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# Pictures of a Revolution: Analyzing the Transition from Global Bimetallism to the Gold Standard in the 1860s and 1870s

Johannes Wiegand

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**Pictures of a Revolution: Analyzing the Transition from Global Bimetallism to the Gold Standard in the 1860s and 1870s**

Prepared by Johannes Wiegand\*

June 2022

Approved by Stephan Danninger

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**ABSTRACT:** In the early 1870s, the global monetary system transitioned from bimetallism—a regime in which gold and silver currencies were tied at quasi-fixed exchange ratios—to the gold standard that was characterized by the use of (only) gold as the main currency metal by the largest and most advanced economies. The transition occurred against the backdrop of both large supply shifts in global bullion markets in the 1850s and 60s and momentous political events, such as the Franco-Prussian war of 1870/71 and the subsequent foundation of the German empire. The causes for the transition have long been a matter of intense debate. This article discusses three separate but interrelated issues: (i) assessing the robustness of the pre-1870 bimetallic system to shocks—which includes a discussion of the appropriate use of Flandreau’s (1996) reference model; (ii) analyzing the transition from bimetallism to gold as a multi-stage currency game played by France and Germany; and (iii) evaluating the monetary debates at the German *Handelstag* conferences in the 1860s, to present a more complete narrative of the German discussion in the run-up to the transition.

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Author’s E-Mail Address:	<a href="mailto:jwiegand@imf.org">jwiegand@imf.org</a>

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WORKING PAPERS

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# I. Introduction and Overview

In the early 1870s, the global monetary system transitioned from bimetallism to the gold standard; a momentous change that would tie down the system's parameters for decades. Newly unified Germany—which, prior to the early 1870s, had maintained an array of silver currencies—introduced a gold currency in 1873. France—on a bimetallic standard since the early 19<sup>th</sup> century—suspended free silver coinage soon thereafter. The United States—on an inconvertible paper currency ('green back') after the civil war years—also legislated the de facto adoption of a gold currency in 1873, it would take effect six years later. Thus, with the United Kingdom already on gold, by the end of the 1870s the world's leading industrial nations all used gold currencies. By contrast, silver—which, until 1873, had been on an equal footing with gold—became a secondary currency metal used mostly by peripheral countries.

The causes behind this shift have long been debated. In a seminal contribution, Flandreau (1996) identified the suspension of silver coinage by the French treasury in October 1873 as the critical event. The step ended France's stabilization of the gold-silver price ratio and dissolved the quasi-fixed exchange rates between gold, bimetallic and silver currencies. Flandreau argued that the decision reflected an "accident of history": an ad-hoc, unnecessary and ultimately futile attempt to deter Germany from adopting a gold currency (as the French step increased the cost of demonetizing the silver stock that Germany's currency reform would render obsolete).

With this contribution, Flandreau took issue with earlier views that the transition to the gold standard had been somehow inevitable. In particular, by developing and estimating a general equilibrium model of the bimetallic system, Flandreau showed that bimetallic system could have absorbed the 'silver glut' of the 1870s that was triggered by both Germany's demonetization of silver in the wake of its currency reform and increased silver production in the Americas. Reaffirming this view, Flandreau and Oosterlinck (2012) showed that bimetallism's demise took financial markets by surprise: in the early 1870s, the valuations of Indian silver rupee bonds relative to gold sterling bonds gave no indications that investors were expecting an imminent silver devaluation.<sup>1</sup>

While Flandreau's (1996) and Flandreau and Oosterlinck's (2012) articles clarified several open questions, some loose ends inevitably remain. This paper seeks to tie some of these ends together. It is organized in three separate but related sections:

**Section II** discusses the appropriate use of Flandreau's reference model of the bimetallic system. Since the publication of Flandreau's article, some authors have argued that bimetallism was less robust than Flandreau had shown. In particular, Meissner (2015) claimed that once the currency reforms of other countries in the 1870s are factored in, "*by 1875 bimetallism would have been unviable, and the US' return to convertibility in 1879 would have made it impossible to sustain true bimetallism*". The section shows that such results reflect (exclusively) the incorrect application of Flandreau's model. Once the corresponding errors are avoided, bimetallism's alleged fragility disappears.

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<sup>1</sup> For an example of the silver glut hypothesis see Kindleberger (1993). It has also been examined by Oppers (1996), Velde and Weber (2000) and Velde (2002), who developed alternative models of the bimetallic system that confirm Flandreau's results. In addition to the silver glut hypothesis, Flandreau took also issue with views that the transition had reflected the greater convenience of gold as a currency metal (see e.g., Redish, 1995) or political economy considerations (see e.g., Gallarotti, 1993).

**Section III** places the currency decisions of France and Germany in the 1850s-70s in a game theoretic setting. It builds on Wiegand (2019), which argued that Germany's adoption of a gold currency in 1871/73 reflected a prisoners' dilemma situation: maintaining a bimetallic regime jointly with France would in principle have been the better option, but Germany could not expect French cooperation in the wake of the Franco-Prussian war. At the same time, French *non-cooperation*—i.e., demonetizing silver while Germany was not yet on gold itself—could have been highly damaging. This confluence of factors made preemptive adoption of a gold currency Germany's dominant strategy. The section expands the timeframe to the two decades before and the years immediately after 1873, and sketches game-theoretic constellations for all these periods. The exercise helps explain why, prior to the Franco-Prussian war, attempts at monetary reform did not gain traction; it also gives insights into why efforts to restore a bimetallic system after 1873 failed.

Finally, **section IV** adds to the narrative of Germany's currency reform—a still under-researched area. Wiegand (2019) documented how the views of the protagonists of Germany's monetary reform debate evolved in the 1860s. This section adds a summary of the debates of the *deutsche Handelstag* assemblies in the 1860s. The *Handelstag* was an umbrella organization of regional chambers of commerce. As political power and representation were decentralized in Germany prior until the late 1860s, the *Handelstag* was one of the most important platforms for national economic policy debates. The *Handelstag* protocols show how the monetary debate obtained pace and direction in the 1860s, starting with mostly technical questions in 1861 and ending with an energetic push to abandon Germany's silver currencies in 1868.<sup>2</sup>

## II. Use and Misuse of Flandreau's (1996) Model of the Global Bimetallic System

This section investigates a claim by Meissner (2015) that bimetallism was more vulnerable to shocks than Flandreau (1996) suggested. The claim is rooted in two variations to Flandreau's analysis:

- *Considering a wider set of currency reforms.* Flandreau's analysis is limited to the impact of Germany's 1873 currency reform on bimetallism—even though several other countries also adopted gold currencies in the 1870s. Adding these countries to the analysis results therefore in a stiffer test for bimetallism.
- *Different data:* Flandreau's estimation procedure implies specific numbers for global bullion stocks in the 1850s and 60s. These figures deviate from numbers for bullion stocks reported elsewhere in the literature. Meissner claims that using different bullion data generates significantly different results.

As the discussion will show, the second variation is more important for Meissner reaching divergent conclusions from Flandreau. Two methodological issues arise though: (i) Meissner analyzes Flandreau's model with data for bullion stocks, while Flandreau uses only cumulative bullion production (=flows) as inputs. Performing the analysis with stocks adds data points that are very likely mismeasured and affect the estimates' accuracy and consistency. And (ii) rather than *re-estimating* the model with stock data, Meissner imposes stocks while *re-using* Flandreau's parameter estimates for inference. This approach is flawed per design and generates very misleading results.

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<sup>2</sup> The material in all three sections emerged as the result of revisions to Wiegand (2019) in the context of an—ultimately unsuccessful—submission to the European Review of Economic History. The results seem relevant enough to make them available to a wider audience, in particular section II.

## Stocks versus Flows

Flandreau's model of the bimetallic system is based on quasi-demand functions for gold and silver specie in the bimetallic block (for a derivation see Flandreau's article):

$$(1a) \quad p_G M_G^b = p_G G(1 - m_G) - S m_G$$

$$(1b) \quad M_S^b = -p_G G m_S + S(1 - m_S)$$

$M_G^b$  and  $M_S^b$  are the monetary gold and silver respectively circulating in the bimetallic block,  $G$  is the global gold stock,  $S$  the global silver stock,  $p_G$  is the legal mint ratio in the bimetallic block, and  $m_G$  and  $m_S$  are specie demand parameters.

Bimetallism is viable as long as both gold and silver coins circulate in the bimetallic block, yielding the boundary condition:

$$(2) \quad m_G \leq p_G G / (p_G G + S) \leq (1 - m_S).$$

**Estimation with stocks.** Estimates for  $m_G$  and  $m_S$  can, in principle, be obtained by estimating (1a) and (1b) directly with constrained least squares, provided  $p_G M_G^b$ ,  $M_S^b$ ,  $G$  and  $S$  are integrated of the same order and reliable data exist for each or these aggregates.<sup>3</sup> The estimates can then be used to compute (2).

**Estimation with flows.** Flandreau (1996) proposed a different estimation procedure, for which he re-wrote the specie demand equations (equivalently) as follows:

$$(3a) \quad p_G M_G^b = A + p_G (\sum_i \Delta G_i)(1 - m_G) - (\sum_i \Delta S_i) m_G$$

$$(3b) \quad M_S^b = B - p_G (\sum_i \Delta G_i) m_S + (\sum_i \Delta S_i)(1 - m_S)$$

$$\text{with } A = p_G G_{49}(1 - m_G) - S_{49} m_G \quad \text{and} \quad B = -p_G G_{49} m_S + S_{49}(1 - m_S).$$

$\Delta G_i$  and  $\Delta S_i$  are annual global gold and silver production in year  $i$ , and  $G_{49}$  and  $S_{49}$  are global gold and silver stocks in 1849.

(3) thus decomposes bullion stocks into (i) stocks in a base year and (ii) cumulative bullion production (=flows) thereafter. Moreover, the base year stocks  $G_{49}$  and  $S_{49}$  are absorbed by the intercept—which means that only data for global bullion production are needed to estimate (3). The estimate for  $A$ ,  $B$ ,  $m_G$  and  $m_S$  imply specific values for  $G_{49}$  and  $S_{49}$  though that can be extracted separately.

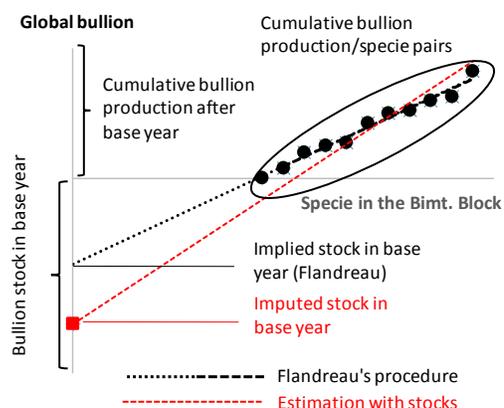
Figure 1 provides a simple illustration of how specie demand is estimated with both approaches; for the sake of the exposition it shows only one currency metal. With Flandreau's procedure (equations (3a/b)), the specie demand curve is estimated from the relationship between cumulative bullion production and specie. Data for

<sup>3</sup> Note that there are four constraints: equality constraints on  $m_G$  and  $m_S$ , and a no-constant constraint for each equation.

bullion stocks are not needed and do not enter the estimation; instead, a bullion stock for the base year is implied by the bullion production/specie relationship.<sup>4</sup>

By contrast, estimating specie demand with stocks as in (1a/b) adds a—potentially influential—data point that the demand curve needs to (also) fit: the imputed bullion stock for the base year. If this stock is mismeasured, specie demand will be estimated incorrectly. Incorrect estimates for specie demand, in turn, translate into an incorrect boundary condition (2), which can provoke misleading inferences about bimetallism’s robustness.

Figure 1: Estimating Specie Demand

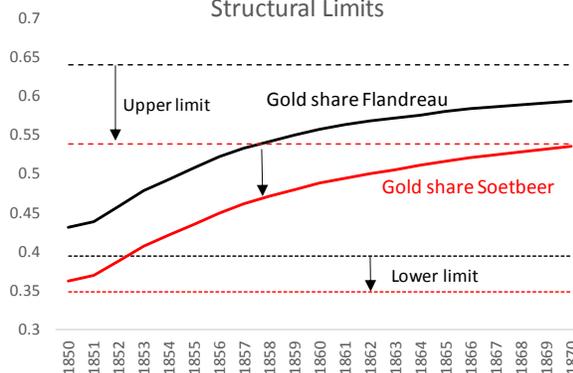


Flandreau’s procedure is valuable *precisely because* it allows estimation without resorting to data for mid-19<sup>th</sup> century bullion stocks, whose reliability is dubious. Bullion stocks cannot be observed directly, instead they need to be imputed from partial and spotty bullion production data that stretch back centuries. The most common source is Soetbeer (1885), a seminal publication that assembled time series for global gold and silver production from the discovery of the Americas in 1493 until the mid-19<sup>th</sup> century. While Soetbeer’s work undoubtedly marked a heroic effort, its limitations are severe—as Soetbeer readily acknowledged himself.<sup>5</sup> By contrast, high-quality data for annual bullion *production* do exist from the mid-19<sup>th</sup> century;<sup>6</sup> Flandreau complemented these with a carefully constructed time series for French specie circulation (Flandreau, 1995). In short, Flandreau’s procedure reflects a careful attempt to extract consistent estimates from limited historical data.

Figure 2 illustrates what happens in practice when evaluating the boundary condition (2) while ignoring Flandreau’s procedure. It shows two sets of estimates:

- The black lines reproduce Flandreau’s estimates. Specie demand parameters are obtained from regressing specie circulation in the bimetallic block on cumulative global bullion production as in (3); the parameters are then used to compute bimetallism’s structural limits, which form the boundary condition (2).<sup>7</sup> The

Figure 2: Gold Share and Bimetallism’s Structural Limits



<sup>4</sup> Denote the currency metal as M, then  $Specie_t = (1 - m_M)M_0 + (1 - m_M)\sum_i \Delta M_i$ , where  $M_0$  is the bullion stock at the start date and  $\sum_i \Delta M_i$  is cumulative bullion production thereafter.  $(1 - m_M)$  is the marginal demand for specie and determines the slope of the specie demand curve. Solving for  $Specie_t = 0$  yields  $M_0 = -\sum_i \Delta M_i$  for the specie stock at the start date.

<sup>5</sup> “When one considers the statistics on bullion production in earlier times, then every expert has to acknowledge that all compilations—even if assembled with the greatest effort and care and even if checked repeatedly—maintain a character of high uncertainty. Many quantitative figures are based on daring, rough estimates with wide confidence intervals, and sometimes even only on highly subjective, probabilistic guesses which are derived from very few and weak reference points” (Soetbeer, 1885, p. 10). Soetbeer’s contemporaries were often critical of his data: Hay (1887) considered them “no more than vague guesses”, del Mar (1902) even a “product of fertile imagination”.

<sup>6</sup> See the various sources listed in Flandreau (1996) and Wiegand (2019).

<sup>7</sup> See Wiegand (2019) for data sources.

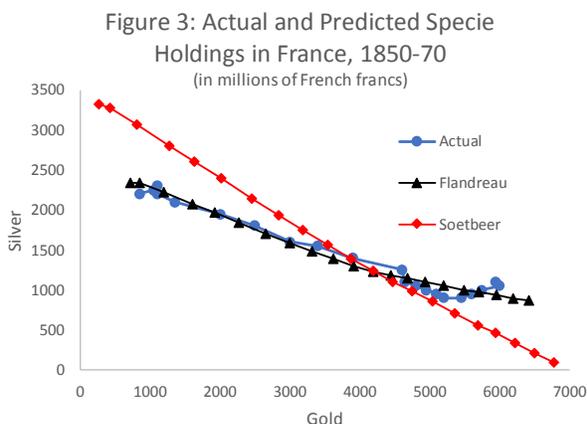
key result is that the structural limits bracket the global gold share throughout the estimation period, hence (2) holds—in line with bimetallism’s viability in the 1850s and 1860s.

- The red lines show results when the analysis is performed with imputed bullion stocks. Stocks are calculated following a procedure proposed by Velde and Weber (2000): aggregating Soetbeer’s historical production figures up to 1849 and applying an annual depreciation rate of 1 percent.<sup>8</sup> This puts global gold/silver stocks at end-1849 about 15/60 percent larger than the stocks extracted with Flandreau’s procedure; as a result, the share of gold in global bullion is some 7 percentage points lower (evaluated at the French mint ratio). (1) is estimated with these imputed stocks, and the resulting demand parameters are used to compute (2), yielding a revised boundary condition.

Note that the estimates for bimetallism’s structural limits shift down broadly in synch with the revision to the global gold share. As a consequence, the boundary condition continues to hold: also with imputed stocks, the structural limits bracket the global gold share throughout the estimation period.

The difference is that the model’s fit is far worse (Figure 3). With the Soetbeer-derived bullion stocks, the projected gold share in French specie is driven to the extreme limits of the bimetallic range in both the early 1850s and (at the opposite end) the late 1860s—even though the underlying data suggest no such thing.<sup>9</sup> As Figure 3 shows, the silver equation (1b) fits the data especially poorly, overpredicting French silver specie for the early 1850s (top left of the figure) and under-predicting it for the late 1860s (bottom right). This causes the residuals of the silver equation to be non-stationary: cointegration relationships between specie in the bimetallic block and global bullion that are implied by bimetallic theory can no longer be found in the data.

In short, imposing stocks mis-specifies the model, as the imputed stocks are inconsistent with the observed behavior of cumulative bullion production and specie. This outcome is *not* specific to the Soetbeer-derived stocks: whenever one imposes bullion stocks that deviate significantly from the global gold/silver ratio extracted with Flandreau’s procedure, the model becomes mis-specified. In this author’s view, this argues strongly in favor of Flandreau’s approach and against imposing stock estimates derived from spotty and incomplete historical data. While such data may be of general historical interest, their quality is too poor to use them in an empirical model.<sup>10</sup>



<sup>8</sup> Velde and Weber (2000) also incorporate estimates for 1493 bullion stocks, which is not done here as the author found no estimate for silver. However, as Velde and Weber note, 1493 stocks are minuscule compared to cumulative production in the 356 years thereafter, hence they do not affect materially 1849 stocks.

<sup>9</sup> For 1850, the Soetbeer-derived estimates predict France to be almost exclusively on silver, with only 6 percent of specie consisting of gold coins, while the actual figure is almost 30 percent. For 1870, the model predicts that France would hold only a sliver of silver (1½ percent of specie circulation), although silver still accounted for 16 percent of French specie. See also Figure 7 below.

<sup>10</sup> A legitimate question is why Flandreau’s implied stocks tend to be much lower than stocks computed by aggregating up past bullion production (in the example used here, the discrepancy is modest only because of the annual depreciation rate of one percent, which is an arbitrary assumption). One possibility is that for specie demand, the relevant determinant is the *effective* supply of bullion, i.e., bullion not tied up in industrial or other processes from where it would be difficult to extract. As such an aggregate cannot be observed directly, inferring it indirectly as Flandreau (1996) would then, as a matter of principle, be the only viable empirical strategy. Whether—or to what extent—such a mechanism is at play is speculative, however.

### Meissner’s (2015) Approach

As shown above, imposing imputed gold/silver stocks on Flandreau’s model provokes poor fit and, consequently, lack of statistical consistency—but it does *not* tend to generate radically different substantive results, as the estimates for bimetallism’s limits adjust in line with changes to gold/silver shares. Meissner *does* reach radically different conclusions, however—which raises the question why.

The reason is that Meissner does not re-estimate the model as in the previous subsection. Instead, he evaluates (1) and (2) by inputting his preferred global gold/silver quantities and then re-using the demand parameters *estimated by Flandreau*—which means that Meissner also copies Flandreau’s boundary condition. This procedure is inconsistent per design: Flandreau’s boundary condition reflects the relationship between his specie demand and global bullion data—thus, when the bullion data change, the boundary condition must change too.

Figure 4 uses again a stylized graph with only one currency metal to illustrate Meissner’s approach to ‘estimating’ specie demand (parallel to Figure 1). The specie demand parameter determines the slope of the demand curve. As this parameter is taken from Flandreau, the slopes of Meissner’s and Flandreau’s demand curves are identical. Different is the intercept, as Meissner imposes a different bullion stock. This results in a parallel shift of his specie demand curve relative to Flandreau’s. Per design, Meissner’s demand curve can bear no relationship with the underlying data, as the specie demand parameter is treated as a natural constant (i.e., data independent).

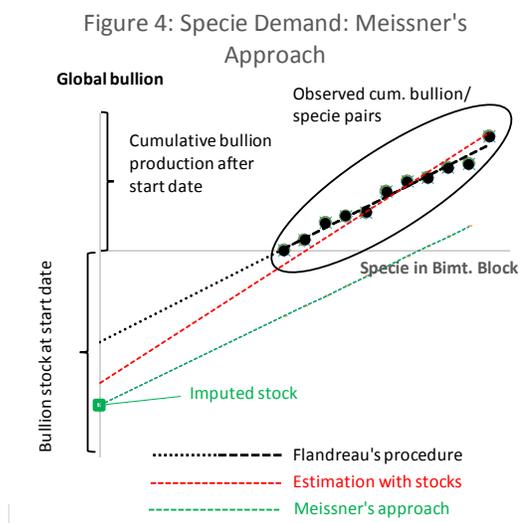
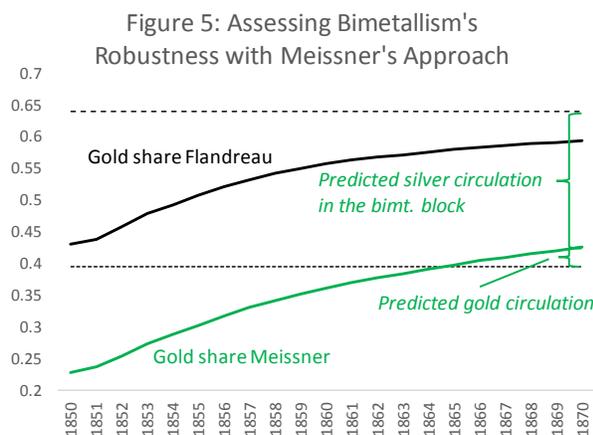


Figure 5 shows what this approach can do to the evaluation of the boundary condition (2) and therefore to the assessment of bimetallism’s robustness. It displays again, in black, the estimates for bimetallism’s structural limits and the global gold share obtained with Flandreau’s method. The green line reproduces a global gold share consistent with the ratio reported in Meissner (2015).<sup>11</sup> Different from Figure 2, however, bimetallism’s limits do *not* adjust in response to using different bullion stocks, as Meissner’s simply reuses Flandreau’s limits.

Note that combining Meissner’s bullion stocks with Flandreau’s boundary condition ‘predicts’ almost no gold coin circulation in the bimetallic block for the late 1860s (and negative circulation for the 1850s and early 1860s)—an enormous



<sup>11</sup> 0.77 in 1873, compared to a ratio of about 1.3 extracted with Flandreau’s procedure. In Figure 5, the ratio is obtained by using the gold stock estimated with Flandreau’s procedure and adjusting the silver stock correspondingly. Gold and silver stocks are then extrapolated backward with the bullion production figures used in Wiegand (2019).

discrepancy with the underlying data, as gold coins accounted for almost 90 percent of French specie the second half of the 1860s (Flandreau, 1995, reproduced in Figure 7 below). It is this incorrectly computed low gold share that makes bimetallism appear vulnerable to silver shocks in Meissner's out-of-sample simulations for the years after 1870: the vulnerability is an artefact generated by a flawed empirical approach.<sup>12</sup>

## So, How Robust Was Bimetallism?

The question that remains is how vulnerable bimetallism was to the currency reforms of the 1870s. As rightly noted in Meissner (2015), not only Germany replaced silver with gold coins in this decade, but also the Netherlands and the Scandinavian countries (Denmark Norway, Sweden and Finland), and the United States replaced the paper ('greenback') dollars from the civil war era with a gold currency.

To assess this question, the following again re-estimates Flandreau's model and then modifies bimetallism's structural limits, to simulate the impact of these reforms on specie circulation in the bimetallic block for the counterfactual case that bimetallism would have persisted. For the most part the simulations follow Flandreau's (1996) article that showed how to adjust the structural limits to account for a country switching from silver to gold. If  $\alpha$  denotes the country's specie circulation relative to that in the bimetallic block (evaluated at the French mint ratio), then the reform generates additional demand for monetary gold of  $\alpha(1 - m_G - m_S)$ , and reduces demand for monetary silver by the same amount. Hence the structural limits post-reform  $LL^*$  and  $UL^*$  can be written as

$$(4a) \quad LL^* = m_G + \alpha(1 - m_G - m_S) \quad \text{and}$$

$$(4b) \quad UL^* = 1 - m_S + \alpha(1 - m_G - m_S).$$

A different computation is needed to derive post-reform limits for the United States' return to the gold standard from paper money.<sup>13</sup> To this end, denote  $m_G^m, m_S^m, k$  as total *nominal* specie demand before reform from the gold block, the silver block, and the bimetallic block, respectively (as in Flandreau, 1996). The lower limit before reform can be written as

$$(5a) \quad LL = m_G = \frac{m_G^m}{m_G^m + m_S^m + k}.$$

A country that joins the gold block from an inconvertible paper currency generates additional demand of  $\alpha k$  for *both* gold and total specie. This modifies the lower limit to

$$(5b) \quad LL^* = \frac{m_G^m + \alpha k}{m_G^m + m_S^m + k + \alpha k}.$$

<sup>12</sup> See also Morys (2015), who even characterized the variation of bullion stocks (without re-estimating the model) as 'robustness checks'—where all this does is produce serially nonsensical results.

<sup>13</sup> This subsection redoes work by Meissner (2015), who derived a different and more cumbersome formula for the same type of currency reform. Meissner's derivation looks incorrect to this author, however. Denoting Meissner's post-reform lower limit as  $LL^M$ , Meissner computes  $LL^M$  as  $LL^*/(1 - LL^*)$ , where  $LL^*$  is defined as in (5b). The scaling with  $(1 - LL^*)$  does not seem to serve a sensible purpose.

Scaling both the nominator and denominator with total specie demand before reform ( $m_G^m + m_S^m + k$ ) yields

$$(5c) \quad LL^* = \frac{m_G + \alpha \frac{k}{m_G^m + m_S^m + k}}{1 + \alpha \frac{k}{m_G^m + m_S^m + k}}.$$

$\frac{k}{m_G^m + m_S^m + k}$  is specie demand from the bimetallic block as a share of global specie demand before reform, however, and therefore identical to  $(1 - m_G - m_S)$ . Substituting this into (5c) yields

$$(6a) \quad LL^* = \frac{m_G + \alpha(1 - m_G - m_S)}{1 + \alpha(1 - m_G - m_S)}.$$

A modified upper limit can be derived along the same lines as

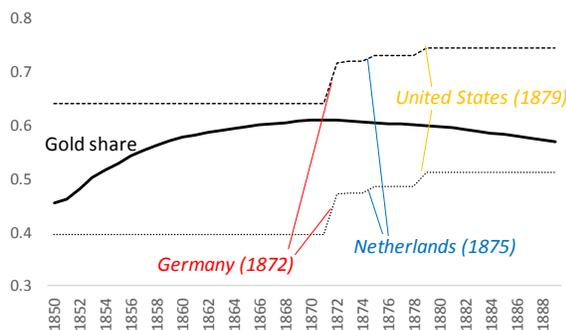
$$(6b) \quad UL^* = 1 - \frac{m_S}{1 + \alpha(1 - m_G - m_S)}.$$

Figure 6 shows the results of the counterfactual computations. To ensure comparability, the currency reforms are dated as in Meissner (2015), i.e., Germany in 1872, Denmark/Norway/Sweden in 1873, the Netherlands in 1875, Finland in 1877, and the United States in 1870.<sup>14</sup> Also the coefficients of proportionality  $\alpha$  are taken from Meissner: 0.31 for Germany, 0.01 for Denmark/ Norway/Sweden combined, 0.045 for the Netherlands, 0.002 for Finland, and 0.23 for the United States.

Not all currency reforms can be seen clearly in Figure 6. In particular, coin circulation in the Nordic countries was too small for these countries' currency reforms to exert a significant impact on bimetallism. However, the German, Dutch and American reforms would have been felt in the bimetallic block: the simulations suggest that the share of gold in French specie circulation would have fallen from 87 percent to 56 percent as a result of Germany's reform, to 49 percent after the Dutch reform, and to 37 percent after the American reform.<sup>15</sup>

There is a second factor that would, over time, have reinforced the replacement of gold by silver coins in the bimetallic block: the silver bonanza in the American West. It is reflected in a downward trend in the global gold share from about 1870 (in sharp contrast to the 1850s and 1860s). In the 1870s, the bonanza's impact on French specie circulation would have been still relatively limited, but it would have made itself felt in the 1880s.

Figure 6: Bimetallism's Robustness to Currency Reforms



<sup>14</sup> Wiegand (2019) places Germany's reform in 1873, as the Reichstag (federal assembly) adopted the gold standard only in July 1873.

<sup>15</sup> France accounted for 90 percent or more of specie in the bimetallic block (Flandreau, 1996). "France" and "bimetallic block" are thus used interchangeably, following the standard treatment in the literature.

To sum up, France could have maintained bimetallism in the 1870s, and it could have done so all on its own. This confirms once more the results of Flandreau (1996), Oppers (1996), Velde (2002), and Flandreau and Oosterlinck (2012).

With many countries adopting gold currencies in the 1870s, however, and with the American silver bonanza boosting disproportionately the global supply of silver, the price would have been a large and potentially unwelcome increase in the share of silver in France's specie circulation. In the 1880s, silver would have been again France's predominant currency metal—in a world where the United States, the United Kingdom, Germany and the Netherlands would all have used exclusively gold.<sup>16</sup> Doubts about whether bimetallism could have remained a viable currency regime in the longer term appear therefore well justified.

### III. What a Game!

## The Transition as a French-German Currency Game from the 1850s to the Early 1870s

As mentioned in the introduction, Wiegand (2019) analyzed Germany's decision to adopt a gold currency in the early 1870s in a game theoretic setting. Germany's reform was only one element in a longer series of events that accompanied the global transition from bimetallism to the gold standard, however. A more comprehensive account therefore requires studying the French-German currency game over a longer period, starting with the (seemingly) stable bimetallic equilibrium of the 1850s and 1860s and ending with the failure to restore global bimetallism in the second half of the 1870s.

This section sketches stylized elements of a four-stage game for this entire period. It analyzes how shifts in the monetary and political environment modified the currency game's configuration for France and Germany. Specifically, the section discusses the impact of (i) gold crowding out silver from specie circulation in France in the 1860s; (ii) Germany's victory in the Franco-Prussian war in 1870/71 and the imposition of the war indemnity on France; and (iii) France settling the indemnity in 1873 and regaining monetary autonomy.

It should be stressed that this section is no more than a sketch. The analysis can surely be refined and strengthened in many ways; however, some results seem interesting enough to share them more widely.

As a starting point, it is helpful to formulate a general, stylized form of France's payoff function:

$$(7) \quad P(x, X) = -C_E(\sigma^*, \sigma_F^*) - C_\sigma(\sigma_F) + \beta I_G + R, \quad C'_{E\sigma^*} > 0, C'_{E\sigma_F^*} > 0, C'_\sigma \geq 0$$

$$\text{with } C_E(\sigma^*, \sigma_F^*) = \sigma_F^* C_{Fiscal}(\sigma^*) + C_{Econ}(\sigma^*).$$

<sup>16</sup> Taken at face value, evaluation with Flandreau's model suggests that the share of gold in French specie circulation would have been less than a quarter in 1889. Such results need to be interpreted with caution, however: the further away the analyzed date is from the estimation period—1850–70—the larger the risk that features treated as exogenous in the analysis may have adapted. In particular, the price of silver relative to gold fell sharply in the 1870s and 1880s. Had France maintained the gold/silver price at the old bimetallic ratio of 15.5:1, the higher price for silver may have incentivized even more silver production; see Friedman (1990) and Morys (2015). Scaling up bullion production takes time, hence a large impact in the 1870s seems improbable. To what extent different prices for precious metals would have affected the supply of bullion in the 1880s and beyond is everybody's guess, however.

It has the following elements:

- $C_E$  are the cost to France from breaking bimetallism and demonetizing silver.  $C_E$  has two components,  $C_{Fiscal}$  and  $C_{Econ}$ .
  - $C_{Fiscal}$  are quasi-fiscal cost from the devaluation of French silver coins that silver demonetization would trigger (Flandreau, 1996).
  - $C_{Econ}$  captures wider economic cost, reflecting factors such as deflation in the gold block (due to higher demand for monetary gold), or disturbances to trade with silver countries from breaking the fixed exchange rate between gold and silver currencies (which, in the 1860s, included Germany).

Both  $C_{Fiscal}$  and  $C_{Econ}$  increase with the size of the devaluation, which, in turn, increases with the amount of demonetized silver relative to global specie. Further,  $C_{Fiscal}$  increases proportionately with the amount of silver demonetized by France. To simplify the notation, demonetized silver is scaled with French specie demand (about one-quarter of the global total, as per Flandreau, 1996). Hence  $\sigma_F^* = \frac{s_F^*}{s_F + g_F}$  and  $\sigma^* = \frac{s_F^* + s_G^*}{s_F + g_F}$ , where  $s_F^*/s_G^*$  are the silver quantities demonetized by France/Germany, and  $s_F/g_F$  are French silver/gold circulation.

- $C_\sigma$  are possible cost caused by a silver component in specie circulation, reflecting, for example, silver's higher maintenance and transaction cost (see Hoffmann, 1838). This formalizes Oppers' (1996) conjecture that France may have ended bimetallism to avoid a surge in silver coin circulation.  $\sigma_F = \frac{s_F}{s_F + g_F}$ .
- $I_G$  is a binomial variable takes on value 1 if France is on the gold standard and 0 otherwise.  $\beta I_G$  captures possible intrinsic benefits from gold monometallism such as avoiding fluctuations in specie shares.
- Finally,  $R$  reflects a possible 'benefit' for France from taking revenge on Germany, by raising the cost of Germany's currency reform (Flandreau, 1996).

## Stage I: Stable Bimetallism (the 1850s and early 1860s)

In the 1850s and 1860s, the French treasury guaranteed fixed exchange values between gold and silver. This placed France at the core of the global monetary system: France's guarantee established quasi-fixed exchange rates between gold, silver and bimetallic currencies.

This role came at a cost, however: by the workings of Gresham's law, France had to tolerate fluctuations in its specie base whenever the global quantities of gold and silver changed. Moreover, France had to accept higher transaction and maintenance cost of silver relative to gold coins. France's payoff from remaining on bimetallism can be thus written as  $P(s, B) = -C_\sigma(\sigma_F)$ ,

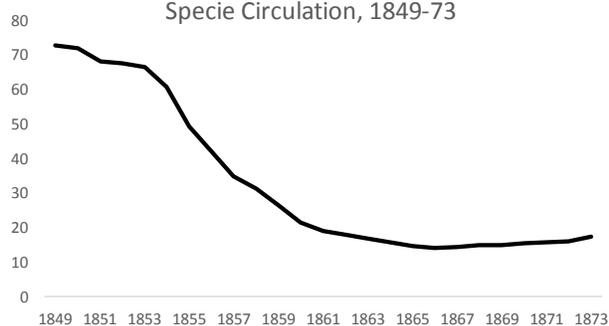
Moving to a gold currency would have eliminated these costs, but only at the expense of breaking global bimetallism. France would have had to demonetize its now obsolete silver coins, and with the bimetallic price ratio broken, silver would have devalued: France would have forced a loss on itself. Moreover, the higher demand for monetary gold would have triggered deflationary pressures in the gold block, and severing the fixed exchange value with silver currencies could have triggered disruptions to trade with silver countries, including Germany. Formally, the payoff associated with moving to gold was therefore  $P(s, G) = -C_E(\sigma^* = \sigma_F^* = \sigma_F) + \beta I_G$  (note that  $\sigma^*$ ,  $\sigma_F^*$  and  $\sigma_F$  are all identical in this case).

France stuck to bimetallism throughout the 1850s and 60s, when its silver share fell from about 70 percent in 1850 to a minimum of 14 percent in 1866 (Figure 7). This suggests:

$$(8) \quad C_E(\sigma^* = \sigma_F^* = \sigma_F) > C_\sigma(\sigma_F) + \beta I_G \quad \text{for } \sigma_F \geq 0.14.$$

The losses from breaking bimetallism exceeded the gains from moving to gold as long as silver made up a sizeable share of France's specie circulation. Note, however, that both  $C_E$  and  $C_\sigma$  approach zero as  $\sigma_F$  approaches zero. Thus, to the extent that gold monometallism carried an intrinsic benefit ( $\beta > 0$ ), there existed a  $\bar{\sigma}_F$  with  $0 < \bar{\sigma}_F < 0.14$  where (8) switches sign: when France's silver share would have become very small, it would have become beneficial for France to move to gold.

Figure 7: Share of Silver Coins in France's Specie Circulation, 1849-73



Source: Flandreau (1995)

## Stage II: French Deterrence (the late 1860s)

The surge of gold in French specie circulation in the 1850s and 1860s created a possibility that gold could crowd out silver altogether and turn France into a de-facto gold country.<sup>17</sup> This changed the game's configuration: as documented in Wiegand (2019), German currency experts became increasingly concerned about being left behind on a floating silver currency, which they viewed as a threat to Germany's integration into global trade and commerce. They discussed two options to avoid this fate: (i) joining the bimetallic block, and (ii) adopting the gold standard.

By the mechanics of the bimetallic system, either reform would have forced a sizeable and potentially undesirable increase in silver coin calculation on France (see section II). However, France could deter reform by threatening to abandon bimetallism and move to gold itself. This would have cut Germany off the near-global fixed exchange rate system—triggering the very outcome Germany sought to avoid.

The conditions for France *accommodating* a German move to bimetallism/gold respectively can be written as

$$(9) \quad C_E(\sigma^* = \sigma_F^* = 0.14) > C_\sigma(\sigma_F = 0.35) + \beta I_G \quad \text{and}$$

$$(10) \quad C_E(\sigma^* = \sigma_F^* = 0.14) > C_\sigma(\sigma_F = 0.47) + \beta I_G.$$

The comparison of (9) and (10) with (8) illustrates how the prospect of German reform affected France's monetary strategy.

<sup>17</sup> As shown in Wiegand (2019), in the mid-1860s such a scenario looked plausible, although it never rose to the status of an immediate threat to bimetallism: several more years of high global gold and low silver production would have been needed before France would have gotten close to the bimetallic tipping point.

- While Germany was safely on silver (8), the price France had to pay for eliminating a silver share ( $\sigma_F$ ) of 14 percent was the fiscal and economic cost triggered by demonetizing 14 percent of France's specie ( $\sigma_F^*$ ). Judged by their lack of action, French policymakers were not prepared to pay this price.
- A German move to bimetallism/gold would have caused silver circulation in bimetallic France to surge to 35/47 percent respectively (9/10)—not 14 percent. Thus, when used to preempt German reform, demonetizing the same 14 percent of silver prevented a much higher silver share: paying the same price avoided a much larger cost.

The above demonstrates France's commanding position in the late 1860s' currency game. If France was *not* overly concerned with a higher silver share, it would accommodate Germany's reform. If France was adverse to more silver, the mere—implicit or explicit—threat that it could move to gold itself would deter Germany. Germany's policymakers were left guessing: history held not clues as to whether (9) and/or (10) would hold. The influential German economist and currency expert John Prince Smith, for example, hoped that (9) could hold: "*we can only introduce bimetallism if France sustain its bimetallic system. To ensure the latter would be the most urgent task*" (Prince Smith, 1869, p. 263). But he was adamant that the more stringent (10) would not: "*if Germany would really ... offer its demonetized silver ... for sale and demand gold for it ... France would, at the first indication of such a step, have to abolish bimetallism.*" (p. 250).<sup>18</sup>

In the end, Germany did not advance currency reform beyond preparatory steps in the 1860s.

### Stage III: First-Mover Advantage with Germany (the early 1870s)

Stage III is discussed extensively in Wiegand (2019). Germany's imposition of the war indemnity on France forced France to maintain bimetallism as long as the indemnity was not settled. It therefore removed France's ability to deter German reform—(9) and (10) no longer applied.

Germany, now able to choose its currency regime unconstrained, found itself in a prisoners' dilemma situation: bimetallic cooperation with France would have been desirable in principle, as it would have ensured stable monetary conditions and avoided the cost associated with demonetizing Germany's silver. However, having just faced off in war, Germany could not count on France's cooperation.

In this situation, preemptively adopting the gold standard dominated the alternatives. Had Germany instead remained on silver or adopted bimetallism, a later move by France to gold would have thrown Germany back onto an effective silver standard and into monetary isolation—the outcome German monetary experts had sought to avoid since the 1860s.

Confronted with this situation, Germany swiftly introduced a gold currency in 1871–73.

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<sup>18</sup> Note that the only circumstance under which bimetallism could have been broken in the late 1860s was if Germany had mis-read (9) or (10); i.e., if it had underestimated France's determination to move to gold to forestall an increase in silver circulation. Also note that France's threat vis-a-vis Germany was credible because Germany was (relatively) large: possible currency reforms by smaller silver countries would have given France less of an incentive to abandon bimetallism, as they would have had less of an impact on French silver circulation (see the simulations in the previous section).

## Stage IV: France's Response (1873/74 and beyond)

As Germany started to offload the silver that had become obsolete as a result of its currency reform, France had, by the workings of Gresham's law, to expect that silver coins would eventually swell to almost half of French specie if France maintained bimetallism (see section II). However, having settled the war indemnity in September 1873, France had regained its capacity to act: it could now again break bimetallism and move to gold.

Should it do so? Formally, the condition for France to *maintain* bimetallism after settling the indemnity is

$$(11) \quad C_E((\sigma^* = 0.47)(\sigma_F^* = 0.17)) > C_\sigma(\sigma_F = 0.47) + \beta I_G [+R]$$

with  $C_E = 0.17 * C_{Fiscal}(\sigma^* = 0.47) + C_{Econ}(\sigma^* = 0.47)$ .

(11) did not hold: France cut the bimetallic ties one day after transferring the war indemnity's final tranche. As Flandreau (1996) and others have stressed, the rationale behind this decision is not easy to identify. Ending bimetallism was bound to trigger major monetary and economic disturbances; at the same time, the only near-term cost that France would have had to accept to *avoid* such an outcome would have been an elevated and fluctuating share of silver coins in its specie circulation—something France was well used to from the 1850s and 1860s.

Flandreau (1996) concluded that a desire to take revenge on Germany must have influenced the decision (captured by the term  $[R]$  in equation (11) above): breaking the bimetallic ties harmed not only France but also Germany, as Germany could no longer offload its silver at a fixed exchange value with the bimetallic block. Moreover, Flandreau and Oosterlinck (2012) showed that France's step took financial markets by surprise, specifically the holders of Indian gold and silver bonds: the pricing of this bonds in the early 1870s does not suggest that bond holders expected an imminent end of stable exchange values between gold and silver.

(11) contains a hint of another feature though that may have influenced France's decision: the discrepancy between  $C_{Econ}$  and  $C_{Fiscal}$ .<sup>19</sup>

- The *economic cost*  $C_{Econ}$  from breaking bimetallism loomed indeed large in the early 1870s—larger than in the late 1860s. It would now involve demonetizing a very large amount of silver, as not only France's but also Germany's silver coins would lose their monetary function. This, in turn, held the prospect of a very sharp silver devaluation and the unleashing of severe deflationary forces in gold countries.
- France's *quasi-fiscal loss* from silver demonetization  $C_{Fiscal}$  was still limited to 17 percent of France's specie base at end-1873, however (the figure is as per Flandreau, 1995). Germany—which had only begun to shed its obsolete silver—still held more monetary silver than France, hence most of the quasi-fiscal loss would fall on Germany. At the same time, without action  $C_{Fiscal}$  would change rapidly to France's disadvantage: the longer it maintained bimetallism while Germany was offloading its silver, the larger its own silver share  $\sigma_F^*$  would swell, and the higher the quasi-fiscal cost of moving to gold would become at a later stage.

<sup>19</sup> The following conjecture is speculative and would need to be backed up by archival or other evidence. The author leaves this to experts more familiar with French politics and institutions in the 1870s.

A *possible* explanation for France's surprising step is therefore that the French treasury may have focused mainly on the quasi-fiscal cost of silver demonetization and its unfavorable near-term trajectory: better swallow the bitter pill now while the cost for France was still relatively contained—and the cost for Germany high—than wait for a later date when the roles would be reversed.<sup>20</sup> Holders of Indian bonds, by contrast, may have disregarded such a possibility, given the prohibitive economic cost  $C_{Econ}$ . If so, they failed to internalize domestic French policy considerations.

## Could Bimetallism Have Been Resurrected?

The final issue to address is whether monetary cooperation between France and Germany could have held promise in late 1873 and beyond. As argued in Wiegand (2019), for Germany, joint bimetallism should have been preferable relative to both France and Germany adopting gold currencies: while either outcome would have ensured Germany's membership in the fixed exchange rate system of the advanced economies, joined bimetallism would have avoided silver demonetization and deflation.

For France the trade-off is less clear. The condition for preferring a cooperative outcome (joint bimetallism) over an uncooperative outcome (both countries on gold) in 1873 is

$$(12) \quad C_E((\sigma^* = 0.47)(\sigma_F^* = 0.17)) > C_\sigma(\sigma_F = 0.35) + \beta I_G.$$

There is only a narrow set of circumstances in which both, breaking unilaterally the bimetallic ties in late 1873 *and* welcoming a bimetallic agreement with Germany, would appear rational: France would have needed to tolerate a 35 percent silver share in its specie to avoid the cost from ending bimetallism, but not a 47 percent share. While it is impossible to determine whether this circumstance applied, a useful point of comparison though is France's situation in about 1857, when inequality (8) read  $C_E(\sigma^* = \sigma_F^* = 0.34) > C_\sigma(\sigma_F = 0.34) + \beta I_G$ . The share of silver in specie circulation  $\sigma_F$  that a bimetallic France had to tolerate was about the same in both years. In 1873, moving to gold implied a somewhat smaller quasi-fiscal loss  $C_{Fiscal}$  than in 1857, while the economic consequences  $C_{Econ}$  of silver depreciation loomed larger in 1873.<sup>21</sup>

The key question is therefore again to what extent French policymakers factored the wider economic repercussions from an end to global bimetallism into their decision making. If they did, a bimetallic accord in 1873/74 could have been mutually beneficial, provided France and Germany could have solved their policy coordination problem.<sup>22</sup>

<sup>20</sup> This argument implies that French policymakers placed a non-zero probability on France having to abandon bimetallism eventually. As the previous section showed, while in the early 1870s such a scenario seemed implausible for the near term, it could be not ruled out for the longer term.

<sup>21</sup> In 1873, silver demonetization equivalent to 47 percent of France's monetary base devalued 17 percent of the monetary base. In 1855, 34 percent demonetization would have devalued 34 percent of the monetary base.

<sup>22</sup> According to Flandreau (1996), French officials kept the door open to re-stabilizing the silver-gold price ratio in 1873/74 to cajole Germany into reconsidering its reform, but to no avail. Note (from 11) that a joint bimetallic agreement would have been more attractive for France had France held a higher share of silver coins. France's early repayment of the war indemnity—which gave Germany no time to offload its obsolete monetary silver on France—therefore worsened the prospect to preserve a global bimetallic system.

## IV. The Monetary Debates at the German *Handelstag* Assemblies in the 1860s

The German currency debate of the 1860s is still covered only sparsely in the economic history literature. The most comprehensive account remains Helfferich (1898), but it is both (very) outdated and in German, and therefore inaccessible to many readers. A more recent work by Thiemeyer (2009) is in German too.

Wiegand (2019) sought to fill part of the gap by documenting the debate's evolution among Germany's leading currency experts and monetary policy makers. From the early 1860s, influential German pundits became concerned about the crowding out of silver by gold from bimetallic France—a trend that, if it would have continued unabated, could have turned France into a de-facto gold country and pushed Germany into monetary isolation on a floating silver currency (see section III). By the late 1860s, the need for currency reform enjoyed broad intellectual and political support, even though Germany's monetary experts disagreed on whether Germany should replace its silver currencies with a gold currency or join the bimetallic block. Unclear was also *how* currency reform could be achieved, given that a shift in the monetary regime required cooperation at both the national (between different German states) and international (in particular with France) level.

Missing from this account is how the currency debate evolved in wider public fora. The most prominent forum to discuss currency questions in the 1860s were arguably the assemblies of Deutsche *Handelstag*. The *Handelstag* was established in 1861 and encompassed regional chambers of commerce from all states and regions of the *Deutsche Zollverein*, the German customs union that had been set up in the 1830s. Given the lack of centralized political power and parliamentary representation during the early and mid-1860s, the *Handelstag* filled a vacuum in terms of providing a platform for national economic policy debates.

Before describing the *Handelstag* debates, some words on the German political and institutional setting are in order: it underwent significant shifts in the 1860s, with important implications for the conduct of monetary affairs. Prior to 1866 there was no clear center of political power: the two largest German states—Prussia and Austria—competed for hegemony, smaller states carefully guarded their independence. Currency matters were regulated through multilateral treaties, the most important being the Vienna currency treaty of 1857, which obliged all member states of *Zollverein* and Austria to base their currencies on silver. In effect the Vienna treaty established three currency zones: Northern Germany, where the Prussian Thaler was the dominant currency; Southern Germany (that included Bavaria, Württemberg and Baden), where a common Guilder currency circulated; and Austria, which had a different Guilder currency. The Vienna treaty established fixed exchange values of 4:6:7 between the Prussian Thaler/Austrian Guilder/Southern German Guilder respectively.<sup>23</sup>

A seismic shift occurred with the Austro-Prussian war of 1866 and subsequent establishment of the Northern German Federation in 1867. The Federation cemented the hegemonial status of Prussia in Northern and Central Germany and already encompassed three-quarters of the population of the German Empire of 1870. The Federation had the authority to regulate monetary matters for its members; an all-German currency policy still required treaties with the Southern German states, however. Moreover, Austria was released from the obligations of the Vienna currency treaty in 1867 and played no longer a role in German monetary affairs.

<sup>23</sup> Most German states other than Austria were members of the *Zollverein* in 1861, the main exceptions were Mecklenburg, Schleswig-Holstein and the Hanseatic cities Hamburg, Bremen and Lübeck.

## The 1861 *Handelstag*

The *Handelstage* of 1861, 1865 and 1868 debated monetary issues. Of these, the protocol of the 1861 *Handelstag* contains relatively little material. It occurred four years after the Vienna treaty had come into effect. Many delegates bemoaned that currency harmonization was still incomplete, however, taking issue in particular with heterogeneously defined subdivisions of the main currency units (*Kreuzer*, *Neukreuzer*, *Groschen*, *Pfennige* etc.). The *Handelstag* adopted a resolution that recommended introducing the decimal system into the currency regimes of all German states.

The delegate from Cologne went further and recommended adopting the French currency system, which would have meant the de-facto introduction of a bimetallic standard. The delegate from Brunswick pushed, as the only participant, for a gold currency, which would have violated the Vienna currency treaty.

The *Handelstag's* influential spokesperson for currency matters—a delegate from Hamburg by the name of Adolf Soetbeer—advised against overloading the resolution with such demands.<sup>24</sup> Instead Soetbeer proposed adding another Article to the resolution, for which he obtained the *Handelstag's* support: “*the removal of the exceptional conditions and obstacles that stand in the way of a complete currency union in Germany must no longer be delayed. The regard for the possibility that in future the adoption of a gold currency may become necessary—an eventuality that must remain an open question for the future—cannot be considered an appropriate reason for delaying the German currency union any longer.*” (Deutscher Handelstag, 1861, p. 44).

Soetbeer's cautious stance at the 1861 *Handelstag* stood in remarkable contrast to his activities as a publicist. It had been Soetbeer who, also in 1861, had first sounded the alarm bells about the crowding out of silver by gold coins in bimetallic France (see Figure 7 above), and who had recommended that Germany move to gold currencies in response (Soetbeer and Weibezahn, 1861, discussed in Wiegand, 2019).

However, despite the case for monetary reform Soetbeer made in his writings, his *Handelstag* intervention suggests that he did not yet consider the conditions in place for a political initiative.

## The 1865 *Handelstag*

The monetary debate at the 1865 *Handelstag* was more extensive, and also more controversial. At the surface, the debate was about a resolution that requested replacing the common *Zollverein* gold coin—introduced in 1857 as part of the Vienna treaty—with a new coin, noting that the old coin had found little use.

Some delegates argued that the coin's failure reflected its inconvenient denomination, as it did not translate easily into the denominations of the main silver-based currency systems (the Thaler and the two Guilder systems, see above). Other speakers identified the lack of convertibility as the coin's key shortcoming: the governments of the German states were not obliged to accept it as a means of payment.

Most delegates agreed that convertibility of a new gold coin was a must. A debate arose whether governments should accept the coin at a *floating* or a *fixed* value relative to domestic silver coins—the latter would have

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<sup>24</sup> This is the same Soetbeer who assembled the statistics on global bullion production mentioned in Section II.

meant de-facto adoption of a bimetallic standard by the German states. The *Handelstag* agreed on a compromise formulation.<sup>25</sup>

Below the surface, more significant frictions emerged. Several speakers requested to put the resolution on hold and take up the topic up only at a subsequent *Handelstag*. They were driven by different motivations, however. One group, led by the delegate from Bremen and supported by speakers from Barmen (in the Ruhr area) and Bockenheim (at the time a suburb of Frankfurt/Main), wanted to pass a resolution only if it contained declaration of intent to move to the gold standard eventually—arguing that it was in Germany’s interest to adopt a practice “to which the world’s great trading nations have long transitioned.” (Deutscher Handelstag, 1865, p. 62). Another group, led by the influential delegates from Berlin and from Frankfurt/Main, saw no need to introduce a new gold coin; more generally, they considered any discussion of the currency question premature. Both groups teamed up seeking to defeat the gold coin resolution, but failed.<sup>26</sup>

## The 1868 *Handelstag*

The most insightful is the 1868 protocol. As noted above, several seismic shifts had taken place between 1865 and 1868: Prussia had won the Prussia-Austrian war, leading to the establishment of the Prussian-led Northern German Federation; the Vienna currency treaty had been dissolved;<sup>27</sup> and the 1867 international monetary conference had produced a resolution in favor of a global monetary standard based on gold and oriented on the French currency system.

Soetbeer now put forward a resolution that requested introducing gold currencies in all German states, oriented on the principles of the 1867 international monetary conference. All but one chamber approved in principle—the exception was Berlin, whose delegate argued again that such step was premature and that the resolution would place unacceptable demands on state governments.

A debate ensued whether the German currencies should be based “exclusively on gold” or just “on gold”—the latter formulation left the door open for a bimetallic regime. There was a vote, Figure 8 shows the regional distribution.<sup>28</sup> In Northern, Central Germany and Southern Germany the supporters of a gold-only currency regime were in a clear majority. In the East and the West preferences were more balanced—both regions were

<sup>25</sup> Some speakers argued that recommending bimetallism would reduce the proposal’s chances to be adopted; others countered that the governments would ignore the *Handelstag* recommendations anyway, hence it would be better to be clear. The compromise formulation read: „in principle, it is recommended that the coin will be accepted by public entities at a fixed exchange value. In case this proposal would, for the time being, still be met with reluctance by governments, it is recommended that the coin would be accepted by public entities at a published exchange value that should reflect, except for rounding, the existing, actual price ratios of precious metals.” (Deutscher Handelstag, 1865, p. 77).

<sup>26</sup> The vote was taken by simple declamation; hence the protocol does not report how many and which delegates voted in favor or against the resolution. Unfortunately, this prohibits gauging the groups’ relative strengths.

<sup>27</sup> Different to 1865 and 1861, Austrian delegates no longer participate in the 1868 *Handelstag*.

<sup>28</sup> “South” comprises Bavaria (including Palatinate), Baden, Wurttemberg, Hesse-Darmstadt, and enclosed territories. “West” is Westphalia and the Rhine Province. “East” includes Brandenburg, Silesia, Pomerania, East and West Prussia. “North” are the Hanseatic cities, but also northern territories such as Mecklenburg, Oldenburg, or Hannover (that had become Prussian only in 1867). “Center” is everything that remains, including Saxony, Thuringia, and North Hesse. Some cities sent two delegates, to give a clearer picture of regional preferences their votes are counted only once. A curiosity are the two Hildesheim delegates, of which one voted for gold, the other for bimetallism. Neither vote is counted. Berlin voted to defeat the bimetallic amendment, but, as the intervention of Berlin’s delegate suggests, this was not because of support for bimetallism but because of his opposition against any type of currency reform—hence Berlin is not counted either. The raw vote without these corrections was 75 vs. 37 in favor of gold.

governed (mostly) by Prussia. This may suggest that delegates from Prussian chambers saw a move to gold as a threat to the hegemonial status of the Prussian silver Thaler, but establishing this would require more analysis.

As important as what the 1868 protocol and the vote show is what they do *not* show. In particular, there is no evidence that the delegates tried to harmonize the currency system with that of their immediate neighbors. Delegates from regions that bordered the bimetallic block, for example, failed to express a clear preference for bimetallism.<sup>29</sup> Similarly, all Bavarian delegates voted for gold, even though Bavaria did not share (or was anywhere near) a border with a gold currency country.

This pattern is quite different from what Flandreau (1996) reports for France, i.e., correspondence of preferences of regional chambers of commerce with the currency regimes of neighboring countries. For Germany there is no evidence that such considerations played a role, neither in the *Handelstag* interventions nor in the contemporary monetary literature (see Wiegand, 2019).

Two factors may account for this. First, the focus of the *Handelstag* assemblies was still on harmonizing currency systems *within* Germany. Second, *as long as bimetallism persisted*, German states benefitted anyway from the quasi-fixed exchange rates that tied gold, bimetallic and silver currencies together—regardless of what currency metal they used themselves. As detailed in Wiegand (2019), this made the continued viability of the bimetallic system a critical concern for German monetary pundits, and they debated preemptive steps to insure against possible shifts that might undermine the system.<sup>30</sup> Consistent with such concerns, many advocates of currency reform—including at the *Handelstage*—argued that it was in Germany’s interest to join an emerging club of advanced countries that used predominantly gold currencies, either *de jure* or *de facto*.

## V. Main Conclusions

The objective of this paper was to tie together some loose ends in the debate about the global transition from bimetallism to the gold standard in the early 1870s. The main findings are as follows:

- **Bimetallism’s viability.** The paper confirms once more that bimetallism was technically viable in the early 1870s, and that it could have persisted for several more years had France not limited silver coinage in September 1873. This result—originally established by Flandreau (1996), Oppers (1996), Velde and Weber (2000) and Velde (2002)—seems beyond reasonable doubt, at least to this author. Recent divergent assessments reflect flawed methodologies (and not more comprehensive historical scenarios or better data).

Figure 8: Currency Regime Preferences at the 1868 *Handelstag*

	Gold	Bimetallic
North	14	7
East	9	9
West	10	11
Center	13	3
South	21	4
Total	67	34

Source: author’s calculations based on Deutscher *Handelstag* (1868), p. 49

<sup>29</sup> Baden, Palatinate and the southern Rhine Province shared a border with bimetallic Belgium, France and/or Switzerland. 8 delegates from these regions voted for gold (Eberbach, Heidelberg, Karlsruhe, Lahr, Landau, Ludwigshafen Mannheim, Zweibrücken), while 4 voted for bimetallism (Koblenz, Luxemburg, Saarbrücken, Trier).

<sup>30</sup> This was arguably less of a consideration for France, which guarded and controlled the bimetallic system in the 1860s (section III).

Bimetallism's longer-term viability is a different matter, but one needs to stretch the analysis into the 1880s to find plausible scenarios under which bimetallism could have become imperiled.

- **Strategic interactions between France and Germany.** The transition from bimetallism to the gold standard can be analyzed as a multi-stage game in which France and Germany were the main players. The game-theoretic treatment suggests answers to both why currency reform did *not* advance in the 1860s—despite intense debates, among other things at the 1867 international monetary conference—and why Germany introduced a gold currency in the early 1870s. In the 1860s, bimetallic France could deter German currency reform by an implicit though credible threat to abandon bimetallism itself, move to gold, and create the very monetary isolation that silver-standard Germany sought to avoid. Victory in the Franco-Prussian war in 1870 not only shifted first-mover advantage to Germany, it also created a prisoners' dilemma type situation in which adoption of a gold currency was Germany's dominant strategy.

France's decision to abandon bimetallism in late 1873 remains more difficult to rationalize. The analysis suggests one option though: *if* (i) French policymakers focused narrowly on the quasi-fiscal cost from the demonetization of silver—rather than the wider economic repercussions—and (ii) they were unconvinced of their ability to uphold bimetallism in the long term, then triggering bimetallism's demise early while France's silver holdings (and the corresponding demonetization cost) were still limited can have been preferable over maintaining bimetallism and absorbing the silver that Germany would shed in the wake of its currency reform. Whether such a motivation played a role among French policymakers is speculative though and would need to be established with archival or other historic evidence.

- **Germany's monetary debate in the 1860s.** The paper complemented the analysis of the 1860s literature in Wiegand (2019) with an evaluation of the *Handelstage* protocols, an assembly of chambers of commerce attended by delegates from all across Germany.

Similar to the debate in academic and political circles, the *Handelstag* deliberations gained purpose and direction in the 1860s, beginning with mostly technical discussions in 1861 and ending with an energetic push to abandon silver currencies in 1868. The overwhelming motivation for moving away from silver was avoiding monetary isolation as other advanced economies transitioned—or were expected to transition—to gold currencies (*de jure* or *de facto*).

By contrast, there is no evidence that German interest groups sought to align the currency metal with those used by immediate neighbors or trading partners.<sup>31</sup> As long as the bimetallic system existed, Germany enjoyed quasi-fixed exchange rates with gold, silver and bimetallic currencies anyway. The real threat to Germany's ability to trade and transact at reliable terms with the advanced world was the prospect that one day the bimetallic system could become non-viable. A preemptive move away from silver would have insured Germany against such an outcome—however, as argued in the section III, only victory in Franco-Prussian war made such a move possible.

<sup>31</sup> Harmonization of currency metals to benefit from trade externalities has been identified as factor behind other currency reforms in the 19th century, see for example Mitchener and others. (2010) for Japan in the 1890s. Different from the 1860s, in the 1890s choosing a different currency metal meant choosing a different currency regime, however.

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# PUBLICATIONS

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