King Cotton, the Munificent

Slavery and (Under)development in the United States, 1789-1865

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Abstract

Slavery made an important contribution to the development of the United States up to the Civil War. Slaves were necessary for the country's cotton boom because cotton was not sufficiently remunerative to attract yeoman farmers. Cotton exports then balanced the imports that the Federal Government taxed to obtain most of its revenues. Those revenues were used to fund westward expansion, both directly through the acquisition and conquest of new territory, and indirectly through the policy of retiring the national debt, which pumped liquidity into the country's nascent capital markets and bolstered the reputation of American bonds among foreign investors. State government could then borrow to finance the transportation infrastructure that connected the new lands to markets, allowing them to be settled. Westward expansion tended to weaken slaveholders' position in Congress because they were excluded from the rapidly growing Midwest. They therefore seceded. The North would not let the South leave the Union, however, because secession threatened to take away the Federal Government's main source of revenues. As a result, the Civil War began, leading to emancipation. Slavery had thus financed the development of the settler society that would eventually abolish it, while the slaves themselves became an underdeveloped nation within a nation.

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> It is demonstratively clear, that on this Estate (Mount Vernon) I have more working Negros by a full moiety, than can be employed to any advantage in the farming System; and I shall never turn Planter thereon.
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> George Washington, 17 August 1799

This paper examines the role of slavery in the development of the United States up to the Civil War. Slavery was necessary for the country's cotton boom in the early nineteenth century because it was not a sufficiently remunerative crop to attract free labour. Cotton's contribution to the development of the United States then came through its role in public finances. As the country's main export commodity, cotton balanced the imports that the Federal Government taxed to obtain the bulk of its revenues. These revenues were used to promote westward expansion in two ways. Firstly, they paid for the acquisition and conquest of new lands. Secondly, they were used to retire the national debt, which pumped liquidity into the country's nascent capital markets and improved its reputation among foreign investors. State governments borrowed the funds made available to build the transportation infrastructure that connected the new lands to markets. In the North, prosperous yeoman farmers then provided demand for the goods and services of a sprawling network of towns and cities, leading to industrialisation. In the South, by contrast, population density was limited by poor soil and climate, which led to a shifting cultivation in which large amounts of land was kept as fallow, inhibiting urban growth. Slave-produced cotton thus made an important contribution to the expansion of the North's settler society, even as the South lagged behind due to its ecological limitations. The resulting shift in the balance of power from South to North threatened the institution of slavery, ultimately leading to secession and civil war. Such is this paper's argument in a nutshell.

The role of slave-produced cotton in the United States's development has long been debated. In an influential early analysis Douglass North argued that the cotton boom drove the growth of the whole country in the first half of the nineteenth century as the South provided markets for Midwestern foodstuffs and the industry and services of the Northeastern cities.[1] Problems with this cotton-centric account of the United States' development soon became apparent when subsequent research found that the South was self-sufficient in food, so it was not a major market for Midwestern grains,[2] while it also took only a small share of the Northeast's manufactured goods.[3] Moreover, the South became a less import-

1. D.C. North, *The Economic Growth of the United States 1790-1860*, Englewood Cliffs, 1961, pp. 67-68.
2. R.E. Gallman, 'Self-Sufficiency in the Cotton Economy of the Antebellum South', *Agricultural History*, 44:1, 1970; D. Lindstrom, 'Southern Dependence upon Interregional Grain Supplies: A Review of the Trade Flows, 1840-1860', *Agricultural History*, 44:1, 1970; and S.B. Hilliard, *Hog Meat and Hoecake: Food Supply in the Old South, 1840-1860*, Carbondale, 1972, ch. 11.
3. P.J. Uselding, 'A Note on the Inter-Regional Trade in Manufactures in 1840', *Journal of Economic History*, 36:2, 1976, pp. 434-35.

ant market as the North's population grew.[4] Similarly, the North's capital markets financed a wide range of activities in the North itself, rather than being focused on cotton exports and the slave trade.[5] In light of these findings, economic historians have long ceased to see cotton as central to the expansion of the antebellum United States.[6] Some historians have continued to ignore this historiography, however, insisting that cotton was of overwhelming importance.[7] Edward Baptist, most infamously, used some 'back-of-the-envelope accounting' to arrive at the conclusion that 'almost half of the economic activity in the United States in 1836 [...] derived directly or indirectly from cotton'.[8] As economic historians have pointed out, Baptist's calculations involve considerable double and even triple counting, based on a misunderstanding of national accounting.[9] Even at its peak in the 1850s, cotton represented only around 5 per cent of national income.[10] Cotton did make up half of commodity exports from the 1820s through the 1850s, but exports in themselves contributed relatively little to growth in this period.[11] Even the claim that the South's cotton provided a vital raw material for Northern industrialisation is dubious because it could have simply been imported from abroad at a minor extra cost.[12] Moreover, economic historians have

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4. A. Fishlow, *American Railroads and the Transformation of the Ante-Bellum Economy*, Cambridge, MA, 1965, pp. 282-88.
5. E.J. Perkins, *American Public Finance and Financial Services 1700-1815*, Columbus, 1994, chs. 10-15; R. Sylla, 'U.S. Securities Markets and the Banking System, 1790-1840', *Federal Reserve Bank of Saint Louis Review*, 80:3, 1998; and R.E. Wright, *The Wealth of Nations Rediscovered: Integration and Expansion in American Financial Markets, 1790-1850*, Cambridge, 2002.
6. A.L. Olmstead and P.W. Rhode, 'Cotton, Slavery, and the New History of Capitalism', *Explorations in Economic History*, 67, 2018; and G. Wright, 'Slavery and Anglo-American Capitalism Revisited', *Economic History Review*, 73:2, 2020.
7. For example, S. Beckert, 'Emancipation and Empire: Reconstructing the Worldwide Web of Cotton Production in the Age of the American Civil War', *American Historical Review*, 109:5, 2004, p. 1408; *Empire of Cotton: A New History of Global Capitalism*, New York, 2014, p. 119; E.E. Baptist, *The Half Has Never Been Told: Slavery and the Making of American Capitalism*, New York, 2014, pp. xix, 82-83.
8. Baptist, *Half Has Never Been Told*, p. 322.
9. Olmstead and Rhode, 'Cotton, Slavery, and the New History of Capitalism', p. 13
10. Estimated from M. Towne and W. Rasmussen, 'Farm Gross Product and Gross Investment in the Nineteenth Century', in Conference on Research in Income and Wealth, ed., *Trends in the American Economy in the Nineteenth Century*, Princeton, NJ, 1960, p. 308; and T. Weiss, 'Estimates of Gross Domestic Output for the United States, 1800 to 1860', mimeo, 1993, Table 4.
11. I.B. Kravis, 'The Role of Exports in Nineteenth-Century United States Growth', *Economic Development and Cultural Change*, 20:3, 1972; also C.D. Goldin and F.D. Lewis, 'The Role of Exports in American Economic Growth during the Napoleonic Wars, 1793-1807', *Explorations in Economic History*, 17:1, 1980.
12. In 1860 raw cotton sold for 10 cents per pound in Philadelphia and around 15 cents (or 7.3 pennies) per pound in Manchester, so American cotton goods manufacturers did have some advantage from a cheaper domestic supply of raw cotton. On the other hand, the census of that year found that cotton goods manufacturers used 272.5 million pounds of raw cotton, which – at 10 cents per pound – was valued at $27 million, whereas the value of total output was $66 million, so even a 50 per cent increase in the price of the raw material is unlikely to have been ruinous, especially as the cotton goods produced by American and British manufacturers were not easily substituted for each other. Calculated from 'Commercial and Historical Review of 1863', supplement to *The Economist*,

argued that, in any case, slaves were not actually necessary to grow cotton, as could be seen most clearly in its increasing production in the 1870s and '80s, after slavery had been abolished.[13] From this perspective, slavery was an unnecessary evil that made no positive contribution to the United States' development. Indeed, economic historians generally argue that it actually contributed to the underdevelopment of the South because it inhibited investment in other activities, such as industry and infrastructure, limited population growth by deterring migrants, and reduced incentives for mechanisation.[14] Taking this analysis to its logical conclusion, poor white Southerners end up being seen as themselves victims of slavery.

This paper begins with a new interpretation of the affinity between cotton and slavery. Previous explorations have looked for a technical economic explanation, such as the intensity, unpleasantness, and seasonality of the work slaves did, as well as the role of risk in commercial agriculture.[15] Yet, where slavery was legal and the ecological conditions suitable, slaves could profitably grow more typically Northern crops, as in the case of wheat in Virginia's Piedmont. This suggests that it was only legal prohibition in the North that prevented them from growing such crops more widely.[16] It is therefore argued here that the affinity

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20/2/1864, p. 42; United States, *Manufactures of the United States in 1860*, Washington, DC, 1865, p. ix; and A.H. Cole, *Wholesale Commodity Prices in the United States, 1700-1861: Statistical Supplement: Actual Wholesale Prices of Various Commodities*, Cambridge, MA, 1938, data available at: http://centerforinternationalprices.org/cipr_wordpress/wp-content/uploads/2015/07/Cole_final_data.xlsx (accessed 12/1/21); also see D.A. Irwin and P. Temin, 'The Antebellum Tariff on Cotton Textiles Revisited', *Journal of Economic History*, 61:3, 2001.

13. Olmstead and Rhode, 'Cotton, Slavery, and the New History of Capitalism', pp. 6-7; and Wright, 'Slavery and Anglo-American Capitalism', p. 372.

14. Most notably, see G. Wright, *Old South, New South: Revolutions in the Southern Economy Since the Civil War*, New York, 1986, ch. 2; and *Slavery and American Economic Development*, Baton Rouge, 2006, chs. 2-3. Wrights supports his case by presenting data that seem to show that the South had just $294 of non-slave wealth per capita in 1860 compared to $482 in the North. It is, however, unclear how he arrived at those figures. Possibly, he included the West as part of the North, while he also seems to have used the census officials' estimate of the true value of wealth rather than the wealth declared by individuals to the census takers. If the West is excluded (although with Missouri added to the South) and the declared wealth used, it gives per capita non-slave wealth of $554 in the North and $448 in the South, which is a somewhat less substantial difference. Calculated from United States, *Population of the United States in 1860*, Washington, DC, 1864, p. 599; *Statistics of the United States (Including Mortality, Property, &c.,) in 1860*, Washington, DC, 1866, pp. 294-95, 319; and Wright, *Slavery and American Economic Development*, p. 60, Table 2.4.

15. R.W. Fogel and S.L. Engerman, *Time on the Cross: The Economics of American Negro Slavery*, New York, 1974, pp. 204-06; G. Wright and H. Kunreuther, 'Cotton, Corn and Risk in the Nineteenth Century', *Journal of Economic History*, 35:3, 1975; C.V. Earle, 'A Staple Interpretation of Slavery and Free Labor', *Geographical Review*, 68:1, 1978; S. Fenoaltea, 'Slavery and Supervision in Comparative Perspective: A Model', *Journal of Economic History*, 44:3, 1984; and C. Hanes, 'Turnover Cost and the Distribution of Slave Labor in Anglo-America', *Journal of Economic History*, 56:2, 1996.

16. J.R. Irwin, 'Exploring the Affinity of Wheat and Slavery in the Virginia Piedmont', *Explorations in Economic History*, 25:3, 1988; also J. Majewski, 'Why Did Northerners Oppose the Expansion of Slavery? Economic Development and Education in the Limestone South', in S. Beckert and S.

between cotton and slavery had fundamentally political origins as yeomen farmers and their representatives successfully excluded slaves from Northern agriculture. Estimates of labour requirements in 1860 demonstrate why: the Northern staples of cereals and livestock were far more remunerative than the Southern staples, especially cotton, in terms of returns per hour worked. Following John Majewski and Victor Tchakerian,[17] it is argued here that this reflected the South's greater ecological limitations due to poor soil and climate, which made it of little interest to Northern yeoman farmers. Cotton did nonetheless provide a crop that slaves could profitably grow for their masters, despite their confinement in the South. Moreover, as documented by Alan Olmstead and Paul Rhode,[18] improved plant breeding increased the yields and picking rates of cotton, increasing slaves' productivity. Eventually, these rising productivity levels made cotton a more attractive crop for yeoman farmers, so slavery became an unnecessary evil. Up to then, however, the cotton boom had depended upon slave labour.

The paper goes on to outline how slave-produced cotton contributed to the United States' development. It argues that its contribution was primarily fiscal. As was common among American republics in the period,[19] the United States' Federal Government was heavily dependent upon the customs house for the bulk of its revenues – in this, it was unexceptional. What made the United States different was the cotton boom, which gave the Federal Government greater resources than elsewhere. As the country's major export, cotton balanced the imports that the Federal Government taxed to obtain the bulk of its revenues. Cotton thus contributed to the United States' development because it gave the Federal Government the resources it needed to acquire and conquer new territory, pacify its indigenous inhabitants, and retire the national debt, which helped state governments borrow funds to build the transportation infrastructure that connected the new lands to markets. Land could be made available cheaply because the Federal Government did not need land sales for revenues, since it had the customs house to fall back on. Open to settlers, the expanding frontier

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Rothman, eds., *Slavery's Capitalism: A New History of American Economic Development*, Philadelphia, 2016.

17. J. Majewski and V. Tchakerian, 'The Environmental Origins of Shifting Cultivation: Climate, Soils, and Disease in the Nineteenth-Century US South', *Agricultural History*, 81:4, 2007; also J. Rubin, 'The Limits of Agricultural Progress in the Nineteenth-Century South', *Agricultural History*, 49:2, 1975; and J. Majewski, *Modernizing a Slave Economy: The Economic Vision of the Confederate Nation*, Chapel Hill, 2009, ch. 1.
18. A.L. Olmstead and P.W. Rhode, 'Biological Innovation and Productivity Growth in the Antebellum Cotton Economy', *Journal of Economic History*, 68:4, 2008; *Creating Abundance: Biological Innovation and American Agricultural Development*, New York, 2008, pp. 98-114; and 'Productivity Growth and the Regional Dynamics of Antebellum Southern Development', in P.W. Rhode, J.L. Rosenbloom, and D.F. Weiman, eds., *Economic Evolution and Revolution in Historical Time*, Stanford, 2011.
19. M.A. Centeno, *Blood and Debt: War and the Nation-State in Latin America*, University Park, 2002, pp. 116-27.

acted as a 'safety valve' that prevented population growth from depressing incomes.[20] Prosperous yeomen farmers then formed a large market for the goods and services of the North's towns and cities, whose urban bourgeoisie provided the capital and entrepreneurship for new industrial corporations. As John Habbakuk described, the frontier's safety-valve effect led to high industrial wages that encouraged investment in labour-saving machinery.[21] Cotton-financed westward expansion thus provided the preconditions for capital-intensive industrialisation.

The paper ends with an analysis of how this cotton-financed westward expansion led to the Civil War. The North's population grew faster than the South's because settlers preferred the Midwest's more remunerative agriculture, while there were also more jobs for immigrants in the Northeast's factories. As a result, the slave states' share of seats in Congress fell, so slaveholders feared for the future of their right to hold other people as property. This fear over the future of the slavery features prominently in the historiography on the origins of the Civil War.[22] Less noted is slaveholders' resentment over the role that their cotton had played in financing their own disempowerment. Even accounts stressing the 'economic' origins of the Civil War have tended to ignore the slaveholders' complaints about how they were financing the expansion of the settler society to the

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20. E. von Nardroff, 'The American Frontier as a Safety Valve: The Life, Death, Reincarnation, and Justification of a Theory', *Agricultural History*, 36:3, 1962. The concept of the frontier as safety valve is most often associated with Frederick Jackson Turner's late nineteenth-century 'frontier thesis', it can be traced back to at least the eighteenth century. F.J. Turner, *The Frontier in American History*, New York, 1920, esp. pp. 259-60, 280; and H.N. Smith, *Virgin Land: The American West as Symbol and Myth*, Cambridge, MA, 1950, ch. 20. Economic historians have focused on the question of whether unskilled labourers could have afforded to move westward to take up farming, with the conclusion being that start up costs were too high. C.H. Danhof, 'Farm-Making Costs and the 'Safety Valve': 1850-60', *Journal of Political Economy*, 49:3, 1941; R.E. Ankli, 'Farm-Making Costs in the 1850s', *Agricultural History*, 48:1, 1974; and J. Atack, 'Farm and Farm-Making Costs Revisited', *Agricultural History*, 56:4, 1982. Yet it did not matter who moved, as long as the frontier was providing enough opportunities to keep draining labour from the East to high-productivity occupations in the West. Von Nardroff, 'American Frontier', pp. 135-36.
21. H.J. Habakkuk, *American and British Technology in the Nineteenth Century: The Search for Labour-Saving Inventions*, Cambridge, 1962, ch. 2, esp. pp. 11-12, fn. 2. Claudia Goldin and Kenneth Sokoloff clarified, Habbakuk argued that American industrialists first sought to save on labour by replacing expensive men with cheaper women. Ibid., pp. 65-66, 105-07; and C. Goldin and K. Sokoloff, 'Women, Children, and Industrialization in the Early Republic: Evidence from the Manufacturing Censuses', *Journal of Economic History*, 42:4, 1982, p. 755; also 'The Relative Productivity Hypothesis of Industrialization: The American Case, 1820 to 1850', *Quarterly Journal of Economics*, 99:3, 1984. This paper explains why there was such a substantial pool of underemployed female labour: the North's agriculture had such low labour requirements that women were seen as redundant to it. Only once their wages rose sufficiently did industrialists begin to invest more heavily in machinery.
22. W.W. Freehling, *The Road to Disunion*, I, *Secessionists at Bay 1776–1854*, Oxford, 1990; II, *Secessionists Triumphant 1854-61*, Oxford, 2007; J.M. McPherson, *This Mighty Scourge: Perspectives on the Civil War*, Oxford, 2007, ch. 1; and W.L. Barney, *Rebels in the Making: The Secession Crisis and the Birth of the Confederacy*, Oxford, 2020.

North.[23] Yet understanding those complaints, it is argued here, is crucial for answering the widely neglected question of why the North did not let the South leave the Union.[24] The answer is that the North would not let the South's slaveholders leave because they threatened to take with them much of the customs revenues that had financed the Federal Government up to then.

The paper consists of three parts: the first uses estimates of labour requirements in 1860 to show that slavery was necessary for the boom in cotton exports because it was not remunerative enough to attract yeomen farmers; the second argues that cotton exports played an important role in public finances because they balanced the imports that the Federal Government taxed to obtain the bulk of its revenues, thereby providing the funds for westward expansion; the third discusses how this westward expansion led to a shift in the balance of power from South to North, ultimately leading to civil war. The paper concludes by arguing that the antebellum United States should be seen as a case study of how globalisation generated both development and underdevelopment in the long nineteenth century.[25] Throughout, the paper relies upon synthesis and interpretation of the existing literature, together with the analysis of newly compiled historical statistics, the most important of which are described in the Appendix.

An Unnecessary Evil?

Slavery's confinement to the South began during the American Revolution, when Northern farmers and their political representatives successfully pushed for its prohibition in the new lands in the Midwest. In the 1780s, the states of New England and the Middle Atlantic regions had begun to pass laws to gradually abolish slavery, while the Northwest Ordinance of 1787, which established a process for admitting new states into the union, contained a clause prohibiting the introduction of more slaves to the large Northwest Territory that covered much of the Great Lakes region. By the early years of the nineteenth century, slavery had thus been heavily restricted – if not entirely abolished – across the North. In doing so, legislators reflected the interests of their constituents: the yeoman farmers who made up much of the electorate. Hence, the prohibition clause of the Northwest Ordinance resulted from pressure from the Ohio

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23. R.L. Ransom, *Conflict and Compromise: The Political Economy of Slavery, Emancipation, and the American Civil War*, New York, 1989; R.L Ransom and R. Sutch, 'Conflicting Visions: The American Civil War as a Revolutionary Event', *Research in Economic History*, 20, 2001; J.L. Huston, *Calculating the Value of the Union: Slavery, Property Rights, and the Economic Origins of the Civil War*, Chapel Hill, 2003; and M. Egnal, *Clash of Extremes: The Economic Origins of the Civil War*, New York, 2009.
24. This question is largely ignored in the literature. Exceptions are K.M. Stampp, *And the War Came: The North and the Secession Crisis 1860-1861*, Chicago, (1950) 1964; R. McClintlock, *Lincoln and the Decision for War: The Northern Response to Secession*, Chapel Hill, 2008; and W.J. Cooper, *We Have the War Upon Us: The Onset of the Civil War, November 1860-April 1861*, New York, 2012.
25. In this, it agrees with the research agenda outlined in S. Link and N. Maggor, 'The United States as a Developing Nation: Revisiting the Peculiarities of American History', *Past & Present*, 246:1, 2020.

Company of Associates, which consisted of veteran officers, many of whom had been drawn from the ranks of the yeomanry. By establishing the Ohio Company, they sought to exchange the devalued debt certificates that they had been paid with during the Revolution for land that they could either sell or settle. In doing so, they desired not only payment for their service, but also to replace the squatter 'banditti' who were settling the frontier with a more ordered society based on the model of incorporated towns that had been used to colonise New England.[26] Slavery played little part in that model.[27]

Estimates of the labour requirements in agriculture show why Northern farmers did not need slavery. Relatively little labour was required for Northern agriculture, so there was little demand for slaves, whereas agriculture in the South was far more labour-intensive. Reliable estimates are not available for early in the nineteenth century, but the pattern can be seen in those for 1860, shown in Table 1. As detailed in the Appendix, the man-hour estimates are approximate, yet they are reliable enough to demonstrate the difference between North and South. Thus, according to these estimates, in 1860 a typical acre of cotton required 92 hours of labour pre-harvest and 41 hours to harvest, whereas an acre of wheat in the Midwest required 12 hours preharvest and 11 hours for the harvest. When combined with yield and price data, this suggests that an hour of labour produced cotton worth just 16 cents, compared to 53 cents for the Midwest's wheat. Northern farmers' cattle, corn, hogs, and wheat thus required little labour beyond what could be provided by their families, so they had little need for slaves. In the South, by contrast, such mixed farming was limited by acidic soils and the parasitic insects that fed on livestock.[28] Northern farmers were therefore content to allow slavery in the South, where they believed that slaves were a necessary evil for the production of cash crops such as cotton and sugar. They justified this tolerance of Southern slavery with the argument that the region's climate made it unsuited to white people, so its land should instead be cultivated by slaves.[29]

Slaveholders agreed to their confinement in the South because they had been severely weakened by the Revolution. During the Revolutionary War, there had been widespread unrest among their slaves. Thousands had sided with the British in exchange for their freedom: around 30-40,000 escaped from a total slave

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26. A.R.L. Cayton, *The Frontier Republic: Ideology and Politics in the Ohio Country, 1780-1825*, Kent, 1986, ch. 2; and K. Maulden, *The Federalist Frontier: Settler Politics in the Old Northwest, 1783-1840*, Columbia, 2019, ch. 1. On the origins of that model, see B. Levy, *Town Born: The Political Economy of New England from Its Founding to the Revolution*, Philadelphia, 2009.
27. There were slaves in New England, but unlike in the South, they were more concentrated in the coastal cities, where they were forced to work in industry. J.R. Hardesty, *Black Lives, Native Lands, White Worlds: A History of Slavery in New England*, Amherst, 2019, p. xv.
28. Rubin, 'Limits of Agricultural Progress'; and Majewski and Tchakerian, 'Environmental Origins'.
29. M. Mason, *Slavery and Politics in the Early American Republic*, Chapel Hill, 2006, pp. 25-26, 148-49.

Table 1
Returns to Agricultural Labour in the United States, 1860

	Man-hours per acre			Yield (unit per acre)	Man-hours per unit	Price ($ per unit)	¢ per man-hour
	Pre-harvest	Harvest	Total				
Corn (bu)							
Northeast	92	15	107	34	3.1	0.72	23
Midwest	38	13	51	34	1.5	0.40	27
South	54	8	62	16	3.8	0.48	13
Cotton (lb)							
South	92	41	133	197	0.7	0.11	16
Dairy products (lb)							
Northeast	…	…	…	…	3.1	0.86	28
Midwest	…	…	…	…	2.6	0.86	33
South	…	…	…	…	4.7	0.80	17
Hogs (cwt)							
Midwest	…	…	…	…	3.4	4.81	141
South	…	…	…	…	4.6	4.36	95
Wheat (bu)							
Northeast	20	12	32	15	2.1	1.20	57
Midwest	12	12	24	13	1.8	0.95	53
South	12	10	22	9	2.4	1.07	45

Source: See the Appendix.

population of about 500,000 when the Revolution began.[30] Moreover, the South's commercial agriculture was stagnating because of reduced overseas demand for its staples – indigo, rice, and tobacco – due first to the Revolutionary War, which was then followed by further disruptions caused by the Napoleonic Wars in Europe.[31] Consequently, slaveholders faced the prospect of having insufficient work for their expanding population of slaves, which depressed their output and, consequently, their value as capital.[32] Abolitionism was also gaining ground, even

30. G.B. Nash, 'The African Americans' Revolution', in J. Kamensky and E.G. Gray, eds., *The Oxford Handbook of the American Revolution*, Oxford, 2012, p. 270, note 47; and J.D. Hacker, 'From '20. and Odd' to 10 million: The Growth of the Slave Population in the United States', *Slavery & Abolition*, 41:4, 2020, pp. 843-44, Table 1. Also see S.R. Frey, *Water from the Rock: Black Resistance in a Revolutionary Age*, Princeton, 1991; G.B. Nash, *The Forgotten Fifth: African-Americans and the Age of Revolution*, Cambridge, 2006, ch. 1; and C. Pybus, *Epic Journeys of Freedom: Runaway Slaves of the American Revolution and Their Global Quest for Liberty*, Boston, 2006, chs. 1-4.
31. G.C. Bjork, 'The Weaning of the American Economy: Independence, Market Changes, and Economic Development', *Journal of Economic History*, 24:4, 1964, pp. 556-58; and J.F. Shepherd and G.M. Walton, 'Economic Change after the American Revolution: Prewar and Postwar Comparisons of Maritime Shipping and Trade', *Explorations in Economic History*, 13:4, 1976, pp. 412-14.
32. P.C. Mancall, J.L. Rosenbloom, and T. Weiss, 'Slave Prices and the South Carolina Economy, 1722-1809', *Journal of Economic History*, 61:3, 2001; and 'Agricultural Labor Productivity in the Lower South, 1720–1800', 39:4, 2002. On the threat of underemployment more generally, see J. Clegg and D. Foley, 'A Classical-Marxian Model of Antebellum Slavery', *Cambridge Journal of Econ-*

in the South, with many seeing emancipation as an inevitable result of the Revolution.[33] Slaveholders therefore agreed to the prohibition of slaves from the Northwest Territory as a price to be paid for constructing a state that would be willing and able to uphold their property rights over people who sought to escape from their captivity. Slaveholders understood the need for a strong settler society in the North to buttress that state against the British in Canada, while they were also reassured by the Northwest Ordinance's Runaway Slave Clause, which promised that escaped slaves in the new territories would be returned to them. Moreover, the Ordinance implicitly left them with the new lands in the Southwest, where they hoped – correctly – new employment would be found for their slaves.[34]

Cotton revived slaveholders' fortunes because it was a crop that slaves could profitably grow in the South. The crop became widespread during the Revolutionary Wars, when slaves gained considerable autonomy to produce goods for their own subsistence, including growing cotton to spin and replace the fabrics that had previously been imported from Britain. Beginning with this process of import substitution, cotton became an alternative to indigo and rice, the previous staples of the Lower South.[35] In 1794, Eli Whitney, a Massachusetts farmer's son who received financial support from the manager of a slave plantation in Georgia, won the race to patent a toothed cotton gin, which more efficiently stripped seeds from the lint, gradually replacing the older roller gin.[36] Thereafter, cotton exports boomed, growing from 6 million pounds in 1796 to 1.8 billion in 1860.[37] The United States' became the main supplier of cotton to the burgeoning textile sector of Britain's Industrial Revolution. In this, it was also aided by the breeding of new plant varieties that had higher yields and were easier to pick, greatly increasing labour productivity.[38]

Thanks to the cotton boom, slaveholders were able to achieve something resembling the full employment of their captive labour force. As the Southern frontier spread westward, a cotton belt was established that stretched from South Carolina on the east coast to Texas in the southwest. In the new lands slaveholders established plantations on which their slaves – when they were not required

omics, 43:1, 2019.

33. R. Blackburn, *The Overthrow of Colonial Slavery*, London, 1988, pp. 116-22.
34. P.S. Onuf, *Statehood and Union: A History of the Northwest Ordnance*, Notre Dame, (1987) 2019, p. 111; and P. Finkelman, *Slavery and the Founders: Race and Liberty in the Age of Jefferson*, Armonk, 1996, pp. 40-42.
35. J.E. Chaplin, 'Creating a Cotton South in Georgia and South Carolina, 1760-1815', *Journal of Southern History*, 57:2, 1991, pp. 177, 181-82.
36. A. Lakwete, *Inventing the Cotton Gin: Machine and Myth in Antebellum America*, Baltimore, 2003, chs. 3-4.
37. United States, *Imports and Exports*, II, Senate Report 259, Part 2, 53rd Congress, 2nd Session, 1894, pp. 20, 121, Tables 2 and 7.
38. Olmstead and Rhode, 'Biological Innovation'; *Creating Abundance*, pp. 98-114; and 'Productivity Growth'.

in the cotton fields – were made to grow and process their own food, clear land, construct and maintain buildings, engage in handicrafts, and provide services.[39] These largely self-sufficient and isolated plantations were surrounded by unused land because large amounts long-term fallow were required to replenish the nutrients in the region's poor soils.[40] Nevertheless, slaveholders sought to overcome the South's ecological limitations through plant breeding and better plantation management,[41] especially the gang system, which organised slaves by the tasks that they were physically most suited to, in order to make them work the maximum number of hours possible.[42] Longer hours worked by slaves compensated for the lower hourly returns of Southern agriculture.

Economic historians have not always recognised how labour-intensive Southern agriculture was. Some have even claimed that farming in the North had greater labour requirements.[43] To dispel that myth, Table 2 combines estimates of the man-hours required for different crops and animals with figures on the labour force and output from the census of 1860. The results illustrate how labour-intensive Southern agriculture was. The actual hours worked would have been longer, since Table 2 only includes the labour required for the cultivation of crops, animal husbandry, and farm maintenance. They do not take into account

39. R.V. Anderson and R.E. Gallman, 'Slaves as Fixed Capital: Slave Labor and Southern Economic Development', *Journal of American History*, 64:1, 1977.
40. Majewski and Tchakerian, 'Environmental Origins'; and Majewski, *Modernizing a Slave Economy*, ch. 1.
41. R.K. Aufhauser, 'Slavery and Scientific Management', *Journal of Economic History*, 33:4, 1973; J. Metzer, 'Rational Management, Modern Business Practices, and Economies of Scale in the Antebellum Southern Plantations', *Explorations in Economic History*, 12:2, 1975; C. Rosenthal, 'Slavery's Scientific Management: Masters and Managers', in Beckert and Rockman, eds., *Slavery's Capitalism*; and *Accounting for Slavery: Masters and Management*, Cambridge, MA, 2018. These studies can sometimes seem a little too in awe of slaveholders' managerial capabilities; for a useful corrective, see J. Oakes, *The Ruling Race: A History of American Slaveholders*, New York, 1982, Ch. 6.
42. J.T. Toman, 'The Gang System and Comparative Advantage', *Explorations in Economic History*, 42:2, 2005.
43. R.W. Fogel and S.L. Engerman, 'Explaining the Relative Efficiency of Slave Agriculture in the Antebellum South', *American Economic Review*, 67:3, 1977, p. 285; also *Time on the Cross,* pp. 207-08. The main basis for this conclusion was a study by John Olson, who found that slaves on seven plantations worked on average 2,798 hours per year circa 1860, whereas free farmers in the North worked perhaps 3,100 hours, although probably more. J.F. Olson, 'Clock Time versus Real Time: A Comparison of the Lengths of the Northern and Southern Agricultural Work Years', in R.W. Fogel and S.L. Engerman, eds., *Without Consent or Contract: The Rise and Fall of American Slavery: Technical Papers,* I, *Markets and Production*, New York, 1992, pp. 228, 234. However, Olson's methodology is suspect because he uses twentieth-century estimates of hours worked in the North, despite the average numbers of hours worked by farmers having increased substantially in the late nineteenth century as surplus labour was drawn off the land into the cities. See R.E. Gallman, 'The Agricultural Sector and the Pace of Economic Growth: U.S. Experience in the Nineteenth Century', in Klingaman and Vedder, eds., *Essays in Nineteenth Century Economic History*, pp. 55-57; and L.A. Craig and T. Weiss, 'Hours at Work and Total Factor Productivity Growth in Nineteenth-century U.S. Agriculture', in K.D. Kauffman, ed., *Advances in Agricultural Economic History*, I, *New Frontiers in Agricultural History*, Bingley, 2000.

Table 2

Agriculture in the United States, 1860

	Gross product (mill. $)	Farm labour force (1,000)	% slave	% women and children	Man-hours (mill.)	$ per labourer	Man-hours per labourer	¢ per man hour
United States	1,319	6,231	31	25	9,018	210	1,450	14
Northeast	258	1,147	0	6	1,276	220	1,110	20
New England	59	330	0	4	300	180	910	20
Mid Atlantic	199	817	0	6	976	240	1,190	20
Midwest	401	1,695	3	9	2,224	240	1,310	18
East North Central	300	1,247	0	7	1,724	240	1,380	17
West North Central	101	448	12	13	501	230	1,120	21
South	621	3,306	56	41	5,358	190	1,620	12
South Atlantic	225	1,531	58	43	2,038	150	1,330	11
East South Central	244	1,243	53	40	2,143	200	1,720	12
West South Central	151	531	59	40	1,178	280	2,220	13
West	40	84	0	3	160	480	1,900	25
Mountain	3	26	0	7	15	120	580	21
Pacific	37	58	0	2	144	640	2,500	26

Note: The value of production includes only crops and livestock entering farm gross product (that is, not used for animal feed or seed). Man-hours include all output as well as time spent on farm improvements. The figures for $ and man-hours per labourer have both been rounded to the nearest ten.

Source: See the Appendix.

other farm and off-farm activities, including household manufacturing, the construction of new buildings, forestry production, and transportation, especially hauling produce to market. Such non-agricultural activities may have taken up more time in the North, yet it was precisely the high level of remuneration in Northern agriculture that let farmers engage in them to such a degree. What is more, Table 2 tends to understate how labour-intensive Southern agriculture was because far more women and children were included in its labour force. If they are converted into 'adult male equivalents', the contrast between North and South appears far starker. Both female slave prices and female agricultural wages were around 60 per cent of their male equivalents in 1860,[44] while a 40 per cent rate can be given to children. Applied to the data underlying Table 2, those rates produce man-hours per male equivalent labourer of 1,150 in the Northeast, 1,380 in the Midwest, 2,020 in the South, and 1,950 in the West.

Only with slavery was such labour-intensive agriculture possible because free settlers preferred more remunerative mixed farming, as in the North. The

44. L.A. Craig and E.B. Field-Hendrey, 'Industrialization and the Earnings Gap: Regional and Sectoral Tests of the Goldin-Sokoloff Hypothesis', *Explorations in Economic History*, 30:1, 1993, p. 76, Table 5.

natural experiment carried out by Georgia's Board of Trustees in the mid-eighteenth century gives the best indication of what would have happened if there had been no slavery. Slavery was prohibited in 1735 and the Board attempted to settle the colony with yeoman farmers, who it was hoped would produce indigo and silk for export to England, while also forming a military buffer against the Spanish Empire. They failed because it proved impossible for the settlers to produce cash crops as even indentured labourers were too expensive for the labour-intensive cultivation of export staples. Settlers preferred to either abandon the colony or focus on subsistence agriculture. Only when the prohibition was removed in 1751 did settlement take off, leading to the rapid growth of exports of indigo and rice produced by slaves.[45] This suggests that free settlers in the South would have been subsistence-oriented yeoman farmers, primarily producing food for their own consumption, then devoting their remaining time to growing cash crops, making home manufactures such as liquor and textiles, working for others, childcare, leisure, socialising – in other words, the multitudinous activities that free people engage in once their basic needs are met. Indeed, the squatters who settled the expanding Southern frontier tended to practice such subsistence-oriented agriculture, until they were displaced by slaveholders, who established cotton plantations.[46] To persuade these settlers to specialise in cotton production, cotton prices would have needed to be higher, so American cotton would have become uncompetitive on the world market. Brazil would arguably have been the best-placed candidate to become the world's principal cotton producer, since costs of production were similar and it grew the longer staples that were best suited to mechanised spinning.[47] Notably, wages were far lower in Brazil, so its landowners were not dependent on slavery to keep labour costs down.[48]

Slavery was, then, a necessary evil for the United States' cotton boom because yeoman farmers preferred more subsistence-oriented agriculture. From this perspective, cotton and slavery were symbiotic. Far from slavery in the United States making Britain's Industrial Revolution possible, as has sometimes

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45. R.M. Miller, 'The Failure of the Colony of Georgia Under the Trustees', *Georgia Historical Quarterly*, 53:1, 1969; R. Gray and B. Wood, 'The Transition from Indentured to Involuntary Servitude in Colonial Georgia', *Explorations in Economic History*, 13:4, 1976; B. Wood, *Slavery in Colonial Georgia, 1730-1775*, Athens, 1984; and W.W. Jennison, *Cultivating Race: The Expansion of Slavery in Georgia*, Lexington, 2012, ch. 1.
46. For example, see D.S. Dupre, *Transforming the Cotton Frontier: Madison County, Alabama 1800-1840*, Baton Rouge, 1997, ch. 1.
47. T.A. Zamberlan Pereira, 'The Rise of the Brazilian Cotton Trade in Britain during the Industrial Revolution', *Journal of Latin American Studies*, 50:4, 2018; and 'Taxation and the Stagnation of Cotton Exports in Brazil, 1800-1860', *Economic History Review*, forthcoming. The 600 *réis* tax that Pereira argues brought Brazil's cotton boom to an end were equivalent to only 20-25 per cent ad valorem, so could have been fairly easily negated by higher prices on the world market.
48. Cf. N. Palma, A. Papadia, T. Pereira, and L. Weller, 'Slavery and Development in Nineteenth Century Brazil', *Capitalism: A Journal of History and Economics*, forthcoming.

been argued,[49] Britain's explosive demand for raw cotton allowed American slavery to persist for several more decades than it would otherwise have done. Slaveholders needed cotton, just as the cotton boom needed slavery. The revival of Southern slaveholders' fortunes should therefore be understood as part of the worldwide surge of a 'second slavery' in response to the renewed globalisation that followed the Napoleonic Wars.[50] As will be seen, the settler society of the North would also become one of the main winners of that globalisation, thanks in large part to the cotton produced by the slave society in the South.

Building the Behemoth

Cotton's contribution to the United States' national income was small, yet it had a disproportionate importance for the country's development because, as its key export, it helped the young republic to escape the financial constraints it had faced after independence. Cotton's role was to balance the imports that the Federal Government taxed to obtain the bulk of its revenues. Hence, while cotton was not large enough to be the engine of growth that is sometimes portrayed, it did help to finance the Federal Government, which in turn used its revenues to expand westward, making possible rapid population growth without depressing living standards. The prosperous farmers who settled the new lands then formed a large market for manufactured goods, leading to industrialisation. Cotton's contribution to the United States' development was thus indirect but crucial.

Before the cotton boom began, the Federal Government's finances were precarious.[51] Large debts had been incurred in fighting the British and the thirteen states had struggled to finance themselves during the Confederation period of the 1780s, relying heavily on inflationary issues of paper currency. The Continental Congress was forced to borrow and issue IOUs that it was unable to repay because it was not permitted to levy taxes. Following the ratification of the constitution and the election of George Washington as president in 1789, the reforms of his Secretary of the Treasury Alexander Hamilton were supposed to rectify this situation: state banks were prohibited from issuing their own currencies and in exchange the state debts were absorbed into the national debt; the newly formed Federal Government was to be funded by a basic 5 per cent tariff on most imports, with higher rates of up to 15 per cent on a few specific goods. The tariff did not provide the Federal Government with sufficient revenues to cover its

49. Baptist, *Half Has Never Been Told*, pp. 81-82, 130-31.
50. A.E. Kaye, 'The Second Slavery: Modernity in the Nineteenth-Century South and the Atlantic World', *Journal of Southern History*, 75:3, 2009; also D.W. Tomich, *Through the Prism of Slavery: Labor, Capital, and the World Economy*, Lanham, 2004, ch. 3.
51. See especially R. Sylla, 'Financial Foundations: Public Credit, the National Bank, and Securities Markets', in D.A. Irwin and R. Sylla, eds., *Founding Choices: American Economic Policy in the 1790s*, Chicago, 2011, pp. 61-74; also M.G. Myers, *A Financial History of the United States*, New York, 1970, chs. 2-3; E. Wright, *One Nation Under Debt: Hamilton, Jefferson, and the History of What We Owe*, New York, 2008, chs. 3-4.

expenditures, however, so it borrowed funds from the newly created Bank of the United States, which it provided by printing money, leading to inflation and a drain of specie.[52] By 1795, the Bank's specie reserves had fallen to just 20-30 per cent of its notes in circulation,[53] so its directors began to pressure the Treasury to repay its debts and refused to lend it more. Despite Hamilton's subsequent image as a financial genius, his spell as Secretary of the Treasury ended in January 1795 with the Federal Government on the edge of bankruptcy.[54]

Bankruptcy was avoided thanks to the Napoleonic Wars, which led to a great expansion in the country's re-export trade. With the onset of war in Europe, their country's neutrality allowed the United States' shippers to improve their position within the Mediterranean's trading networks.[55] Napoleon's success against the Spanish in the War of the Pyrenees then led Spain to break from its coalition with Britain and instead ally with the French in 1796. The British in turn placed a blockade on Spain, cutting it off from its empire, allowing merchants from the United States to become middlemen between Europe and the Spanish colonies, leading to a new re-export trade.[56] Increased shipping earnings paid for a higher level of imports, which were taxed. Customs revenues boomed, so the Federal Government was able to repay the Bank of the United States,[57] which saw its charter expire in 1811.[58]

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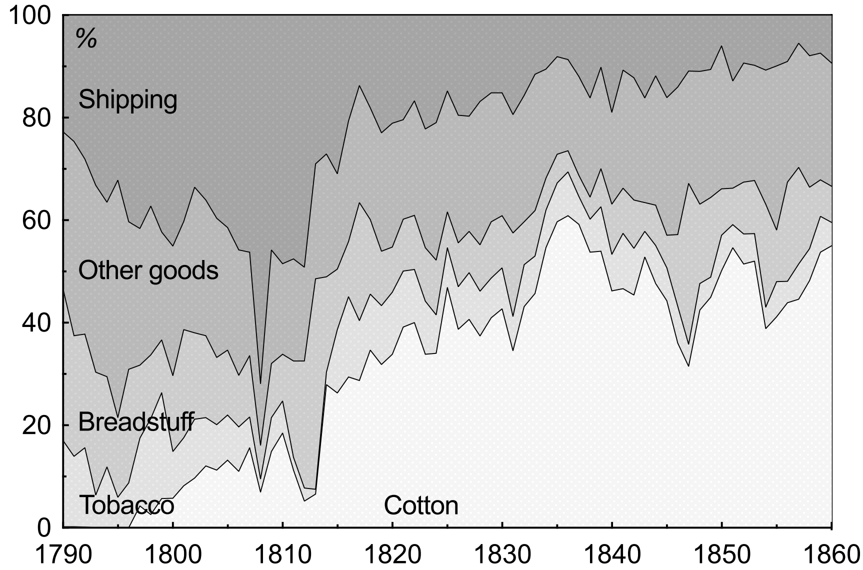
52. A. Javat, 'An Analysis of the Balance Sheet of the First Bank of the United States', *Studies in Applied Economics*, 74, 2017, p. 22.
53. Data underlying ibid., on-line at: https://sites.krieger.jhu.edu/iae/files/2017/04/Balance-Sheet-of-First-Bank-of-United-States.xlsx (accessed 7/1/21).
54. Sylla, 'Financial Foundations', p. 71
55. S. Marzagalli, 'The United States and the Mediterranean during the French Wars (1793–1815)', in J. Eloranta, E. Golson, P. Hedberg, and M.C. Moreira, eds., *Small and Medium Powers in Global History: Trade, Conflicts, and Neutrality from the Eighteenth to the Twentieth Centuries*, London, 2018.
56. J. Cuenca-Esteban, 'British "Ghost" Exports, American Middlemen, and the Trade to Spanish America, 1790–1819: A Speculative Reconstruction', *William and Mary Quarterly*, 71:1, 2014.
57. This repayment is often portrayed as being financed through the Federal Government's sale of its shares in the Bank. For example, Perkins, *American Public Finance*, p. 239. In reality, of the 5,000 bank shares originally held by the Federal Government, 2,160 were sold for $1,080,000 in 1796, another 620 for $304,260 in 1797, and the remaining 2,220 for $1,287,600 in 1802. This $2.6 million made a dent in the $10 million owed to Bank at the beginning of 1795, but the majority of the funds came from customs revenues. See United States, *Reports of the Secretary of the Treasury*, I, Washington, DC, 1828, p. 254; *American State Papers*, V, *Finance*, I, Washington, DC, 1832, pp. 467, 498; and the data underlying Javat, 'An Analysis of the Balance Sheet'.
58. Sylla attributes the Federal Government's financial salvation to 'economic growth'. Sylla, 'Financial Foundations', pp. 73-74. Yet it was specifically the growth in international trade that provided it with revenues, since little was raised from internal taxes. Sylla also argues that the French Revolutionary Wars were relatively unimportant because there was a previous expansion in federal revenues, from just $162,000 in 1789 to $3.7 million in 1792. Ibid., p. 73, Table 2.1. It seems likely, however, that rather than reflecting wider growth, this represented more the increasing efficiency of the custom houses and higher tariffs. See D.A. Irwin, 'New Estimates of the Average Tariff of the United States, 1790-1820', *Journal of Economic History*, 63:2, 2003; and G. Rao, *National Duties: Custom Houses and the Making of the American State*, Chicago, 2016, chs. 2-3.

Figure 1

US Exports of Goods and Services, 1790-1860



Note: Missing data on export values in the 1790s were interpolated using quantities and wholesale prices.

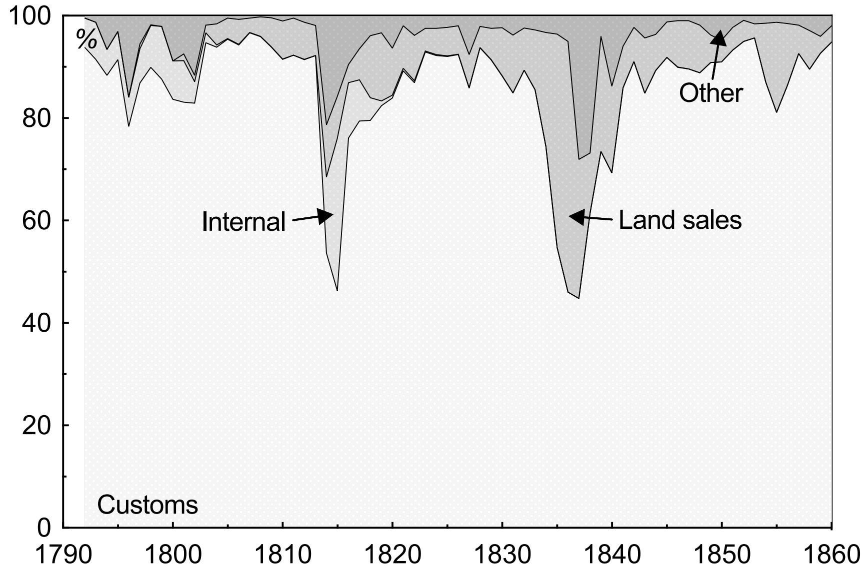
Source: Goods exports: United States, *Imports and Exports*, II, Senate Report 259, Part 2, 53rd Congress, 2nd Session, 1894. Shipping: D.C. North, 'The United States Balance of Payments, 1790-1860', in Conference on Research in Income and Wealth, ed., *Trends in the American Economy in the Nineteenth Century*, Princeton, NJ, 1960, pp. 595, 600, Tables A.3 and A.4. Wholesale prices: A.H. Cole, *Wholesale Commodity Prices in the United States, 1700-1861: Statistical Supplement: Actual Wholesale Prices of Various Commodities*, Cambridge, MA, 1938, data available at: http://centerforinternationalprices.org/cipr_wordpress/wp-content/uploads/2015/07/Cole_final_data.xlsx (accessed 12/1/21).

From the 1810s, cotton replaced shipping earnings as the main balancer of imports. During the War of 1812 with Britain, the re-export trade was brought to a halt and only partially recovered afterwards. Figure 1 shows how cotton exports replaced shipping as the principal source of foreign exchange. From 10 per cent of exports at the turn of the century, cotton's share increased steadily, until it accounted for around 50 per cent from the 1830s through the 1850s. Cotton had thus replaced shipping earnings as the principal balancing item in the United States' international trade, paying for the imports that were taxed by the Federal Government, which remained heavily dependent on customs revenues throughout the antebellum era, as shown in Figure 2. In this way, the boom in slave-produced cotton allowed the United States' to escape the financial constraints it faced after independence.

Cotton was vital to the Federal Government because the customs house had particular characteristics that made it more politically viable than other sources of revenue. Import taxes could be collected cheaply and with relatively little

Figure 2

Sources of US Federal Government Revenues, 1792-1860



Source: United States, *Historical Statistics of the United States: Colonial Times to 1970*, II, 1975, p. 1106, Series Y352-56.

opposition.[59] Internal taxes, by contrast, were far harder to raise, as seen in a series of three revolts in the 1780s and '90s in Massachusetts and Pennsylvania against attempts to impose taxes on property and whiskey.[60] Each rebellion was swiftly repressed, but neither the whiskey excise tax nor the property tax could be properly collected thereafter. Moreover, the discontent they provoked, combined with the conflicts among the Federalists over how to respond to them, played an important part in the Democratic-Republican Party's victory in the elections of 1800-01. Under President Thomas Jefferson, Congress swiftly abolished the whiskey and other excise taxes, only raising them again temporarily during the War of 1812, when the conflict with Britain once again risked bankrupting the Federal Government.[61] Land sales, meanwhile, faced similar prob-

59. D.A. Irwin, 'Revenue or Reciprocity? Founding Feuds over Early U.S. Trade Policy', in Irwin and Sylla, eds., *Founding Choices*, p. 103.

60. D.F. Burg, A *World History of Tax Rebellions: An Encyclopedia of Tax Rebels, Revolts, and Riots from Antiquity to the Present*, New York, 2004, pp. 292-93, 308-10, 312-15.

61. T.P. Slaughter, *The Whiskey Rebellion: Frontier Epilogue to the American Revolution*, New York, 1986, pp. 225-26; and P.D. Newman, *Fries's Rebellion: The Enduring Struggle for the American Revolution*, Philadelphia, 2004; also W.E. Brownlee, *Federal Taxation in America: A Short History*, new ed., Cambridge, 2004, pp. 24-25, 28-29; R. Sylla, 'Experimental Federalism: The Economics of American Government, 1789-1914', in S.L. Engerman and R.E. Gallman, eds., *The Cambridge Economic History of the United States*, II, *The Long Nineteenth Century*, Cambridge, 2000, pp. 516, 519; and Wright, *One Nation*, pp. 170-71. That the revolts occurred in Massachusetts and Pennsylvania somewhat undermines the argument that the Federal Government's dependence on the tariff was due to the opposition of slaveholders to federal taxes. Rather, slaveholders in the South and yeoman farmers in the

lems as a source of revenues. Charging high prices for public lands was opposed by settlers on the frontier and their representatives in Congress,[62] while it proved difficult to collect the payments promised for land that had been sold. Hence, from 1796 to 1820, the Federal Government sold 20 million acres of land for a nominal value of $48 million, yet only $28 million was collected. In response, the Federal Government insisted on payment in cash, leading to a significant increase in revenues from land sales in the 1830s. Payment now came, however, in the form of state bank notes, which tended to be of dubious quality, leading President Andrew Jackson to issue the Specie Circular in 1836, which made it obligatory to pay for public land in gold or silver.[63] Land sales then fell back to their previously low level as a source of revenues, with the focus instead on keeping land cheap to prevent unrest on the frontier.[64] As a result, the Federal Government remained heavily dependent upon customs revenues, which continued to flow in thanks to the cotton boom.

The Federal Government mainly used it revenues to finance the expansion of its borders to the Rio Grande and the Pacific. Large payments were made to purchase new territory: according to the standard estimates, $23 million was paid to France for the Louisiana Purchase in 1803, $7 million to Spain for Florida in 1819, $16 million to Mexico for around half its territory following the Mexican-American War of 1846-48, $17 million to pay off the creditors of Texas in 1850, and $10 million for the Gadsen Purchase of more territory from Mexico in 1858.[65] Some $73 million was spent fighting the Mexican-American War,[66] providing the United States with a vast superiority of resources that allowed it to invade Mexico and occupy Mexico City.[67] The new lands acquired through such conquest and acquisition then required the removal of their indigenous inhabitants. Outside the War of 1812 and the Mexican-American War, around two thirds of expenditure on the US army from 1789 to 1806 – $270 million – was used for this purpose,[68] especially through the construction, occupation, and supply of a

North were fairly united in not wanting to pay taxes. Cf. R.L. Einhorn, *American Taxation, American Slavery*, Chicago, 2006, chs. 4-5.

62. S. Gailmard and J.A. Jenkins, 'Distributive Politics and Congressional Voting: Public Lands Reform in the Jacksonian Era', *Public Choice*, 175, 2018.
63. Myers, *Financial History*, pp. 96-98.
64. Sylla, 'Experimental Federalism', p. 515.
65. United States, *Historical Statistics of the United States: Colonial Times to 1970*, I, 1975, p. 428, Series J7.
66. Ibid., II, p. 1140, Series Y849. Also see J.W. Cummings, *Towards Modern Public Finance: The American War with Mexico, 1846-1848*, London, 2009, pp. 158-60.
67. P. Guardino, *The Dead March: A History of the Mexican-American War*, Cambridge, 2017, pp. 366-67.
68. Statisticians working on the 1890 census suggested that outside of the war years of 1812-15, 1846-48, and 1861-65, 'at least three-fourths of the total expense of the army is chargeable, directly or indirectly, to the Indians', although in their own calculations they used the lower figure of two thirds. United States, *Report on Indians Taxed and Indians Not Taxed in the United States (Except Alaska) at the Eleventh Census: 1890*, Washington, DC, 1894, p. 643. Here the lower figure of two thirds has been used. Calculated from United States, *Annual Report of the Secretary of the Treasury: 1940*, Washington, DC, pp. 646-47, Table 6.

network of roads and forts on the western frontier.[69] The settler populations that this infrastructure protected and provisioned allowed the United States to overwhelm indigenous societies.[70] Although $84 million was spent on the Bureau of Indian Affairs, which was notionally tasked with protecting the Indians, it probably did more to assist in their removal than promote their welfare.[71] Some $20 million was also spent on internal improvements in the states and territories beyond the eastern seaboard.[72] In total, then, close to $600 million – equivalent to a third of total ordinary revenues over the period[73] – can be seen as a reasonable low estimate for the Federal Government's expenditure on western expansion.

Looking beyond direct expenditures, western expansion was also promoted by the Federal Government's policy of retiring the national debt, which channelled liquidity into the country's nascent capital markets. During the Revolutionary Wars, much of the country's liquid capital had either been destroyed by inflation or borrowed by the state and national governments.[74] When the national debt was consolidated in 1790 as part of Hamilton's financial reforms, it stood at almost $80 million. It fluctuated around that level until it began to be retired from 1806, falling to $45 million in 1812. Following the war with the British, it peaked again at $127 million in 1816, but was steadily reduced to nothing in 1835, then slowly grew again to $65 million in 1860. Over this period, the Federal Government spent some $640 million – another third of its revenues – on servicing and redeeming the debt.[75] In doing so, it put funds into the pockets of bondholders, who – with no new federal bonds being floated – looked to other assets, especially the bonds of state governments, which began to borrow significantly in the 1820s.[76]

The policy of retiring the national debt also encouraged foreign investors to invest in state bonds, since they saw the Federal Government's repayment of the debt in the 1820s as an indication that American bonds were a reliable invest-

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69. D.W. Meinig, *The Shaping of America: A Geographical Perspective on 500 Years of History*, II, *Continental America, 1800-1867*, New Haven, 1993, pp. 170-71, 401-04; and D. Ball, *Army Regulars on the Western Frontier, 1848-1861*, Norman, 2001, pp. xxi-xxxi.
70. B. Vandervort, *Indian Wars of Mexico, Canada, and the United States, 1812-1900*, New York, 2006, p. 15.
71. E. Davis, 'An Administrative Trail of Tears: Indian Removal', *American Journal of Legal History*, 50:1, 2008-2010; and S.J. Rockwell, *Indian Affairs and the Administrative State in the Nineteenth Century*, New York, 2010, ch. 6.
72. L.J. Malone, *Opening the West: Federal Improvements before 1860*, Westport, 1998, pp. 125-36.
73. United States, *Historical Statistics*, II, p. 1106, Series Y352-56.
74. It is tempting to see the formation of the Bank of the United States in 1791, with a capitalisation of $10 million, as a sign of abundant capital. However, investors were allowed to fund three quarters of the value of their shares using Treasury securities that had been issued as part of the 1790 debt restructuring, so the amount of new capital actually raised was far smaller than the bank's capital suggests. Sylla, 'U.S. Securities Markets', p. 86.
75. Calculated from United States, *Report of the Secretary of the Treasury on the State of the Finances*, Washington, DC, 1861, p. 297-99.
76. B.U. Ratchford, *American State Debts*, Durham, 1942, pp. 84-85; and Sylla, 'Experimental Federalism', pp. 500-01, 521-22.

ment. Notably, the retirement of the national debt occurred just as Latin American republics were defaulting on theirs.[77] Awash with savings due to the new wealth generated by the Industrial Revolution, British investors instead looked towards American bonds. In this, they were encouraged by the merchant bankers, who, as Anglo-American trade expanded with the cotton boom, increasingly used American state bonds as cover for mercantile credit, introducing them to the British capital market. The same merchant bankers would then begin to promote American securities in London during the 1830s, facilitating the rapid growth in lending to the American states.[78] Even Rothschilds, the leading merchant bankers of the period, were reluctantly drawn into marketing American state bonds in Europe due to their involvement in the cotton trade.[79] Although the lending largely ended after several states defaulted on their debts in 1841 and 1842, investments made in the previous decades would have a profound long-term impact on the country's development.

Most of the borrowed funds were used to finance the transportation infrastructure required to connect the new lands to markets. In the South relatively little investment was needed because cotton's high value-to-weight ratio made it inexpensive to transport, while there was also an extensive system of navigable rivers.[80] In the North, by contrast, state governments borrowed heavily in the 1820s and '30s to build canals, which reduced transportation costs, giving the yeoman farmers who settled the new lands access to markets in which they could sell their produce.[81] As farming incomes grew, land values rose,[82] increasing the

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77. C. Marichal, *A Century of Debt Crises in Latin America: From Independence to the Great Depression*, New Jersey, 1989, ch. 2.
78. M. Wilkins, *The History of Foreign Investment in the United States to 1914*, Cambridge, 1989, pp. 54-59.
79. N. Ferguson, *The House of Rothschild,* I, *Money's Prophets 1798-1848*, London, 2000, pp. 369-70.
80. In 1860 cotton sold for around 11 cents per pound, compared to less than 1 cent for corn and 2 cents for wheat. Towne and Rasmussen, 'Farm Gross Product', pp. 294, 297, 308. River transportation was also considerably cheaper in terms of cents per ton-mile than both canals and railways throughout the antebellum period. D.C. North, 'The Role of Transportation in the Economic Development of North America', in Commission International d'Histoire Maritime, ed., *Les grandes voies maritimes dans le monde XV-XIX siecles*, Paris, 1965, pp. 244-45, Table 4. On the persistence of river transportation in the South, see E.F. Haites, J. Mak, and G.M. Walton, *Western River Transportation: The Era of Early Internal Development, 1810-1860*, Baltimore, 1975.
81. State governments' investments in canals brought substantial 'social savings', even if they were soon replaced by marginally cheaper railways. See R.W. Fogel, *Railroads and American Economic Growth: Essays in Econometric History*, Baltimore, 1964, pp. 23-25; and R.L. Ransom, 'Canals and Development: A Discussion of the Issues', *American Economic Review*, 54:3, 1964, pp. 371-72; also T. Leunig, 'Social Savings', *Journal of Economic Surveys*, 24:5, 2010, pp. 783-86. The effect on farmers' terms of trade can be seen in wholesale prices in Cincinnati, where the relative prices received by farmers improved by around 400 per cent from the 1790s to the 1850s. T.S. Berry, *Western Prices before 1861: A Study of the Cincinnati Market*, Cambridge, MA, 1943, p. 564, Tables 18-19.
82. L. Craig, Lee, R.B. Palmquist, and T. Weiss, 'Transportation Improvements and Land Values in the Antebellum United States: A Hedonic Approach', *Journal of Real Estate Finance and Economics*, 16, 1998; and J. Atack and R. Margo, 'The Impact of Access to Rail Transportation on Agricultural Improvement: The American Midwest as a Test Case, 1850–1860', *Journal of Transport and Land Use*,

property taxes that states subsequently relied upon for revenues.[83] Similarly, as trade expanded, urban property values grew, swelling the tax base for municipal governments, whose revenues began to outstrip those of the states in the 1840s.[84] Municipal governments then worked with local investors to make further investments in transportation infrastructure, especially railways,[85] while the states largely limited themselves to financing the more expensive lines that crossed the Appalachian mountains to reach the Midwest.[86] The funds made available by the cotton boom had thus allowed the Midwest to be integrated with the cities of the Northeast, effectively undermining the role of the South's river system as the country's primary transportation hub.[87]

The rapid growth and integration of the Midwest promoted the Northeast's industrialisation. The new transportation infrastructure, combined with the policy of cheap land, meant that yeomen farmers' children could move west, rather than subdivide their fathers' landholdings or move to the city to compete with immigrants for jobs. Prosperous farmers then provided demand for the goods and services of the emerging networks of towns and cities.[88] This buoyant demand, aided by the tariff, spurred the Northeast's industrialisation as urban bourgeoisies invested in industry, taking advantage of the region's supply of cheap female labour.[89] Female wages were low because there was insufficient work for them in agriculture, where they were seen as redundant as a result of the low labour requirements. Instead they focused on childcare, housework, and home manufacturing. Higher wages could be offered to draw them into the new factories due to the diffusion of the technologies of the Industrial Revolution, which were particularly suited to New England because of the cheap water power provided by its fast-flowing rivers.[90] Young women therefore gave up

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4:2, 2011.

83. J.J. Wallis, R.E. Sylla, and A. Grinath III, 'Sovereign Debt and Repudiation: The Emerging Market Debt Crisis in the U.S. States, 1839-1843', NBER Working Paper 10753, 2004, pp. 10-12, 16-25.
84. J.J. Wallis, 'American Government Finance in the Long Run: 1790 to 1990', *Journal of Economic Perspectives*, 14:1, 2000, pp. 63-71.
85. For the case of the Philadelphia Main Line, see J. Majewski, *A House Dividing: Economic Development in Pennsylvania and Virginia Before the Civil Wa*r, Cambridge, 2000, pp. 119-24.
86. C. Goodrich, 'Internal Improvements Reconsidered', *Journal of Economic History*, 30:2, 1970, pp. 304-05.
87. G.R. Taylor, *The Transportation Revolution 1815-1860*, New York, 1951, pp. 165-66; and Haites, Mak, and Walton, *Western River Transportation*, pp. 6-11.
88. D.R. Meyer, 'Emergence of the American Manufacturing Belt: An Interpretation', *Journal of Historical Geography*, 9:2, 1983; and *The Roots of American Industrialization*, Baltimore, 2003.
89. Goldin and Sokoloff, 'Relative Productivity Hypothesis'; and 'Women, Children, and Industrialization'.
90. P.P. Christensen, 'Land Abundance and Cheap Horsepower in the Mechanization of the Antebellum United States Economy', 18:4, 1981, pp. 312-24; and S.J. Goldfarb, 'A Note on Limits to the Growth of the Cotton-Textile Industry in the Old South', *Journal of Southern History*, 48:4, 1982, pp. 549-50.

their traditional occupation of spinning and weaving at home,[91] with many working as wage labourers in factories for several years before marriage.[92] Greater employment in turn raised their wages, so the male-female wage gap closed, leading capitalists to instead hire immigrants and invest more in machinery, raising productivity levels and thereby permitting further increases in incomes.[93] Larger, more heavily capitalised industrial corporations became the norm as the United States began to become an agro-industrial behemoth of unprecedented scale.

North by Midwest

Their continuing exclusion from the growth of the Midwest made the position of the slaveholders increasingly precarious. Following the Northwest Ordinance of 1787, there were numerous other more or less local struggles over whether slavery would be permitted in the new Midwest, culminating in the Missouri Compromise of 1820, which admitted Missouri as a slave state but prohibited slavery elsewhere north of the 36°30′ parallel.[94] This arrangement allowed slave-holders to establish the Southern cotton belt across the Southwest, which had been opened for settlement following the defeat of the Creek Indians during the War of 1812. Ultimately, however, it undermined their political power by confirming slavery's exclusion from the Midwest, where the population grew rapidly as settlers were attracted by its cheap land and remunerative agriculture. Much of the Midwest began to resemble a Greater New England, settled by prosperous farmers living together in towns integrated through the new transportation infrastructure.[95] The farmers' prosperity spurred industrialisation as members of the urban bourgeoisie took advantage of plentiful supplies of raw materials to invest in factories that could compete with those of the Northeast.[96] In the South, by contrast, markets were limited by low population density, which resulted from the need to keep large amounts of land in fallow.[97] There were few

91. In the counties for which it recorded data, the 1810 census found an annual value of $6.44 of home manufactures in New England, which then fell to $0.37 in 1860. Calculated from R.M. Tryon, *Household Manufactures in the United States 1640-1860: A Study in Industrial History*, Chicago, 1917, pp. 166, 308-09, Tables 11 and 27.
92. T. Dublin, *Women at Work: The Transformation of Work and Community in Lowell, Massachusetts*, New York, 1979, ch. 3.
93. Habakkuk, *American and British Technology*, pp. 65-66, 105-07; and Goldin and Sokoloff, 'Women, Children, and Industrialization', p. 755.
94. J.C. Hammond, '"Uncontrollable Necessity": The Local Politics, Geopolitics, and Sectional Politics of Slavery Expansion', in J.C. Hammond and M. Mason, eds., *Contesting Slavery: The Politics of Bondage and Freedom in the New American Nation*, Charlottesville, 2011.
95. M. Egnal, 'The Beards Were Right: Parties in the North, 1840–1860', *Civil War History*, 47:1, 2001.
96. D.R. Meyer, 'Midwestern Industrialization and the American Manufacturing Belt in the Nineteenth Century', *Journal of Economic History*, 49:4, 1989.
97. J. Majewski and V. Tchakerian, 'Markets and Manufacturing: Industry and Agriculture in the Ante-bellum South and Midwest', in S. Delfino and M. Gillespie, eds., *Global Perspectives on Industrial*

towns and cities, so the South lacked the urban bourgeoisie that provided the capital and entrepreneurship for industrialisation in the North.[98] Moreover, labour-intensive agriculture meant there was less surplus labour to be employed in factories, whereas in the Midwest's wheat-growing areas farm hands found work in industry during the winter.[99] In this way, the South's ecological limitations made it lag behind the North's more rapid growth.

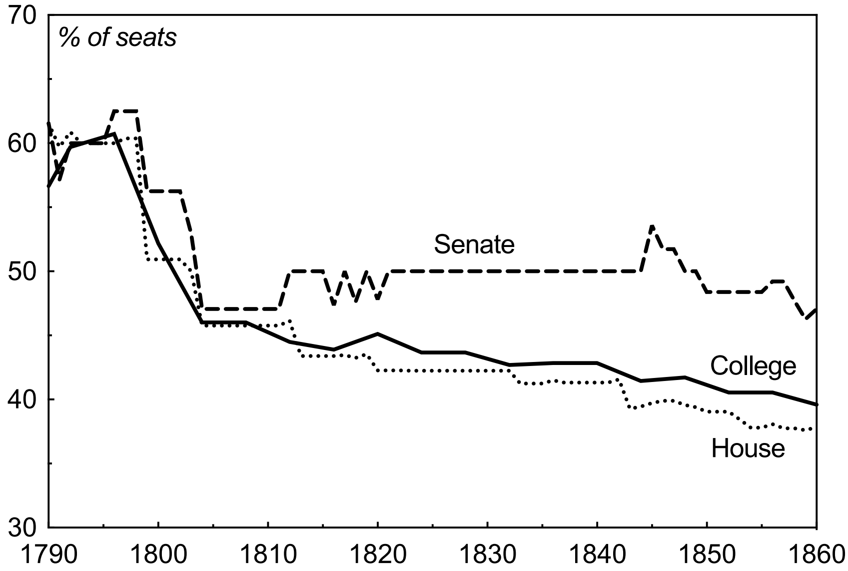
As the South's share of the population fell, slaveholders saw their political power wane. They had always been few in number: roughly one in eight free American families held slaves in 1790, which then fell to more like one in fourteen in 1860.[100] Nonetheless, they had traditionally enjoyed considerable political power, aided by the three-fifths rule, which counted each slave as 60 per cent of a free person when apportioning seats in the House of Representatives and Electoral College, giving slave states around a third more seats than their share of voters warranted. Still, their position was eroded by the growth of the Midwest. Figure 3 shows how the slave states' share of seats declined from around 60 per cent in the first half of the 1790s to less than 40 per cent by 1860. The initial drop was due to New York and New Jersey prohibiting slavery in 1799 and 1804 respectively, but subsequently it resulted from the Midwest's growth. As a result, slaveholders came to rely on their position in the Senate, where each state was awarded two seats irrespective of its size. After the Missouri Compromise, there was a de facto rule that new states would be created in pairs: one free, one slave. Slave states briefly gained a majority with the admission of Texas in 1845, but lost it as Iowa joined in 1846, and then the rule was broken when Wisconsin was admitted as a free state in 1848, followed by California in 1850, denting slaveholders' hopes of establishing the use of slave labour in the West's gold mines.[101] Slavery had thus been excluded from the Midwest to the Pacific, fuelling slaveholders' resentment as they saw the revenues derived from cotton financing the westward expansion that was undermining their position in Congress.[102]

Transformation in the American South, Columbia, 2005.

98. The lack of an urban bourgeoisie explains why there was little investment in industry despite high profit rates, since in both North and South there was little movement of capital from agriculture to industry. D.R. Meyer, 'The Industrial Retardation of Southern Cities: 1860-1880', *Explorations in Economic History*, 25:4, 1988, p. 367; cf. F. Bateman and T. Weiss, *A Deplorable Scarcity: The Failure of Industrialization in the Slave Economy*, Chapel Hill, 1981, ch. 5.
99. D.E. Schob, *Hired Hands and Plowboys: Farm Labor in the Midwest, 1815-60*, Urbana, 1975, pp. 150-72; K.L. Sokoloff and V. Tchakerian, 'Manufacturing Where Agriculture Predominates: Evidence from the South and Midwest in 1860', *Explorations in Economic History*, 34:3, 1997; and R.A. Margo, *Wages & Labor Markets in the United States*, Chicago, 2000, pp. 82-83.
100. Estimated from United States, *Population of the United States*, pp. 599-600; and L. Soltow, 'Economic Inequality in the United States in the Period from 1790 to 1860', *Journal of Economic History*, 31:4, 1971, p. 825, Table 1.
101. J.M. McPherson, *Battle Cry of Freedom: The American Civil War*, London, 1988, ch. 2; and L.L. Richards, *The Slave Power: The Free North and Southern Domination, 1780-1860*, Baton Rouge, 2000, pp. 47-49, 56-57, 68-70, 97-99.
102. See especially J.C. Calhoun, 'Speech on the Slavery Question, Delivered in the Senate, March 4th,

Figure 3

Slave States in the US Congress and Electoral College, 1790-1860



Source: Compiled from M.J. Dubin, *United States Presidential Elections, 1788-1860: The Official Results by County and State*, Jefferson, 2002; and United States, *Biographical Directory of the United States Congress 1774-2005*, Washington, DC, 2005, pp. 45-161.

Attempts to reestablish an equilibrium between North and South failed. In 1854 the Kansas-Nebraska Act effectively repealed the Missouri Compromise, replacing it instead with the principle that each new state should decide for itself whether it would allow slavery. The assumption was that in some states settlers would prefer to have the option of becoming slaveholders. Yet the possibility of achieving that goal had become ever more remote. As slaves' productivity grew,[103] their prices trebled from the 1790s to the 1850s, until a prime male hand

1850', in R.K. Crallé, ed., *The Works of John. C. Calhoun*, IV, *Speeches of John C. Calhoun Delivered in the House of Representatives and in the Senate of the United States*, New York, 1888, pp. 542-50; also A Citizen of Virginia, *The Union, Past and Future: How It Works and How to Save It*, 4th ed., Charleston, 1850; and L.W. Spratt, *A Series of Articles on the Value of the Union to the South, Lately Published in the Charleston Standard*, Charleston, 1855, pp. 4-5; also Majewski, *Modernizing a Slave Economy*, pp. 111-13.

103. The value of the main slave-produced commodities (cane sugar products, cotton, rice, and tobacco) was around $44 per member of the slave agricultural labour force in 1800, increased slowly to $53 in 1830, but then exploded to $155 in 1860. Deflated, that suggests a fairly consistent annual per capita growth rate of 4 per cent. Taking into account slaves' production for their own consumption slows the rate of growth down somewhat; for instance, if such production is assumed to be worth $30 in 1860 and projected back to 1800 using the numbers in the slave farm labour force, the annual per capita growth rate falls to a still impressive 2 per cent. Calculated from Towne and Rasmussen, 'Farm Gross Product', pp. 295, 300, 307-08; and L.A. Craig and T. Weiss, 'The Agricultural Labor Force by State, 1800 to 1900', University of Kansas, computer files, 1998, on-line at https://sites.google.com/a/ncsu.edu/lacraig/home/file-cabinet (accessed 19 February 2021).

cost around $1,500 in New Orleans in 1860.[104] By contrast, the cost of establishing a farm on the western frontier at the time was from $500 to $1,000,[105] while labour could mainly provided by family members and horses pulling machines.[106] Slavery was therefore of little appeal to most settlers. Rather, they saw it as a harbinger of higher land prices as slaveholders had used their better access to credit to bid up land prices in the South.[107] The hundreds of thousands of Southerners who had migrated to the Midwest attested to this, contributing to settlers' hostility towards slavery.[108] Consequently, attempts to establish Kansas as a slave state were resisted, leading to years of violent conflict between settlers and slaveholders. The slave states' position in the Senate was then further eroded by the admissions of Minnesota and Oregon as free states in 1858 and 1859 respectively.[109]

Secession was born out of slaveholders' fear for the future of their property, combined with their resentment over how the revenues from cotton had financed their own disempowerment. The Democratic Party was split by the attempts to impose slavery on Kansas, so the way was paved for the victory of Abraham Lincoln and his Republican Party in the 1860 elections. Opposition to the 'Slave Power' had been fundamental to the emergence of the Republicans as they saw the South's slaveholding aristocracy as the main obstacle to their programme of expanding the North's settler society to the Pacific.[110] Slaveholders in the cotton belt responded by pushing their states to secede soon after Lincoln's victory and then sought to spread the secessionist movement across the South. As Figure 4 shows, secession cascaded through the slave states, beginning where slaveholding was most common. South Carolina, where almost half of free families owned slaves, was the first to secede in late December 1860, less than two months after Lincoln's victory. From there, secession commissioners spread out across the

104. Estimated from R. Ransom and R. Sutch, 'Capitalists without Capital: The Burden of Slavery and the Impact of Emancipation', *Agricultural History*, 62:3, 1988, p. 155, Table A.4; and Mancall, Rosenbloom, and Weiss, 'Slave Prices', pp. 619-20, Table 1.

105. Danhof, 'Farm-Making Costs'; Ankli, 'Farm-Making Costs'; and Atack, 'Farm and Farm-Making Costs'.

106. Horse prices had remained fairly constant during 1800-60, even as slave prices boomed. For the former, see Towne and Rasmussen, 'Farm Gross Product', p. 286. On the importance of cheap horses to Northern agriculture, see Christensen, 'Land Abundance', pp. 314-18.

107. D.F. Weiman, 'The First Land Boom in the Antebellum United States: Was the South Different?', in E. Aerts, M. Aymard, J. Kahk, G. Postel-Vinay, and R. Sutch, eds, *Structures and Dynamics of Agricultural Exploitations: Ownership, Occupation, Investment, Credit, Markets*, Leuven, 1990; and 'Peopling the Land by Lottery? The Market in Public Lands and the Regional Differentiation of Territory on the Georgia Frontier', *Journal of Economic History*, 51:4, 1991.

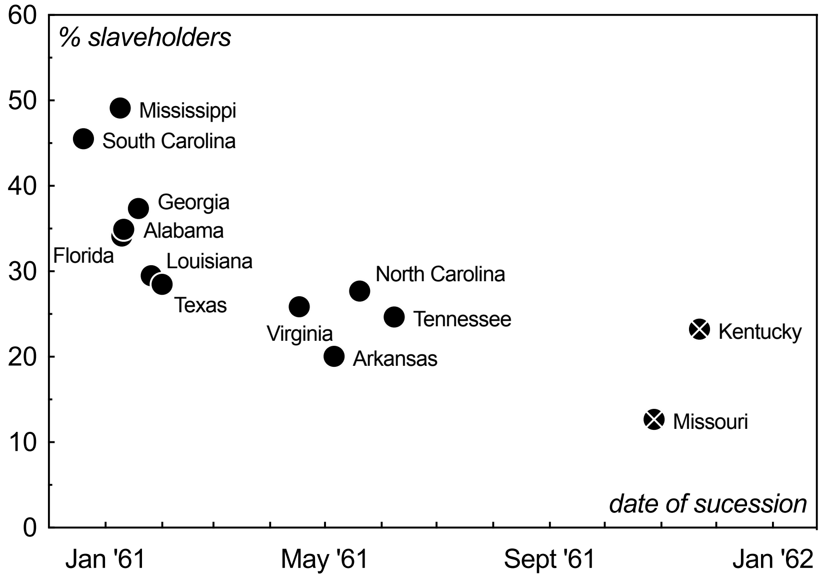
108. N. Etcheson, *The Emerging Midwest: Upland Southerners and the Political Culture of the Old Northwest, 1787-1861*, Bloomington, 1996, pp. 67-71.

109. McPherson, *Battle Cry of Freedom*, ch. 5.

110. L. Gara, 'Slavery and the Slave Power: A Crucial Distinction', *Civil War History*, 15:1, 1969; and W.E. Gienapp, 'The Republican Party and the Slave Power', in R.H. Abzug and S.E. Maizlish, eds., *New Perspectives on Race and Slavery in America: Essays in Honor of Kenneth M. Stampp*, Lexington, 1986.

Figure 4

Secession from the United States and Slaveholding, 1860-62



Notes: Percentage of slaveholding families is estimated as the number of slaveholders divided by the number of free families in the 1860 census. Kentucky and Missouri's succession ordinances were nullified.

Source: Slaveholders from United States, *Agriculture of the United States in 1860*, Washington, DC, 1864, pp. 224, 247. Families from United States, *Compendium of the Tenth Census (June 1, 1880)*, II, rev. ed., Washington, DC, 1888, p. 1415, Table 108

South, raising fears over the future of slavery.[111] In response, South Carolina was followed in January and early February 1861 by a group of four more states where around 30-40 per cent of families owned slaves. No more states seceded until after the Battle of Fort Sumter in April 1861, when South Carolina's militia bombarded a US Army garrison that had been ordered to hold its position. When Lincoln responded by announcing his intention to fight for the Union and called for 75,000 men to volunteer, four more Southern states, where 20-30 per cent of families owned slaves, would declare secession. The slaveholders' strategy had worked, with secession spreading from the most heavily slaveholding states to some of the least.[112] In total, 11 out of 15 slave states seceded.[113]

The government of the new Confederacy envisioned using the revenues from cotton to finance the South's industrialisation. In doing so, the state would

111. C.B. Dew, *Apostles of Disunion: Southern Secession Commissioners and the Causes of the Civil War*, Charlottesville, 2001.
112. H. Meadwell and L.M. Anderson, 'Sequence and Strategy in the Secession of the American South', *Theory and Society*, 37:3, 2008.
113. Slaveholders in Kentucky (23 per cent of families) and Missouri (13 per cent) tried to secede at the end of 1861, but their attempts were rebuffed by the state governments. In Delaware (3 per cent) and Maryland (12 per cent) no attempt was made.

provide the capital and entrepreneurship that had been lacking due to the small urban bourgeoisie. Already in the 1850s, several Southern state governments had borrowed heavily to invest in transportation infrastructure, especially railways,[114] which tended to benefit Yeoman farmers in the more inaccessible Upcountry by giving them better access to markets. As a result. the benefits of growth were more widespread than in previous decades, although landless poor whites gained little.[115] Employment in industry offered a way to improve their lot,[116] but the South's industrialisation was inhibited by being in a customs union with the Northeast,[117] where the proximity of fast-flowing rivers to towns and cities had early on provided a comparative advantage in manufacturing, since water power was still industry's main source of energy.[118] Hence, secession not only promised to provide more fiscal resources, but also presented the opportunity to use tariffs to support infant industries in the South by protecting them from Northern competition.[119] In doing so, secessionists hoped to turn the South's slave society into an agro-industrial behemoth to rival the North.

Yet the North would not let the South leave precisely because secession threatened to deprive the Federal Government of its principal source of revenues. The risk was that the Confederacy's lower tariffs would lead to the import trade being redirected to Southern ports, potentially depriving the Northeastern ports of their role as entrepôts for the Midwest, while also threatening the solvency of the Federal Government. Customs revenues rapidly became the single most important issue in Northern debates about how to respond to secession, not least because the value of Federal Government bonds fell as investors feared for the future of the public finances.[120] As an editorial in the *New York Times* observed in March 1861, succession was 'quite likely to deprive the Federal Government almost entirely of its revenues'.[121] For Lincoln's Republican Party, this threat of insolvency was particularly acute because it had promised its voters an expansion of the Federal Government's activities, including the construction of better transportation infrastructure, a Homestead Act that would provide farmers with public lands at minimal cost, land-grant universities to educate their children,

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114. Ratchford, *American State Debts*, pp. 124-28; and Majewski, *Modernizing a Slave Economy*, ch. 3.
115. This pattern can be seen in Lindert and Williamson's estimates of income distribution. They show, for instance, the middle 40-60 per cent of South Atlantic free households increasing their average income by 25 per cent from 1850 to 1860, whereas the bottom 60-100 per cent increased theirs by just 3 per cent. Similar patterns can be seen in the other Southern regions, although also in much of the North. Calculated from P.H. Lindert and J.G. Williamson, *Unequal Gains: American Growth and Inequality since 1700*, Princeton, 2016, pp. 115-16, Tables 5-6 and 5-7.
116. K.L. Merritt, *Masterless Men: Poor Whites and Slavery in the Antebellum South*, Cambridge, 2017, pp. 96-98.
117. T.F. Huertas, 'Damnifying Growth in the Antebellum South', *Journal of Economic History*, 39:1, 1979.
118. Goldfarb, 'Note on Limits'.
119. Majewski, *Modernizing a Slave Economy*, pp. 125-30.
120. Stampp, *And the War Came*, pp. 231-38.
121. 'Secession and Business', *New York Times*, 27 March 1861, p. 4.

and a new Department of Agriculture to provide them with technical support.[122] Pressures for action grew more intense towards April, when the Morrill Tariff Bill was due to raise tariffs in the North, thereby giving importers greater incentives to use Southern ports.[123] Unwilling to lose the Federal Government's principal source of revenue, Lincoln ordered the army to hold the federal forts in the South, leading to the Battle of Fort Sumter. Only after the war began and it became clear that Lincoln intended to fight did investors begin to recover confidence in the Federal Government's finances: having lost 20 per cent of their value from December 1860 to June 1861, Federal Government bonds had recovered to pre-war levels by April 1862. Thereafter, the bond markets demonstrated little doubt over the North's prospects for victory.[124]

The South lost the war because the secessionist vision had been predicated on the miscalculation that the cotton boom would continue, paying for any military conflict that would be required to gain independence. The assumption was that Britain's need for imported cotton would make it prevent any attempts by the North to blockade Southern ports. Britain remained neutral, however, while the measure that may have brought British recognition of the Confederacy – the promise of a free trade agreement – was resisted by those Southern politicians who believed in the need to use tariffs to promote industrialisation. The Confederacy instead responded by placing an embargo on cotton exports, in order to convince the British that they could not live without American cotton.[125] Britain in turn found other sources in Brazil, Egypt, and especially India, where production increased rapidly.[126] As a result, recognition was not forthcoming. Instead, the embargo made the Union Navy's blockade of Southern ports more effective than it might otherwise have been. Customs revenues dried up, so the Confederacy turned to currency issues and 'impressments', forcefully buying provisions at below market prices. Runaway inflation and the predations of the impressment officers then undermined morale.[127] Even slaveholders' began to doubt the

122. R.F. Bensel, *Yankee Leviathan: The Origins of Central State Authority in America, 1859-1877*, Cambridge, 1990, pp. 64-78; S.T. Phillips, 'Antebellum Agricultural Reform, Republican Ideology, and Sectional Tension', *Agricultural History*, 74:4, 2000; Egnal, *Clash of Extremes*, ch. 9; A. Ron, 'Summoning the State: Northern Farmers and the Transformation of American Politics in the Mid-nineteenth Century', *Journal of American History*, 103:2, 2016; and *Grassroots Leviathan: Agricultural Reform and the Rural North in the Slaveholding Republic*, Baltimore, 2020. This literature tends to overlook the issue of how the Republicans intended to fund their new leviathan.

123. Stampp, *And the War Came*, p. 232; McClintlock, *Lincoln and the Decision for War*, pp. 216-17; and Cooper, *We Have the War*, pp. 247-48.

124. G.P. Dwyer Jr., R.W. Hafer, and W.E. Weber, 'Weekly U.S. and State Bond Prices', *Historical Methods: A Journal of Quantitative and Interdisciplinary History*, 32:1, 1999, p. 39, Figure 1.

125. D.B. Ball, *Financial Failure and Confederate Defeat*, Urbana, 1991, pp. 62-69; and B. Schoen, *The Fragile Fabric of Union: Cotton, Federal Politics, and the Global Origins of the Civil War*, Baltimore, 2009, pp. 264-68.

126. D.G. Sardan, 'King Cotton: Monarch or Pretender? The State of the Market for Raw Cotton on the Eve of the American Civil War', *Economic History Review*, 51:1, 1998, pp. 119-25.

127. Ball, *Financial Failure*, pp. 189-91, 231-32; also R. Burdekin and F.K. Langdana, 'War Finance in the

virtues of the government they had called into being. With the cotton trade ruined, their slaves were put to work growing corn and other provisions that provided little profit. Moreover, slave resistance increased, with hundreds of thousands escaping to Union territory and those who remained on their plantations growing rebellious, adapting their work routines to suit their own interests. In this, they were emboldened by Lincoln's Emancipation Proclamation, issued in September 1862, which decreed that slavery would be abolished in the states of the Confederacy once they were under Union control. As the slaveholders' world fell apart, the war seemed to be undermining the institution that they had sought to defend when they pushed for secession.[128] By the time of the Confederacy's surrender in April 1865, the Union controlled the territory where two thirds of the country's slaves had lived before the war began.[129] The secessionists' cause – slavery – was lost.

After the war, cotton's fiscal contribution to the Federal Government resumed, but its importance was greatly diminished. The cotton boom resumed: having peaked at 4.5 million bales in 1861, cotton production collapsed to 299,000 bales in 1864 but then rebounded and increased to 14 million bales by the eve of the First World War.[130] Economic historians have interpreted this as evidence that slavery had never been necessary for the cotton boom,[131] since output grew despite all slaves being emancipated with the Thirteenth Amendment at the end of 1865. Yet this interpretation fails to recognise the various conditions that had not been in place in the early nineteenth century. The new plant varieties had had made cotton more remunerative, increasing its attraction for yeoman farmers. Moreover, after the war, population growth in the South led to the subdivision of landholdings, so farmers looked to crops that gave higher returns per acre, even if at the expense of lower returns per hour worked. Facilitating this, the railways arrived, bringing guano fertiliser, which compensated for the acidity of the South's soils, reducing the need for keeping land in fallow. And perhaps most importantly, the former slaves became a black proletariat that was systematically excluded from high-wage occupations, making them available for seasonal employment on farms.[132] Thanks to these changes, the cotton boom could con-

Southern Confederacy, 1861-1865', *Explorations in Economic History*, 30:3, 1993.

128. J.L. Roark, *Masters Without Slaves: Southern Planters in the Civil War and Reconstruction*, New York, 1977, chs. 1-2; and C.E. Woodward, *Marching Masters: Slavery, Race, and the Confederate Army during the Civil War*, Charlottesville, 2014, ch. 5.

129. Estimated by county from United States, *Population of the United States*; E. Hergesheimer, 'Map Showing the Distribution of the Slave Population of the Southern States of the United States: Compiled from the Census of 1860', Washington, DC, 1861, on-line at https://www.loc.gov/item/99447026 (accessed 6/4/2021); and M. Gilbert, *American History Atlas*, London, 1968, p. 55.

130. United States, *Statistics on Cotton and Related Data*, Washington, DC, 1951, pp. 4-5, Table 1.

131. Olmstead and Rhode, 'Cotton, Slavery, and the New History of Capitalism', pp. 6-7; and Wright, 'Slavery and Anglo-American Capitalism', p. 373.

132. S. Hahn, *The Roots of Southern Populism: Yeoman Farmers and the Transformation of the Georgia Upcountry, 1850-1890*, New York, 1983, pp. 46-47, 143-46, 153-56; and J.R. Irwin, 'Farmers and Laborers: A

tinue, but it was no longer of such importance to the Federal Government because the growth of exports of manufactured goods reduced its role as the country's principal export.[133] Moreover, customs revenues had in any case been supplemented by an array of new excise taxes first imposed to finance the war and then kept in place after it.[134] Thus, having begun the war to preserve the revenues it received from cotton, measures taken by the Federal Government to fight the war subsequently made those revenues far less important. While cotton's munificence continued, it was no longer king.

(Under)development, US-Style

This paper has outlined how slavery played an important role in the development of the United States up to its abolition in 1865. Previous studies have tended to either make unrealistic claims about slavery's all-pervasive centrality to the United States' growth or deny that it made any contribution at all. The analysis made here has been more nuanced. It has shown that slavery was necessary for the boom in cotton exports because cotton was not a sufficiently remunerative crop for yeoman farmers. The cotton boom therefore required the slaveholders' captive labour force, which had been left underemployed by the decline of the colonial export staples. Cotton exports then balanced the imports that were taxed by the Federal Government to provide its main source of revenues. Much of those customs house revenues were used to fund the expansion of the western frontier and retire the national debt, which pumped liquidity into the country's nascent capital markets, helping to finance the transportation infrastructure that connected the new lands to markets. The frontier's safety-valve effect kept incomes high despite rapid population growth, so prosperous farmers provided demand for the goods and services of the North's towns and cities, where the urban bourgeoisie began to invest in manufacturing, leading to industrialisation.

This analysis suggests that the antebellum United States can be understood as an example of how globalisation generated both development and underdevelopment during the long nineteenth century.[135] Globalisation tended to benefit those countries that could exploit abundant natural resources or had the institutional capacity to promote industrialisation. The United States was exceptional in that had both, turning itself into an agro-industrial behemoth. Yet there were distinct winners and losers from the country's globalisation. Much as Britain's industrialisation required the deindustrialisation of India and the underdevelopment that it entailed,[136] the United States' cotton boom – and the develop-

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Note on Black Occupations in the Postbellum South', *Agricultural History*, 64:1, 1990.

133. R.E. Lipsey, 'U.S. Foreign Trade and the Balance of Payments 1800-1913', in Engerman and Gallman, eds., *Cambridge Economic History*, II, pp. 700-03.
134. Sylla, 'Experimental Federalism', pp. 527-29.
135. See A.G. Frank, *Latin America: Underdevelopment or Revolution*, New York, 1969, ch. 1.
136. For an overview, see I. Habib, 'Studying a Colonial Economy – Without Perceiving Colonialism',

ment it financed – needed the South's slaves. Their employment in growing cotton was a response to the scarcity of labour, since yeoman farmers preferred not to grow such labour-intensive crops. Unlike the ploughs and reapers used in the North, however, slaves were capital made from flesh and bone, and suffered as such. Child mortality rates were particularly high, with half of slave children dying before their fifth birthday, roughly double the rate of the white population.[137] Slave children died in such numbers because their mothers were forced to work long hours while pregnant, leading to low birth weights, and then returned to work shortly after birth, reducing their ability to care for and feed their underweight babies, who became more susceptible to disease as a result.[138] The surviving children then risked being sold and separated from their families, with roughly a fifth of slave children sold away from their families before they reached 16 years old.[139] As adults, they faced a lifetime of hard labour, as could be seen by the distinct lesions of overwork on their bodies when they died.[140] And they had been poor: the best estimates suggest that on the eve of the Civil War, the average slave's 'income' – essentially the food that they ate – was worth around 20-25 per cent of the average income of the free population.[141] The United States' slaves thus formed an underdeveloped nation within a nation.[142]

The irony of slavery in the United States was that it was ultimately abolished by the settler society that it had helped build. In the early nineteenth century, Northerners had viewed slavery in the South as a necessary evil, while reserving the more remunerative agriculture of the North to themselves. They

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Modern Asian Studies, 19:3, 1985.

137. R.H. Steckel, 'A Dreadful Childhood: The Excess Mortality of American Slaves', *Social Science History*, 10:4, 1986, p. 428, Table 1.
138. Ibid.; and debate in P.R.P. Coehlo and R.A. McGuire, 'Diet versus Disease: The Anthropometrics of Slave Children' and reply by R.H. Steckel, *Journal of Economic History*, 60:1, 2000.
139. S. Crawford, 'The Slave Family: A View from the Slave Narratives', in C. Goldin and H. Rockoff, eds., *Strategic Factors in Nineteenth Century American Economic History: A Volume to Honor Robert W. Fogel*, Chicago, 1992, pp. 341-42.
140. T.A. Rathbun and R.H. Steckel, 'The Health of Slaves and Free Blacks in the East', in R.H. Steckel and J.C. Rose, eds., *The Backbone of History: Health and Nutrition in the Western Hemisphere*, New York, 2002.
141. Ransom and Sutch's estimate of annual slave consumption of $30 in 1860 is based on direct estimates of each item of consumption. Combined with Weiss' national income estimates and population data from the 1860 census, they suggest slaves' average consumption was 19 per cent of the free population's average income. Lindert and Williamson, by contrast, prefer the indirect method of estimating slave consumption as half the free farm wage rate, resulting in a higher slave consumption of $43. However, their estimate of average national income is also higher than Weiss', so their figures suggest an average slave consumption of 24 per cent of the free population's average income. Calculated from United States, *Population of the United States*, p. 599; Weiss, 'Estimates of Gross Domestic Output', Table 4; R.L. Ransom and R. Sutch, *One Kind of Freedom: The Economic Consequences of Emancipation*, 2nd ed., Cambridge, 2001, pp. 210-12; and Lindert and Williamson, *Unequal Gains*, p. 99, Table 5-2, also pp. 290-93.
142. The phrase is from M.R. Delany, *The Condition, Elevation, Emigration, and Destiny of the Colored People of the United States: Politically Considered*, Philadelphia, 1852, p. 12.

settled the Midwest following the model of social order used to colonise New England. Settlers established towns, which were then connected to markets by new transportation infrastructure, leading to the arrival of more people and rising land prices. Owning slaves did not appeal to these settlers because their family's labour was more or less sufficient, given the low labour requirements of Northern agriculture. Letting the slaveholders in risked pushing up land prices and undermining the (white) republic that the settlers wished to build. For this reason, when slaveholders were at their weakest in the 1780s, the political representatives of New England's settler society established the principle that more slaves should not be allowed to enter the Northwest Territory. Without that precedent, it is possible to imagine the whole of the Midwest looking like Missouri, with an elite of small slaveholders growing cash crops on the best land and dominating local politics.[143] Had slavery taken hold in the Midwest, perhaps New England would have held out as a bastion of free labour; perhaps it would have seceded once the slave-state majority in Congress attempted to impose the legalisation of slavery there. Such counterfactuals are beyond the scope of this paper. What actually happened was that the Midwest became a settler society much like New England, with slavery confined to the South. Slaveholders recognised that it was their misfortune to be in a union with this Greater New England, so they sought to secede. The Yankees would not let them go, however, because they believed that they could not afford to lose the customs revenues that had traditionally been central to the finances of the Federal Government. Eventually, they abolished slavery as part of the war effort. Yet there would be little recognition of – or reparations for – the contribution slaves had made to the expansion of the North's settler society up to then.

Appendix: Man-hours in Agriculture in 1860

This paper's estimates of man-hours required in agriculture in 1860 have built on work by economists in the United States Department of Agriculture (USDA) from the 1930s onwards.[144] In the 1960s, Judith Klein and William Parker extended those estimates back to the first half of the nineteenth century for corn, oats, and

143. J.H. Combs, 'The South's Slave Culture Transplanted to the Western Frontier', *Professional Geographer*, 56:3, 2004; and K. Epps, *Slavery on the Periphery: The Kansas-Missouri Border in the Antebellum and Civil War Eras*, Athens, GA, 2016, ch. 2.

144. The studies used here are J.C. Schilleter, R.B. Elwood, and H.E. Knowlton, *Changes in Technology and Labor Requirement in Crop Production: Vegetables*, Philadelphia, 1939, p. 27; J.A. Hopkins, *Changing Technology and Employment in Agriculture*, Washington, DC, 1941, pp. 118, 123, 126, 131, 133, 137, 141, 143, Tables 40-44 and 49-50; M.R. Cooper, W.C. Holley, H.W. Hawthorne, and R.S. Washburn, *Labor Requirements for Crops and Livestock*, Washington, DC, 1943, pp. 1-3, 14-15, 20-21, 112-13, 115, 117-18, 121-27, 133-38; R.W. Hecht and K.R. Vice, *Labor Used for Field Crops*, Washington, DC, 1954, pp. 4-5, Table 1; and R.W. Hecht, *Labor Used to Produce Livestock: Estimates by States, 1959*, p. 3, Table 1.

wheat,[145] while Parker later published a similar study of cotton.[146] Subsequently, the study of man-hours in agriculture declined,[147] with one notable exception being Lee Craig and Thomas Weiss' compilation of existing estimates and their extension to other crops and animals over the period 1840-1900.[148] This paper has built on these earlier studies.[149]

Total man-hours required in 1860 were calculated through three steps:

(1) Table A1 shows the various sources used to estimate man-hours per unit of product. The estimates based on Klein and Parker's work are of the best quality, followed by those of Craig and Weiss. Respectively, these two sources cover 33 and 50 per cent of the value of production of crops and livestock in 1860, based on the estimates of Marvin Towne and Wayne Rasmussen.[150] Man-hours for most of the remaining 17 per cent of gross production were estimated from USDA reports from the early twentieth century, without modifications made for changes in productivity. Cane sugar products and rice were an exception due the substantial mechanisation of these industries in the late nineteenth century,[151] which would make twentieth-century man-hour estimates particularly inappropriate. More suitable estimates were therefore found.[152] In the case of sugar cane products, it proved necessary to use figures from Jamaica, which is assumed to have been operating at a similar technological level as sugar production in Louisiana.

(2) The value of production was calculated using Towne and Rasmussen's

145. W.N. Parker and J.L.V. Klein, 'Productivity Growth in Grain Production in the United States, 1840-60 and 1900-10', in D.S. Brady, ed., *Output, Employment, and Productivity in the United States after 1800*, New York, 1966, p. 532, Table 1.

146. W.N. Parker, 'Labor Productivity in Cotton Farming: The History of a Research', *Agricultural History*, 53:1, 1979, p. 238, Table 4.

147. See Parker, *Europe, America, and the Wider World*, Annex A.

148. Craig and Weiss, 'Hours at Work', pp. 8-9, Table 1.

149. The USDA's estimates of historical man-hour requirements for corn, cotton, and wheat back to 1800 have not been used because no methodological details or sources were given. One indication that they should be avoided is that their authors appear to have been unaware of the substantial improvements in picking rates for cotton: they estimate an improvement of 11 per cent in picking rates from 1800 to 1840, whereas Olmstead and Rhode's figures indicate a roughly 160 per cent increase. M.R. Cooper, G.T. Barton, and A.P. Brodell, *Progress of Farm Mechanization*, Washington, DC, 1947, p. 3, Table 1; and Olmstead and Rhode, 'Productivity Growth', p. 183, Figure 8.1.

150. Calculated from Towne and Rasmussen, 'Farm Gross Product'.

151. See M. Schmitz, 'The Transformation of the Southern Cane Sugar Sector: 1860-1930', *Agricultural History*, 53:1, 1979; H.C. Dethloff, *A History of the American Rice Industry, 1685-1985*, College Station, 1988, ch. 4; and J.C. Rodrigue, *Reconstruction in the Cane Fields: From Slavery to Free Labor in Louisiana' Sugar Parishes 1862-1880*, Baton Rouge, 2001, ch. 5.

152. G.E. Cumper, 'Labour Demand and Supply in the Jamaican Sugar Industry, 1830-1950', *Social and Economic Studies*, 2:4, 1954, p. 45; and J.M. Clifton, 'A History of the American Rice Industry, 1685-1985. By Henry C. Dethloff', *North Carolina History Review*, 66:2, 1989, p. 251.

Table A1

Sources of Man-hour Estimates for 1860

	Livestock and livestock products
Cattle and calves (cwt)	From Craig & Weiss, with regional variation from USDA 1929-38.
Hogs (cwt)	From Craig & Weiss, with regional variation from USDA 1929-38.
Sheep (head)	From USDA 1929-38.
Horses (head)	From USDA 1929-38.
Chickens (cwt)	From Craig & Weiss, with regional variation from Hopkins 1909-13.
Eggs (100)	From Craig & Weiss, with regional variation from Hopkins 1909-13.
Dairy products (cwt)	From Craig & Weiss, with regional variation from Hopkins 1909-13.
Wool	Included with sheep.
Misc livestock products	Same value/man-hour ratio as the rest of livestock.
	Food grains
Wheat (100 bu)	Interpolated between Parker and Klein 1839 and USDA 1910-14, with regional variation from Hopkins 1909-13.
Rye (100 bu)	From Craig & Weiss, with regional variation from USDA 1929-38.
Rice (cwt)	From Clifton.
Buckwheat (100 bu)	From Craig & Weiss, with regional variation from USDA 1929-38.
Corn (100 bu)	Interpolated between Parker and Klein 1839 and USDA 1910-14, with regional variation from Hopkins 1909-13.
Oats (100 bu)	Interpolated between Parker and Klein 1839 and USDA 1910-14, with regional variation from Hopkins 1909-13.
Hay (ton)	Alfalfa hay from USDA 1910-14, with regional variation from USDA 1929-38.
Barley (100 bu)	From Craig & Weiss, with regional variation from USDA 1929-38.
	Sugar crops
Cane sugar (ton)	Based on figures for Jamaica from Cumper.
Cane syrup (gal)	From USDA 1929-38.
Molasses	Included in cane sugar.
Maple sugar	From USDA 1929-38.
Maple syrup	From USDA 1929-38.
Sorgo syrup	From USDA 1929-38.
	Vegetables
Irish potatoes (bu)	From USDA 1910-14, with regional variation from Hopkins 1909-13.
Sweet potatoes (bu)	From USDA 1910-14, with regional variation from Schilletter, Elwood, & Knowlton 1909-13.
Truck crops	Same value/man-hour ratio as the rest of vegetables.
Peas and beans (lb)	From dry beans in USDA 1910-14, with regional variation from USDA 1929-38.
	Other crops
Fruits	Same production/man-hour ratio as vegetables, with same regional variation.
Hops (lb)	From USDA 1929-38.
Tobacco (100 lb)	From Craig & Weiss, with regional variation from USDA 1929-38.
Cotton (lb)	From Parker.
Hemp (lb)	From USDA 1929-38.
Flax fibre	Included with flaxseed.
Flaxseed (100 lb)	From USDA 1929-38.

Table A1 (cont.)

Nursery products	Same production/man-hour ratio as vegetables, with same regional variation.
Miscellaneous minor crops	Same production/man-hour ratio as food grains, sugar crops, vegetables, and other crops, with same regional variation.

Source: See the text.

national totals for each product,[153] with the distribution estimated from census data of physical output,[154] combined with the state-level prices collected by Craig, Michael Haines, and Weiss,[155] as well as some USDA data for livestock prices in 1867.[156] All regional production and price estimates were adjusted so that their sum equalled Towne and Rasmussen's national totals. The value of intermediate products consumed was subtracted, with regional totals estimated using census and gross production data.[157]

(3) The man-hour estimates were then applied to data on gross output (that is, including feed and seed), which was taken from the 1860 census for crops and from Towne and Rasmussen for livestock production. The regional man-hours were adjusted so that their sum equaled the national totals. Those adjusted regional man-hours are those shown in Table 1 and form the basis of the calculations in Table 2, which also includes estimates of man-hours spent on farm maintenance drawn from Martin Primack's work on farm capital formation.[158] The labour force estimates are those of Craig and Weiss,[159] with the child and female share of the slave labour force in each

153. Towne and Rasmussen, 'Farm Gross Product'.
154. United States, *Agriculture of the United States in 1860*, Washington, DC, 1864, pp. 184-87. For chickens, it was necessary to use the regional distribution from the 1880 census. United States, *Report on the Productions of Agriculture as Returned at the Tenth Census (June 1, 1880)*, Washington, DC, 1883, p. 284. For nursery products, the 1890 census was used. United States, *Report on the Statistics of Agriculture in the United States at the Eleventh Census: 1890*, Washington, DC, 1895, p. 540.
155. L.A. Craig, M. Haines, and T. Weiss, 'U.S. Census of Agriculture by County, 1860', computer file, 2000, on-line at https://sites.google.com/a/ncsu.edu/lacraig/home/file-cabinet/ag860co(1).xls (accessed 7/2/21).
156. United States, *Monthly Report of the Department of Agriculture for March 1868*, Washington, DC, 1868, pp. 135-37, 159.
157. The value of intermediate products consumed was still small in 1860. Towne and Rasmussen, 'Farm Gross Product', p. 272, Table 3. For repairs to farm structures and rent paid to nonfarm landlords, the 1860 census value of farms was used to estimate the regional distribution; for repairs to implements and machinery, the census value of farm implements; for fertiliser and lime, the value of crop output; for cotton ginning, the value of cotton output; for horseshoeing, the value of horse and mule output; and for miscellaneous, the value of all output.
158. Farm maintenance was calculated as average annual man-years spent in capital formation during 1849-59, minus man-years spent on building construction for new farms. It was assumed that there were 300 days in a man-year and 11 man-hours in a man-day. From M.L. Primack, *Farm Formed Capital in American Agriculture 1850 to 1910*, New York, 1977, pp. 181-86, Tables 13-14.
159. Craig and Weiss, 'Agricultural Labor Force'.

state estimated from the age distribution of the slave population in the 1860 census.[160]

All the raw data and calculations underlying the estimates can be found at www.joefrancis.info/data/US_ag_man-hours_1860.xlsx.

Finally, it should be stressed that these are minimum estimates of the amount of time spent in agriculture. As Robert Gallman, who pioneered the methodology used in this paper, put it, they exclude 'tasks of management, and [make] no allowance for time consumed in moving from one task to another'.[161] Moreover, it also seems that some agricultural tasks may not be included. In Parker's estimate of man-hours in cotton growing in the 1850s, for instance, there does not seem to be any time allocated to pest control,[162] even though the boll-worm was becoming more prevalent in this period. The slaveholders' solution was to send their slaves out into the field to pick the worms by hand, significantly adding to the number of man-hours spent on the crop. A Southern newspaper noted that 'A hand might, with exceptional diligence, go over an acre in *fifteen or twenty days!*'.[163]

160. United States, *Population of the United States*, pp. 594-95.
161. Gallman, 'Agricultural Sector', p. 56.
162. Parker, 'Labor Productivity in Cotton Farming'.
163. Quoted in Olmstead and Rhode, *Creating Abundance*, p. 138, original emphasis.