CHAPTER 9

Terms of Trade

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9.1 Prelude

9.1.1 New Historical Balance of Payments

The entirety of Officer (2021) constitutes a new historical annual balance of payments for the United States. The beginning year is 1790, the first year of sufficient data; the ending year is 1919, the first year of the official balance of payments. For the terms of trade, the relevant parts of the balance of payments are the goods account and the services account.

Components of the goods account are merchandise, non-monetary silver, ships, and slaves.[1] Components of the services account are transportation (freight [direct trade and carrying trade], port charges, and charter), travel (oceanic and overland), fares (sailing ships and steamships), financial transactions (marine insurance and bankers' commissions), military expenditures, and non-imported slaves.

The balance of goods is "exports *minus* imports" of goods; the balance of services is exports *minus* imports of services; the balance of goods and services is the algebraic sum of balance of goods and balance of services.

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Equivalent terms to "exports *minus* imports" are net exports, credits *minus* debits, net credits, receipts *minus* payments, and net receipts.

Merchandise silver is positive from 1853 onward.[2] Discernible imports of enslaved persons end in 1820 (there are no data on slave exports); but purchases of non-imported slaves (a debit) continue intermittently to 1860.[3] There are sales (exports) of ships but no counted purchases (imports). Transit (overland carrying trade) payments begin in 1886 (Officer 2021, p. 236). Military expenditures abroad (there are no receipts) are recorded for the Mexican–American War (1846–1848) and then continuously from the Spanish-American and Philippine-American Wars (1898 onward).

9.1.2 Openness of Economy

Did the U.S. economy become more or less open over time? The usual way to measure openness is to take ratios of trade to GDP. Previous authors confined trade to merchandise. It is more logical to include trade of both goods and services in the numerator. Officer (2021, p. 336) exhibits the ratios of total goods-and-services exports and total goods-and-services imports to GDP. There is co-movement of the two ratios, and both show a trend decline until about 1910; but the subsequent sharp jump in the export ratio, with World War I, is not followed by imports.

The conventional data and narrative are not inconsistent with these findings.[4] However, the ratios here are naturally higher, with trade inclusive of services. This makes the United States much more of an open economy throughout 1790–1913 than, for example, the figures shown in Lipsey (2000, p. 691).

An even higher degree of openness is achieved by taking the ratio of total (exports *plus* imports) goods-and-services trade to GDP, with both numerator and denominator measured in *real* terms.[5] The series, shown in the fifth column of Table 9.1, is broadly similar to the exports and imports GDP ratios; but the level is higher. As a single and comprehensive measure, it summarizes openness better than the other ratios.

No matter the measure, openness drops sharply in 1808, after the Embargo Act, and never again reaches the high level of the pre-Embargo years.

Table 9.1 Terms of trade and related series

Year	*Terms of trade (1790 = 100)*			*Ratio of goods-and-services trade to GDP*		*Percent of services in real trade*	
	Goods	*Services*	*Goods and services*	*1790 = 100*	*Percent*	*Imports*	*Exports*
1790	100	100	100	100	26.41	14.14	5.17
1791	81	116	85	106	28.08	13.47	5.16
1792	79	112	85	107	28.23	13.83	6.08
1793	93	128	103	110	29.02	15.46	7.28
1794	97	107	105	113	29.96	13.24	8.59
1795	133	86	133	132	34.84	10.71	10.92
1796	137	77	134	139	36.83	11.08	12.56
1797	142	75	138	124	32.66	13.12	14.97
1798	171	70	160	119	31.37	13.51	17.27
1799	159	68	152	127	33.64	13.73	16.77
1800	127	75	130	154	40.77	10.77	11.53
1801	134	72	134	164	43.25	9.89	11.08
1802	123	68	121	133	35.24	11.10	10.78
1803	119	76	119	117	30.85	11.59	9.80
1804	117	73	118	137	36.30	11.39	11.14
1805	118	72	119	156	41.19	10.79	11.86
1806	116	73	118	171	45.16	10.49	10.99
1807	113	82	119	155	41.05	10.72	10.36
1808	98	90	109	66	17.30	8.90	8.91
1809	99	85	106	91	24.09	10.89	8.35
1810	108	81	113	95	25.14	11.02	8.89
1811	111	83	114	74	19.50	12.51	8.27
1812	95	104	104	53	13.93	14.48	8.84
1813	73	120	94	25	6.67	37.49	9.65
1814	69	116	83	22	5.90	29.03	9.10
1815	114	72	113	59	15.48	11.98	10.72
1816	159	50	142	76	20.02	9.54	12.86
1817	166	40	143	67	17.70	8.31	12.61
1818	155	52	140	67	17.69	9.32	13.41
1819	135	45	121	64	16.98	8.23	11.39
1820	118	60	113	67	17.65	8.81	9.46
1821	120	52	113	62	16.27	7.67	8.84
1822	123	49	115	70	18.40	6.06	8.99

(continued)

Table 9.1 (continued)

Year	*Terms of trade (1790 = 100)*			*Ratio of goods-and-services trade to GDP*		*Percent of services in real trade*	
	Goods	*Services*	*Goods and services*	*1790 = 100*	*Percent*	*Imports*	*Exports*
1823	116	53	110	73	19.36	6.58	8.42
1824	135	47	125	70	18.54	6.01	9.10
1825	141	42	127	73	19.32	6.02	9.19
1826	117	51	110	72	19.05	6.56	7.71
1827	114	52	108	74	19.51	6.30	7.25
1828	116	48	108	69	18.18	5.63	7.25
1829	125	47	116	65	17.28	5.59	7.59
1830	125	46	117	67	17.79	4.70	7.08
1831	130	49	124	73	19.19	3.97	7.27
1832	140	43	129	69	18.14	3.89	7.39
1833	145	41	132	65	17.20	4.19	7.79
1834	160	42	143	67	17.61	5.07	8.62
1835	181	38	158	70	18.54	4.67	8.87
1836	174	44	155	72	18.93	5.27	9.52
1837	167	51	152	65	17.23	6.41	9.48
1838	168	55	154	63	16.66	6.81	8.69
1839	181	48	163	67	17.59	6.15	9.49
1840	136	60	128	76	20.00	8.86	7.52
1841	148	45	133	71	18.81	6.77	7.34
1842	135	51	124	68	17.96	7.62	6.88
1843	130	56	119	69	18.31	7.33	5.41
1844	131	54	122	72	18.92	6.00	6.15
1845	131	55	123	69	18.13	5.68	6.71
1846	156	78	147	66	17.54	11.75	7.88
1847	164	77	154	71	18.72	12.45	8.08
1848	151	118	150	76	19.97	10.91	7.51
1849	174	40	157	69	18.28	4.25	9.05
1850	198	47	177	71	18.79	5.84	10.79
1851	177	54	161	77	20.21	9.84	11.16
1852	148	46	134	78	20.59	8.50	9.43
1853	156	44	140	79	20.92	8.78	9.85
1854	174	46	155	73	19.22	8.42	10.25
1855	173	44	155	81	21.52	5.80	9.40

(continued)

Table 9.1 (continued)

Year	*Terms of trade (1790 = 100)*			*Ratio of goods-and-services trade to GDP*		*Percent of services in real trade*	
	Goods	*Services*	*Goods and services*	*1790 = 100*	*Percent*	*Imports*	*Exports*
1856	178	39	156	82	21.67	5.50	9.14
1857	178	38	155	68	18.03	6.52	9.14
1858	172	41	152	67	17.77	6.94	8.99
1859	168	42	147	72	19.04	8.31	8.69
1860	164	49	147	66	17.42	7.88	8.75
1861	170	57	154	50	13.17	9.39	9.23
1862	158	54	142	44	11.68	10.30	7.75
1863	138	49	124	46	12.05	12.22	7.71
1864	131	48	119	41	10.88	15.08	7.54
1865	129	70	122	49	12.82	17.02	5.71
1866	146	63	136	57	15.11	15.11	7.43
1867	171	58	154	52	13.79	14.06	8.17
1868	172	60	155	51	13.49	13.12	8.40
1869	166	57	150	55	14.50	12.74	8.04
1870	159	52	143	60	15.91	12.67	7.50
1871	163	53	146	65	17.10	12.16	7.22
1872	166	53	149	67	17.74	11.63	6.15
1873	170	52	151	66	17.33	11.21	5.40
1874	180	48	158	61	16.10	10.64	5.19
1875	188	48	165	59	15.66	10.31	5.42
1876	177	48	155	60	15.83	10.30	5.16
1877	161	49	143	61	16.05	9.90	4.36
1878	163	47	143	62	16.31	10.80	4.46
1879	172	47	152	59	15.56	11.48	5.06
1880	171	52	153	56	14.83	11.78	5.05
1881	184	52	164	50	13.15	11.41	5.26
1882	189	54	169	47	12.35	11.85	5.72
1883	191	54	169	48	12.69	12.46	6.35
1884	196	54	174	48	12.73	13.04	6.31
1885	199	52	175	50	13.19	12.42	5.73
1886	188	50	165	49	12.99	12.37	5.31
1887	181	50	159	47	12.39	13.07	5.21
1888	194	49	170	45	11.82	11.73	5.28

(continued)

Table 9.1 (continued)

Year	*Terms of trade (1790 = 100)*			*Ratio of goods-and-services trade to GDP*		*Percent of services in real trade*	
	Goods	*Services*	*Goods and services*	*1790 = 100*	*Percent*	*Imports*	*Exports*
1889	176	48	156	47	12.38	11.94	5.31
1890	175	49	155	46	12.09	12.50	4.92
1891	183	53	163	47	12.38	12.88	4.67
1892	178	54	159	47	12.41	12.28	5.15
1893	169	60	153	45	11.99	10.45	6.25
1894	164	48	145	50	13.30	11.13	4.26
1895	175	50	154	47	12.50	11.55	4.43
1896	170	50	151	53	13.92	11.64	4.46
1897	175	48	154	55	14.54	7.87	3.55
1898	173	71	159	53	13.90	12.65	3.51
1899	170	53	152	50	13.27	9.46	3.25
1900	179	61	162	49	13.02	11.22	3.99
1901	184	57	165	48	12.72	10.10	3.60
1902	193	57	171	47	12.31	10.29	3.88
1903	197	52	174	45	11.95	13.40	4.61
1904	194	52	171	48	12.77	14.86	4.29
1905	177	52	157	48	12.77	15.72	4.89
1906	182	54	162	49	13.05	15.96	6.12
1907	183	58	165	47	12.45	17.46	7.58
1908	196	55	172	53	14.01	14.86	5.30
1909	204	58	180	51	13.54	15.67	8.64
1910	206	57	181	52	13.67	16.99	8.41
1911	186	54	165	56	14.76	16.68	6.65
1912	181	54	160	57	14.99	17.38	7.33
1913	191	55	169	56	14.78	17.41	7.98
1914	199	60	177	56	14.83	14.27	6.91
1915	206	90	186	69	18.34	12.67	4.96
1916	215	78	191	70	18.58	13.04	6.17
1917	232	70	196	69	18.30	19.30	8.81
1918	242	107	229	64	16.80	37.17	11.11
1919	227	64	201	71	18.63	26.66	11.38

9.1.3 Goods-Versus-Services Economy

Did the United States transition from a goods economy to a services economy or vice-versa, *relative to the rest of the world* (the U.S. international-transactions partners)? Comparing the balance of services with the balance of goods is one approach. The balance of goods is in Officer (2021, column (2) of Table 5 in chapter 18); and the balance of services is column (3) *minus* column (2). The results are remarkable. Until 1852, the balance of services is in surplus in all but one year (1814), and that year it is trivially negative. From 1862 onward, the balance of services is in continuous deficit. In contrast, the balance of goods is in deficit in all but 11 years 1790–1839. After a run of surpluses in the 1840s, it is in deficit again until 1873—but thereupon, except for 1887–1888, uniformly in surplus. Most tellingly, the balance of goods exceeds the balance of services in only ten years until 1872, but in every year thereafter. The suggestion is that the United States may have had a comparative advantage in services relative to goods until the early 1870s, but that this relationship reversed itself in the final quarter of the nineteenth century.

The switch of the United States from comparative advantage in services to that in goods is also illustrated via comparison of the share of services in real exports of goods and services versus the share of services in real imports of goods and services. These shares presumably shed light on the U.S. goods-services production structure. The underlying real-trade series are constructed in Sect. 9.2, and the shares are exhibited in the sixth and seventh columns of Table 9.1.

The peaks in the import series are associated with the War of 1812 and the end of World War I. Interesting is the result for the antebellum period versus thereafter. During the antebellum period, the share of services in imports exceeds that of exports in only 22 of the 71 years. From 1861 onward, the services proportion of imports is *uniformly* higher than that of exports. The structure of the U.S. economy became strongly goods-oriented rather than services-oriented *relative to its trading partners*, and remained there throughout the postbellum period. The conventional statement that the United States became an "industrial power" (Lipsey, 2000, p. 717) is reflected in the behavior of international transactions.

9.2 Construction of Series

9.2.1 Method

Terms of trade (TT) are defined as the price of exports to the price of imports. TT for goods, services, and combined goods and services (the last by summation) are constructed in five steps.

1. Current-dollar series of six aggregates—exports and imports of goods, services, goods-and-services combined (the last by summation)—are assembled, via summation of individual components.
2. Real (constant [1919]-dollar) series for the same six aggregates are generated, again via summation of individual items in goods and services, now re-expressed in *constant (1919) dollars*. Two alternative techniques are utilized. Either a price index (base 1919 = 1) deflates the current-dollar series, or a direct physical measure of the item is applied. In the latter case, the physical measure is converted to constant-dollar form via linking to the current-dollar figure for 1919. Thus all constant-dollar series are expressed in "millions of 1919 dollars" (corresponding to current-dollar series in "millions of current dollars").
3. Implicit deflators for the six aggregates (goods, services, goods-and-services; exports, imports of each) are calculated as current-dollar/constant-dollar ratios.
4. For the three series–goods, services, goods-and-services combined: TT, base 1919 = 1, are computed as the export/import deflator ratio.
5. Division by the 1790 figure and multiplication by 100 converts the three TT series to base 1790 = 100. Details only of steps (1) and (2), and only for the individual components, warrant discussion.

9.2.2 Goods

Exports of goods are merchandise, nonmonetary silver, and ships; while imports of goods are merchandise, nonmonetary silver, and slaves. Current-dollar series of these components are in Officer (2021, pp. 123–126, 157–158).

Real exports of conventional merchandise are current-dollar exports divided by the price index of merchandise exports (Officer 2021, pp. 141–142). Real exports of merchandise silver are current-dollar exports divided by the price of silver (*Historical Statistics*, 1975, series M270). Real exports of ships are derived physically via tonnage sold to foreigners (Officer 2021, chapter 9, Sect. 1.2). The associated price of ship sales (dollars per ton) is generated in Officer 2021, p. 154.

Real imports of conventional merchandise are current-dollar imports divided by the price index of merchandise imports (Officer 2021, pp. 141–142). Real imports of merchandise silver are current-dollar imports divided by the price of silver. Current-dollar imports of slaves are total revenues from U.S.-ship and foreign-ship imports of slaves, that is, the sum of columns (1)–(3) in Officer 2021, chapter 9, Table 1. I convert year-1807 current-dollar imports to constant (1919) dollars via multiplication by the 1919/1807 ratio of the wholesale price index.[6] For the other years, that resulting figure is multiplied by the ratio of the number of imported slaves to the number in 1807.[7] Thus a physical measure of slave imports extends the "constant-dollar" 1807 figure to the other years; but, as with the current-dollar measure, it does not account for the value of the damaged and destroyed lives of the enslaved persons themselves.

9.2.3 Services

9.2.3.1 Transportation

Current-dollar series of components are in Officer (2021, pp. 229–231, 240). Deflators are developed using four sets of weights: 1860 weights for 1790–1860, 1879 weights for 1860–1879, 1913 weights for 1879–1913, 1919 weights for 1913–1919, with one-year linking of the resulting series segments. The year 1860 is the final antebellum year; 1879 marks the end of the greenback period, and 1913 is the final "normal year" before World War I. The weight of an item is the proportion of its value in total transportation exports or imports, as the case may be, and the corresponding price index is based at 1919 = 1.

For exports, the items and price indexes are (a) merchandise freight earnings: freight rate for merchandise exports; (b) specie freight earnings: specie freight rate; (c) port-costs earnings: wholesale price index; (d) transit earnings: overland-exports freight rate. For imports, they are (a) merchandise freight payments and charter payments: freight rate for

merchandise imports; (b) specie freight payments: specie freight rate; (c) port-costs payments: U.K. wholesale price index; (d) transit payments: freight rate for inland imports from Canada.[8]

9.2.3.2 Travel

Current-dollar series of components are in Officer (2021, pp. 249–252). Exports of travel services are deflated by the price index for foreign travel expenditures in the United States (Table 10.1, first column). Imports (U.S. travel expenditures abroad) are deflated by the weighted average of U.S.-resident-travel U.K. and Canada price indexes (Officer 2021, pp. 254–255), with weights the proportions of U.S.-citizen expenditures overseas versus in Canada and Mexico.

9.2.3.3 Passenger-Ship Revenue

Rather than constructing price deflators to be applied to the current-dollar series of passenger-ship revenue (fares—Officer 2021, pp. 284–288), I obtain the corresponding "real" series via physical measure: number of passengers.[9] This yields constant-dollar series of greater precision, albeit the procedure lacks an index-number basis. The number of one-way passengers represents "real" oceanic passenger service (ship revenue). A round-trip counts as two one-way trips.

U.S. steamship constant-dollar revenue from foreign residents is set equal to current-dollar revenue in 1919 and extrapolated to earlier years via number of foreign passengers on U.S. steamships (1919 overlap, of course). Foreign steamship constant-dollar revenue from U.S. residents is similarly derived.

The above technique cannot be applied to sailing-ship revenue, because there is zero such revenue in 1919. The solution is to express sailing-ship revenue in 1860 dollars, then extrapolate to 1919 dollars via an inflator factor. The inflator series is steamship per-passenger revenue, dollars per one-way trip, constructed as the ratio of all steamship revenue (U.S. and foreign steamships, revenue from U.S. and foreign residents) to all steamship passengers (U.S. and foreign steamships, number of U.S. and foreign passengers). The inflator factor is the 1919/1860 ratio of the inflator series.

Thus U.S. sailing-ship constant-dollar revenue from foreign residents is set equal to current-dollar revenue in 1860, extrapolated to other years (forward and back, 1860 overlap) via the number of U.S. sailing-ship

foreign passengers (resulting in a constant-1860-dollar series), and multiplied by the inflator factor (for the constant-1919-dollar series). Foreign sailing-ship constant-dollar revenue from U.S. residents is similarly generated.

U.S.-ship constant-dollar revenue from foreign residents is the sum of U.S. steamship and U.S. sailing-ship constant-dollar revenues. Foreign-ship constant-dollar revenue from U.S. residents is the sum of foreign steamship and foreign sailing-ship constant-dollar revenues.

9.2.3.4 Financial Transactions

Current-dollar financial transactions are in Officer (2021, pp. 303–306). Deflators for financial transactions are ideally based on the wage rate in the financial sector of the country providing the services. The second-best is a clerical or white-collar wage of the country, and the third-best the unskilled or manual-worker wage. Where a wage rate is not available (or, for consistency), weekly or annual earnings are adopted.

For exports, the deflator begins with Lebergott's (1996, Table A7, series 46) deflator for personal expenditures on finance 1900–1919. Linked to it via 1900 overlap is a clerical-wage series constructed as follows. Railways clerical average annual earnings 1890–1900 (Douglas, 1930, p. 361) are extended to 1860, 1869, 1879, 1889 (1899 overlap) via weekly wage of clerks and weekly wage in retail trade (Lebergott, 1964, pp. 300–301; Barger, 1960, p. 329).[10] Average hourly earnings of manufacturing production workers (Officer, 2009, p. 166) 1859–1889 interpolates 1861–1868, 1870–1878, 1880–1888. Monthly wage of white-collar workers 1822–1860 (Margo, 2000, Table 5B.4), monthly wage of clerks in iron-producing firms 1800–1822 (Jeffrey F. Zabler, 1972, p. 112), and the David-Solar (1977, p. 59) unskilled wage 1790–1800 extrapolate the series to 1790 (via 1860, 1822, 1800 overlaps).[11]

For imports, a weighted average of men and women clerk's pay for 1911–1919 is generated from data in Guy Routh (1980, pp. 7, 90), using Feinstein's (1995, pp. 264–265) manual-worker earnings as wage interpolator.[12] Linked via 1911 overlap is a clerical-earnings series developed from Jeffrey G. Williamson's (1982, p. 48, series 9H) figures for 15 years over 1781–1911, with intervening years interpolated by Feinstein's (1998, pp. 652–653) manual-worker earnings series.[13] The resulting series for 1790–1919 is denominated in U.S. dollars, via the dollar-pound exchange rate.

9.2.3.5 *Military Expenditures Abroad*

Current-dollar military expenditures abroad are in Officer (2021, pp. 303–306). For the deflator, armed forces overseas are extrapolated from 1917–1919 to 1846–1848, 1898–1916 via 1917 overlap with total military personnel on active duty (*Historical Statistics*, 2006, series Ed26). Constant-dollar is set equal to current-dollar military expenditures abroad in 1919 and extrapolated to the earlier years via armed forces overseas. With no direct data, constant-cost military expenditures are estimated by the number of personnel stationed overseas. The implicit assumption is that the cost of maintaining a soldier overseas in earlier years is the same, adjusted for inflation, as it was in 1919.[14]

9.2.3.6 *Non-Imported Slave Purchases*

Purchases of non-imported slaves, in current dollars, are in Officer 2021, pp. 157–158. Just as for imports, I convert year-1807 current-dollar non-imported slave purchases (in Officer 2021, p. 157) to constant (1919) dollars via multiplication by the 1919/1807 ratio of the wholesale price index. For the other years, the resulting figure is multiplied by the ratio of "the number of U.S-ship purchased slaves not imported into the United States" to "this number in 1807."[15]

9.3 Interpretation

Terms of trade (TT) for goods, services, combined goods and services, are shown in Table 9.1, first, second, third columns. The series are based 1790 = 100.

With TT the ratio of the price of exports to the price of imports; for a given volume of trade, TT increasing enhances the *real income* of the country. Even that hypothesis has been challenged.[16] In placing this chapter in Part III, I am making a stronger statement: TT increasing improves the *standard of living* of the country's population. Reasonable assumptions regarding the ratio of consumption to GDP and the distribution of consumption among the population, both at the margin, are implicitly applied.

Computation of the real-income or standard-of-living effect of a TT change is not attempted here, only a simple statement that a heuristic measure of the strength of the TT change may be given by association with the trade/GDP ratio, presented as an index number and an absolute level in the fourth and fifth columns of Table 9.1. Note that

trade/GDP measures *strength* (that is, the *magnitude* of the effect of the TT movement on real income and thereupon on the standard of living), without incorporating *direction*, of the TT movement. Trade/GDP can either amplify or diminish the *implication* of a TT movement, whether the movement is an improvement (increase) or deterioration (decrease) in TT.

Lipsey (2000, p. 718) provides figures for the U.S. TT for 14 periods 1789–1913. His series has three deficiencies, absent here. First, as are all existing historical TT, Lipsey's are confined to merchandise trade.[17] A complete measurement requires that goods involve non-merchandise as well as merchandise items, and that services also are included. Second, Lipsey shows only period averages, whereas a continuous annual series is preferred. Third, as is the norm, Lipsey's TT are essentially a ratio of Laspeyres index numbers with disjoint changes in weights over time. In contrast, I use implicit deflators, which have the advantage of incorporating continuous changing weights of components.

Lipsey (2000, p. 717) writes: "On the whole, the picture is one of long-term improvement in the terms of trade–perhaps an increase of two-thirds from the founding of the country to World War I." The 1904–1913/1789–1798 ratio for his merchandise series is 1.71. For my goods series the ratio is 1.66–almost exactly his "two-thirds" assessment. There is a marked difference for services, with the ratio only 0.57—-a TT *decrease* of over 40%; while goods-and-services together have a ratio of 1.45.

TT of goods have an upward trend from the 1820s—and, after 1866, never fall below 160 (except trivially in 1870). From a global maximum of 128 in 1793, TT of services decrease to 72 in 1815; after which TT are below 60 in all but seven years until World War I. Terms-of-trade movement in conjunction with the balances of goods and services suggests that the United States was fortunate indeed to experience a shift in revealed comparative advantage from services to goods! And U.S. businesspersons and merchants were wise to respond to price incentives in their import–export trade of goods and services.

TT for combined goods-and-services is closer to the goods TT than the services TT. Therefore, in the postbellum period, the effect of TT movements on the standard of living was very probably upward. Furthermore, from 1865, the trade/GDP ratio is at least 12% in all but three years (with two of these observations trivially below, the other only slightly below that

level). One can reasonably hypothesize that the standard-of-living effect was not only positive but also "strong."

Notes

1. The preferred term is "enslaved persons," in recognition of the full humanity of the people exploited by the slave trade. I largely retain the old usage, for simplicity and in accordance with the traditional economic-history literature. Merchandise may also be termed "conventional merchandise," for differentiation from nonmonetary silver.
2. Monetary gold and silver do not enter the goods account. For the monetary-versus-nonmonetary distinction of the precious-metal flows, see Officer (2021, ch. 8).
3. See Officer (2021, ch. 9, Sect. 2; ch. 17, Sect. 2).
4. See Lipsey (2000, pp. 685, 690–692) and Edelstein (2006, p. 5–441).
5. Real GDP is the Johnston-Williamson (measuringworth.com) constant-dollar series converted to 1919 dollars. The series of real goods and services (in constant [1919] dollars) are constructed in Sect. 9.2.
6. The extrapolator is inadequate statistically, but little else can be done to denominate slave imports in 1919 dollars—a century after slave imports ended! The base 1807 is logical, because that is the highest-activity slave-import year, whether in numbers or value. More fundamentally, though the technique is a logical way to adjust the data from a balance-of-payments standpoint, what results is an inadequate measure of the cruelty associated with enslavement and sale of human beings. The wholesale price index is from Warren and Pearson (1933, pp. 25–27).
7. The number of imported slaves is the sum of columns (2)–(4) in Officer (2021, chapter 4, Table 1).
8. Freight rates are generated in Officer 2021, pp. 120–121, 136, 226–227. The U.K. wholesale price index has components Board of Trade total index, Sauerbeck-*Statist* overall index, and Gayer-Rostow-Schwartz domestic-and-imported commodities index, linked via overlap years 1846 and 1871. Source is Mitchell (1988, pp. 721, 725, 728–729). The index is converted to dollar denomination via multiplication by the dollar-pound exchange rate (Officer 2021, pp. 36–37).
9. Passenger information is in Officer (2021, chapters 3 and 15).
10. For 1869, 1879, 1889, 1899, weekly wage is the product of hourly wage and hours per week.
11. The Margo and Zabler data are controversial (for discussion and references, see Officer (2009, pp. 144–146, 150–151); but, regarding the white-collar wage, their series are the best available for the purpose at hand. For lack of white-collar wage data in the eighteenth century, the David-Solar unskilled wage is used.

12. Routh's wage data are for 1911–1913, 1924. Feinstein's series interpolates 1914–1919. Routh's numbers of male clerks and of female clerks are linearly interpolated 1912–1919 between 1911 and 1921.
13. The Williamson years are 1781, 1797, 1805, 1810, 1815, 1819, 1827, 1835, 1851, 1861, 1871, 1881, 1891, 1901, 1911.
14. See Officer (2021, chapter 17, Sect. 1).
15. The number is: slaves embarked in Africa less those disembarked revenue-earning in the United States (Officer 2021, chapter 4, Table 1, column (1) *minus* column (2)) plus creole slaves landed in Havana (chapter 4, Table 2, column (5) *plus* column (6)).
16. See Derksen (1980) and, in refutation, Greenfield (1984).
17. The merchandise TT series of *Historical Statistics* (2006, series Ee433, Ee436, Ee439, Ee442) have data sources identical to mine, but do not adjust the underlying price series for the gold dollar, fiscal year, or change in base. See Officer (2021, chapter 7, appendix).

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