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Joseph A. Francis *

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Abstract

Since the pioneering work of Tulio Halperín Donghi, historians have tried to explain why Argentina experienced a dramatic pastoral expansion in the first half of the nineteenth century even though there were no price incentives for increasing output. Here this 'Halperín paradox' is resolved by correcting the methodological error that underlies it. Halperín Donghi made the mistake of looking at the nominal prices of Argentina's exports in Britain, whereas he should have looked at their prices in Argentina deflated by the prices of the country's imports – that is, its terms of trade. When this methodological error is corrected, a massive term-of-trade boom can be seen from the 1780s through to the First World War. It is likely that Argentina's terms of trade improved by at least 2,000 percent over this period, so there were considerable price incentives for the expansion on the Pampas. With the Halperín paradox resolved, future research should look less at the Pampean zone and more at the effects of the terms-of-trade boom on the relatively land-scarce regions of the Interior.



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**Resolving the Halperín Paradox:
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Joseph A. Francis

This paper demonstrates that there was a massive improvement in Argentina's terms of trade from independence up to the First World War. In doing so, it corrects a major methodological error in the existing literature. Historians have previously tended to look at *absolute* rather than *relative* prices, often drawing them, moreover, from the core countries, rather than from Argentina itself. This paper argues that this methodological error is at the heart of what can be called the 'Halperín paradox' – that is, the question of why Argentina's expanded so dramatically in the long nineteenth century despite a lack of price incentives. Here it is demonstrated that once Argentina's terms of trade are correctly measured, this apparent paradox is resolved, as there were actually clear price incentives for the expansion.

Tulio Halperín Donghi first noted the paradox in two influential essays on Argentina's pastoral expansion in the first half of the nineteenth century.¹ Examining the nominal prices of River Plate hides and tallow in Britain, he found that they rose somewhat after independence in 1810, but then experienced a 'slow but very prolonged fall' from the mid-1830s onwards,² precisely as exports from Buenos Aires took off. This led Halperín Donghi to conclude that the pastoral expansion was *not* due to price incentives because, as he put it, his numbers 'perfectly demonstrate the economic climate in which pastoral production occurred in the whole River Plate area (and, for that reason, also in the countryside of Buenos Aires); [it was] a production that did not receive its stimulus, nor see its momentum hampered, by movements in prices'.³

Following Halperín Donghi, historians have attempted to explain why Argentina's expansion occurred *despite* falling prices. In the words of one major survey, the problem became to 'explain the paradox posited by Halperín

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1. T. Halperín Donghi, 'La expansión ganadera en la campaña de Buenos Aires (1810-1852)', *Desarrollo Económico*, 3:1/2, 1963; and idem, 'La expansión de la frontera de Buenos Aires (1810-1852)', in A. Jara, ed., *Tierras nuevas: Expansión territorial y ocupación del suelo en América (siglos xvi-xix)*, México, DF, 1969.
 2. Halperín Donghi, 'Expansión de la frontera', p. 82, my translation.
 3. Halperín Donghi, 'La expansión ganadera', p. 61, my translation.

Donghi more than thirty years ago: the great boom in the ranching economy was achieved during a time of declining export prices'.⁴ Halperín Donghi himself concluded that it occurred because Argentine capitalists were pushed out of commerce by the arrival of British merchants, so they instead invested in pastoral activities.⁵ The problem with this explanation is that there was no British monopoly of commerce, and both creole and Spanish merchants remained heavily involved in trade long after independence.⁶ As an alternative, Samuel Amaral suggested that the expansion was due to the rise of the estancia, which was a particularly efficient way of organising pastoral production.⁷ Alejandra Irigoin then suggested that the expansion also occurred because merchants began to invest in land as a hedge against civil war-induced inflation.⁸

Such explanations become unnecessary once the terms of trade are examined. To be clear, what are being referred to are technically known as the 'net barter terms of trade' (NBTT), which are the ratio of a country's export price index (Px) to its import price index (Pm). They are, then, calculated as:

$$NBTT = \frac{Px}{Pm}$$

When this ratio goes up, the terms of trade are improving; when it goes down, they are deteriorating.

This paper's main finding is that Argentina's terms of trade improved massively over the course of the long nineteenth century. Even those scholars who have previously observed an improvement have failed to recognise the magnitude of the terms-of-trade boom because they have used prices from the core countries as proxies for prices in Argentina itself.⁹ In doing so, they have introduced a major downward bias into the trend of their estimates due to the substantial convergence that occurred between prices in Argentina and the core

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4. R. Salvatore and C. Newland, 'Between Independence and the Golden Age: The Early Argentine Economy', in G. della Paolera and A.M. Taylor, eds., *A New Economic History of Argentina*, Cambridge, 2003, p. 22.
 5. See Halperín Donghi, 'Expansion ganadera', pp. 72-73; and idem, 'The Buenos Aires Landed Class and the Shape of Argentine Politics (1820-1930)', in E. Huber and F. Safford, eds., *Agrarian Structure & Political Power: Landlord & Peasant in the Making of Latin America*, Pittsburgh, 1995, p. 42.
 6. K. Robinson, 'The Merchants of Post-Independence Buenos Aires', in M.L. Moorhead and W.S. Coker, eds., *Hispanic-American Essays in Honor of Max Leon Moorhead*, Pensacola, 1979.
 7. S. Amaral, *The Rise of Capitalism on the Pampas: The Estancias of Buenos Aires, 1785-1870*, Cambridge, 1998, esp. ch. 1.
 8. A. Irigoin, 'Inconvertible Paper Money, Inflation and Economic Performance in Early Nineteenth Century Argentina', *Journal of Latin American Studies*, 32:2, 2000.
 9. Most notably, C. Newland, 'Exports and Terms of Trade in Argentina, 1811-1870', *Bulletin of Latin American Research*, 17:3, 1998; C. Newland and J. Ortíz, 'The Economic Consequences of Argentine Independence', *Cuadernos de Economía*, 38:115, 2001; and Salvatore and Newland, 'Between Independence'.

during the nineteenth century.¹⁰ This paper partially corrects that bias by using prices from Argentina itself for exports, resulting in what can be called ‘part-proxy’ estimates of its terms of trade. With some adjustments made for price convergence on the import side, they suggest an improvement of at least 2,000 percent from the 1780s through to the first decade of the twentieth century. There were, then, massive price incentives for the expansion on the Pampas.

To begin, the paper explains why the terms of trade were depressed in the late colonial period and why they improved following independence. Just how much Argentina’s terms of trade improved during the nineteenth century is demonstrated using newly compiled series for the country’s export prices, combined with the export prices of its trade partners as a proxy for its import prices. How the long terms-of-trade boom triggered expansion on the Pampas is then outlined. By way of a conclusion, it is argued that – with the Halperín paradox resolved – future research should focus less on the Pampean zone and more on the negative impacts of the boom on the country’s more densely populated Interior regions.¹¹

Opening Doors

Under the Spanish empire the River Plate’s terms of trade had been depressed by Spanish merchants’ monopoly of trade with the American colonies. The logic of this monopoly has often been misunderstood, as historians have assumed that it was intended to promote the peninsula’s own development.¹² In establishing the monopoly, however, the crown’s principal goal was to finance its own war-making, rather than to provide markets for Spanish industry. Much of the crown’s revenues came from taxing American exports and imports when they passed through Spain, while it also extracted a disproportionate amount of its domestic tax from Cádiz, the region of Spain that benefited most from the Indies trade.¹³ The trade monopoly was thus intended to generate flows of

10. On this problem for the periphery’s terms of trade in general, see J.A. Francis, ‘The Periphery’s Terms of Trade in the Nineteenth Century: A Methodological Problem Revisited’, Technical Paper 1, 2014, online at http://www.joefrancis.info/pdfs/Francis_TP_1.pdf (accessed 8 August 2014).

11. In this, it suggests the research agenda implied by J.G. Williamson, ‘Globalization and the Great Divergence: Terms of Trade Booms, Volatility and the Poor Periphery, 1782-1913’, *European Review of Economic History*, 12:3, 2008; and idem, *Trade and Poverty: When the Third World Fell Behind*, Cambridge, MA, 2011, ch. 3. It should be noted that while Williamson’s narrative is convincing, there are major problems with the empirical data he uses to support it. See Francis, ‘Periphery’s Terms of Trade’.

12. Thus, one economic historian claims that the trade monopoly was intended to ‘build a rich and solid economy’ in Spain. G. Márquez, ‘Commercial Monopolies and External Trade’, in V. Bulmer-Thomas, J. Coatsworth, and R. Cortés Conde, eds., *The Cambridge Economic History of Latin America, I, The Colonial Era and the Short Nineteenth Century*, Cambridge, 2005, p. 397.

13. See J.A. Barbier and H.S. Klein, ‘Revolutionary Wars and Public Finance: The Madrid Treas-

goods and bullion through Spain that could be taxed by the crown.¹⁴

In the River Plate the colonial order was primarily concerned with ensuring that the silver from Upper Peru's mines flowed back to Spain. All goods legally imported from Europe had to be shipped from Seville (or, later, Cádiz) to the Isthmus of Panama, carried across land to the Pacific, shipped to Callao, Lima's Pacific port, then taken 4,000 kilometres overland in mule trains to the River Plate. Such a lengthy journey brought high trade costs, which inflated the prices of imports, thereby providing a considerable degree of protection for the 'proto-industry' of the Andean peasant societies. In the River Plate's Littoral region, Buenos Aires developed as an entrepôt for a flourishing contraband trade, with imports of African slaves, European manufactures, and tropical goods from Brazil illicitly exchanged for silver from Upper Peru.¹⁵

For the River Plate's pastoral producers, depressed terms of trade were a side effect of the Spanish trade monopoly. The monopoly generated great price differentials between Europe and the Americas due to the high trade costs that it entailed. Even following some trade liberalisation in the late eighteenth century, competition among Spanish merchants in Buenos Aires remained minimal, so their markups were high.¹⁶ Their shipping, moreover, was inefficient, and their goods were heavily taxed – in both Spain and Buenos Aires – by the Spanish authorities.¹⁷ Consequently, export prices were depressed and

ury, 1784-1807', *Journal of Economic History*, 41:2, 1981, pp. 327-30; C. Marichal, 'Beneficios y costes fiscales del colonialismo: Las remesas americanas a España, 1760-1814', *Revista de Historia Económica*, 15:3, 1997, p. 480; and J. Cuenca-Esteban, 'Was Spain a Viable Fiscal-Military State on the Eve of the French Wars?', in S. Conway and R. Torres Sánchez, eds., *The Spending of States: Military Expenditure During the Long Eighteenth Century: Patterns, Organisation, and Consequences, 1650-1815*, Saarbrücken, 2011.

14. The failure to recognise the fiscal role of the trade monopoly has led to some bizarre interpretations of the political economy of the Spanish empire. Grafe and Irigoín, for example, have interpreted the fiscal transfers from treasuries in mining regions to the treasuries of ports as evidence that the Spanish empire 'successfully aimed at making the colonies self-sufficient, with intra-colonial transfers covering the needs of regions that either could not or would not raise sufficient revenue'. R. Grafe and M.A. Irigoín, 'The Spanish Empire and Its Legacy: Fiscal Redistribution and Political Conflict in Colonial and Post-Colonial Spanish America', *Journal of Global History*, 1:2, 2006, p. 263. Channelling silver to the ports was, however, merely intended to ensure that it flowed back to Spain in exchange for imported European goods.
15. On the geography of the late colonial River Plate, see T. Halperín Donghi, *Politics, Economics and Society in Argentina in the Revolutionary Period*, Cambridge, 1975, pp. 6-16; and E. Tandeter, 'El eje Potosí-Buenos Aires en el imperio español', in M. Ganci and R. Romano, eds., *Governare il mondo: L'imperio spagnolo dal XV al XIX secolo*, Palermo, 1991. On its international trade, see Z. Moutoukias, 'El crecimiento en una economía colonial de antiguo régimen: Reformismo y sector externo en el Río de la Plata', *Arquivos do Centro Cultural Calouste Gulbenkian*, 34, 1995; and idem, 'Comercio y producción', in Academia Nacional de Historia, ed., *Nueva historia de la Nación Argentina*, IV, Buenos Aires, 2000, pp. 72-81.
16. Socolow suggests that 70 percent was considered an 'acceptable markup'. S.M. Socolow, *The Merchants of Buenos Aires, 1778-1810*, Cambridge, 1978, p. 60.

import prices inflated. Thus, in the first half of the 1790s cattle hides sold in Buenos Aires for as little as 20 percent of their wholesale price in Cádiz.¹⁸ Ranchers accordingly tended to be impoverished, with most illiterate and many lacking basic goods, such as shoes and socks.¹⁹ Merchants and bureaucrats instead formed the dominant class.²⁰

The colonial order began to disintegrate following the British invasions of 1806 and 1807. Even though the British forces were repelled from Buenos Aires on both occasions, the province's ranchers soon heard of the greatly improved terms of trade that the British merchants were offering in Montevideo, the city across the River Plate estuary that had been successfully occupied. The ranchers therefore lobbied the Spanish authorities to liberalise trade. Mariano Moreno, a prominent young lawyer, famously appealed to the Spanish viceroy on the ranchers' behalf.²¹ He noted that in Montevideo '[s]ales were made at advantageous prices, goods were bought at minimal values, and the rural world wore fabrics that it had never known before, having sold at high values hides that its grandparents had thrown away as useless'.²² The ranchers and their representatives recognised, then, that across the River Plate the terms of trade had improved dramatically under the British, so they sought the end of the Spanish trade monopoly, through independence if necessary.²³

The disintegration of the empire brought Spain's trade monopoly to an end. Already in November 1809 the Spanish viceroy had been persuaded to allow two British merchants to disembark and sell their cargoes.²⁴ Then, three days after an independent government was declared in late May 1810, the remaining restrictions on trade with foreigners were removed.²⁵ Subsequently, the number of merchants arriving rose: whereas 50 ships had docked annually

17. Many goods imported from Spain came from other parts of Europe, so they were taxed when they entered Spain, taxed again when they were reexported, then taxed again upon arrival in Buenos Aires. The River Plate's exports would pay the same taxes, although in the opposite order. Newland and Ortíz, 'Economic Consequences', pp. 276-78.

18. Amaral, *Rise of Capitalism*, p. 234, Table 11.1.

19. C.A. Mayo, 'Landed but not Powerful: The Colonial Estancieros of Buenos Aires (1750-1810)', *Hispanic American Historical Review*, 71:4, 1991, pp. 769-70; and idem, *Estancia y sociedad en la Pampa 1740-1820*, Buenos Aires, 1995, pp. 60-61.

20. The formation of this ruling alliance is described in Z. Moutoukias, 'Power, Corruption, and Commerce: The Making of the Local Administrative Structure in Seventeenth-Century Buenos Aires', *Hispanic American Historical Review*, 68:4, 1988.

21. J. Lynch, *The Spanish American Revolutions, 1808-1826*, 2nd ed., London, 1986, pp. 49-50.

22. D.M. Moreno, *Representación que el apoderado de los hacendados de las campañas del Río de la Plata*, Buenos Aires, (1809) 1874, p. 29, my translation.

23. As Adelman has stressed, independence in itself was not necessarily the goal of revolutionaries such as Moreno. Rather, they sought trade liberalisation so that the country would be able to exploit its land resources. J. Adelman, *Republic of Capital: Buenos Aires and the Legal Transformation of the Atlantic World*, Stanford, 1999, ch. 3.

24. Lynch, *Spanish American Revolutions*, pp. 49-50.

25. H.S. Ferns, *Britain and Argentina in the Nineteenth Century*, Oxford, 1960, p. 65.

at Buenos Aires in the mid-1790s,²⁶ there were over 250 foreign merchant vessels entering by the early 1820s.²⁷ Crucially, this dramatic increase in overseas trade became the new basis for state finance in Buenos Aires, as import taxes replaced fiscal transfers from Upper Peru as the main source of government revenues. This ensured that all post-independence governments would be committed to promoting trade.²⁸

Increased competition among merchants turned Buenos Aires into more of a sellers' market for pastoral producers and a buyer's market for consumers of imported goods. Furthermore, export duties were lowered considerably,²⁹ British and other foreign shipping was more efficient than Spanish vessels, and merchants were no longer obliged to ship their goods via Spain. As trade costs fell, there was rapid price convergence: in the first half of the 1790s hides had sold in Buenos Aires for around 20 percent of their 'in bond' price in Britain, but they were selling for 80-90 percent by the 1820s.³⁰ Prices are not available for imports, but it is likely that a similar convergence took place. Hence, in the early 1820s, a resident British merchant complained that he had 'bought English stockings cheaper than I could buy them in London', and that it was 'cheaper to purchase a stock of linen [in Buenos Aires] than at home'.³¹

26. Moutoukias, 'Crecimiento en una economía', p. 803, Cuadro 2.

27. M. Llorca-Jaña, *The British Textile Trade in South America in the Nineteenth Century*, Cambridge, 2012, p. 341.

28. Halperín Donghi, 'Buenos Aires Landed Class', pp. 44-45.

29. Within two weeks of independence, export taxes would be lowered (Buenos Ayres, *Gazeta*, 1, 1810, p. 6), and they would then be further eroded by inflation, falling to just four percent on dry ox hides by the end of the 1820s. Calculated from J. Broide, 'La evolución de los precios pecuarios argentinos en el periodo 1830-1850', mimeo, 1951, p. 41, Cuadro 16; also published in *Revista de la Facultad de Ciencias Económicas*, 4:32; and M.A. Irigoín, 'Finance, Politics and Economics in Buenos Aires, 1820s-1860s: The Political Economy of Currency Stabilisation', PhD diss., University of London, 2000, p. 126, Table II.1.6. Export taxes were eroded by inflation because, from 1822 onward, they were in fixed paper money amounts that were only sporadically adjusted for rising prices. See *ibid.*, pp. 129-30.

30. In bond prices are those prior to the payment of any applicable import taxes. For hide prices in Buenos Aires, see Anon., 'Report on the Trade of the River Plate', reproduced in R.A. Humphreys, *British Consular Reports on the Trade and Politics of Latin America 1824-26*, London, (1824) 1940, p. 33; Anon., 'Precios corrientes de productos en Buenos Aires en los años 1821, 1822 y 1823', in E.M. Barba, ed., *Informes sobre el comercio exterior de Buenos Aires durante el gobierno de Martín Rodríguez*, Buenos Aires, (1824) 1978, p. 60; Broide, 'Evolución de los precios', pp. 41, Cuadro 16; and Moutoukias, 'Crecimiento en una economía', p. 804, Cuadro 3. For Buenos Aires hide prices in London, see A.D. Gayer, W.W. Rostow, and A.J. Schwartz, microfilmed supplement to *The Growth and Fluctuation of the British Economy 1790-1850*, I and II, Oxford, 1953; as compiled by D.S. Jacks, K.H. O'Rourke, and J.G. Williamson, 'Commodity Price Volatility and World Market Integration since 1700', *Review of Economics and Statistics*, 93:3, 2011, pp. 800-13; with the database available online at <http://www.sfu.ca/~djacks/data/publications/Britain,%20Commodity%20Prices,%201790-1850,%20monthly.xlsx> (accessed 3 May 2013); and Halperín Donghi, 'Expansión ganadera', p. 65. The differential varies according to which series of hide prices in Britain is used.

31. An Englishman, *A Five Years Residence in Buenos Ayres During the Years 1820 to 1825*, 2nd ed.,

Argentina's terms of trade had been depressed, then, by the colonial order, but they appear to have improved dramatically following independence. Initially this was due to the abolition of the Spanish trade monopoly, as has been outlined here, but subsequently it was thanks to the industrial and transport revolutions. In the North Atlantic core mechanisation combined with the competitive organisation of industry to lower the prices of the manufactured goods that Argentina imported, while more efficient shipping, better packaging, and faster flows of information radically reduced trade costs, which raised export prices and lowered import prices across the periphery.³²

Measuring the Boom

Up to now, historians have not realised the magnitude of Argentina's nineteenth-century terms-of-trade boom due to two methodological errors. Firstly, they have often not looked at Argentina's terms of trade at all, preferring instead to simply examine the nominal prices of its exports.³³ Secondly, given the work entailed in piecing together Argentina's fragmentary price record, even those who have looked at the terms of trade have relied upon prices from core countries as proxies for prices in Argentina itself.³⁴ While commonly used by historians of peripheral countries, such 'proxy' estimates of the terms of trade are liable to have a major downward bias in the trend for the nineteenth century due to the considerable price convergence that took place between the North Atlantic core and the periphery.³⁵ For Argentina, proxy estimates have implied an improvement in the terms of trade of around 150 percent from 1810 to 1913.³⁶ Nonetheless, a careful reconstruction of the existing price record suggests that this is a major underestimate.

Figure 1 provides an initial illustration of Argentina's terms-of-trade boom. It shows the domestic wholesale prices of nine of the country's main

London, 1827, p. 93.

32. Evidence of these processes in the River Plate can be found in D.C.M. Platt, *Latin America and British Trade 1806-1914*, London, 1972, p. 14; J.E. Oribe Stemmer, 'Freight Rates in the Trade between Europe and South America, 1840-1914', *Journal of Latin American Studies*, 21:1, 1989; Y. Kaukiainen, 'Shrinking the World: Improvements in the Speed of Information Transmission, c. 1820-1870', *European Review of Economic History*, 5:1, 2001, pp. 5, 20, Tables 1 and 4; and Llorca-Jaña, *British Textile Trade*, ch. 7.
33. Most notably, Halperín Donghi, 'Expansión ganadera', pp. 62-66; but also H. Sabato, *Agrarian Capitalism and the World Market: Buenos Aires in the Pastoral Age, 1840-1890*, Albuquerque, 1990, pp. 204-08; Amaral, *Rise of Capitalism*, pp. 232-41; and J.C. Garavaglia, 'La economía rural de la campaña de Buenos Aires vista a través de sus precios: 1756-1852', in R. Fradkin and J.C. Garavaglia, eds., *En busca de un tiempo perdido: La economía de Buenos Aires en el país de la abundancia, 1750-1865*, Buenos Aires, 2004.
34. See Newland, 'Exports and Terms of Trade'; and Llorca-Jaña, *British Textile Trade*, p. 195, Figure 7.4.
35. Francis, 'Periphery's Terms of Trade'.
36. O.J. Ferreres, *Dos siglos de economía argentina, 1810-2004: Historia argentina en cifras*, Buenos Aires, 2005, Table 8.1.7.

Figure 1

Part-Proxy Terms of Trade for Nine Argentine Exports, 1780-1913

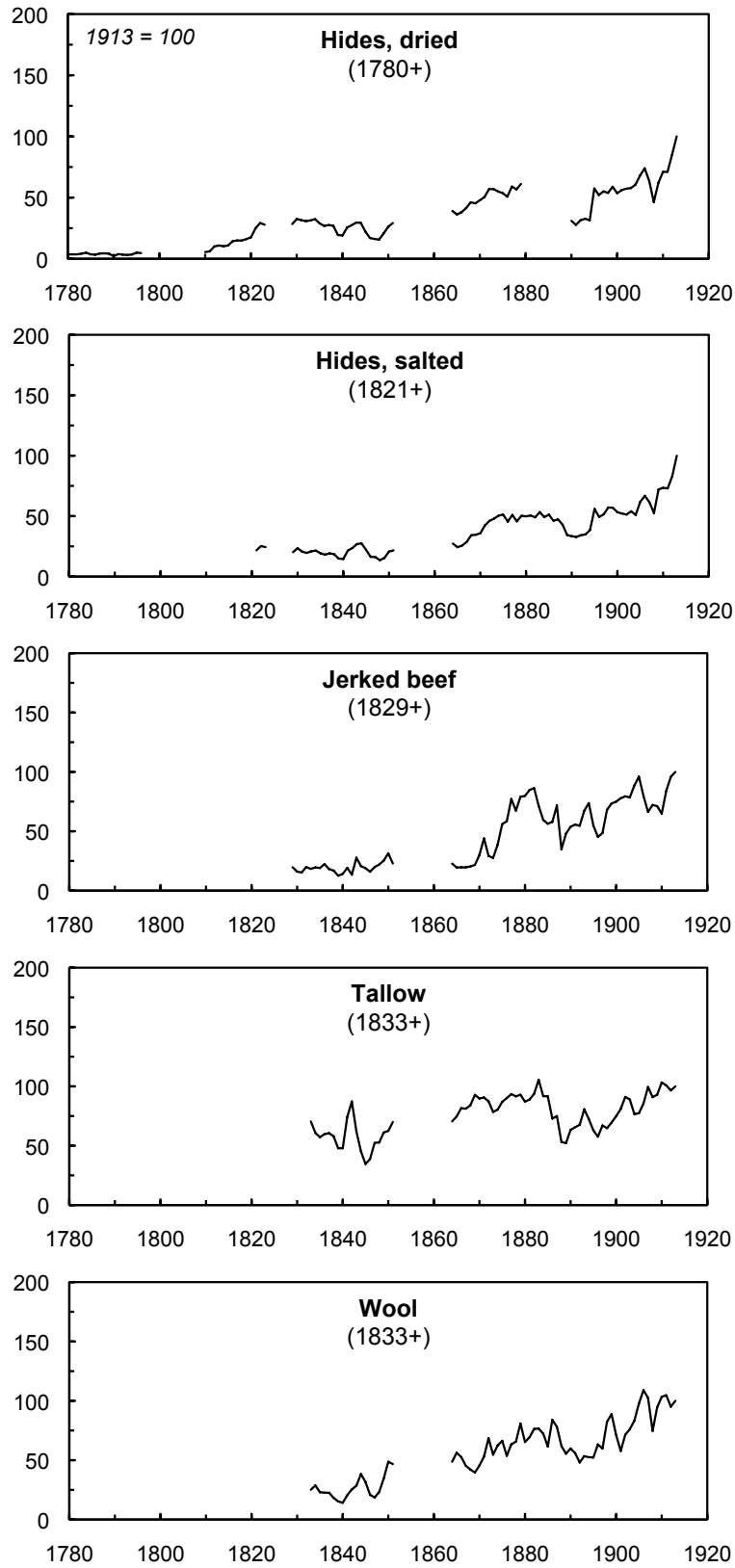
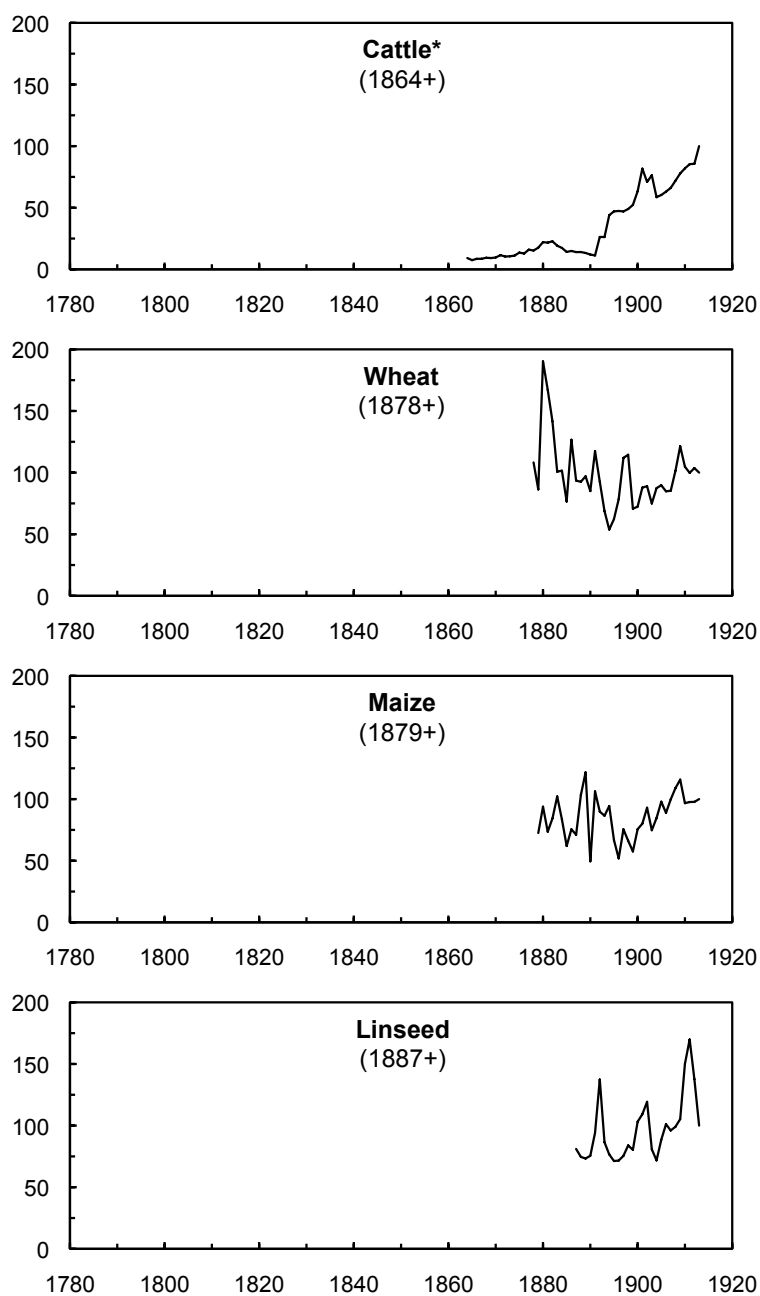


Figure 1 (cont.)

Part-Proxy Terms of Trade for Nine Argentine Exports, 1780-1913



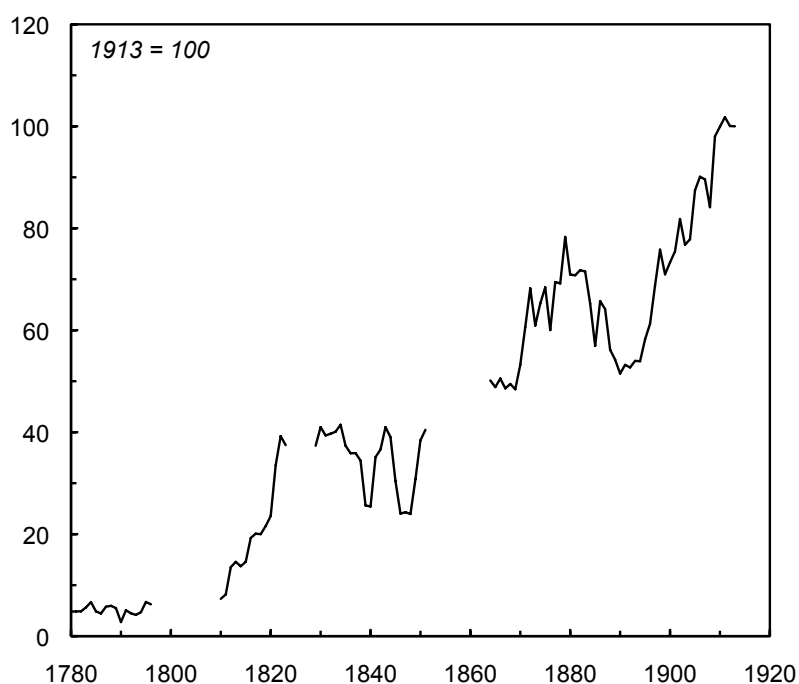
* Also used as a proxy for chilled and frozen beef in the export price index.

Note: The wholesale price of each good in Buenos Aires was divided by a chained, geometric Laspeyres index of the export prices of Argentina's major trade partners, then all series were referenced so that 1913 equalled 100. The trade partners included in the proxy import price index are Britain (from 1780), the United States (from 1790), France (from 1809), Brazil (from 1821), Italy (from 1862), and Germany (from 1880).

Sources: See the Appendix.

Figure 2

Part-Proxy Terms of Trade for Argentina, 1780-1913



Note: The series is a chained, geometric Laspeyres index, calculated from the nine series in Figure 1, together with series for sheep skins (1864+), flour (1880+), goat skins (1893+), and numerous other minor exports from 1910 onward.

Sources: See the Appendix.

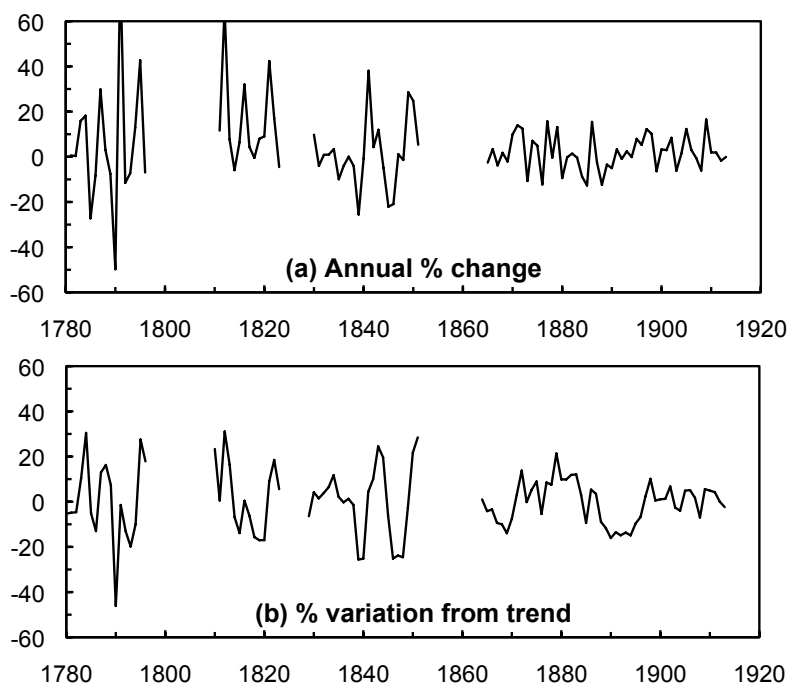
exports relative to a crude proxy import price index constructed from the export prices of six of Argentina's major trade partners. These therefore represent 'part-proxy' terms of trade, in that they use Argentina's own prices for its exports but depend upon prices from Argentina's trade partners as proxies for its import prices. As such, they are still likely to have a downward bias in the trend due to the price convergence that took place during the nineteenth century.³⁷ Nonetheless, they suggest a far greater terms-of-trade boom than is normally supposed.

When all the price series are indexed to make a single series of Argentina's terms of trade, as in Figure 2, they show an improvement of around 1,500 percent from the 1780s to the 1900s. What is more, even this is likely to be an underestimate because the crude proxy import price index does not take into account the price convergence that took place on the import side. If adjustments are made for the effects of falling trade costs on import prices, it seems likely that the improvement would be more than 2,000 percent over the same period. Assuming, for instance, that the differential of import prices in Argentina to export prices in the core fell from 100 percent in the 1780s to 20 percent in the

37. On this problem in such 'part-proxy' estimates of peripheral countries' terms of trade, see Francis, 'Periphery's Terms of Trade', pp. 13-15.

Figure 3

Volatility in Argentina's Part-Proxy Terms of Trade, 1780-1913



* The cyclical component as a percentage of the trend component. Both were calculated using a Hodrick-Prescott Filter, with the smoothing parameter set at 1,000.

Sources: Calculated from the series in Figure 2.

1900s, which is plausible, the terms of trade would have improved by 2,500 percent.³⁸ Furthermore, the terms of trade also appear to have become increasingly stable, as indicated by the two measures of volatility shown in Figure 3. Panel (a) simply shows the annual percentage change in the series, while Panel (b) shows the cyclical component in the series as a percentage of its trend component. Both suggest decreasing volatility.³⁹ The terms of trade thus appear to have improved persistently for over a century, while they also become less volatile. Here were the price incentives for the expansion on the Pampas.

Expansion on the Pampas

The Robertson brothers, two prominent Scottish merchants, provided a vivid account of how improved terms of trade triggered growth in Corrientes, a province in Argentina's Littoral region, in the 1810s.⁴⁰ When the Robertsons

38. See the Appendix.

39. Some caution should be exercised in interpreting the strong volatility during the 1810s because the source for the export price index for this period is based on hide prices that are given as several-year averages. Nonetheless, even if the 1810s are excluded from the picture, the impression of declining volatility remains.

40. J.P. Robertson and W.P. Robertson, *Letters on South America: Comprising Travels on the Banks of the Paraná and Rio de la Plata*, I, London, 1843, pp. 174-86. On the Robertsons, see Halperín Donghi, *Politics, Economics*, pp. 87-88; V.B. Reber, *British Mercantile Houses in Buenos Aires*,

arrived, they found that the province's ranchers 'paid high prices for their goods, and got low ones for their produce'⁴¹ – their terms of trade were, in other words, depressed. According to their own account, the Robertsons transformed that situation by reversing 'the plan of the Old Spaniards: we gave high prices for hides, and took low ones for goods'.⁴² They described the result as follows:

[T]he country, as if by magic, started into industrious life and mercantile activity, in every section of its wide extent. Herds and flocks were gathered together, – thousands and tens of thousands of the wild cattle were slaughtered for their hides; and in all directions the creaking of the large wheels of huge and ponderous wagons, laden with the produce of the estancias and villages, as they uninterruptedly traversed the country, gave token of renewed prosperity and peace, where a few months, nay a few weeks, before, all had been rapine, desolation, and decay.⁴³

Such optimism reflected the experience of the Littoral provinces, which were able to take advantage of the terms-of-trade boom due to the navigable rivers that connected them to the oceans, allowing them to export their pastoral products.

Buenos Aires, in particular, benefitted from improved terms of trade. Not only were there roughly 400,000 square kilometres of Pampas grasslands to its south and west,⁴⁴ but the city's strategic location on the River Plate estuary also allowed it to monopolise the customhouse revenues that came from taxing overseas trade.⁴⁵ To increase its revenues, the Buenos Aires government encouraged the expansion of ranching. Land grants were made soon after independence to encourage ranchers to push Buenos Aires' frontiers into Indian territory,⁴⁶ and in the 1820s large tracts of Pampean land, which was mostly publicly owned, became available on 20-year, transferable leaseholds, most of which would later be converted to freehold titles in the 1830s.⁴⁷ Merchants

1810-1880, Cambridge, MA, 1979, pp. 112-13; and R.D. Salvatore, 'The Breakdown of Social Discipline in the Banda Oriental and the Littoral, 1790-1820', in M.D. Szuchman and J.C. Brown, eds., *Revolution and Restoration: The Rearrangement of Power in Argentina 1860*, Lincoln, NE, 1994, pp. 90-95.

41. Robertson and Robertson, *Letters on South America*, pp. 174-75

42. *Ibid.*, pp. 176-77

43. *Ibid.*, p. 179.

44. Estimated from R. Cortés Conde, *El progreso argentino: 1880-1914*, Buenos Aires, 1979, p. 56, Cuadro 2.1.

45. T. Halperín Donghi, *Guerra y finanzas en los orígenes del Estado argentino (1791-1850)*, Buenos Aires, (1982) 2005, pp. 175-77.

46. M.A. Cárcano, *Evolución histórica del régimen de la tierra pública 1810-1916*, 3rd ed., Buenos Aires, 1972, ch. 3; and M.E. Infesta, 'Aportes para el estudio del poblamiento de la frontera del Salado', in Archivo Histórico de la Provincia de Buenos Aires, ed., *Estudios sobre la Provincia de Buenos Aires*, La Plata, 1991.

47. M.E. Infesta, 'La enfiteusis en Buenos Aires, 1820-1850', in S. Amaral and M. Valencia, eds., *Argentina: El país nuevo: Problemas de historia económica, 1800-1914*, La Plata, 1999; and *idem*, *La pampa criolla: Usufructo y apropiación privada de tierras públicas en Buenos Aires, 1820-1850*,

diversified into landownership in response to the shift in relative prices. Gradually, a new landowning class emerged, becoming the principal beneficiary of the dramatic export expansion that began in the 1840s.⁴⁸ Cattle hides initially accounted for most of the growth, although jerked beef, other skins and hides, tallow, and increasingly wool also became important exports. Initially, these pastoral goods mainly went to Britain, but continental Europe and the United States subsequently became the major importers.⁴⁹

The arrival of the railways in the second half of the nineteenth century turned the pastoral expansion into an arable expansion that encompassed the whole of the Pampas. The customhouse revenues were used to subsidise foreign railway companies and to build publicly-owned lines,⁵⁰ resulting in a new railway network that facilitated the final defeat of the Pampas Indians.⁵¹ Around 500,000 km² of Pampean land would then be incorporated into Argentina from the mid-1850s to the end of the 1880s. Buenos Aires Province itself increased from 89,000 km² in 1855 to 311,000 km² in 1890, while La Pampa was created as a new 'national territory' to incorporate 145,000 km² of the conquered land in the centre of the country.⁵² Reduced costs of overland transportation then allowed the land away from the rivers to be profitably cultivated for the first time. Figure 4 illustrates how a dramatic expansion in arable exports followed the arrival of the railways, as Argentina became one of the world's major exporters of agricultural products. Improved terms of trade had in this way inspired a century-long expansion on the Pampas.

Progress and Decline

This paper has resolved the Halperín paradox. It has argued that much of the historiography of Argentina's long nineteenth century has been misled by

Mar del Plata, 2006.

48. This transformation has been documented in R. Hora, 'Landowning Bourgeoisie or Business Bourgeoisie? On the Peculiarities of the Argentine Economic Elite, 1880-1945', *Journal of Latin American Studies*, 34:3, 2002; and idem, 'El perfil económico de la elite de Buenos Aires en las décadas centrales del siglo XIX', *Revista de Historia Económica*, 24:2, 2006.

49. Amaral, *Rise of Capitalism*, ch. 12; and M.A. Rosal and R. Schmit, 'Del reformismo colonial borbónico al libre comercio: Las exportaciones pecuarias del Río de la Plata (1768-1854)', *Boletín del Instituto de Historia Argentina y Americana 'Dr Emilio Ravignani'*, 3:20, 1999, pp. 90-95.

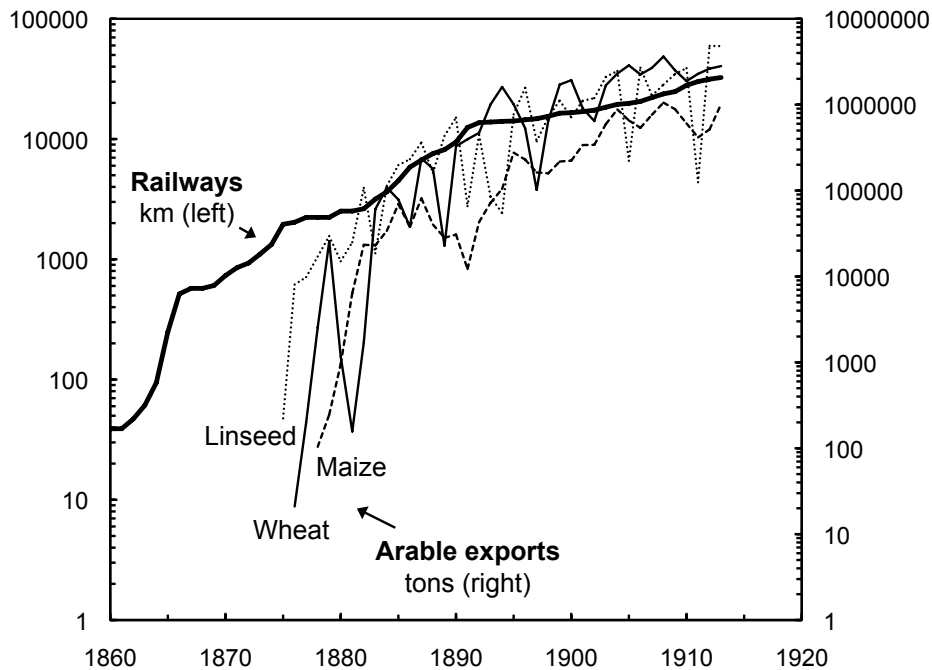
50. C.M. Lewis, *British Railways in Argentina 1857-1914: A Case Study of Foreign Investment*, London, 1983, pp. 10-13; S.A. Palermo, 'The Nation Building Mission: The State-Owned Railways in Modern Argentina, 1870-1930', PhD diss., State University of New York, 2001, pp. 68-70; and A.M. Regalsky, 'Políticas públicas, capital extranjero y estructura de mercado: El desarrollo de los ferrocarriles en la Argentina antes de 1914', *Revista de Instituciones, Ideas y Mercados*, 46, 2007, pp. 178-79.

51. C.M. Lewis, 'La consolidación de la frontera argentina a fines de la década del 70: Los indios, Roca y los ferrocarriles', in G. Ferrari and E. Gallo, eds., *La Argentina del ochenta al centenario*, Buenos Aires, 1980.

52. Estimated from Cortés Conde, *Progreso argentino*, p. 56, Table 2.1.

Figure 4

Argentina's Arable Expansion, 1875-1913



Source: E. Tornquist, *The Economic Development of the Argentine Republic in the Last Fifty Years*, Buenos Aires, 1919, pp. 30-31, 116-17.

Halperín Donghi's methodological error of looking at the nominal prices of Argentina's exports in foreign markets as a proxy for prices in Argentina itself. Following Halperín Donghi, historians have attempted to explain why there was an expansion on the Pampas despite the lack of price incentives. By applying a better methodology, however, this paper has demonstrated that there were in fact clear price incentives for the expansion. Indeed, over the whole of the long nineteenth century – from the 1780s through to the 1900s – Argentina's terms of trade probably improved by at least 2,000 percent. There were, then, massive price incentives for increasing output.

The progress that resulted from Argentina's expansion has been much celebrated by some historians.⁵³ It could be seen most clearly in the growth of territory, population, and trade.⁵⁴ The federal government enlarged the territory

53. Especially in Cortés Conde, *Progreso argentino*; idem, 'The Export Economy of Argentina 1880-1920', in idem and S.J. Hunt, eds., *The Latin American Economies: Growth and the Export Sector 1880-1930*, New York, 1985; R. Cortés Conde, 'The Growth of the Argentine Economy, c. 1870-1914', in L. Bethall, ed., *The Cambridge History of Latin America*, V, c. 1870-1930, Cambridge, 1986; R. Cortés Conde, *La economía argentina en el largo plazo: Ensayos de historia económica de los siglos XIX y XX*, Buenos Aires, 1997; and idem, 'The Vicissitudes of an Exporting Economy: Argentina (1875-1930)', in E. Cárdenas, J.A. Ocampo, and R. Thorp, eds., *An Economic History of Twentieth-Century Latin America*, I, *The Export Age*, Oxford, 2000.

54. Economic historians also point toward dramatic per capita GDP growth but their numbers are far from reliable. See J.A. Francis, 'The Terms of Trade and the Rise of Argentina in the

under its control from around 1.9 million square kilometres at the end of the 1860s to 2.8 million by the eve of the First World War,⁵⁵ while the land under cultivation increased from roughly 600,000 hectares at the beginning of the 1870s to 24 million in 1913.⁵⁶ Immigrants provided much of the labour for this expansion, with about three million foreigners, mainly Italians and Spanish, settling from the 1860s through to the First World War, leading to a population growth of 3.3 percent per year⁵⁷ – faster than any other major country.⁵⁸ Export volume grew by approximately five percent annually.⁵⁹

Yet improved terms of trade were not entirely beneficial. Inequality tended to increase not only between landowners and the landless,⁶⁰ but also between regions that were relatively land abundant and land scarce. While the Pampean zone prospered, much of the Interior, where approximately two thirds of the population lived at independence,⁶¹ was less fortunate. Prior to colonisation in the sixteenth century, the mountainous North and West had been populated by sedentary peasants, living on the southern periphery of the Incan empire. Spanish settlers had rapidly established themselves as overlords of these peasant societies, using Indian labour to supply Potosí, the great mining city in Upper Peru, with mules, sugar, wine, tobacco, and other goods. Crucially, they were protected from competition with imports by the high trade costs that resulted from the Spanish monopoly.⁶²

After independence, the Interior's products struggled to compete with the cheaper imports arriving at the Littoral's expanding market because the high costs of overland transportation made them uncompetitive. In 1825, for example, it was estimated that at a distance of 1,040 km the cost of transporting

Long Nineteenth Century', PhD diss., London School of Economics and Political Science, 2013, Appendix 1.1, esp. pp. 45-53.

55. Estimated from Superintendente del Censo, *Primer censo de la República Argentina*, Buenos Aires, 1872, p. 672; and Comisión Nacional de Censo, *Tercer censo nacional*, III, *Población*, Buenos Aires, 1916, p. 58. It can be assumed that the indigenous-occupied 'national territories' were not under the federal government's control when the 1869 census was taken.

56. Tornquist, *Economic Development*, p. 26.

57. Z. Recchini de Lattes and A.E. Lattes, eds., *La población de Argentina*, Buenos Aires, 1975, pp. 199-200.

58. See the estimates in A. Maddison, *The World Economy*, II, *Historical Statistics*, Paris, 2006.

59. H. Diéguez, 'Crecimiento e inestabilidad del valor y el volumen físico de las exportaciones argentinas en el periodo, 1864-1963', *Desarrollo Económico*, 12:46, 1972, p. 349, Cuadro 18.

60. See L.L. Johnson, 'Distribution of Wealth in Nineteenth-Century Buenos Aires Province: The Issue of Social Justice in a Changing Economy', in K.J. Andrien and L.L. Johnson, eds., *The Political Economy of Spanish America in the Age of Revolution, 1750-1850*, Albuquerque, 1994; and R. Hora, 'La evolución de la desigualdad en la Argentina del siglo XIX: Una agenda en construcción', *Desarrollo Económico*, 47:187, 2007.

61. This is an approximation and does not include the indigenous populations beyond the frontiers. From J. Comadrán Ruiz, *Evolución demográfica argentina durante el período hispano: 1535-1810*, Buenos Aires, 1969, p. 115.

62. P. Santos Martínez, *Las industrias durante el Virreinato (1776-1810)*, Buenos Aires, 1969; and Halperín Donghi, *Politics, Economics*, pp. 6-16.

wine overland to Buenos Aires equalled half the price of wine in that city.⁶³ For distant wine-producing provinces such as Mendoza or San Juan, both around 1,000 km away from Buenos Aires, such high transportation costs meant that their wines struggled to compete with imports in the Littoral's market. The loss of these markets then reduced profit margins, so vineyards were converted to alfalfa, in order to feed the cattle that were being herded from the Pampas to Chile.⁶⁴

Worse still, the Interior's textile producers were vulnerable to imported cloths, which could be profitably transported over land due to their light weight. In the late colonial era, textile production was widespread among peasant women, both for their own consumption and for sale in urban markets.⁶⁵ Hence, in 1788 the governor of Córdoba reported that:

Córdoba's sheep are the principal respite of the poor people or those of middling means because their wool is of a predictable quality, they employ it in blankets, cloths, ponchos, throws, and rugs, with which they do a considerable trade to Buenos Aires, Mendoza, Chile, Salta, and even Peru, and almost all the women of the countryside dedicate themselves to these goods, which they generally exchange with merchants for Castilian goods, such as linens, cottons, velvets, silks, etc. From sheep and goats skins they make very good rugs and cured leathers that have their own circulation.⁶⁶

Following independence, the Interior's textiles were first pushed out of the Littoral's market by cheaper imports; then their place in the Interior's own markets was gradually diminished as North Atlantic manufacturers began to adapt their products to Argentine tastes. Only the still considerable costs of overland transportation appear to have allowed the textile producers to continue, although it

63. M. Burgin, *The Economic Aspects of Argentine Federalism 1820-1852*, Cambridge, MA, 1946, p. 118, Table 17. Conversion factor from leagues to kilometres from Tornquist, *Economic Development*, p. 326.

64. B. Bragoni, 'Condiciones y estímulos en la recuperación de una economía regional: Prácticas mercantiles e instituciones empresarias en Mendoza, 1820-1880', in M.A. Irigoien and R. Schmit, eds., *La desintegración de la economía colonial: Comercio y moneda en el interior del espacio colonial (1800-1860)*, Buenos Aires, 2003, pp. 278-79. This analysis has been disputed by Amaral, who argues that it was actually the civil wars that destroyed the West's wine industry after independence, rather than competition with foreign imports, and that it then took decades for grape production to recover 'because of its slower rhythms'. S. Amaral, 'Free Trade and Regional Economies: San Juan and Mendoza, 1780-1820', in Szuchman and Brown, eds., *Revolution and Restoration*, p. 144. This argument is strange, however, because it should not take decades to reestablish vineyards if the incentives are there.

65. Santos Martínez, *Industrias durante el Virreinato*, pp. 44-48; and C.S. Assadourian, *El sistema de la economía colonial: Mercado interno, regiones y espacio económico*, Lima, 1982, pp. 253-54. For a detailed case study, see E. Hermitte and H.S. Klein, 'Crecimiento y estructura de una comunidad provinciana de tejedores de ponchos: Belén, 1678-1869', Documento de Trabajo 78, Centro de Investigaciones Sociales, Instituto Torcuato Di Tella, 1972.

66. Marques de Sobre Monte, 'Sobre la Intendencia de Córdoba del Tucumán (1788)', *Revista de Buenos Aires*, 2:6, 1865, p. 483, my translation.

was in a considerably impoverished state.⁶⁷

Textile producers all but disappeared completely when the railways brought the terms-of-trade boom to the Interior from the 1870s and '80s. In 1869 the first national census had found 94,882 textile producers,⁶⁸ but their numbers fell to just 39,725 in 1895.⁶⁹ To put these numbers in perspective, in 1869 textile producers represented 19 percent of the Interior's workforce, whereas in 1895 they had fallen to 6 percent. The authors of the 1895 census report were unequivocal as to why this had occurred:

Until 1869, having no railways in the interior, and with high [internal] transportation costs, a great proportion of the population consumed [domestic textiles], which could rival the prices of similar goods from abroad: today, the competition due to the relatively low freight rates has made the consumption of domestic products fall, and therefore made redundant many of those who used to engage in this profession.⁷⁰

By the 1914 census the number of textile workers recorded had fallen further to 30,980 people; in the Interior, they made up just 3 percent of the workforce.⁷¹ As in other parts of the periphery,⁷² this major 'proto-industry' had been under-

67. Assadourian, *Sistema de la economía*, pp. 253-65; S. Romano, *Economía, sociedad y poder en Córdoba: Primera mitad del siglo XIX*, Córdoba, 2002, pp. 123-26, 162-65; and C.S. Assadourian and S. Palomeque, 'Las relaciones mercantiles de Córdoba (1800-1830): Desarticulación y desmonetización del mercado interno colonial en el nacimiento del espacio económico nacional', in Irigoien and Schmit, eds., *Desintegración de la economía*, pp. 177-79, 182-84; also see M. Llorca-Jaña, 'Knowing the Shape of Demand: Britain's Exports of Ponchos to the Southern Cone, c. 1810s-70s', *Business History*, 51:4, 2009; and idem, *British Textile Trade*, pp. 263-67.

68. Including the census categories 'blanqueadores', 'cordeleros, hiladores é hiladoras', 'tejedores y tejedoras', 'pelloneros', 'tintoreros', and 'torcedores de lana, seda, etc'. Calculated from Superintendente del Censo, *Primer censo*, pp. 642-669. This number is somewhat inflated because the 1869 census included child workers, whereas later censuses only included those aged 14 and over. A computer-coded sample of 100,944 individual returns from the 1869 census suggests that only 6 percent of textile workers were below 14 years old. Calculated from R. McCaa, M.R. Haines, and E.M. Mulhare, 'Argentina: The First National Historical Census Microdata', in P.K. Hall, R. McCaa, and G. Thorvaldsen, eds., *Handbook of International Historical Microdata for Population Research*, Minneapolis, 2000; underlying data available online at http://www.hist.umn.edu/~rmccaa/data/argentine_censuses_19thc.zip (accessed 1 September 2013). Applying that figure to the 1869 census data would suggest that there were 89,189 textile workers in that year.

69. Including the census categories 'cordeleros, cabulleros, etc', 'tejedores', and 'tintoreros'. Calculated from Comisión Directiva, *Segundo censo de la República Argentina*, II, *Población*, Buenos Aires, 1898, pp. 47-50, 139-142, 183-186, 216-219, 257-60, 297-300, 326-29, 365-68, 402-05, 439-42, 476-79, 515-16, 552-55, 592-95, 624-27, 706-09.

70. *Ibid.*, p. cxliv, my translation.

71. Including the census categories 'cardadores de lana; cordeleros; fabricantes de tejidos; hiladores, tejedores, tellaristas; tintoreros'. Calculated from Comisión Nacional de Censo, *Tercer censo*, IV, *Población*, Buenos Aires, 1916, pp. 201-329.

72. Williamson, *Trade and Poverty*, esp. chs. 3-5. Again, for major caveats about Williamson's

mined by improved terms of trade.

Unfortunately, research into these processes of decline has been inhibited by the Halperín paradox. Historians have focused on trying to explain why the expansion occurred on the Pampas despite the lack of price incentives, so the Interior has been largely overlooked. Nevertheless, as this paper has shown, once the terms of trade are measured correctly, considerable price incentives for the expansion on the Pampas can be seen. The Halperín paradox has in this way been resolved. What now needs to be further investigated is how the terms-of-trade boom impacted on the 'other Argentina'.⁷³ In other words, future research must look beyond Buenos Aires to the Interior, in order to explain not only Argentina's progress in the long nineteenth century, but also its decline.

Appendix: Argentina's Terms of Trade, 1780-1913

This appendix briefly describes how the new 'part-proxy' estimate of Argentina's 'net barter terms of trade' (NBTT) was calculated.⁷⁴ To begin with, some of the terminology will be clarified, then the sources and methods used for the new estimate will be discussed.

Ideally, a country's terms of trade should be calculated using its own prices for both the export price index (Px) and the import price index (Pm). This can be done using wholesale prices from within the country, as follows:

$$\text{Wholesale NBTT} = \frac{\text{Domestic wholesale } Px}{\text{Domestic wholesale } Pm}$$

Alternatively, at-the-port prices can be used, which include wholesale markups and excise duties for export prices, but exclude customs taxes and wholesale markups for imports. Technically, these are known as 'cost, insurance, and freight' (CIF) import prices and 'free on board' (FOB) export prices. The at-the-port terms of trade are calculated in this way:

$$\text{At-the-port NBTT} = \frac{\text{FOB } Px}{\text{CIF } Pm}$$

Regrettably, such historical price data are often unavailable, particularly for poorer, more peripheral countries. As a result, historians have often used prices from Britain and the United States as proxies for prices in the peripheral

data, see Francis, 'Periphery's Terms of Trade'.

73. The phrase comes from L. Sawers, *The Other Argentina: The Interior and National Development*, Oxford, 1996.

74. The accompanying workbook is available online at http://www.joefrancis.info/data/Francis_Arg_tots.xlsx. For a longer account of its contents, see Francis, 'Terms of Trade', Appendix 4.1.

countries themselves.⁷⁵ The results can be considered 'proxy terms of trade':

$$\text{Proxy NBTT} = \frac{\text{Foreign } P_x}{\text{Foreign } P_m}$$

Proxy terms-of-trade estimates are, then, those in which another country's prices are used in place of a country's own prices.

For the nineteenth century, such proxy estimates are problematic because of the price convergence that took place between core and peripheral countries. This meant, for example, that for much of the nineteenth century the price of Indonesian sugar fell in London, even as it rose in Java. Consequently, proxy terms of trade for Indonesia calculated using London prices have a significant downward bias in their trend. In the case of Indonesia, this can be demonstrated thanks to the scrupulous work of Dutch researchers in reconstructing the country's price history.⁷⁶ For no other peripheral country, however, has equivalent research been done,⁷⁷ so historians have routinely relied upon proxy estimates. The terms-of-trade series presented for most other peripheral countries during the nineteenth century must consequently be treated with considerable scepticism, including those for Argentina.⁷⁸

75. See Francis, 'Periphery's Terms of Trade', Appendix.

76. W.L. Korthals Altes, *Changing Economy in Indonesia: A Selection of Statistical Source Material from the Early 19th Century up to 1940*, XV, *Prices (Non-Rice) 1814–1940*, Amsterdam, 1994. For analysis of this data, see Francis, 'Periphery's Terms of Trade', pp. 10-17.

77. Although the situation is starting to improve. Most notably, see D. Chilosi and G. Federico, 'Asian Globalizations: Market Integration, Trade and Economic Growth, 1800-1938', Economic History Working Paper 183, London School of Economics and Political Science, 2013.

78. The standard series for Argentina for 1811-70 comes from Newland, 'Exports and Terms of Trade', pp. 413-15; for the underlying data, see idem, 'Puramente animal: Exportaciones y crecimiento en Argentina 1810-1870', mimeo, 1990. Newland mainly used wholesale prices and unit values from the core countries. There is no canonical series for 1870-86, so the gap is filled by various means. Williamson, for example, relies on a series calculated using British commodity prices for exports and US wholesale price indices for imports. J.G. Williamson, 'Globalization and the Great Divergence: Terms of Trade Booms, Volatility and the Poor Periphery, 1782-1913', *European Review of Economic History*, 12:3, 2008, p. 390; also see C. Blattman, J. Hwang, and J.G. Williamson, 'Winners and Losers in the Commodity Lottery: The Impact of Terms of Trade Growth and Volatility in the Periphery 1870-1939', *Journal of Development Economics*, 82:1, 2007. For 1886-1913, an index originally calculated by Ford is the standard series. He used a mixture of prices from Argentine trade statistics and British wholesale prices that he corrected for changes in transportation costs. A.G. Ford, 'Export Price Indices for the Argentine Republic, 1881-1914', *Inter-American Economic Affairs*, 9:2, 1955. This correction procedure means that Ford's estimates should be considerably more accurate than those of Newland or Williamson, although there are doubts about Argentina's trade statistics for much of this period. See R. Cortés Conde, T. Halperin, and H. Gorostegui de Torres, 'Evolución del comercio exterior argentino: Tomo I: Exportaciones: Parte primera 1864-1930', mimeo, 1965. Moreover, the version of Ford's index that has routinely been used is that presented by G. di Tella and M. Zymelman, *Etapas del desarrollo*,

The new terms-of-trade estimate for Argentina that is presented in Figure 2 of this paper is far from perfect. It can be considered a ‘part-proxy’ estimate, in that it uses Argentina’s own prices for exports but the prices of Argentina’s main trade partners for imports. It is calculated as:

$$\text{Part-proxy NBTT} = \frac{\text{Domestic } P_x}{\text{Foreign } P_m}$$

It should be stressed that the terms-of-trade estimate for nineteenth-century Argentina that results from this formula is likely to have a downward bias in the trend because it does not take into account the price convergence that occurred on the import side.

Calculating Argentina’s export price index was a complicated task. The following sources were found for the raw price data: unit values for hides from Zacharías Moutoukias’ compilation of late colonial trade statistics for 1779-96;⁷⁹ wholesale hide prices for 1810-23 from a report presented by British merchants to the new British consul in 1824.⁸⁰ Julio Broide’s compilation of wholesale prices for 1829-51, as reported in the English-language *British Packet and Argentine News*;⁸¹ Juan Álvarez’ compilation of wholesale prices for the 1860s onwards, taken from the bulletin of the Buenos Aires Stock Exchange;⁸² Roberto Cortés Conde, Tulio Halperín Donghi, and Haydée Gorostegui de Torres’s unpublished reconstruction of Argentina’s export statistics from the 1860s to the early twentieth century, when market prices began to be used in the official trade statistics;⁸³ and the official trade statistics from the early twentieth century onwards.⁸⁴ The fragmentary price series compiled from these sources were then converted into British pound sterling,⁸⁵ the era’s dominant currency, and metric

Las etapas del desarrollo económico argentino, Buenos Aires, 1973, p. 56, Table 10. Bizarrely, when attempting to chain two of Ford’s export price indices, di Tella and Zymelman did not ratio splice them; rather, they simply jumped from one series to another in 1892, resulting in an artificial increase. Unfortunately, other scholars have tended to use the di Tella and Zymelman version rather than Ford’s original. For example, see Ferreres, *Dos siglos*, p. 658; and L. Arroyo Abad, ‘Persistent Inequality? Trade, Factor Endowments, and Inequality in Republican Latin America’, *Economic History Review*, 73:1, 2013, p. 71.

79. Moutoukias, ‘Crecimiento en una economía’, p. 804, Cuadro 3.

80. Anon., ‘Report on the Trade’, p. 33; and idem, ‘Precios corrientes’, p. 60.

81. Broide, ‘Evolución de los precios’, pp. 41-43, 50, Cuadros 16-18, and 22.

82. J. Álvarez, *Temas de historia económica argentina*, Buenos Aires, 1929, pp. 208-26.

83. Cortés Conde, Halperin, and Gorostegui de Torres, ‘Evolución del comercio’, pp. 73-79.

84. As compiled in Dirección General de Estadística de la Nación (DGEN), *Extracto estadístico de la República Argentina correspondiente al año 1915*, Buenos Aires, 1916, pp. 204-17; A. Bunge, *Intercambio económico de la República, 1910-1917*, Buenos Aires, 1919, ch. 11; and V. Vázquez-Preedo, *Estadísticas históricas argentinas (comparadas)*, II, *Segunda parte 1914-1939*, Buenos Aires, 1971, pp. 194-221.

85. For 1780-1822, it was necessary to estimate the exchange rate based on the silver content of the peso and the price of silver in London. From Álvarez, *Temas de historia*, pp. 80-124; as

units.⁸⁶

The various export price series were combined into a chained geometric Laspeyres index, which was used as a shorthand means to approximate a chained Fisher index.⁸⁷ Ten separate subperiods were calculated; then they were spliced together using the geometric mean of their overlapping periods.⁸⁸ The weights assigned to the 31 different goods in each subperiod can be seen in Appendix Table 1.⁸⁹ They were assigned based on the values of goods exported in the indicated years, according to Argentina's trade statistics. As can be seen, the number of goods included in the index increases over time: from 1780 to 1821 it includes dry hides only; in 1822 salted hides are added; in 1829 jerked beef; and so on. This reflects both the paucity of price data and the increasing variety of goods exported from Argentina.

The proxy import price index, by contrast, is considerably cruder. It is calculated from export price indices for six of Argentina's major trade partners: Brazil, Britain, France, Germany, Italy, and the United States. With the exception of Brazil,⁹⁰ the export price indices were taken from the work of other scholars,⁹¹ then converted to sterling.⁹² Again, they were combined into a

compiled by Rodolfo G. Frank, online at http://www.anav.org.ar/sites_personales/5/MONEDA.XLS (accessed 2 May 2013); and R.W. Jastram, *Silver: The Restless Metal*, New York, 1981, Table 15 and App. C; reproduced by Clark and Lindert, online at [http://gpih.ucdavis.edu/files/England_1209-1914_\(Clark\).xls](http://gpih.ucdavis.edu/files/England_1209-1914_(Clark).xls) (accessed 3 May 2013). From 1816 onward, the exchange rate was compiled from Anon., 'Precios corrientes', p. 60.; J. Schneider, O. Schwarzer, and M.A. Denzel, *Währungen der Welt, VII, Lateinamerikanische Devisenkurse im 19. und 20. Jahrhundert*, Stuttgart, 1997, pp. 212-18; and M. Balboa, 'La evolución del balance de pagos de la República Argentina, 1913-1950', *Desarrollo Económico*, 12:45, 1972, p. 160.

86. Weights and measures come from Tornquist, *Economic Development*, pp. 325-28.

87. International Monetary Fund, *Producer Price Index: Theory and Practice*, Washington, DC, 2004, pp. 566, 593.

88. The geometric mean has been preferred due to its mathematical properties. See R.J. Hill and K.J. Fox, 'Splicing Index Numbers', *Journal of Business & Economic Statistics*, 15:3, 1997.

89. When a series was not available for part of a subperiod, these weights were adjusted accordingly.

90. Nine goods were included in Brazil's export price index. They were reweighted every 10 years according to the value of their exports. Calculated from Instituto Brasileiro de Geografia e Estatística, *Estatísticas históricas do Brasil: Séries econômicas demográficas e sociais de 1550 a 1988*, 2nd ed., Rio de Janeiro, 1990, pp. 345-56.

91. Britain: A.H. Imlah, *Economic Elements in the Pax Britannica: Studies in British Foreign Trade in the Nineteenth Century*, Cambridge, MA, 1958, pp. 94-98, Table 8; C. Feinstein, *National Income, Expenditure and Output of the United Kingdom, 1855-1965*, Cambridge, 1972, pp. T132-32, Table 61; and J. Cuenca Esteban, 'The Rising Share of British Industrial Exports in Industrial Output, 1700- 1851', *Journal of Economic History*, 57:4, 1997, p. 901, App. Table 1. France: United Nations, 'International Trade Statistics 1900-1960', mimeo, 1962, Table 11, online at http://unstats.un.org/unsd/trade/imts/historical_data.htm (accessed 1 July 2014); and M. Lévy-Leboyer, 'L'héritage de Simiand: Prix, profit et termes d'échange au XIX e siècle', *Revue Historique*, 243, 1970, pp. 108-111, Table 5. Germany: W.G. Hoffmann, *Das Wachstum der deutschen Wirtschaft seit der Mitte des 19. Jahrhunderts*, Berlin, 1965, pp. 606-09,

chained geometric Laspeyres index, using the weights shown in Appendix Table 2.⁹³

The part-proxy terms of trade derived from these export and import price indices show a considerably greater improvement than has previously been supposed. In Appendix Table 3 that is confirmed by comparing the new series with that found in Orlando Ferreres' commonly used compilation of Argentine historical statistics. Whereas Ferreres found a 152 percent improvement from 1810s to the 1900s, the new series suggests 441 percent. Moreover, if some adjustments are made to account for the falling trade costs for imports, the terms-of-trade boom appears even greater still. If it is assumed that high trade costs meant that Argentina's import prices were 100 percent higher than the core's export prices until independence in 1810, but then fell at a constant rate until they reached 20 percent of the core's export prices in the first decade of the twentieth century, the improvement from the 1810s to the 1900s increases to 771 percent. Looking further back, the adjusted part-proxy estimate suggests an even greater boom, as it shows a 2,485 percent improvement from the 1780s to the 1900s, compared to 1,451 percent in the unadjusted estimate.

To test whether such a boom could feasibly have occurred, in Appendix Figure 1 the adjusted part-proxy estimate for Argentina is compared to Indonesia's terms of trade, which, thanks to the work of the Dutch researchers mentioned above, is the only peripheral country to have a reliable own-price terms-of-trade estimate that reaches back to the first half of the nineteenth century.⁹⁴ As can be seen, the improvement in the adjusted part-proxy estimate for Argentina is similar to that for Indonesia. This suggests that the magnitude of the terms-of-trade boom suggested for Argentina in this paper is highly plausible.

Table 151. Italy: G. Federico, S. Natoli, G. Tattara, and M. Vasta, *Il commercio estero italiano 1862-1950*, Rome, 2011, pp. 228-29, Tabella 7b. United States: various series compiled in D.A. Irwin, 'Exports and Imports of Merchandise – Price Indexes and Terms of Trade: 1790-2002', in S.B. Carter et al, eds., *Historical Statistics of the United States: Earliest Times to the Present: Millennial Edition*, New York, 2006, online at <http://hsus.cambridge.org/HSUSWeb/HSUSEntryServlet> (accessed 20 November 2013)

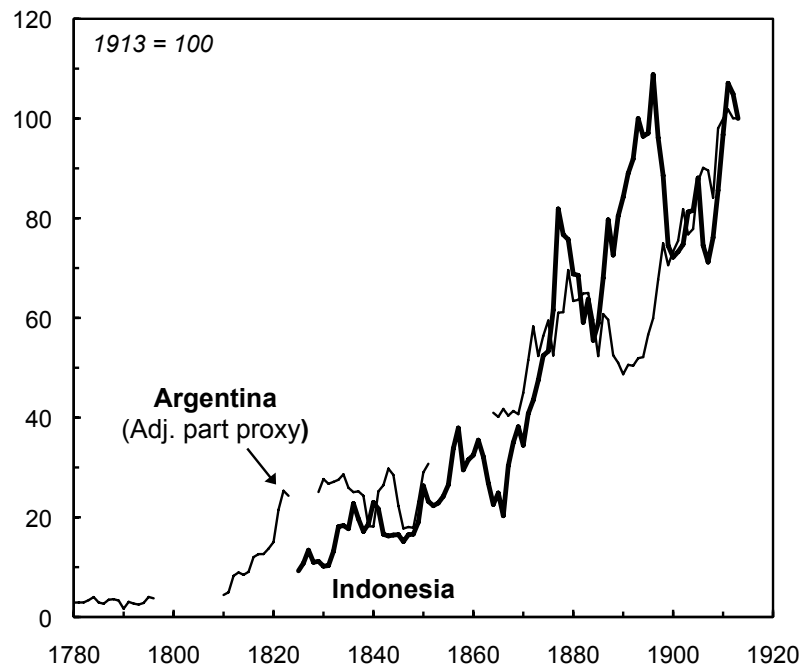
92. Using exchange rates from Officer, 'Dollar–Sterling Exchange Rates: 1791-1914' and 'Bilateral Exchange Rates – Europe: 1913-1999', in Carter et al, *Historical Statistics*, Series Ee618, Ee625, Ee626, Ee629, and Ee636; and M.A. Denzel, *Handbook of World Exchange Rates, 1590-1914*, Farnham, 2010, pp. 15-28, 42-43.

93. The use of such a proxy index is crude because it assumes that the composition of Argentina's imports from each of the six countries was similar to the composition of their exports to all countries. Nevertheless, it is still preferable to the common practice of just using Britain's export prices as a proxy for a peripheral country's import prices (see Francis, 'Periphery's Terms of Trade'). How the six countries' export prices were indexed is detailed in the Appendix.

94. Francis, 'Periphery's Terms of Trade'.

Appendix Figure 1

Terms of Trade for Argentina and Indonesia, 1780-1938



Sources:

Argentina: See the text.

Indonesia: Korthals Altes, *Changing Economy*, XV, pp. 158-60.

Appendix Table 1

Weights in Argentina's Export Price Index, 1780-1938

	<i>Base year:</i>	...	1822	1837	1851	1866	1881	1896	1910	1925	1938
	<i>Subperiod:</i>	1780	1780	1822	1837	1851	1866	1881	1896	1910	1925
		to	to	to	to	to	to	to	to	to	to
		1822	1837	1851	1866	1881	1896	1910	1925	1938	1938
Hides, dried (1780+)	1.0000	0.7347	0.6971	0.6501	0.3438	0.2658	0.0579	0.0382	0.0182	0.0093	
Hides, salted (1822+)		0.0880	0.0835	0.0779	0.0412	0.0409	0.0471	0.0471	0.0668	0.0587	
Beef, jerked (1829+)		0.1222	0.1057	0.0967	0.0296	0.0577	0.0274	0.0029			
Tallow and fat (1833+)		0.0435	0.0356	0.1348	0.0763	0.0275	0.0248	0.0293	0.0229	0.0103	
Wool, dirty (1833+)		0.0116	0.0781	0.0164	0.4039	0.4899	0.3507	0.1633	0.0840	0.0998	
Cattle (1864+)*					0.0193	0.0210	0.0899	0.0130			
Sheep skins, dirty (1864+)				0.0242	0.0858	0.0871	0.0453	0.0246	0.0063	0.0075	
Wheat (1878+)						0.0002	0.1193	0.2004	0.2345	0.1491	
Maize (1879+)						0.0078	0.1487	0.1672	0.1418	0.1467	
Flour (1880+)						0.0022	0.0181	0.0137	0.0154	0.0083	
Linseed (1887+)							0.0638	0.1238	0.1064	0.1473	
Goat skins (1893+)							0.0070	0.0036			
Barley (1910+)								0.0004	0.0036	0.0149	
Beef, chilled (1910+)*								0.0033	0.0853	0.1352	
Beef, conserved (1910+)								0.0059	0.0202	0.0364	
Beef, frozen (1910+)								0.0953	0.0581	0.0271	
Bran (1910+)								0.0125	0.0073	0.0129	
Butter (1910+)								0.0050	0.0251	0.0072	
Oats (1910+)								0.0226	0.0204	0.0184	
Quebracho extract (1910+)								0.0123	0.0220	0.0280	
Quebracho logs (1910+)								0.0156	0.0033	0.0034	
Rye (1910+)								0.0000	0.0004	0.0003	

Appendix Table 1 (cont.)

	<i>Base year:</i>	...	1822	1837	1851	1866	1881	1896	1910	1925	1938
	<i>Subperiod:</i>	1780	1780	1822	1837	1851	1866	1881	1896	1910	1925
		to	to	to	to	to	to	to	to	to	to
		1822	1837	1851	1866	1881	1896	1910	1925	1938	1938
Sugar (1910+)									0.0000	0.0000	0.0009
Cotton (1914+)										0.0045	0.0099
Sheep skins, treated (1914+)										0.0039	0.0015
Casein (1916+)										0.0037	0.0029
Guts, salted (1916+)										0.0038	0.0021
Mutton (1916+)										0.0261	0.0275
Offal, frozen (1916+)										0.0055	0.0093
Wool, clean (1916+)										0.0069	0.0068
Wool, washed (1920+)										0.0035	0.0184
<i>Total:</i>		<i>1.0000</i>	<i>1.0000</i>	<i>1.0000</i>	<i>1.0000</i>	<i>1.0000</i>	<i>1.0000</i>	<i>1.0000</i>	<i>1.0000</i>	<i>1.0000</i>	<i>1.0000</i>

* Prior to 1910, the price of cattle is used as a proxy for the prices of chilled and frozen beef, which is reflected in the weight given to cattle until that year.

Note: The year after each good indicates the year in which is price series begins. When a weight of 0.0000 is given, it indicates that the product was included, but the weight given was less than 0.01 percent. The sum of the weights may not equal one due to rounding.

Sources:

The base year weights were calculated from the following sources:

1822, 1837, 1851: W. Parish, *Buenos Ayres and the Provinces of the Rio de la Plata*, 2nd ed., London, 1852, pp. 353-54, Tables 1 and 2.

1866, 1881, 1896: Cortés Conde, Halperín Donghi, and Gorostegui de Torres, 'Evolución del comercio', pp. 66-68, Cuadro 3.

1910: Bunge, *Intercambio económico*, pp. 314-18.

1925, 1938: Vázquez-Presedo, *Estadísticas históricas*, II, pp. 194-221.

Appendix Table 2

Weights in Argentina's Proxy Import Price Index, 1780-1938

Base year:	1825	1850	1870	1890	1910	1930
	1780	1825	1850	1870	1890	1910
Subperiod:	to	to	to	to	to	to
	1850	1870	1890	1910	1930	1938
Britain (1780+)	0.6250	0.4639	0.3674	0.5194	0.3727	0.2710
United States (1790+)	0.1406	0.1031	0.0814	0.0836	0.1650	0.3016
France (1809+)	0.0859	0.2577	0.3630	0.1786	0.1147	0.0823
Brazil (1821+)	0.1484	0.1134	0.0955	0.0301	0.0310	0.0565
Italy (1862+)		0.0619	0.0479	0.0778	0.1083	0.1277
Germany (1880+)			0.0448	0.1105	0.2083	0.1608
Total:	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000

Note: The year after each good indicates the first year of its export price index. The sum of the weights may not equal one due to rounding.

Sources:

1825 and 1850: W. Parish, *Buenos Ayres and the Provinces of the Rio de la Plata*, 2nd ed., London, 1852, p. 361.

1870: R. Napp, *La República Argentina*, Buenos Aires, 1876, p. ii.

1890: F. Latzina, *Estadística retrospectiva del comercio exterior argentino 1875-1904*, Buenos Aires, 1905, pp. 220-23.

1910 and 1930: DGEN, *Anuario del comercio exterior de la República Argentina correspondiente a 1937 y noticia sumaria del período 1910-1937*, Buenos Aires, 1938, pp. lxxxviii-cv.

Appendix Table 3

Three Estimates of Argentina's Terms of Trade, 1780s-1900s

	Ferrerres	New	
		Part-proxy	Adj. part-proxy*
1780s		6.4	3.9
1810s	39.7	18.5	11.5
1830s	68.3	44.8	31.0
1870s	76.8	79.0	68.6
1900s	100.0	100.0	100.0
Growth, %:			
1780s to 1900s		1,451	2,485
1810s to 1900s	152	441	771

* Based on the assumption that Argentina's import prices were 100 percent higher than the core's export prices until 1810, but then fell exponentially to 20 percent in the 1900s.

Note: All three estimates were referenced so that 1900-09 equals 100.

Sources: Ferreres, *Dos siglos*, Table 8.1.7; and the text.

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