



## Bullionist Periods

### 20.1 BULLIONIST CONTROVERSIES (EMPIRICAL EVIDENCE)

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The bullionist periods of Sweden, England, and Ireland involved bullionist versus anti-bullionist macroeconomic debates, with empirical studies vindicating largely the anti-bullionist side.

#### *20.1.1 History of Bullionist Periods*

The bullionist controversy is a debate that can occur in monetary history when a paper currency and floating exchange rate interrupt a metallic standard. The three famous bullionist periods pertain to Sweden, England and Ireland. In 1745, the Riksbank made its notes inconvertible into copper bullion, resulting in the paper daler. It was not until 1776 that the Swedish bullionist period ended, with conversion to a new currency unit (the riksdaler) on a silver standard. The English, followed by the Irish, bullionist period began in 1797, each by government order requiring the Bank of England and Bank of Ireland to cease making gold payments for its notes. Legislation, periodically renewed, solidified the orders. In 1821

the Bank of England, followed by the Bank of Ireland, resumed payment in gold, and the countries were back on a gold standard. The English episode is called the 'Bank Restriction Period'.

The three bullionist periods involved common elements: a prior metallic standard replaced by a paper standard, a fixed exchange rate (constrained within a band around an effective mint parity) giving way to a floating rate, unusually high inflation, depreciation of the currency in the foreign-exchange and bullion markets, a subperiod of deflation, and eventual return to a specie standard and fixed exchange rate. Also, periods of war occurred both before and during the bullionist periods.

Some characteristics were shared by only two of the periods. First, the proximate cause of the Swedish and English Restrictions was a tremendous loss of reserves on the part of the Riksbank and Bank of England. This was not the case for the Bank of Ireland; British pressure induced the Irish government to suspend convertibility of Bank of Ireland notes. Second, for Sweden and England, their main trading partners remained on a metallic standard. This was not so for Ireland, with England also on paper. Third, England and Ireland returned to a gold standard at the old parity; Sweden switched from an effective copper to an effective silver standard, and banknotes were depreciated by 50% in terms of silver.

Two additional features characterize all three periods. First, the macroeconomic debate centered on determination of the exchange rate and price level, and their relationship to the balance of payments and note issues of the central bank. The bullionists adopted a monetarist approach, and the anti-bullionists a non-monetarist position. Second, Parliament played a key role in the controversy. In the case of Sweden, two political parties vied for control of Parliament. The 'Caps' had a bullionist agenda, and the 'Hats' an anti-bullionist policy. Both had intellectual supporters on the outside. The British House of Commons appointed committees, in 1804 and 1810, to investigate the depreciated Irish and English currencies. Each committee produced a highly bullionist report, important in the literature; but in neither case was the report favorably received by Parliament.

### 20.1.2 *Bullionist, Anti-Bullionist, and Country-Bank Models*

To examine the empirical literature on the bullionist controversies, each side is represented by its mainstream model of chains of causality, sequential hypotheses. Notation is  $X \rightarrow Y$  ('X causes Y, with  $\partial Y/\partial X > 0$ ').

Multiple hypotheses are  $W, X \rightarrow Y$  ( $W \rightarrow Y$  and  $X \rightarrow Y'$ ) and  $X \rightarrow Y, Z$  ( $X \rightarrow Y$  and  $X \rightarrow Z'$ ). The subscript  $f$  designates a foreign variable. Variables are:

- BN: central-bank notes in circulation
- BP: balance-of-payments deficit
- CN: country banknotes in circulation
- ER: exchange rate, price of foreign currency
- FR: remittances to foreign countries
- HQ: quantity and quality of harvest
- MS: money supply (M1)
- PG: price of gold
- PL: price level
- PM: price of imports
- PW: price of wheat
- TR: foreign trade-restrictions

The *bullionist model* is decidedly monetarist: only monetary variables affect only monetary variables. The English-bullionist chain of causation is:

$$BN \rightarrow MS \rightarrow PL \rightarrow ER, PG$$

$BN \rightarrow MS$  reflects the bullionist, and correct, perception that Bank of England notes constituted the monetary base during the Restriction Period. There was a hierarchy of banks: Bank of England (central bank), London private banks, and country banks. Bank of England notes (held as reserves by the country banks and London private banks) were non-redeemable; deposits at the Bank (held as reserves only by the London private banks) were cashable only in Bank of England notes. The country banks—but not the London private banks—issued notes. There were no legal reserve requirements for any bank; but, like all companies, banks had to settle their debts (note and deposit liabilities) in cash. Reserves of the country banks were principally deposits at the London private banks, with Bank of England notes (and, in principle, gold) for vault cash. Bank of England notes circulated in and around London, as well as in Lancashire and Norwich; country banknotes circulated elsewhere in England and Wales. During the Bank Restriction Period, the English country banks

and Scottish banks ‘redeemed’ their notes in Bank of England notes rather than gold. This was a matter of practice rather than law.

Strictly speaking, gold coin was a component of the monetary base, but the premium on gold bullion did not have a counterpart in the premium of gold coin over Bank of England notes. There was no legal market for domestic coin in terms of paper money, and an overwhelming proportion of the gold coin nominally in circulation or newly minted was in fact hoarded or exported.

For the bullionists (and anti-bullionists), the money supply had as components Bank of England notes, country banknotes, and coin. In excluding *deposits* from M1, the writers of the Restriction Period were not far off the mark. First, except in London, ‘deposits’ generally meant time or savings deposits rather than demand deposits. Second, if interbank transactions are excluded, demand deposits typically were exchanged for cash rather than transferred to another account.

BN  $\rightarrow$  MS was also asserted by the Irish bullionists, even though the banking system was looser. In and around Dublin, notes of the Dublin private banks circulated along with notes of the Bank of Ireland. Gold did not circulate, except in the north until 1808–1809, when it was replaced by the notes of newly established Belfast banks. Elsewhere, local private banknotes generally dominated, but in competition with Bank of Ireland notes and, to a lesser extent, Dublin private-bankers’ notes. The private banks kept their reserves in Bank of Ireland notes (and gold), and by convention their notes were redeemed in Bank of Ireland notes.

In the Swedish bullionist period, BN = MS. With little coin circulating, no commercial banks in existence, and deposits at the Riksbank representing merely the right to make withdrawals in notes, Riksbank notes essentially equaled the money supply.

MS  $\rightarrow$  PL pertains to the quantity theory of money. Underlying this theory is the bullionist view that the Bank of England effectively pegged the market interest rate at five percent, by standing ready to discount all ‘good’ commercial bills at that rate. Thus the monetary base is perfectly elastic at the constant discount rate of five percent, a powerful impetus to the quantity theory.

There is good reason for this view: the usury laws set a five-percent limit on annual interest on bills of exchange, and the discount rate of the Bank of England was fixed at this rate. While bill brokers could charge a commission and private banks could require a minimum balance, the Bank did not use such devices. The market discount rate (for good bills) did not

*exceed* five percent during the Restriction. In fact, only for about a year (beginning July 1817) did the market rate even *fall below* five percent. The situation was yet stronger regarding the Bank of Ireland: its discount rate was limited to five percent by charter.

However, the English and Irish bullionists were wrong in inferring that the monetary base (essentially BN) could rise without limit. First, there is evidence that in historical fact the monetary base was not perfectly elastic. Only ‘good’ bills—a minority of bills—were acceptable by the Banks. Also, the Bank of England effectively regulated discounts via a rationing system. These facts act against the quantity theory but support the concept of BN as an autonomous policy variable.

Second, even if the *supply* of the monetary base (essentially BN) is perfectly elastic at the pegged market interest rate, BN is limited by the *demand* for the monetary base. The Bank of England and Bank of Ireland could not induce the private sector to hold more BN than demanded. BN was viewed by the bullionists as the first link in the causal chain; but it is an endogenous variable. A low level of economic activity could hold down the demand for BN.

PL → ER is the purchasing-power-parity theory (given  $PL_f$ ), the causal nature of which is generally ignored in the modern literature. PL → PG involves a relatively unchanged  $PG_f$ , for, under perfect markets, PG is the product of ER and  $PG_f$ . PG was not as interesting to the Swedish and Irish bullionists as it was to the English. Sweden had been on a copper standard; the concern in Ireland was depreciation of the Irish currency against the British. For the Swedish and English protagonists, foreign exchange was Continental currencies.

For most Swedish and Irish bullionists, the latter part of the chain is merely  $MS \rightarrow PL, ER$ . The price level and exchange rate are co-determined by the money stock. Some Irish bullionists allowed for a changing foreign (English) price level, so the hypothesis becomes  $MS/MS_f$  (or  $BN/BN_f$ ) → ER.

The English *anti-bullionist model* involves a balance-of-payments theory of the exchange rate, with demand for and supply of bills of exchange represented by the payments deficit (BP), yielding ER and PG. The state of the harvest, a real factor, determines the domestic price of grain, represented by the price of wheat (PW). The exchange rate is an ingredient in the price of imports, which, together with PW, determines PL. These anti-bullionists saw three principal determinants of BP, that is, of shifts in the demand for or supply of foreign exchange: PW,

foreign trade-restrictions (wartime restraints: the Continental System and the American embargo), and foreign remittances (external government payments: direct military expenditure and subsidies to allied countries). The English anti-bullionist causal chain is:

$$\begin{array}{ccccc}
 1/HQ & \rightarrow & PW & \rightarrow & PL \rightarrow BN \\
 & & \downarrow & & \uparrow \\
 TR, FR & \rightarrow & BP & \rightarrow & ER, PG \rightarrow PM
 \end{array}$$

In emphasizing the price of wheat, the anti-bullionists recognized the highly agrarian state of the British economy, notwithstanding the industrial revolution in progress. The emphasis on wartime interference with trade and on external military expenditure reflected the French Revolutionary and Napoleonic Wars, in which Britain was engaged for much of the Bank Restriction Period.

For the Irish anti-bullionists, concerned with the English exchange, TR and PG were unimportant. They did not make explicit the connection of PW and PM to PL, and FR took the form of payments to absentee landlords in England. Some consolidated the trade balance, interest payments, net capital exports, and FR, to compose (and presumably shift) BP in the causal chain. They left unclear the mechanism from BP to PL. The Swedish anti-bullionists had the chain:

$$BP \rightarrow ER \rightarrow PM \rightarrow PL, \text{ allowing real shocks to operate on BP.}$$

The anti-bullionists used the ‘real-bills’ doctrine to reverse the bullionist  $BN \rightarrow PL$  causation. They accepted that the Bank behaved passively in its note issuance, but used the real-bills theory to demonstrate that excess issue (beyond the ‘needs of trade’) would be returned to the Bank instead of acting to increase the price level monetarily. Only non-monetary forces could cause real income and then the price level to increase, and would underlie the demand for discounting to finance a higher volume of transactions, whence  $PL \rightarrow BN$ . The Irish bullionists also propounded the real-bills doctrine (for the Bank of Ireland), although some saw ER playing the role of PL.

Bullionists in all three periods essentially inverted the real-bills theory by offering the *policy rule* that central-bank note issuance should be oriented to the exchange rate and (for the English bullionists) gold price:  $ER, PG \rightarrow 1/BN$ .

### 20.1.3 *Extension to Country Banks*

A subsidiary part of the English and Irish bullionist controversies was the extent to which the country banks (in Ireland, including Dublin private banks) could affect the money supply independent of the central bank. Should the first hypothesis in the bullionist chain,  $BN \rightarrow MS$ , incorporate CN naturally as  $BN \rightarrow CN \rightarrow MS$  (country banks unable to vary their note issues independent of the central bank)? Or should the hypothesis be  $(BN + CN) \rightarrow MS$  (the central bank and country banks able either jointly or separately to change their issues)? Or should the hypothesis be  $CN \rightarrow MS$  (only the country banks, not the central bank, having the power to change the money supply)? The question was answered differently by groups that cut across the bullionist versus anti-bullionist line.

The correct hypothesis is not clear, because of the environment in which banks operated. Among the complicating, and largely unknown, elements are the extents to which (a) one-time replacement of gold by central-bank notes in reserves altered country-bank policy regarding reserve ratios, (b) country-bank reserve ratios varied over time, (c) public preference for central-bank over country-bank notes changed in particular geographic areas and over time, (d) circulation of counterfeit notes and unlicensed-bank notes affected the demand for and supply of country-bank and central-bank notes, and (e) London private banks were prepared to run down their reserve ratios to accommodate country-bank demand for additional reserves.

### 20.1.4 *Empirical Studies: Visual Comparison of Movements of Variables*

The empirical studies examined here make use of quantitative information to test one or more component hypotheses of the bullionist or anti-bullionist models. It is logical to begin with contemporary studies, as it is the hypotheses of contemporary authors that are delineated in the previous sections.

All contemporary investigations use a simple technique: visual inspection of sets of figures, formal tables, or charts. The earliest such studies pertain to the Irish bullionist period, with  $BN$  and  $BN_f$  the note circulations of the Bank of Ireland and Bank of England. Parnell (1804), Foster (1804), and the 1804 Currency Report (in Fetter 1955) find that  $BN \rightarrow$

ER is confirmed. Ó Gráda (1993) and Fetter (1955) criticize the Report for its small number of observations and selective observations. These criticisms can be extended to Parnell, but not to Foster. The report of 1804 and Parnell also claim successful testing of  $BN/BN_f \rightarrow ER$ . Ó Gráda (1991) finds this part of the Report misleading in several respects; but the Report is to be commended for making specific allowance for the replacement of gold coin by notes. The Report also claims to disprove  $BP \rightarrow ER$ , via computation of a net balance-of-payments surplus. However, this proves little, because there is no representation of shifts in the demand for or supply of bills on London.

Contemporary empirical work on the English bullionist period begins with Ricardo (1811), whose positive finding of  $BN \rightarrow ER$  (Hamburg exchange) is reinforced by observation of a lagged effect and by accounting for replacement of gold coin by Bank of England notes. Galton (1813) confirms that  $BN \rightarrow ER$ , PG. Anonymous (1819) sees mixed evidence for that hypothesis, but observes that grain imports and FR (not precisely defined) affect the exchange rate—the first results in favor of anti-bullionism.

There is a hiatus of more than a century, but three groupings of subsequent work do not merit review. First is any investigation, such as Silberling (1924), involving the London price of the Spanish dollar to represent the exchange rate. That choice is methodologically unsound. Britain was on a suspended gold (not silver) standard, and the Spanish silver dollar was not a circulating coin in Hamburg, the main foreign-exchange market. Second are tests making use of Silberling-developed series of Bank of England total advances and their private versus public components. These series have been shown to be seriously inconsistent with the Bank's published data. Third, and most unfortunate, are all studies using 'data' on country banknote circulation. There exist no true data on country banknote circulation in England, or private banknote circulation in Ireland, during the bullionist period. Further, with no legal or fixed reserve ratio of note liabilities to cash, the circulation of the Bank of England, or Bank of Ireland, cannot be used to infer that of the private banks.

Private banks were required to register at the Stamp Office and pay a stamp tax on notes, prior to issuance. Some have used stamp-tax data to develop proxy CN series for England, based on the value of country banknotes stamped; but the series are based on assumptions so tenuous as to make the series unusable.



Silberling (1924) develops an annual series for FR ('extraordinary foreign payments'), consisting of grain imports over a normal amount, Continental British war expenditures, and subsidies to foreign states. Using various definitions of FR, based largely on Silberling, Angell (1926) shows that  $FR \rightarrow ER$ , but can find no causal relationship between PL and ER. This result, favorable to anti-bullionism, is supported by Morgan (1939, 1943) and Viner (1937). Morgan rejects  $BN \rightarrow PL$ , but accepts  $PL \rightarrow BN$ . His only finding not supportive of anti-bullionism is the lack of a relationship between PW and PL or BN.

Gayer et al (1953, p. 932) support  $BP \rightarrow ER$ ; but they represent BP by the balance of trade, the data of which are crude. For the Swedish period, Eagly (1971) and Bernholz (1982, 2003) support  $BN \rightarrow PL$ , ER, favorable to bullionism.

This entire body of literature must be viewed with caution. First, interpretation of relationships among variables is subjective when data are merely tabulated or plotted. Second, macroeconomic variables are generally non-stationary, leading to the possible outcome of 'spurious regression'.

### 20.1.5 *Empirical Studies: Time-Series Analysis*

Myhrman (1976) computes annual growth rates of BN and PL, for Sweden and England, and argues that  $BN \rightarrow PL$ . Jonung (1976) does the same for Sweden alone. Transforming data to growth rates could yield stationarity. In a joint test of bullionist and anti-bullionist hypotheses, Arnon (1990) regresses PL on PW, BN, and a trend. He finds that BN contributes more to the regression than PW. The variables are transformed to correct for serial correlation, which could correct spurious regression.

Formal time-series analysis in the bullionist literature begins with Ó Gráda (1989, 1993). For England, he cannot reject a cointegration relationship between  $\log PL$  and  $\log BN$ . This means that there is no long-term equilibrium between the variables, a failure of support for either bullionism or anti-bullionism. The same negative result holds for Ireland, with  $BN/BN_f$  used in place of BN.

Nachane and Hatekar (1995) use Granger causality and cointegration techniques for England. Their variables are PL, ER, PG, BP, and  $BN/Y$  (transformed to logarithms except for BP, the only non-stationary variable), where Y is real output. Their results are  $ER \rightarrow PL$ ,  $PL \rightarrow$

BN/Y (with PL and BN/Y the only cointegrated pair of variables), and BP → ER, PG. The findings are strongly supportive of anti-bullionism; but measuring the money supply in relation to output is outside the mainstream controversy.

The analyses of Ó Gráda and Nachane-Hatekar are restricted to bivariate econometrics. Officer (2000) applies multivariate testing to PL, ER, BN, FR, and PW, for England. Non-stationarity cannot be rejected, but cointegration is rejected. The logarithmic variables are first-differenced (to achieve stationarity), and Granger causality testing along with innovation analysis is applied. Results are mixed for bullionism, but unambiguously favorable to anti-bullionism. For example, the real-bills doctrine, PL → BN, receives stronger support than does the quantity theory, BN → PL.

It is logical that the time period for testing hypotheses be strictly within the pertinent bullionist period, because the alternative (bullionist versus anti-bullionist) models are geared to a paper standard and floating exchange rate. As his sample, Officer uses the 96 quarters encompassed by the Bank Restriction Period (1797-Q2 to 1821-Q1, where Q is the quarter-year). Nachane and Hatekar employ annual data, and extend the time period to 1838. Ó Gráda has quarterly observations, but begins his time periods prior to 1797.

Nachane and Hatekar can also be criticized for using the exchange rate on Paris rather than Hamburg to represent ER. There are no quotations on Paris until 1802 (whence they lose observations), and historians agree that the Hamburg exchange was more representative during wartime.

To conclude: certainly, at least for England, the anti-bullionist position receives greater support (or less contradiction) than the bullionist side of the controversy. This result is inconsistent with modern macroeconomics. The anti-bullionist approach to the exchange rate (a flow theory) and monetary policy (passive, accommodating the price level) has been superseded in modern theory. Also, modern monetarism emanates from bullionism.

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