A measurement of asymmetry in the running of the classical gold standard

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Summary (1)

- Main features of the gold standard (including symmetry)
- Purpose of the paper: measurement of symmetry and legal constraint to symmetry
- Symmetry in a (quasi) fixed exchange rate system (Bretton Woods). The case of a single currency: the Eurozone
- Symmetry in a gold specie standard, and in a system with notes and bank deposits

Summary (2)

- Comparison of 5 European countries, pre-WW1 ("classical" gold standard period)
- Common definition of aggregates, common conversion ratio ("apprehension ratio")
- Obstacles to symmetry
- Empirical analysis: how much reserves, the current account account balance and the apprehension ratio help to explain changes in the monetary base

Gold standard: rules of the game

The expression was first mentioned by Keynes (The Economic Consequences of Mr Churchill):

. Currency's gold parity

. Free gold movements within the system; no currency controls

. Fixed conversion ratio currency/gold

. **Money supply linked to movements of gold in/out: hence, symmetry**

. High degree of price/wage flexibility

Purpose of the paper

- We try to respond to two basic questions:
- **Whether changes in the monetary base followed changes in the international reserve (symmetry)**
  - Previous studies measured symmetry by observing changes in interest rates
  - When not observed, we provide a measure of the asymmetry gap
- **Whether the observance of the legal conversion ratio was a constraint to symmetry**

Symmetry in a fixed exchange rate system

- Adoption of macroeconomic policies (demand management) coherent with the surplus/deficit position of each country member of the system.

- Asymmetries under the **Bretton Woods system** (US as hegemonic country):

- US in surplus: "shortage of dollar", deflation elsewhere; US in deficit: dollar's exorbitant privilege, inflation elsewhere. Demise of the system, 1971

Symmetry in a single currency system (monetary union)

- The Eurozone
- Single monetary policy (by definition); fiscal policy: budget consolidation, balanced budget: ordoliberalism, neutrality of money.
- Resort to supply side policies.
- Germany as hegemonic country. Asymmetries difficult to assess

Gold (*specie*) standard symmetry

- In a gold *specie* standard: symmetry is market-induced, non-discretionary:

- Trade deficit→gold outflow→money supply shrinks→prices/wages decrease→exports increase→trade rebalanced

- Vice versa in surplus countries

(Hume, 1764)

Gold standard symmetry in a notes and bank deposits system

- Not an embedded symmetry, potential strong expansion of the money supply
- To maintain convertibility: legal limits to this expansion
- Two targets (the 'rules of the game'):
  - **a legally defined rule: statutory conversion ratio currency (notes)/gold**
  - **a non statutory rule: to adjust money supply to gold movements (symmetry).** Being non statutory, the surplus country is free not to expand money supply (potential asymmetry)

Complying with the two rules of the game

- The first rule, being a legal requirement, is very important because its observance may affect compliance with the second, non statutory rule (symmetry).

- For instance: if a country has difficulty to comply with the legal ratio, it will be reluctant to expand money supply even though in a certain year it has an increase in the gold reserve, following a surplus in its trade balance

To verify symmetry: Focus on 5 countries

- **Britain, France, Germany, Italy, Spain**, the largest European economies in the second half of the 19th century (A. Maddison's GDP estimates)

- Broadly speaking, they were, de jure or de facto, on a gold standard basis, save periods of suspension

- Starting date varies, according to availability of statistics; final date 1913 (WW1)

To verify symmetry, we need to know:

- Level and changes in each country's balance of payments(1), **international reserve, money supply**, and

- **Conversion ratio**, whose observance may affect – as mentioned – changes in monetary base due to changes in the reserves, i.e. may affect symmetry

- We also need a **common definition** for the aggregates, and a common conversion ratio, for comparison

(1) *The balance of payments, though important, will not be used because its data are often inconsistent with reserves data. And, in fact, the relevant variable that affects money supply is the international reserve*

International reserve, money supply

- **Different legal situations in different countries**, particularly in reference to components of money supply, where we can observe; notes issued by the central bank, or more than one central bank (Italy), by private commercial banks (UK), by the Treasury, and coins.
  - Necessity to take homogeneous data, for comparison.
- Regarding the **reserves,** we have taken into account that the **int.nal reserve was made of gold, but in some countries also of "hard" currencies (gold exchange standard)**
- About the **money supply**, for convertibility purposes gold standard countries never considered the whole money supply (however defined, various Ms). They either **considered just circulation, or –also- bank balances at the central bank**: **monetary base.** From the monetary base we have subtracted coins, in the assumption that they were often not directly convertible into gold.
- **In summary, for purpose of comparison, for each country we take: (1) reserves: gold and foreign exchange; (2) Money supply: notes circulation and bank balances (monetary base), less coins**

Conversion ratio and "apprehension ratio"(1)

- **Different conversion ratios** in different countries (levels and money aggregates as denominator)

- Of an "arbitrary and variable character" (Keynes); "30-40%, or 1/3 of the note issue" (Hawtrey); 1/3 of circulation (Hayek); "no royal road to the amount of the apprehension minimum" (Bagehot)

Conversion ratio and "apprehension ratio" (2)

- **Legal approach**: to rely on (changing) different legislation; difficulties and unfair comparison

- **Economic approach**: to rely on a common definition of the relevant aggregates (as mentioned), and on a single ratio that we call – from Bagehot – **"apprehension ratio", at 35% of the monetary base**

Our equation to measure the coverage ratio

- Linking coverage ratio, international reserve, notes circulation and bank balances at the central bank

$$Coverage\,ratio\left(CR,\%\right)=\frac{Metallic\,Reserves+Foreign\,Exchange\,Reserves}{Circulation\left(notes\right)+Banks\,reserves}\,x100$$

Symmetry and obstacles to symmetry

- Symmetry implies that changes in the reserve are accompanied by changes of the monetary base in the same direction (passive: in **absolute** terms; active: in **proportional** terms)
- Obstacles: **legal conversion ratio**; precaution, inflationary concerns, national interest/prestige, bank's profitability; international investment position

Empirical analysis (1)

- Panel data estimate of the main determinants of the changes in the monetary base (dependent variable):
  - **Reserves**: (+) and significant
  - **Coverage ratio**: (-) and significant
    - This shows that other factors, such as the (implicit) following of the level of the CR, may also explain changes in the monetary base
    - The sign indicates that when R increased, but yet the CR was considered as low (not safe enough or close to the 35% AR), central banks were more conservative/cautious in the issue of currency
  - **Current account balance**: no significant

Empirical analysis (2)

- We compare the actual monetary base figures per country with the following of these rules:

Reserves-based rule. The gold standard **symmetry rule**: a policy rule based on changes in the reserves held by the central bank:

$$MB_t = MB_{t-1} \times \left(1 + DR\right) \qquad DR = R_t - R_{t-1} \qquad \text{(Eq. 1)}$$

Coverage ratio-based rule: a policy rule based on changes in the CR, irrespective of its level:

$$MB_t = MB_{t-1} \times \left(1 + DCR\right) \qquad DCR = CR_t - CR_{t-1} \qquad \text{(Eq. 2)}$$

Apprehension ratio-based rule: a policy rule based on changes in the deviations of the CR from the AR, 35%:

$$\text{(Eq. 3)}$$

$$MB_t = MB_{t-1} \times \Delta\left(CR - 35\%\right)_t$$

Empirical analysis (3)

- Calculation of the asymmetry gap as the **deviations of the actual monetary base from the reserves-based rule (see eq. 1)**.

  - When the **asymmetry gap is positive** (Monetary Base > Prescriptions of the reserves rule): An **inflationary gap**

  - When the **asymmetry gap is negative** (Monetary Base > Prescriptions of the reserves rule): A **deflationary gap**

Results:
Estimates of asymmetry gap per country

Measurement of asymmetry in the running of the gold standard
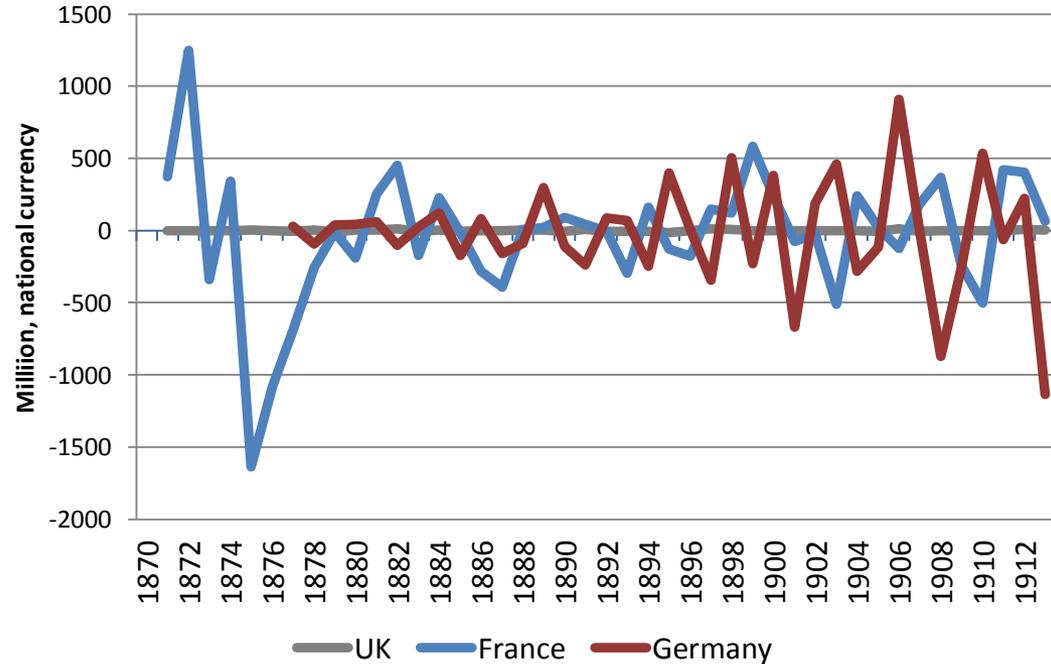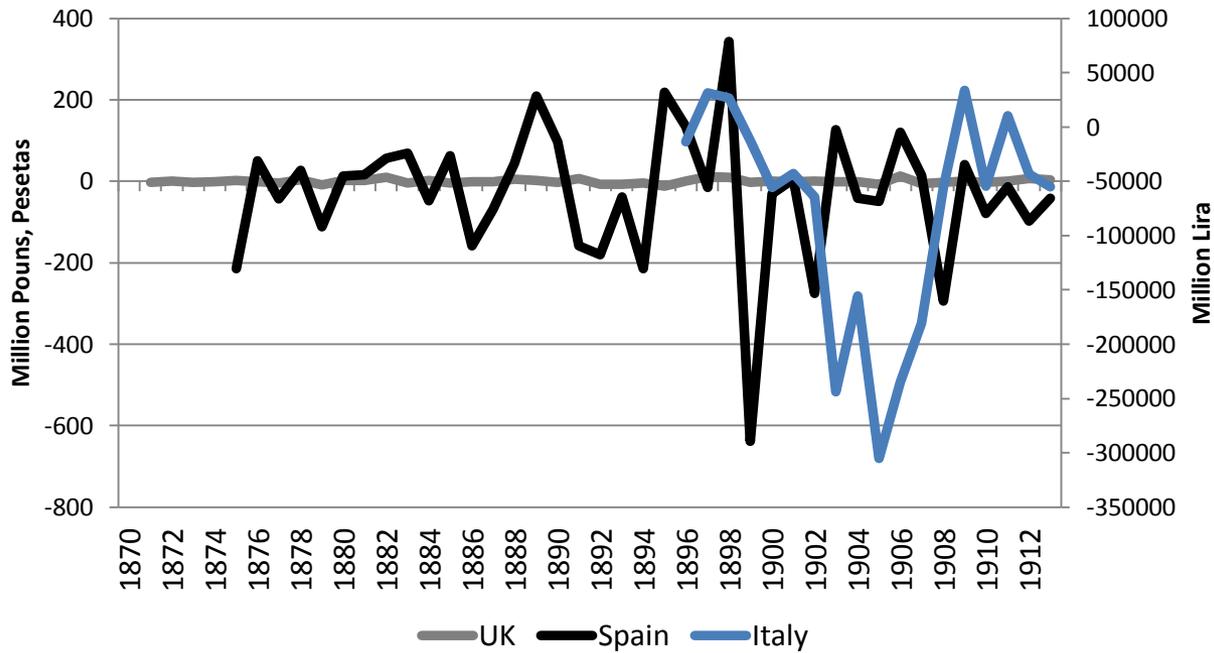Annual percentage deviation from the 'reserves rule' (symmetry),

(Yearly average, %)

- Spain   -2.8%
- France   -1%
- Italy   - 9%
- Germany   -1.1%
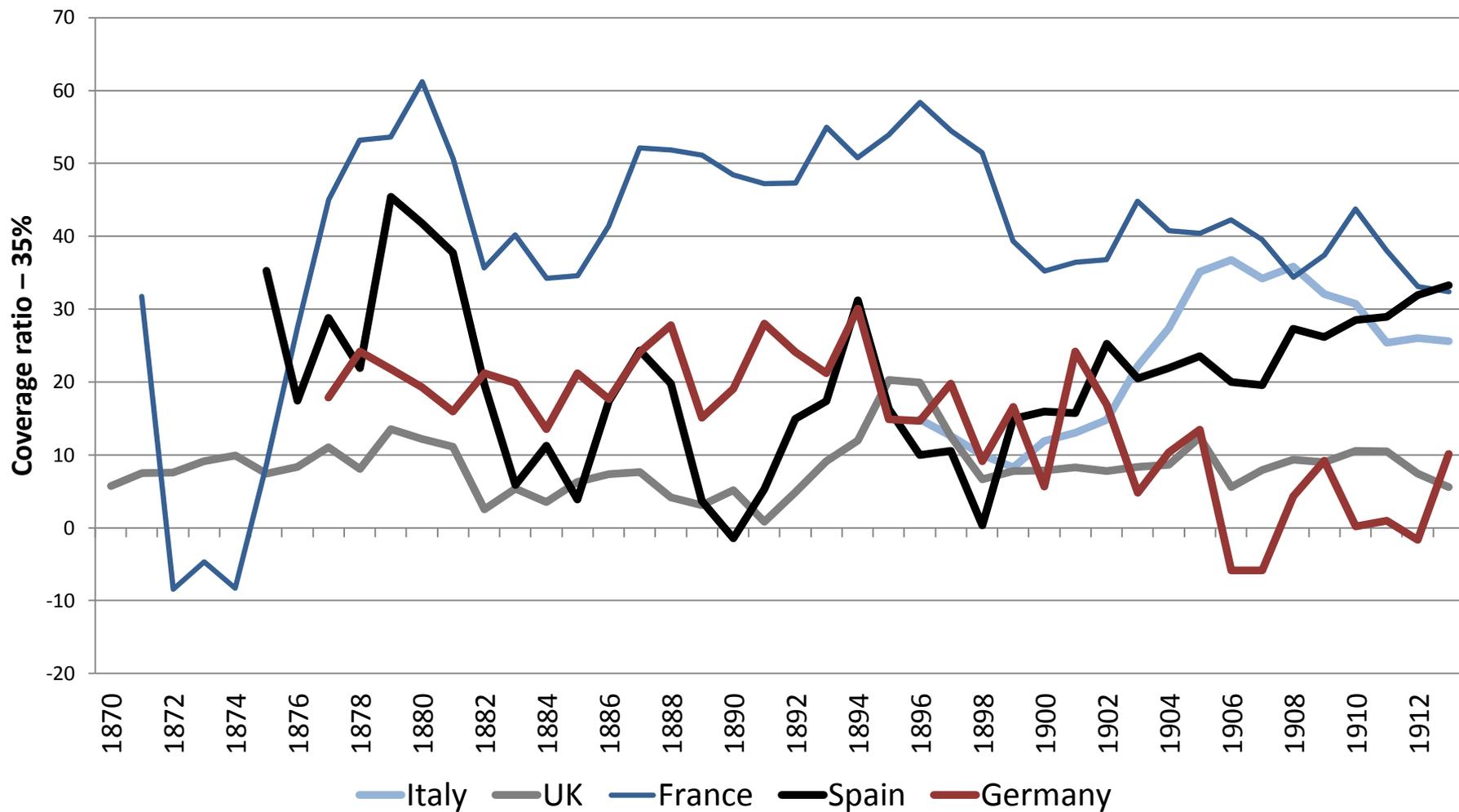- UK   -0.0003%

A negative/positive sign indicates an under issue/over issue of currency as compared to the symmetry rule

Observance of symmetry?

How big was the apprehension ratio?

Deviations of the coverage ratio from a 35% apprehension ratio

Conclusions

- Only the **UK abided by the rules of the game**: virtually no asymmetry gap from 1874 to 1913.
- The classical gold standard ran under asymmetry by all but the hegemonic country
  - The **system did not collapse because of asymmetry** but the outbreak of WW1
- The other 4 countries seem to have paid more **attention to the coverage ratio** in the running of the gold standard:
  - They systematically held a much greater than 35% coverage ratio as a **'safety ratio'**.
  - Only when the safety ratio was reached, they were more willing to follow symmetry.