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DATA APPENDIX

A unit was created in 1884 within the Banque de France whose sole objective was to produce harmonised balance sheets of foreign central banks (it was called the *Foreign Banking Statistics Service*), and economists were hired because of their skills in understanding foreign languages. It was not until 1891 that this unit began to systematically produce ledgers with weekly or monthly statistics for a significant number of foreign central banks. Later, in the mid-1890s, it became a real research department, broadening the scope of its studies. The interest in comparing central bank balance sheets can be tracked to a 1881 volume published by the Italian statistical institute. It was published in French. *Statistique International des banques d’émission: Autriche-Hongrie, Belgique, Pays-Bas, Suède, Norvège, Espagne,* Direzione Generale Della Statistica, Rome, Imprimerie Héritiers Botta. During this period, only the Bank of England, the Banque de France and the Reichsbank had a research department (Martin-Acena & Tortella 2013) but we found no evidence of similar work in the other two central banks.

# Description of the balance sheet data found in the Banque de France archives

The harmonized balance sheet data provided by the source helped us to build comparable series across countries. We assembled five series for each bank of note issue: (1) metallic reserves (gold plus silver); (2) foreign papers; (3) foreign funds; (4) discount portfolio of domestic papers; (5) short term advances on securities and other collateral. (1), (2), and (3) constitute the international portfolio while (4) and (5) capture the domestic portfolio.

In describing the data below, we also provide the French terminology based on the monthly archival data and the quarterly and annual publications of the Bank of France we rely on. Some of the notions do not lend themselves to a straightforward translation into English. This reflects the fact that the Bank of England followed a unique classification due its separation of an issuance and a banking department (1844 Bank Act); and that the U.S. did not have a central bank at all until the establishment of the Federal Reserve System in 1913. By contrast, continental European terminology and classification is typically similar to French practice, as evidenced by country-specific balance sheet data which we have consulted if and where possible. As the French classification is broadly identical to the approach pursued in an important Reichsbank (1925) publication covering seven key Classical Gold Standard central banks, we also provide German terminology.

Most banks in our sample enjoyed the exclusive right of note issuance. They constitute the natural candidate for analysing the monetary policy of a specific country, irrespective of how far they had already travelled on the way from a 19th century bank of note issue to a 20th century central bank. The situation is more complicated in the cases of Italy, Germany, Greece and Sweden given their system of multiple banks of note issue. In the first three cases, this reflected single banks of note issue on the political entities later forming (Italy and Germany) or joining (Greece) the country in question. In the Swedish case, the Riksbank was a state institution, but all other banks (so-called Enskilda banken) were private and had to deposit funds at the Riksbank to issue their own currency.

The Bank of France statisticians took the view that only the Italian case reflected a genuinely multipolar system; whereas the Reichsbank (Germany), the National Bank of Greece and the Riksbank (Sweden) dominated their respective monetary system to the point that they did not even include the data of the smaller banks into their data collection. Their judgment has been borne out by later research on the four countries (Sprenger 2002, Lazaretou 2014 for Greece, Bonelli 1991 for Italy, Ögren 2012 for Sweden) and we follow their lead as a result. Consequently, we include the Bank of Naples and the Bank of Sicily in addition to the Bank of Italy, but confine our analysis to one bank only for the cases of Germany, Greece and Sweden.

## International portfolio

1. metallic reserves / “en caisse” / “Barvorrat”

Time series #1 consists for the most part of gold coin and gold bullion. It occasionally contains silver and other specie (e.g., copper and bronze in the case of Sweden). The proportion of silver is typically large only when silver coin retained its legal tender status after the country switched to gold at some point in the 1870s. This was often the case in countries of the so-called limping gold standard (also referred to as limping bimetallism) which preserved silver as legal tender up to a certain amount. Contemporary sources refer to the entirety of specie as „metallic reserves“ (e.g., „Metallvorrat“ for the Reichsbank).

For some banks of note issue, “reserves” (Reichsbank: “Barvorrat”) are a marginally broader concept than “metallic reserves” (Reichsbank: “Metallvorrat”). In the cases of multiple banks of note issue (Germany, Greece, Italy and Sweden in our case), the category „en caisse“ / „Barvorrat“ also encompasses bank notes issued by other (domestic) banks of note issue. The Reichsbank, for instance, was allowed to include bank notes issued by other German banks of note issue on the grounds that such notes enjoyed metallic backing by their respective issuing bank. We follow this practice, not least because the Bank of France statisticians fully subscribed to it (despite coming intellectually from a single bank of note issue system).

In the cases of the Reichsbank and the three Italian banks of note issue (National Bank of the Kingdom of Italy, Bank of Naples, Bank of Sicily), we add – in line with domestic and French practice at the time – short-term treasury notes („Reichskassenscheine“ for the Reichsbank and „billets et bons de caisse de l‘Etat“ for the three Italian banks). These were highly liquid debt instruments and the four banks were allowed to include them into their note cover. It remains unclear why only these four banks of note issue include such notes into their note cover, and whether there is a connection to the system of multiple banks of note issue prevalent in Germany and Italy. The items described in this and the preceding paragraphs above were typically very small. E.g., in the case of the Reichsbank, they accounted for approximately 5% of total reserves.

2. foreign paper / “portefeuille commercial – papier étranger” / “auswärtige Wechsel”

Time series #2 consists of bills of exchange drawn on foreign places. Such a series is recorded for all 21 banks in our sample, even if values are very small (Russia, Serbia), a monthly series is reported but begins late (France in 1906) or the reported series only constitutes a lower-bound estimate (Romania). In the cases of Germany and Portugal, such data are only available on a yearly basis and are of very small value.

The very low numbers for France and Germany suggest that central banks in mature money markets bought such bills infrequently and left this business to specialised banks and brokerage firms. By contrast, central banks in peripheral countries acquired an important share of the market for the lack of strong competitors; in some situations, they may have well have constituted the only domestic buyer of bills of exchange drawn on foreign places.

We acknowledge that the cases of Portugal, Russia and Serbia are difficult to square with this explanation. Yet the very low numbers in these cases might reflect country-specific idiosyncrasies. In the case of Russia, the treasury – and not the bank of note issue which we study – managed foreign bill (Drummond 1976). Portugal was not on gold in the time period under investigation. The case of Serbia might be similar to the Portuguese case. We have positive knowledge of no foreign bills until 1904 (when the country was on a fiat standard), but cannot be certain for the period thereafter (data for 1905-1013 only report “portefeuille commercial” without distinguishing between foreign and domestic); a period which roughly coincides with the country’s de facto adherence to gold (1909-1912).

3. foreign funds / „fonds à l’étranger“ / „Auslandsguthaben“

Time series #3 captures of funds held abroad. Such funds were usually held by so-called foreign correspondents, i.e., typically a foreign commercial bank with whom the bank of note issue was in regular contact. In many cases, funds held abroad reflect bills of exchange drawn on foreign places after reaching maturity. Such bills are classified as time series #2 before the settlement date and as time series #3 thereafter.

None of the five core countries of Britain, France, Germany, Belgium and the Netherlands report such a series, but all other countries do with the exception of Japan, Portugal and Romania. We hypothesize that core countries stabilised their exchange-rate in the currency market located in their own country, avoiding the need to hold foreign funds. Such purely domestic intervention was not possible for all other countries where currency trading took place abroad rather than at home.

Japan, Portugal and Romania are the only peripheral countries to not report such a series. In the case of Portugal, the absence might be explained by the country being off gold at the time (similar to the absence of time series #2, cf. above). The Romanian case might be similar to the Austro-Hungarian case where, if only relying on published documents at the time, we would have a lower bound estimate for time series #2 and no data at all for time series #3 (Jobst and Scheiber 2014 for Austria-Hungary vs. Stoenescu et al. 2014 for Romania). The Japanese case awaits further investigation.

## Comment on the relative sizes of time series ##1, 2, 3

### Exceptions to #1 > > #2 + #3

Time series #1 is typically much larger than time series ##2 and 3 combined. The Classical Gold Standard (1870s-1914) was a specie standard at its heart and a larger role for foreign exchange was left to the interwar period. The gold exchange standard of the 1920s finds some precedents among late-stabilizing countries on the European periphery, namely Bulgaria and Greece(stabilising in 1906 and 1910, respectively). In the case of Greece, foreign funds account for the largest share of the international portfolio; foreign funds exceed metallic reserves by factor 7 at the time of currency stabilisation in 1910 and by factor 10 in 1913.

The other exception to the rule #1 > > #2 + #3 were the Nordic countries of Finland, Norway and Sweden (though not Denmark). The combined of ##2 and 3 are often larger than #1, and foreign funds in particular played an important role. This reflects the fact that these three countries were allowed, as members of the Scandinavian Monetary Union, to include foreign funds held at the banks of note issue of the other members countries as part of their note cover (and hence as international portfolio in our terminology). See Sumner et al. (1896), Lévy (1911), Conant (1915).

### Exceptions to #2 > #3

There are typically more bills of exchange drawn on foreign places than foreign funds. Banks of note issue are typically last buyers (and in peripheral countries often first buyers) of such bills in the domestic market. We note that the only cases in which foreign exchange is typically larger than bills of foreign exchange are the four Nordic countries, Bulgaria and Greece. In the Nordic countries, this eflects the privileged situation which foreign funds enjoyed due to the rules of the Scandinavian Monetary Union referred to in the paragraph above. In the other two cases, it might reflect the mechanics of late stabilisation (in the case of Greece, we cannot even identify a separate time series #2, even though the data description of time series #3 in Lazaretou (2014) leaves open the possibility that some of the foreign funds were actually foreign bills of exchange).

## Domestic portfolio

4. domestic paper / “portefeuille commercial – papier indigène” / „Diskontdarlehen“ or „Wechsel“

Time series #4 consists of bills of exchange drawn on domestic places and typically accounts for the majority of the domestic portfolio. (Re-)discounting bills of exchange was at the heart of central bank lending at the time (Bloomfield 1959 is particularly clear on this issue).

In a limited number of cases, time series #4 potentially includes a certain amount of foreign bills of exchange (Germany, Portugal). Yet we do know from the Bank of France Annual Data that these amounts were very small compared to domestic bills of exchange. End-of-year comparisons for Portugal and Germany suggest that foreign bills accounted for less than 1% and 10%, respectively.

5. advances on collateral / „avances“ / „Lombarddarlehen“

Time series #5 consists of advances. Such advances were typically made available against safe and liquid assets such as government bonds. Yet practice varied with local conditions and we witness a considerable variety of what exactly classifies as an advance. For most countries, a careful comparison of the monthly, quarterly and annual data of the Bank of France delivered the same result. Advances were only made available against safe and liquid assets and their size was small compared to discounted bills of exchange (typically a quarter).

Only the cases of Bulgaria, Denmark, Greece, Norway, Russia, Serbia and Sweden posed specific problems. Incidentally, these seven countries were also the cases where time series #5 was large relative to time series #4, and in some cases even exceeded it. Given the economically backward nature of these countries (with the possible exception of Denmark and Sweden), we view these data problems as pointing to a more fundamental problem on the European periphery: how to enable short-term lending in the absence of sufficient bills of exchange (discount lending) and a shortage of good collateral (conventional advances)?

In these seven cases, unsecured lending, lending against commodities (e.g., iron in the case of Sweden) and lending against real-estate played an important role. We have included all three categories as long as there was sufficient evidence that the lending was short-term.

## Comment on the relative sizes of time series ##4, 5

### Exceptions to #4 >> #5

Typically, there were many more bills of exchange than advances; a predominance captured in some languages to this day when a central bank’s main lending rate is referred to as „discount rate“ (e.g., “Diskontsatz” in German). In the cases of Denmark, Norway, and Sweden, #4 remains larger than #5 even if we include marginal balance sheet items such as lending against iron (cf. our description of time series #5 above). The only exceptions are found in Bulgaria, Greece, Russia and Serbia. This dichotomy between the Balkans (and possibly Russia) on the one hand, and all other peripherals countries on the other hand, is consistent with recent interpretations that South-East Europe (and Russia) were particularly backward, with implications for the development of its monetary system (Morys 2017).

# Description of the time series for historical stock market indices

Belgium: Brussels stock market index underlying Annaert et el. (2012) and subsequently updated by the authors; time series “Belgian companies with main activity in Belgium”

Germany: Berlin stock market index from Eube (1998), time series “Gesamtindex”

France: Paris stock market index from Hautcoeur and Le Bris (2010)

Italy: Milan stock market index from Baia Curioni (2001), time series “indice 70”

Portugal: Monthly stock market index of the Lisbon Stock Exchange, kindly shared by Rita Martins de Sousa, Pedro Neves and Amélia Branco

Russia: Monthly stock market index available from the St. Petersburg Stock Exchange History Research Project at Yale University (<https://som.yale.edu/faculty-research-centers/centers-initiatives/international-center-for-finance/data/historical-financial-research-data/st-petersburg-stock-exchange-project>)

Sweden: Stockholm stock market index collected by Daniel Waldenström (<https://sites.google.com/view/danielwaldenstrom/data-programs>)

U.S.: NBER Macroeconomic Time Series n° 11025.

Sources

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