Appendix E: Country notes regarding historical GDP and FX bases.

1. ADVANCED ECONOMIES

- **Australia**: From 1870, annual current GDP data in LCY is based on Jorda, Schularick, and Taylor (2017) [labelled "JST" throughout].
- **Austria**: From 1913, annual current GNP is reported (in schilling) in Mitchell (2013, 4828f.); our pre-1913 current GDP estimates are based on Kausel (1979, 717ff.; "Republik" series) on which we also base the Gulden-Kronen exchange rate.
- **Belgium**: Prior to 1870, we rely on Horlings (1997; value-added current GDP basis); from 1870, annual current GDP data in LCY is based on "JST".
- **Canada**: continuous current GDP figures are only reported in Mitchell (2013) from 1926 – we use "JST" prior to this year'; the 1861 crises cost (code "CAD-1861") is put into relation to the 1867 current GDP figure in Mitchell (ibid.).
- **Cyprus**: current GDP figures are reported (in pounds) from 1950 via Mitchell (2013, 1977ff.).
- **Denmark**: current GDP from 1818 is based (in kroner) on Mitchell (2013, 4818ff.).
  - For liquidity costs of "DK-1877" we add the Dkr 3.7M extra Lombard credit provision over September-December 1877, plus the Dkr 3M raise of the note issuance ceiling, reported via Svendsen and Hansen (1968, 333f.).
- **Finland**: current GDP from 1860 is based (in Finnish Markka) on Hjerppe (1991, table 3. A1).
  - For "FIN-1900", Kusterae and Tarkka (2011, 349) note that the final accounts following the bankruptcy of the Bank of Agriculture and Industry were not drawn up until 1917, with the Markka 1.5M loss figure for the Bank of Finland referring to this 1917 audit: this loss figure may therefore be inflated from the loss figure at market prices in 1900. Finnish current GDP more than tripled over the period of 1900-1917. However, the same authors also indicate additional "substantial" deposit exposure by the Treasury to the Bank, and record total unfunded liabilities of the Bank at Markka 5.74M: at the 1917 current GDP of Finland, this latter figure would still come to 15.2% of GDP – only a marginal difference to our base estimate.
- **France**: from 1815, current GDP is based on Mitchell (2013, 4820f.); for the 1810 emergency loan (code "FRA-1810"), we use 1815 current GDP via Mitchell (ibid.); current GDP prior to 1815 is based on the new series in Nuvolari and Ridolfi (2020).
- **Germany**: prior to 1815 – until the dissolution of the "Holy Roman Empire" – we relate intervention sizes to current GDP estimates for the respective free cities or states (such as Prussia), as there exists no centralized fiscal or monetary Imperial authority, and Imperial stakeholders have virtual autonomy on all detected intervention policies (see above and Isenmann 1980); current (per capita and aggregate) GDP data is based on Pfister (2021), who reports figures in Mark; we use Gulden/Rfl – Mark conversions reported in Sander (1902, 750); from 1870, we consolidate all German intervention costs and annual current GDP data in LCY is based on "JST";

- o For "GER-1798", a GBP – Hamburg Mark Banco exchange rate of 1:13.5 is used, following Fenn and Nash (1874, 117).
- o **Prussia:** Prussian current GDP prior to 1870 follows the German per capita estimates in Pfister (2021), using population figures in Hohorst (1978) and Buesch and Neugebauer (1981);
- o **Saxony:** Saxonian current GDP for "GER-1866" is based on Pfister (2021).
- **Greece**: current NNP from 1927 (reported in drachmae) is based on Mitchell (2013, 4831ff.).
- **Iceland**: current GDP data is sourced via Statistics Iceland (2021).
- **Ireland**: Irish current GDP at factor cost from 1700 is separately reported in Dimsdale and Thomas (2017, sheet A.9), which we use for Irish interventions; from 1924, current GNP (reported in pounds) is based on Mitchell (2013, 4832ff.).
- **Italy**: As in the German case, we do not consolidate intervention sizes on any national level prior to 1870, but rather on the city state or state level, where full fiscal, monetary, and political autonomy lies; from 1300, current per capita GDP is based on Malanima (2011), who reports figures for Northern Italy in Florentine lire, as well as the silver content of the lire in annual terms – the currency conversion to the gold basis is undertaken based on Karaman, Pamuk, and Yildirim-Karaman (2019); we only use Malanima's figures for Northern Italian city-states at this point, with Malanima (2006) arguing that pre-1800 per capita GDP figures for Northern and Southern Italy are closely aligned. From 1870, we begin consolidating intervention costs on the national level, with annual current GDP data in LCY based on "JST"; "IT-1595" assumes a 0.35 grams gold content of the Bolognese lire; "
  - o For the Bolognese cases ("IT-1583" and "IT-1595"), we rely on exchange rates of the Bolognese lira based on Salvioni (1909), recording a gold content of 0.671 grams per lire.
  - o For "IT-1597", we calculate with a population in Tuscany in 1597 of 800,000 (see Breschi and Malanima 2002); for "IT-1588" and "IT-1593" we calculate with a weight of the French Ecus of 3.23g of gold.
  - o For "IT-1622" we use the Spanish per capita GDP via Alvarez-Nogal and Escosura (2012), and work with a population for the Kingdom of Naples of 3M, based on Beloch (1937, 225), reaching an overall current GDP of Ducats 89.1M; Some authors (e.g. Malanima 2006) have posited that Southern and Northern Italian GDP prior to 1800 is closely comparable – for the Bank of Annunziata crash ("IT-1701"), Malanima's (2011) Northern Italian figures are used, per arguments in Malanima (2006).
  - o The Venetian population figures are based on Pezzolo (2013, 257), while figures for all other cities and city states are based on Bairoch (ibid.).
  - o For "IT-1974" our estimate of a USD 400M (Lire 293.4BN) guarantee volume is based on various contemporary media estimates, including those in Businessweek (1974, 46).
  - o For **"IT-1982"**, we distribute intervention costs (USD 1BN) equally between liquidity costs and guarantees.

- **Japan**: current GNP is reported on the basis of Mitchell (2013) from 1885 – we estimate the 1890 BoJ intervention (code "JP-1890") on the basis of Nakabayashi's (2018, 235) data.
- **Holland/Netherlands**: Between 1347 and 1807, current GDP data is based on van Zanden and van Leeuwen (2012), reported in guilders, where we interpolate decadal figures; current GDP

between 1807-1913 is based on Smits, Horlings, and van Zanden (2000, table I.2, market prices); current GDP in Euros from 1998 are taken from ECB SDW.

- **New Zealand**: current GDP prior to 1935 is based on Greasley and Oxley (2000, taking "model 5" approach, in pounds), and is reported between 1935-1938 on an API basis, from 1938 also on the "clean" GDP basis in Mitchell (2013).
    - o For "NZL-1931", our guarantee size – following the official Treasury assumptions detailed by Tocker (1933, 124f.) – works with a loss provision of 25% on the accumulated (actual) FX purchases: hence, GBP 9.05M.
- **Norway**: current GDP is sourced via Mitchell (2018) from 1865.
    - o For "NOR-1857", we use a current GDP figure of Kroner 420M, adjusting Mitchell's (ibid.) 1865 figure (Kroner 480M); intervention size is put at Kroner 4.25M, adding the foreign currency loan and the Kroner 1.6M payouts recorded in Grytten and Hunnes (2010, 13).
    - o For "NOR-1898" our total liquidity aid stands at NOK 124.25, composed of NOK 4M aid to *Industriebanken* in the form of deposits, NOK 3.25 liquidity aid via Norges Bank for *Industriebanken*, and NOK 117M in general liquidity aid over 1898-1901, all based on Lie (2020, 104ff.).
    - o For "NOR-1991" we note that Steigum (2009, 63) estimates significantly higher gross fiscal costs than Laeven and Valencia (2020), but for consistency purposes we take the latter's estimates as our base case. We take the Government Bank Insurance Fund's total 1991 capitalization (NOK 11BN, via Steigum ibid., 62) as our guarantee cost, though the Fund is also reported to have undertaken capital injections with these (ibid.).
- **Portugal**: current GDP data is sourced via "JST" from 1870; at least one intervention size is reported in GBP (code "PT-1919"), which we convert to PTE via Dollar/GBP crosses in "JST".
- **Scotland**: prior to the Act of Union of 1707, we treat Scotland as a separate fiscal and political entity and use the residual of GB-English current GDP at market prices in Broadberry et al. (2015); afterwards, intervention costs are consolidated and put into relation to Great Britain current GDP at market prices in Broadberry et al. (ibid.).
- **Sweden:** current GDP data between 1620 and 2012 is based on Edvinsson (2014); from 2013, current GDP data is based on "JST".
    - o For "SWE-1890", the excess annual growth in Riksbank private loans over 1890 is 1.3%, over the average 2.1% annual growth rate for 1879-1889; hence, SEK 880k is our liquidity cost estimate. Data via Fregert (2014).
    - o For "SWE-1907" we base our liquidity cost figure on the monthly Riksbank discount volumes for domestic bills presented in Grodecka-Messi, Kenny, and Oegren (2021, appendix figure A.2), working with a "normal" pre-crisis discount level of SEK 120M, and total liquidity costs of SEK 320M.
- **Switzerland:** we rely on current GDP figures in Halbeisen, Mueller, and Veyrassat (2012) for 1851-1869, and on "JST" (reported in CHF) from 1870.
    - o For "SZ-1859", our estimate of the total liquidity assistance amounts to CHF 12.75M, based on the total liabilities of the Paris branch that led to the bank run, and the information that 75% of the deposits were withdrawn (via Jöhr 1915, I, 162ff.).
    - o liquidity costs for "SZ-1907" are estimated on the basis of data in Bachmann, Schnyder, and Weber (1932, 56).

- o For "SZ-1921", our estimate of the total liquidity support by the SNB to Neuenburger Kantonalbank is based on the values of the transferred assets from Caisse d'Epargne detailed in SNB (1921, 18), and put there at CHF 107M.
  - o For "SZ-1928", our cost estimate is based on the report that Diskontbank incurred at least CHF 6.1M in losses from the collapse of Wolfensberger, and Escher & Freisz, see Halbeisen (2001).
- **United Kingdom/England**: current GDP data to 1870 is based on Broadberry et al. (2015) via Dimsdale and Thomas (2017, sheet A.9); we use English current GDP (at market prices) in the same source to 1706 to relate English intervention costs separately: from 1707, we use aggregate current GDP figures (at market prices) for Great Britain as a whole; liquidity outlays are reported in the IFS on the basis of "monetary authority claims on the private sector" rather than "claims on other depository institutions";
- **United States**: between 1789 and 1869, current GNP is reported in Mitchell (1983, 886ff.); from 1870, annual current GDP data in LCY is based on "JST".
  - o For "US-1861", we take as the amount of committed liquidity the volume of total paid-in capital of NYCH member banks, with the members agreeing to pool reserves upon the war outbreak. Camp (1892, 687) reports NYCH paid-in balances for the year ending September 30, 1861 of US$ 353.4M.
  - o For "US-1890" we estimate the peak liquidity provision by the NYCH at USD 12.5M, based on the figure in Gorton and Tallman (2018, 47).
  - o For "US-1914" we add the USD 500M Treasury emergency liquidity offer, the USD 510M in extra circulation by currency associations (table 1 in Wicker 2005, 48f.), and the USD 125M in loan certificate issuance upon war outbreak by the NYCH (Wicker ibid., 45).
  - o For "US-1932", for the RFC total loans, we follow the USD 1.237BN in total authorized funds over Feb-1932 to Mar-1933 compiled in Butkiewicz (1995, table 1), for equity purchases, we follow the USD 1.3BN purchased until the termination of the program in June 1935, stated in Olson (1988, 82).

2. EMERGING ECONOMIES

- **Argentina**: current GDP is reported from 1935 (in pesos) in Mitchell (2013, 3309ff.).
  - o Liquidity costs for "ARG-1990" are a lower-bound estimate, given a lack of data for 1989.
- **Azerbaijan**: no current GDP data is reported via IFS or Mitchell (2013);
- **Bangladesh**: current GDP is reported from 1973 (in taka) in Mitchell (2013, 1953ff.);
- **Brazil**: current GDP from 1861 (reported in milreis) is based on Mitchell (2013, 3309ff.); a number of interventions (i.e."BRL-1900") are reported on a GBP cost basis – currency conversions are undertaken here via Global Financial Data (annual average rates), starting with 1970 on the IFS basis;
- **Bulgaria**: current NNP from 1924 (reported in leva) is based on Mitchell (2013, 4828f.).

- **Czechoslovakia**: current GDP from 1913 (reported in kotura) is based on Mitchell (2013, 4829ff.); as with other post-Communist economies during the 1990s, the current GDP figures involve sharp breaks – for the 1991 intervention (code "CZK-1991") we have used Mitchell's (ibid.) 1990 NMP figures in kotura;
- **Chile**: current GDP from 1940 (reported in pesos/escudos) is based on Mitchell (2013, 3309ff.).
- **China**: current GDP from 1962 (in yuan) is based on Mitchell (2013, 1952ff.); pre-1962 intervention costs as a share of current GDP are currently not covered.
- **Colombia**: current GDP is reported from 1945 (in pesos) in Mitchell (2013, 3014ff.).
- **Congo, Republic**: for "COGR-1994", we take take the 1994-5 change in monetary claims on depository institutions for the liquidity cost basis, against 1994 current GDP, given FX basis changes. Sourced via IFS.
- **Costa Rica**: current GDP is reported from 1950 (in colones) in Mitchell (2013, 3283ff.).
- **Cuba**: current GDP is reported (in pesos) from 1903 in Mitchell (2013, 3274ff.); for "CB-1893" we take the year 1903 as the current GDP reference.
- **Ecuador**: current GDP is reported (in sucres) from 1939 in Mitchell (2013, 3283ff.).
- **Egypt**: current GDP from 1950 (reported in pounds) is based on Mitchell (2013, 1918ff.).
- **El Salvador**: current GNP from 1939 is reported (in colones) via Mitchell (2013, 3277ff.).
- **Guyana**: current GDP is sourced via IFS; for "GY-1993" we use changes in depository institution liabilities to the central government as our liquidity volume (via IFS).
- **Hong Kong**: current GDP reported from 1961 (in HK$) in Mitchell (2013, 1955ff.).
- **Hungary**: current NMP is reported (in forint/pengo) from 1950 in Mitchell (2013, 4847ff.); for "HUG-1931", we base our liquidity cost estimate on the figures in Macher (2019, 661ff.) by summing up the deposit withdrawals between July and November 1931, and the associated index change in HNB discounts over 1931.
- **India**: from 1970, we use current GDP via IFS (2000; 2014).
  - For "IN-1969", we use the 1970 current GDP figure.
- **Indonesia**: current NNP is reported (in guilders) from 1921 in Mitchell (2013, 1950ff.).
- **Israel**: current GDP is reported (in new shekels) from 1950 in Mitchell (2013, 1971ff.).
- **Jamaica**: for "JAC-1996", we rely on "depository institutions': credit from monetary authorities", reported via IFS, to obtain liquidity costs.
- **Jordan**: in the case of "JOR-1989" we take changes in government deposits at deposit money banks over the crisis period as our proxy for liquidity costs, given absent monetary authority claims data in IFS.
- **Kazakhstan**: current GDP in USD is reported via World Bank, which we convert to USD via IFS year-average figures.
- **Latvia**: current GDP figures are reported via IFS in Euros.
  - For "LAT-2008", we convert LCY liquidity figures at the rate used by the IMF (0.782 lat per Euro); a 1924-33 GNI estimate is taken from Clark (1938).
- **Lithuania**: the 1924-33 GNI estimate is taken from Clark (1938) for "LIT-1933".
- **Mexico**: Between 1895-1924, current GDP is reported in INEGI (1985, I, 311); current GDP from 1925 is reported (in pesos) in Mitchell (2013, 3279ff.).
  - For the note guarantee volumes of "MX-1913", we use the 1910 note figures in INEGI (1985, II, 797), and 1910 current GDP (INEGI, I, 311).

- **Mongolia**: current GDP in USD is reported via World Bank, which we convert to USD via IFS year-average figures.
- **Paraguay**: current GDP is reported (in guaranies) from 1950 in Mitchell (1983, 902ff.).
- **Peru**: current GDP from 1942 is reported (in soles) in Mitchell (1983, 903ff.).
- **Philippines**: current GDP from 1946 (in pesos) is reported in Mitchell (2013, 1979ff.).
- **Poland**: current NMP from 1950 is reported (in zloty) in Mitchell (2013, 4853ff.); a 1924-33 GNI estimate is taken from Clark (1938) for "POL-1931"; the GDP figures for the immediate post-Communist transition period (1989-1993) until the Polish currency stabilization are highly inflated and not representative – we have still calculated the 1990 intervention (code "POL-1990") on the Mitchell (ibid.) basis.
- **Russia/USSR**: for 1885-1913, we rely on Gregory's (1982, table 3.2) current NNP figures (in credit roubles); current GNP from 1928 (reported in roubles) is based on Mitchell (2013, 4834ff.).
- **Slovak Republic**: current GDP is sourced via IMF IFS.
- **Tanzania**: current GDP from 1955 is sourced via Mitchell (2013).
- **Uruguay**: current GDP from 1955 is reported (in pesos) in Mitchell (1983, 903ff.).
  - "UG-2002" is reported with a "zero" liquidity cost value, given that the IFS reports declining central bank claims on depository institutions over the timeframe.
- **Venezuela**: current GDP from 1950 is reported (in bolivares) in Mitchell (1983, 904).
  - for "VN-1960" we split the 28% of GDP cost equally between "fiscal" and "liquidity" costs; for "VN-1978", we apply a total 3.5BN bolivares as a fiscal cost to authorities (which de facto assume all liabilities), following Ugalde (1979).
- **Vietnam**: "VT-1997" – the episode reports declining central bank claims on depository institutions, as per IFS data, we rely on Laeven and Valencia's estimates.
- **Yugoslavia**: current NMP from 1923 is reported (in dinari) in Mitchell (2013, 4836ff.); for historical FX conversions, we take black market rates to US Dollars reported by Global Financial Data.

If not otherwise specifically stated, our default source for historical current GDP data is Mitchell (2013), and for modern data IFS statistics. Note that T-1, the year immediately preceding our first "crisis year", is always taken as the basis for the current GDP figure.

Refer to the "Appendix D" for all associated references.