*Appendices[[1]](#footnote-1)*

*Appendix 1: Price accuracy index*

The price accuracy index for Brazilian exports takes the form

$PAI\_{it} =\sum\_{j=1}^{n}\left(\frac{P\_{ij}\*Q\_{ij}}{P\_{mj}\*Q\_{ij}}\right)$

where PAIit is the price accuracy index of country *i* at time *t*, Pij the unit value of commodity *j* in country *i* at time *t*, Pmj the unit value of commodity *j* in country *m* at time *t*, and Qij the quantity in metric tons of commodity *j* in country *i* at time *t*. The results are given in the text.

Data for Pij and Qij come from Brazil, *Anuário Estatístico do Brasil de 1939/1940*, pp. 1374-1378. Data sources for international prices (Pmj) are listed as follows:

1821-1846: We have computed a weighted average of the monthly prices from different origins to the United Kingdom and Philadelphia. As weights we use the distribution of each origin in a sample of total quantum exports. Price data for the United Kingdom comes from A. D. Gayer, W. W. Rostow, and A. J. Schwartz, *Microfilmed Supplement to Volumes I and II of The Growth and Fluctuation of the British Economy 1790-1850* (Oxford: Clarendon Press, 1953). Data from Philadelphia from Anne Bezanson, Robert D. Gray and Miriam Hussey, *Wholesale prices in Philadelphia, 1784-1861* (Philadelphia: University of Pennsylvania Press, 1936-37).

The origin and destination of each price series used in the weighted average and quantities used as weights for each product are as follows:

Coffee: Prices: Cuba, St. Domingo, Brazil Rio 7 and Java to Philadelphia, and Jamaica Ordinary to the United Kingdom. Quantities: exports, Mario Samper and Radin Fernando, ‘Appendix: Historical Statistics of Coffee Production and Trade from 1700 to 1960,’ in William Gervase Clarence-Smith and Steven Topik (eds.), *The Global Coffee Economy in Africa, Asia, and Latin America, 1500–1989* (Cambridge: Cambridge University Press, 2004), pp. 411-463, Tables A12, A13, A14, A15.

Sugar: Prices: Jamaica Brown to the United Kingdom, Cuba Brown and Muscovado to Philadelphia. Quantities: exports, Victor Bulmer-Thomas, *The Economic History of the Caribbean*, Table A10; world production, Manuel Moreno Fraginals, *El ingenio: Complejo económico social cubano del azúcar* (Havana: Editorial de Ciencias Sociales, 1978).

Hides: Prices: Buenos Aires to the United Kingdom, Buenos Aires Ox hides to Philadelphia. We have taken the arithmetic average of the two series.

Cotton: Prices: Guyana Raw (Berbice or Demerara) to the United Kingdom, Middling Uplands from the United States to the United Kingdom, from M. B. Hammond, *The cotton industry; an essay in American economic history* (New York: Macmillan, 1897), p. 898. Quantities: exports, Bulmer-Thomas, *The Economic History of the Caribbean*, Table A10; exports, Hammond, T*he cotton industry,* p. 898; world production, Harry Hammond, 'Production and Consumption of Cotton in bales of 400 lb. weight by the countries contributing to the world's supply and demand for a series of years from 1790 to 1895,' in *The Cotton Plant: its history, botany, chemistry, culture, enemies and uses* (Washington: Government Printing Office, 1896), p. 42, Plate II.

Cocoa: Prices: Granada to the United Kingdom, Caracas to Philadelphia, “Island” (includes Guayaquil, St. Domingo, Caracas and Trinidad) to Philadelphia. Quantities: William Gervase Clarence-Smith, *Cocoa & Chocolate, 1765-1914* (London: Routledge, 2000), Appendix 2.

1846-1850s: As computed values are not listed in the official British statistics for this period, we have taken the prices of four commodities (sugar, hides, coffee, cotton) from Augustus Sauerbeck, ‘Prices of Commodities and the Precious Metals,’ *Journal of the Statistical Society of London*, 49: 3, (1886), pp. 581-648, adjusting them for the appropriate trade costs. The transition from the weighted average series to the UK series has been performed as follows:

Coffee: 1846-1850: we have taken the arithmetic average of the weighted average series and Sauerbeck’s Rio Good Channel variety, 1851-1853: we use Sauerbeck’s series, 1854-1855: we use the arithmetic average of the UK and Sauerbeck series, 1856-1913: we use the UK series.

Sugar: 1846-1850: we take the arithmetic average of the weighted average series and Sauerbeck’s British West Indian variety, 1851-1853: we use Sauerbeck’s series, 1854-1913: we use the UK series.

Hides: 1846-1853: we use the arithmetic average of the weighted average series and Sauerbeck’s River Plate Dry variety, 1854: we use the arithmetic average of the Sauerbeck and UK series, 1855-1913: we use the UK series.

Cotton: 1846-1850: we use the arithmetic average of the weighted average series and Sauerbeck’s Middling Uplands variety, 1851-1853: we use Sauerbeck’s series, 1854-1856: we use the arithmetic average of the Sauerbeck and UK series, 1857-1913: we use the UK series.

Cocoa: 1850-1855: Cocoa is not included in Sauerbeck’s sample, so we extend the weighted average series and take the arithmetic average of this series and the UK series, 1856-1913: we use the UK series. For the period 1850-1853 we have also included the average cocoa price during the period 1847-1851 as found in B. Poole, *Statistics of British Commerce: Being a Compendium of the Productions, Manufactures, Imports, and Exports, of the United Kingdom* (London: McCorquodale and Co, 1852), p. 52.

Rubber prices for the period 1850-1853 are taken as the average price for Caoutchouc in 1850. These figures are also taken from Poole, *Statistics of British Commerce*, p. 75.

1854-1913: Imports from Brazil to the United Kingdom, taken from United Kingdom, *Annual statement of the trade of the United Kingdom with foreign countries and British possessions* (House of Commons Parliamentary Papers, various years).

The overall price series for each commodity and the figures showing the transition between the different series can be seen in appendices 1A and 1B, respectively.

As mentioned in the text, from these international prices we deduct export duties, freight rates, and insurance costs. The data sources for these trade costs are as follows:

Export duties:

Given the diverse nature of the origins of the international price series for the period 1821-1849, we have deducted an “additional” trade cost - which does not include freight or insurance costs - equivalent to the Brazilian export tax. This additional cost falls in the range of 1 to 7 per cent of the value of exports. For the Imperial period, we have used the effective duty on exports (the ratio between the total quantity of export duties collected and the total value of exports) in an attempt to obviate the problems associated with the application of the official ad valorem rates to the *pauta*. During the Republican period the issue is somewhat more complicated. The Republican Constitution devolved the right to earn export duties to the regional governments. The size of the export duty on a single commodity could thus differ across regions; for example, the export duty on cacao from Bahia in 1913 was 14 per cent while that from Pará was 6 per cent. Where possible, we use the duties applied by the principal exporting regions, as these duties would have fallen heaviest on the values of exports. Thus it must be kept in mind that the rate used for the calculation of the price accuracy index is most likely under-valued by a number of percentage points.

Cacao: 1821-1869: Brazil, *Finanças, Quadros synopticos da receita e despeza do Brasil, Periodo de 1822 a 1913* (Rio de Janeiro: Typographia do Ministerio da Agricultura, 1914), pp. 14-17; 1870-1871: Brazil, *Estatistica do Commercio Maritimo do Brazil do Exercicio de 1871-1872, 2.a Parte, Commercio Geral* (Rio de Janeiro: Typographia Nacional, 1878), pp. 220-221; 1881-1913: Pará, *Mensagem dirigida em 1 de agosto de 1915 ao Congreso Legislativo do Pará pelo Dr. Enéas Martins* (Belém: Imprensa Official do Estado do Pará, 1915) p. 91. The years 1872 to 1880 have been assumed using the general trend of national duties.

Coffee: 1821-1849: Brazil, *Finanças,* pp. 14-17; 1850-1890: Annex ‘Impostos de exportação, 1850-1930’ from Abreu and Fernandes, 'Market power and commodity prices,' available from http://www.economia.puc-rio.br/mpabreu/projeto%20cnpq.html; 1891-1913: São Paulo, *Annuario Estatistico de São Paulo 1913* (São Paulo: Typographia do Diario Official, 1915), p. 124.

Cotton: 1821-1869: Brazil, *Finanças,* pp. 14-17; 1870-1881: Pernambuco, *Projecto de receita provincial organisado por ordem do exm. sr. desembargador José Manoel de Freitas, dignissimo presidente desta provincia, pelo administrador do Consulado Provincial, bacharel Francisco Amynthas de Carvalho Moura* (Pernambuco: Typographia de Manoel Figueiroa de Faria and Filhos, 1884), Mapa 5; 1881-1886: Rio de Janeiro, *Mappas estatisticos do commercio e navegação do Porto do Rio de Janeiro* (Rio de Janeiro: Typographia da Alfandega, various years); 1891-1899: Rio Grande do Norte, *Mensagem dirigida ao Congresso Constituinte do Estado do Rio Grande do Norte* (Typographia do Rio Grande do Norte, various years); 1902-1913: Pernambuco, *Mensagem do Governador do Estado* (Recife: Typgraphia do Diario de Pernambuco, various years). The years 1883, 1887 to 1890, 1899 to 1901, 1905 to 1907 have been assumed using the general trend of national and regional duties.

Hides: 1821-1869: Brazil, *Finanças,* pp. 14-17; 1870-1882: Pernambuco, *Projecto de receita,* Mapa 5; 1884-1888: Rio de Janeiro, *Mappas estatisticos*; 1900-1906: Pará, *Mensagem dirigida em 7 de Setembro de 1911 ao Congresso Legislativo do Pará pelo Dr. João Antonio Luiz Coelho* (Belém: Imprensa Official do Estado do Pará, 1911), pp. 233-234; 1890-1891, 1907-1913: Bahia, *Mensagem apresentada a Assembléa Geral Legislativa do Estado da Bahia* (Bahia: Typographia do Diario da Bahia, various years). The years 1883, 1889, 1892 to 1899 have been assumed using the general trend of national and regional duties.

Rubber: 1850-1869: Brazil, *Finanças,* pp. 14-17; 1870-1871: Brazil, *Estatistica do Commercio Maritimo,* pp. 234-235; 1878-1884: Rio de Janeiro, *Mappas estatisticos*; 1885-1913: Pará, *Mensagem dirigida em 1 de agosto,* p. 91. The years 1875 to 1877, 1883 have been assumed using the general trend of national duties.

Sugar: 1821-1869: Brazil, *Finanças,* pp. 14-17; 1870-1871: Brazil, *Estatistica do Commercio Maritimo,* pp. 218-219; 1884-1887: Rio de Janeiro, *Mappas estatisticos*; 1870-1882, 1902-1904, 1908-1913: Pernambuco, *Mensagem do Governador do Estado*. The years 1883, 1888 to 1901, 1905 to 1907 have been assumed using the general trend of national and regional duties.

Freight rates:

Cacao: We use the freight rates for coffee.

Coffee: 1821-1847: Paul Schöller, ‘L'évolution séculaire des taux de fret et d'assurance maritimes 1819-1940,’ *Bulletin de l'Institut de Recherches Économiques et Sociales*, 17: 5 (1951), pp. 519-557. Rio de Janeiro to Antwerp, “bulky” freight index, interpolated for the periods 1831-1841 and 1843-1848 to extend backwards Klovland's 1848 figure.

1848-1856: J. T. Klovland, ‘A Repeat Sailings Index of Ocean Freight Rates for the 1850s,’ Discussion paper SAM 40 2006, Department of Economics, Norwegian School of Economics and Business Administration, 2006. Rio de Janeiro to the British Channel.

1857-1875, 1877-1878: C. Knick Harley, ‘Coal Exports and British Shipping, 1850-1913,’ *Explorations in Economic History*, 26 (1989), pp. 311-338. Rio to Britain.

1876: we take the arithmetic mean of monthly rates from Rio de Janeiro to the British Channel as found in the *Retrospectivo Commercial* (various years) of the *Jornal do Commercio* (various years)*.*

1879-1892: we take the arithmetic mean of monthly freight rates from Rio de Janeiro to London as found in the *Retrospectivo Commercial* of the *Jornal do Commercio.*

1893-1897: we extend the series using the East Latin American nominal freight index for grain from Saif I. Shah Mohammed and Jeffrey G. Williamson, ‘Freight rates and productivity gains in British tramp shipping 1869–1950,’ *Explorations in Economic History,* 41 (2004), pp. 172–203.

1898-1913: we take the arithmetic mean of monthly freight rates from Rio de Janeiro and Santos to London as found in *Wileman's Brazilian Review* (various years).

Cotton: 1821-1849: C. Knick Harley, ‘Ocean Freight Rates and Productivity, 1740-1913: The Primacy of Mechanical Invention Reaffirmed,’ *The Journal of Economic History*, 48: 4 (1988), pp. 851-876. New Orleans to Liverpool. The period 1821-1824 has been interpolated using the 1820 and 1825 values.

1850-1868: Schöller, 'L'évolution séculaire.' Rio de Janeiro to Antwerp, “light” freight index.

1869-1877: we extend the series backwards using the East North American nominal freight index of grain from Mohammed and Williamson, 'Freight rates and productivity gains.'

1878-1897: we extend the series backwards using the North American Gulf Coast cotton nominal freight index of cotton from Mohammed and Williamson, 'Freight rates and productivity gains.'

1885: we cover this year using the East Latin American nominal freight index of grain from Mohammed and Williamson, 'Freight rates and productivity gains.'

1898-1913: we take the arithmetic mean of monthly freight rates from Pernambuco to Liverpool as found in *Wileman's Brazilian Review*.

Hides: 1821-1847: Schöller, 'L'évolution séculaire.' Rio de Janeiro to Antwerp, “bulky” freight index, interpolated for the periods 1831-1841 and 1843-1848 to match Klovland's 1848 figure.

1848-1861: Klovland, 'A Repeat Sailings Index.' Rio-Grande to the United Kingdom.

1862-1868: we have extended Klovland's series using Schöller's Rio de Janeiro to Antwerp, “bulky” freight index.

1869: we take the arithmetic mean of 1868 and 1870.

1870-1872: we take the arithmetic mean of the minimum and maximum rates from Rio Grande do Sul to the United Kingdom from E. A. V. Angier, *Fifty year' freights* (London: Fairplay, 1920).

1874, 1876-1892: we take the arithmetic mean of monthly rates from Rio de Janeiro to the British Channel as found in the *Retrospectivo Commercial* of the *Jornal do Commercio.* These rates are not explicitly denoted as Hides (Couros) until 1891.

1875: Harley, 'Coal Exports and British Shipping,' coffee, Rio to Britain.

1893-1897: we extend the series using the East Latin American nominal freight index of grain from Mohammed and Williamson, 'Freight rates and productivity gains.'

1898-1900, 1902-1903: we take the arithmetic mean of monthly freight rates from Rio de Janeiro to the British Channel as found in *Wileman's Brazilian Review*.

1901: we take the arithmetic mean of 1900 and 1902.

1904-1913: we extend using the East Latin American nominal freight index of grain from Mohammed and Williamson, 'Freight rates and productivity gains.'

Rubber: We use the freight rates for coffee.

Sugar: 1821-1868: Schöller, 'L'évolution séculaire.' Rio de Janeiro to Antwerp, “bulky” freight index, interpolated for the periods 1831-1841 and 1843-1850.

1869-1897: we extend the series backwards using the East Latin American nominal freight index of grain from Mohammed and Williamson, 'Freight rates and productivity gains.'

1898-1913: we take the arithmetic mean of monthly freight rates from Pernambuco to Liverpool as found in *Wileman's Brazilian Review*.

*Insurance*:

Schöller, 'L'évolution séculaire,' Statistical appendix. We use the insurance quotes for Brazil from 1821-1867 and for Rio de la Plata from 1880-1910. The intervening period, 1868-1879, has been interpolated.

*Table 1A: Official quantities and corrected prices of Brazil’s principal export commodities, 1821-1913.*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Cacao** | **Coffee** | **Cotton** | **Hides** | **Rubber** | **Sugar** |  | **Other** |
| Year | official | corrected | official | corrected | official | corrected | official | corrected | official | corrected | official | corrected |  | corrected | official |
|  | Quantity, tonnes | fob prices, pounds sterling | Quantity, tonnes | fob prices, pounds sterling | Quantity, tonnes | fob prices, pounds sterling | Quantity, tonnes | fob prices, pounds sterling | Quantity, tonnes | fob prices, pounds sterling | Quantity, tonnes | fob prices, pounds sterling |  | Current prices | Current prices |
| **1821** | 1016 | 63,79 | 7740 | 107,24 | 10631 | 61,52 | 8535 | 60,20 |  |  | 35168 | 29,24 |  | 901071 | 976000 |
| **1822** | 684 | 54,42 | 11160 | 102,50 | 12989 | 50,64 | 9431 | 68,39 |  |  | 36694 | 27,25 |  | 913275 | 837000 |
| **1823** | 714 | 55,36 | 13560 | 108,24 | 12593 | 51,45 | 6343 | 70,65 |  |  | 53549 | 29,28 |  | 1153343 | 944000 |
| **1824** | 1251 | 61,38 | 16440 | 69,54 | 12006 | 57,18 | 6128 | 67,75 |  |  | 44976 | 28,82 |  | 1138784 | 922000 |
| **1825** | 1545 | 62,54 | 13440 | 67,29 | 15441 | 79,02 | 7650 | 71,57 |  |  | 35485 | 36,58 |  | 984685 | 901000 |
| **1826** | 1614 | 54,11 | 19080 | 57,33 | 5123 | 40,87 | 8916 | 65,60 |  |  | 35410 | 28,77 |  | 670126 | 607000 |
| **1827** | 1996 | 44,08 | 25800 | 53,18 | 10101 | 42,41 | 7112 | 72,47 |  |  | 50483 | 33,64 |  | 512957 | 407000 |
| **1828** | 667 | 46,91 | 27120 | 49,63 | 13549 | 46,26 | 5415 | 78,32 |  |  | 67641 | 32,52 |  | 527777 | 424000 |
| **1829** | 1221 | 44,96 | 27540 | 46,74 | 13544 | 40,10 | 9629 | 60,60 |  |  | 55059 | 28,45 |  | 356029 | 279000 |
| **1830** | 654 | 43,25 | 28800 | 44,83 | 16196 | 49,75 | 8460 | 59,42 |  |  | 65386 | 25,76 |  | 364573 | 261000 |
| **1831** | 858 | 29,99 | 32940 | 45,28 | 15703 | 39,22 | 10416 | 63,79 |  |  | 62996 | 24,84 |  | 487374 | 339000 |
| **1832** | 1599 | 35,55 | 43020 | 51,69 | 10409 | 48,29 | 10575 | 60,94 |  |  | 75873 | 26,66 |  | 577408 | 448000 |
| **1833** | 1396,5 | 37,09 | 67230 | 52,90 | 13519 | 63,23 | 10709 | 61,25 |  |  | 73394,5 | 29,71 |  | 818681 | 613000 |
| **1834** | 1020 | 34,03 | 62730 | 50,39 | 11834 | 65,48 | 9775 | 58,79 |  |  | 63997,5 | 30,56 |  | 1061215 | 769000 |
| **1835** | 1090,5 | 41,60 | 60660 | 50,64 | 12374 | 75,12 | 12395,5 | 51,96 |  |  | 77263 | 34,36 |  | 1540183 | 1049000 |
| **1836** | 1279 | 35,86 | 58860 | 49,47 | 13022,5 | 68,77 | 12921,5 | 51,50 |  |  | 77854,5 | 38,77 |  | 1623181 | 1085500 |
| **1837** | 1998 | 36,52 | 61770 | 43,53 | 11819 | 43,89 | 7443,5 | 49,46 |  |  | 81526 | 30,00 |  | 993224 | 673000 |
| **1838** | 2870,5 | 36,55 | 74460 | 43,79 | 10212 | 44,11 | 5218,5 | 52,07 |  |  | 78973,5 | 31,92 |  | 826932 | 500000 |
| **1839** | 2963,5 | 33,94 | 81480 | 45,06 | 9825 | 54,51 | 8543 | 55,74 |  |  | 74688 | 31,98 |  | 932506 | 607000 |
| **1840** | 2955,5 | 39,19 | 78660 | 43,86 | 10208,5 | 38,57 | 8595,5 | 61,39 |  |  | 89897,5 | 36,02 |  | 994709 | 631500 |
| **1841** | 2811 | 44,70 | 78060 | 43,63 | 9779,5 | 43,00 | 9943,5 | 57,07 |  |  | 85084,5 | 31,86 |  | 1108597 | 686000 |
| **1842** | 2451,5 | 52,87 | 84210 | 38,21 | 9725 | 36,05 | 11879 | 51,23 |  |  | 74150,5 | 28,39 |  | 1154902 | 726500 |
| **1843** | 2506,5 | 42,37 | 89550 | 33,83 | 10873 | 31,95 | 15041 | 49,30 |  |  | 79957 | 29,95 |  | 1223880 | 725000 |
| **1844** | 2368,5 | 42,67 | 91980 | 31,31 | 11915 | 34,86 | 18249 | 49,32 |  |  | 96597,5 | 29,22 |  | 1200006 | 696000 |
| **1845** | 2442,5 | 40,96 | 97440 | 29,65 | 10809 | 27,74 | 19879 | 48,21 |  |  | 107127,5 | 32,59 |  | 1207153 | 717000 |
| **1846** | 2978,5 | 42,43 | 123300 | 27,92 | 9211 | 35,73 | 20465,5 | 48,39 |  |  | 104355,5 | 30,09 |  | 1187705 | 745500 |
| **1847** | 2693,5 | 42,37 | 141810 | 28,63 | 9166,5 | 45,78 | 19281 | 44,13 |  |  | 109184,5 | 25,48 |  | 1515502 | 983500 |
| **1848** | 3031 | 40,89 | 133380 | 25,11 | 10973 | 29,42 | 18174 | 39,10 |  |  | 119516 | 19,15 |  | 1576987 | 1189000 |
| **1849** | 3917 | 42,72 | 106770 | 31,29 | 14927,5 | 34,25 | 16199,5 | 37,41 |  |  | 120668 | 21,52 |  | 1392673 | 953500 |
| **1850** | 3993,5 | 34,25 | 118140 | 41,25 | 15181,5 | 55,97 | 16534,5 | 40,77 | 1137 | 116,40 | 124067 | 23,37 |  | 1259727 | 821000 |
| **1851** | 4061 | 33,42 | 144660 | 32,66 | 13173,5 | 43,01 | 16977 | 49,55 | 1483,5 | 116,65 | 121266,5 | 19,95 |  | 1298359 | 1058500 |
| **1852** | 3825 | 28,98 | 143010 | 35,48 | 14020 | 41,79 | 16201 | 52,53 | 1591 | 118,32 | 134380 | 17,39 |  | 1472102 | 1157000 |
| **1853** | 4012 | 30,36 | 136800 | 39,24 | 13945,5 | 46,06 | 17203 | 61,86 | 1961 | 118,43 | 138248 | 19,44 |  | 1754004 | 1175000 |
| **1854** | 3407 | 30,84 | 159600 | 40,69 | 13009 | 48,88 | 17380 | 53,05 | 2590 | 212,20 | 119440,5 | 17,23 |  | 1562295 | 1300500 |
| **1855** | 2290,5 | 33,75 | 181290 | 38,56 | 13968 | 48,24 | 16682,5 | 54,24 | 2496,5 | 139,96 | 114873 | 22,68 |  | 1780414 | 1399500 |
| **1856** | 2972,5 | 35,56 | 181260 | 40,12 | 15516,5 | 51,93 | 17027,5 | 71,85 | 1884,5 | 124,72 | 111034 | 24,10 |  | 1911455 | 1587000 |
| **1857** | 3575,5 | 67,43 | 167070 | 41,98 | 15441,5 | 64,69 | 16121,5 | 73,09 | 1625 | 112,06 | 109633,5 | 30,65 |  | 2047147 | 1607000 |
| **1858** | 3876 | 44,80 | 153450 | 35,55 | 15844,5 | 63,24 | 15151 | 58,96 | 1663 | 98,69 | 131511,5 | 22,66 |  | 1628436 | 1437000 |
| **1859** | 3657 | 42,07 | 157770 | 44,56 | 14095,5 | 64,78 | 15436,5 | 70,91 | 2125,5 | 184,09 | 123328 | 21,40 |  | 1838138 | 1557500 |
| **1860** | 3331 | 48,65 | 182850 | 51,92 | 10188 | 62,84 | 16398,5 | 67,62 | 2505,5 | 213,31 | 77764 | 22,23 |  | 1923972 | 1638500 |
| **1861** | 3233 | 50,37 | 179730 | 48,19 | 10891,5 | 77,16 | 18689,5 | 59,09 | 2379 | 137,20 | 110286 | 19,02 |  | 2091020 | 1777500 |
| **1862** | 3429 | 46,02 | 136680 | 57,38 | 14374,5 | 141,74 | 19414,5 | 54,04 | 2670,5 | 158,03 | 149945 | 17,99 |  | 2538263 | 2013500 |
| **1863** | 3659 | 40,31 | 124200 | 60,54 | 17869 | 181,93 | 20504 | 46,75 | 3237,5 | 153,20 | 119828,5 | 17,89 |  | 2143784 | 1854500 |
| **1864** | 3320 | 37,94 | 139470 | 56,82 | 22576 | 228,94 | 21662 | 49,63 | 3377,5 | 141,51 | 101288 | 22,84 |  | 2318114 | 1795000 |
| **1865** | 2899,5 | 34,82 | 152430 | 54,64 | 33966,5 | 156,01 | 22203,5 | 43,17 | 3407,5 | 142,37 | 119439,5 | 18,35 |  | 2257438 | 1800500 |
| **1866** | 2746 | 49,98 | 167790 | 48,39 | 41029,5 | 138,18 | 22522,5 | 42,76 | 4096,5 | 184,47 | 108956,5 | 16,75 |  | 2442153 | 2046000 |
| **1867** | 3386 | 44,56 | 201540 | 44,94 | 40572 | 90,76 | 21312,5 | 45,78 | 4838,5 | 169,04 | 105239,5 | 18,13 |  | 2924422 | 2524000 |
| **1868** | 3343 | 36,92 | 220890 | 43,62 | 40491,5 | 85,83 | 22020,5 | 50,11 | 4808,5 | 170,09 | 94487 | 19,30 |  | 3640051 | 2791500 |
| **1869** | 3690 | 35,08 | 207510 | 42,12 | 41170,5 | 97,79 | 23487,5 | 45,89 | 4720,5 | 196,35 | 101587,5 | 20,43 |  | 3145693 | 2460500 |
| **1870** | 4524,5 | 34,42 | 208260 | 44,39 | 43980 | 82,21 | 22476 | 48,60 | 4912 | 237,39 | 127079 | 19,44 |  | 2181765 | 1854000 |
| **1871** | 5009 | 33,57 | 236610 | 46,23 | 61726,5 | 64,42 | 21635,5 | 48,84 | 5368,5 | 242,16 | 144611,5 | 21,16 |  | 2521042 | 1877500 |
| **1872** | 4937 | 42,26 | 226710 | 59,33 | 62235,5 | 73,28 | 23632 | 53,91 | 5380,5 | 246,37 | 184354,5 | 22,45 |  | 2709636 | 1975500 |
| **1873** | 4469,5 | 35,88 | 188130 | 71,10 | 51091 | 73,23 | 23595 | 57,80 | 5882 | 239,94 | 175389,5 | 19,05 |  | 1918211 | 1730000 |
| **1874** | 4976 | 41,11 | 198810 | 76,73 | 49894 | 64,59 | 22102 | 60,11 | 6265,5 | 222,38 | 180967,5 | 18,34 |  | 1917120 | 1547000 |
| **1875** | 5252,5 | 40,80 | 217800 | 74,09 | 35668,5 | 60,78 | 22762 | 58,73 | 5785 | 222,55 | 164375,5 | 18,38 |  | 2096900 | 1660000 |
| **1876** | 5496 | 45,06 | 208800 | 70,40 | 29322 | 53,03 | 22167 | 46,49 | 5955,5 | 213,69 | 152473 | 17,62 |  | 2081726 | 1791000 |
| **1877** | 5233,5 | 58,10 | 221880 | 71,97 | 24310,5 | 49,74 | 18805 | 55,00 | 6409 | 199,77 | 176708 | 23,66 |  | 3492758 | 2262500 |
| **1878** | 4853 | 76,46 | 262410 | 70,34 | 21620,5 | 48,99 | 19673,5 | 50,05 | 6549 | 176,60 | 158698,5 | 18,02 |  | 3594272 | 2075000 |
| **1879** | 5019 | 75,33 | 225660 | 59,75 | 18421,5 | 47,19 | 24170,5 | 48,60 | 6668 | 231,21 | 181659,5 | 16,91 |  | 2381288 | 2280000 |
| **1880** | 5888,5 | 61,57 | 188340 | 65,38 | 12037,5 | 51,70 | 23400,5 | 51,93 | 6801,5 | 310,75 | 188859,5 | 18,94 |  | 3642310 | 3862000 |
| **1881** | 7153 | 51,50 | 232230 | 53,08 | 17317,5 | 50,69 | 20891 | 54,01 | 6781,5 | 298,86 | 204013,5 | 19,37 |  | 4084661 | 3890500 |
| **1882** | 7132 | 50,85 | 323040 | 46,78 | 27740,5 | 54,43 | 15727,5 | 47,98 | 7170 | 364,23 | 212712 | 18,14 |  | 2440464 | 2288000 |
| **1883** | 6860 | 62,28 | 360090 | 46,85 | 33125 | 47,52 | 11250 | 51,42 | 8326 | 385,27 | 254015 | 16,67 |  | 548986 | 1474000 |
| **1884** | 6585,5 | 65,28 | 346620 | 44,83 | 28495 | 51,09 | 12225 | 51,40 | 8528 | 265,08 | 301843 | 13,16 |  | 1003278 | 1634000 |
| **1885** | 5213 | 68,82 | 350220 | 43,70 | 19679,5 | 49,93 | 16295 | 48,50 | 8044,5 | 236,79 | 193355 | 11,31 |  | 1923919 | 1924500 |
| **1886** | 5576 | 68,76 | 345330 | 46,25 | 19167 | 45,66 | 16570 | 44,73 | 8413,5 | 268,80 | 169204,5 | 11,68 |  | 1629647 | 1965500 |
| **1887** | 6320 | 58,48 | 283890 | 63,62 | 27487 | 43,51 | 14017 | 45,07 | 11016 | 258,30 | 207660 | 9,97 |  | 2207503 | 2389500 |
| **1888** | 10107 | 63,46 | 206640 | 55,78 | 22094 | 44,11 | 18755 | 37,84 | 17062 | 276,47 | 158496 | 11,48 |  | 1796509 | 2350477 |
| **1889** | 9042 | 61,91 | 335160 | 69,02 | 13575 | 46,03 | 22175 | 41,12 | 15990 | 263,45 | 105558 | 12,99 |  | 2350905 | 2862022 |
| **1890** | 6236 | 60,04 | 306540 | 68,21 | 12738 | 47,49 | 21464 | 39,83 | 15355 | 283,84 | 133908 | 10,76 |  | 1367371 | 2499754 |
| **1891** | 10094 | 62,99 | 322380 | 70,52 | 20143 | 44,87 | 23847 | 37,92 | 16650 | 266,74 | 184902 | 10,75 |  | 1222348 | 1995838 |
| **1892** | 6478 | 54,60 | 426540 | 68,10 | 11914 | 41,13 | 24750 | 32,59 | 18250 | 211,03 | 161872 | 10,98 |  | 2309612 | 1908745 |
| **1893** | 10059 | 62,44 | 318420 | 71,57 | 38937 | 40,14 | 18516 | 35,61 | 19050 | 228,64 | 103962 | 11,95 |  | 1201484 | 2081025 |
| **1894** | 8461 | 63,23 | 334920 | 70,15 | 27261 | 34,52 | 19165 | 32,52 | 19710 | 218,80 | 152398 | 10,36 |  | 1724115 | 1988592 |
| **1895** | 10509 | 64,62 | 403200 | 71,56 | 9510 | 33,85 | 21292 | 44,53 | 27794 | 225,91 | 163530 | 7,75 |  | 2565106 | 1988432 |
| **1896** | 8966 | 69,79 | 404640 | 76,47 | 7209 | 36,22 | 24642 | 42,64 | 24370 | 237,35 | 172886 | 8,68 |  | 2939801 | 1959248 |
| **1897** | 10467 | 55,27 | 567780 | 55,75 | 11500 | 34,15 | 27533 | 42,66 | 21621 | 240,62 | 127712 | 7,93 |  | 6587220 | 2342638 |
| **1898** | 11270 | 56,91 | 556020 | 34,01 | 8070 | 29,55 | 29146 | 47,72 | 21218 | 215,72 | 126484 | 8,49 |  | 6199376 | 2839069 |
| **1899** | 12792 | 50,34 | 586260 | 28,23 | 3738 | 30,71 | 31396 | 44,33 | 20790 | 274,49 | 50268 | 9,17 |  | 4048361 | 2490757 |
| **1900** | 15364 | 70,35 | 549300 | 34,22 | 20720 | 40,39 | 26452 | 41,84 | 24302 | 285,99 | 92188 | 9,37 |  | 2763989 | 3445492 |
| **1901** | 15682 | 68,72 | 885600 | 33,04 | 11765 | 44,96 | 23835 | 48,40 | 30241 | 321,53 | 187166 | 8,19 |  | 5577223 | 4095447 |
| **1902** | 20642 | 61,14 | 789420 | 30,95 | 32138 | 41,83 | 28792 | 50,36 | 28632 | 296,74 | 136757 | 5,88 |  | 5083639 | 4246609 |
| **1903** | 20900 | 55,97 | 775620 | 32,85 | 28236 | 56,92 | 30676 | 51,23 | 31717 | 341,44 | 21889 | 7,17 |  | 6380829 | 3716070 |
| **1904** | 23160 | 56,38 | 601500 | 35,57 | 13263 | 63,65 | 35959 | 58,02 | 31866 | 397,90 | 7861 | 7,20 |  | 3218315 | 3853147 |
| **1905** | 21090 | 49,12 | 649260 | 36,27 | 24082 | 64,37 | 29041 | 66,20 | 35393 | 446,74 | 37747 | 8,59 |  | 4769227 | 4349534 |
| **1906** | 25135 | 52,26 | 837960 | 32,89 | 31668 | 57,01 | 35053 | 70,69 | 34960 | 452,17 | 84948 | 5,37 |  | 3439804 | 5261154 |
| **1907** | 24397 | 91,50 | 940800 | 30,11 | 28036 | 63,64 | 34405 | 76,44 | 36490 | 423,50 | 12858 | 14,65 |  | 4090613 | 5665386 |
| **1908** | 32956 | 66,71 | 759480 | 32,65 | 3565 | 58,68 | 33975 | 75,84 | 38206 | 343,82 | 31577 | 9,14 |  | 4987180 | 4817807 |
| **1909** | 33818 | 49,96 | 1012860 | 33,04 | 9968 | 65,95 | 39680 | 76,46 | 39027 | 541,61 | 68483 | 9,15 |  | 3666568 | 5668645 |
| **1910** | 29158 | 50,81 | 583440 | 34,06 | 11160 | 89,21 | 36755 | 82,28 | 38547 | 634,20 | 58824 | 11,18 |  | 716616 | 6365654 |
| **1911** | 34994 | 52,19 | 675480 | 52,74 | 14647 | 65,73 | 34630 | 82,37 | 36547 | 487,02 | 36208 | 8,58 |  | 1195810 | 5905847 |
| **1912** | 30492 | 54,66 | 724800 | 62,63 | 16774 | 61,66 | 39444 | 92,21 | 42286 | 432,05 | 4772 | 12,26 |  | 4360625 | 9649240 |
| **1913** | 29759 | 63,29 | 796080 | 57,09 | 37424 | 60,52 | 44969 | 114,61 | 36232 | 310,35 | 5371 | 9,05 |  | 8482550 | 6947840 |

*Figure 1B: Sources of complete price series, by commodity, 1821-1913.*

*Appendix 2: Export Price Index*

We construct a Fisher index of Brazilian export prices, calculated as the geometric mean of the product of the Paasche and Laspeyres indices:

$$EPI\_{it}\sqrt{\frac{\sum\_{}^{}P\_{jt}\*Q\_{jt}}{\sum\_{}^{}P\_{j, 1880-82}\*Q\_{jt}}\*\frac{\sum\_{}^{}P\_{jt}\*Q\_{j,1880-82}}{\sum\_{}^{}P\_{j,1880-82}\*Q\_{j,1880-82}}}$$

where EPIit is the export price index of country *i* at time *t*, Pjt is the unit value of commodity *j* at time *t*, and Qjt is the quantity in metric tons of commodity *j* at time *t*.We have used the average of the years 1880-82 as a reference period because it represents the complete cross section of Brazil's export commodity structure. Data for prices in quantities are listed in appendix 1.

*Appendix 3: Constant market share analysis*

The constant market share analysis for exports on the aggregate- and commodity-level takes the form

$$V\_{j,t+1}-V\_{j,t}=\left(R\_{j,t-t+1}\*V\_{j,t}\right)+[V\_{j,t+1}-V\_{j,t}-\left(R\_{j,t-t+1}\*V\_{j,t}\right)]$$

where Vj,t+1 is Brazil's exports of commodity *j* in period *t+1*, Vj,t is Brazil's exports of commodity *j* in period *t*, and Rj,t-t+1 is the percentage increase of total world exports of commodity *j* from period *t* to period *t+1.* For the aggregate-level we use total export values in constant prices and for the commodity-level we use total quantities. Data sources are given in Appendix 1.

*Appendix 4: Commodity composition of exports, corrected series, 1821-1913*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Cacao** | **Coffee** | **Cotton** | **Hides** | **Rubber** | **Sugar** | **Other** |
| **1821/29** | 1,4% | 25,7% | 13,5% | 11,6% | 0,0% | 30,4% | 17,4% |
| **1830/39** | 0,8% | 37,4% | 9,9% | 8,0% | 0,0% | 31,5% | 12,3% |
| **1840/49** | 1,4% | 38,6% | 4,5% | 8,7% | 0,0% | 32,1% | 14,7% |
| **1850/59** | 1,1% | 48,2% | 6,2% | 7,7% | 2,1% | 21,6% | 13,2% |
| **1860/69** | 0,8% | 47,0% | 17,9% | 5,7% | 3,3% | 11,5% | 13,8% |
| **1870/79** | 1,0% | 55,8% | 10,6% | 4,7% | 5,3% | 12,8% | 9,9% |
| **1880/89** | 1,7% | 60,1% | 4,2% | 3,2% | 10,9% | 11,4% | 8,5% |
| **1890/99** | 1,6% | 68,0% | 1,7% | 2,8% | 13,8% | 3,8% | 8,3% |
| **1900/09** | 3,0% | 53,6% | 2,4% | 4,1% | 26,5% | 1,2% | 9,3% |
| **1912/13** | 2,4% | 61,0% | 2,2% | 5,9% | 19,8% | 0,1% | 8,6% |

*Appendix 5: Corrected series of Brazilian exports, 1821-1913*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Year* | *Corrected,* *current sterling prices* | *Corrected,**constant sterling prices* | *Official series, current sterling* | *Export price index,* *(1913=1)* | *Year* | *Corrected,* *current sterling prices* | *Corrected,**Constant sterling prices* | *Official series, current sterling* | *Export price index,* *(1913=1)* |
| 1821 | 3992039 | 2572004 | 4324000 | 1,55 | 1868 | 20618179 | 24407851 | 15838500 | 0,84 |
| 1822 | 4397251 | 2960671 | 4030000 | 1,49 | 1869 | 20122427 | 23397839 | 14902000 | 0,86 |
| 1823 | 5324439 | 3356143 | 4358000 | 1,59 | 1870 | 19926969 | 22863724 | 15446000 | 0,87 |
| 1824 | 4756459 | 3758208 | 3851000 | 1,27 | 1871 | 23021259 | 26067328 | 17264000 | 0,88 |
| 1825 | 5051293 | 3612560 | 4622000 | 1,40 | 1872 | 27666967 | 26169762 | 20740500 | 1,06 |
| 1826 | 3664166 | 3270944 | 3319000 | 1,12 | 1873 | 25311086 | 22154798 | 21506000 | 1,14 |
| 1827 | 4615356 | 4058387 | 3662000 | 1,14 | 1874 | 26639788 | 22631652 | 21506000 | 1,18 |
| 1828 | 5155786 | 4617021 | 4142000 | 1,12 | 1875 | 26260275 | 22820214 | 21606000 | 1,15 |
| 1829 | 4391021 | 4442287 | 3441000 | 0,99 | 1876 | 23573242 | 21801217 | 20696500 | 1,08 |
| 1830 | 4676596 | 4868315 | 3348000 | 0,96 | 1877 | 27469958 | 23784465 | 19818000 | 1,15 |
| 1831 | 4849295 | 5218698 | 3373000 | 0,93 | 1878 | 28484990 | 26126631 | 19285500 | 1,09 |
| 1832 | 6027982 | 5842151 | 4677000 | 1,03 | 1879 | 22899803 | 23585853 | 19648500 | 0,97 |
| 1833 | 8118696 | 7505343 | 6079000 | 1,08 | 1880 | 23847624 | 22205975 | 20519000 | 1,07 |
| 1834 | 7562365 | 7143575 | 5480000 | 1,06 | 1881 | 24763859 | 26244612 | 20193500 | 0,94 |
| 1835 | 8885785 | 7927859 | 6052000 | 1,12 | 1882 | 26651016 | 30343694 | 18258000 | 0,88 |
| 1836 | 9160393 | 7980148 | 6126000 | 1,15 | 1883 | 27439695 | 31476900 | 18435500 | 0,87 |
| 1837 | 7087605 | 7470553 | 4802500 | 0,95 | 1884 | 25289079 | 32143911 | 19498500 | 0,79 |
| 1838 | 7435775 | 7728150 | 4496000 | 0,96 | 1885 | 23452261 | 31201414 | 17307000 | 0,75 |
| 1839 | 8104504 | 8243917 | 5275500 | 0,98 | 1886 | 23838395 | 30215059 | 17806000 | 0,79 |
| 1840 | 8720049 | 8561917 | 5536000 | 1,02 | 1887 | 27380770 | 28803073 | 21954000 | 0,95 |
| 1841 | 8338722 | 8596812 | 5160000 | 0,97 | 1888 | 22184701 | 25297762 | 21714000 | 0,88 |
| 1842 | 7566876 | 8933528 | 4760000 | 0,85 | 1889 | 33164431 | 31544998 | 28552000 | 1,05 |
| 1843 | 7842962 | 9773962 | 4646000 | 0,80 | 1890 | 29910918 | 29087831 | 26382000 | 1,03 |
| 1844 | 8318146 | 10639723 | 4824500 | 0,78 | 1891 | 32828939 | 31734450 | 27136000 | 1,03 |
| 1845 | 8945055 | 11271168 | 5313000 | 0,79 | 1892 | 38636345 | 38787430 | 30854000 | 1,00 |
| 1846 | 9216461 | 12525413 | 5785000 | 0,74 | 1893 | 32437691 | 31339765 | 32007000 | 1,04 |
| 1847 | 9742514 | 14018469 | 6322500 | 0,69 | 1894 | 33210631 | 33342289 | 30491000 | 1,00 |
| 1848 | 8372358 | 14502509 | 6312500 | 0,58 | 1895 | 40912773 | 40548500 | 32586000 | 1,01 |
| 1849 | 8615294 | 12551218 | 5898500 | 0,69 | 1896 | 43106203 | 39919179 | 28333000 | 1,08 |
| 1850 | 10826102 | 13383021 | 7026500 | 0,81 | 1897 | 46603278 | 54054726 | 25883000 | 0,86 |
| 1851 | 10158828 | 15155465 | 8102000 | 0,67 | 1898 | 33030315 | 54826086 | 25019000 | 0,60 |
| 1852 | 10619190 | 15600982 | 8250500 | 0,68 | 1899 | 28916534 | 51800507 | 25545000 | 0,56 |
| 1853 | 11869461 | 15703700 | 8769500 | 0,76 | 1900 | 32396501 | 49983513 | 33163000 | 0,65 |
| 1854 | 12327214 | 16231558 | 9780000 | 0,76 | 1901 | 48851166 | 76634997 | 40622000 | 0,64 |
| 1855 | 13381291 | 17551015 | 10640000 | 0,76 | 1902 | 42870088 | 72189481 | 36437000 | 0,59 |
| 1856 | 14229477 | 17527328 | 11995500 | 0,81 | 1903 | 47194129 | 71673308 | 36883000 | 0,66 |
| 1857 | 15020791 | 16503191 | 11909500 | 0,91 | 1904 | 41587285 | 56532977 | 39430000 | 0,74 |
| 1858 | 12296885 | 16280135 | 11020500 | 0,76 | 1905 | 48962164 | 63039965 | 44643000 | 0,78 |
| 1859 | 14060570 | 16177915 | 11582500 | 0,87 | 1906 | 52864478 | 74848068 | 53059000 | 0,71 |
| 1860 | 15592594 | 16390670 | 12517000 | 0,95 | 1907 | 54702252 | 75599514 | 54177000 | 0,72 |
| 1861 | 15283306 | 17492169 | 13049000 | 0,87 | 1908 | 48194210 | 69433012 | 44155000 | 0,69 |
| 1862 | 16745363 | 16301389 | 13140500 | 1,03 | 1909 | 64271161 | 83974276 | 63724000 | 0,77 |
| 1863 | 16658694 | 15113493 | 14158000 | 1,10 | 1910 | 51191823 | 57003771 | 63092000 | 0,90 |
| 1864 | 19403825 | 16446661 | 15312500 | 1,18 | 1911 | 60574413 | 60720413 | 66839000 | 1,00 |
| 1865 | 19622053 | 18643246 | 16051500 | 1,05 | 1912 | 74424514 | 66781527 | 74649000 | 1,11 |
| 1866 | 19912794 | 20498054 | 16078000 | 0,97 | 1913 | 74527019 | 74527019 | 65451000 | 1,00 |
| 1867 | 19517299 | 22731914 | 16556000 | 0,86 |

1. Due to changes made during the final revision of this article, the series presented here differs slightly from that presented in Christopher David Absell and Antonio Tena-Junguito, ‘Brazilian export growth and divergence in the tropics during the nineteenth century,’ *Universidad Carlos III de Madrid Working Papers in Economic History WP 15-03*, May 2015. These changes, however, do not affect the general argument of the paper. [↑](#footnote-ref-1)