cologne (see figure 2) strongly suggest a rising trend over the eighteenth century. Both exhibited the same general annual growth trend of 1.3 percent between 1690 and 1789, and a sharp increase in the second half of the 1750s and early 1760s (roughly coinciding with the Seven Years' War [1756-1763]). A clear dip is apparent again during the Fourth Anglo-Dutch War 1780-1782, and in the French period after 1795. Both the revenues of the

37 Jan Luiten van Zanden and Arthur van Riel, *Nederland 1780-1914. Staat, instituties en economische ontwikkeling* (Amsterdam 2000) 89; E. Hurlings, *The economic development of the Dutch servicesector 1800-1850* (Amsterdam 1995) 509.

Figure 2 Comparison of 'Schenkenschanse Tol' (Rhine trade toll) and Cologne Crane Tax revenues

Note: the annual revenues are presented here as indices (base year 1690) in order to compare the two. The revenues of both taxes were collected in guilders. Both of these taxes were levied on the Rhine (the Schenkenschans near Emmerich and the other in Cologne): all ships passing upstream as well as downstream had to pay, except for a few local shippers with privileges. The duties levied by the Schenkenschanse Tol were based on the weight and volume of loads of the commodities on board. No changes in the taxation are known after 1751, and earlier changes pertained to adding new commodities to the list. For the Cologne Crane Tax the basis of taxation is unknown to me. A moving average over 11 years is shown as a trendline for both, which shows that the trends are very similar in the decades 1750s and 1760s.

Source: M.M. Verheul, *Anderhalve eeuw Rijnvaart. Een kwantitatieve studie naar de Rijnhandel met het Duitse achterland op basis van de tolregisters van schenkenschans 1650-1800*, unpublished thesis, Utrecht, 1994; Wilfried Paul Feldenkirchen, *Der Handel der Stadt Köln im 18. Jahrhundert (1700-1814)*, unpublished dissertation, Bonn 1975, 286-288.

Cologne Crane Tax and the Schenkenschanse Tol show sharp declines during the Anglo-Dutch War and the French occupation of the Dutch Republic. Yet the Cologne Crane Tax maintains its growth trend, whereas the Schenkenschanse Tol exhibits a slight decline.

We may assume that the sharp increase of both proxies indicates a real growth in Rhine trade in this period. Additionally, from the serial data from the Schenkenschanse Tol and Cologne Crane Tax, we can infer that Rhine trade grew rapidly between 1755 and 1770 and sustained the higher level. Is it a likely scenario that Rhine trade increased particularly fast in these fifteen years, because of two important separate

developments: the Seven Years' War and the staggering growth of Atlantic trade in slave-based products.

Whereas the Seven Years' War involved all major European powers, the Dutch Republic remained neutral, which turned out to be highly beneficial to its commerce.³⁸ While Prussia and France were at war with each other, the Dutch brought the necessary foodstuffs to the German hinterland. The Schenkenschanse Tol registers show that in the year 1758, the Dutch grain exports over the Rhine were exceptionally high, while in the same year troops of Allied and French armies were on campaign on the west bank of the Rhine. The volume of single convoy of rye was as large as the city of Amsterdam normally consumed in one year.³⁹ The war was also favourable for Dutch re-exports of Atlantic commodities, particularly because the war circumstances impeded sugar and coffee shipments to Hamburg, which normally supplied some overseas products to inland Germany over land.⁴⁰ Martinique and Guadeloupe were occupied by the British and lost for the French. The vessels under neutral Dutch flag obtained a unique opportunity to ship off the sugar and other commodities from these Antillean islands.

The increase in trade volume on the Rhine was not temporary but stayed at high levels after the Seven Years' War. From the late 1760s onwards Atlantic plantation production was vastly expanding. These decades saw major plantation investments in the Caribbean region and the rapid expansion of coffee cultivation.⁴¹ The relatively modest coffee production of Jamaica tripled in that decade and tripled again in the five years that followed.⁴² From the Dutch colony Surinam coffee exports increased steadily after 1755, reaching their highest level at an average three times higher in the 1770s.⁴³ In Saint Domingue, coffee production increased at a similar rate as that from Suriname between 1755 and 1767, but really soared during the last two decades before the Hai-

38 Van Nierop, 'Uit de bakermat der Amsterdamsche handelsstatistiek'.

39 Verheul 'Anderhalve eeuw Rijnvaart', 24.

40 Otto-Ernst Krawehl, Jürgen Schneider, and Frank Schulenburg (eds), *Statistik des Hamburger see-wärtigen Einfuhrhandels*, (St. Katharinen 2001). Also, less sugar and tobacco passed the Sound Toll, see for this: H. den Heijer, 'Sugar and tobacco to the Baltic. The Amsterdam trade in West Indian products through the Sound in the eighteenth century', unpublished paper, presented in Rotterdam 2012, kindly shared with me by the author.

41 K. Kramer, 'Plantation development in Berbice from 1753 to 1779. The shift from the interior to the coast', *Nieuwe West-Indische Gids / New West Indian Guide* 65:1/2 (1991) 51-65. His export figures are based on the Landings Manifesten, one of the few figures on colonial Dutch imports for the late 1750s and 1760s.

42 Clarence Smith and Topik (eds), *The global coffee economy*, 412 Table a.1.

43 Van Stipriaan, *Surinaams contrast*, Bijlage I, 530.

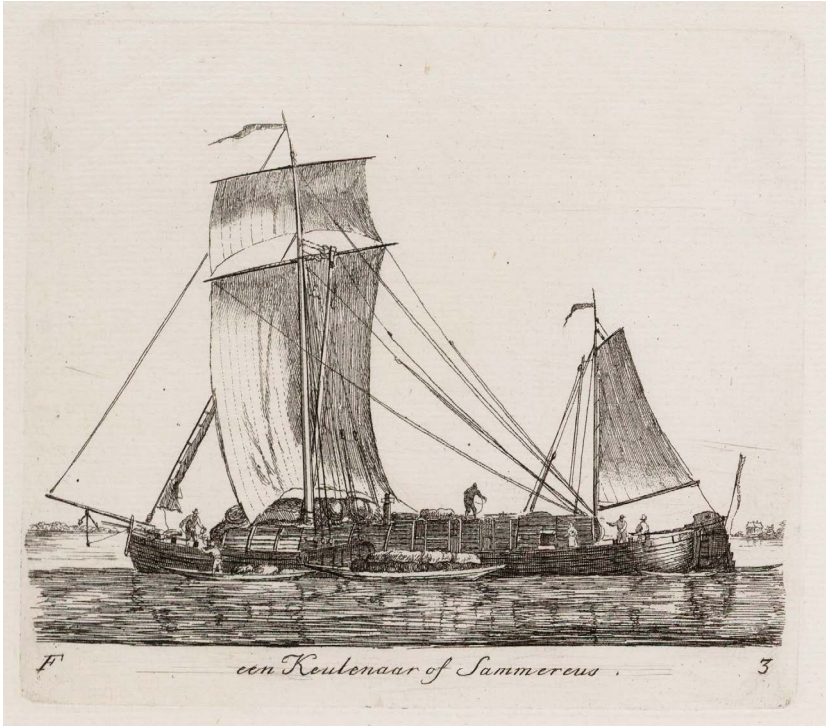


Illustration 2 A Keulenaar or Sammereus used for the transport of wood on the Rhine, by Gerrit Groenewegen (source: City Archives Amsterdam <http://archieff.amsterdam/archief/10097/010097013817>.)

tian Revolution (1793).⁴⁴ The next section will discuss how the staggering growth of coffee and sugar production in the Caribbean region impinged upon the Rhine trade.

Increase of the Rhine trade and slave-based commodities

While the Rhine trade grew substantially, the trade volume of slave-based commodities rose more than that of other commodities. In absolute terms, the weight of slave-based commodities traded up the Rhine from Amsterdam rose from 8 to 34 million pounds. In relative terms, the share of slave-based commodities in the Amsterdam Rhine trade as reported to Amsterdam admiralty in *convoyen* and *licenten* rose from

44 Clarence Smith and Topik (eds), *The global coffee economy*, 413.

Table 1 Amsterdam Rhine exports in 1753 and 1790 in weight and in value

Slave-based or not?	Product group	lb 1753 Rhine	lb 1790 Rhine	fl. 1753 Rhine	fl. 1790 Rhine
Europe and Near East	Eur-agro	4,574,501	12,904,001	3,837,518	4,245,828
Europe and Near East	Fishery	2,720,014	1,971,497	416,093	286,767
Europe and Near East	Miscellaneous	712,607	3,322,011	2,153,685	1,621,546
Europe and Near East	cotton&tobacco	573,549	728,809	1,204,669	1,033,032
Europe and Near East	Dyes	411,705	581,197	68,452	109,913
Europe and Near East	Metal	229,140	148,997	24,510	21,714
other colonial	Spices	444,586	773,772	269,971	1,010,124
other colonial	Metal	77,515	77,004	34,264	35,526
other colonial	Tea	43,499	64,709	38,714	34,825
other colonial	Miscellaneous	36,553	11,181	12,378	2,416
other colonial	Dyes	7,611	206,911	75,062	212,139
slave-based	Sugar	7,139,772	19,070,298	1,822,193	8,171,256
slave-based	rice&cacao	398,187	1,120,958	48,651	109,105
slave-based	Cotton	310,052	645,069	130,571	366,083
slave-based	Coffee	188,846	12,938,584	88,758	6,563,391
slave-based	Indigo	23,291	160,726	96,425	969,470
slave-based	Tobacco	10,707	1,542	20,772	2,815

about two fifths to almost two thirds of the weight (see table 1 and figure 1). Furthermore, the volume of slave-based exports grew; since the prices of these goods rose as well, the value of these exports increased exponentially. Coffee exports from Amsterdam along the Rhine developed from negligible in 1753 to about 6.6 million guilders in 1790, making up a major share of the total Rhine trade. Exports of sugar, indigo, cotton, and rice also grew both in volume and in value. Meanwhile, the shipment of goods up the Rhine that were produced in Europe and the Near East fell in value although not in volume. Exports of sea products declined, while cheese exports grew.⁴⁵ In the category of clothing, we see a shift from valuable woollen and silk manufactures, towards re-exports of skins, as well as towards mostly Turkish raw cotton and cotton yarn.⁴⁶

45 Van Zanden and Van Riel, *Nederland 1780-1914*, 33.

46 Note that this drop in value of European commodities on Rhine is less pronounced in De Vries's calculations.

In sum, the growth of Amsterdam Rhine trade in volume and value was entirely due to slave-based commodities, which offset declines in other rubrics.

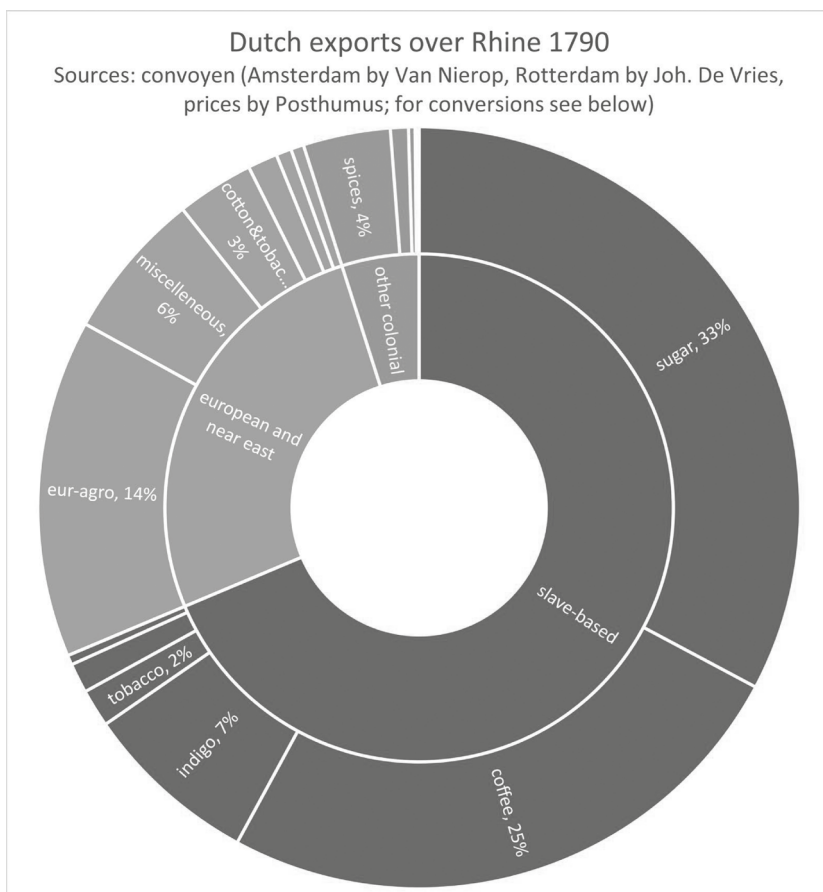
While table 1 presents figures for Amsterdam, it is unlikely that those for Rotterdam would be very different. In fact, for the year 1790, it was possible to combine the *Convoyen en Licenten* data from both Amsterdam and the De Maze region (together these regions accounted for over 80 percent of Dutch exports), showing that about 64 percent of Dutch Rhine trade was slave-based in terms of value (see figure 3, and see also table i in the appendix).

Other evidence corroborates these data indicating the major share of the slave-based commodities in the Rhine trade. For the early nineteenth century more precise statistics are available, and these show a similar pattern.⁴⁷ Other evidence confirms the impression that from the mid-eighteenth century onwards, an increasing share of Rhine trade comprised colonial commodities. Several Rhine-related registries did list commodities on board. Although the respective volumes were not listed, they may still offer an impression. Verheul notes that initially fish is the most mentioned item in the registries of the Schenkenschance Tol, but that this diminished after 1715, and that tobacco, sugar, and coffee appeared with increasing frequency.⁴⁸ This observation is corroborated by other sources. In 1747, the Gelderse tollen near Arnhem mentioned sugar and tobacco only sporadically and as a minor part of the loads coming from Amsterdam or Rotterdam, but sugar, coffee, and rice appeared frequently in 1801. In the *Amsterdamse Waagboeken* (Amsterdam Weigh House Books), the loads of the ships to Cologne were registered from 1793 onward and even list mostly slave-based goods.⁴⁹

47 H.P.H. Nusteling, *De Rijnvaart in het tijdperk van stoom en steenkool 1831-1914* (Amsterdam 1974), 464. Colonial commodities continue to make up most of the shipped commodities. Compared to the late eighteenth century, it seems that metal re-exports have grown (they were already growing noticeably between 1784 and 1790), tobacco shrunk, and woollens seem to have been further replaced by cotton (mostly [English] yarn) for the Wuppertal textile industry – although neat comparison is difficult due to the different nature of sources.

48 Verheul, 'Anderhalve eeuw Rijnvaart', 24. She counted for the sample years 1715, 1752, 1780, 1800.

49 Gelders Archief, Gelderse Rekenkamer, acces.nr. 0012, Rekeningen van Jasper Schulder, inv. nr. 2410, 1739. R.A.J. Dix (ed.), *De Grote Gelderse tol te Arnhem en IJseloord. Deel 1, 1801-1805* (Arnhem 1995). SAA, Archief van de Commissarissen over de Vaart op den Rijn, access nr. 56, Waagboeken van schippers, inv.nr. 218.

Figure 3 Dutch exports over the Rhine in 1790

See table i in Appendix for data supporting this graph.

Atlantic slave-based trade within the value of Dutch Rhine exports: 64%

Note that in the graph above all coffee is shown as slave-based, because coffee is a single unspecified category in the sources on which this was based. About 80% of this coffee was slave-based, but circa 20% was from Java. The figure of 64% is corrected for this.

Sources and note on conversions:

Trade data: Based on Convoyen en Licenten for the Admiralty of Amsterdam and the Admiralty of De Maaze published in: Johan De Vries, 'De statistiek van in- en uitvoer van de Admiraliteit op de Maaze', *Economisch Historisch Jaarboek* (NEHA), 29 (1963) 188-259; and by Leonie van Nierop, 'Uit de bakermat der Amsterdamsche handelsstatistiek', *Amstelodamum* 13 (1915).

Measures and prices: Some products are listed in value and others in pounds or other measures of volume or weight. I converted all to values using either to the value given in the statistics itself, or Posthumus prices for the equivalent product and year (Nicolaas W. Posthumus jr., *Nederlandse prijsgeschiedenis* (Leiden 1943)). In a few occasions extra conversions, assumptions or other sources were needed. These sources on historical measures are the web database 'De oude Nederlandse maten en gewichten' by Ritzo Holtman e.o. provided by the Meertens Institute on <https://mgw.meertens.knaw.nl>, which is based on J.M. Verhoeff,

De oude Nederlandse maten en gewichten (Amsterdam 1982); W.C.H. Staring, *De binnen- en buitenlandsche maten, gewichten en munten van vroeger en tegenwoordig, met hunne onderlinge vergelijkingen en herleidingen, benevens vele andere, dagelijks te pas komende opgaven en berekeningen* (1902). This was used for vinegar, various grains, and oils.

Additional sources for conversion or prices: For the conversions or prices of a few products other sources were needed: cheese was not listed by Posthumus at all, whereas other products like wine were listed in different measures. When conversions were not found in Staring or Meertens historical prices and wages, other sources were used for the conversions, or other sources for prices in the right measure were found such as archival material on shiploads and trade, contested contracts, and newspaper ads. **Rice:** Stadsarchief Amsterdam 5075:10124, aktenr 2061, insinuatie notaris Philipus Pot, 29 oktober 1735; Leeuwarden courant, 9 april 1768 "beursprijzen amsterdam, carolina rijst"; **Whine:** Stadsarchief Amsterdam 5061.2904, aktedatum 16 juni 1790; **Cheese:** SAA 5061.2845, pagina 43, 6 november 1753. The weight of some fishery products and of honey, which were listed in volume was converted based on their specific weight.

Note on product groups and specific products: in the original source products are listed quite specific. For this figure I grouped them in relevant product groups. I also labelled each specific product in the listing as either slave-based, other colonial, or non-colonial. Please note that part of the **tobacco** was European/Dutch tobacco and therefore listed as non-slave-based cotton and tobacco. Much of the cotton arriving in the Dutch Republic in the eighteenth century came from Turkey and was not slave-based. The origin of products was not listed, except for 'Turkish cotton yarn', raw cotton is assumed to be mostly slave-based, since cotton was produced in Guyana's, and listed as such. Note that in the Convoyen **spices** are grouped and only noted in pounds; the value of spices is based on Posthumus prices with the assumption that 80 percent of spices were pepper. This assumption is based on Femme Gastra, *De geschiedenis van de VOC* (Zutphen 2002) 13, which lists the value of Amsterdam VOC Chambers sales and notes the relative shares of pepper and fine spices. Note that the **coffee** arriving the Dutch Republic came for about 20 percent from Java, although in Rotterdam the share of Java coffee might have been lower than in Amsterdam.

Reports from the tolls at Emmerich (see appendix, figure i) confirm that slave-based wares were the most important goods shipped upstream in 1780, although one ought to be careful in using a war year to deduce general trends in trade.⁵⁰ Nonetheless, existing data points in the direction that coffee, sugar, indigo, and tobacco became the most important goods among the growing Dutch export trade on the Rhine.

Conclusion

This article looked at volume, value, and content of upstream Rhine trade in the eighteenth century and, specifically, at the role of slave-based commodities in its dynamics. On the basis of multiple sources, we can confirm earlier observations that Rhine trade grew substantially and steadily in the eighteenth century, in terms of both volume and value. Second, we can clearly discern a jump in growth between 1755-

50 M. Scholz-Babisch, *Quellen zur Geschichte des Klevischen Rheinzollwesens vom 11. bis 18. Jahrhundert* (Wiesbaden 1971) 1001-1012.

1770, which coincides with the plantation boom in the West Indies and a substantial growth of Dutch imports and, in particular, shipment of French slave-based commodities. This rise took off during the Seven Years' War but was sustained afterwards. Third, the growth in value and quantity of upstream Rhine trade almost exclusively consisted of slave-based commodities. In the late eighteenth century, slave-based commodities may have amounted to two thirds of the value of Dutch exports via the Rhine.

These findings have important implications. First, the growth of slave-based Rhine exports was an important element in the reorientation of the Dutch economy, as has been suggested by De Vries and Van der Woude. This includes a shift from the Dutch trade in the Sound towards the Rhine trade. Second, in German regions along the Rhine, the consumption of slave-based commodities must have been considerable. On the eve of the French revolution, the Rhine region consumed about 10 percent of all western sugar, and about 17 percent of all coffee in Europe went up the Rhine (see figure ii and table ii in appendix).⁵¹ This part of Europe became increasingly connected to the Caribbean plantation complex, whereas Central and Eastern Europe became connected via Hamburg. Still, more research is needed to assess the interaction between the growth of intra-European and river trade in the eighteenth century and the growth of Atlantic commerce.

Moreover, there is yet another, broader implication. So far, the large size of intra-European and regional trade has been used to contradict the importance of extra-European trade, including Atlantic commerce. However, intra-European trade consisted increasingly of re-exports of slave-based products as well as supplies for the Atlantic production complexes. In French historiography, it has been pointed out that huge amounts of sugar, coffee, and indigo from Saint Domingue made up

51 J.J. Reesse, *De suikerhandel van Amsterdam. Van het begin der 17^e eeuw tot 1813*. (Haarlem 1908) 63 and 58 for estimates of European consumption. For Rhine export figures: Joh. De Vries, 'De statistiek van in- en uitvoer van de Admiraliteit op de Maaze', *Economisch Historisch Jaarboek* (NEHA) 29 (1963) 188–259, and by Leonie van Nierop, in *Amstelodamum* (1915). For European import figures on coffee see: Tamira Combrink, 'Slave-based coffee in the eighteenth century and the role of the Dutch in global commodity chains', *Slavery and Abolition* 42:1 (2021); Dutch import figures on sugar see: J. Postma (2009): *Dutch shipping and trade with Surinam, 1683-1795*, DANS database. <https://doi.org/10.17026/dans-zeh-h82t>; Klaas Kramer, 'Plantation development in Berbice from 1753 to 1779: the shift from the interior to the coast' *Nieuwe West-Indische Gids* Vol. 65, No. 1-2 (1991) 51-65; Henry Bolingbroke, *A Voyage to the Demerary* (London 1807), Appendix I, 397; Loïc Charles, Guillaume Daudin, Guillaume Plique and Paul Girard, TOFLIT18 website (consulted June 2018). Retrieved from <http://toflit18.medialab.sciences-po.fr>; Wim Klooster, *Illicit Riches*, 226-227, appendix 5.

an increasing share of French's imports *and* exports during this period.⁵² These slave-based commodities were largely exported to the 'north', and a substantial share of them went up the Rhine. The argument once famously made by O'Brien in 1982, which he later retracted, that non-European commerce was peripheral to Europe did indeed not pay attention to intra-European trade – which increasingly consisted of redistribution of colonial wares – nor to the fact that the growth of eighteenth century trade was largely based on these Atlantic items.⁵³ The growing Rhine trade of the second half of the eighteenth century demonstrates this phenomenon keenly. The catalyst that slave-based commodities provided for the Rhine trade calls for a wider perspective on the economic stimuli from slavery, one that looks beyond the profits of planters and beyond the colonial port cities. Extra-European trade gave a boost to intra-European trade. The crucial implication of this conclusion is that slavery and slave-based production, in contrast to what is still suggested often in historiography, clearly did contribute to European economic dynamics and growth.

About the author

Tamira Combrink (1982) is a lecturer in history at Vrije Universiteit Amsterdam and a research fellow at the International Institute for Social History in Amsterdam; she is writing a Ph.D. dissertation on Atlantic slave-based commodity chains in the Dutch Republic.

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52 Pierrick Pourchasse, *Le commerce du Nord. Les échanges commerciaux entre la France et l'Europe septentrionale au XVIII^e siècle* (Rennes 2006); P. Butel, *Les négociants bordelais, l'Europe et les Iles au XVIII^e siècle* (Paris 1974).

53 Patrick O'Brien, 'European Economic Development: The Contribution of the Periphery', *The Economic History Review*, New Series 35, no. 1 (1982): 1–18.

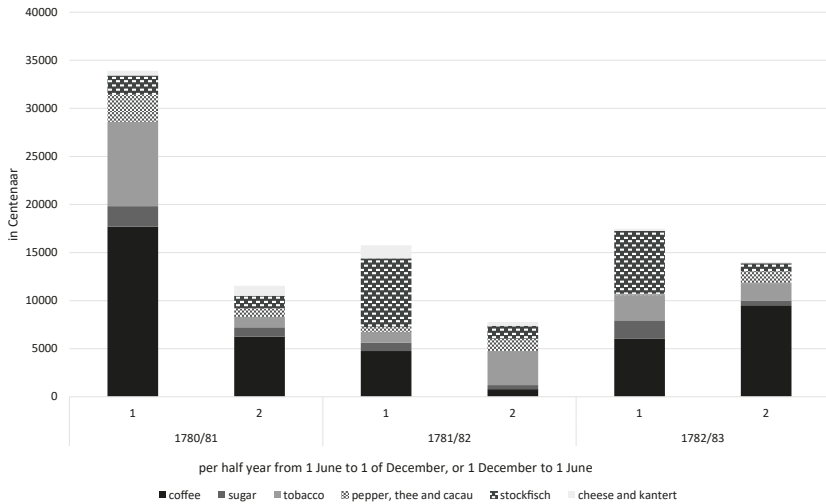
Appendix

Table i supporting Figure 3. Dutch exports over Rhine 1790.

slave-based/colonial/non	product-group	% 1790 Dutch Rhine exports	1790 Dutch Rhine exports	1790 Dutch exports
slave-based	sugar	33%	11210215	13974177
slave-based	coffee	25%	8587914	11384870
slave-based	indigo	7%	2550096	3796324
slave-based	tobacco	2%	550040	736212
slave-based	cotton	1%	431783	1635506
slave-based	rice&cacao	0%	140208	184334
other colonial	spices	4%	1265553	5458339
other colonial	dyes	1%	259967	843723
other colonial	metal	0%	94245	301981
other colonial	tea	0%	46303	302569
other colonial	miscellaneous	0%	12678	36372
european and near east	eur-agro	14%	4908087	23475430
european and near east	miscellaneous	6%	2162260	9046464
european and near east	cotton&tobacco	3%	1122121	2503534
european and near east	fishery	1%	431435	1141651
european and near east	metal	1%	222650	2053915
european and near east	dyes	1%	187939	1907644

Source: Trade statistics from 'convoyen and licenten' as published by Johan De Vries, 'De statistiek van in- en uitvoer van de Admiraliteit op de Maaze', *Economisch Historisch Jaarboek* (NEHA), 29 (1963) 188–259, and by Leonie van Nierop, 'Uit de bakermat der Amsterdamsche handelsstatistiek' in *Amstelodamum* 13 (1915). **Prices:** from convoyen itself, or Nicolaas W. Posthumus jr., *Nederlandse prijsgeschiedenis* (Leiden 1943). **Measures:** web database 'De oude Nederlandse maten en gewichten' by Ritzo Holtman e.o. provided by the Meertens Institute on <https://mgw.meertens.knaw.nl>, which is based on J.M. Verhoeff, *De oude Nederlandse maten en gewichten* (Amsterdam 1982); W.C.H. Staring, *De binnen- en buitenlandse maten, gewichten en munten van vroeger en tegenwoordig* (Arnhem 1902). For measures and prices on products missing in these sources: Rice: Stadsarchief Amsterdam 5075:10124, aktenr 2061, insinuatie notaris Philipus Pot, 29 oktober 1735; Leeuwarden courant, 9 april 1768 "beursprijzen amsterdam, carolina rijst"; Whine: Stadsarchief Amsterdam 5061.2904, aktedatum 16 juni 1790; Cheese: SAA 5061.2845, pagina 43, 6 november 1753. For data on the import of spices: on Femme Gaastra, *De geschiedenis van de VOC* (Zutphen 2002) 134.

For more notes on the sources and conversions see figure 3.

Figure I Main goods shipped upstream on the Rhine at Emmerich 1780-1783

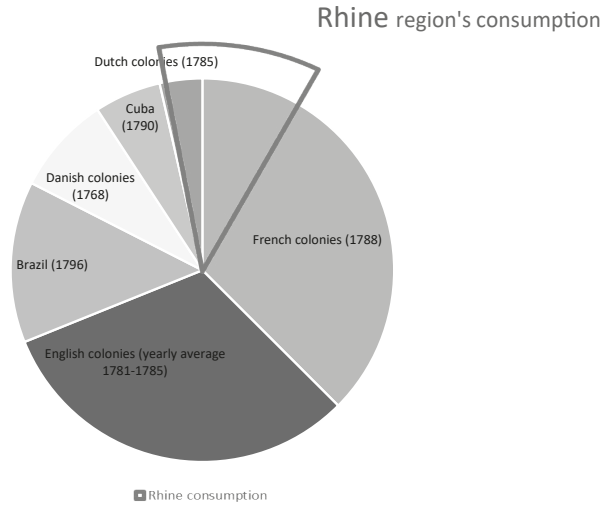
Source: M. Scholz-Babisch, *Quellen zur Geschichte des Klevischen Rheinzollwesens vom 11. bis 18 Jahrhundert* (Wiesbaden 1971) 1001-1012.

Note that although some products are absent from the source, some products are only absent from the graph because they were only reported in kind or in local volume measures, for which I could not find a conversion factor

Note: One might wonder why coffee is so much more important than sugar in this toll report, while Dutch *Convoyen en Licenten* suggest otherwise. In correspondence about the toll revenues, King Friedrich II of Prussia remarked that he regarded coffee as the most important product traded up the Rhine. The meaning is ambiguous and may point to a prioritized focus of the Prussian authorities on coffee – as the state sought to regulate its import. Furthermore, from the published correspondence out of which these statistics are abstracted, it is very clear that corruption, smuggling, and tax evasion are major issues for the Prussian authorities regarding the Rhine tolls in general. The total amounts reported here are rather low compared to those the Dutch customs office registered. However, this was probably caused by the Fourth Anglo-Dutch War, which clearly had a severe effect on the quantity of colonial commodities sent upstream, especially in the years 1781 and 1782, but probably already in the second half of 1780 as well.

Figure II Western sugar production vs Rhine region's sugar consumption

Shares of the total 500 million pounds.



Source: J.J. Reesse, *De suikerhandel van Amsterdam. Van het begin der 17^e eeuw tot 1813*. (Haarlem 1908) 63 For the Rhine region's consumption, my estimates are based on the table below.

Table 2, supporting figure II calculation leading to estimated 10% of world sugar production on the eve of the French Revolution being consumed in the Rhine regions

1790	24.7 million pound	total Dutch export of refined sugar over the Rhine
	31.4 million pound	total Dutch export of sugar
	58 million pound	total Dutch sugar imports of raw sugar
	44.4 million pound	estimated Dutch production of refined sugar
	13 million pounds	estimated domestic consumption of refined sugar around 1770
This means:		
	56%	Rhine trade as a % of total sugar production in 1790
	29%	domestic consumption as a % of total sugar production
	15%	export of sugar to elsewhere in 1790
thus:		
	49.3	million pounds raw sugar consumed in the Rhine region (incl. Holland).

470	estimated European sugar consumption around 1790 by Reesse*
500	estimated western sugar production eve French revolution by Reesse
10.5%	estimate share Rhine consumption in total European consumption
9.9%	estimate share of Rhine consumption of total western sugar production

Sources:

Export figures: L. van Nierop, 'Uit de bakermat der Amsterdamsche handelsstatistiek', *Amstelodamum* 13 and 15, bijlagen, (Amsterdam, 1915 and 1917). Joh. de Vries, 'De statistiek van in- en uitvoer van de admiraliteit op de Maaze 1784-1793, II: de statistiek van uitvoer', *Economisch-Historisch Jaarboek* 60 (1965).

Import figures: J. Postma (2009): *Dutch shipping and trade with Surinam, 1683-1795*. DANS database. <https://doi.org/10.17026/dans-zeh-h82t>; Klaas Kramer, 'Plantation development in Berbice from 1753 to 1779 : the shift from the interior to the coast' *Nieuwe West-Indische Gids* Vol. 65, No. 1-2 (1991) 51-65; Henry Bolingbroke, *A Voyage to the Demerary* (London 1807), Appendix I, 397; Loïc Charles, Guillaume Daudin, Guillaume Plique and Paul Girard, TOFLIT18 website (consulted June 2018). Retrieved from <http://toflit18.medialab.sciences-po.fr>; Wim Klooster, *Illicit Riches*, 226-227, appendix 5.

Domestic consumption: My estimate for refined sugar consumption, based on trade figures over various years and a factor 1.25 for the amount of raw sugar needed to produce one pound of refined).

World consumption/production: J.J. Reesse, *De suikerhandel van Amsterdam. Van het begin der 17^e eeuw tot 1813*. (Haarlem 1908) 63 for production (he calls it 'world production' but sugar for Indian, Chinese, or Arabian markets is not included); 58 for estimates of European consumption.

*Reesse mentions that Lippman estimated European sugar consumption at 450 million pounds for 1800, 150 million of which was English sugar consumption. He mentions, however, that English sugar consumption was higher in 1770 (158 million pounds). Assuming that Continental consumption was equally higher, the estimate for total European consumption would be 470 million – it is likely that Continental sugar consumption was indeed substantially higher in the 1770-1790 period than in the troubled years around 1800 (in which Caribbean production and trade were to some extent disrupted by the effects of warfare, the Haitian Revolution, and other uprisings).

For coffee:

Europe on the eve of the French Revolution imported an approximated 100 million pounds of coffee (of which about 94% were slave-based). About 17 million pounds of coffee were exported up the Rhine in 1790 from Amsterdam and the De Maaze area (thus about 17% of European coffee consumption).

Sources: *Convoyen en Licenten* for the Admiralty of Amsterdam and the Admiralty of De Maaze published in: Joh. De Vries, 'De statistiek van in- en uitvoer van de Admiraliteit op de Maaze' in: *Economisch historisch jaarboek* (NEHA), 29 (1963) 188–259, and by Leonie van Nierop, in *Amstelodamum* 1915. For European coffee import figures see: Tamira Combrink, 'Slave-based coffee in the eighteenth century and the role of the Dutch in global commodity chains', *Slavery and Abolition* 42:1 (2021) appendix.

