The Gun-Slave Cycle in the 18th century British slave trade in Africa

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THE GUN-SLAVE CYCLE IN THE 18TH CENTURY BRITISH SLAVE TRADE IN AFRICA*

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ABSTRACT

The trans-Atlantic slave trade is considered by many to have been a major shock to Africa, one that transformed African economies and contributed to long-term poverty. In this paper I combine data from the Transatlantic Slave Trade Database and the Anglo-African Trade Statistics to document some of the ways West Africans responded to the demand and technology shocks of the slave trade – how they responded to the growing international demand for African people as slaves and the introduction of the new gunpowder technology called the flintlock. I find that the early interaction of these two shocks – the gun-slave cycle – initiated a vicious cycle, a "raid or be raided" arms race. In the process, large numbers of Africans were victimized and sold into the Middle Passage.

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"…it was not the war which was the cause of the Slave Trade, but the Slave Trade which was the cause of the war."

Thomas Clarkson (1839, p. 167).

"Previous to my being in this employ, I entertained a belief that the kings and principal men [in Africa] breed Negroes for sale as we do cattle. All the information I could procure confirms me in the belief that to kidnapping, the trade owes its key support. "

Alexander Falconbridge (1788, p. 15).

INTRODUCTION

The trans-Atlantic slave trade carried an estimated 15 million enslaved Africans across the Atlantic and into the Americas. What factors lay behind this enormous enslavement of people? To Thomas Clarkson, the intellectual leader of the British abolition movement, this question went to the heart of the matter –the legitimacy and the legality of the trade itself.[1] If African slaves were captured in "justified" wars among African peoples – peoples caught in the "natural" struggles of nation building – then the victors had the right to enslave the vanquished, those whose lives they had just chosen to spare. On the other hand, if "it was the slave trade which was the cause of the war," then neither the Africans captors, nor their British traders or their planters had any rights to the captives whatsoever. Alexander Falconbridge's admission, while less steeped in the natural rights philosophy of the time, is probably closer to the layman's query: did African societies produce human slaves in their normal course of affairs (which British merchants were all too happy to buy), or where they kidnapped mothers, fathers, sons and daughters?

200 year later, this debate is still unresolved. Prominent historians of Africa like Philip Curtin (1975), David Eltis (1987) and John Thornton (1998) argue that the slave trade was of little consequence to Africa and that the majority of the captives came from justified wars amongst

[1] See Clarkson (1786), his award-winning Oxford essay that launched his career as a major figure in the abolition movement. Also see Patterson (1982) who calls the process of enslavement "social death" regardless of justification. On the other hand, the anti-abolitionist must have taken great delight in the often quoted words of Ose Bonsu, King of Asante, who proudly proclaimed, "I cannot make war to catch slaves in the Bush, like a thief. My ancestors never did so. But if I fight a king, and kill him when he is insolent, then certainly I must have his gold, and his slaves, and the people are mine too (DuPuis, 1824, p. 163)."

Africans peoples. Other prominent historians of Africa like Walter Rodney (1972), Joseph Inikori (1982), Robin Law (1991) and Basil Davidson (1961) argued that the slave trade had devastating effects on Africa, and that the growth of slave exports was in response to large demand and technology shocks – the New World demand for Africans as slaves and the introduction of the new flintlock gunpowder technology. Recent empirical work has produced econometric evidence confirming that the slave trade was a discernible shock to Africa, one with long term negative consequences (Nunn, 2008, 2011; Whatley and Gillezeau, 2011; Dalton and Leung, 2011), but we know very little concretely about the magnitude of this shock or how African responded to it, primarily because most Africans lived beyond the gaze of literate observers, both Christian and Muslim.[2] Until we know more about the magnitude of these shocks and how African responded to them we will remain unable to assess Clarkson's claim.

Which of these perspectives is closer to the truth? Did the wars cause the slave trade or did the slave trade cause the wars? That is the central question of this paper. Empirically, the answer is found in the African slave export supply function. The trans-Atlantic slave trade lasted for more than 400 years, but as Figure 1 shows the major expansion occurred in the 18th century when slave exports exploded from 20,000 to 100,000 per year, making the 18th century a good place to look for African responses to the demand and technology shocks. How and why did West Africans increase slave exports by more than 80,000 per year in the 18th century? Did Africans capture more slaves in response to increases in the international demand for slaves, or were large numbers of captives available for export for reasons unrelated to international demand? Did the dynamics of slave supply evolve over time? Did European merchants help finance the trade? Did a gun-slave cycle exist? Did the diffusion of the new gunpowder technology accelerate growth in slave exports, and if so how?

In this paper I conduct econometric tests of each of these questions utilizing annual time-series data on the 18th century British slave trade. I combine data from the *Transatlantic Slave Trade*

[2] One of the very few first-hand accounts of the process of capture and transport to the coast is the recollection of Olaudah Equiano (1995), who later became a prominent abolitionist crusader in England and around the world.

Database[3] with data from the *Anglo-African Trade Statistics* (1990) to build a time series of observations on slave prices and quantities that spans the period 1699-1807. Using war-related variations in cargo shipments to Africa, I identify and estimate a variety of short-run slave export supply functions. I find that in the early stages of expansion in slave exports, the interaction of demand and technology shocks – what has been called the gun-slave cycle – initiated a "raid or be raided" arms race in Africa. In the process, large numbers of people were victimized and sold into the Middle Passage. Coefficient estimates imply that an extra 100 pounds of gunpowder shipped to Africa produced approximately three additional slave exports, and each additional slave export attracted 2.7 additional pounds of gunpowder the next year. After controlling for the gun-slave cycle, which is essentially a supply-side shift factor, the estimated price elasticity of supply is 0.41, less than half previous estimates. After the mid-century mark the structure of supply changes. I conclude by offering several conjectures as to why.

THE BRITISH SLAVE TRADE TO AFRICA

On the eve of the 18th century Britain had just completed a political revolution that gave merchants, landowners and financiers greater control over economic policy, the nation's finances and the management of its public debt. The first order of business was strengthening the navy. The second order of business was expanding trade. By 1697 the new nation-state had established the Bank of England and had won the War of the Grand Alliance. Post-war optimism swept through financial markets, as old monopolies and privileges fell to free-competition. One of the first trades, if not the first trade, thrown open to free-competition was the transatlantic slave trade.

In 1699 the Royal African Company lost its royal charter. Interlopers had always nibbled around the edges of the trade, but now private interests were free to enter at will (Carlos and Brown, 1996). New trade policy restructured the Royal African Company, turning it into a quasi-public corporation with primary responsibility for maintaining the forts and factories it had acquired along the Guinea Coast of Africa (K. G. Davies, 1975) . Private traders paid a 10 percent tax to use these structures as warehouses for trade goods and as holding pens for slave.

[3] www.slave voyages.org.

Figure 1 presents data on annual British purchases of African slaves, along with numbers for other nations.[4] The British trade was largely confined to the 18th century, but it quickly became one of the largest slave trades in the world. The British trade was abolished in 1807, after which the Portuguese, Brazilian and Spanish trades expanded to pick up some of the slack. The British trade mimics the trade of other nations, with rapid growth over the entire 18th century and sharp contractions in the 1740s, 1770s and 1790s. These contractions correspond to military conflicts among European nations, like the American War for Independence and the Napoleonic Wars which disrupted Atlantic trade generally.

The British demand for slaves arrived on the coast of Africa as slave ships laden with cargo looking for slaves to buy. African destinations were determined before ships left Britain, with cargos carefully selected to meet the anticipated preferences of intended African consumers (Metcalf, 1987a, 1987b; Eltis, 2000). The most popular items were textiles, iron and copper bars, firearms and other weapons, pots, rum, cowrie shells and a vast array of manufactured goods.[5] On the coast of African these cargos (*CARGO*) were exchanged for slaves (*SLAVES*) who had previously been captured by Africans in wars and raids in the interior. Captives were marched to the coast and exchanged for imported *CARGO*.[6] The average annual rate of exchange between British *CARGO* and African slaves (*CARGO/SLAVES*) is my estimate of the average annual price (*PRICE*) that British merchants paid for slaves on the coast of Africa. This is the appropriate price for our purposes because we want to estimate the responses of African to changes in the prices they received. Slave prices in the interior were lower than coastal prices, but movements in the two prices must have been highly correlated.

Available data on the 18th century British slave trade allow me to construct a time series of average annual slave export prices (*CARGO/SLAVES)* for the years 1699 to 1807. Annual estimates of *CARGO* come from the *Anglo-African Trade Statistics* that were recorded in the

[4] All data on slave export quantities are taken from the Transatlantic Slave Trade Database at www.slavevoyages.org

[5] The *Anglo-African Trade Statistics* do not report trade by region, but several studies have analyzed trade books and ship's ledgers that document the regional variation in African preferences. See Metcalf (1987) and Eltis (2000, p. 168) for a sample.

[6] For historical studies of the African slave trade see Boubacar (1998), Lovejoy (2000), Miller (1988), Northrup (1978) and Law (1991).

British Customs Office and digitized by Johnson, et al (1990). The *Anglo-African Trade Statistics* contain annual estimates of the *real* value of British *CARGO* traded for slaves on the African coast. The British Customs Office valued trade at "official prices," primarily 1699 prices, which did not change over the sample period, so annual variations in *CARGO* capture variations in quantities not prices.[7] Annual estimates of *SLAVES* come from the *Transatlantic Slave Trade Database* compiled by David Eltis et. al. (1999). The variable *SLAVES* measures the number of slaves boarding the same British ships that brought the *CARGO* to Africa.[8] The ratio of the two (*CARGO/SLAVES)* is my estimate of the real price of slaves on the coast of Africa (*PRICE*).

The resulting *PRICE* series (labeled Whatley) is graphed in Figure 2, along with other price series for comparison. My estimate of *PRICE* closely tracks the annual price series constructed by David Richardson (1991) who uses a similar method and similar data, the difference being updates to the slave trade data since 1991. *PRICE* also tracks the price series compiled by Philip Curtin (1975) for the lower Gambia, but only when he uses similar account books in a similar manner.[9] *PRICE* also tracks the price series for enslaved Africans newly arrived in the Americas.[10] American prices are higher, reflecting the additional cost of the Middle Passage, but the trends are similar.

PRICE sat at approximately five pounds sterling between the third-quarter of the 17th century and the middle of the 18th century. At mid-century *PRICE* begins to rise sharply. By the end of the century prices average between 25 and 30 pounds sterling -- a five-fold increase in 50 years.[11]

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[7] *The Anglo-African Trade Statistics* do not record British slave purchases because slaves were shipped to the Americas and never entered Britain. *CARGO* is calculates by taking total British commodity exports to Africa and subtracting total African commodity exports to Britain. What is left is the real value of goods used to purchase slaves.

[8] For example, if $CARGO_t$ is cargo leaving Britain in 1750, then $SLAVES_t$ is the number of slaves leaving Africa on the ships that left Britain in 1750.

[9] These are prices from invoice books listing the goods exchanged for series or lots of slaves in the lower Gambia, without any corrections for loading or transportation costs, which Curtin did for some of his other price calculations. These prices are from Curtin (1975) Vol. II, Table A8.1, pp. 48-49.

[10] I thank David Eltis for making these data available to me. These prices are constructed from new world price quotes on slave shipments recorded in the *Transatlantic Slave Trade Database.* See Eltis and Ricardson (2004) .

[11] Gemery, Hogendorn and Johnson (1990) refer to this as improvements in African terms of trade, but it could also reflect increases in the cost of slave capture and transport to the coast. As time passed, African slavers had to

Figure 3 places prices and quantities on the same graph, along with five year moving averages to reveal general market trends. The first thing to notice is the pronounced inverse relationship between prices and quantities in the first half of the 18th century. Shifts in supply are outstripping shifts in demand, increasing exports while driving down price. The second thing to notice is the way this patterns stops sometime around mid-century. In a dramatic reversal that seems to occur sometime in the 1750s, prices and quantities begin to move together. Exogenous shifts in British demand for slaves begin to dominate exogenous shifts in supply, driving up prices and quantities together. The British abolish the trade in 1807.

THE AFRICAN SUPPLY RESPONSE

What was the African supply response to changes in the international demand for African slaves? Africa is where slaves were "produced," but we should think of production in this context not as an activity carried out in firms, but as broader social processes that somehow increase the number of slaves for export when it becomes more valuable to do so. Africans certainly exported more slaves over the course of the 18th century. Was this increase animated by increases in international demand?

There are a few estimates of long-run price elasticity in the literature. They are typically average correlations between slave exports and slave prices over long periods of time, where the long-run supply function is identified by assuming it is stable over time. These estimates range from a low of one Curtin (1975, ch. 4; LeVeen, 1975; Grubb and Stitt, 1994) to a high of thirty-five (Gemery and Hogendorn, 1977). By this method, the data in Figures 1 and 2 also exhibit highly elastic long-run supply. Between 1700 and 1750 international prices remained fairly constant while the number of exported slaves tripled.[12] Long-run price elasticity appears

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venture further inland to capture slaves, and communities used a variety of means to defend themselves See Diouf (2003) and Klein (2001) for numerous examples of defensive strategies, especially among decentralized societies, the primary victims of the slave trade.

[12] This is typically the situation assumed by studies of the transition from indentured servitude to slavery in the Americas. Economic historians working on the American side of the Atlantic invoke an elastic supply function to explain the transition from indentured servitude to African slavery in the Americas. The popular exposition is found in the influential textbook by Atack and Passell, *A New Economic View of American History* (1994, pp. 40-51):

to decline in the second half of the century, where exports do not keep pace with the five-fold increase in prices.

What about the short-run slave export supply curves? The British data are annual observations that allow me to estimate annual price-quantity relationships. It is possible that the elastic long-run supply curve in the first half of the 18th century consisted of a series of inelastic short-run supply curves that shifted out dramatically over time, and the later period could have consisted of a series of elastic short-run supply curves that did not shift out very much at all. Long-run and short-run supply curves can tell very different stories about the structure of supply and how it evolves over time.

The historical literature on short-run price elasticity focuses on the differences between the political and economic motivations for slaving, which line up nicely with Thomas Clarkson's distinction between justified and unjustified enslavement. What has been called the political warfare model emphasizes political conflict among Africans as the primary source of supply ("war produces the slave trade"), with most captives being by-products of political and ethnic conflicts unrelated to the international demand for slaves (Curtin, 1975; Engerman and Genovese, 1975; Thornton, 1998; Klein, 2007; Thomas, 1997). According to this view, one should think of African slaves as captives of wars who were exported rather than killed. They are sometimes called "joint-products of war," sometimes called "stolen goods," but always thought of as the outcomes of conflicts unrelated to the international demand for slaves, and always as people with zero or very low opportunity cost in Africa.

The extreme case is depicted in Figure 4 by the vertical perfectly inelastic supply curve. Supply is insensitive to international price and exogenously determined by domestic conflicts.

> "The higher the American wage, the greater the number of indentured servants willing to commit…. If the wage rises to W^2 -- the cost of securing and importing slaves -- then slave labor will be import. The supply of slave labor is perfectly elastic at any rate above the cost of importation -- that is, from the slavers' perspective, there was a limitless supply of potential slaves in Africa, theirs for the taking, subject only to the costs of transportation…. (O)nce the wage rate rises to W^2, all the new labor is supplied by slaves (p. 48)."

Galenson's (1981, 1991) telling is more-nuanced and historical, but the underlying economic logic is the same. Also see Solow and Engerman (1987, pp. 15, 73) and Grubb and Stitt (1994).

Price merely allocates the conflict-generated supply among the competing European ships docked off of the coast of Africa at any point in time. Increases in demand will increase price but not quantity. Political motivations reduced price elasticity.

Economic motives increased price elasticity. If wars and raids were conducted with an eye towards selling captives ("the slave trade causes the wars") then internalized costs could be substantial -- including the lives and resources lost during incursions and the costs associated with transporting captives to the coast (food, guards, shackles, tolls, taxes, etc.). Increases in price will motivate enterprising slavers to trek further into the interior to find additional captives or intensify their local activities, and competing domestic demands for captives will influence the percentage of captives exported. An example is the export supply model formulated by LeVeen (1975). Once captured, African slave traders have to decide between domestic and international sale, a decision influenced by the ratio of international to domestic slave prices. Captives in excess of domestic demand are exported, so even if capture processes are insensitive to international price, exports will not be. This conception is depicted in Figure 4 by the positively sloped export supply curve. Economic considerations increase the short-run price elasticity of exports.

The British data allow me to estimate the short-run price elasticity of slave *exports*, not the short-run price elasticity of *capture*. I do not have information on domestic labor demand. I make the strong assumption that movements in the ratio of international to domestic slave prices were driven primarily by movements in international slave prices. This was certainly the case in the 18th century. Plantation agriculture in the Americas was one of the fastest growing industries in the world. The price increases shown in Figure 2 were driven by the derived international demand for slaves, maybe by rising supply costs in Africa, but certainly not by rising productivity in African agriculture.[13]

Still, by all accounts domestic slavery in Africa exploded in the era of the trans-Atlantic slave

[13] In fact, the negative externalities of slaving most-likely disrupted alternative economic activity in Africa and reduced agricultural productivity, which would reduce the domestic demand for slaves and increase the share of captives exported.

trade. From small beginnings in the early 17th century, African slavery spread in the 18th and 19th centuries to become the largest social class in Africa. Much of this domestic expansion follows the abolitions of international trades. Lovejoy (1983) and Miller (1988), however, argue that the international slave trade drove the expansion of domestic slavery. Miller argues explicitly that the expansion of domestic slavery was the means by which the export slave trade expanded. He views the trans-Atlantic slave trade as a two-stage process in Africa requiring financing from international merchants. In the first stage, African slave traders invest their imported $CARGO_t$ in local forms of wealth, which in labor-scarce Africa often meant accumulating the obligations of people -- servants, wives, porters, workers, soldiers, political supporters and allies. In the second stage, some of these accumulated people are exported as slaves ($SLAVES_{t+1}$) to pay-off international debt.

Slave production certainly required financing. Gathering slaves and marching them to the coast took time and resources. The issue here is the enforcement mechanism in the market for credit. A variety of institutions facilitated repeat exchanges between African and Europeans, including the use of factories and forts as holding pens and warehouses, African canoe houses and other trade coalitions, secret societies, and treaties between European and African nations. Where treaties were not possible, the pawning of family members as collateral for debt was an effective collection mechanism (Toyin Falola and Paul E. Lovejoy, 1994).

These types of enforcement mechanisms are often observed in port towns along the coast, the sites of the first and last exchanges in the Africa slave trade. We know much less about enforcement mechanisms in the interior. The strong presumption is that similar enforcement mechanisms existed in the interior and evolved to help finance the expansion of slave production -- from increasing the resources available to bandits and kidnappers, to increasing the treasuries of chiefs and kings who organized military-style raids. If this is true, then increases in the real value of cargo shipped to Africa ($CARGO_t$) should increase the future production and export of slaves ($SLAVES_{t+1}$). I look for evidence of this in the annual British data. Call it a credit-slave cycle.

THE GUN-SLAVE CYCLE

What about the gun-slave cycle? Historians have documented dramatic increases in the numbers of flintlock firearms shipped to Africa in the late 17th and early 18th centuries, precisely when slave exports begin to increase.[14] Before then, the older gunpowder technology, the matchlock musket, had not proved to be very effective in tropical climates, and the Catholic Church prohibited their sale to non-Christians, although some were distributed to Kings as gifts and others were captured by Africans in skirmishes with Europeans. The sale of large numbers of guns and gunpowder to Africans began with Protestant slave traders not bound by Catholic prohibitions.[15] The Dutch were the first to sell large numbers, followed by the English as their participation in the slave trade expanded. Fearful of losing their position in the trade, the Portuguese quickly followed suit. By the 1680s the more-efficient flintlock began to replace the matchlock and firearms became a staple outbound cargo on most slave ships destined for Africa. By the 1690s the new gunpowder technology is influencing military formations and military strategies along the Lower Guinea Coast, precisely when slave exports from this region begin to skyrocket.[16]

Thus began a period of rapid growth in both firearms shipments and slave exports. The British Royal African Company had shipped only 2,615 firearms per year to Africa between 1680 and 1685. Inikori (1977) estimates that by the end of the 18th century the British were shipping 150,000 to 200,000 guns per year. The British were the most active gun traders, but other nations sold large numbers as well. Inikori (1977) estimates that for the late 18th century total shipments to Africa by all European nations were between 300,000 and 400,000 guns per year.

The aggregate correlation between firearm shipments and slave exports is not controversial. What is controversial is the claim that the two are systematically related on the supply side -- that the diffusion of the new gunpowder technology increased productivity in slaving and drove the expansion of slave exports. When one thinks of the violent process of enslaving people and marching them to the coast, one can imagine how firearms might give captors an advantage, especially in the 18th century after the more-reliable flintlock replaced the matchlock. Shock-

[14] See Curtin (1975, p. 320-25); Inikori (1977); and Richards (1980).
[15] See Kea (1971) and Northrup (2002), especially pages 90 - 98.
[16] See Kea (1971), Thornton (1998), Daaku (1970) and Law (1991).

and-awe was a tactic learned early and often from encounters with Europeans. The early Portuguese traders were quick to display the power of their weaponry. When British ships arrived on the coast of Africa to purchase slaves, they announced their arrival by firing rounds of canons (St. Clair, 2007, chapter 1).

In Europe, the strategic advantage of the gunpowder technology was its ability to pierce armor, something that was seldom worn in and around the rainforests of Africa. There the advantage was the projectile's ability to cut through the thicket and overgrowth that often served as cover for troops and escapees (Thornton, 1999). Kea (1971) describes how the flintlock revolutionized military formations and strategies along the Lower Guinea Coast. Thornton (1999) describes how the flintlock allowed marksmen to cover wider gaps in infantry formations to slow the advance of cavalry from the north.

On the other hand, a wounded captive was of little value, although no less valuable than a runaway, and firearms probably allowed slave traders to threaten captives more effectively. Firearms were also effective defensive weapons, especially behind walls (Thornton, 1999). They were used extensively to hunt for ivory and food, and to defend against predatory animals and people (White, 1971).

The centrality of firearms in the capture and transport of slaves is not a forgone conclusion. It is an empirical issue. Eltis and Jennings (1988), for example, show that while firearms shipments to Africa increased tenfold between the 1680s and the 1780s (from 20,000 to 200,000 guns per year) they did not keep pace with the overall growth of *CARGO*, declining from 8.6% of the trade in the 1680s to 7.5% of trade in the 1780s. How then can we think of guns as driving the expansion of the slave trade in the 18th century?

The *Anglo-African Trade Statistics* show the same kind of decline in the importance of gunpowder technology, this time in gunpowder shipments not firearms. The *Anglo-Africa Trade Statistics* do not record guns separately,[17] but they do contain a continuous time series of

[17] We still do not know why. Marion Johnson, the scholar who digitized the *Anglo-African Trade Statistics*, believes guns were recorded in the category "Iron and Steel."[17] Inikori (1977, p. 347) finds in the *British*

gunpowder. For our purposes gunpowder may be a better measure than guns. There were so many kinds of guns that is would prove difficult to construct a reliable annual index. Also, firearms are durable goods, so in order to convert trade flows into the stocks available for slave production one would need estimates of depreciation rates, and ideally a different depreciation rate for each type of gun. And even if the stock of guns could be estimated, their effective capacity as weaponry is still largely determined by the amount of gunpowder available to activate them.

Gunpowder, on the other hand, is a more homogeneous product and much easier to handle quantitatively. While there are different grades of gunpowder, the differences are matters of degree, and a poor grade was always shipped to Africa to match the poor quality of the firearms shipped there [see Inikori (1977), West (1991) and Richards (1980)]. Gunpowder is measured in standardized pounds or barrels, which we could never do for guns. And gunpowder does not last nearly as long as guns, especially in the humid tropics. My analysis assumes that the flow of gunpowder largely determines the productive capacity of the gunpowder technology.

Figure 5 displays the time series of British gunpowder shipments to Africa found in the *Anglo-African Trade Statistics*. As a share of British *CARGO*, gunpowder increases steadily during the first half of the 18th century, peaks at about 10 percent of imports in the 1760s and holds steady or declines thereafter. If we add available data on the value of firearms shipments between 1792 and 1805, as reported by Inikori (1977, p. 347), the share of weaponry in British *CARGO* increases by approximately ten percentage points. Adding knives and swords would increase the share further. A reasonable range for British weapons exports to Africa in the late 18th century appears to be 15-25 percent of British *CARGO*. For comparison, in the period 1758-1806, Richardson (1979, p. 312) estimates guns and gunpowder to be 25-33 percent of British cargo in the New Calabar and Windward Coast slave trades, and about 20 percent of British cargo in the Gambia and Bonny trades.

As high as these figures appear to be, the constant or declining share of gunpowder in *CARGO*

Parliamentary Papers data on the value of firearm shipment between 1796 and 1805, so the data exist for that period. Other than this, a time series on British firearms shipments to Africa does not seem to exist.

again raises an important issue. If guns were driving expansion, then one would expect the share of gunpowder in *CARGO* to increase throughout the 18th century, along with the increases in slave exports, but the share peaks around mid-century. This is the primary reason Eltis and Jennings (1988) cautioned that "[t]hose claiming a major impact from arms will have to build their arguments on some basis other than just the volume of imports (954)."[18]

I address this caution in two ways. First, note that the share of gunpowder in *CARGO* is not the appropriate measure for our purposes. It measures the importance of guns-for-slaves in exchange, not guns-for-slaves in production, and while the two are related they are not the same. The distinction is highlighted in Figure 5. A good measure for guns-for-slaves in exchange is the share of gunpowder in *CARGO*, or gunpowder per unit of *CARGO* shipped exchanged for slaves. A good measure of guns-for-slaves in production is gunpowder per *SLAVE* captured and exported from Africa. If gunpowder was used to capture slaves then a lot more of it was available per captive in the second half of the 18th century. There was a lot more of everything else around too, as Eltis and Jennings point out, but the other commodities were not used to capture slaves. This distinction between gunpowder and other cargo items allows me to use British cottons in a placebo test to see if the estimated guns-slave relationship is a supply-side relationship or a demand-side relationship. All *CARGO* items, including gunpowder and cottons, exchanged for slaves (demand-side) but only gunpowder was used to produce slaves (supply-side).

Second, rather than rely on annual levels to investigate the gun-slave cycle, I rely on changes in annual levels. This is the more-appropriate way to view gunpowder and international demand as shocks to Africa. Larger changes are larger shocks. A larger shock will intensify slave-induced conflict along the coast and extend it further inland.

[18] Eltis and Jennings (1988) also compare Africa with the United States. They estimate that in the 1820s Africans were toting £.009 worth of guns and gunpowder per person (about one gun for every 145 persons). The gun-toting, slave-paranoid, cattle-rustling, rich farmers in the United States were producing more than Africa was toting, (£.013 worth of guns of guns per person). Eltis and Jennings conclude from this comparison that Africa was not as armed as the United States. Per capita incomes in Africa and the United States, however, were wildly different and this changes the picture dramatically. Angus Madison (2001, page 264, table B - 21) estimates African per capita income in 1820 to be $418 (in 1990 dollars). Per capita income in the United States is estimated to be $1257. United States per capita income was 300% higher than Africa's but Americans carry only 44% more guns and gunpowder per person. Controlling for income, the gun is clearly more important in Africa then in the United States.

What about the circular aspect of the gun-slave cycle? The term implies a dynamic, like a vicious cycle that feeds on itself.[19] If so, then what initiated the cycle and what was the feedback loop? One finds in the literature two distinct conceptions: the gun-slave cycle and slave-gun cycle. Gun-slave cycle describes the cycle when viewed from the perspective of European merchants who dump large amounts of guns and gunpowder on Africa, causing slave exports to increase, which in turn attracts more guns. Finding a causal relationship between gunpowder imports and slave exports would be strong evidence that the cycle begins with British gun merchants. I have not found in the literature any discussion of an accelerator in Britain, except the profit motive and competition among slave traders for a piece of the trade.[20]

Slave-gun cycle describes the cycle when viewed from the perspective of Africans, being initiated by political and economic ambitions that drive them to exchange slaves for the latest military technology which is used to capture more slaves. Gemery and Hogendorn (1974) describe the accelerator in Africa as a prisoner's dilemma arms race of "raid or be raided:"

> "States playing no role in the slave trade, and therefore not receiving muskets in payment for slaves, found themselves on the losing side of an arms race. Their dilemma: without firearms defense was precarious. To get muskets, there must be something to export. The only item in great demand was slaves. Thus, it is not surprising that slave trading spread rapidly, especially in the eighteenth century when flintlock replaced the cumbersome matchlock (p. 242)."

Finding a causal relationship between slave exports and future gunpowder imports would be strong evidence that the cycle is driven by this kind of "raid or be raided" arms race in Africa.

[19] Acemoglu and Robinson (2012) chapter X has a number of examples of this, most pertaining to Africa.
[20] There may be a smoking gun here, but I have yet to find it. The fact that the data are not prominently recorded in the Anglo-African Statistics leaves open the possibility of a policy cover-up, but that is highly unlikely since no other document leave clues and 100 years is a long time for a cover-up. There is a recorded instance of the gun industry influence trade policy with Africa. During the Seven Years war they were able to secure exemptions to the prohibition on gunpowder exports during the war because it was needed to "grease" the slave trade.

IDENTIFICATION STRATEGY

I address each of these issues empirically by identifying and estimating the impact of international slave prices, gunpowder technology and credit on the supply of African slave exports. The British data allow me to estimate the following short-run supply function for the period 1699 to 1807:

$$(1)\ SLAVES_t = S(PRICE_t, GUNPOWDER_{t+1}, GUNPOWDER_t, GUNPOWDER_{t-1}, CARGO_{t-1})$$

Equation (1) is the supply function and is the structural equation we want to estimate. All data are in real terms and differenced one period [for example, X_t=X(t)-X(t-1)]. Cargo prices are fixed at 1699 levels. *SLAVES* measures changes in the number of enslaved Africans leaving Africa on British ships. *PRICE* measures changes in the average annual real price of slave on the coast of Africa. The estimated coefficient on *PRICE* is the estimated slope of the short-run slave export supply function. *GUNPOWDER* is measured in hundreds of pounds (cwt). Changes in *GUNPOWDER* are physical pounds of gunpowder exported from Britain to Africa each year.[21] We want to interpret this as a variable that shifts the supply curve and tests for the gun-slave cycle.

$PRICE_t$, in the supply equation is endogenous and must be instrument. The logical instruments are demand-side factors. The following instruments are available:

$$(1)\ PRICE_t = D(CARGO_t, WARS, MILITARY_t, CPI)$$

$CARGO_t$ measures changes in the real value of British cargo sent to Africa and exchanged for slaves.[22] It includes the value of *GUNPOWDER* and all of the other commodities traded for

[21] I translate the gunpowder value series into physical pounds of gunpowder by dividing through by the 1699 price for gunpowder. Inikori (1977) reports annual data on the quantity of gunpowder exported from Britain to Africa between 1750 and 1807. Dividing the real value of gunpowder found in the *Anglo-African Trade Statistics* data by the pounds of gunpowder reported by Inikori yields a price of .03375 pounds sterling per pound of gunpowder for every year between 1750 and 1807. I take this to be the 1699 price of gunpowder used in the British Customs Office. The Anglo-African gunpowder series is then divided by .03375 to get the quantity of gunpowder (measured in physical pounds) exported from England to Africa for the years between 1699 and 1807.

[22] See Richardson (1991) for a discussion of biases in the Anglo-African Trade Statistics. Customs records underestimate British exports to Africa. Ships took on additional goods at non-British ports and at Channel Island and the Isle of Man. And between 1713 and 1730 many ships outbound for Madeira eventually sailed to Africa.

slaves. $CARGO_t$ is a good candidate for an instrument because it is correlated with $PRICE_t$, but $SLAVES_t$ is unlikely to influence $CARGO_t$. First, the British slave trade was a one-way triangular trade from Britain-to-Africa-to-America-to-Britain. On average it took more than a year to complete this voyage, so information about the world of $SLAVES_t$ will not reach Britain in time to influence decisions about $CARGO_t$.[23] Figure 6 plots voyage times between Britain and the Americas for the voyages in our sample. The average time is almost a year. Ships then had to unload their cargoes in the Americas and return to Britain.

Second, Dickey Fuller tests show that $PRICE_t$ followed a random walk around a trend during the 18th century.[24] This is consistent with adaptive expectations in price formation ($Price_t = Price_{t-1} + t + e_t$).[25] The best predictor of this year's slave price was last year's slave price plus some contribution from a trend. Given the long-distance, risky and one-way nature of the slave trade, it is reasonable to assume that the best British merchants could do is assume that prices in Africa would fluctuate randomly around last year's prices and choose $CARGO_t$ accordingly. Voyages were approximately one year in length and were exposed to all kinds of random events, states of nature and market fluctuations along the way. Merchants making investment decisions in Britain were largely ignorant of the supply conditions they would encounter on the coast of Africa. Information technology was primitive and unreliable, and captains generally lacked the option of exchanging their goods along the way for some alternative commodity. Exacerbating all of this, the British slave trade moved in one direction, so British traders could not receive updates on downstream markets from traders moving in the opposite direction. All of these conditions forced British slave traders to rely heavily on last year's prices when deciding which commodities to include in $CARGO_t$ and how many. They probably incorporated information on the general health of the sugar industry during their stay in the Americas, and they probably carried this information back to Britain, but for slave ships gathering cargo in

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These biases are likely to be offset by the fact that the Customs Office did not record imports of gold from Africa. No official record of gold imports exists and no attempt has been made to correct this bias. British gold imports from Africa virtually stopped sometime in the early 18th century. See Gemery, Hogendorn and Johnson (1990) for a similar use of these data.

[23] Some information about conditions on the coast may have returned to British ports by the few direct return voyages that traded in African cargos other than slaves, but this was of negligible portion of the total traffic.

[24] The estimated equation is PRICE(t) = (1-ρ)*PRICE(t-1) + β*time + e(t). The estimated coefficient on *PRICE(t-1)* is -0.0678 with a t-statistic of -1.61, so we are fairly confident that ρ is close to 1. The estimated coefficient on *time* is 0.99 with a t-statistic of 1.76

[25] Wooldridge (1999), chapter 11.

Britain, the state of knowledge about supply conditions on the coast of Africa was notoriously thin. Finally, cargoes were carefully chosen to meet African preferences. Once chosen and shipped to Africa British merchants had little choice but to sell it there. It could not be carried to the Americas, and certainly not back to Britain.

The same applies to gunpowder shipments. They are exogenous to this year's supply process, and for exactly the same reason. In order for $SLAVES_t$ to influence $GUNPOWDER_t$ new information about supply conditions and consumer preferences in Africa would have to return to Britain and influence the composition of outbound $GUNPOWDER_t$ shipments, all within the observation-year t. This is unlikely. I therefore interpret $GUNPOWDER_t$ as a variable that captures guns-for-slaves in production on the supply side, but only after guns-for-slaves in exchange is controlled for on the demand side. $GUNPOWDER_{t-1}$ captures longer-term guns-for-slaves in production effects. $GUNPOWDER_{t+1}$ capture a slaves-for-guns effect, the possibility that information gathered on the coast of Africa this year might influence the outbound shipments of gunpowder next year, or slaves-for-guns. Since $GUNPOWDER_{t+1}$ cannot influence this year's export supply decisions in Africa, it is not properly an argument in the supply function. It is also endogenous. It does, however, tell us if information learned on the coast of Africa this year induced British slave merchants to ship more gunpowder to Africa in the next year.

Another instrumental variable is the state of war between Britain and other European powers. Most Africans did not even know about these wars, but they disrupted the British demand for slaves and they disrupted Atlantic trade generally. To capture the shocks of European wars, I construct a dummy variable that takes the value 1 when Britain is at war; 0 otherwise. The wars are Queen Anne's War (1701-1714), the War of Austrian Succession (1740-1748), the Seven Years War (1756-63), the American Revolution (1775-82) and the Napoleonic Wars (1792-1815). The variable $WARS_t$ captures changes in the state of war from year-to-year. It takes the value 1 in the year Britain enters a war. The value is -1 the year Britain ends a war. Contiguous years of war or peace take the value 0.

Sometimes wars began early in the year, sometimes late. Sometimes wars geared up or ended

quickly, sometimes slowly. Additional information on the intensity of war and the degree to which it disrupted trade is gotten from annual data on British military expenditures. I construct two variables from Mitchell's *British Historical Statistics* (1988, pages 578-580). The first is changes in total British military expenditures from year-to-year. The second is changes in total British military expenditures over a two-year period.

CPI_t is a control variable that measures changes in the consumer price index in the city of London.[26] It is included to pick up general changes in the supply price of cargo. $CARGO_t$ and $PRICE_t$ are measured in real terms -- an index of the total or per slave quantity of items shipped to Africa, weighted by their 1699 prices. Declining nominal prices in London might signal a cheapening of cargo costs, which might produce exogenous increase in the number of *CARGO* items shipped to Africa. Increases in prices would tend to reduce the number of items shipped.

RESULTS FOR THE 18TH CENTURY

Sample means are reported in Table 1. I begin with the simple OLS regression of $SLAVES_t$ on $PRICE_t$ reported in the first column of Table 2. The estimated coefficient on price is positive and statistically significant. $PRICE_t = CARGO_t/SLAVES_t$, so the algebraic relationship between $SLAVES_t$ and $PRICE_t$ is negative, yet the OLS regression of $SLAVES_t$ on $PRICE_t$ produces a positive coefficient on $PRICE_t$. This indicates that the supply response time in Africa was less than a year. When increases in cargo increased prices additional slaves were exported within the year.

$PRICE_t$ in column 1 is endogenous, the result of interaction between supply and demand. In column 2, I instrument price using Equation 2. The first-stage price equation is reported in the column labeled (2) in Appendix Table A1. Price is influenced by cargo and military expenditures, as expected. Cargo includes gunpowder, so the effect of guns-for-slaves in exchange is accounted for in the price equation. Shea's partial R-squared and the F-statistic indicate that these are not weak instruments. The corresponding supply equation is reported in column (2) of Table 2. The coefficient on price increases from 716 to 2,380 and is significant at the 99% confidence level.

[26] Brown and Hopkins (1984).

Columns 3-7 of Table 2 report results for models with 2-period lags, pre-whitening and Newey-West standard errors. In all of these equations, the Wooldridge score implies that the instrumental variables satisfy the exclusion condition. Column 4 adds gunpowder to the supply equation as a shift factor. The estimated coefficient on gunpowder is positive and significant at the 90% confidence level. 100 additional pounds of gunpowder increased slave exports by 1.179 slaves. Adding gunpowder as a shift factor reduces the estimated price elasticity of supply by a third, as one would expect, but the coefficient on price remains significant at the 95% confidence level and remain stable throughout the remainder of the analysis.

In column 5 I add lagged gunpowder to the model as a test for guns-for-slaves over a longer-term. Column 6 adds forwarded gunpowder, a test for slaves-for-guns. Neither is significant for the century taken as a whole, but changes when we look at sub-periods. Model 7 adds to the first-stage price equation a control variable measuring the percent of gunpowder in cargo. This is added to capture any additional purchasing power of gunpowder on the coast of Africa that might be correlated with slave exporting, like a preference for guns among African slave traders that drives up the exchange rate between guns and slaves.[27] The results do not change. The estimated coefficient on price remains stable at approximately 1,500 additional slaves per pound sterling increase in slave prices. At mean values for price and quantity over the century this implies an average short-run price elasticity of about 0.65. If gunpowder was not added to the supply equation, the implied short-run price elasticity of supply would be 1/3 higher, or close to the long-run elasticity of 1.0 that many others estimate.

[27] An observed preference for guns among African slave traders is often taken as indirect evidence of a productivity advantage in slaving. Inikori (1977): "These imports (guns) were due very largely to the strong preference for firearms by slave sellers and gatherers. The preference of ivory sellers for guns came a distant second to that of slave sellers. Sellers of other commodities, particularly foodstuffs, do not seem to have had any stronger demand for firearms (p. 361). Studies by Johnson (1966) and Richardson (1979) find similar preferences for firearms among slave traders.

THE GUN-SLAVE CYCLE

Figure 3 revealed general structural changes in the British slave trade sometime around mid-century, so Tables 3 report regressions for the first half of the 18th century (1699-1755).[28] Table 4 reports regression on the second half of the century. Column (1) of Table 3 replicates column (7) in Table 2, but for the first half of the century only. The estimated coefficients on $PRICE_t$ and $GUNPOWDER_t$ are still statistically significant, with a slightly smaller coefficient on $PRICE_t$ and a much larger coefficient on $GUNPOWDER_t$. The more-important change is the coefficient on $GUNPOWDER_{t+1}$. It is now positive, very large and statistically significant at the 99 percent confidence level.

$GUNPOWDER_{t+1}$ is endogenous to $SLAVES_t$ and is not properly an argument in the supply equation, so model (2) removes it. The implied short-run price elasticity is 0.412. The coefficients on *GUNPOWDER* implies that in the first half of the 18th century, 100 pounds of gunpowder produced approximately three additional slave exports, and each additional slave exported attracted 2.7 additional pounds of gunpowder the next year.

Column (3) adds $CARGO_{t-1}$ to test for a credit-slave relationship on the supply side. There is no evidence of this in the first half of the century. Column (3) also adds $CARGO_{t+1}$ to see if the coefficient on $GUNPOWDER_{t+1}$ is picking up a forward effect on $CARGO_{t+1}$. The coefficient on $CARGO_{t+1}$ is not significant and the coefficient on $GUNPOWDER_{t+1}$ is still large and significant. Increases in slave exports influenced future gunpowder shipments, but not future cargo shipments generally. The information from Africa was clear: "there is an excess demand for gunpowder in Africa."[29]

One last specification test is reported in column (4). There I add to the supply equation the annual shipments of British cotton as a placebo. If I have identified and estimated a supply function then British cotton exports to Africa should not affect $SLAVES_t$. Both British cottons

[28] First-stage results are reported in Appendix Table A.2. *WARS, MILITARY, CPI, %GUNPOWDER,* $GUNPOWDER_t$ and $GUNPOWDER_{t+1}$ are all significant. Shea's partial R-squared and the F-stat show that these are not weak instruments.

[29] See the many quotes in Inikori (1977) and Richards (1980).

and gunpowder exchange for slaves, but only gunpowder produces slaves. Column (4) shows that the model passes this placebo test.

This is convincing evidence of a gun-slave cycle in the first half of the 18th century. Increases in gunpowder shipments to Africa produced additional slaves that attracted more gunpowder in the future. It also corroborates the general market trends revealed in Figure 3 -- that supply shifts dominated demand shifts in the first half of the 18th century. It also corroborates the idea that the interaction between the demand and technology shocks locked Africa into an arms race that produced large numbers of slaves.[30] The following quote, from the Dutch Director General at Elmina Castle in 1730, describes clearly what was happening:

> "The great quantity of guns and gunpowder which the Europeans have brought have caused terrible wars between the Kings and Princes and Caboceers of these lands, who made their prisoners of war slaves; these slaves were immediately brought up by Europeans at steadily increasing prices, which in its turn, animates again and again these people to renew their hostilities, and their hope of big and easy profits makes them forget all labor, using all sorts of pretexts to attack each other or revive old disputes (quoted in Richards, 1980, 46)."

It was not like this along the Gold Coast before British slavers arrived.[31]

Table 4 reports results for the second half of the 18th century. The structure of the trade has clearly changed. There is no longer much evidence of a supply response to price changes. There is evidence of guns-for-slaves, but it does not survive the placebo test in column (4). Apparently the supply process has become more complicated than our model or data can detect, but we do know that the structure of the trade in the second half of the century was different from that of the first.

[30] The horse was introduced in the Senegambia region much earlier and could have had similar destabilizing effects. See Boubacar (1998) and Law (1980).
[31] Kea (1971) and Wilks (1993).

CONCLUSION

This paper has presented a preponderance of evidence that a vicious gun-slave cycle drove the expansion of the British slave trade in Africa in the first half of the 18th century, and that this process gave way to something else as the slave trade matured. I want to conclude with some observations on the second half of the century and what might explain this change.

First I consider the British side. In 1750 the Royal African Company was reorganized again. The Company of Traders to Africa was formed on April 12, 1750 to maintain the forts, but it could not legally trade in slaves.[32] By 1752 the Company of Traders had secured complete control from the Royal African Company. Private traders paid 40 shillings to use the forts. Annual parliamentary grants of 10-20,000 pounds sterling were given to the Company each year

> "For the purchase of goods and stores which… are to be sent and exported to Africa, they are to be sold, disposed of and applied for the sole use, preservation and improvement of the forts and settlements there, and for the payment of salaries and wages to the officers and other persons employed for keeping and preserving the said forts and settlements and not otherwise (31, Act Clause 5, quoted in Martin, 1970, p. 29)"

The annual grants were disbursed as annual shipments of cargo to Cape Coast Castle, British headquarters in Africa, and distributed from there to the other British establishment on the Guinea Coast. The parliamentary committee charged with oversight encouraged trading by officers, including trading for slaves as a supplement to wages, but they discouraged competition with free traders. Company employees could trade with locals for slaves, stockpile them in the forts and sell them to free traders, but they could not engage in exporting activities directly. There is no way of knowing how wide-spread this practice was. If the turnover was reasonable (say a few weeks) then the annual grants were large enough to gather much of the British slave trade. However, Martin (1970) thinks this practice pre-dated the company re-

[32] The following discussion relied heavily on Martin (1970).

organization, so it may not explain the structural change. Also, there is no discernible decline in ship-time on the coast of Africa in the second half of the century.

Jenny West (1991) documents how British slave traders were successful at petitioning Parliament for exceptions to the prohibition against private gunpowder exports during the Seven-Years War, but this exception does not appear to apply to the American Revolutionary War or the Napoleonic Wars. Gunpowder and cargo shipments to Africa declined sharply during these wars.

Neither of these Britain-specific developments appears to explain the change in the African supply structure.[33] On the African-side there are several viable hypotheses. First, British activities in the early 18th century were concentrated in the Gold Coast and in the Bight of Benin. These are regions and period that witnessed the rise of the famous forest kingdoms of Asante and Dahomey. They are also places where the new gunpowder technology was particularly effective, given its capacity to cut through forest thicket and overgrowth, and defend against cavalry charges from the north. The Transatlantic Slave Trade Database shows explosive growth in the number of slaves exported from these regions in the first half of the 18th century.

In the second half of the century, slave exports from these regions stabilize at a plateau and do not increase further, yet the overall British trade continues to grow along with the total trade volumes shown in Figure 1. By the second half of the century Asante and Dahomey we the clear winners of the arms race, and each had reached new diplomatic relationships with their surrounding adversaries, relations that regularized a flow of slaves to the coast. Asante brought northern kingdoms into tributary status, where the tribute was an annual delivery of slaves to the capital city of Kumase.[34] In 1748 Dahomey, after years of fighting off annual cavalry charges from the northern empire of Oyo, finally agreed to become a pass-through state for slaves captured by Oyo further to the north (Law, 1991).

[33] What they do show is that at mid-century slave interests in Britain still had enough political clout to influence policy, and that the abolition movement takes off precisely when the demand for slaves becomes the driving force behind the British slave trade.
[34] See Wilks (1975) and Daaku (1970).

British growth in the second half of the century did not come from these areas, but instead from expansions into new areas like the Bight of Biafra, Sierra Leone and the Windward Coast. The regressions for the second half of the century may not pick up a stable supply-side structure because it varied by region, whereas in the first half of the century British activities faced similar challenges in all its regions – opening up sources of supply. An arms race would accomplish this, but eventually there would be winners and losers, with a new regional balance of power that could maintain export levels, and even have some monopsony control over supply, but probably not grow supply as easily.

Another possibility is depopulation of the country-side following the run-up of slave exports for generations. Whatley and Gillezeau (2011) calculates that a person living along the west coast of Africa in the 18th century had a 10-20% chance of becoming a victim of the slave trade at some point in his life. If population is not being replenished at this rate then the potential effect of depletion on $SLAVES_t$ is dumped in the error term.[35] This might explain why $PRICE_t$ does not have a significant affect $SLAVES_t$ in the second half of the century. Population depletion could be shifting the supply curve inward, driving up price in an effort to sustain the current volume of exports.

These are plausible scenarios, but beyond the scope of this paper. Regional estimates of British cargo shipments to Africa do not exist for the 18th century, and population estimates for pre-colonial Africa are notoriously scarce. All we can say at this point is that a gun-slave cycle drove expansion in the first half of the century, and that the structure of aggregate supply to the British changed in the second half of the 18th century, most-likely due to developments in Africa.

[35] See Manning (1990) ch. 4 for estimates of de-population due to the slave trades.

Figure 1
Transatlantic Slave Trade by National Carrier

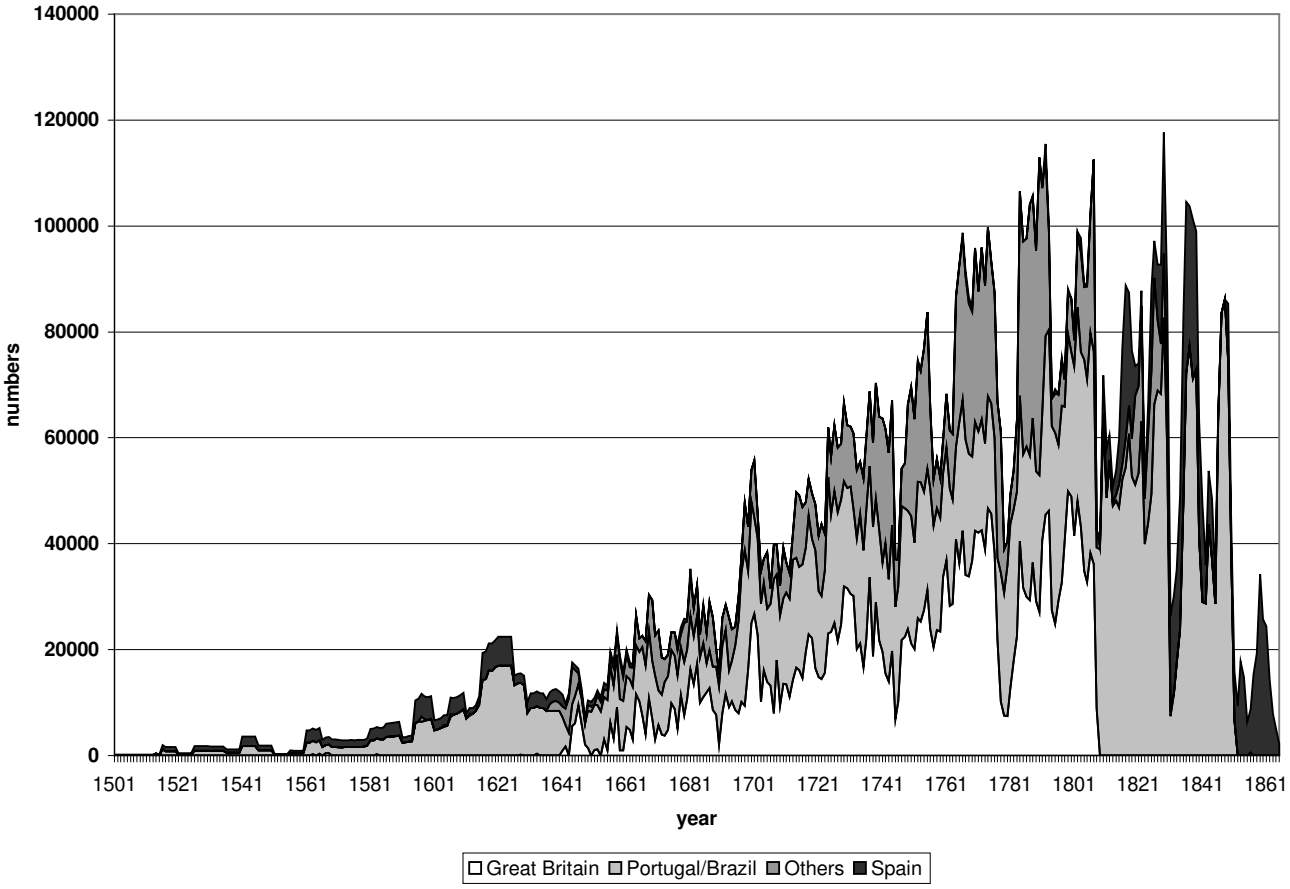
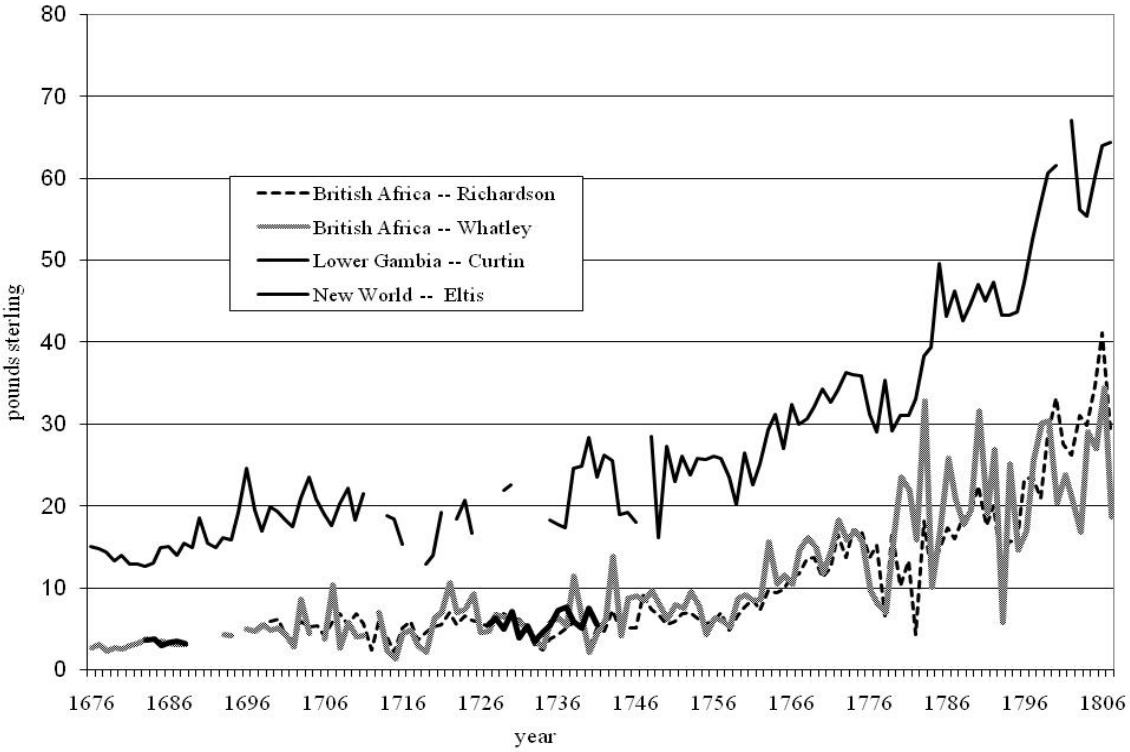


Figure 2

Slave Prices, 1676-1807



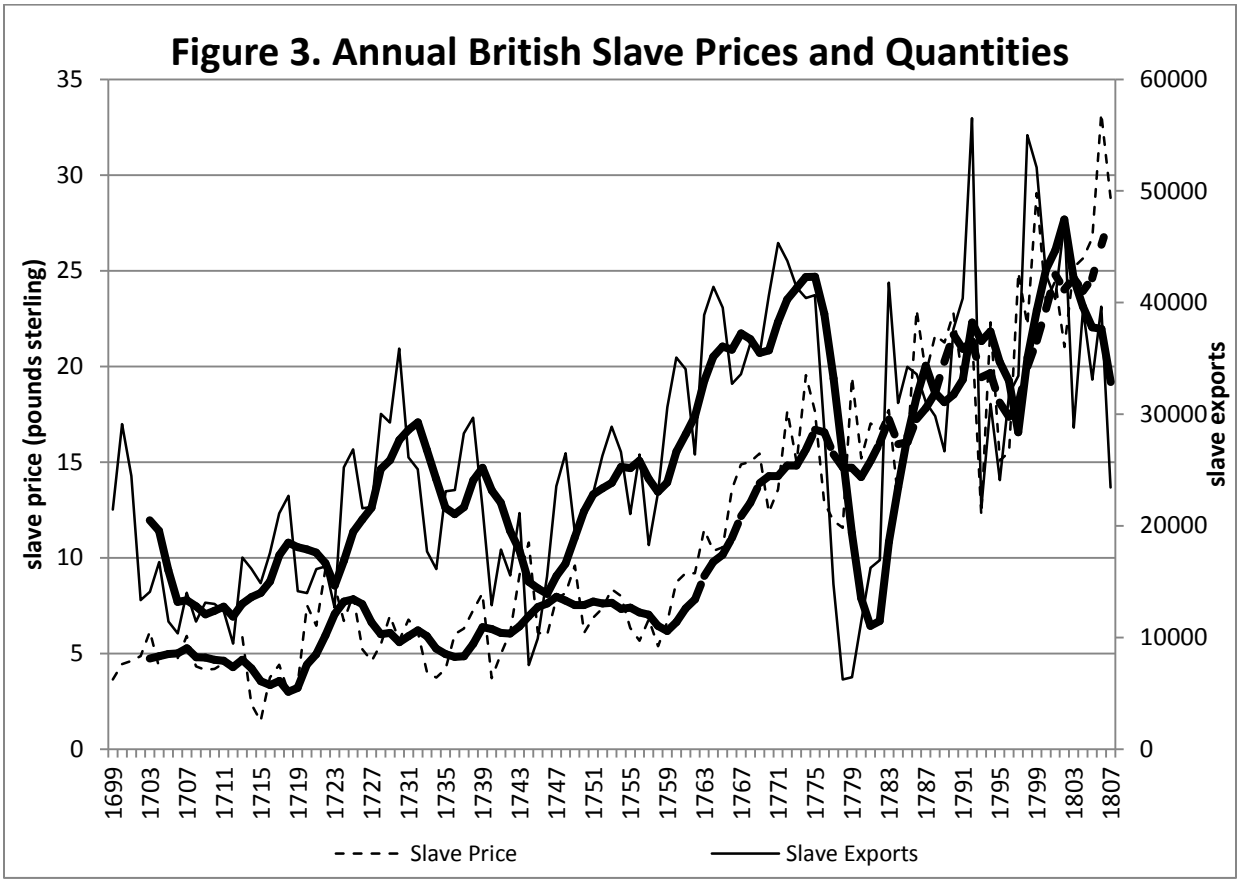


Figure 3. Annual British Slave Prices and Quantities
slave price (pounds sterling)
slave exports
0
5
10
15
20
25
30
35
0
10000
20000
30000
40000
50000
60000
1699
1703
1707
1711
1715
1719
1723
1727
1731
1735
1739
1743
1747
1751
1755
1759
1763
1767
1771
1775
1779
1783
1787
1791
1795
1799
1803
1807
Slave Price
Slave Exports

Figure 4

Politics vs. Economics

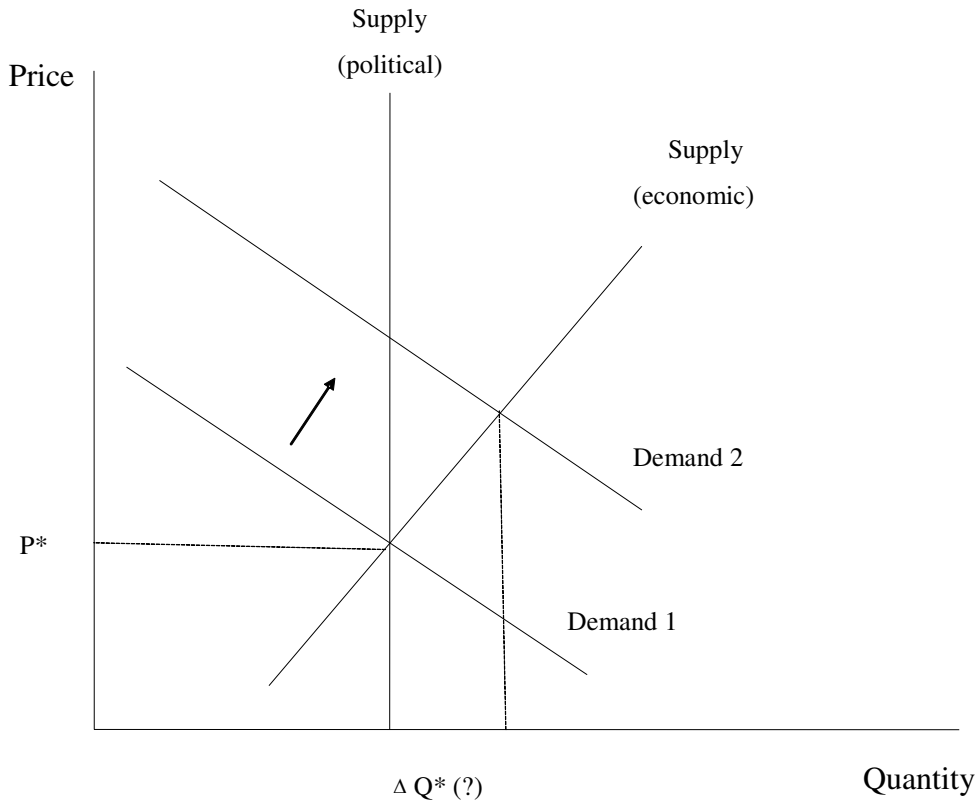
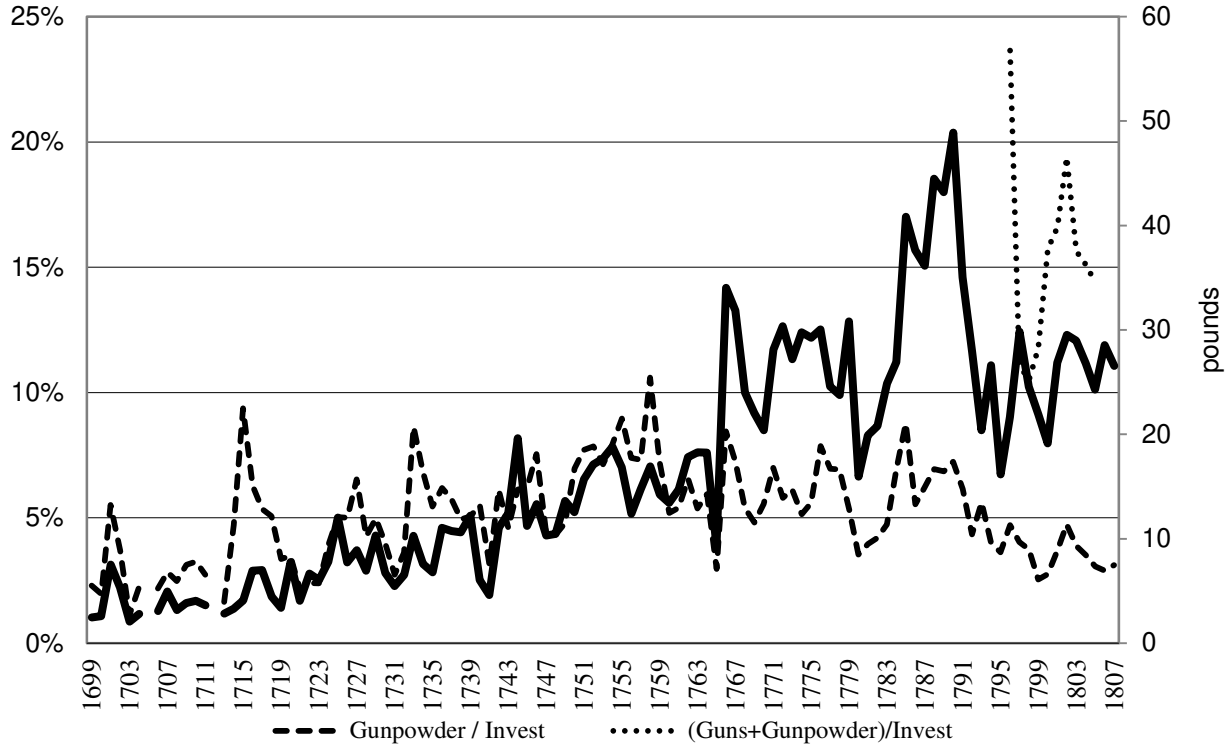


Figure 5. Guns-for-Slaves in Exchange and Production



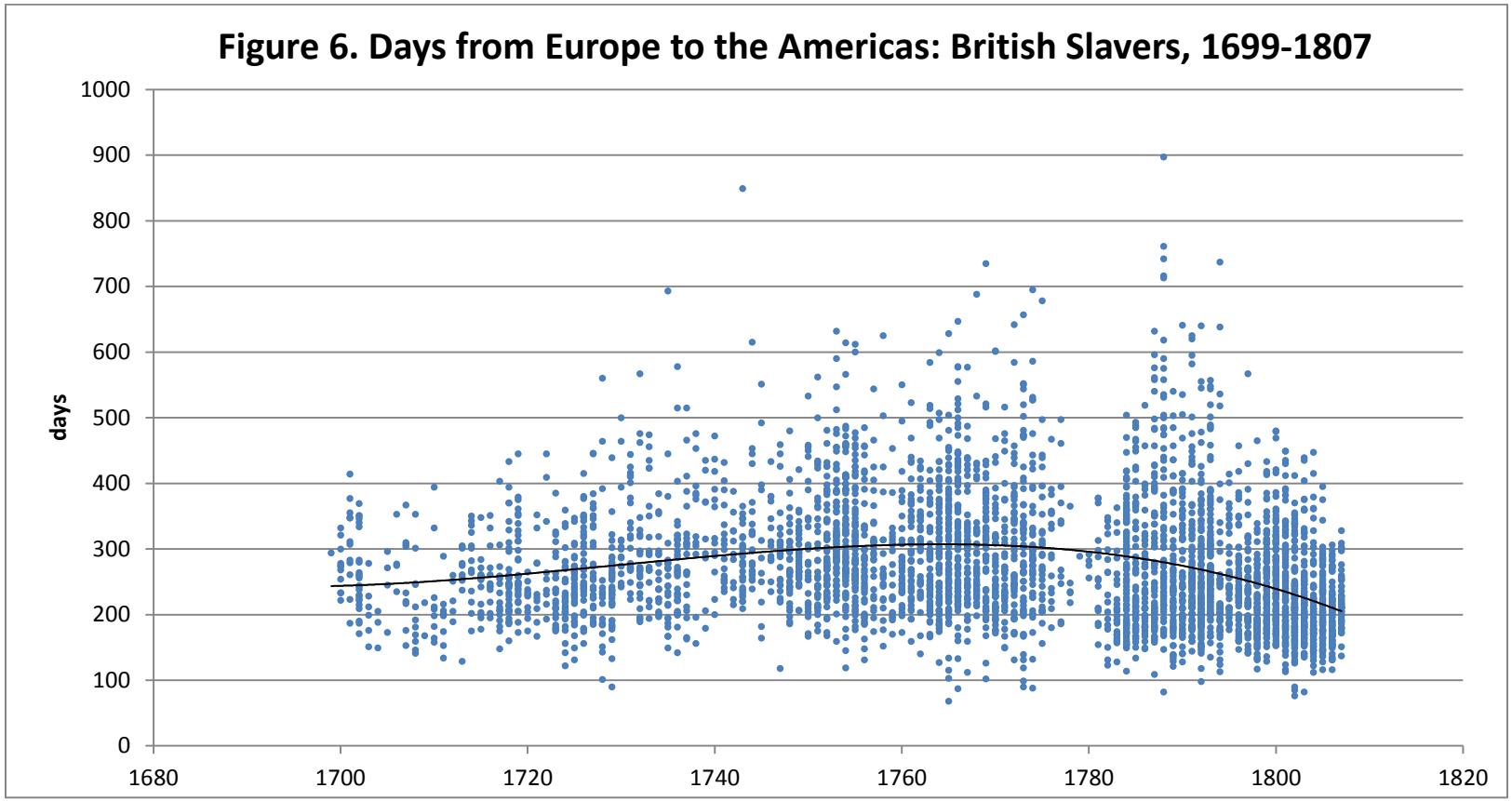


Figure 6. Days from Europe to the Americas: British Slavers, 1699-1807
days
1000
900
800
700
600
500
400
300
200
100
0
1680
1700
1720
1740
1760
1780
1800
1820

Table 1. Sample Means

	1699-1807			1699-1755			1755-1807		
Variables	N	Mean	SD	N	Mean	SD	N	Mean	SD
Average annual price of slaves	107	11.32	7.34	55	5.86	1.94	52	17.09	6.46
Annual slave exports	109	25937	11128	57	19583	6430	52	32903	11057
£100 of Trade Cargo	108	3456.45	3306.41	55	1190.8	583.59	53	5807.6	3328.39
cwt. of Gunpowder	107	5044.93	4544.02	55	1730.51	1212.96	52	8550.59	4120.71
London CPI	110	0.9832	0.33	57	0.7814	0.0889	53	1.2001	0.3567

Table 2. The Gun-Slave Cycle in the British Slave Trade, 1699-1807

	Dependent Variable = Annual Slave Exports(t)						
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Price of Slaves (£)	716.7***	2,380***	2,380***	1,532**	1,484**	1,491**	1,536**
	(243.4)	(398.5)	(516.1)	(697.8)	(731.4)	(748.1)	(738.1)
cwt. Gunpowder (t)				1.179*	1.350**	1.348**	1.323**
				(0.713)	(0.677)	(0.679)	(0.674)
cwt. Gunpowder (t-1)					0.457	0.463	0.466
					(0.325)	(0.336)	(0.342)
cwt. Gunpowder (t+1)						0.00395	0.0116
						(0.369)	(0.373)
Constant	-126.5	-311.6	-311.6	-242.3	-379.0	-438.5	-449.9
	(751.7)	(905.9)	(691.3)	(555.6)	(545.9)	(577.0)	(581.1)
Observations	104	95	95	95	93	91	91
R-squared	0.078	.001	.001	0.122	0.161	0.164	0.147
Durbin-Watson(2)	2.45						
Wald chi2		35.66	21.27	48.80	51.59	53.74	55.03
(p-value)		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Sargan score, chi2(2)		10.71					
(p-value)		(0.030)					
Wooldridge chi2 score (1 lag)			2.84	3.46	3.61	4.17	3.97
(p-value)			(0.584)	(0.484)	(0.462)	(0.384)	(0.553)

The first equation is estimated OLS. The remaining equations are estimated 2SLS. The first-stage price equations are reported in the Appendix. Columns 3-7 reports Newey-West standard errors with two-period lags and pre-whitening. Standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Sargan and Wooldridge scores are test of the over-identification restriction. A statistically significant p-value indicates that the instruments may not be valid.

Table 3. The British Slave Trade in Africa, 1699-1755

	Dependent Variable = Annual Slave Exports(t)			
VARIABLES	(1)	(2)	(3)	(4)
Price of Slaves (£)	1,077**	1,377**	1,048**	845.0**
	(454.1)	(674.0)	(418.4)	(409.6)
cwt. Gunpowder (t)	3.110***	2.913**	3.316***	3.931***
	(1.038)	(1.275)	(0.945)	(0.896)
cwt. Gunpowder (t-1)	0.273	-0.949	2.128	2.296
	(1.037)	(1.254)	(1.515)	(1.436)
cwt. Gunpowder (t+1)	2.717***		2.763*	3.202**
	(0.873)		(1.512)	(1.519)
£100 of Trade Cargo (t-1)			-3.700	-3.482
			(2.430)	(2.478)
£100 of Trade Cargo (t+1)			-0.972	-1.213
			(1.961)	(2.016)
£100 of British Cottons (t+1)				-8.355
				(7.120)
£100 of British Cottons (t)				-4.864
				(6.635)
£100 of British Cottons (t-1)				-7.920
				(8.914)
Constant	-593.5	-314.3	-694.0	-622.0
	(519.9)	(602.4)	(517.5)	(519.0)
Observations	47	49	47	47
R-squared	0.251	0.033	0.306	0.371
Wald chi2	46.93	45.23	51.28	90.39
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)
Woolridge chi2 score (1 lag)	8.72	6.57	10.88	11.57
(p-value)	(0.121)	(0.255)	(0.054)	(0.072)

Equations are estimated 2SLS. The first-stage price equations are reported in the Appendix. Columns 1-4 reports Newey-West standard errors with two-period lags and pre-whitening. Standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Wooldridge scores are test of the over-identification restriction. A statistically significant p-value indicates that the instruments may not be valid. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 4. The British Slave Trade in Africa, 1756-1807

Dependent Variable = Annual Slave Exports(t)				
VARIABLES	(1)	(2)	(3)	(4)
Price of Slaves (£)	1,068	1,192	1,206	587.1
	(736.6)	(749.8)	(838.9)	(476.4)
cwt. Gunpowder (t)	1.462**	1.457**	1.493**	0.792
	(0.688)	(0.680)	(0.748)	(0.543)
cwt. Gunpowder (t-1)	0.502	0.466	0.0348	-0.316
	(0.313)	(0.308)	(0.513)	(0.486)
cwt. Gunpowder (t+1)	-0.263		-0.285	-0.0178
	(0.328)		(0.576)	(0.337)
£100 of Trade Cargo (t-1)			0.916	1.023
			(0.768)	(0.808)
£100 of Trade Cargo (t+1)			0.0445	-1.024
			(0.909)	(0.824)
£100 of British Cottons (t+1)				6.072***
				(1.346)
£100 of British Cottons (t)				6.632***
				(1.705)
£100 of British Cottons (t-1)				-1.298
				(2.331)
Constant	-175.0	-260.5	-377.2	-339.0
	(945.1)	(900.7)	(970.6)	(745.1)
Observations	44	44	44	44
R-squared	0.386	0.342	0.362	0.636
Wald chi2	45.32	38.10	40.89	238.46
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)
Woolridge chi2 score (1 lag)	6.33	6.00	6.66	9.14
(p-value)	(0.275)	(0.306)	(0.252)	(0.166)

Equations are estimated 2SLS. The first-stage price equations are reported in the Appendix. Columns 1-4 reports Newey-West standard errors with two-period lags and pre-whitening. Standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Wooldridge scores are test of the over-identification restriction. A statistically significant p-value indicates that the instruments may not be valid. Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Appendix Table A.1. First Stage Estimates of Coastal Slave Prices in the British Slave Trade, 1699-1807

	Dependent Variable = £ Average Annual Coastal Slave Price (t)					
VARIABLES	(2)	(3)	(4)	(5)	(6)	(7)
cwt. Gunpowder (t)			-9.73e-05	-0.000157	-0.000163	-5.56e-05
			(0.000180)	(0.000192)	(0.000202)	(0.000247)
cwt. Gunpowder (t-1)				-0.000155	-0.000170	-0.000167
				(0.000105)	(0.000119)	(0.000118)
cwt. Gunpowder (t+1)					6.58e-05	5.30e-05
					(0.000111)	(0.000112)
£100 of Trade Cargo (t)	0.00134***	0.00134***	0.00144***	0.00145***	0.00149***	0.00132***
	(0.000133)	(0.000152)	(0.000271)	(0.000289)	(0.000288)	(0.000376)
Wars	-0.256	-0.256	-0.271	-0.391	-0.378	-0.449
	(0.754)	(0.677)	(0.676)	(0.656)	(0.642)	(0.649)
CPI	-3.539	-3.539	-3.676	-3.419	-3.536	-3.414
	(3.352)	(3.921)	(3.799)	(3.900)	(4.048)	(4.123)
Percent Gunpowder						-0.157
						(0.127)
£100 OF British Military	0.0588***	0.0588**	0.0576**	0.0595**	0.0615***	0.0608***
Expenditures (t)	(0.0187)	(0.0238)	(0.0235)	(0.0228)	(0.0223)	(0.0224)
£100 OF British Military	-0.0283**	-0.0283*	-0.0283*	-0.0317**	-0.0331**	-0.0329**
Expenditures (s2)	(0.0108)	(0.0146)	(0.0147)	(0.0141)	(0.0146)	(0.0144)
Constant	0.0769	0.0769	0.0810	0.160	0.160	0.172
	(0.220)	(0.156)	(0.157)	(0.161)	(0.163)	(0.160)
Observations	95	95	95	93	91	91
Shea's partial R-squared	0.565	0.565	0.424	0.438	0.430	0.436
F-stat (HAC, 2 lags)	23.08	30.35	13.29	9.94	10.75	9.38
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

Columns 3-7 reports Newey-West standard errors with two-period lags and pre-whitening. Standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Appendix Table A2. First Stage Estimates of Coastal Slave Prices, British Slave Trade, 1699-1755

	Dependent Variable = £ Average Annual Coastal Slave Price (t)			
VARIABLES	(1)	(2)	(3)	(4)
cwt. Gunpowder (t)	0.00164**	0.00118	0.00143**	0.00136**
	(0.000705)	(0.000723)	(0.000570)	(0.000533)
cwt. Gunpowder (t-1)	-0.000142	0.000189	-0.000835**	-0.000959**
	(0.000350)	(0.000361)	(0.000320)	(0.000369)
cwt. Gunpowder (t+1)	-0.000767***		-0.000537	-0.000701
	(0.000213)		(0.000516)	(0.000508)
£100 of Trade Cargo (t-1)			0.00145*	0.00154*
			(0.000774)	(0.000802)
£100 of Trade Cargo (t+1)			-6.39e-05	-1.51e-05
			(0.000544)	(0.000536)
£100 of British Cottons (t+1)				0.00105
				(0.00208)
£100 of British Cottons (t)				0.00256
				(0.00257)
£100 of British Cottons (t-1)				-0.000629
				(0.00243)
£100 of Trade Cargo (t)	-0.000374	0.000307	-0.000186	-0.000205
	(0.00139)	(0.00142)	(0.00115)	(0.00109)
Wars	-1.826***	-1.226*	-2.199***	-2.299***
	(0.549)	(0.617)	(0.576)	(0.556)
CPI in London	-6.225**	-6.611**	-5.381**	-4.728*
	(2.496)	(2.608)	(2.268)	(2.556)
Percent Gunpowder (t)	-0.452***	-0.329*	-0.450***	-0.440***
	(0.163)	(0.193)	(0.153)	(0.134)
Percent British Cottons (t)				0.0275
				(0.0671)
£100 of British Military	0.0170	0.00874	0.0535	0.0587
Expenditures (t)	(0.0237)	(0.0237)	(0.0370)	(0.0364)
£100 of British Military	0.0272**	0.0259*	0.00718	0.00942
Expenditures (s2)	(0.0132)	(0.0148)	(0.0157)	(0.0201)
Constant	0.0408	0.00591	0.0781	0.0906
	(0.183)	(0.188)	(0.166)	(0.178)
Observations	47	49	47	47
Shea's Partial R-squared	0.480	0.392	0.529	0.532
F-stat (HAC, 2 lags)	29.14	10.03	30.77	25.79
(p-value)	(0.000)	(0.000)	(0.000)	(0.000)

Columns 3-7 reports Newey-West standard errors with two-period lags and pre-whitening. Standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

Appendix Table A3. First Stage Estimates of Coastal Slave Prices, British Slave Trade, 1756-1807

Dependent Variable = £ Average Annual Coastal Slave Price (t)				
VARIABLES	(1)	(2)	(3)	(4)
cwt. Gunpowder (t)	-0.000225	-0.000167	-0.000283	-0.000398
	(0.000313)	(0.000303)	(0.000338)	(0.000268)
cwt. Gunpowder (t-1)	-0.000218*	-0.000185*	9.22e-05	0.000159
	(0.000126)	(0.000106)	(0.000126)	(0.000165)
cwt. Gunpowder (t+1)	0.000130		0.000175	0.000106
	(0.000142)		(0.000195)	(0.000155)
£100 of Trade Cargo (t-1)			-0.000533***	-0.000570**
			(0.000171)	(0.000267)
£100 of Trade Cargo (t+1)			-0.000121	0.000542*
			(0.000272)	(0.000264)
£100 of British Cottons (t+1)				-0.00250***
				(0.000659)
£100 of British Cottons (t)				-0.000445
				(0.00191)
£100 of British Cottons (t-1)				0.000545
				(0.000988)
£100 of Trade Cargo (t)	0.00164***	0.00148***	0.00160***	0.00192***
	(0.000520)	(0.000511)	(0.000578)	(0.000646)
Wars	0.613	0.481	0.720	1.351*
	(1.069)	(1.149)	(0.996)	(0.792)
CPI in London	1.376	0.717	-0.808	0.0454
	(7.410)	(7.191)	(7.550)	(7.321)
Percent Gunpowder (t)	0.101	0.0338	0.282	0.643
	(0.413)	(0.399)	(0.502)	(0.472)
Percent British Cottons (t)				-0.0998
				(0.104)
£100 of British Military	0.0747**	0.0722**	0.0654**	0.0519**
Expenditures (t)	(0.0298)	(0.0300)	(0.0267)	(0.0242)
£100 of British Military	-0.0449**	-0.0422**	-0.0378**	-0.0338**
Expenditures (s-2)	(0.0184)	(0.0172)	(0.0154)	(0.0131)
Constant	0.196	0.222	0.314	0.283
	(0.352)	(0.339)	(0.357)	(0.292)
Observations	44	44	44	44
Shea's Partial R-squared	0.572	0.519	0.408	0.504
F-stat (HAC, 2 lags)	6.33	6.21	4.08	11.05
	(0.000)	(0.000)	(0.004)	(0.000)

Columns 3-7 reports Newey-West standard errors with two-period lags and pre-whitening. Standard errors are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1.

REFERENCES

Acemoglu, Daron and James Robinson. 2012. *Why Nations Fail: The Origins of Power, Prosperity and Poverty*. New York: Crown Business.

Barry, Boubacar. 1998. *Senegambia and the Atlantic Slave Trade*. Cambridge: Cambridge University Press.

Carlos, Ann M. and Jamie Brown Kruse. 1996. "The Decline of the Royal African Company: Fringe Firms and the Role of the Charter." *The Economic History Review*, 49(2), 291-313.

Clarkson, Thomas. 1786. *An Essay on the Slavery and Commerce of the Human Species*. London: J.Phillips.

Clarkson, Thomas. 1839. *The History of the Rise, Progress, and Accomplishment of the Abolition of the Slave Trade by British Parliament*. Project Gutenberg e-book #10633s.

Curtin, Philip. 1975. *Economic Change in Precolonial Africa : Senegambia in the Era of the Slave Trade*. Madison: University of Wisconsin Press.

Curtin, Philip D. 1975. "Economic Change in Precolonial Africa : Supplementary Evidence," Madison: University of Wisconsin Press, xi, 150 p.

Daaku, Kwame Yeboa. 1970. *Trade and Politics on the Gold Coast, 1600-1720: A Study of the African Reaction to European Trade*. London,: Clarendon.

Dalton, John T. and Tin Cheuk Leung. 2011. "Why Is Polygyny More Prevalent in Western Africa: An African Slave Trade Perspective," *MPRA No. 32598.*

Davidson, Basil 1961. *Black Mother*. Boston.

Davies, K. G. 1975. *The Royal African Company*. New York: Octagon Books.

Diouf, Sylviane A. 2003. *Fighting the Slave Trade: West African Strategies. Athens*. Athens: Ohio University Press

Dupuis, Joseph. 1824. *Journal of a Residence in Ashantee*. London.

Eltis, David. 1987. *Economic Growth and the Ending of the Transatlantic Slave Trade*. New York: Oxford University Press.

Eltis, David. 2000. *The Rise of African Slavery in the Americas*. New York: Cambridge University Press.

Eltis, David ; Stephen D. Behrendt; David Richardson and Herbert S. Klein. 1999. *The Trans-Atlantic Slave Trade: A Database on Cd-Rom*. London: Cambridge University Press.

Eltis, David and Lawrence C. Jennings. 1988. "Trade between West Africa and the Atlantic World in the Pre-Colonial Era." *American Historical Review*, 9(4), 936-59.

Eltis, David and David Richardson. 2004. "Prices of African Slaves Newly Arrived in the Americas, 1673-1865: New Evidence on Long-Run Trends and Regional Differentials," D. Eltis, F. D. Lewis and K. L. Sockoloff, *Slavery in the Development of the Americas.* Cambridge: Cambridge University Press, 181- 218.

Engerman, Stanley L.; Eugene D. Genovese and Alan H. Adamson. 1975. *Race and Slavery in the Western Hemisphere; Quantitative Studies*. Princeton,: Princeton University Press.

Equiano, Olaudah, and Robert J. Allison. 1995. *The Interesting Narrative of the Life of Olaudah Equiano*.

Falconbridge, Alexander. 1788. *Account of the Slave Trade on the Coast of Africa*. London: J. Phillips, George Yard, Lombard Street.

Falola, Toyin and Paul E. Lovejoy. 1994. *Pawnship in Africa : Debt Bondage in Historical Perspective*. Boulder: Westview Press.
Gemery, Henry and Jan Hogendorn. 1974. "The Atlantic Slave Trade: A Tentative Economic Model." *Journal of African History*, 15(To), 223- 46.
Gemery, Henry and Jan Hogendorn. 1977. "Elasticity of Slave Labor Supply and the Development of Slave Economies in the Caribbean: The Seventeenth Century Experience," V. R. a. T. Tuden, *Comparative Perspectives on Slavery in New World Plantation Societies.* New York:
Gemery, Henry and Jan Hogendorn. 1990. "Evidence on English/African Terms of Trade and 18th Century." *Explorations in Economic History*, 27, 157- 77.
Grubb, Farley and Tony Stitt. 1994. "The Liverpool Emigrant Servant Trade and the Transition to Slave Labor in the Chesapeake, 1697-1707: Market Adjustments to War." *Explorations in Economic History*, 31, 376-405.
Inikori, Joseph ed**.** 1982. *Forced Migration: The Impact of the Slave Trade on African Societies*. New York: Africana Publishing Company.
Johnson, Marion. 1966. "The Ounce in 18th Century West African Trade." *The Journal of African History*, 7(2), 197- 214.
Johnson, Marion; J. Thomas Lindblad and Robert Ross. 1990. *Anglo-African Trade in the Eighteenth Century : English Statistics on African Trade 1699-1808*. Leiden: Centre for the History of European Expansion.
Kea, R. A. 1971. "Firearms and Warfare on the Gold and Slave Coasts from the Sixteenth to the Nineteenth Centuries." *The Journal of African History*, 21(2), 185-213.
Klein, Herbert. 2007. *The Atlantic Slave Trade*. Cambridge: Cambridge University Press.
Klein, Martin A. 2001. "The Slave Trade and Decentralized Societies." *The Journal of African History*, 42(1), pp. 49-65
Law, Robin. 1980. *The Horse in West African History*. Oxford: Oxford University Press.
Law, Robin. 1991. *The Slave Coast of West Africa, 1550-1750 : The Impact of the Atlantic Slave Trade on an African Society*. Oxford: Oxford University Press.
LeVeen, E. Phillip 1975. "The African Slave Supply Response." *African Studies Review*, 18(1), 9-28.
Lovejoy, Paul E. 2000. *Transformations in Slavery : A History of Slavery in Africa*. Cambridge, UK ; New York: Cambridge University Press.
Lovejoy, Paul E. 1983. *Transformations in Slavery: A History of Slavery in Africa. African Studies Series, 36*. Cambridge [Cambridgeshire] ; New York Cambridge University Press.
Manning, Patrick. 1990. *Slavery and African Life: Occidental, Oriental, and African Slave Trades*. Cambridge: Cambridge University Press.
Martin, Eveline Christiana. 1970. *The British West African Settlements, 1750-1821; a Study in Local Administration*. New York,: Negro Universities Press.
Metcalf, George. 1987a. "Gold, Assortment and the Trade Ounce: Fante Merchants and the Problem of Supply and Demand in the 1770s." *A Journal of African History*, 28(1), 27- 41.
Metcalf, George. 1987b. "A Microcosm of Why Africans Sold Slaves: Akan Consumption Patterns in the 1770s." *The Journal of African history*, 28(3), 377- 94.
Miller, Joseph C. 1988. *Way of Death; Merchant Capitalism and the Angolan Slave Trade, 1730-1830*. Madison: Wisconsin University Press.
Mitchell, B. R. . 1988. *British Historical Statistics*. Cambridge: Cambridge University Press.

Northrup, David. 2002. *Africa's Discovery of Europe : 1450-1850*. New York: Oxford University Press.
Northrup, David. 1978. *Trade without Rulers : Pre-Colonial Economic Development in South-Eastern Nigeria*. Oxford: Clarendon Press.
Nunn, Nathan. 2008. "The Long Term Effects of Africa's Slave Trades." *Quarterly Journal of Economics*, 123(1), 139-76.
Nunn, Nathan and Leonard Wantchekon. 2011. "The Slave Trade and the Origins of Mistrust in Africa." *American Economic Review*, 111(7), 3221-52.
Patterson, Orlando. 1982. *Slavery and Social Death: A Comparative Study*. Cambridge: Harvard University Press.
Richards, W. A. 1980. "The Import of Firearms into West Africa in the Eighteenth Century." *The Journal of African History*, 21(1), 43-59.
Richardson, David. 1991. "Prices of Slaves in West and West Central Africa: Towards an Annual Series, 1698-1807." *Bulletin of Economic Research*, 43(1), 21- 56.
Rodney, Walter. 1972. *How Europe Underdeveloped Africa*. London,: Bogle-L'Ouverture Publications.
Solow, Barbara L. and Stanley L. Engerman. 1987. *British Capitalism and Caribbean Slavery : The Legacy of Eric Williams*. Cambridge [Cambridgeshire] ; New York: Cambridge University Press.
Thomas, Hugh. 1997. *The Slave Trade: The Story of the Atlantic Slave Trade: 1440-1870*. New York: Touchstone.
Thornton, John. 1998. *Africa and Africans in the Making of the Atlantic World, 1400- 1800*. Cambridge: Cambridge University press.
Thornton, John K. 1999. *Warfare in Atlantic Africa, 1500-1800*. London: UCL Press.
West, Jenny. 1991. *Gunpowder, Government and War in the Mid-Eighteenth Century*. Rochester, New York: The Boydell Press.
Whatley, Warren and Rob Gillezeau. 2011a. "The Fundamental Impact of the Slave Trade on African Economies," P. Rhode, J. Rosenbloom and D. Weiman, *Economic Evolution and Revolution in Historical Time.* Stanford: Stanford University Press,
Whatley, Warren and Rob Gillezeau. 2011b. "The Impact of the Slave Trade on Ethnic Stratification in Africa." *American Economic Review*, 101(3), 571-76.
White, Gavin. 1971. "Firearms in Africa." *The Journal of African History*, 12(2), 173-84.
Wilks, Ivor. 1975. *Asante in the Nineteenth Century : The Structure and Evolution of a Political Order*. London ; New York: Cambridge University Press.
Wilks, Ivor. 1993. *Forests of Gold : Essays on the Akan and the Kingdom of Asante*. Athens: Ohio University Press.