Did foreign capital flows finance the industrial revolution? A reply

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W hen beginning to construct the balance of payments of eighteenth-century Britain, I was confronted with the dilemma that scholars working with data encounter: whether or not to estimate data with wide errors of measurement. A decision that the data were not worth publishing because they were too fraught with errors would have meant that we would have no idea whether Britain had a current account deficit in the eighteenth century. Scholars dealing with the financial side of the industrial revolution would therefore continue to argue without a quantitative base.

I chose to estimate the data in the best way possible, since I was dissatisfied with the fact that some scholars were, in any case, analysing savings and investments; and I hoped that, with time, by a process of trial and error, the estimates would become more accurate. The best method to begin estimating the balance of payments was to continue on Imlah's path, since there is consensus on his data.[1] This I did, being aware that my research was the first tentative effort to evaluate the eighteenth-century balance of payments.[2] Three times in my article I stated: 'The estimates are very tentative, but are none the less a starting point in the empirical area'.

Any attempt to improve estimates should surely be welcomed, even if this is just one more link in the chain of data refinement. I welcome the work of Nash, since he has added to our knowledge about the subject, and he is indeed trying to improve existing data.[3] However, his new estimates present serious inconsistencies and, unfortunately, would have to be used with caution.

Before analysing Nash's refinement, I would like to say that I emphasized in my own article that everyone working with data is liable to inaccuracies, and Nash is no exception. Moreover, in the section on the balance of commodity trade, he uses a phrasing that is inappropriate. He writes: 'No attempt has so far been made to re-evaluate imports, since it has *proved* impossible. . . . Brezis claims to have found a solution. . . . However, she does not present this new trade series . . . referring readers instead to her unpublished paper.'[4]

This could lead the reader to think that I attempted the impossible,

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[1] Imlah, *Economic elements*.
[2] Brezis, 'Foreign capital flows'.
[3] Nash, 'Balance of payments'.
[4] Ibid., pp. 111-2 (italics added).; Brezis, 'British nominal imports'.

and that I have hidden my series. It is not impossible to find data on prices, and to multiply them by quantities, though the work is tedious and the computing intensive. Moreover, I did not try to conceal my data. They are available and I have sent them to scholars (including Nash himself) who have requested them. Therefore, I shall leave this point and respond to Nash's estimation.

The purpose of Nash's comment is to give new estimates with great detail, on only two series of the balance of trade and services: net credit from shipping, and profits on trade (table 1, rows 5 and 7, p. 49 of my article). My estimates of these series were explained in the appendix, p. 61. His table 1 is equivalent to my table A1, and his table 2 is my row 7, p. 49. To be concise, I shall focus on the two main problems with the estimates, and leave the detailed analysis to the appendix.

The first inconsistency is that when Nash adds his new estimates for these two series to my own estimates on the other series, he comes to the conclusion that Britain did run a huge balance of payment surplus. This would mean in the years around 1780, a foreign credit of £80 million; yet he presents alternative data to mine which show a foreign debt of £20 million. The difference of £100 million between his estimates in the first part of his comment and the data he displays is intriguing. This discrepancy indicates that his method of estimation is not without problems.

The second problem, when summarizing Nash's data, is that from 1700 to 1770, British shipping earnings increased by 91 per cent (from £1.1 million to £2.1 million). In my data, there is an increase of 190 per cent during this period (from £1.5 million to £4.3 million).[5] Which increase makes more sense? Since we both agree that shipping earnings increased by 100 per cent, Nash's data imply that the share of British shipping earnings decreased during those years, by 5 per cent, while my data exhibit during those 70 years an increase of 46 per cent, half of 1 per cent per year on average.

A reduction in the British share of shipping earnings during these years that is implied by his data is inexact. Therefore, despite the extensive research on the different elements entering this series, there is a substantial problem with these data. The same problem occurs with the series on trade profits.[6]

What went wrong with the bottom line of Nash's data despite meticulous research on the different elements influencing the series? When estimating the different series composing the balance of trade, some scholars estimate each series with a small margin of error, but all the series are biased in the same direction. For instance, they may be overestimated. Other scholars might be less careful and make bigger errors of estimation, but the bias is in both directions. When many series

[5] See Nash, 'Balance of payments', tab. 1, my estimates in row (5), his in row (6). British shipping earnings can be compared, but not net shipping, since my data on the balance of trade are c.i.f., and he intends to take them f.o.b.

[6] Nash's data show an increase of 47 per cent, which seems too low, while mine show an increase of 100 per cent.

are combined to calculate the balance of trade, the first type of calculation gives an estimation that is strongly biased upward, while the second type of estimation might yield a point estimate which is quite close to the truth, since the errors cancel each other out, although the accuracy of the series may not be as high as that obtained using the first type of calculation.

This idea was expressed by Imlah when estimating the nineteenth-century balance of payments: 'The balances so constructed measure the growing volume of foreign investments, which in turn can be checked at certain points with the more credible results achieved by other investigators who have made different approaches to the problem. These comparisons . . . are reassuring. They suggest that any errors in the annual estimates for particular items in the balance sheet are relatively small or are cancelled by compensating errors in other items in the same year.'[7] Krugman calls it the 'law of an even number of errors'. A scholar estimating data makes errors; but he should find a way of making an *even* number of mistakes that will cancel each other out.

Despite the very serious research undertaken by Nash, his data are biased, as he always overestimates the data for 1700, and underestimates those for 1770. Nevertheless, many of the points, if taken cautiously, can improve the data, as I explain in the appendix. In conclusion, taking into consideration the appropriate arguments of Nash will lead to only minor revisions in the balance of payments. Therefore, quoting Nash: 'We are required to . . . recognize that industrialization, at least with respect to the financing of capital formation, was heavily influenced by forces operating in the international as well as in the domestic economy.'[8]

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APPENDIX: Estimates of the current account

Balance of trade
I have presented imports c.i.f. and exports f.o.b., so that they are compatible with and comparable to Imlah's data. Nash suggests presenting the trade balance f.o.b., to make the conversion from constant prices to current values on the f.o.b. data, and then adding the services. This is a useful suggestion.

Earnings from shipping
i. Nash is right to underline, as Davis showed, the 'one-way character' for English shipping. So on this point, I have *over-estimated* the shipping earnings of Great Britain.
ii. Nash is contradictory. On the one hand, he criticizes the high proportion of shipping in England's transoceanic trade that was foreign owned, criticizing my use of Wilson's view, that led me 'into the error of stating that a high proportion of shipping . . . was foreign owned'. On the other hand, in n. 22, he claims that 'a growing volume of colonial-owned shipping was employed in the Atlantic trades . . . which counts as foreign in the estimation of invisible earnings'. To imply that the view that the Navigation Acts were evaded is unsubstantiated in the literature is not a serious criticism.

Nash is correct that I have probably *underestimated* the English share of shipping in

[7] Imlah, *Economic elements*, p. 43.
[8] Nash, 'Balance of payments', p. 110.

the trade to colonial America, but since it is on a small tonnage, the error is small. However, he has overestimated this share in all trades, and does not take into account the changes in the trade with northern Europe. Moreover, in the triangular trade, most of the profits went to colonial America, so they should not be added.

iii. Regarding the freight rates, Nash writes that 'on European trade, Brezis's data are clearly wrong'. I took them from Davis. Would he suggest that the data he does not quote from Davis are 'clearly wrong' while those he uses are clearly correct? Nash argues that £4 a ton in the trades to Europe is incorrect and that prices tended to decline. Davis writes: 'In wartime, the rate for this voyage rose very steeply reaching peaks of £21 in 1746 and in 1761-3. . . . The principal cheap commodity paid the much lower rate of £4 per ton.'[9] It should not be forgotten that Britain was at war one year in two from 1689 to 1815.

Profits
Nash is right that 15% is too high, but the rate of profit he presents is too low, and the African problem is seriously overestimated. This explains the implausible results of an increase of profits by less than 48% in 70 years. In the next version, the rate of profits will vary depending on the merchandise and geography, rates varying from 5% to 30%.[10]

The current account deficit
Nash mentions the deficits of the year 1690, but not the overseas expenses which were much bigger during the war of the Spanish succession (1701-13).

Nash claims that foreign holdings in English government stocks were insignificant before 1720. It is correct that from then on, foreign investment was considerable, but it was not insignificant prior to that date, since the Dutch bought stocks of the Bank of England from its foundation in 1694.[11]

Nash claims that Dutch investment was liquidated after 1783. However, we know that the government continued to pay interest to the Dutch after the occupation of Holland by the French in 1795; actually the liquidation was partial.

Nash's conclusion is that England was a net debtor but by less than my estimates imply. In fact, his point estimate is included in my sensitivity tests presented in table 3, case c. Moreover, he claims that I underestimated the current account deficit in the second half of the century, which reinforces my conclusion that England experienced persistent current account deficits.

[9] Davis, 'English shipping industry', p. 253.
[10] I would like to thank S. D. Smith for his suggestions.
[11] See Wilson, *Anglo-Dutch commerce*, despite the fact that Nash seems to mistrust this source.

Footnote references
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