**Estimation Methods**

Even the large amount of data in the existing NOSLs were incomplete and inadequate for constructing a continuous time series for the value of imports and exports from each district in Virginia and Maryland. Therefore, estimation methods were employed to fill the gaps. The methods used generally varied between Virginia (with its more complete data) and Maryland (with its much scarcer data). In general, simple estimation techniques were preferred working with known data to generate estimates of the unknown, given the limitations inherent in early modern trade data.

For the Virginia districts, data years had values for imports and exports to each region: West Indies, North America, Great Britain, Ireland, Northern Europe, Southern Europe, Africa, and Unknown. For years which had incomplete data, estimates were built using straight line interpolations between regional values in years for which there were actual data.

For example, the estimate for the value of exports for 1728 for the Lower District of James River, was the sum of: the estimated value for exports to the West Indies (obtained by linear interpolation between the value of exports to the West Indies in 1727 and the value of exports to the West Indies in 1730); the estimated value of exports to North America (obtained by linear interpolation between the value of exports to North America in 1727 and the value of exports to North America in 1730); the estimated value of exports to Great Britain (obtained by linear interpolation between the value of exports to Great Britain in 1727 and the value of exports to great Britain in 1730);the estimated value of exports to Southern Europe (obtained by linear interpolation between the value of exports to Southern Europe in 1727 and the value of exports to Southern Europe in 1730).

Areas where trade had been sporadic or non-existent were excluded from the interpolation technique. Similarly, trade with Africa was excluded from the estimated value of imports, as it could vary radically from one year to the next; several slave ships could arrive in one year transporting cargoes worth tens of thousands of pounds sterlingthe next year might have no slaves imported.

The estimates for Maryland are much more complex because of the varied nature of the data: for periods when it is good, it exists in quantity and is continuous; for periods when it is bad, there is virtually no information, even spotty in nature. The estimates for each of Maryland’s Naval Officer Districts were constructed using geographical and agricultural regions as comparable as possible to the district in question. In general, where the spotty Maryland information existed, it was in the form of the number of hogsheads of tobacco being exported from a particular district. Therefore, this tobacco information was used as the basis for estimating relationships with the Chesapeake districts with better data. This was a relatively good estimation basis, as tobacco was always the most valuable export from the Chesapeake.

As the estimation methodology is more complex for Maryland, the technique is described in detail for each district.

North Potomac District: At first glance, North Potomac and South Potomac Districts should be similar: both bordered on the Potomac River; both saw the establishment of small trading towns in the late colonial period (Alexandria in Virginia, and Georgetown in Maryland); and both seem to have a similarly sized drainage basin. However, the North Potomac District almost always exported much more tobacco than the South Potomac District.

| Year | Tobacco Exports from North Potomac (hhd) | Tobacco Exports from South Potomac (hhd) | Ratio of North Potomac to South Potomac |
| --- | --- | --- | --- |
|  |  |  |  |
| 1731 | 6620 | 3513 | 1.884 |
| 1733 | 7616 | 2312 | 3.294 |
|  |  |  |  |
| 1753 | 10022 | 7396 | 1.355 |
| 1753 | 10022 | 6379 | 1.571 |
|  |  |  |  |
| 1761 | 16059 | 5641 | 2.847 |
|  |  |  |  |
| 1768 | 9014 | 6817 | 1.322 |
| 1769 | 9735 | 8151 | 1.194 |
| 1770 | 10416 | 10856 | 0.959 |
| 1771 | 14729 | 12417 | 1.186 |
| 1772 | 14459 | 10094 | 1.432 |
|  |  |  |  |

Sources: North Potomac: 1731, 1733, Calvert Papers; 1753, and 1761: MSA; 1768-1772, CUST 16/1. South Potomac: 1731, 1733, 1753, 1761, datasets; 1768-1772, CUST 16/1.

Based on these ratios, the value of imports and exports from 1725 to 1750 for North Potomac were estimated at twice the value of those for South Potomac, and from 1750 to 1775, they were estimated at 1.25 times the value of those for South Potomac.

Patuxent District: Of all the naval officer districts in Maryland, this was perhaps the hardest to construct estimates for. The Patuxent River Valley was relatively short, but had very rich tobacco lands. And, it was a mature tobacco region by the beginning of the eighteenth century, and appears to have remained heavily involved in tobacco until the time of the American Revolution. In many ways the district it most clearly resembled geographically and agriculturally was York River District in Virginia. However, York largely grew sweet-scented tobacco, while Patuxent grew orinocco.[[1]](#footnote-1) This difference aside, they were similar in many ways, so the estimates for Patuxent were constructed using the York River district as a basis. The tobacco exports of the regions are given in the table below.[[2]](#footnote-2)

| Year | Tobacco Exports from Patuxent Naval Officer District  (hhd) | Tobacco Exports from York Naval Officer District  (hhd) | Ratio of Patuxent to York |
| --- | --- | --- | --- |
|  |  |  |  |
| 1730 |  | 10634 |  |
| 1731 | 8410 | 10322 (est.) | 0.8148 |
| 1731 |  | 10099 |  |
| 1733 | 7105 | 10690 | 0.6646 |
|  |  |  |  |
| 1756 | 5814 | 9900 | 0.5873 |
|  |  |  |  |
| 1761 | 4513 | 11404 | 0.3957 |
|  |  |  |  |
| 1768 | 5670 | 6258 | 0.9060 |
| 1769 | 7697 | 8689 | 0.8858 |
| 1770 | 6315 | 7528 | 0.8289 |
| 1771 | 7299 | 10474 | 0.6969 |
| 1772 | 7701 | 9198 | 0.8372 |
|  |  |  |  |

Sources: Patuxent: 1731, 1733: Calvert Papers; 1756, 1761: MSA; 1768-1772: CUST 16/1. York: 1731, 1733, 1756, 1761: Tables below; 1768-1772: CUST 16/1.

Based on the table above, the value of imports and exports for the Patuxent district was estimated to be 0.8 times those for York district.

Annapolis District: After 1750, data for the Annapolis district are complete and long-running; before that time, they are virtually non-existent. Even as early as 1750, this district had started exporting considerable quantity of grain, while keeping tobacco production fairly high. The only remotely similar area appeared to be a combination of two districts: the Upper and Lower Districts of James River. The Lower district had a port townNorfolkthat was comparable to Annapolis. And the Upper district produced large quantities of tobacco. Although after 1750, the Upper district boomed with tobacco exports, the approximation of the Annapolis district ends in 1750. The table below gives the tobacco exports of each area.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Year | Annapolis District Tobacco Exports  (hhd) | James River, Lower District Tobacco Exports  (hhd) | James River, Upper District Tobacco Exports  (hhd) | Ratio of Annapolis to Both Upper and Lower Districts, James River |
|  |  |  |  |  |
| 1731 | 10447 | 2515 | 8925 | 0.9131 |
| 1733 | 13169 | 1617 | 5542 | 1.8395 |
|  |  |  |  |  |
| 1749 | 5748 | 3028 | 10099 | 0.4379 |
| 1750 | 8236 | 2430 | 13737 | 0.5094 |
| 1751 | 8080 | 1771 | 16166 (est.) | 0.4504 |
| 1752 |  |  | 18595 |  |
|  |  |  |  |  |

Sources: Annapolis: 1731, 1733: Calvert Papers; 1749, 1750, 1751: see tables below. Upper District, James River: 1731, 1733, 1749, 1750, 1751: see tables below. Lower District, James River: 1731, 1733, 1749, 1750, 1752: see tables below.

Based on the table above, the value of imports from and exports to Great Britain for the Annapolis District were estimated as follows: for 1725 to 1734, 1.5 times the sum of the Upper and Lower Districts of James River; for 1735 to 1744, the sum of the Upper and Lower Districts of James River; and from 1745 to 1748, 0.5 times the sum of the Upper and Lower Districts of James River.

For the remaining regions, the value of imports and exports were estimated at 0.5 times the sum of the Upper and Lower Districts of James River. Using the factors generated by tobacco above, the estimates of exports to the West Indies, North America, and Southern Europe became quite large. However, there is no evidence to support this sizable contribution of Annapolis to these trades in the 1720s, 1730s, and 1740s. Therefore, the ratio of the Annapolis exports from 1749 to 1752 to the average of the combined exports from the Upper and Lower Districts of James River from 1749 to 1752, was used to estimate the factors for Annapolis trade to and from each of these regions. The value of Annapolis imports from and exports to each of these regions from 1725 to 1748 was estimated as follows: for the West Indies, 0.20 times the sum of the Upper and Lower Districts of James River; for North America, 0.55 times the sum of the Upper and Lower Districts of James River; and for Southern Europe, 0.35 times the sum of the Upper and Lower Districts of James River.

Oxford District: The Oxford district was in many ways a smaller version of the Annapolis district. It had a central port town, Oxford, but on a smaller scale and it grew tobacco and grain like Annapolis, but again on a smaller scale. From 1760 to 1772, the records for Oxford were complete and continuous. Before 1760, the only complete run were the years from 1744 to 1746. The table below gives the tobacco exports for Oxford and Annapolis for available years:

| Year | Tobacco Exported from Oxford District  (hhd) | Tobacco Exported from Annapolis District  (hhd) | Ratio of Oxford to Annapolis |
| --- | --- | --- | --- |
|  |  |  |  |
| 1731 | 3118 | 10447 | .2985 |
| 1733 | 2773 | 13169 | .2106 |
|  |  |  |  |
| 1743 | 7044 |  |  |
| 1744 | 6176 |  |  |
| 1745 | 3704 |  |  |
| 1746 | 5864 |  |  |
|  |  |  |  |
| 1760 | 5148 | 10914 | .4717 |
| 1761 | 4411 | 8739 | .5047 |
| 1762 | 2355 | 6903 | .3411 |
| 1763 | 5255 | 7119 | .7382 |
| 1764 | 2990 | 5985 | .4996 |
| 1765 | 2795 | 6781 | .4122 |
|  |  |  |  |

Sources: Oxford: 1731, 1733: Calvert Papers; 1743-46 and 1760-65: see tables below. Annapolis: 1731, 1733: Calvert Papers; 1760-65: see tables below.

Based on the information above, the value of imports and exports for the Oxford district were estimated as follows: from 1725 to 1742, it was estimated as 0.25 times the values for Annapolis district; for 1747 and 1748, straight line interpolations between 1746 and 1749; and, from 1749 to 1759, it was estimated as 0.5 times the values for Annapolis district.

Pocomoke District: The Pocomoke District mostly closely resembles Accomack district in Virginia. Both are Eastern Shore areas which largely abandoned tobacco growing in the early eighteenth century. However, unlike Accomack, the available evidence suggested that Pocomoke always produced some tobacco. The table below gives the available data:

| Year | Tobacco exported from Pocomoke District  (hhd) |
| --- | --- |
|  |  |
| 1731 | 978.5 |
| 1733 | 911 |
|  |  |
| 1761 | 1279 |
|  |  |
| 1768 | 1003 |
| 1769 | 425 |
| 1770 | 341 |
| 1771 | 1154 |
| 1772 | 254 |
|  |  |

Source: 1731, 1733: Calvert Papers; 1762: MSA; 1768-72: CUST 16/1.

Based on this table, it appeared that Pocomoke district almost always exported between 800 and 1000 hogsheads of tobacco. Thus, the value of exports from Pocomoke are estimated as equal to those of Accomack with the value of 800 hogshead of tobacco added to the value of exports to Great Britain. The value of imports from Great Britain is unaffected, as this is not reflected in the Naval Officer Shipping Lists. The values added from 1725 to 1771 are as follows:

|  | Value |
| --- | --- |
| Year | ( Sterling) |
|  |  |
| 1725 | 7050 |
| 1726 | 3567 |
| 1727 | 3637 |
| 1728 | 3305 |
| 1729 | 3198 |
| 1730 | 2954 |
| 1731 | 2861 |
| 1732 | 3201 |
| 1733 | 3052 |
| 1734 | 3928 |
| 1735 | 3298 |
| 1736 | 3229 |
| 1737 | 3735 |
| 1738 | 3955 |
| 1739 | 3508 |
| 1740 | 3268 |
| 1741 | 4019 |
| 1742 | 4439 |
| 1743 | 4121 |
| 1744 | 3112 |
| 1745 | 3094 |
| 1746 | 3247 |
| 1747 | 3736 |
| 1748 | 4338 |
| 1749 | 4186 |
| 1750 | 4919 |
| 1751 | 4992 |
| 1752 | 4971 |
| 1753 | 4808 |
| 1754 | 4332 |
| 1755 | 3634 |
| 1756 | 3714 |
| 1757 | 4277 |
| 1758 | 4579 |
| 1759 | 5283 |
| 1760 | 5224 |
| 1761 | 5164 |
| 1762 | 5138 |
| 1763 | 4860 |
| 1764 | 4508 |
| 1765 | 4789 |
| 1766 | 5729 |
| 1767 | 6028 |
| 1768 | 5859 |
| 1769 | 6977 |
| 1770 | 7981 |
| 1771 | 8199 |
| 1772 | 8191 |
|  |  |

Notes: The value was calculated by multiplying 800 hhd/yr by the average weight of Maryland hogsheads (from Appendix 1) by the price (Pennsylvania shillings per cwt from Bezanson, Table 10) and converting to Sterling using the Pennsylvania Exchange Rate (see Appendix 1)

1. Lorena S. Walsh, “Summing the Parts: Implications for Estimating Chesapeake Output and Income Subregionally,” *William and Mary Quarterly*, 3d ser., 56 (1999): 53-61. [↑](#footnote-ref-1)
2. There were two “Patuxent Districts” in Maryland, one a Naval Officer’s district and the other a Customs Collector’s district; they did not have the same boundaries. The tobacco export figures are for the Naval Officer district, which encompassed just the Patuxent river. However, the CUST 16/1 figures for 1768-1772 are for the Customs Collector’s district. The following relationship applied between the various Maryland districts:

   1. The North Potomac Naval Officer district had the same boundaries as the North Potomac Customs Collector district.
   2. The Pocomoke Naval Officer District had the same boundaries as the Pocomoke Customs Collector district.
   3. The combined boundaries of the Patuxent, Annapolis, and Oxford Naval Officer districts were the same as the combined boundaries of the Patuxent and Chester Customs districts.

   Thus, the amount of tobacco exported from the Patuxent Naval Officer District is equal to the amount of tobacco exported from the Patuxent Customs district (from CUST 16/1) plus the Chester Customs district (from CUST 16/1), minus the amount of tobacco exported from the Annapolis Naval Officer district (from the tables below) minus the amount of tobacco exported from the Oxford Naval Officer district (from the tables below). This is how the figures for exports from the Patuxent Naval Officer district in Table75 were calculated. [↑](#footnote-ref-2)