

Estimates of the Volume of Direct Shipments of Tobacco and Sugar from the Chief English Plantations to European Markets, 1620-1669*

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1. Introduction

During the seventeenth century a great deal of the tobacco and sugar produced on English colonial plantations was shipped directly to Continental European markets. After the attempts of James I's government to limit colonial tobacco imports in 1624 - and especially after the near collapse of tobacco prices in Virginia through overproduction from 1629 onward - the Virginians began to sell increasing amounts of tobacco to Dutch traders and to ship much of their crop directly to Europe in both English and Dutch vessels. Although from 1621 to 1641 the English government attempted to force all colonial tobacco to be sent to England for sale or re-export, the planters' exports often by-passed English ports in the 1620s and early 1630s, and the Civil Wars and the Royalist sympathies of Virginia allowed the Dutch to gain a considerable share of Virginia's exports during the later 1640s.¹

*I am indebted to Prof. Richard Sheridan of the University of Kansas for criticizing an earlier version of this article. For its conclusions, however, I must take sole responsibility.

¹ See Bruce (1896, I, p. 348; II, pp. 299-310); Beer (1908, pp. 93-95, 137-158, 199-203, 206 n. 1, 214-215, 340-359); MacInnes (1926, pp. 54-58, 134-135, 163-166); Washburn (1957, pp. 33, 39-40); Pagan (1982, pp. 486-493). The Early Stuart regulations requiring all colonial tobacco to be sent to England are in Lyle (1932, pp. 73, 434-435); Grant and Munro (1908, pp. 61-62); Steele (1910, I, nos. 1385, 1415); Grant and Munro (1908, pp. 27-29). There was little sympathy in government circles for Francis Bacon's (1625) dictum that there should be "till the Plantation be of Strength... Freedome to carrie their Commodities, where they may make their Best of them..."

The Civil War period also saw Dutch capital develop sugar planting in Barbados, and Dutch ships took off most of the island's sugar at least until the arrival of English naval forces connected with Cromwell's Western Design of 1655.² The Navigation Act of 1651 had been designed to curtail Dutch shipping to the English plantations, but since it contained no "enumeration clause" requiring plantation exports to be sent to England, many English vessels carried tobacco and sugar directly from the plantations to Europe.³ Those chiefly responsible for the Act, Maurice Thomson and his partners, had plantations in Barbados, and it was to their own interest to maintain Barbados's free access to her traditional markets in Holland and Hamburg as well as in England.⁴ This legalizing of direct shipment to foreign markets by English vessels was even more beneficial to the tobacco colonies of North America. Unlike the sugar producers, who had a good market in England by the 1650s,⁵ the tobacco planters had to compete with home-grown English tobacco, which had come to equal colonial production by the latter part of the Protectorate.⁶ Only after the adoption of a strict enumeration system by the Navigation Act of 1660 did Virginia planters begin to lose their direct access to Continental markets. As late as 1664, however, they continued to send tobacco to the Dutch entrepôt of New Amsterdam. In Barbados the planters also defied

² See Harlow (1926, pp. 22-24, 37-39, 42-44); Beer (1908, pp. 389-390, 391-392).

³ For examples, see *Calendar of State Papers, Domestic, 1655* (p. 194); *Calendar of State Papers, Domestic, 1656-1657* (pp. 20, 339); *Calendar of State Papers, Domestic, 1659-1660* (pp. 481, 551). In the early 1660s, John Bland remarked that "I am sure upon the first obtaining this Act [of 1651] in the Long Parliament, our Traders to Virginia and Mariland carried the Tobacco from those colonies directly to Holland themselves, and neither paid Duties in the country, nor in England" Bland (1893, p. 150).

⁴ For the role of Thomson and his associates in framing the Navigation Act of 1651, see Clark (1923, p. 285); Farnell (1964, pp. 439-454). For their holdings in Barbados, see *Journals of the House of Lords* (IX, p. 50); Historical Manuscripts Commission, *Report VI*, (Appendix, House of Lords MSS, pp. 202-203); *Calendar of State Papers, Colonial, 1574-1660* (p. 329); Williamson (1926, pp. 125-126, 156-157). In 1650 Nicholas Foster wrote that Barbados had "a very faire correspondency" with England, New England, Holland, Hamburg, and other foreign parts. Foster (1650, p. 3).

⁵ *Calendar of State Papers, Venetian, 1655-1656* (pp. 243, 309).

⁶ See Bruce (1896, I, pp. 363-365); Beer (1908, pp. 403-408); MacInnes (1926, pp. 92-104); Lipson (1956, III, pp. 170-171); Williams (1971, pp. 145-152).

the new Navigation Act by continuing to send much of their sugar directly to Holland.⁷ Part of England's purpose in fighting the Second Dutch War of 1664-1667 was to seize New Netherland and stop its smuggling trade in colonial tobacco, and in fact the war did result in the accomplishment of both these aims.⁸ Barbadian and Leeward Island sugar, however, continued to be smuggled to the Dutch, operating from their entrepôt at St. Eustatius.⁹ The significance of this entrepôt for the English sugar planters is reflected in the fact that the governor of Jamaica tried to loose his privateers upon the Dutch slave entrepôt of Curaçao in 1666, but no action was taken or even proposed against the equally vulnerable Dutch sugar emporium at St. Eustatius.¹⁰ Parliament even attempted to realize revenue from this illicit trade in 1663 by charging plantation sugar exports a 4 ½ percent duty which was to be collected before shipment from the colonies, but this action simply spurred the planters to greater secrecy in their smuggling.¹¹ Not until the end of the century, when rising sugar prices in England made the home market more attractive than the foreign, did the practice of sugar smuggling decline.¹²

The object of this article is to estimate how much of the tobacco and sugar exported from the chief English plantation colonies was shipped directly to European markets during each of the documentable years from 1620 to 1669, or the period from just after the beginning of colonial plantation production up to a point

⁷ See Bruce (1896, I, pp. 357-359; II, p. 314-315); Beer (1908, p. 396); Wilson (1957, p. 116).

⁸ See Harper (1939, pp. 256-257); MacInnes (1926, p. 148). In 1664 General Monck, Duke of Albemarle, is reported to have remarked upon the impending Dutch War as follows: "What matters this or that reason? What we want is more of the trade which the Dutch now have." Quoted in Mahan (1965, p. 107). Cf. Wilson (1957, pp. 116-117) who thinks that the government was chiefly worried about New England wool exports which were being sent to Holland by way of New Netherland.

⁹ See Wilson (1957, p. 45); Higham (1921, pp. 36-37); Rich (1970, p. 705).

¹⁰ Routledge (1932, pp. 474, 547). The privateers gave up the Curaçao expedition in favor of another venture to the Spanish island of St. Katherine, formerly the English island of Providence.

¹¹ See Barbour (1963, p. 93 n. 31).

¹² See Sheridan (1973, pp. 398, 404, 496); Harper (1939, p. 263).

just after the establishment of the main Restoration Navigation Laws.¹³

2. Estimating Tobacco and Sugar Exports from English Plantations to Europe

These estimates are attempted for tobacco by subtracting the estimated total volume of exports sent to England by Virginia, Maryland and Bermuda in a specific year from the estimated total volume of all exports of those areas during that year and assuming that the difference represents a reasonable estimate of the total volume which was sent directly to Europe.¹⁴ The estimated amount exported to Europe is then expressed as a percentage of the estimated total Virginia-Maryland-Bermuda export production.

The same procedure has been followed for sugar. Barbados was the only major producer of the period, and the island's estimated total exports to England in each specified year have been subtracted from its estimated total exports overall for that year.¹⁵ Again, the difference is assumed to be the estimated amount which was sent directly to Europe and is expressed as a percentage of the estimated total Barbadian exports.

¹³ No attempt has been made to deal with statistics for re-exports from England to the Continent during this period. It is probable that this could be done by a thorough study of the Port Books for the periods 1615-1640 and 1660 onwards. The attempt to do this for tobacco re-exports by Gray and Wyckoff (1940, pp. 18-24) is incomplete. However, there is a good discussion of Virginia tobacco re-exports from London during the years 1634 and 1640 in Pagan (1979, p. 255). As for sugar re-exports, we know that the eighteenth-century analyst John Campbell (1768, p. 30) estimated that in the reign of Charles II England re-exported twice as much sugar as she consumed at home. In fact, Sheridan (1973, p. 45) has estimated that "from 1650 until about the end of the 17th century, between one half and two-thirds of the sugar imported into England from the colonies was re-exported to foreign markets."

¹⁴ This is contrary to the approach used by Menard (1980, p. 113), who holds that because no reliable statistics exist for tobacco production, the output of the Chesapeake should simply be measured by total imports into England. Cf. Also McCusker and Menard (1985, p. 120).

¹⁵ This differs from Ward (1978, Table 8, "Sources," p. 206), who estimates Barbadian sugar production in the 1650s "from statistics of sugar imports into England and Wales or Great Britain (adding 30 percent to take account of losses in shipment and sales in other markets)"

The results of these calculations for estimated tobacco and sugar exports appear in Tables 1 and 2, respectively.

TABLE 1. Estimated Virginia, Maryland, and Bermuda tobacco exports sent directly to European markets for selected years, 1620-64

Years	Estimated total Virginia exports (000 lbs.)	Estimated total Maryland exports (000 lbs.)	Estimated total Bermuda exports (000 lbs.)	Estimated total Va., Md., Ber. exports (000 lbs.)	Estimated total Va., Md., Ber. exports to England (000 lbs.)	Estimated total Va., Md., Ber. exports sent directly to European markets (000 lbs.)	Percentage of estimated total Va., Md., Ber. exports sent directly to European markets
1620	55	0	70	125	125	0	0%
1621	55	0	70	125	78	47	38%
1622	60	0	70	130	65	65	50%
1628	500	0	193	693	581	112	16%
1629	1,500	0	193	1,693	188	1,505	89%
1630	1,500	0	193	1,693	481	1,212	72%
1631	1,300	0	193	1,493	286	1,207	81%
1637	-	-	-	-	1,513	-	-
1638	-	-	-	-	3,306	-	-
1639	1,500	100	193	1,793	1,530	263	15%
1640	1,300	100	193	1,593	1,463	130	8%
1641	1,300	100	193	1,593	-	-	-
1647	1,500	100	120	1,720	788	932	54%
1651	-	-	120	-	-	-	-
1663	-	-	-	-	12,414	-	-
1664	Va. & Md. 19,500		235	19,735	12,414	7,321	37%

Sources: as indicated in Appendix A.

TABLE 2. Estimated Barbadian sugar exports sent directly to European markets for selected years, 1650-69

Years	Estimated total Barbadian exports (000 lbs.)	Estimated total Barbadian Exports to England (000 lbs.)	Estimated total Barbadian exports sent directly to European markets (000 lbs.)	Percentage of estimated total Barbadian exports sent directly to European markets
1650	166,538	0	166,538	100%
1655	89,600	17,514	72,086	80%
1663		18,396		
1669	29,568	24,003	5,565	19%

Sources: as indicated in Appendix B.

It must be pointed out, however, that there are numerous difficulties with this statistical approach. As is so often the case with seventeenth-century statistics, none of the available figures are completely reliable. The estimated total colonial exports are based mainly on literary evidence and legal regulations which cannot pretend to absolute accuracy. The estimated total colonial exports to England are projected from English import figures taken mainly from studies of Port Books, but this import data has been inflated by 5 percent for tobacco and by 12 ½ percent for sugar to compensate for spoilage and loss during the voyage to the mother country. Nevertheless, not even this adjustment will guarantee the integrity of the original export volume because the Port Book figures themselves are not totally trustworthy owing to the corruption and indifference of the Port Book keepers.¹⁶ And even if the quantitative differences

¹⁶ The upward adjustment of tobacco imports by 5 percent is based on the contention of Menard (1980, p. 113) that "the landed weight in Britain was thus about 5 percent lower than the shipping weight in America." The inflation of sugar imports by 12 ½ percent is based on the estimates of the eighteenth-century historian Brian Edwards (1801, II, pp. 571-572), who states that shipping losses were usually 12 ½ percent of total weight. Cf. Ward (1978, Table 8, "Sources," p. 206), who estimates Barbadian sugar production in the 1650s "from statistics of sugar imports into England and Wales or Great Britain (adding 30 percent to take account of losses in shipment and sales in other markets)...." Ward does not distinguish the proportion between losses in shipment and losses by sales in other markets; but if he is assuming that the two were of equal weight, then shipping losses would, of course, be 15 percent, a figure which would substantially agree with Edwards. For a brief discussion of graft among English customs officials, see Williams (1957, pp. 410-412).

between estimated total colonial exports and estimated total colonial exports sent to England were accurate, there is no certainty that precisely these quantities of tobacco and sugar would have reached Europe. They would have been subject to loss at sea through spoilage, piracy, storms, fire, pilfering, and privateering during wartime. Finally, the lack of archival evidence for import statistics for the major northern European ports during much of the seventeenth century makes it impossible to verify the assumption that these plantation staples were actually sent to Europe.¹⁷

Despite all these obstacles, however, there is still sufficient justification for the statistical results presented in this study. While it is true that the literary and legal estimates for total colonial exports probably often err on the high side because of special pleading and cannot be statistically adjusted by any universally applicable weight factor, they are not completely without meaning. The generators of the seventeenth-century sources upon which most of these estimates are based had no precise knowledge of the actual level of exports that would reach England (or Europe) and thus no base figure for systematically inflating their calculations for total colonial production. Therefore, with no way to reflect specific numerical bias, it seems unlikely that pure accident could account for the fact that these estimates of total exports do reveal a general secular trend of being consistently higher than the systematically inflated estimates for total exports sent directly to England. And the difference between these two series of estimates, or the estimated total exports sent directly to Europe, at least confirms the impressionistic contemporary evidence documenting the activities of Dutch carriers on behalf of English planters.

¹⁷ For example, import-export figures for Amsterdam, the chief entrepôt of Europe, are available for only one year during the entire seventeenth century. See Barbour (1963, p. 63 n. 11). The Notarial Archives of Amsterdam and Rotterdam contain a great volume of notarial acts relating to Dutch trade in Virginia tobacco during the first half of the seventeenth century. This evidence produced by Dutch notaries provides information on "ships, ship owners and captains, freight prices, and the conditions of trade" but "the volumes of cargoes are not usually stated in these Documents." Kupp (1973, p. 654).

3. Estimated English Plantation Exports to Europe as Confirmation of Contemporary Evidence for the Role of Dutch Carriers

For example, from Table 1 it may be seen that as early as 1621 the English government's attempt to confine all tobacco exports from Virginia and Bermuda to England had failed. The Virginia Company's plan to send all its production to Holland in 1620¹⁸ clearly had been thwarted by the Privy Council, but during 1621 the Company established an entrepôt in this "forraine countrie" for receiving its tobacco.¹⁹ It is impossible to say precisely what volume of Virginia exports was subsequently sent directly to any specific Dutch port, but Table 1 shows that by 1622 half of the estimated Virginia-Bermuda exports were bypassing all English ports. It should also be noted that by 1628 estimated Virginia export production had risen sharply and was usually, by itself, greater than the estimated total colonial exports to England.

The catastrophic drop in tobacco prices in Virginia during the period from 1628 to 1632²⁰ probably accounts for the fact that the great bulk of the estimated Virginia-Bermuda crop was shipped to foreign markets during the years 1629 to 1631. Under these circumstances, it is not surprising that the Dutch established their tobacco-processing industry at Amsterdam in 1631 and that it grew rapidly after that date.²¹ In 1632 comes the first evidence that an extensive tobacco trade had opened between Virginia and New Netherland.²²

The relatively vast estimated exports of North American tobacco to England in 1638 were probably caused by the fact that the government decided to enforce strictly its policy of *Mare Clausum*

¹⁸ Beer (1908, pp. 120-121).

¹⁹ Lyle (1932, p. 73).

²⁰ The "farm price" per pound of tobacco in Virginia during these years was as follows: 1628, 7.8d; 1629, 6.5d; 1630, 5.3d; 1631, 4.0d; 1632, 2.9d. See Menard (1980, p. 157).

²¹ See Barbour (1963, p. 63 n. 12).

²² See Washburn (1957, p. 14).

in the English Channel. The Ship Money fleets attempted to stop all vessels, English and foreign, going through the Narrow Seas and to force them to pay customs on their cargoes. Although this action was initiated mainly to prevent evasions of the "composition trade" at Dover by Flemish vessels,²³ the result seems to have been that most English plantation tobacco headed directly for the Continent was forced in to pay duties.²⁴ Thus, the estimated 3,306,000 pounds of Virginia-Maryland-Bermuda tobacco sent to England in 1638 probably represented nearly the entire export crop of those colonies.²⁵

And, as Table 1 indicates, this complete dominance by the English home market continued for the next two years. Direct shipment to Holland may have proved difficult in 1639 after the bulk of the English fleet was sent to Newcastle (very nearly on the North Sea route to Amsterdam) to support the army engaged against the Scots and the remaining warships in the Channel were placed on continuous alert as they observed the actions of the Spanish and Dutch fleets prior to the Battle of the Downs.²⁶ During 1640 access to Dutch ports must have continued to be impractical because a large part of the English fleet remained off the Scottish coast.²⁷

Nevertheless, the great volume of Virginia-Maryland-Bermuda export production reflected by the estimated exports to England for 1638 could not be maintained during the years 1639 to 1641. The price of tobacco in Virginia had fallen from 5.5d per pound in 1636 to 2.8d per pound in 1638,²⁸ and the Virginia House of Burgesses

²³ For all this, see Kepler (1972, p. 266).

²⁴ Few examples of apprehended smugglers survive in official records for 1638. See Shilton and Holworthy (1932, pp. 73-74). This could mean that not many tried—or that not many were caught!

²⁵ It should be noted, however, that foreign markets were still vitally important even for these English imports. Early in 1639 English tobacco processors complained to the King that the re-export of leaf tobacco had become so great that many of their workers were emigrating across the Channel in order to find employment. *Calendar of State Papers, Domestic, 1638-1639* (p. 546).

²⁶ See Kepler (1972, p. 269).

²⁷ *Calendar of State Papers, Venetian, 1640-1642* (p. 52).

²⁸ See Menard (1980, p. 157).

acted to prevent a recurrence of the overproduction which had caused this decline. It limited Virginia's output to 1.5 million pounds for 1639 and 1.3 million pounds for the period 1640 to 1641.²⁹ Thus, the decrease in colonial production caused just over a 50 percent decline in estimated total exports sent to England in 1639 and 1640 from the level of 1638.

There are no surviving data for estimating the volume of Virginia-Maryland-Bermuda exports for most of the 1640s, but it seems clear that England's share of her own colonial market declined again by the end of the First Civil War. The volume of estimated total exports to England for 1647 in Table 1 suggests that she managed to keep not quite half of her North American tobacco trade. The remainder almost certainly had fallen to the Dutch.³⁰ Nevertheless, even in the war year of 1645 there seems to have been enough plantation tobacco in English ports to cause a surplus. In that year, for example, the entrepreneur Maurice Thomson saw fit to re-export 1,000 pounds of Virginia tobacco from Dover.³¹

From 1647 to 1664 tobacco production in Virginia and Maryland increased enormously. One cause of this increase certainly must have been the growth of Virginia's population from 15,300 in 1649 to 40,000 in 1665,³² but equally important was the fact that the planters still had direct access to the European market at a time when competitive English domestic production for home consumption was also thriving. Governor Stuyvesant of New Netherland carefully cultivated trade relations with Virginia from 1653, and he finally managed to secure a regular trade agreement

²⁹ Hening (1823, I, p. 225).

³⁰ Beer (1908, p. 356) states that "toward the end of the war, the Dutch controlled to some extent the most important branches of the English colonial trade." See below, Appendix A, section entitled, "Estimated total Virginia-Maryland-Bermuda exports to England," discussion for 1647.

³¹ Great Britain, Public Record Office, Exchequer 122/212/37: Dover Port Book, export section, 15/25 Feb. 1644/45.

³² See Bruce (1896, I, pp. 336, 397; II, p. 77). White planters and indentured servants accounted for most of the increase. Black slaves numbered 300 in 1649 and only 2,000 by 1671. Virginia planters continued to rely mainly on the labour of white indentured servants throughout the century. See Wertenbaker (1922, pp. 30-31, 125).

in 1660.³³ And even though New Amsterdam was captured by the English in August 1664,³⁴ we know that as late as October the English governor was still permitting Dutch ships to take Virginia tobacco from what was now New York to Amsterdam.³⁵

However, as Table 1 shows, by the end of 1664 the estimated Dutch percentage of the carrying trade from Virginia had been reduced considerably from the level of 1647. The bulk of North American tobacco exports was now being shipped to England.

This new dominance of the English market must be attributed in the first instance to the enforcement of the Restoration Navigation System because the Second Dutch War did not officially begin until 1665. Nevertheless, the war itself did have the effect of reducing even further the amount of Dutch smuggling from Virginia's increasingly productive plantations.³⁶

But, of course, Dutch carriers had not confined themselves to English colonial tobacco. Table 2 shows that estimated total Barbadian sugar exports reached massive proportions during the 1650s and that, at most, only an estimated 20 percent of this early output was sent to England. During 1650 Lord Willoughby's Royalist government confined all trade to the Dutch,³⁷ and this is why the table shows no exports to England for that year. The relatively low volume of estimated total exports to England for 1655 is even more significant, however, because during that year trade with the Dutch was all but prevented by General Venables's squadron being present in the island for several months.³⁸ The only explanation is that English vessels must have been directed to take their cargoes to foreign rather than English markets. The planters themselves admitted in 1655 that while their 20,000 negroes produced sugar worth "200,000 lbs. Sterling yearly which is so

³³ See Bruce (1896, II, pp. 310, 314-315); (Beer 1908, p. 396); Birch (1742, V, p. 80); Stokes (1915-1928, IV, p. 214).

³⁴ *Calendar of State Papers, Colonial, 1661-1668* (pp. 225, 230).

³⁵ Stokes (1915-1928, IV, p. 250).

³⁶ See Bruce (1896, II, p. 312); Harper (1939, p. 257).

³⁷ See Harlow (1926, p. 68).

³⁸ See Harlow (1926, pp. 86-88).

much increase to the Nations [England's] Stock," the whole production of the island "is estimated annually to amount unto at least a Million."³⁹ As indicated above, the Navigation Act of 1651 did not prohibit direct exports to foreign markets as long as English ships were used, and this situation left the planters free to take advantage of the greater demand in Holland. Although by the mid-1650s English demand for Barbadian sugar was growing among consumers, refiners, and re-exporters,⁴⁰ England did not possess anything like the sixty great sugar refineries to be found in the Dutch Republic.⁴¹

While a series of natural disasters and soil exhaustion led to a drastic decline in estimated total Barbadian sugar exports by 1669,⁴² England's estimated percentage of these exports by that date had increased by 61 percent over the level of 1655,⁴³ with only an estimated total of 19 percent of Barbadian production going directly to Europe. The new Navigation Acts of the Restoration and the continuing English naval presence in the Caribbean which often permitted their enforcement no doubt account for this increasing benefit to England from Barbados.

4. Conclusion

In sum, it may be concluded that if the estimates of the volume of direct shipment of tobacco and sugar from the principal English

³⁹ British Library, Add. MS 11,411, fol. 9.

⁴⁰ *Calendar of State Papers, Venetian, 1655-1656* (pp. 243, 309); *Calendar of State Papers, Domestic, 1654* (p. 118). See also Atton and Holland (1908-1910, I, p. 92).

⁴¹ See Masefield (1967, p. 293).

⁴² See below, Appendix B, section entitled, "Estimated total Barbadian exports," discussion for 1669.

⁴³ It should be pointed out, however, that a great deal of sugar imported into England in the 1660s continued to be re-exported to foreign markets. It was well known, for example, that English refined sugar was underselling the Portuguese product on the Continent to such an extent that Portuguese re-exports from Brazil had declined by more than 50 percent. British Library, Egerton MS 2,395, fol. 632; Child (1669, p. 20). In addition, see the discussion of re-exports above in n. 13.)

plantations to Continental European markets presented in this article are at all accurate, then we can gain at least some statistical approximation of how important European centres of demand were in stimulating the development of the English plantation colonies during their formative years. In relation to the destination of the estimated combined annual tobacco exports from Virginia, Maryland, and Bermuda, the data for the 11 documentable years from 1620 to 1664 show that Europe was the intended recipient of anywhere from zero percent to 89 percent of these shipments and that, of the estimated 30,793,000 pounds of total tobacco exports, an estimated 12,794,000 pounds, or 42 percent, went directly to the Continent. As for the direction of the estimated yearly Barbadian sugar exports, the data for the three documented years during the period 1650 to 1669 show that Europe was the target for a range of 19 percent to 100 percent of these cargoes and that, of the estimated 285,706,000 pounds of total sugar exports, an estimated 244,189,000 pounds, or 85 percent, went directly to European markets. The English government took no effective measures against this direct access to foreign markets until the enactment of the enumeration clause in the Navigation Act of 1660. The planters' compliance with this legislation resulted in England's receiving the bulk of the estimated colonial tobacco exports by 1664 and the great majority of the estimated sugar exports by 1669. However, until the 1660s, it seems certain that direct access to the relatively vast European market was a constant factor in encouraging tobacco production in Virginia and in driving Barbadians to attempt to maintain their mammoth sugar output on worn-out soil by the increased use of slaves.⁴¹ The economic growth of the major English plantation colonies in the New World was thus a product not merely of English market forces but those of Western Europe as well.

⁴¹ The black slave population of Barbados increased from 20,000 in 1655 to 40,000 in 1669. See Harlow (1926, p. 338).

APPENDIX A

Sources for Table 1

Estimated total Virginia exports

For 1620, we may assume that Virginia export production was at least 55,000 lbs. The "Estimated total Virginia-Maryland-Bermuda exports to England" for that year were 125,000 lbs. (total imports increased by 5 percent). Of this, the "Estimated total Maryland exports" were zero and the "Estimated total Bermuda exports" were 70,000 lbs. - which leaves "Estimated total Virginia exports" of 55,000 lbs. This figure for Virginia is also substantiated by the fact that in 1620 the King's Council decided to allow both the Virginia Company and the Somers Islands Company to import 55,000 lbs. of tobacco into England. The Virginia Company, however, decided to permit the Somers Islands Company to import the entire amount. The Virginia Company claimed that 55,000 lbs. as a limit to its production was not nearly sufficient to maintain its planters. The Company actually planned to send its entire crop to Holland, but the "Estimated total Virginia-Maryland-Bermuda exports to England" for 1620 indicate that the government must have been successful in confining Virginia to 55,000 lbs. and in forcing both the Virginia and Somers Islands exports to be landed in England. See Beer (1908, pp. 120-121).

For 1621-1622, see MacInnes (1926, p. 134).

For 1628, the figure is based on the level of 1627, which was taken from U.S. Department of Agriculture (1908, p. 683). Beer (1908, p. 87) says that by 1627 exports from Virginia "had increased to 500,000 pounds, and were still rapidly expanding."

For 1629-1631, see MacInnes (1926, p. 134).

For 1639-1641, see U.S. Department of Agriculture (1908, p. 683) and the sources there cited; Hening (1823, I, p. 225).

For 1647, see the estimates in Brock (1884, p. 147).

For 1664, we know that the combined crop of Virginia and Maryland amounted to 50,000 hogsheads, which at 390 lbs. per hogshead would be 19,500,000 lbs. See Bruce (1896, I, pp. 391, 383 n. 2).

Estimated total Maryland exports

For 1639-1641, 1647, the estimates are based on Wyckoff (1936, p. 49), who states that Maryland was exporting 100,000 lbs. a year by 1640.

For 1664, see above under "Estimated total Virginia exports," discussion for 1664.

Estimated total Bermuda exports

For exports in 1620, which also form the basis of the estimates for 1621-1622, see Wilkinson (1958, p. 141).

Exports for 1628, which also form the basis of the export estimates for 1629-1631 and 1639-1641, are based on imports into England from the island for that year of 184,000 lbs. See Williams (1957, p. 414). This import figure has been inflated by 5 percent to compensate for spoilage and loss during the voyage to England. See Menard (1980, p. 113).

The estimated exports for 1647 are based on the level of 1651. The latter was determined as follows: About 1650 the Somers Islands Company was charging 1d per lb. on tobacco exported from Bermuda. This duty yielded £500 per year during the early 1650s, making the export crop equal to 120,000 lbs. annually. See Wilkinson (1958, p. 228). And, more precisely, in 1651 the entire crop was carried off by the

Dutch, and the loss in customs and excise was placed at £1,500. *Calendar of State Papers, Colonial, 1574-1660* (p. 378). The combined customs and excise at this time amounted to 3d per lb. See Beer (1908, p. 344). Thus, the total crop would have amounted to 120,000 lbs.

The estimated exports for 1664 of 235,000 lbs. are an average of the only two reliable estimates for maximum production: 193,000 lbs. for 1628 (see the discussion above for 1628) and 276,000 lbs. for 1676 (see Gray and Wyckoff, 1940, p. 21 n. for 1676).

Estimated total Virginia-Maryland-Bermuda exports to England

All these totals have been estimated by adding 5 percent to the weight of tobacco imports into England in order to compensate for loss of bulk during shipment. See Menard (1980, p. 113).

The total English tobacco imports from Virginia, Maryland, and Bermuda for the selected years of this study are as follows:

<i>Years</i>	<i>Imports*</i> (000 lbs.)	<i>Years</i>	<i>Imports*</i> (000 lbs.)
1620	119	1638	3,149 (estimated)
1621	74	1639	1,457 (estimated)
1622	62	1640	1,393 (estimated)
1628	553	1641	-
1629	179	1647	750 (estimated)
1630	458	1651	-
1631	272	1663	11,823 (estimated)
1637	1,441 (estimated)	1664	11,823 (estimated)

(*Compare these import data with the uniformly lower yearly totals in Menard, 1980, pp. 157-158. For the years up to 1637, the discrepancy seems to come from Bermuda data not being included in Menard's figures. For the years 1637-1640, he equates London imports as being the total for all English imports. Menard, 1980, p. 162. But for a different view, see the discussion below.)

These import data were determined as follows:

For 1620-1621, see Newton (1922, p. 526).

For 1622, 1628-1631, see Williams (1957, pp. 419-420).

For 1637-1640, the estimates assume that London imports represented 75 percent of the total imports and that the outports' share amounted to 25 percent. London imports from Virginia and Maryland during these years were as follows (nearest 000 lbs.):

1637	1,081,000
1638	2,362,000
1639	1,093,000
1640	1,045,000.

See Pagan (1979, p. 253); Gray and Wyckoff (1940, pp. 19-21). London was the only legal port for incoming tobacco from 1624 to 1638. In 1638, however, four outports were also permitted to take in colonial production. See MacInnes (1926, pp. 54-55, 58). But the Privy Council then reversed itself in 1639 and again excluded the outports from colonial tobacco traffic. Nevertheless, the fact remains that from 1622 to 1631 the outports' share of English imports from Virginia and Bermuda had averaged 23 percent annually; and despite the lack of Port Book statistics, Pagan has shown that the customs farmers were aware that the outports' involvement in the colonial import

trade was continuing to grow. See Pagan (1979, p. 257). Therefore, I have assumed that the outports received at least 25 percent of the total Virginia-Maryland-Bermuda imports into England by the late 1630s. This would mean that the London figures (75 percent of the trade) need to be increased by one-third to reflect an approximation of total English imports from the northern plantation colonies. These adjusted imports would then be as follows (nearest 000 lbs.):

1637	1,441,000
1638	3,149,000
1639	1,457,000
1640	1,393,000.

For 1647, the estimate is based on the following data: In 1648 the Dutch captain Devrics counted in Virginia 12 Dutch ships, 12 English ships, and 7 from New England. The New Englanders were not hostile to the Parliamentary regime in England, but they also traded freely with the Dutch. Thus, their tobacco ships trading to Virginia could have been sent anywhere. See Beer (1908, pp. 356, 344-345, 357-358). The Bermuda trade was almost entirely in Dutch hands from 1644 to 1652. See Wilkinson (1958, pp. 284-285). There is also evidence that the Dutch had a considerable share of Maryland exports after 1643. See Wyckoff (1936, p. 54 n. 41). Thus, it seems probable that in 1647 England may have obtained, at the maximum, nearly half the "Estimated total Virginia exports" (of 1,500,000 lbs.), only part of those from Maryland, and none of those from Bermuda. Therefore, a total import figure of 750,000 lbs. seems reasonable.

For 1663-1664, the estimates depend on the following data: London imports for 1663 totalled 7,371,000 lbs. About 277,500 lbs. was Spanish and West Indian, leaving a total of 7,093,500 lbs. from North America. See Gray and Wyckoff (1940, p. 20). The figures for imports coming to the outports in Gray and Wyckoff omit Bristol and are thus incomplete. The best guide to the outport total is suggested by the fact that their share was around 40 percent of total English imports in 1672. See Gray and Wyckoff (1940, p. 21). Assuming that the same proportions obtained in 1663, one might estimate the outport total of tobacco imports from America at about 4,729,000 lbs. and the total for England at 11,823,000 lbs. There is no reason to suppose that English imports from North America in 1664 differed much from the level of 1663. The Dutch entrepôt at New Amsterdam was not besieged and taken by the English until late August 1664, and in October of that year the English governor was still permitting Dutch ships to lade Virginia tobacco stored in the colony and to sail with it for Amsterdam. *Calendar of State Papers, Colonial, 1661-1668* (pp. 225, 230); Stokes (1915-1928, IV, p. 250).

APPENDIX B Sources for Table 2

Estimated total Barbadian exports

The estimate for 1650 has been determined as follows: Richard Ligon calculated the total value of the crops for a season of 20 months ending in 1650 at £3,097,800. Ligon (1657, pp. 95-96). For 12 months, this would average out to £1,858,680. Although sugar production utilized only about two-thirds of the acreage on an average plantation in the 1650s, it must have accounted for nearly all the market value of Barbadian crops because tobacco and cotton production in the island had become negligible. See Bridenbaugh and Bridenbaugh (1972, pp. 54, 60, 276, 280-281, 283). Ligon stated that the price of unrefined sugar in Barbados at this time was 25s per cwt. Ligon (1657, pp. 95-96). Thus, assuming what was not quite true, that is, that the entire marketable crop was unrefined sugar, the 12-month crop would be 1,486,944 cwt. The cwt. was taken to be 112 lbs., so the total crop would have weighed 166,537,728 lbs.

Other contemporary comment tends to confirm Ligon's statements. The Barbadian planter Nicholas Foster wrote in 1650 that there were "many Millions of Sugars transported from thence yearely, and the number of Ships that come yearely to that Island, not lesse than a hundred Sayle. . . ." Foster (1650, p. 3). George Gardynier (1651, pp. 77-78) stated that Barbados "flourisheth so much, that it hath more people and Commerce then all the Ilands of the Indies."

The vast size of Barbados's export trade in the early 1650s can also be demonstrated by estimating the amount of shipping tonnage involved. Rich (1970, pp. 705-706) states that "by 1654. . . there were usually sixty or seventy ships at anchor there, while the trade of the island was reported to occupy about 400 ships and about 10,000 seamen [annually]." This would have meant an average crew of 25 men per ship. Davis (1962, p. 110) has shown that in the 1630s a crew of 28 to 30 men was typical for a 200-ton English ship in the trade to Barbados. Dutch vessels of a comparable tonnage, which dominated the trade, would have probably employed even fewer sailors. See Barbour (1930, pp. 282-283). Thus, it might be assumed that the 400 ships trading annually to Barbados during the early 1650s averaged 200 tons a piece at the minimum, making a total of at least 80,000 tons. Taking the standard shipping ton at the dead weight of 4 hogsheads of 5 cwt. (cwt. = 112 lbs.) each (Davis, 1962, pp. 7 n. 1, 178, 282), or 2,240 lbs., this 80,000 tons of shipping would represent 179,200,000 lbs. of carrying capacity, which would have been more than sufficient to lade the estimated 166,537,728 lbs. of sugar exports in 1650. In fact, there would have been enough excess capacity to lade whatever residual tobacco or cotton Barbados might have exported in addition to sugar.

The export estimate for 1655 is based on the following data: In 1655 a petition of the Barbadian planters to the Council of State declared that "ye whole proceed of that Island is estimated annually to amount unto att least a Million £." British Library, Add. MS 11,411, fol. 9. The figure in the table for 1655 was obtained by using Ligon's price of 25s per cwt. for unrefined sugar. Ligon (1657, p. 95). (The cwt. = 112 lbs.) Indicative of the continuing high total volume of exports is the planters' statement that during 1655 "they have intred in their Books 226 Sayles of Shippes, most of them of great burthen, which in one yeare traded with them." British Library, Add. MS 11,411, fol. 9. This figure of 226 ships in the Barbados trade for 1655 is down 44 percent from the 400 vessels of the earlier 1650s, which reflects the similar 46 percent reduction in estimated total export volume for 1655 compared to 1650.

The production estimate for exports in 1669 has been adjusted downward by two-thirds from the figure for 1655. The main basis for doing this is Governor Willoughby's statement in 1668 that "Barbados contains one hundred thousand acres and renders not by two-thirds its former production by acres. The land is almost worn out, and the thickets where cotton and corn are planted are so burnt up that the inhabitants are ready to desert their plantations." *Calendar of State Papers, Colonial, 1661-1668* (p. 586). The reasons for this decline in production in the late 1660s can be attributed to a series of natural disasters as well as to worn-out soil. There was a plague of locusts in 1663, a hurricane in 1667, a drought in 1668, a year of excessive rain in 1669, and an epidemic which killed large numbers of slaves and indentured servants in 1670. See Sheridan (1973, p. 399). Thus, the decline in production from 1655 to 1669 as shown in the table seems justified despite the fact that the Barbadian black slave population increased from 20,000 in 1655 to 40,000 in 1669. See Harlow (1926, p. 338). An additional justification for the 1669 level of exports is that Eltis (1995, pp. 632, n.6, Table 1), using the Barbados Custom Books for August 1664 to April 1667, establishes the combined weight of muscovado and refined sugar exports for the years 1665-1666 at a yearly average of 12,448 metric tons, or (1 metric ton = 1.1 English tons) 27,386,000 lbs. Given the fact that Eltis (1995, p. 638, Table 1) also reports average annual exports for these years of 529,943 liters of molasses and 567,827 liters of rum, which were the other standard sugar products, the average annual total weight of all types of sugar exports for the years 1665-1666 must have been very near the 29,568,000 lbs shown in Table 2 for 1669.

Estimated total Barbadian exports to England

These totals have been estimated by adding 12 ½ percent to the weight of sugar imports into England in order to compensate for loss of bulk during shipment. See Edwards (1801, II, pp. 571-572). See also the discussion in Sheridan (1973, pp. 43, 44 n. 16).

The total English sugar imports from Barbados for the selected years of this study are as follows:

<i>Year</i>	<i>Imports</i> (000 lbs.)
1650	0 (estimated)
1655	15,568
1663	16,352
1669	21,336.

These import data were determined as follows:

For 1650 (and 1651), English imports from Barbados were in all probability nil because Francis Lord Willoughby, who controlled the Barbadian government for the Royalist faction, ordered "the Manage of Trade to be onely with the Hollanders." Quoted in Harlow (1926, p. 68).

For 1655, English imports were 139,000 cwt. See Sheridan (1973, p. 412 and n. 50). The cwt. was taken at 112 lbs.; therefore, there were 15,568,000 lbs. But see McCusker and Menard (1985, p. 150 n. 9), who estimate that total English imports in 1655 were 143,000 cwt.

For 1663, imports were 146,000 cwt. See Thornton (1954, p. 252). In converting to lbs., the 112-lb. cwt. has been used.

For 1669, imports were 190,496 cwt. See Sheridan (1973, p. 412 and n. 50). In converting to lbs., the 112-lb. cwt. has again been used.

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