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War, Bond Prices, and Public Opinion

How Did the Amsterdam Bond Market Perceive the
Belligerents' War Effort During World War One?

Online Appendix

Mohr Siebeck

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VI. Appendix

1. Data Appendix

1.1. Selected countries' GDP data

Table A.1 provides the data on GDP per capita used to compute the indices that are depicted in Figure 1.1 in this study's introductory chapter. Computing indices provides the basis for assessing changes in a time series over time in an illustrative way. But this advantage comes at the cost of a loss of information on the depicted data's levels. Therefore, I provide the original data that I took from the Maddison database along with the computed indices. Given are the absolute GDP per capita figures corresponding to the series in the Maddison database that is labeled "rgdppnac". This series is described as "real GDP per capita in 2011US\$, 2011 benchmark (suitable for cross-country growth comparisons)". For additional information on the database and the data themselves, I refer the reader to the homepage of the Maddison Project at Groningen University as well as to Bolt et al. (2018). Finally, the country abbreviations used in the following are: AUT = Austria; FRA = France; GER = Germany; ITA = Italy; RUS = Russia; TUR = Turkey; and UK = United Kingdom.

Table A.1 continued

	AUT	FRA	GER	ITA	RUS	TUR	UK
1919	3 917	4 625	5 225	4 286	1 231	—	7 456
1920	4 183	5 309	5 647	4 388	1 236	—	6 881
1921	4 595	5 058	6 217	4 239	1 131	—	6 660
1922	4 989	5 939	6 729	4 548	1 313	—	7 247
1923	4 928	6 175	5 554	4 920	1 512	1 242	7 439
1924	5 484	6 876	6 462	5 008	1 916	1 347	7 691
1925	5 838	6 854	7 134	5 305	2 394	1 490	8 041
1926	5 918	6 991	7 282	5 300	2 688	1 718	7 715
1927	6 078	6 834	7 961	5 159	2 800	1 551	8 307
1928	6 341	7 290	8 262	5 435	2 945	1 692	8 373
1929	6 413	7 748	8 184	5 663	2 979	1 931	8 601
1930	6 217	7 455	8 027	5 363	3 114	1 989	8 504
1931	5 700	6 967	7 376	5 257	3 142	2 073	8 031
1932	5 097	6 513	6 791	5 331	3 093	1 918	8 047
1933	4 912	6 974	7 183	5 229	3 210	2 136	8 248
1934	4 944	6 896	7 794	5 174	3 504	2 151	8 764
1935	5 040	6 722	8 322	5 410	4 007	2 160	9 064
1936	5 192	6 982	8 991	5 178	4 279	2 527	9 433
1937	5 471	7 381	9 464	5 651	4 634	2 566	9 718
1938	6 172	7 347	10 088	5 769	4 621	2 745	9 794
1939	7 102	7 885	10 921	6 076	4 809	2 888	9 788
1940	6 865	6 650	10 914	5 905	4 608	2 667	10 716
1941	7 312	5 444	11 537	5 753	—	2 400	11 694
1942	6 906	4 905	11 595	5 398	—	2 478	11 939
1943	7 047	4 705	11 898	4 553	—	2 226	12 103
1944	7 199	3 984	12 290	3 663	—	2 108	11 574
1945	2 990	4 233	9 119	3 279	—	1 804	11 028
1946	3 392	6 342	4 478	4 406	4 113	2 277	10 543
1947	3 756	6 807	4 921	5 209	4 570	2 350	10 322
1948	4 793	7 228	5 724	5 575	5 163	2 606	10 543
1949	5 710	8 137	6 631	6 010	5 639	2 418	10 871
1950	6 426	8 531	7 840	6 465	6 108	2 583	10 846

Sources: Maddison dataset at <https://www.rug.nl/ggdc/historicaldevelopment/maddison/releases/maddison-project-database-2018> as updated and described by Bolt et al. (2018); accessed: 3 May 2019, 18:13 o'clock.

1.2. An overview of the government bonds' financial characteristics

The following Tables A.2 and A.3 inform about the main financial, or formal, characteristics of all officially and unofficially traded sovereign bond series in the cross-section that I constructed for the trading place of Amsterdam. In addition, Plates A.1 to A.3 show the price lists from which I gathered the prices.

A bond series entered my database if I could gather, at least, one price observation in the 2 191-day stretch between the beginning of 1914 and the end 1919. Note that there were few bonds that were admitted to official trade – i.e., they were described in the stock exchange handbooks of the time – but were not traded even once. These few bonds are not part of the database. The bond series are listed alphabetically by country and within country by interest rate, from the lowest to the highest. Given per bond series is the following information in the order of the appearing columns:

- (1) The issuing country. Should the issuer have been the next entity below the level of the central state – e.g., the province of Minas Gerais in the case of Brazil, or the state of Prussia in the case of Germany – this is marked in the first column (“country name/state name”).
- (2) The interest rate, ranging, historically, between 2.5 and 6.0 whereby the majority of bonds exhibited an interest rate of 4.0, 4.5, or 5.0 percent. In some case, the country name plus the interest rate is sufficient to *unequivocally* identify a bond in *my* database (e.g., “the Belgian 2.5 %”).
- (3) An additional attribute following from the bonds’ description in the stock exchange handbooks. Sometimes these attributes are not necessary for identification in *my* database, but given anyway, in accordance with the handbooks. An attribute may be one of the following:
 - (i) an indication of the sources of revenue guaranteeing the flow of interest payments (e.g., “tobacco” referring to a tax on tobacco or “railway” possibly referring to transport revenue as a source of guarantee) or the object to be financed by issuing the bond (e.g., a certain railway line);
 - (ii) an indication of how the interest is intended to be paid (e.g., by payment in metal – i.e., “silver” or “gold” – instead of in paper money – i.e., “paper”);
 - (iii) an indication that the bond is a “consol” which is short for “consolidated” – i.e., a bond created by having merged two or more separate bond series into a new one and/or having adjusted the interest rate;
 - (iv) an indication of whether the bond is foreign or domestic debt;
 - (v) an indication of whether the

bond has been registered in a debt register (Dutch “grootboek”); (vi) an indication of whether the bond is a treasury note or a certificate; (vii) an indication of the bank house that underwrote the bond (e.g., “Rothschild” or “Hope & Co” in the case of some Russian bonds); or (viii) the range of the serial numbers of a bond (e.g., “1st series”).

(4) The exact year or the period in which the bond was issued. In a few instances, the year or period of issuance could not be identified or is possibly wrong (marked by “n/a” or “?”) Together with the interest rate and any addition, the bond series’ may be unequivocally identified in other databases than just mine.

(5) The denomination of shares – i.e., the range of standardized pieces into which the issued nominal debt was cut (e.g., pieces of "100" or "1 000" monetary units). The standardized pieces are either reported in full – e.g., “100/1 000/10 000” – or as a range between the smallest and largest possible piece – e.g., “200–10 000”. Note that the latter way of reporting does not mean that pieces could have taken any possible size in-between. The standardized pieces in-between were merely left out for reasons of space.

(6) The currency in which the bond was denominated. Predominantly this was one of the big players’ currencies (e.g., mark, pound [sterling], [Austrian] Kroner, or Franc).

(7) The date(s), and therefore also the frequency, of the coupon payments. Bonds predominantly paid interest twice a year (e.g., in “Jan[uary]/Jul[y]” or “Apr[il]/Oct[ober]”) to the amount of one-half of the bond’s interest rate.

(8) The redemption date or redemption period. One of three scenarios may apply: (i) the issuer could, or had to, begin to redeem the bond after a specified year or sometime within a specified period, but without the necessity to do that up until a certain year (marked by, for example, “1892–”); (ii) the issuer were to redeem the bond up until a specified year, but could choose when to start (marked by, for example, “–1923”); or (iii) the issuer had to redeem within a specified period (marked by, for example, “1894–1974”). As a feature of the time, redemption was specified to be happening stepwise over long periods of time. Sometimes, the specific amount (a percentage of the issued debt) or the specific serial numbers to be redeemed that way were specified, but sometimes there were not. This information is neglected here as it bears no significance for this study, in contrast to the date up until a bond had to have been redeemed (cf. Chapter II).

(9) The ratio between the sums of effectively gathered raw prices and of total trading days (i.e., the maximum number of recordable prices). This is a measure of the density of the price account over 1914–1919. From the 2 191 days under observation, I subtracted the days on which the Amsterdam Stock Exchange was temporarily closed (i.e., late July 1914 to early February 1915), remaining Sundays, and remaining holidays (562 days overall). Thus, the density of the price account principally lies between close to zero and 100 percent.

As sources for columns (1) to (8), I used the contemporary handbooks on the Amsterdam Stock Exchange – the *Gids bij de Prijscourant* and the *Effectenboek* (cf. Chapter 2). Note that two principally important pieces of information are not reported here, namely the bond series' nominal value outstanding at, for example, the turn of 1913/1914 and the default status of the bond during the war (cf. the text for additional information).

Beside the officially traded bonds, I also gathered prices on a number of English and French war bonds unofficially traded on the grey market. These prices do not appear in the stock exchange handbooks. Table A.3 lists these bonds with a reduced set of characteristics, namely by country (1), the bond series' name as to be found in the unofficial price list, (3) the date of the first observed price quote, (4) the likely currency denomination, (5) the possible redemption date following from the name of the bond in combination with the date of the first price quote, and (6) the density of the price account. The Anglo-French war bond likely is connected with the loan that England and France received from the United States in 1915.

(b) The section on official prices (i.e., the highlighted box in panel (a))

Officiele Prijscourant.		
AMSTERDAM, Donderdag 27 December.		
STAATSLEENINCEN.		
per Ct.	V.K.L.E.U. K.Slotk.	
NEDERLAND.		
Oblig. N.W.S. van f 100 ⁰	100 ⁰ ,100	100 ⁰ ,
dit f 200	5	100 ⁰ ,100
dit ditf. van 500	5	100 ⁰ ,100
dit van 1000	5	100 ⁰ ,100
dit van 10 ⁰	4 ¹	99 ⁰ ,99 ⁰
dit van 50 ⁰	4 ¹	99 ⁰ ,99 ⁰
dit van 100 ⁰	4 ¹	99 ⁰ ,99 ⁰
dit ditf. van 100 ⁰	4 ¹	99 ⁰ ,99 ⁰
dit ditf. van 500 ⁰	4 ¹	99 ⁰ ,99 ⁰
dit ditf. van 1000 ⁰	4 ¹	99 ⁰ ,99 ⁰
Obl. N. W. S. Schuld	3	69 ⁰ ,69 ⁰
Cert. N. W. S.	3	69 ⁰ ,69 ⁰
Groot-oekObl.	2 ¹	58 ⁰ ,58 ⁰
Groot-oekObl.	2 ¹	58 ⁰ ,58 ⁰
NED-INDIE.		
Ned-Indië 1915 f 100... 5	169 ⁰ ,169 ⁰	
Ned-Indië 1915 f 500... 5	100 ⁰ ,99 ⁰	
Ned-Indië 1915 f 1000... 5	99 ⁰ ,99 ⁰	
Ned-Indië 1916 / 1909 ... 5	100 ⁰ ,100 ⁰	
Ned-Indië 1916 / 500 ... 5	100 ⁰ ,99 ⁰	
Ned-Indië 1916 / 1900 ... 5	99 ⁰ ,99 ⁰	
Ned-Indië 1917 a / 50 ⁰ ... 5	100 ⁰ ,99 ⁰	
Ned-Indië 1917 a / 1000 ⁰ ... 5	99 ⁰ ,99 ⁰	
HONGARIJE.		
Obligation 1914	4 ¹	46 ⁰ ,46 ⁰
Goudeleening 1881-1893 .. 4	4 ¹	49 ⁰ ,
Kr. 199-1000 1892-1910 , 4	45 ⁰ ,45 ⁰	
Kr. 20-10 1892-1910 4	45 ⁰ ,45 ⁰	
OOSTENRIJK		
Bel.vijfjeKronenr. Jan-Juli 3	44 ⁰ ,44 ⁰	44 ⁰ ,
Bel.vr. Kronenr Mei-Nov. 4	44 ⁰ ,43 ⁰	44 ⁰ ,
Lemb-Chern.-tasy Spw.O.4	100 ⁰ ,50 ⁰	
Europa.		
Amer. Best Sugar Co. C.v.A.	89	90
Amer Can Gy. Ct. v. zw.A.	55 ⁰ ,57 ⁰	37 ⁰ ,
Am.Care & Laundry Co. C. v. A.	67 ⁰ ,68	69
Americ. Cities Gy. C. v. pr. A.	34 ⁰	33 ⁰ ,33 ⁰
Amer. Jade & Leather Comp.	51 ⁰ ,52 ⁰	55
Am. Smelt. & Ref. Co. C.v.A.	80 ⁰ ,80 ⁰	
Am. Water Works C.v.W.P. A.	17 ⁰ ,17 ⁰	18

Sources: *Algemeen Handelsblad*, issue no. 29 012 (evening issue) of 27 December 1917 showing the price list of the same day. PDF accessed via the digital collection of the *Koninklijke Bibliotheek van Nederland* available here: <https://www.kb.nl/en>.

(b) The section on unofficial prices (i.e., the highlighted box in panel (a))

Niet-officieel genoteerde fondsen.

- 6 % 5-j. notes v. d. Bergh's Ltd. 103 $\frac{1}{2}$.
6 % Engeland 98 $\frac{1}{2}$.
5 % Engeland 96— $\frac{1}{2}$.
5 $\frac{1}{2}$ % Russ. leening 1916 (14/2—14/8) 54— $\frac{1}{2}$.
Id. (14/4—14/10) 54 $\frac{1}{2}$.
Nieuwe Frisco uit de reorganisatie 20 $\frac{1}{2}$ — $\frac{1}{2}$.
Wabash cert. van gew. aand. nieuw Holl.
zegel onbep. nummers 13 $\frac{1}{2}$.
Id. id. pref. B. id. 24.
Id. id. pref. A. id. 48 $\frac{1}{2}$ —49.
Voting Trust South. Rail gew. 25 $\frac{1}{2}$ — $\frac{1}{2}$.
5 % Vaderl. Hyp. Bank 101.
4 $\frac{1}{2}$ % idem 99 $\frac{1}{2}$.
Nwe aand. N. I. Escompto 1917 123.
Claims Overijsselsche Hyp. f 3.50.
Aand. idem 120 en claim.
Aand. Comp. Merc. Argentino 237—45.
Div. No. 13 Common Cities Service f 90.
Nwe Javasche Cult. 350.
5 % Russ. Vrijheidsleening 49 $\frac{1}{2}$.
Cert. f 100 Gecons. Holl. Petr. 175.
N. zegel.
Denemarken 4 % Obl. 1912 86 $\frac{1}{2}$.
Engeland 5 % 1929/47 98 $\frac{1}{2}$.
Engelsch-Francsche leening 93.
Argent. Cedula L. 70 $\frac{1}{2}$ — $\frac{3}{4}$.
Argent. Cedula K. 59— $\frac{1}{4}$.
4 $\frac{1}{2}$ % Japan 1e Serie 75— $\frac{1}{4}$.
4 $\frac{1}{2}$ % Japan 2e Serie 69 $\frac{1}{2}$ — $\frac{1}{2}$.
4 % Kopenhagen 1901 86 $\frac{1}{2}$.
4 % Kopenhagen 1910—11 82 $\frac{1}{2}$ — $\frac{1}{2}$.
4 $\frac{1}{2}$ % Christjania 1914 94.
4 % Gothenburg '99 86.
4 % Gothenburg 1906 87.
4 $\frac{1}{2}$ % Stockholm 1913 96.
4 % Stockholm 1885 86 $\frac{1}{2}$.
4 % Stockholm 1900 86 $\frac{1}{2}$.
4 $\frac{1}{2}$ % Christ. Real Bank 91.
5 % San Paulo 1913 65 $\frac{1}{2}$ —66.
1,5 4 % Wladikawkas 1885 53— $\frac{1}{2}$.
Astra-Romana 146 $\frac{1}{2}$.

Sources: *Algemeen Handelsblad*, issue no. 28 785 of 12 May 1917. PDF accessed via the digital collection of the *Koninklijke Bibliotheek van Nederland* available here: <https://www.kb.nl/en>.

Table A.2: Characteristics of all bonds officially traded in Amsterdam

(1) Country [/Possibly subnational entity]	(2) Interest Rate (%)	(3) Addition	(4) Issued in/over	(5) Pieces	(6) Currency	(7) Coupon frequency	(8) Redemption date/ Redemption period	(9) Density of the price account
[1] Austria	3.0	Local Railway Company	1893	200–10 000	Kroner	Jan/Jul	1894–1974	0.22
[2] Austria	4.0	Consols	1892	100–20 000	Kroner	Mar/Sep	1892–	0.14
[3] Austria	4.0	Consols	1903	2 000	Kroner	Jan/Jul	1903–	0.85
[4] Austria	4.0	Consols	1903	2 000	Kroner	May/Nov	1903–	0.76
[5] Austria	4.0	Gold	1876–1893	200/1 000/10 000	Kroner ^a	Apr/Oct	1893 –	0.34
[6] Austria	4.0	Lemb.-Chern.-Jassy Rw.	1894	200/1 000/4 000	Kroner ^a	Jan/Jul	1895–1955	0.17
[7] Austria	4.5	Railway debt	1913	500–10 000	Mark	May/Nov	1919–1979	0.28
[8] Austria	4.5	Treasury notes	1914	500–20 000	Kroner	Jan/Jul	1915–1929	0.30
[9] Austria	5.0	Paper	1868	100/1 000/10 000	Kroner ^a	Feb/Aug	1868–	0.00
[10] Austria	5.0	Silver	1868	100/1 000/10 000	Kroner ^a	Apr/Oct	1868–	0.49
[11] Argentina	4.0	Foreign debt	1896–1899	100/500/1 000	Pound	Jan/Jul	1896–1954	0.41
[12] Argentina	5.0	Customs	1886/87	20/100/500/1 000	Pound	Jan/Jul	1886–1922	0.39
[13] Argentina	5.0	Domestic debt	1905	500/1 000	Peso	Mar/Jun/Sep/Dec	1911–1947	0.54
[14] Belgium	2.5	–	1842	100–10 000	Franc	Jan/Jul	1842–	0.06
[15] Belgium	3.0	–	1886	100–10 000	Franc	May/Nov	1904–	0.05
[16] Bosnia-Herzegovina	4.5	–	1902	200–10 000	Kroner	Jan/Jul	1903–1963	0.00
[17] Bosnia-Herzegovina	5.0	General purposes debt	1914	2 400/4 800	Kroner	Apr/Oct	1919–1974	0.02
[18] Bosnia-Herzegovina	5.0	Railway debt	1914	2 400/4 800	Kroner	Apr/Oct	1919–1974	0.02
[19] Brazil	4.0	–	1889	100/500/1 000	Pound	Apr/Oct	1890–1945	0.59

Table A.2 continued

(1) Country [/Possibly subnational entity]	(2) Interest Rate (%)	(3) Addition	(4) Issued in/over	(5) Pieces	(6) Currency	(7) Coupon frequency	(8) Redemption date/ Redemption period	(9) Density of the price account
[20] Brazil	4.0	–	1910	100	Pound	Feb/Aug	1911–	0.43
[21] Brazil	4.0	–	1910	500 1000	Pound	Feb/Aug	1911–	0.02
[22] Brazil	4.0	Railway guarantees	1901	200/100/500/1 000	Pound	Jan/Jul	1906–1962	0.59
[23] Brazil	4.5	–	1883	100/500/1 000	Pound	Jun/Dec	1884–1922	0.53
[24] Brazil	4.5	–	1888	100/500/1 000	Pound	Apr/Oct	1889–1925	0.50
[25] Brazil/Minas Gerais	4.5	Gold	1910	500	Franc	Jan/Jul	1915–1973	0.37
[26] Brazil /Minas Gerais	4.5	Gold	1911	500	Franc	Jun/Dec	1916–1974	0.37
[27] Brazil/Rio	4.5	Consol. sterling loan	1912	20/100/500/1 000	Pound	Apr/Oct	1912–1951	0.29
[28] Brazil	5.0	–	1895	100/500/1 000	Pound	Feb/Aug	1897–1936	0.56
[29] Brazil	5.0	–	1898	20/100/500/1 000	Pound	Jan/Apr/Jul/Oct	1901/10–	0.52
[30] Brazil	5.0	–	1903	100/500/1 000	Pound	May/Nov	1903–	0.52
[31] Brazil	5.0	–	1913	20/100/500/1 000	Pound	Apr/Oct	1927–	0.36
[32] Brazil	5.0	–	1914	20/100	Pound	Feb/May/Aug/Nov	1917/1927–	0.58
[33] Brazil	5.0	–	1914	500/1 000	Pound	Feb/May/Aug/Nov	1917/1927–	0.00
[34] Brazil/Bahia	5.0	–	1889	500	Franc	Jun/Dec	1890–1927	0.11
[35] Brazil/Bahia	5.0	Gold	1904	20/100/500	Pound	May/Nov	1905–1955	0.43
[36] Brazil/Bahia	5.0	–	1915	10/20/100	Pound	Jan/Jul	1918–	0.13
[37] Brazil/Para	5.0	Gold	1901	20/50/100/500	Pound	Jan/Jul	1902–1952	0.47
[38] Brazil/Para	5.0	Gold	1907	200/100/200	Pound	Jan/Jul	1908–1945	0.42

Table A.2 continued

(1) Country [/Possibly subnational entity]	(2) Interest Rate (%)	(3) Addition	(4) Issued in/over	(5) Pieces	(6) Currency	(7) Coupon frequency	(8) Redemption date/ Redemption period	(9) Density of the price account
[39] Brazil/Para	5.0	—	1915	20/100	Pound	Jan/Jul	1926–1956	0.29
[40] Brazil/Parana	5.0	—	1905	20/100	Pound	Apr/Oct	1906–1956	0.44
[41] Brazil/Parana	5.0	Gold	1913	20/100	Pound	Apr/Oct	1913–1973	0.23
[42] Brazil/Rio	5.0	Gold	1905	20	Pound	Apr/Oct	1905–1955	0.57
[43] Brazil/Rio	5.0	Gold	1909	20/50/100	Pound	Jun/Dec	1909–1935	0.27
[44] Brazil/Sao Paolo	5.0	—	1888	100/500/1 000	Pound	Apr/Oct	1889–1928	0.09
[45] Brazil/Sao Paolo	5.0	—	1904	20/100/500	Pound	Apr/Oct	1905–1935	0.36
[46] Brazil/Sao Paolo	5.0	Mortgage loan gold	1905	500/2 500	Franc	Jan/Jul	1910–1945	0.35
[47] Brazil/Sao Paolo	5.0	Treasury notes	1913	20	Pound	Jan/Jul	–1923	0.37
[48] Brazil/Sao Paolo	5.0	Treasury notes	1913	1 000	Pound	Jan/Jul	–1923	0.05
[49] Bulgaria	4.5	Gold	1907	500/2 500	Leva	Jul/Aug	1908–1968	0.34
[50] Bulgaria	4.5	—	1909	500–10 000	Franc	Jun/Dec	1910–1960	0.38
[51] Bulgaria	5.0	Tobacco	1902	500	Leva	Mar/Sep	1903–1953	0.50
[52] Bulgaria	5.0	Stamp gold	1904	500	Leva	May/Nov	1905–1955	0.31
[53] Bulgaria	6.0	Mortgage loan gold	1892	500/1 000/2 500	Franc	Jan/Jul	1893–1926	0.38
[54] Chile	4.5	Gold	1906	20/100	Pound	Apr/Oct	1906–	0.27
[55] Chile	4.5	Gold	1906	200	Pound	Apr/Oct	1906–	0.11
[56] Chile	5.0	—	1896	100/500/1 000	Pound	Jan/Jul	1896–	0.33
[57] Chile	5.0	—	1912	20/100/500/1 000	Pound	Jan/Jul	1915–1944	0.35

Table A.2 continued

(1) Country [/Possibly subnational entity]	(2) Interest Rate (%)	(3) Addition	(4) Issued in/over	(5) Pieces	(6) Currency	(7) Coupon frequency	(8) Redemption	(9) Density of the price account
[58] China	4.0	Gold	1895	500/2 500	Franc	Jan/Jul	1896–1932	0.32
[59] China	4.5	Gold	1898	25/50/100/500	Pound	Mar/Sep	1899–1944	0.47
[60] China	5.0	Railway loan	1904	100	Pound	Jun/Dec	1953–	0.18
[61] China	5.0	Gold	1912	20/100/500/1 000	Pound	Apr/Oct	1913–	0.40
[62] Colombia	3.0	–	1896	100/500/1 000	Pound	Jan/Jul	1910–	0.45
[63] Cuba	4.5	Gold	1909	1 000	Dollar	Feb/Aug	1919–1949	0.32
[64] Cuba	5.0	Gold	1904/05	500/1 000	Dollar	Mar/Sep	1910–1944	0.45
[65] Denmark	3.0	Gold	1894	500/1 000/5 000	Kroner	Jun/Dec	1914–	0.01
[66] Denmark	3.5	Domestic debt	1887	200–5 000	Kroner	Jun/Dec	1888–	0.08
[67] Denmark	4.0	–	1912	20/100/500/1 000	Pound	Mar/Sep	1914–1974	0.17
[68] Dominican Republic	5.0	Customs gold	1908	50/100/500/1 000	Dollar	Feb/Aug	1918–1958	0.58
[69] Dutch East Indies	5.0	–	1915	100	Guilder	Apr/Oct	1916–1941	0.64
[70] Dutch East Indies	5.0	–	1915	500	Guilder	Apr/Oct	1916–1941	0.64
[71] Dutch East Indies	5.0	– ^b	1915	100/500	Guilder	Apr/Oct	1916–1941	0.16
[72] Dutch East Indies	5.0	–	1915	1 000	Guilder	Apr/Oct	1916–1941	0.82
[73] Dutch East Indies	5.0	–	1916	100	Guilder	May/Nov	1917–1957	0.58
[74] Dutch East Indies	5.0	–	1916	500	Guilder	May/Nov	1917–1957	0.59
[75] Dutch East Indies	5.0	–	1916	1 000	Guilder	May/Nov	1917–1957	0.61
[76] Dutch East Indies	5.0	–	1917	100	Guilder	May/Nov	1918–1958	0.39

Table A.2 continued

(1) Country [/Possibly subnational entity]	(2) Interest Rate (%)	(3) Addition	(4) Issued in/over	(5) Pieces	(6) Currency	(7) Coupon frequency	(8) Redemption	(9) Density of the price account
[77] Dutch East Indies	5.0	—	1917	500	Guilder	May/Nov	1918–1958	0.39
[78] Dutch East Indies	5.0	—	1917	1 000	Guilder	May/Nov	1918–1958	0.40
[79] Dutch East Indies	5.0	—	1919	100	Guilder	n/a	n/a	0.07
[80] Dutch East Indies	5.0	—	1919	500	Guilder	n/a	n/a	0.07
[81] Dutch East Indies	5.0	—	1919	1 000	Guilder	n/a	n/a	0.07
[82] Egypt	3.5	—	1890	20/100/500/1 000	Pound	Apr/Oct	1891–	0.03
[83] Egypt	4.0	—	1876	20/100/500/1 000	Pound	May/Nov	1877–1942	0.15
[84] Finland	3.5	Railway loan	1889	500/2 000/5 000	Mark	Jun/Dec	1890–1950	0.10
[85] France	3.0	Grootboek	1895(?)	20–3 000	Franc	Jan/Apr/Jul/Dec	1896(?)–	0.04
[86] Germany	3.0	Reich	1890–1903	200–10 000	Mark	Jan/Jul	1904–	0.41
[87] Germany	3.0	Reich	1890–1903	200–10 000	Mark	Apr/Oct	1904–	0.41
[88] Germany/Hamburg	3.0	— ^c	n/a	n/a	Mark	n/a	n/a	0.01
[89] Germany/Prussia	3.0	—	1890–1901	200–10 000	Mark	Apr/Oct	1902–	0.38
[90] Germany/Saxony	3.0	—	1896–1899	500–5 000	Mark	Mar/Sep	1900–	0.05
[91] Germany/Bremen	3.5	—	1899	500–5 000	Mark	May/Nov	1909–	0.03
[92] Germany/Hamburg	3.5	— ^c	n/a	n/a	Mark	n/a	n/a	0.00
[93] Germany/Prussia	3.5	—	1896	200/1 000	Mark	Jan/Jul	1897–	0.30
[94] Germany/Prussia	3.5	—	1896	2 000/5 000	Mark	Jan/Jul	1897–	0.24
[95] Germany/Hamburg	4.0	—	1900	500–5 000	Mark	Jan/Jul	1909–	0.10

Table A.2 continued

(1) Country [/Possibly subnational entity]	(2) Interest Rate (%)	(3) Addition	(4) Issued in/over	(5) Pieces	(6) Currency	(7) Coupon frequency	(8) Redemption	(9) Density of the price account
[96] Hungary	3.0	Gold	1895	20/100/500	Kroner	Jan/Jul	1896–1984	0.00
[97] Hungary	3.5	—	1897	100–10 000	Kroner	Jan/Jul	1898–	0.00
[98] Hungary	4.0	Gold	1881–1894	100–10 000	Kroner ^a	Jan/Jul	1895–	0.63
[99] Hungary	4.0	—	1892–1910	100/1 000	Kroner	Jun/Dec	1911–	0.66
[100] Hungary	4.0	—	1892–1910	2 000	Kroner	Jun/Dec	1911–	0.68
[101] Hungary	4.0	—	1892–1910	10 000	Kroner	Jun/Dec	1911–	0.02
[102] Hungary	4.0	—	1910	20	Pound	Mar/Sep	1911–	0.06
[103] Hungary	4.0	—	1910	100/400	Pound	Mar/Sep	1911–	0.05
[104] Hungary	4.5	—	1913	20/100/200/400	Pound	Apr/Oct	1923–	0.30
[105] Hungary	4.5	—	1914	200/100/200/400	Pound	Mar/Sep	1919–1974	0.34
[106] Hungary	4.5	Treasury notes	1913	500–10 000	Mark	n/a	1916	0.15
[107] Hungary	4.5	Treasury notes	1913	500–10 000	Mark	n/a	1918	0.04
[108] Italy	3.5	—	1862–1881	100–100 000	Lira	Jan/Jul	1882–	0.11
[109] Japan	4.0	—	1899	50/100/500	Pound	Jun/Dec	1909–1954	0.32
[110] Japan	4.0	—	1910	20/50/100/200	Pound	Jun/Dec	1920–1970	0.13
[111] Japan	4.5	1 st ser.	1905	100	Pound	Feb/Aug	1910–1925	0.45
[112] Japan	4.5	1 st ser.	1905	200/500	Pound	Feb/Aug	1910–1925	0.16
[113] Japan	4.5	2 nd ser.	1905	20/100/200	Pound	Jan/Jul	1910–1925	0.36
[114] Japan	5.0	Domestic debt	1908/09	500/1 000	Yen	Jun/Dec	1914–1964	0.42

Table A.2 continued

(1) Country [/Possibly subnational entity]	(2) Interest Rate (%)	(3) Addition	(4) Issued in/over	(5) Pieces	(6) Currency	(7) Coupon frequency	(8) Redemption	(9) Density of the price account
[115] Japan	5.0	Domestic debt	1908/09	5 000/10 000	Yen	Jun/Dec	1914–1964	0.10
[116] Liberia	5.0	Customs	1913	100/500/1 000	Dollar	Jan/Jul	1913–1952	0.10
[117] Mexico	3.0	Consols 1 st ser.	1886	100–5 000	Dollar	Jun/Dec	1887–	0.12
[118] Mexico	3.0	Consols 2 nd ser.	1886	100–5 000	Dollar	Jun/Dec	1887–	0.02
[119] Mexico	4.0	Gold	1904	500/1 000	Dollar	Jun/Dec	1904–1954	0.17
[120] Mexico	5.0	1 st –4 th ser.	1895	100/1 000	Mex. Dol.	Apr/Oct	1896–	0.62
[121] Mexico	5.0	5 th ser.	1895	100/1 000	Mex. Dol.	Apr/Oct	1896–	0.27
[122] Mexico	5.0	Consols gold	1899	20/100	Pound	Jan/Apr/Jul/Oct	1900–	0.46
[123] Mexico	5.0	Consols gold	1899	200/1 000	Pound	Jan/Apr/Jul/Oct	1900–	0.17
[124] Mexico/Sinaloa	5.0	–	1906	100/500/1 000	Dollar	Jan/Jul	1907–1932	0.01
[125] Mexico/Vera Cruz	5.0	–	1902	100/500/1 000	Dollar	Mar/Jun/Sep/Dec	1903–1928	0.29
[126] Netherlands	2.5	NWS Cert.	1814–1842	100–1 000	Guilder	Jan/Jul	1842–	0.95
[127] Netherlands	2.5	Grootboek	1814–1842	1 000	Guilder	Jan/Jul	–	0.30
[128] Netherlands	3.0	Grootboek	1895–1899	1 000	Guilder	Mar/Sep	–	0.26
[129] Netherlands	3.0	NWS	1895–1899	100/500/1 000	Guilder	Mar/Sep	1905–	0.95
[130] Netherlands	3.0	NWS Cert.	1895–1899	100/200/500/1 000	Guilder	Mar/Sep	1905–	0.90
[131] Netherlands	3.5	Grootboek	1911	1 000	Guilder	Jun/Dec	–	0.05
[132] Netherlands	3.5	NWS	1911	500/1 000	Guilder	Jun/Dec	1911	0.80
[133] Netherlands	4.0	Voluntary war loan	1916	100	Guilder	Apr/Oct	1918–1945	0.43

Table A.2 continued

(1) Country [/Possibly subnational entity]	(2) Interest Rate (%)	(3) Addition	(4) Issued in/over	(5) Pieces	(6) Currency	(7) Coupon frequency	(8) Redemption (date)	(9) Density of the price account
[134] Netherlands	4.0	Voluntary war loan	1916	500	Guilder	Apr/Oct	1918–1945	0.43
[135] Netherlands	4.0	Voluntary war loan	1916	1 000	Guilder	Apr/Oct	1918–1945	0.53
[136] Netherlands	4.5	Voluntary war loan	1916	100	Guilder	May/Nov	1917–1942	0.66
[137] Netherlands	4.5	Voluntary war loan	1916	500	Guilder	May/Nov	1917–1942	0.57
[138] Netherlands	4.5	Voluntary war loan	1916	1 000	Guilder	May/Nov	1917–1942	0.69
[139] Netherlands	4.5	Voluntary war loan	1917	100	Guilder	Feb/Aug	1919–1959	0.35
[140] Netherlands	4.5	Voluntary war loan	1917	500	Guilder	Feb/Aug	1919–1959	0.35
[141] Netherlands	4.5	Voluntary war loan	1917	1 000	Guilder	Feb/Aug	1919–1959	0.35
[142] Netherlands	5.0	Voluntary war loan	1914	100	Guilder	Feb/Aug	– ^e	0.36
[143] Netherlands	5.0	Voluntary war loan	1914	200	Guilder	Feb/Aug	– ^e	0.36
[144] Netherlands	5.0	Voluntary war loan ^d	1914	100/200	Guilder	Feb/Aug	–	0.18
[145] Netherlands	5.0	Voluntary war loan	1914	500	Guilder	Feb/Aug	– ^e	0.35
[146] Netherlands	5.0	Voluntary war loan	1914	1 000	Guilder	Feb/Aug	– ^e	0.36
[147] Netherlands	5.0	Voluntary war loan ^d	1914	500/1 000	Guilder	Feb/Aug	–	0.18
[148] Netherlands	5.0	Voluntary war loan	1918	100	Guilder	Jun/Dec	1920–1960	0.17
[149] Netherlands	5.0	Voluntary war loan	1918	500	Guilder	Jun/Dec	1920–1960	0.17
[150] Netherlands	5.0	Voluntary war loan	1918	1 000	Guilder	Jun/Dec	1920–1960	0.17
[151] Nicaragua	5.0	–	1909	20/100/500	Pound	Jan/Jul	1913–	0.19
[152] Norway	5.0	–	1888	20/100/5000/1 000	Pound	Feb/Aug	1889–1963	0.00

Table A.2 continued

(1) Country [/Possibly subnational entity]	(2) Interest Rate (%)	(3) Addition	(4) Issued in/over	(5) Pieces	(6) Currency	(7) Coupon frequency	(8) Redemption (date)	(9) Density of the price account
[153] Portugal	3.0	1 st ser.	1902	500/2 500	Franc	Jan/Jul	1903–2002	0.65
[154] Portugal	3.0	2 nd ser.	1902	500/2 500	Franc	Jan/Jul	1903–2002	0.36
[155] Portugal	3.0	3 rd ser.	1902	500	Franc	Jan/Jul	1903–2002	0.70
[156] Portugal	3.0	3 rd ser.	1902	2 500	Franc	Jan/Jul	1903–2002	0.51
[157] Portugal	4.5	Tobacco	1891	500/2 500/5 000	Franc	Apr/Oct	1900–	0.73
[158] Romania	4.0	Gold	1890	500/1 000	Franc	Jan/Jul	1900–1933	0.01
[159] Romania	4.0	Gold	1890	2 500/5 000	Franc	Jan/Jul	1900–1933	0.02
[160] Romania	4.0	Gold	1891	500/1 000	Franc	Jan/Jul	1901–1945	0.00
[161] Romania	4.0	Gold	1891	2 500/5 000	Franc	Jan/Jul	1901–1945	0.02
[162] Romania	4.0	Gold	1894	500/1 000	Franc	Jan/Jul	1905–1949	0.08
[163] Romania	4.0	Gold	1894	2 500/5 000	Franc	Jan/Jul	1905–1949	0.12
[164] Romania	4.0	Gold	1896	500/1 000	Franc	May/Nov	1906–1950	0.05
[165] Romania	4.0	Gold	1896	2 500/5 000	Franc	May/Nov	1906–1950	0.07
[166] Romania	4.0	Gold	1898	500/1 000	Franc	May/Nov	1908–1968	0.07
[167] Romania	4.0	Gold	1898	2 500/5 000	Franc	May/Nov	1908–1968	0.04
[168] Romania	4.0	Gold	1905	500-20 000	Franc	Apr/Oct	1916–1956	0.05
[169] Romania	4.0	–	1910	500/1 000	Franc	Mar/Sep	1910–1950	0.08
[170] Romania	4.0	–	1910	2 500/5 000	Franc	Mar/Sep	1910–1950	0.15
[171] Romania	4.5	Gold	1913	500/1 000/2 500	Lei	Apr/Oct	1914–1954	0.24

Table A.2 continued

(1) Country [/Possibly subnational entity]	(2) Interest Rate (%)	(3) Addition	(4) Issued in/over	(5) Pieces	(6) Currency	(7) Coupon frequency	(8) Redemption (date)	(9) Density of the price account
[172] Romania	4.5	Treasury notes	1913	500–10 000	Lei	Feb/Aug	1916	0.10
[173] Romania	5.0	Gold	1903	500/1 000	Franc	Jun/Dec	1913–1953	0.10
[174] Romania	5.0	Gold	1903	2 500/5 000	Franc	Jun/Dec	1913–1953	0.12
[175] Russia	3.0	—	1859	100/1 000	Pound	May/Nov	1860–	0.41
[176] Russia	3.0	Great Rw. Comp.	1880	125	Gold ruble	Jun/Dec	1881–1951	0.50
[177] Russia	3.0	Great Rw. Comp.	1880	625	Gold ruble	Jun/Dec	1881–1951	0.51
[178] Russia	3.0	Gold	1896	125	Gold ruble	May/Aug	1897–	0.00
[179] Russia	3.0	Gold	1896	625	Gold ruble	May/Aug	1897–	0.01
[180] Russia	3.0	Gold	1891	125	Gold ruble	Jan/Apr/Jul/Oct	1893–1974	0.05
[181] Russia	3.0	Gold	1891	625	Gold ruble	Jan/Apr/Jul/Oct	1893–1974	0.07
[182] Russia	3.0	Gold 2 nd ser.	1894	125/625	Gold ruble	Jan/Apr/Jul/Oct	1894–1973	0.02
[183] Russia	3.0	Transcaucasian Rw.	1882	125/625	Gold ruble	Jun/Dec	1883–1953	0.57
[184] Russia	3.0	—	1889	125	Gold ruble	Jan/Jul	1891–1957	0.48
[185] Russia	3.5	—	1894	125	Gold ruble	Jan/Apr/Jul/Oct	1895–1976	0.13
[186] Russia	3.5	—	1894	625	Gold ruble	Jan/Apr/Jul/Oct	1895–1976	0.26
[187] Russia	3.8	Mutual Mortgage Comp.	1898	150/750/1 5000	Ruble	Jan/Jul	1898–1979	0.45
[188] Russia	4.0	Great Rw. Comp.	1861	125	Gold ruble	Apr/Oct	1867–1942	0.44
[189] Russia	4.0	Great Rw. Comp.	1888	100	Pound	Feb/Aug	1889–1953	0.72
[190] Russia	4.0	Great Rw. Comp.	1890	100	Pound	Jan/Jul	1891–1952	0.72

Table A.2 continued

(1) Country [/Possibly subnational entity]	(2) Interest Rate (%)	(3) Addition	(4) Issued in/over	(5) Pieces	(6) Currency	(7) Coupon frequency	(8) Redemption (date)	(9) Density of the price account
[191] Russia	4.0	–	1898	500	Gold ruble	Apr/Oct	1899–	0.76
[192] Russia	4.0	Nicolai Rw.	1867–1869	20	Pound	May/Nov	1867–1951	0.65
[193] Russia	4.0	Nicolai Rw.	1867–1869	100	Pound	May/Nov	1867–1951	0.74
[194] Russia	4.0	Consols	1880	125	Gold ruble	May/Nov	1880–1961	0.71
[195] Russia	4.0	Consols	1880	625	Gold ruble	May/Nov	1880–1961	0.80
[196] Russia	4.0	Tambov-Saratov Rw.	1882	125/1 250	Gold ruble	Jan/Jul	1883–1956	0.44
[197] Russia	4.0	Southwest Rw.	1885	125	Gold ruble	Jan/Jul	1885–1953	0.76
[198] Russia	4.0	Southwest Rw.	1885	625	Gold ruble	Jan/Jul	1885–1953	0.82
[199] Russia	4.0	Moscow-Kursk Rw.	1886	500/1 000	Mark	May/Nov	1887–1952	0.46
[200] Russia	4.0	Orel-Griasi Rw.	1887	600	Mark	Apr/Oct	1888–1951	0.30
[201] Russia	4.0	Orel-Griasi Rw.	1889	500/1 000/2 000	Mark	Apr/Oct	1890–1952	0.56
[202] Russia	4.0	Kursk-Chark.-Azow Rw.	1888	100	Pound	Jan/Jul	1888–1954	0.61
[203] Russia	4.0	Kursk-Chark.-Azow Rw.	1888	600	Mark	Jan/Jul	1889–	0.45
[204] Russia	4.0	Kursk-Chark.-Azow Rw.	1889	500/1 000/2 500	Mark	Apr/Oct	1890–1955	0.60
[205] Russia	4.0	Kursk-Chark.-Azow Rw.	1894	125	Gold ruble	Jan/Jul	1895–1955	0.32
[206] Russia	4.0	Rothschild consols	1889	125	Gold ruble	Jan/Apr/Jul/Oct	1890–1971	0.54
[207] Russia	4.0	Rothschild consols	1889	625	Gold ruble	Jan/Apr/Jul/Oct	1890–1971	0.80
[208] Russia	4.0	Rothschild consols	1889	1 250/3 125	Gold ruble	Jan/Apr/Jul/Oct	1890–1971	0.15
[209] Russia	4.0	Hope & Co	1889/90	125	Gold ruble	Mar/Jun/Sep/Dec	1889–1970	0.55

Table A.2 continued

(1) Country [/Possibly subnational entity]	(2) Interest Rate (%)	(3) Addition	(4) Issued in/over	(5) Pieces	(6) Currency	(7) Coupon frequency	(8) Redemption (date)	(9) Density of the price account
[210] Russia	4.0	Hope & Co	1889/90	625	Gold ruble	Mar/Jun/Sep/Dec	1889–1970	0.82
[211] Russia	4.0	Rothschild 3 rd ser.	1890	125	Gold ruble	Mar/Jun/Sep/Dec	1891–1972	0.28
[212] Russia	4.0	Rothschild 3 rd ser.	1890	625	Gold ruble	Mar/Jun/Sep/Dec	1891–1972	0.47
[213] Russia	4.0	Rothschild 4 th ser.	1890	125	Gold ruble	Mar/Jun/Sep/Dec	1891–1951	0.10
[214] Russia	4.0	Rothschild 4 th ser.	1890	625	Gold ruble	Mar/Jun/Sep/Dec	1891–1951	0.47
[215] Russia	4.0	Warsaw-Vienna Rw.	1890	125	Gold ruble	Jan/Jul	1890–1931	0.52
[216] Russia	4.0	Warsaw-Vienna Rw.	1890	625	Gold ruble	Jan/Jul	1890–1931	0.57
[217] Russia	4.0	Warsaw-Vienna Rw.	1890	1 250	Gold ruble	Jan/Jul	1890–1931	0.38
[218] Russia	4.0	Warsaw-V. Rw. 7 th ser.	1890	100/500	Ruble	Jan/Jul	1890–1931	0.42
[219] Russia	4.0	Warsaw-V. Rw. 9 th ser.	1894	125/625/1 250	Gold ruble	Jan/Jul	1894–1931	0.31
[220] Russia	4.0	Warsaw-V. Rw. 10 th ser.	1901	500/1 000/2 000	Mark	Jan/Jul	1902–1933	0.49
[221] Russia	4.0	Warsaw-V. Rw. 11 th ser.	1901	500/1 000/2 000	Mark	Jan/Jul	1901–1961	0.45
[222] Russia	4.0	Rothschild 3 rd ser.	1891	125	Gold ruble	Jan/Apr/Jul/Oct	1891–1971	0.34
[223] Russia	4.0	Rothschild 3 rd ser.	1891	625	Gold ruble	Jan/Apr/Jul/Oct	1891–1971	0.73
[224] Russia	4.0	Rothschild 3 rd ser.	1891	1 250	Gold ruble	Jan/Apr/Jul/Oct	1891–1971	0.04
[225] Russia	4.0	Rothschild 5 th ser.	1893	125	Gold ruble	Feb/May/Aug/Nov	1894–1975	0.46
[226] Russia	4.0	Rothschild 5 th ser.	1893	625	Gold ruble	Feb/May/Aug/Nov	1894–1975	0.69
[227] Russia	4.0	Rothschild 6 th ser.	1894	125	Gold ruble	Jan/Apr/Jul/Oct	1895–1976	0.62
[228] Russia	4.0	Rothschild 6 th ser.	1894	625	Gold ruble	Jan/Apr/Jul/Oct	1895–1976	0.78

Table A.2 continued

(1) Country [/Possibly subnational entity]	(2) Interest Rate (%)	(3) Addition	(4) Issued in/over	(5) Pieces	(6) Currency	(7) Coupon frequency	(8) Redemption (date)	(9) Density of the price account
[229] Russia	4.0	Rothschild 6 th ser.	1894	3 125	Gold ruble	Jan/Apr/Jul/Oct	1895–1976	0.01
[230] Russia	4.0	Donetz Rw.	1894	125	Gold ruble	Jun/Dec	1895–1960	0.66
[231] Russia	4.0	Domestic debt	1894	100/200/500/1 000	Ruble	Mar/Jun/Sep/Nov	1895–	0.67
[232] Russia	4.0	Domestic debt cert.	1894	100/200/500/1 000	Ruble	Mar/Jun/Sep/Nov	1895–	0.53
[233] Russia	4.0	Orel-Viterbsk Rw.	1894	125	Gold ruble	Apr/Oct	1895–1953	0.62
[234] Russia	4.0	Orel-Viterbsk Rw.	1894	625	Gold ruble	Apr/Oct	1895–1953	0.50
[235] Russia	4.0	Mosc.-Jaros.-Arch. Rw.	1897	500/1 000/2 000	Mark	Apr/Oct	1897–1943	0.45
[236] Russia	4.0	Moscow-Smolensk Rw.	1898	1 000	Guilder	May/Nov	1899–1950	0.48
[237] Russia	4.0	Transcaucas. Rw.	1898	500/2 500	Franc	Apr/Oct	1899–1953	0.61
[238] Russia	4.0	Transcaucas. Rw.	1898	5 000	Franc	Apr/Oct	1899–1953	0.20
[239] Russia	4.0	–	1902	500–5 000	Mark	Jan/Jul	1902–1940	0.50
[240] Russia	4.5	Iwangorod-Dombr. Rw.	1881	125	Gold ruble	Jan/Jul	1882–1932	0.58
[241] Russia	4.5	Iwangorod-Dombr. Rw.	1881	625	Gold ruble	Jan/Jul	1882–1932	0.63
[242] Russia	4.5	–	1905	500–5 000	Mark	Jan/Jul	1917–	0.50
[243] Russia	4.5	Ser. 31-36	1909	500	Franc	Jan/Jul	1920–1959	0.59
[244] Russia	4.5	Ser. 31-36	1909	2 500	Franc	Jan/Jul	1920–1959	0.59
[245] Russia	4.5	Ser. 37	1909	500/2 500/5 000	Franc	Jan/Jul	1920–1959	0.35
[246] Russia	5.0	Hamburg	1820	500	Ruble	Mar/Sep	1821–	0.24
[247] Russia	5.0	London	1822	111/148/518/1 036	Pound	Mar/Sep	1823–	0.18

Table A.2 continued

(1) Country [/Possibly subnational entity]	(2) Interest Rate (%)	(3) Addition	(4) Issued in/over	(5) Pieces	(6) Currency	(7) Coupon frequency	(8) Redemption (date)	(9) Density of the price account
[248] Russia	5.0	—	1906	500	Franc	May/Nov	1917–1956	0.64
[249] Russia	5.0	—	1906	2 500/5 000	Franc	May/Nov	1917–1956	0.70
[250] Russia	6.0	Grootboek cert.	1817/18	1 000	Ruble	Jan/Jul	—	0.06
[251] Russia	6.0	Grootboek cert. silver	1817/18	1 000	Ruble	Jan/Jul	—	0.16
[252] Serbia	4.0	—	1895	500	Franc	Jan/Jul	1896–1968	0.58
[253] Serbia	4.0	—	1895	2 500	Franc	Jan/Jul	1896–1968	0.48
[254] Serbia	4.0	—	1895	5 000	Franc	Jan/Jul	1896–1968	0.10
[255] Spain	4.0	—	1881	1 000–6 000	Peseta	Jan/Arp/Jul/Oct	1882–	0.10
[256] Spain	4.0	—	1881	12 000/24 000	Peseta	Jan/Arp/Jul/Oct	1882–	0.02
[257] Surinam	4.5	—	1915	100/500	Guilder	Jan/Jul	1917–	0.03
[258] Surinam	4.5	—	1915	1 000	Guilder	Jan/Jul	1917–	0.03
[259] Sweden	3.5	—	1890	500/1 000/5 000	Mark	Mar/Sep	1891–1941	0.28
[260] Sweden	3.5	—	1895	20/100/500/1 000	Pounds	Apr/Oct	—1930	0.03
[261] Sweden	3.5	—	1900	100/500/1 000	Pounds	Feb/Aug	1920–	0.09
[262] Switzerland	3.5	Railway	1899–1902	1 000	Franc	Jun/Dec	1911–1962	0.24
[263] Turkey	4.0	Consols gold	1890	500/2 500	France	Mar/Sep	1891–1934	0.14
[264] Turkey	4.0	—	1894	500	Franc	Jan/Jul	1895–1959	0.10
[265] Turkey	4.0	Customs	1902	500/2 500	Franc	Jan/Jul	1903–1959	0.19
[266] Turkey	4.0	Unified	1903	500	Franc	Mar/Sep	1904–1964	0.27

Table A.2 continued

(1) Country [/Possibly subnational entity]	(2) Interest Rate (%)	(3) Addition	(4) Issued in/over	(5) Pieces	(6) Currency	(7) Coupon frequency	(8) Redemption (date)	(9) Density of the price account
[267] Turkey	4.0	Unified	1903	2 500	Franc	Mar/Sep	1904–1964	0.24
[268] Turkey	4.0	–	1903	500/2 500	Franc	May/Nov	1903–1958	0.10
[269] Turkey	4.0	Baghdad Rw. 1 st ser.	1904	500/2 500	Franc	Mar/Sep	1903–2001	0.56
[270] Turkey	4.0	–	1905	500/2 500	Franc	Mar/Sep	1906–1961	0.13
[271] Turkey	4.0	Baghdad Rw. 2 nd ser.	1910	500/2 500	Franc	Jan/Jul	1908–2005	0.59
[272] Turkey	4.0	–	1911	500/2 500/10 000	Franc	Jan/Jul	1911–1952	0.12
[273] Uruguay	3.5	Consols	1892	20/100	Pound	Jan/Apr/Jul/Oct	1892–	0.40
[274] Uruguay	5.0	–	1896	20/100	Pound	Feb/May/Aug/Nov	1896–	0.32
[275] USA/Louisiana	4.0	Consols	1874	100/500/1 000	Dollar	Jan/Jul	Originally 1914	0.00
[276] Venezuela	3.0	Diplomatic debt	1905	20/100	Pound	Jan/Jul	1905–1952	0.35
[277] Venezuela	3.0	Diplomatic debt	1905	500	Pound	Jan/Jul	1905–1952	0.21

Notes: “rw.” abbreviates “railway”. “ser.” abbreviates “series”. “NWS” abbreviates “Nederlandsche Werkelijke Schuld”. ^a Originally issued in Austrian guilder. ^b The series on pieces of 100/500 was split into two series beginning with 31 January 1916. ^c According to stock exchange intelligence not officially admitted to trade (i.e., not listed in it). ^d The two series on pieces of 100/200 and 500/1 000 were split into four series beginning with 31 January 1916. ^e Consolidated with the 4.5 % of 1917 as of 1 January 1918.

Sources: Cf. Chapter II and the Appendix text.

Table A.3: Characteristics of war bonds unofficially traded in Amsterdam

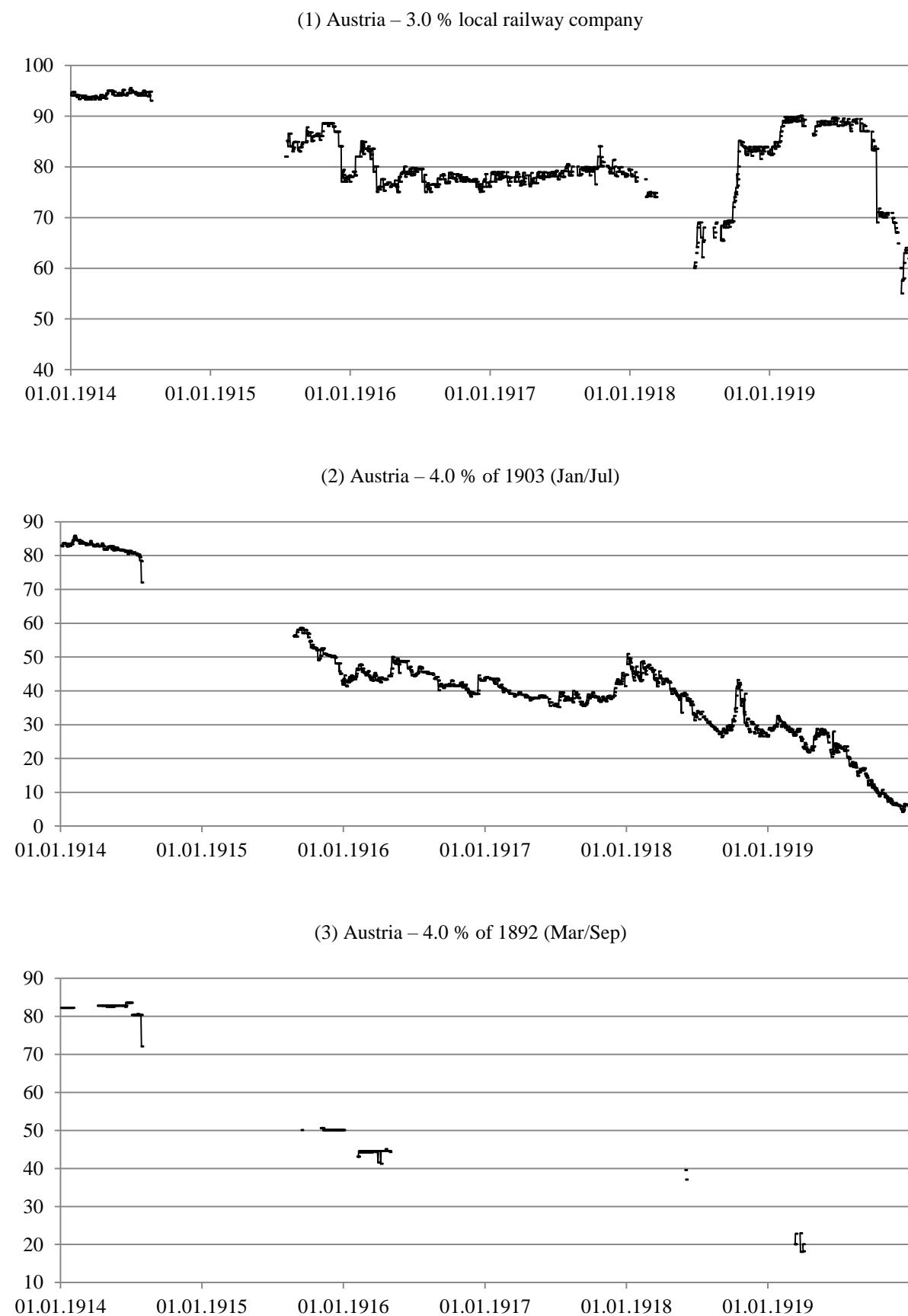
(1) Country	(2) Bond series (as named in the unofficial price list)	(3) First price observed (dd/mm/yyyy)	(5) Currency denomination	(6) Redemption	(9) Density of the price account during WWI
England	5.0 % 1917	02/03/1916	Pound	1917(?)	0.01
England	5.0 % 1919	06/05/1916	Pound	1919(?)	0.25
England	5.0 % 1920	15/06/1916	Pound	1920(?)	0.20
England	5.0 % 1921	15/06/1916	Pound	1921(?)	0.10
England	5.0 % 1917–21	02/03/1916	Pound	1917–21(?)	0.08
England	5.0 % 1929–47	18/01/1917	Pound	1929–47(?)	0.19
England	6.0 % 1920	07/10/1916	Pound	1920(?)	0.27
England/France	5.0 %	16/12/1915	US-Dollar(?)	1920(?)	0.17
France	4.0 % 1917/18	15/11/1917	Franc	?	0.08
France	5.0 %	29/11/1915	Franc	?	0.21

Sources: Cf. Chapter II and the Appendix text.

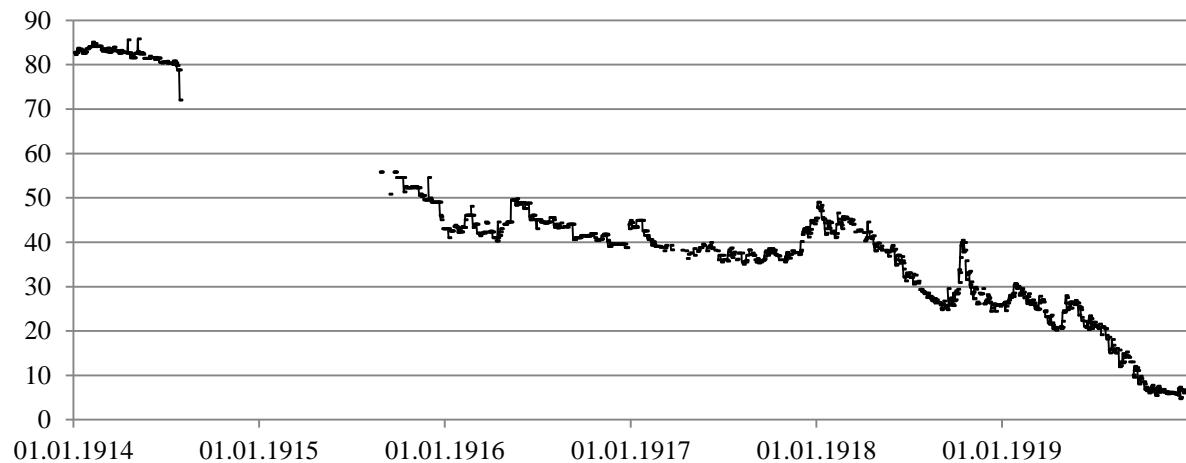
1.3. Plots of the bonds' raw price development

Figures A.1 and A.2 plot the raw prices as gathered from my sources for the cross-section of bonds traded at the Amsterdam Stock Exchange over 1914–1919. Prices are shown for all bond series that exhibit a density of the price account of at least ten percent, which is implying that 164 daily price observations are recorded (cf. column (9) in Tables A.2 and A.3). The plots are ordered alphabetically by country and the bonds are identified according to the way they are in Tables A.2 and A.3 (column (2)). As the raw price series naturally contain gaps and can thus be drawn only with marks, each series is shown in its own plot. This approach raises the number of plots while making it easier for the reader to assess the time patterns of the bonds of interest.

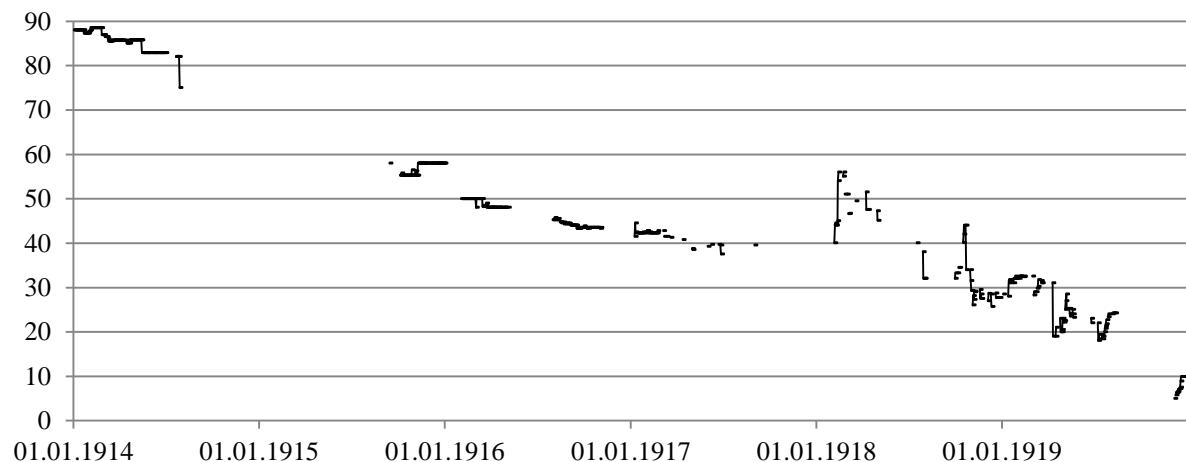
Figure A.1: Raw price development of all bonds traded in Amsterdam over 1914–1919



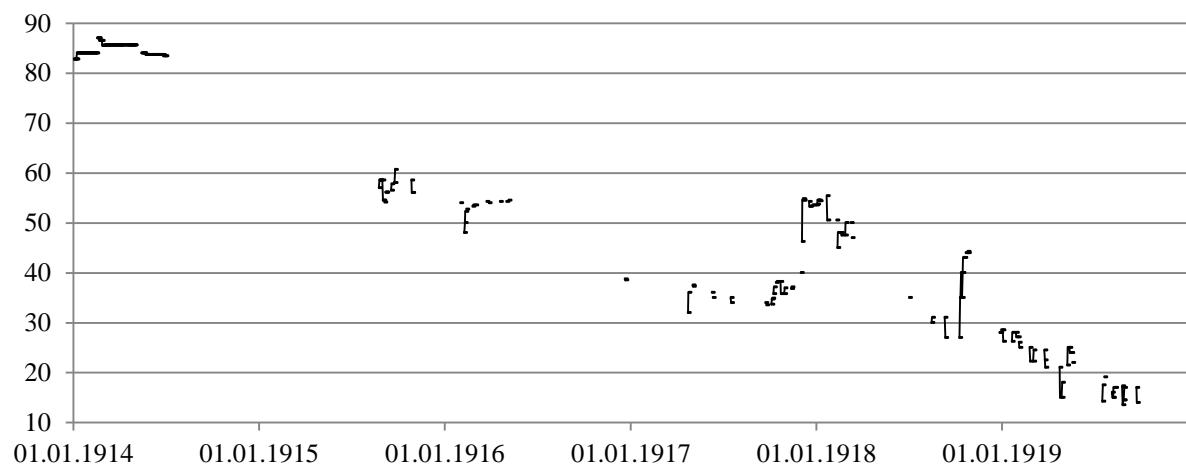
(4) Austria – 4.0 % of 1903 (May/Nov)



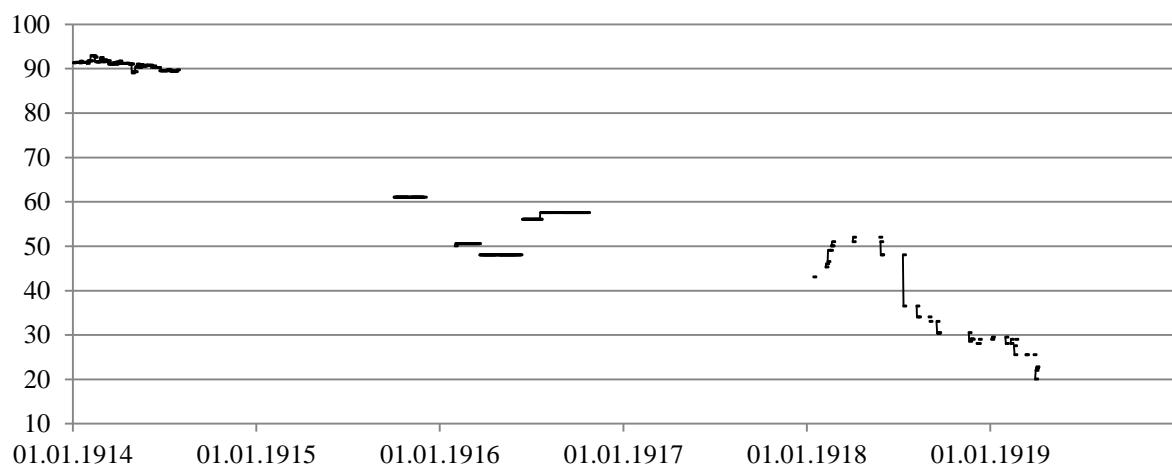
(5) Austria – 4.0 % of 1867–93



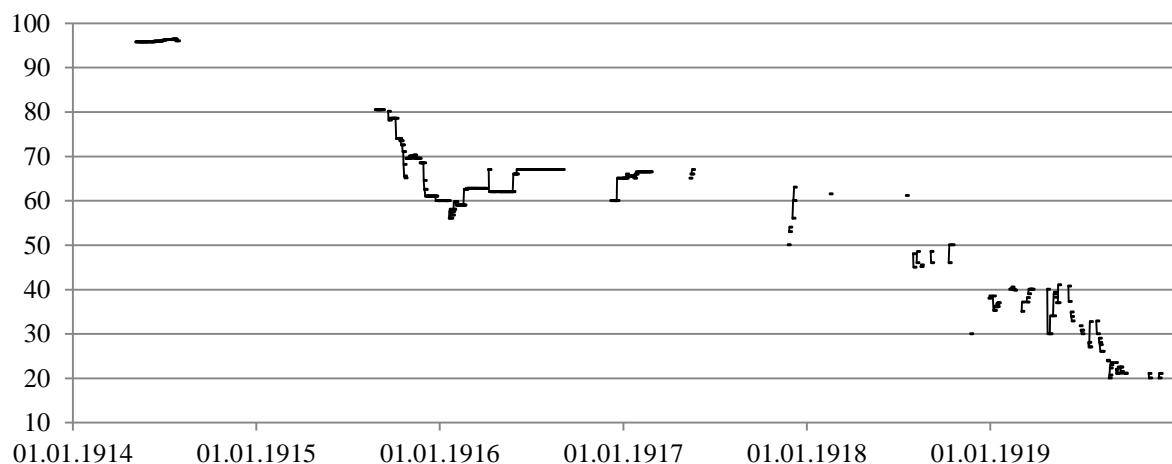
(6) Austria – 4.0 % Lemberg-Chern.-Jassy Railway



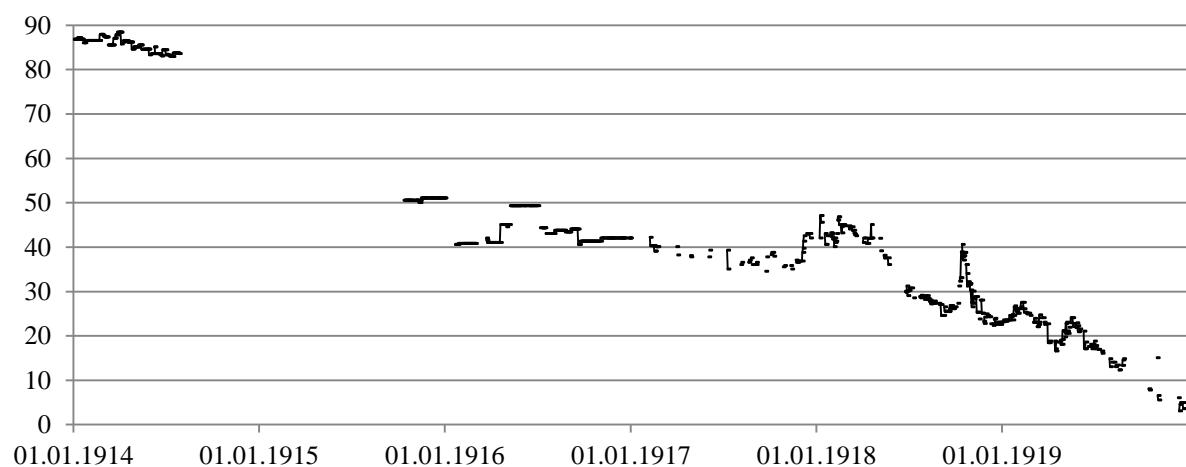
(7) Austria – 4.5 % of 1913



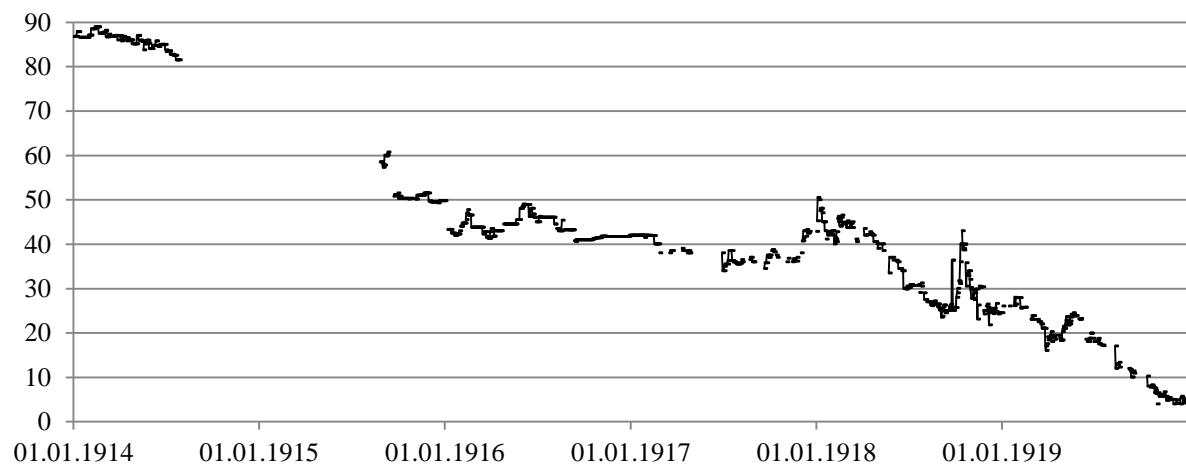
(8) Austria – 4.5 % of 1914



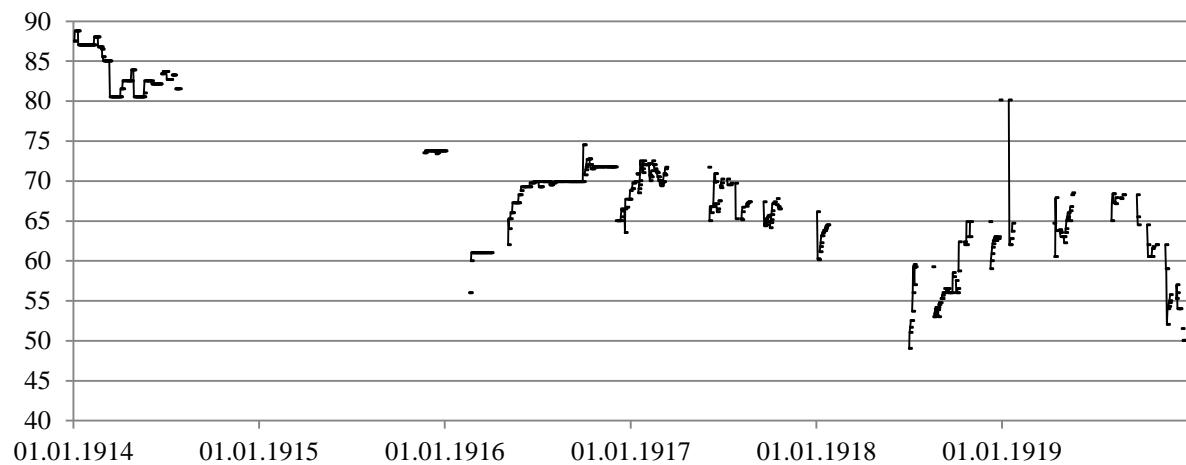
(9) Austria – 5.0 % of 1868 (Paper)



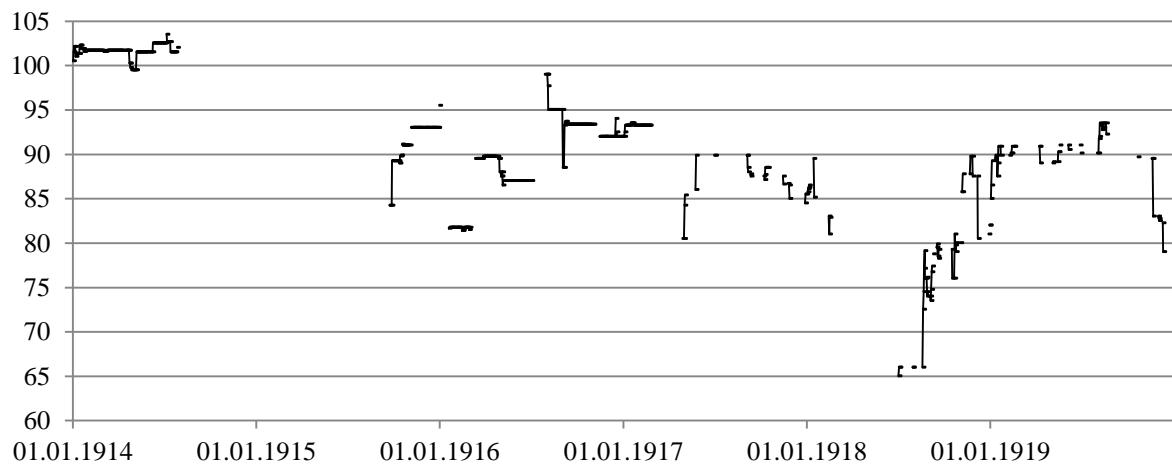
(10) Austria – 5.0 % of 1868 (Silver)



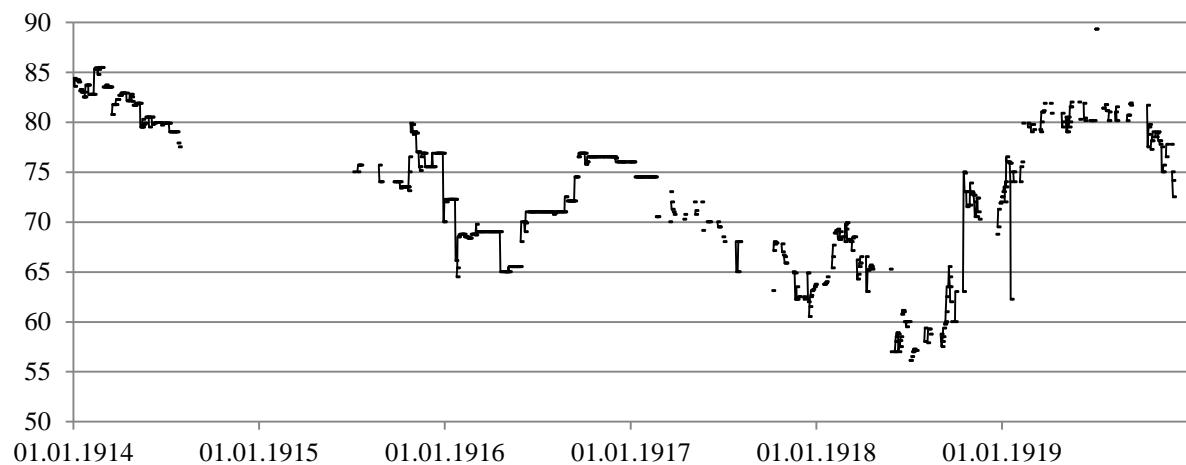
(11) Argentina – 4.0 % of 1896–1899



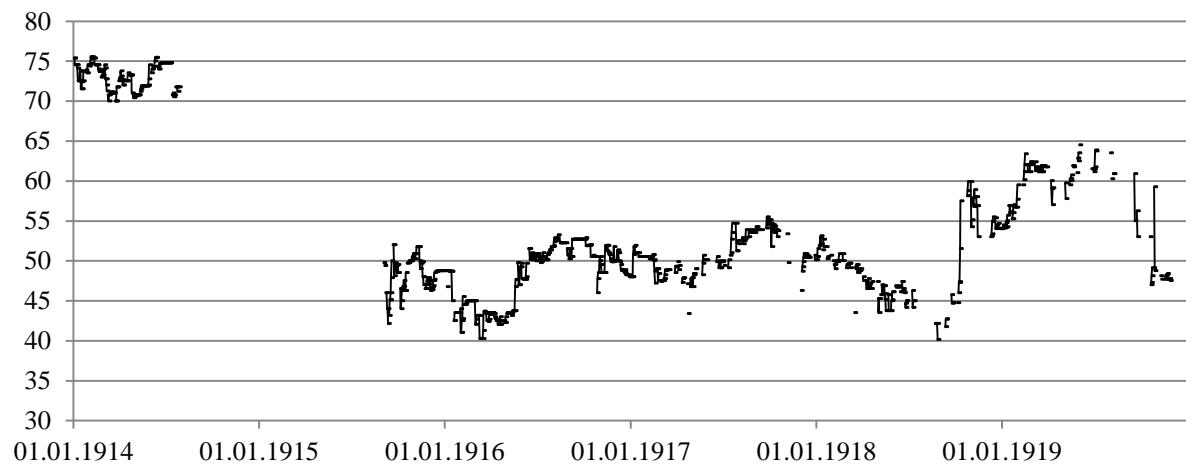
(12) Argentina – 5.0 % of 1886/87



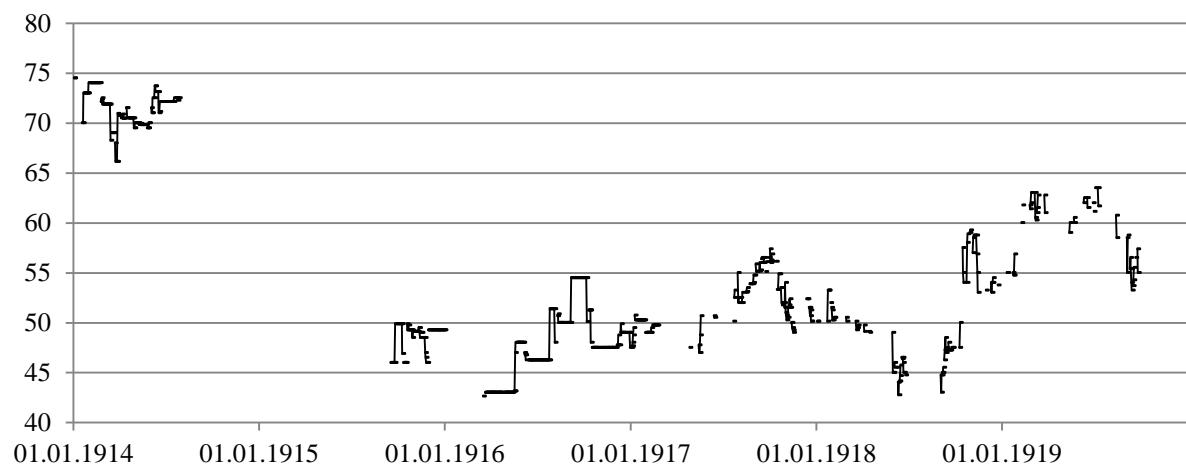
(13) Argentina – 5.0 % of 1905



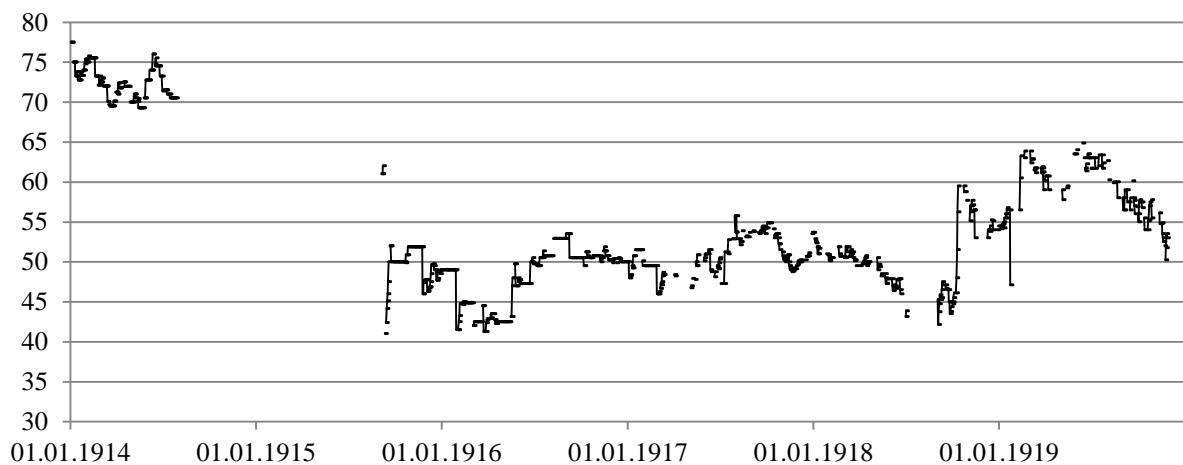
(14) Brazil – 4.0 % of 1889



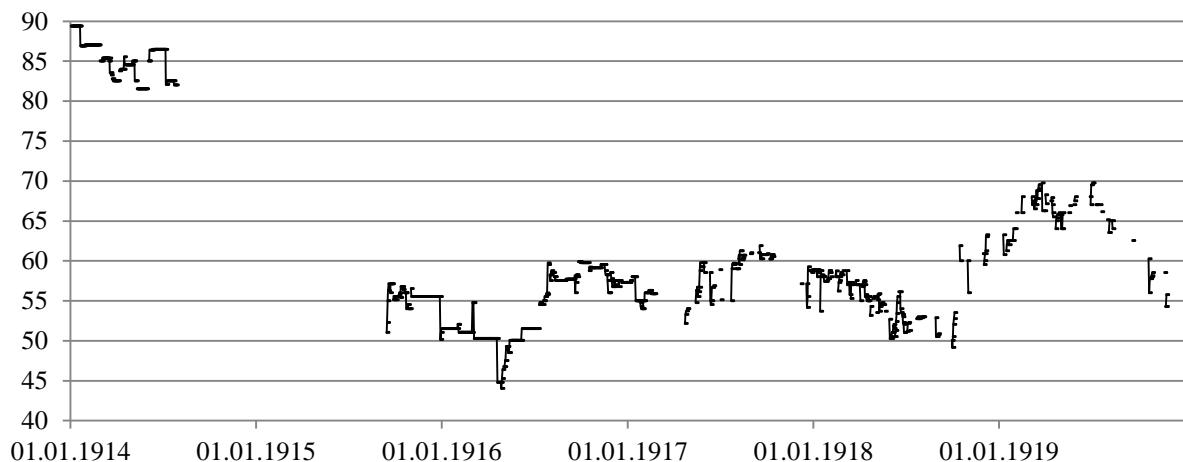
(15) Brazil – 4.0 % of 1910 (100)



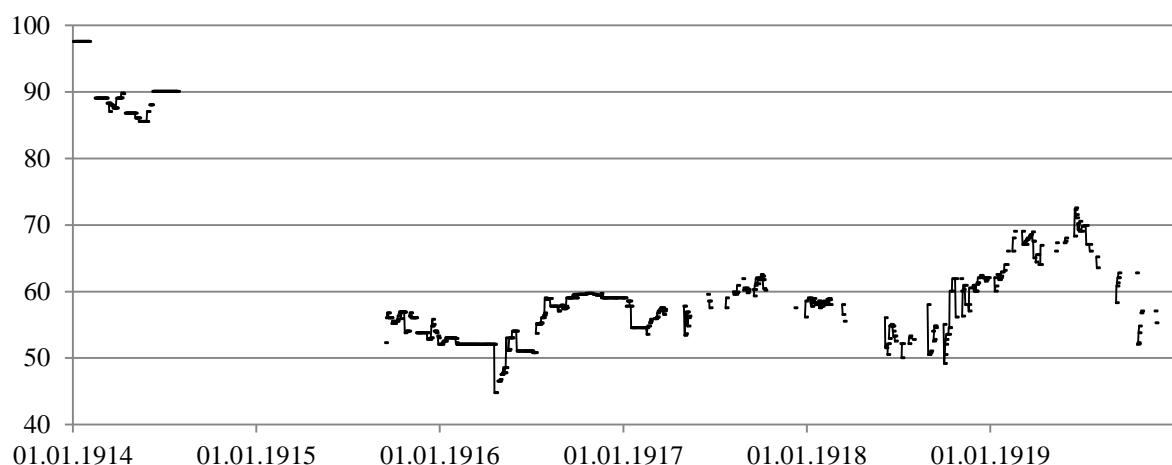
(16) Brazil – 4.0 % of 1901



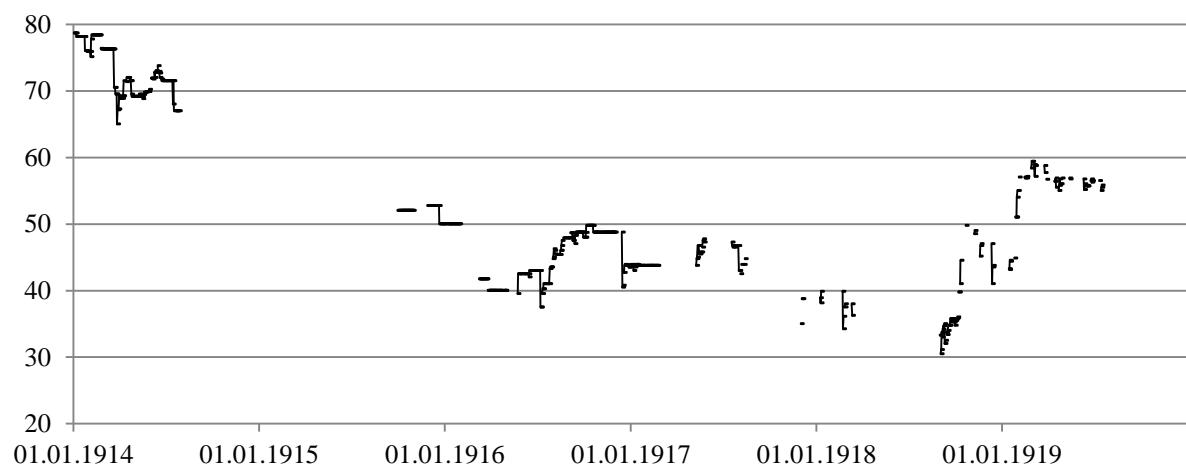
(17) Brazil – 4.5 % of 1883



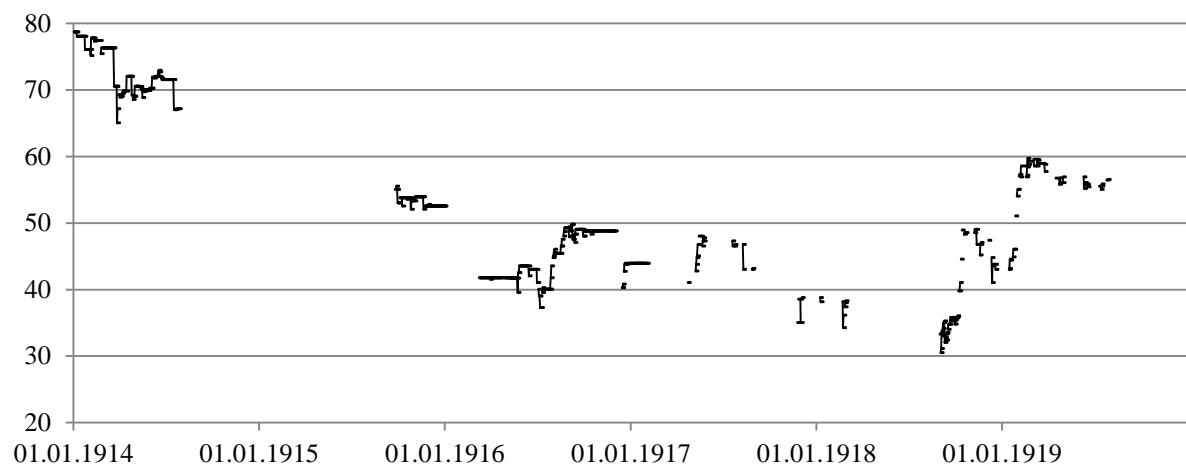
(18) Brazil – 4.5 % of 1888



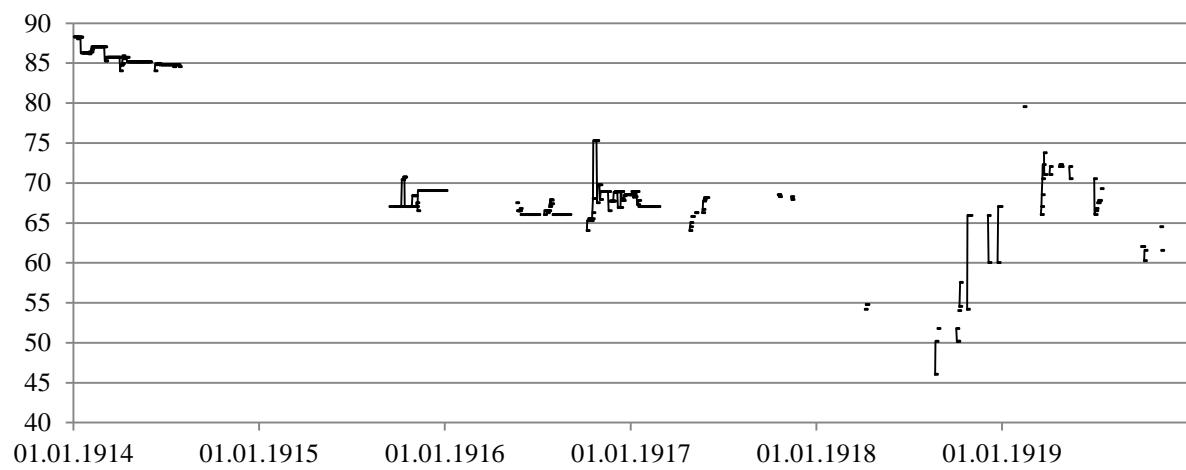
(19) Brazil – 4.5 % Minas Gerais of 1910



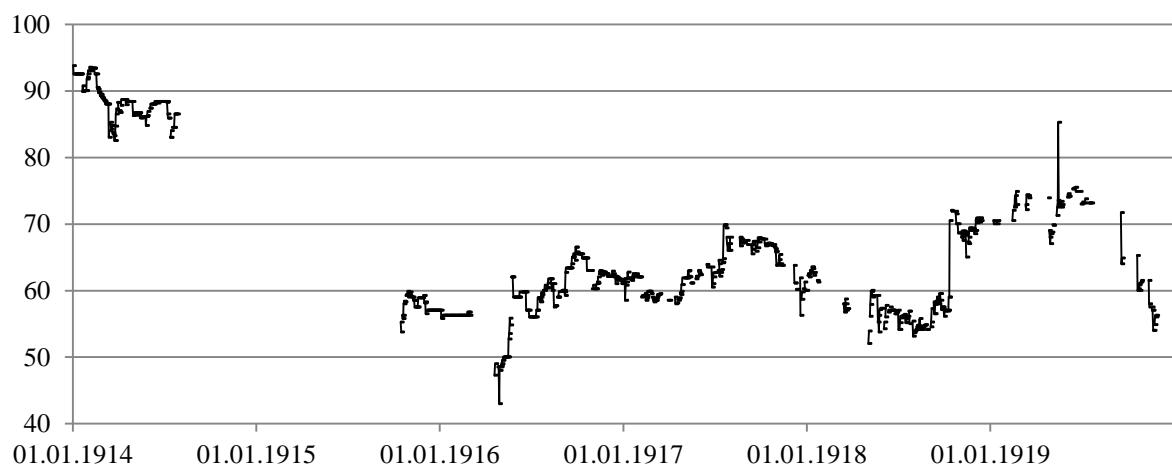
(20) Brazil – 4.5 % Minas Gerais of 1911



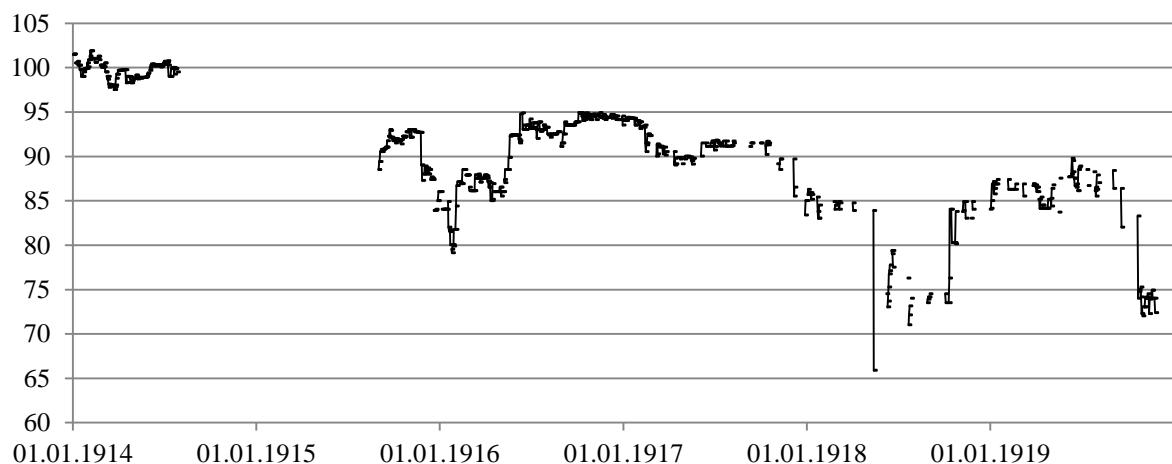
(21) Brazil – 4.5 % Rio of 1912



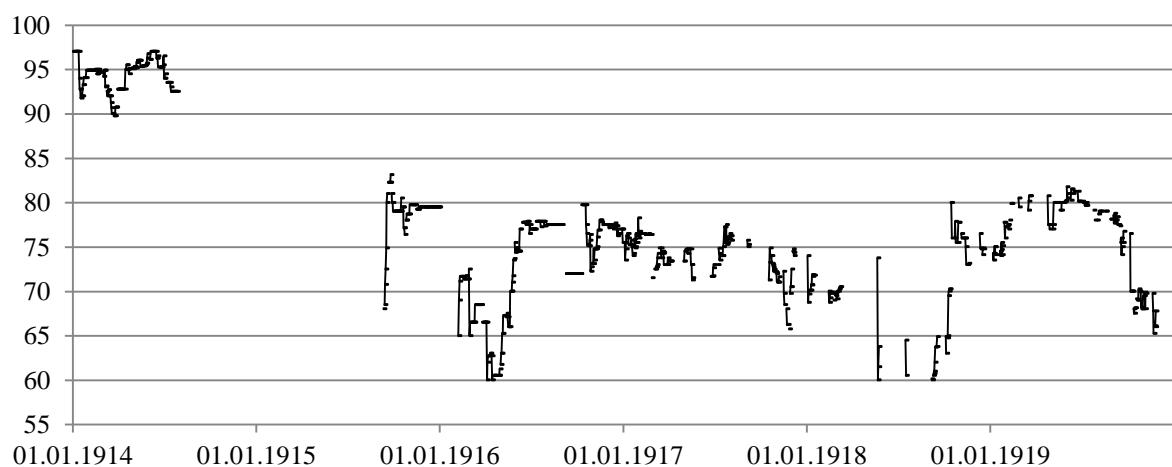
(22) Brazil – 5.0 % of 1895



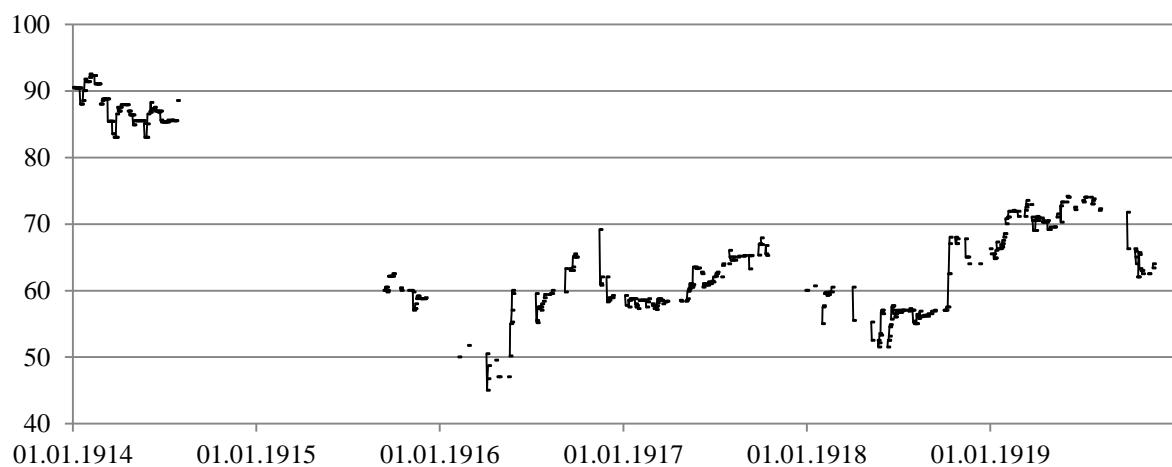
(23) Brazil – 5.0 % of 1898



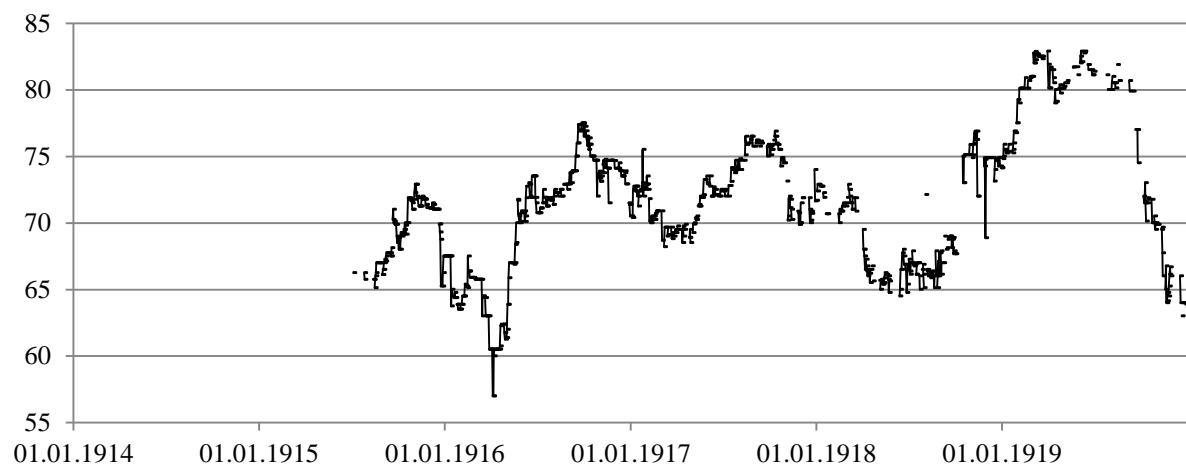
(24) Brazil – 5.0 % of 1903



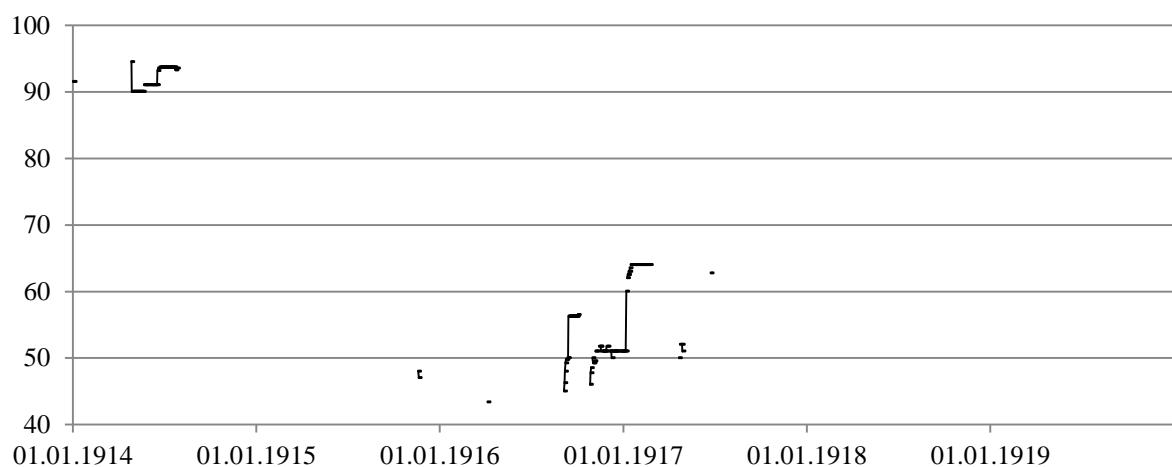
(25) Brazil – 5.0 % of 1913



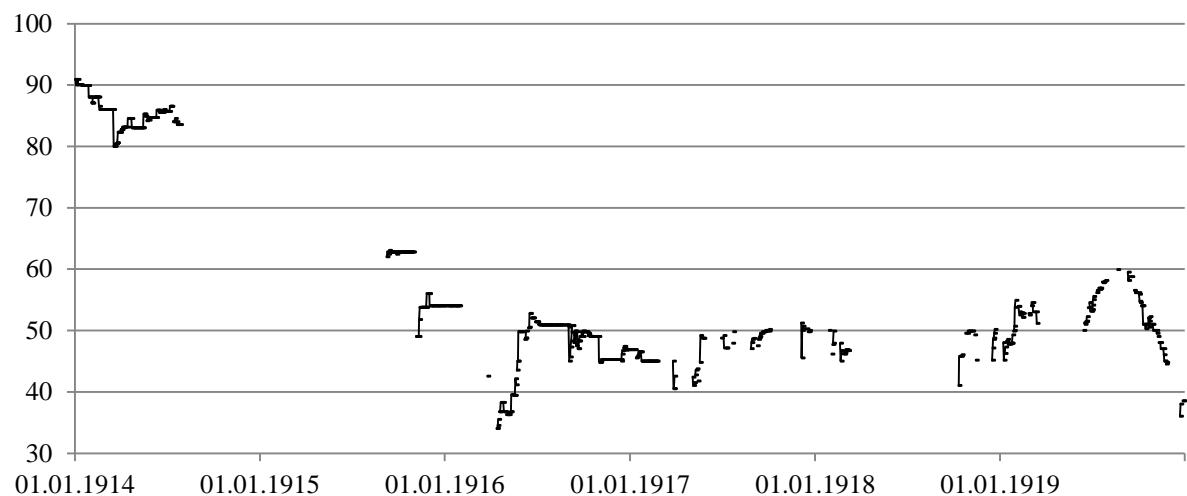
(26) Brazil – 5.0 % of 1914 (20–100)



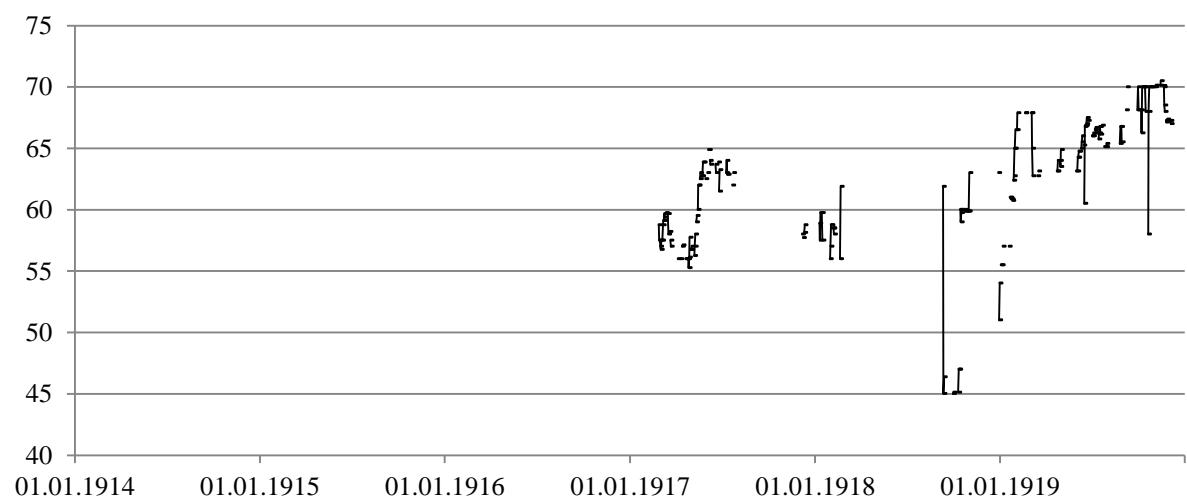
(27) Brazil – 5.0 % Bahia of 1889



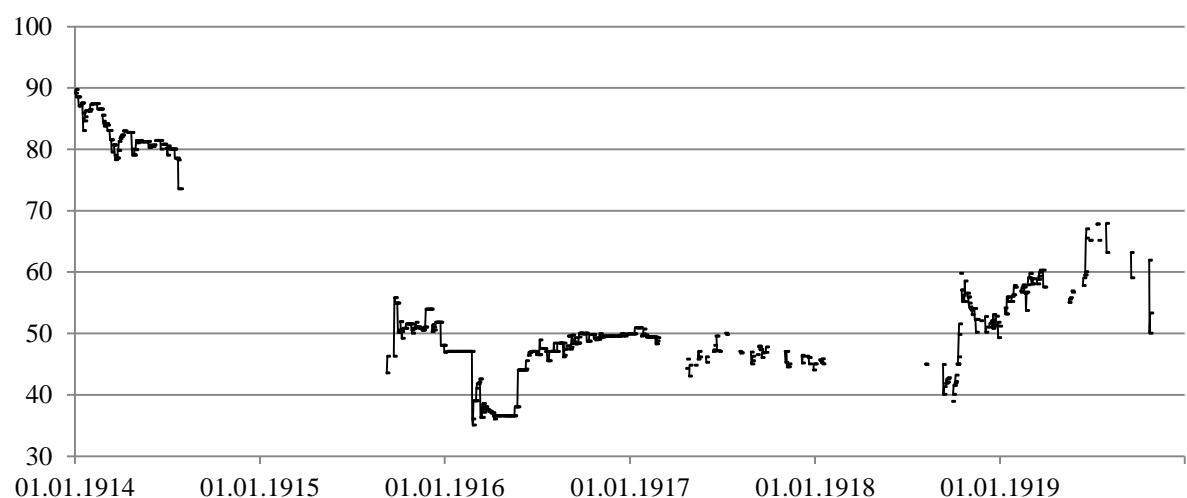
(28) Brazil – 5.0 % Bahia of 1904



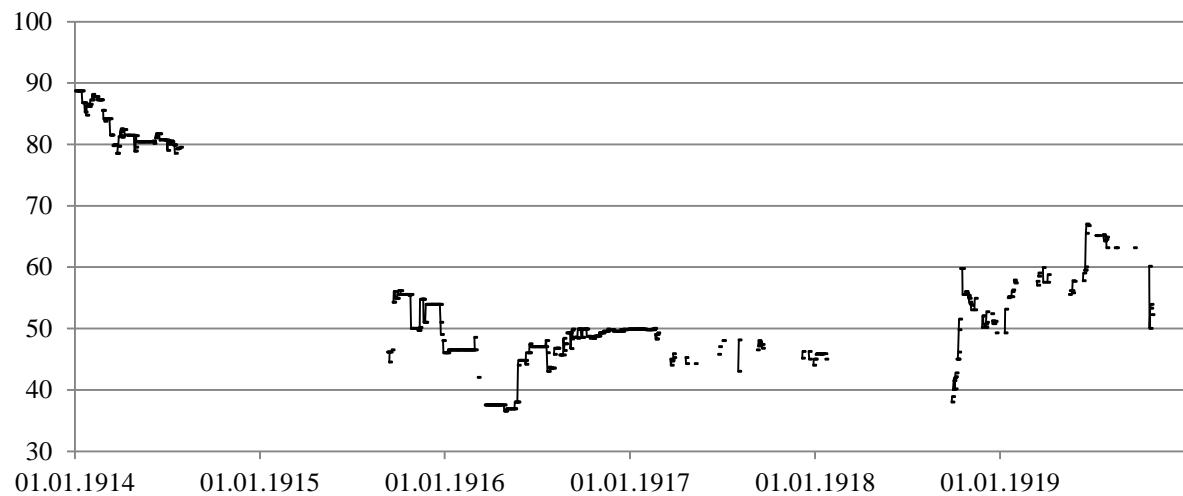
(29) Brazil – 5.0 % Bahia of 1915



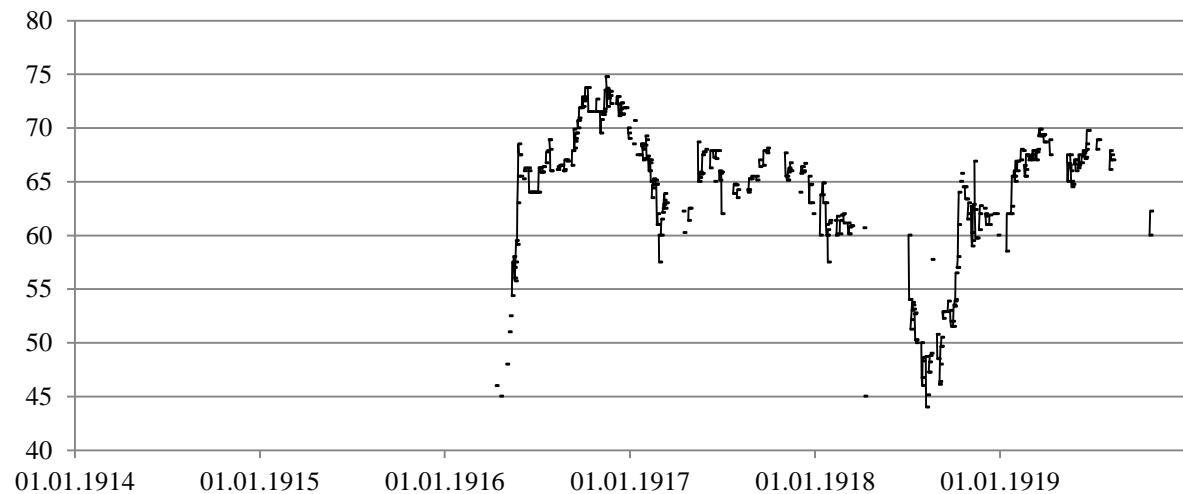
(30) Brazil – 5.0 % Para of 1901



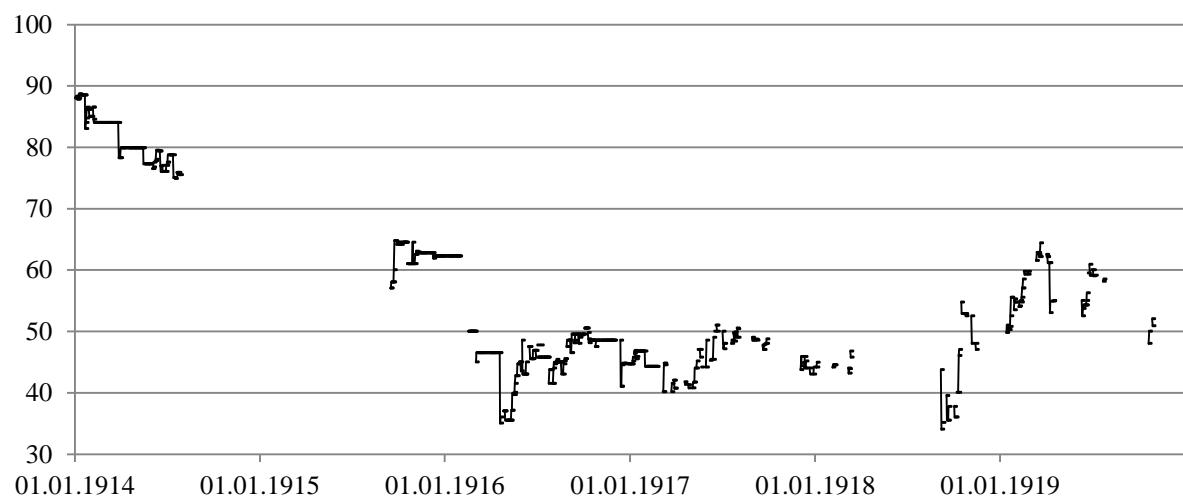
(31) Brazil – 5.0 % Para of 1907



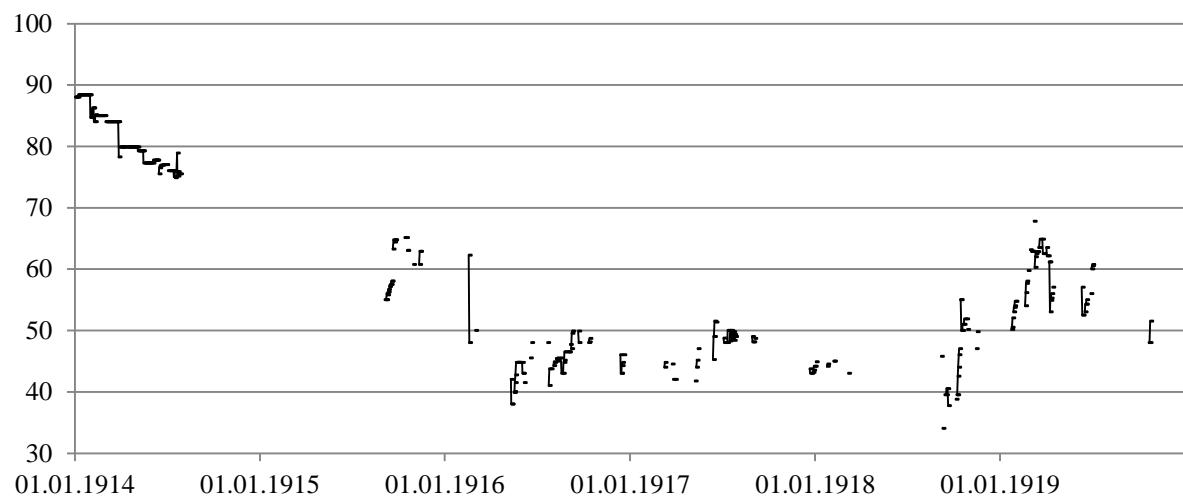
(32) Brazil – 5.0 % Para of 1915



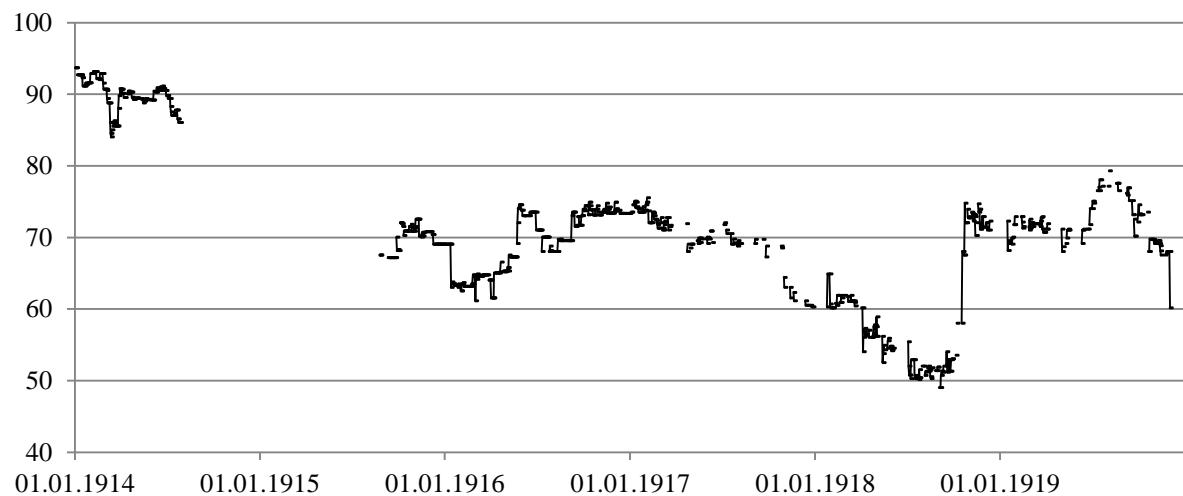
(33) Brazil – 5.0 % Parana of 1905



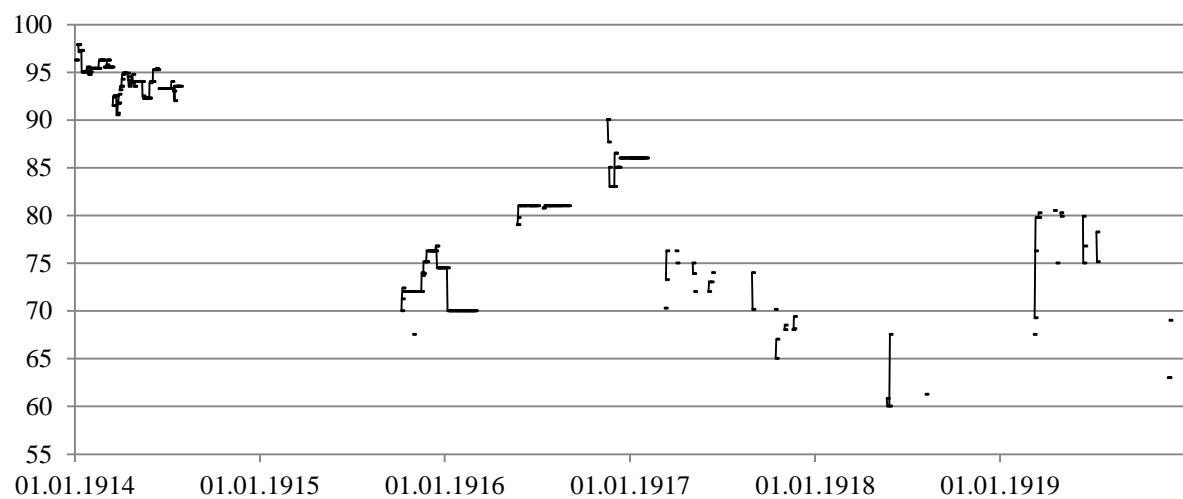
(34) Brazil – 5.0 % Parana of 1913



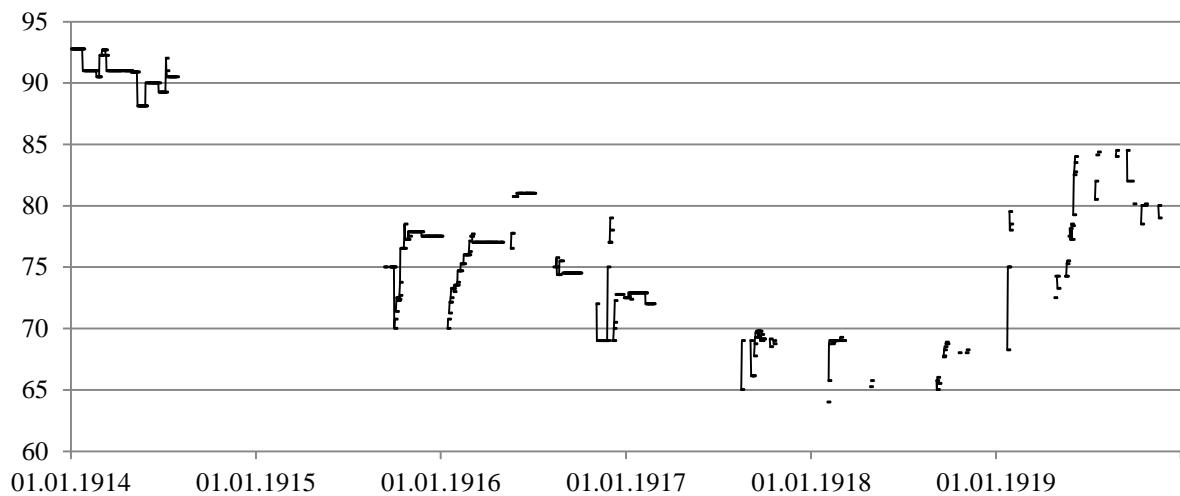
(35) Brazil – 5.0 % Rio of 1905



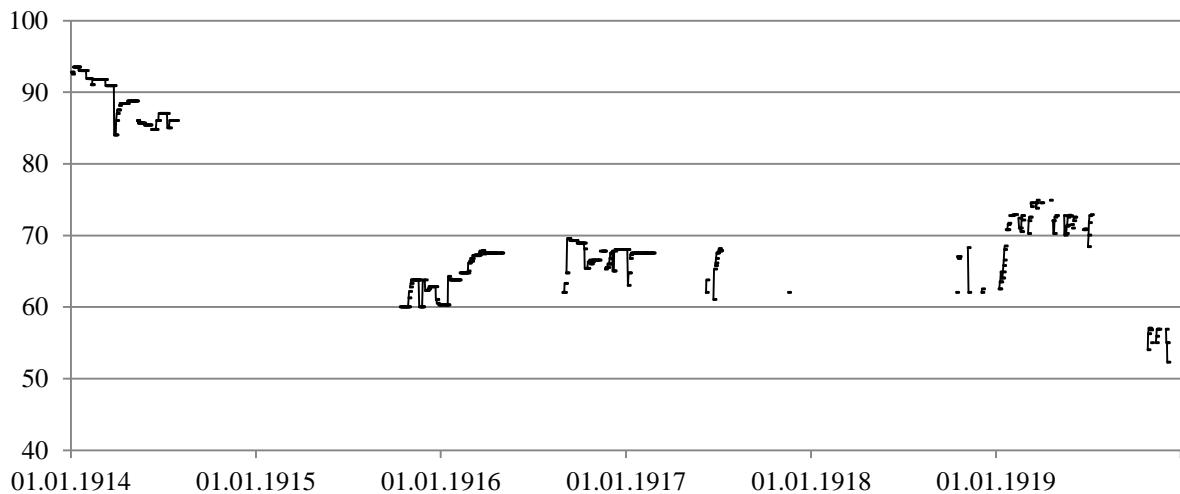
(36) Brazil – 5.0 % Rio of 1909



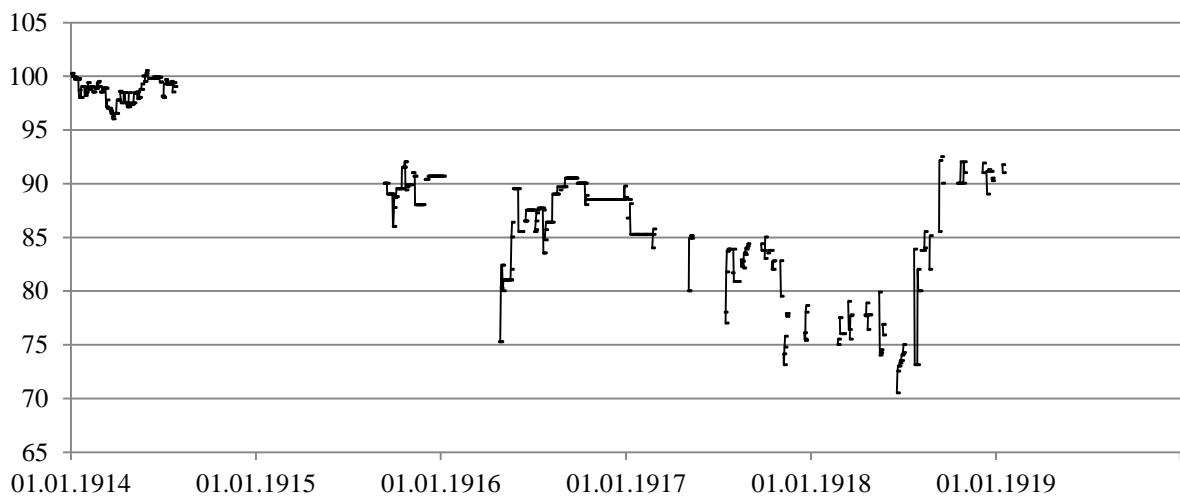
(37) Brazil – 5.0 % Sao Paolo railway of 1904



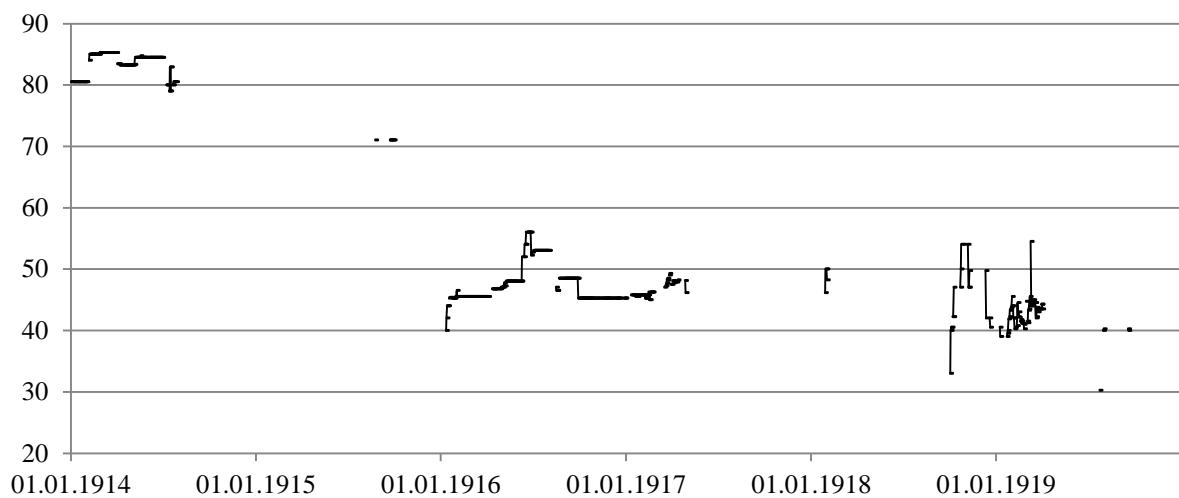
(38) Brazil – 5.0 % Sao Paolo railway of 1905



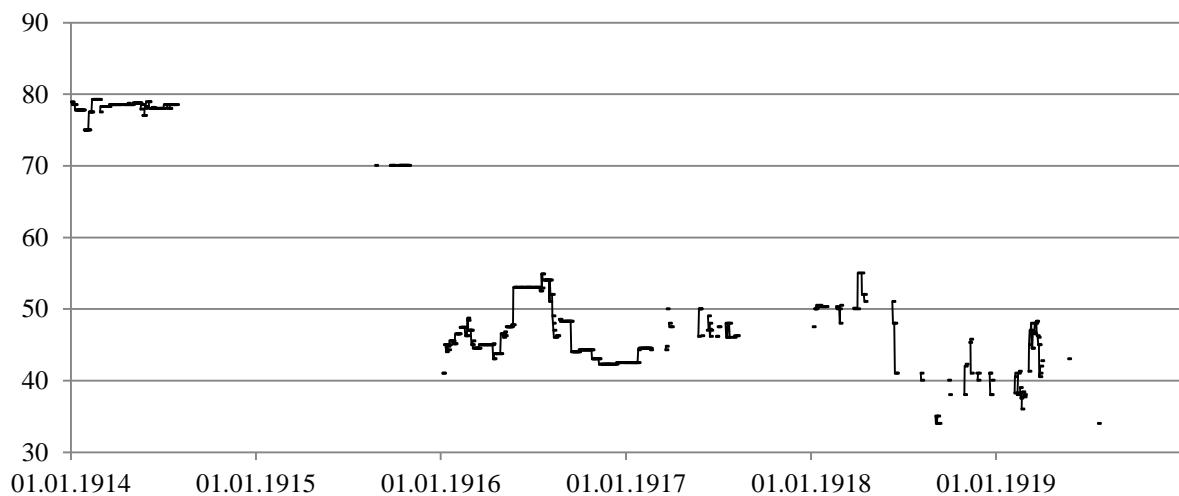
(39) Brazil – 5.0 % Sao Paolo railway of 1913



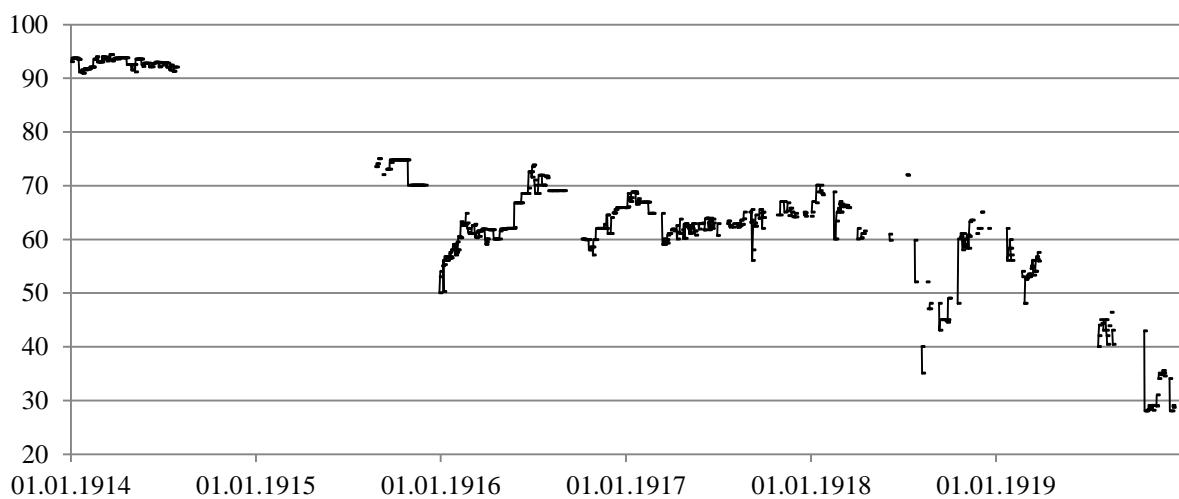
(40) Bulgaria – 4.5 % of 1907



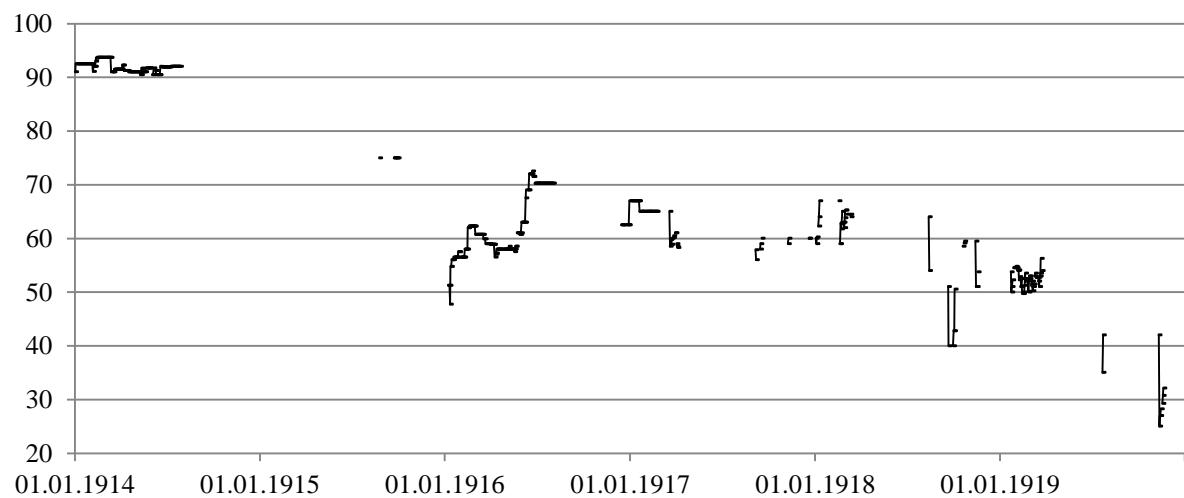
(41) Bulgaria – 4.5 % of 1909



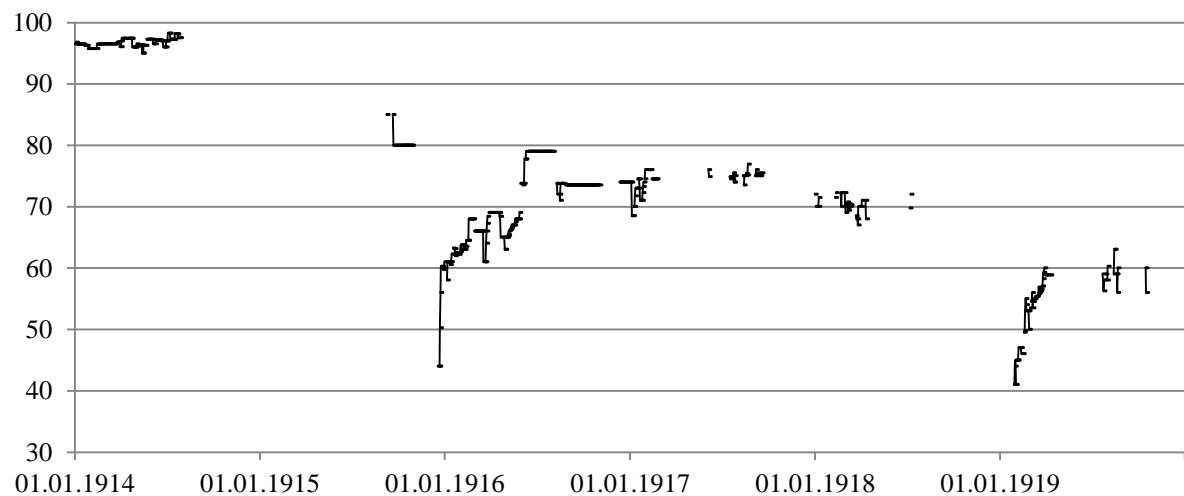
(42) Bulgaria – 5.0 % of 1902



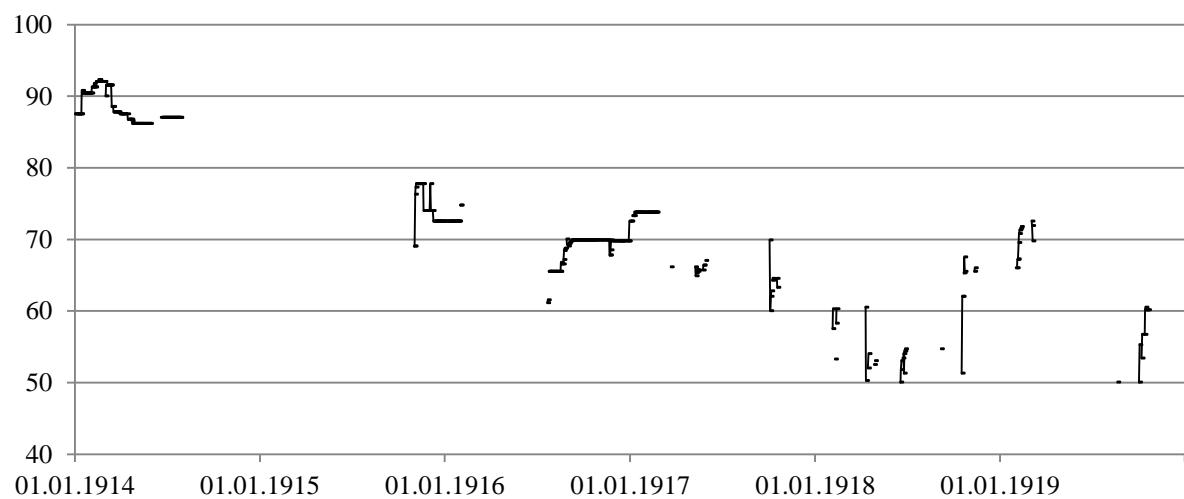
(43) Bulgaria – 5.0 % of 1904



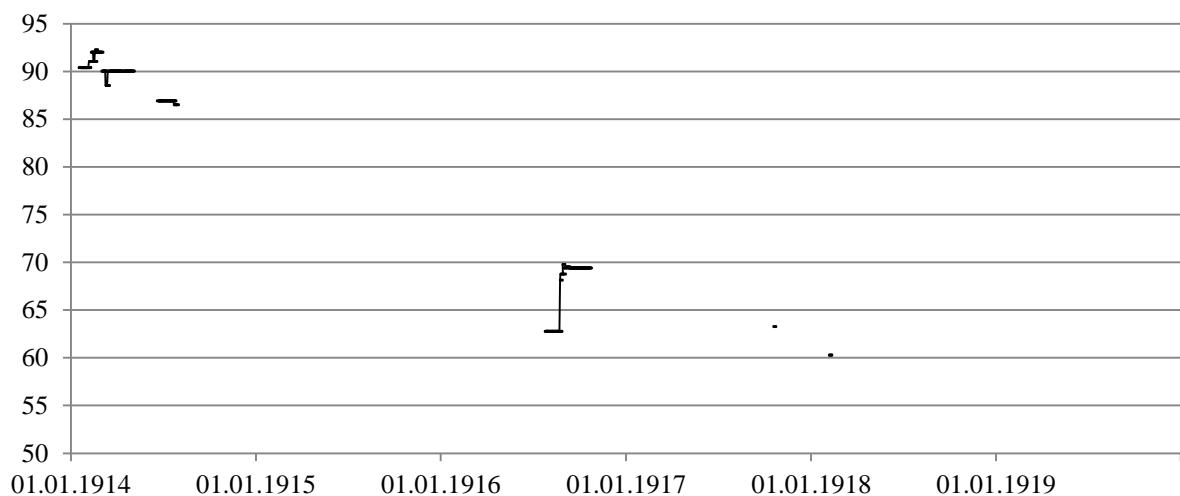
(44) Bulgaria – 6.0 of 1892



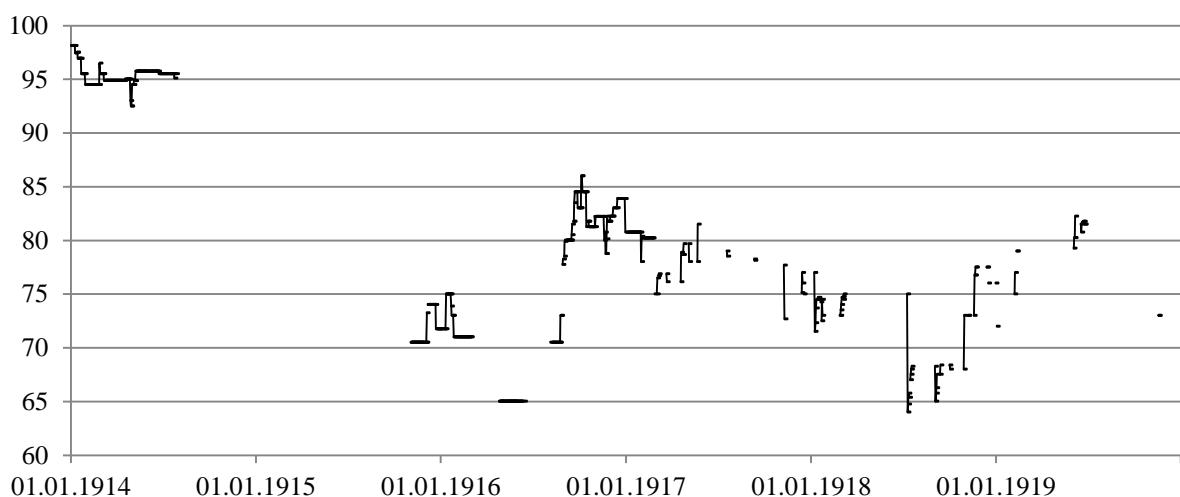
(45) Chili – 4.5 % of 1906 (20/100)



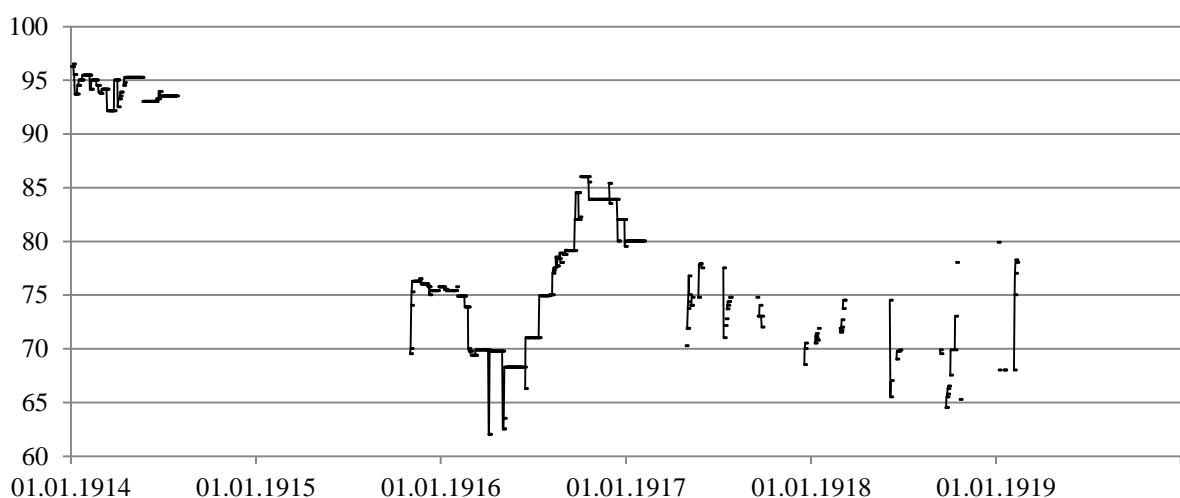
(46) Chili – 4.5 % of 1906 (200)



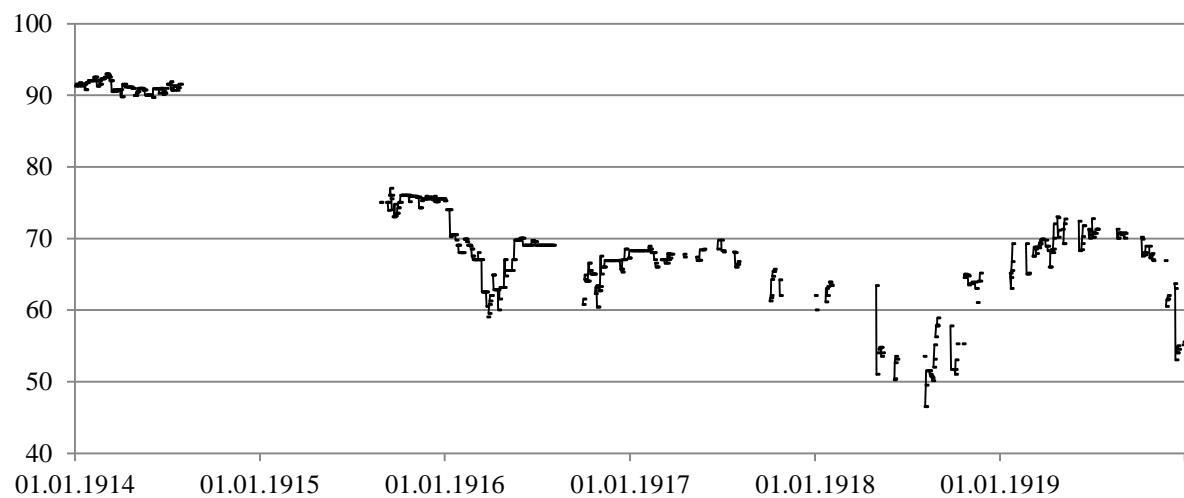
(47) Chili – 5.0 % of 1896



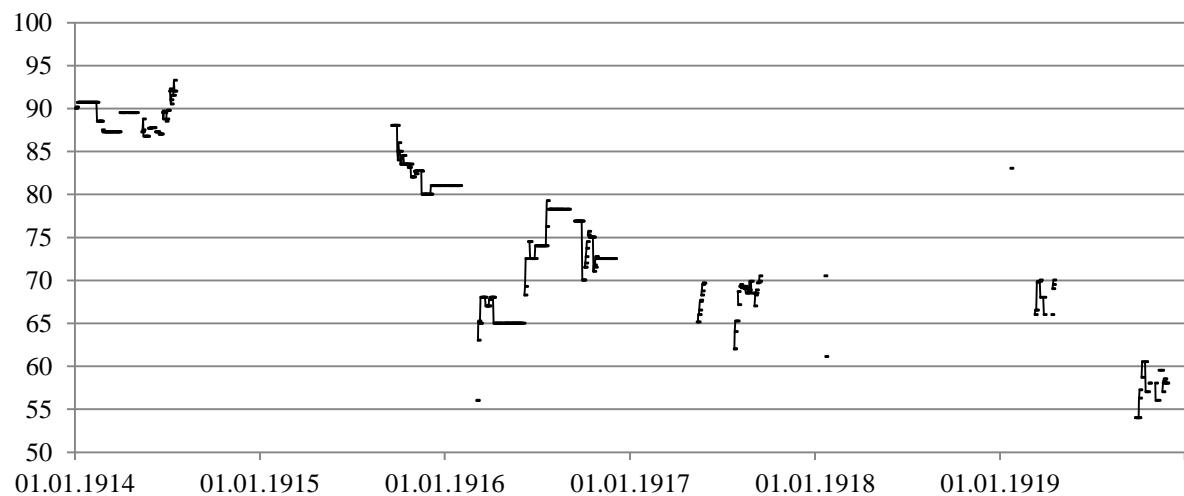
(48) Chili – 5.0 % of 1912



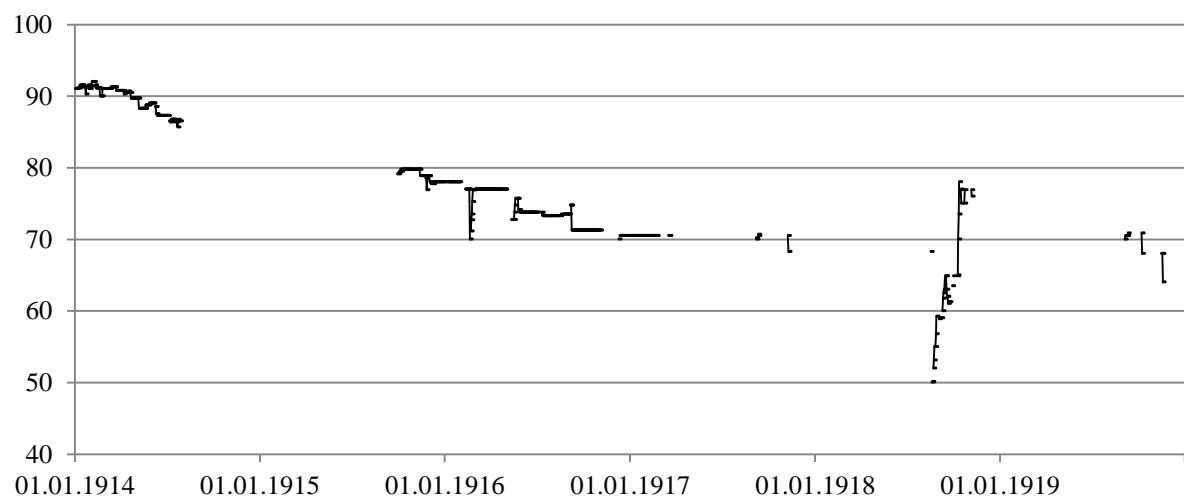
(49) China – 4.0 % of 1895



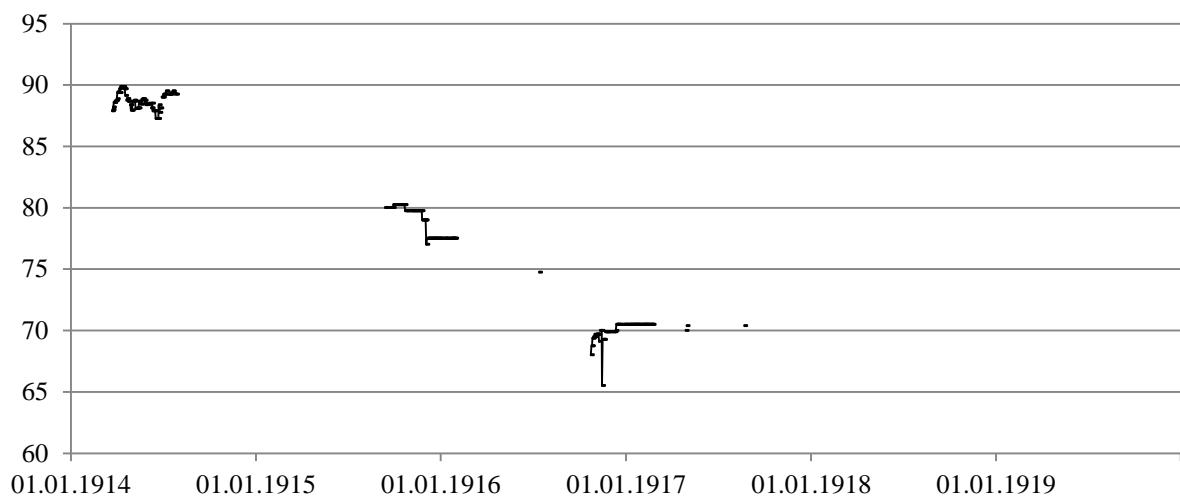
(50) China – 4.5 % of 1898



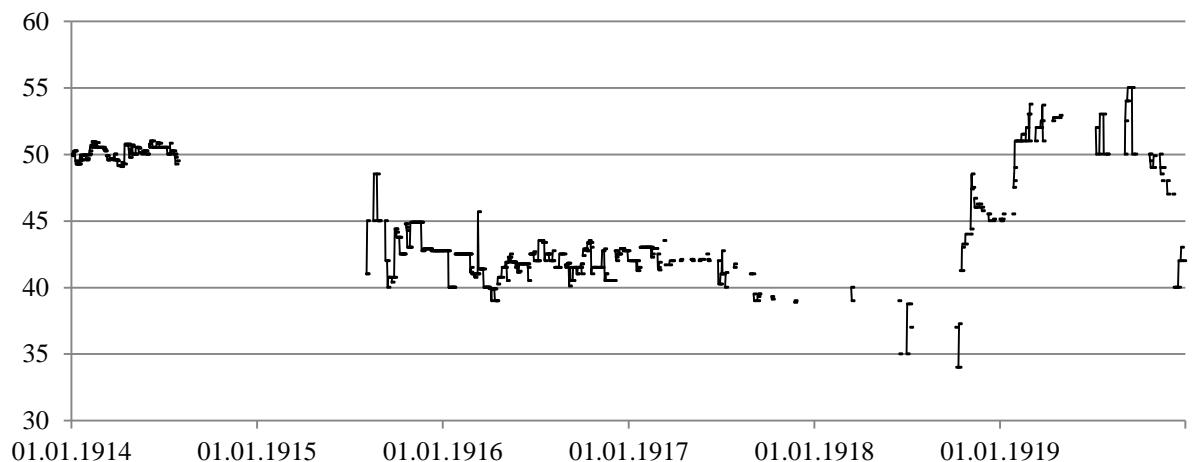
(51) China – 5.0 % of 1904



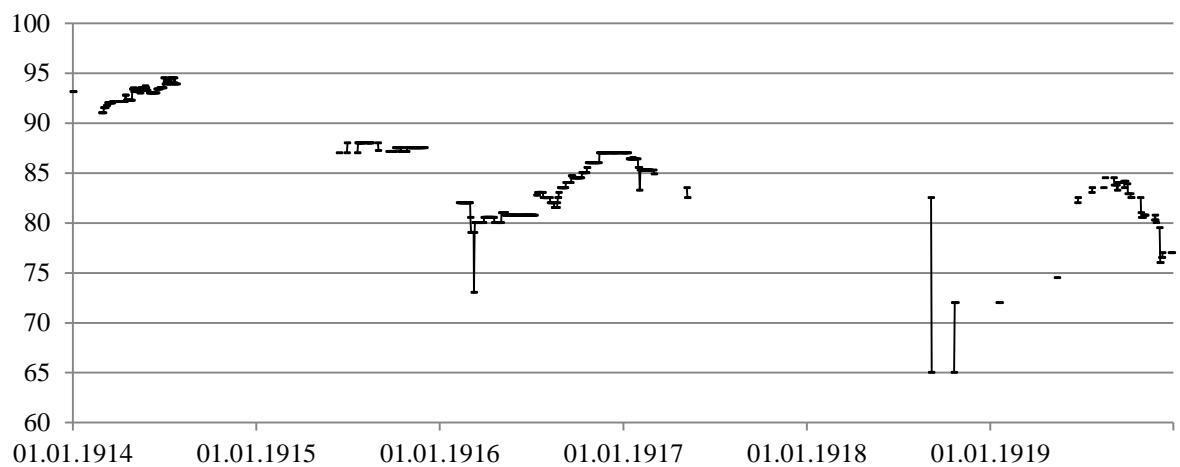
(52) China – 5.0 % of 1912



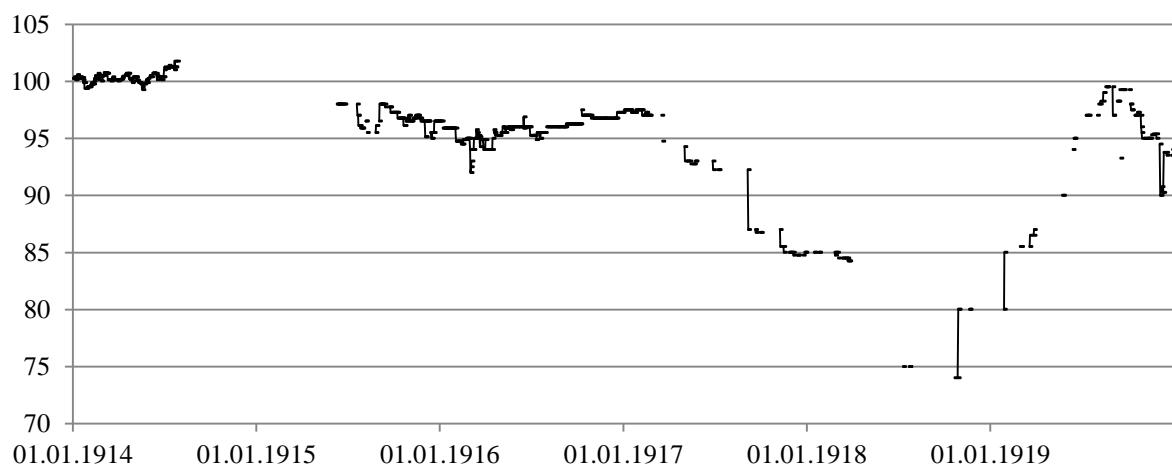
(53) Colombia – 3.0 % of 1896



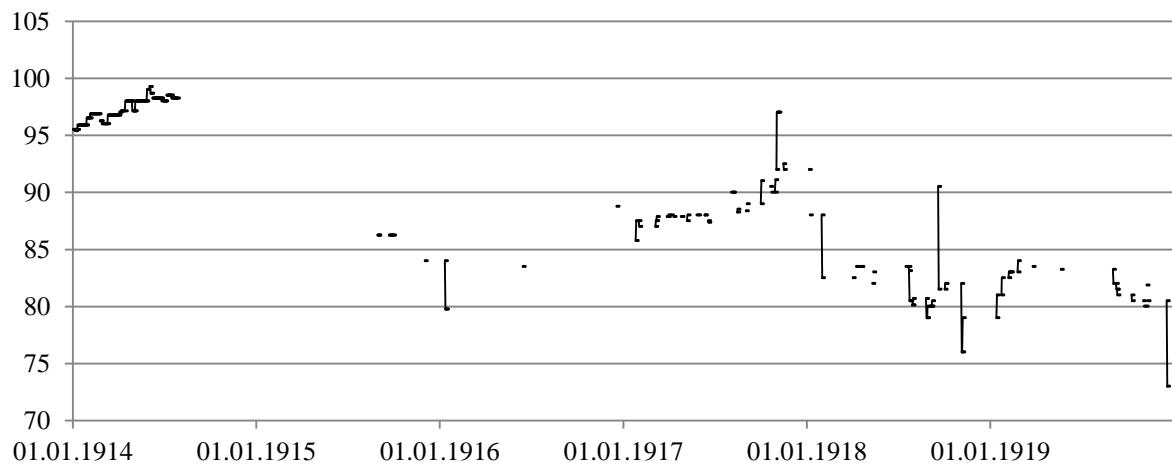
(54) Cuba – 4.5 % of 1909



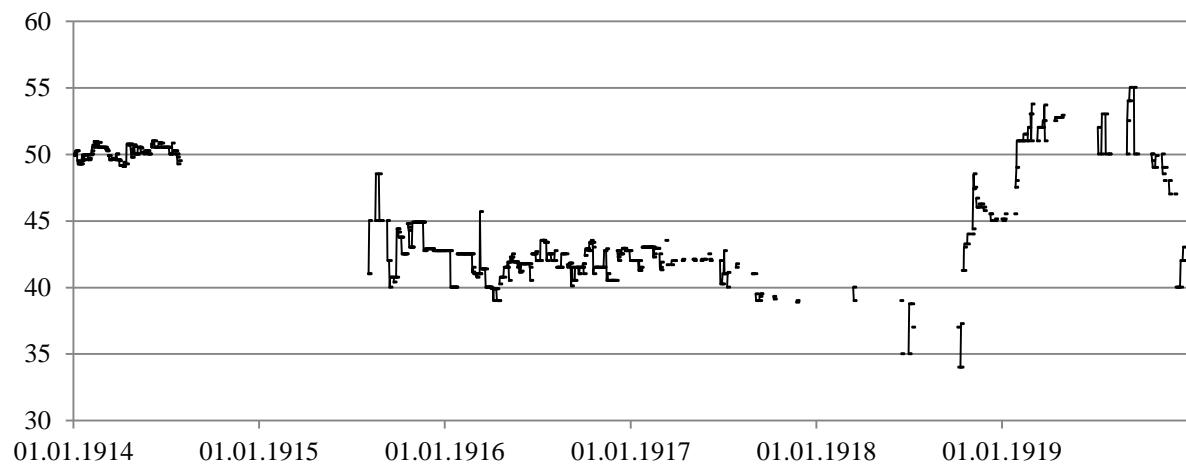
(55) Cuba – 5.0 % of 1904/05



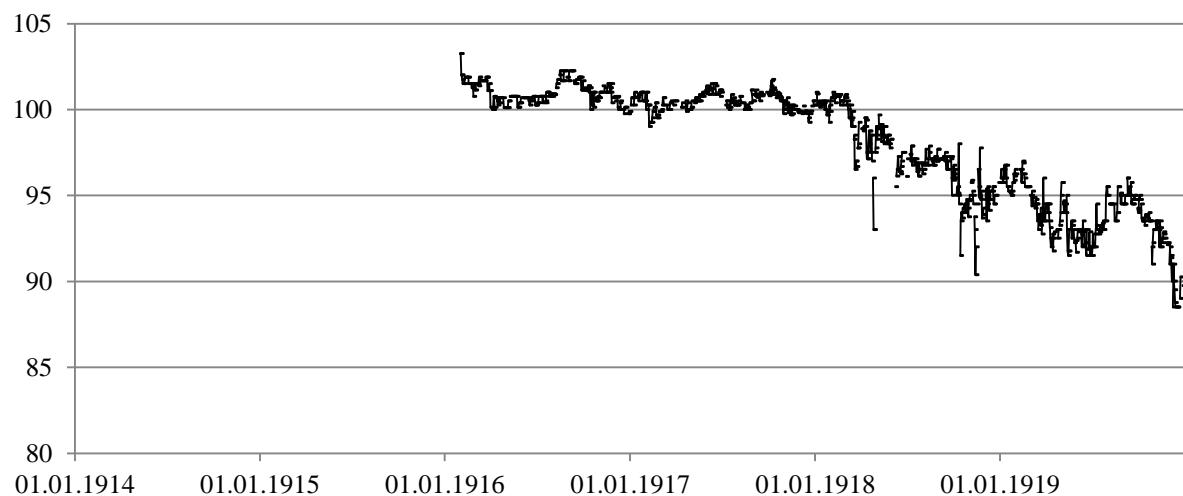
(56) Denmark – 4.0 % of 1912



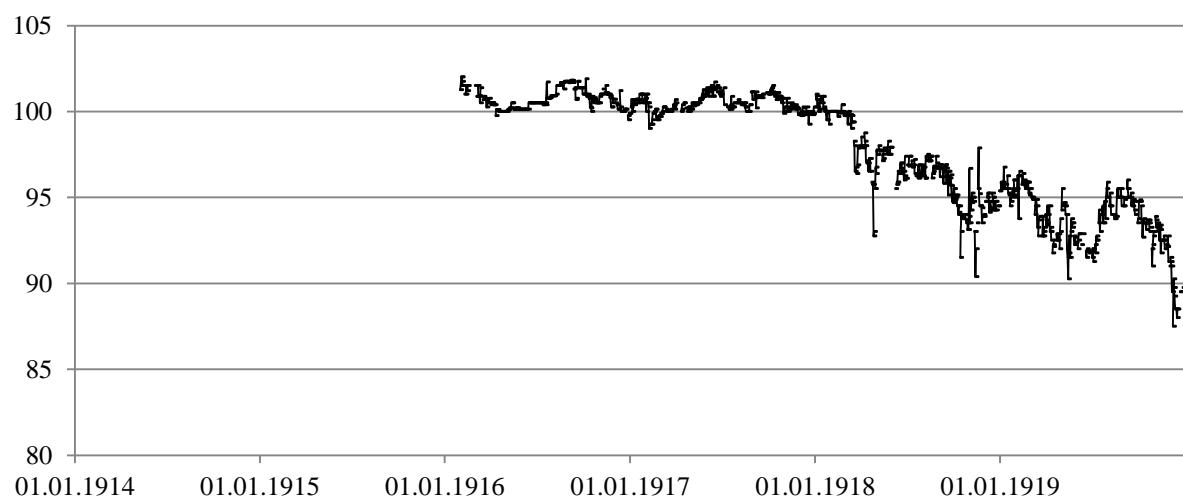
(57) Dominican Republic – 5.0 % of 1908 (customs)



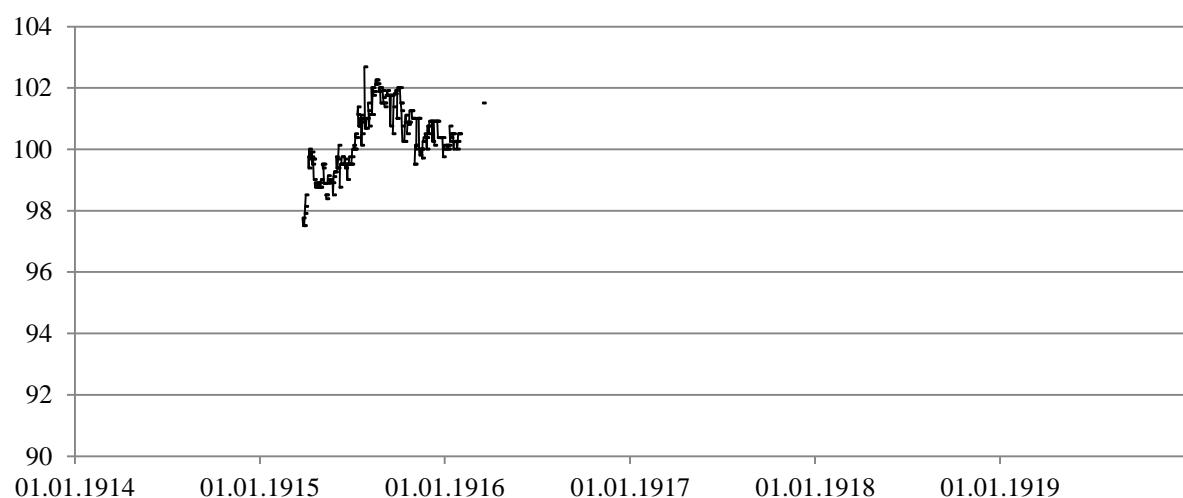
(58) Dutch East Indies – 5.0 % of 1915 (100)



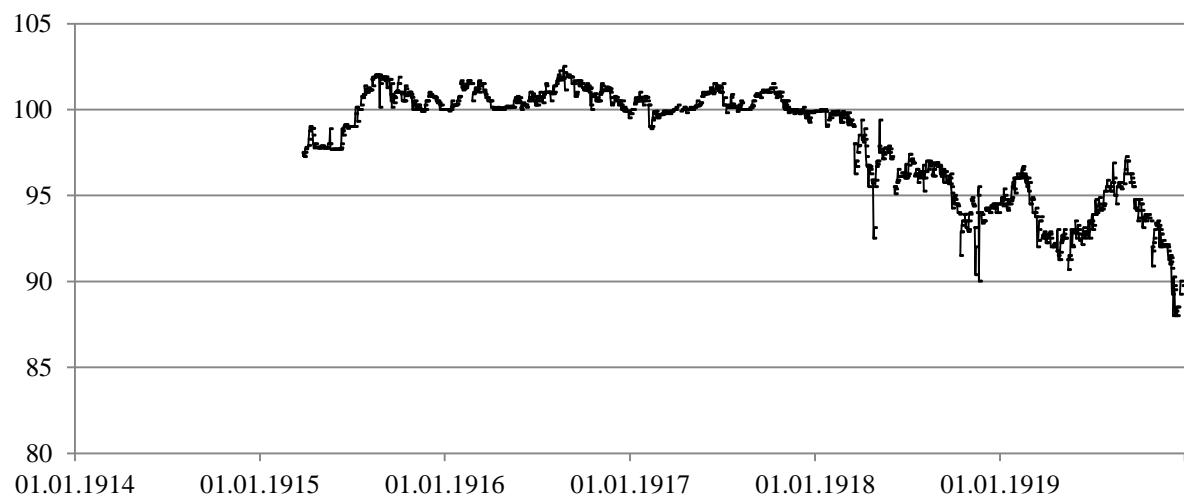
(59) Dutch East Indies – 5.0 % of 1915 (500)



(60) Dutch East Indies – 5.0 % of 1915 (100/500)



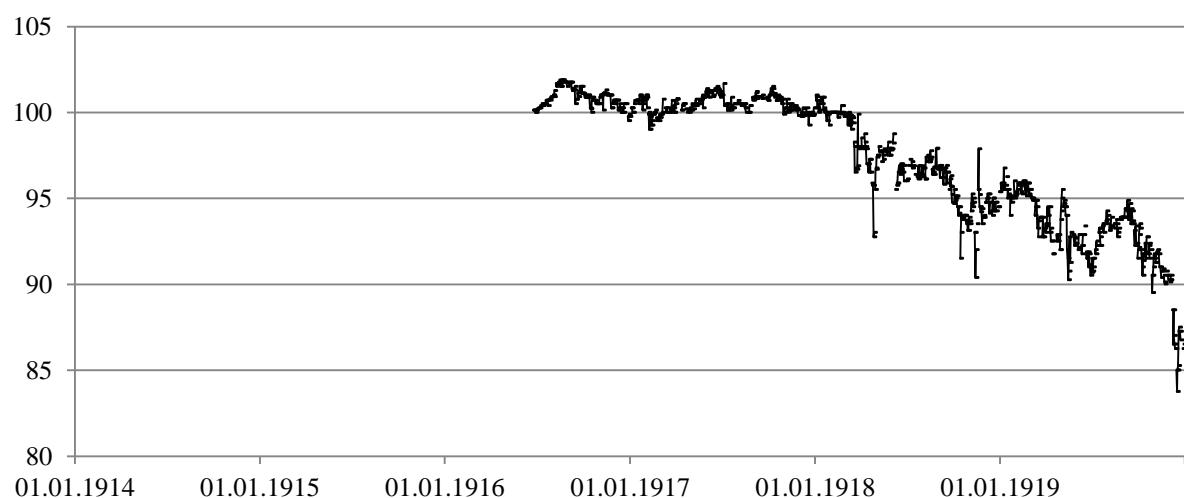
(61) Dutch East Indies – 5.0 % of 1915 (1 000)



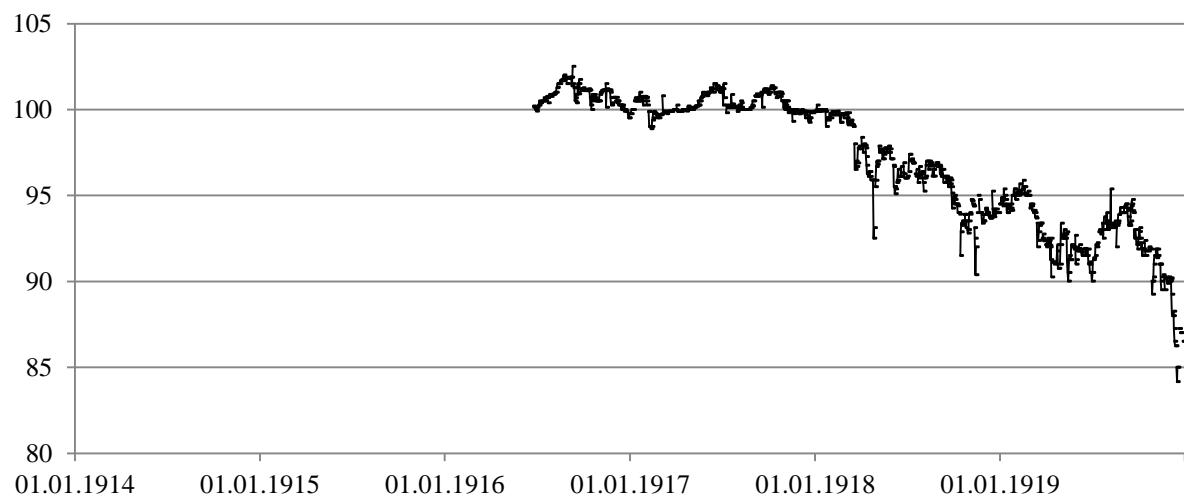
(62) Dutch East Indies – 5.0 % of 1916 (100)



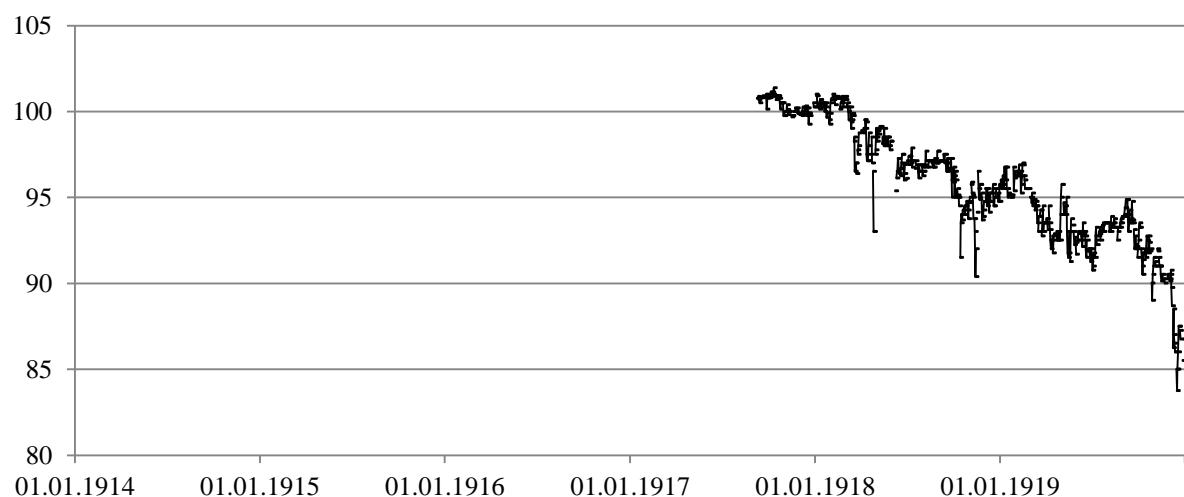
(63) Dutch East Indies – 5.0 % of 1916 (500)



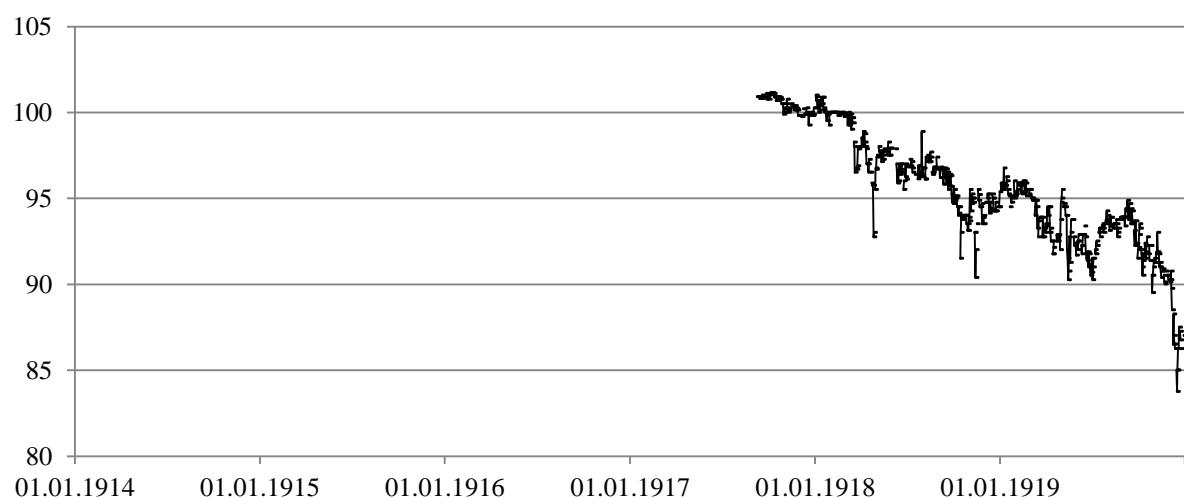
(64) Dutch East Indies – 5.0 % of 1916 (1 000)



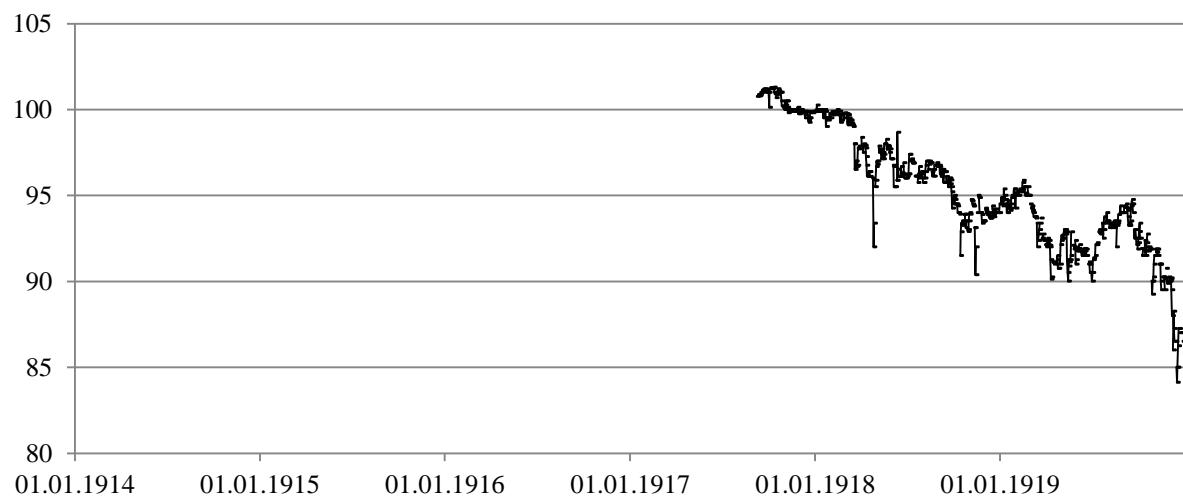
(65) Dutch East Indies – 5.0 % of 1917 (100)



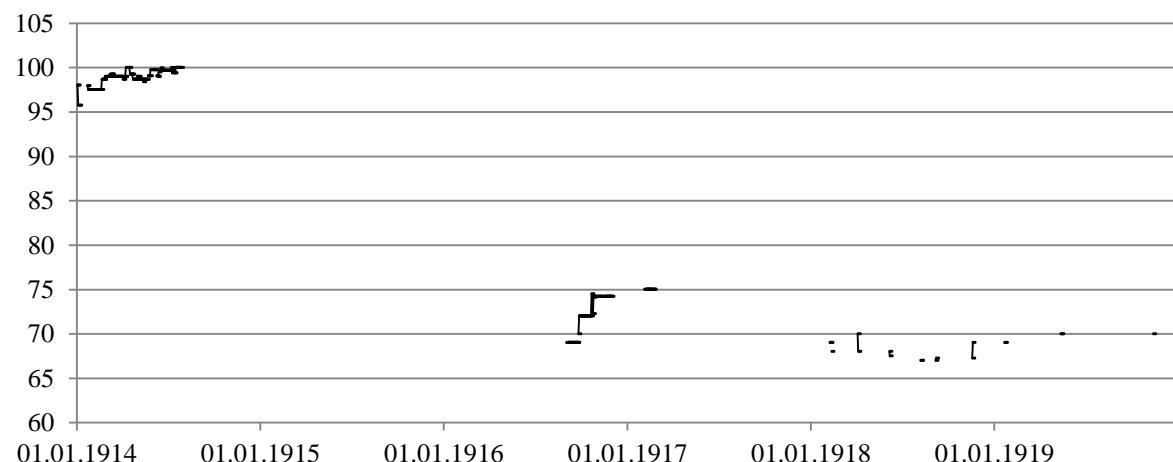
(66) Dutch East Indies – 5.0 % of 1917 (500)



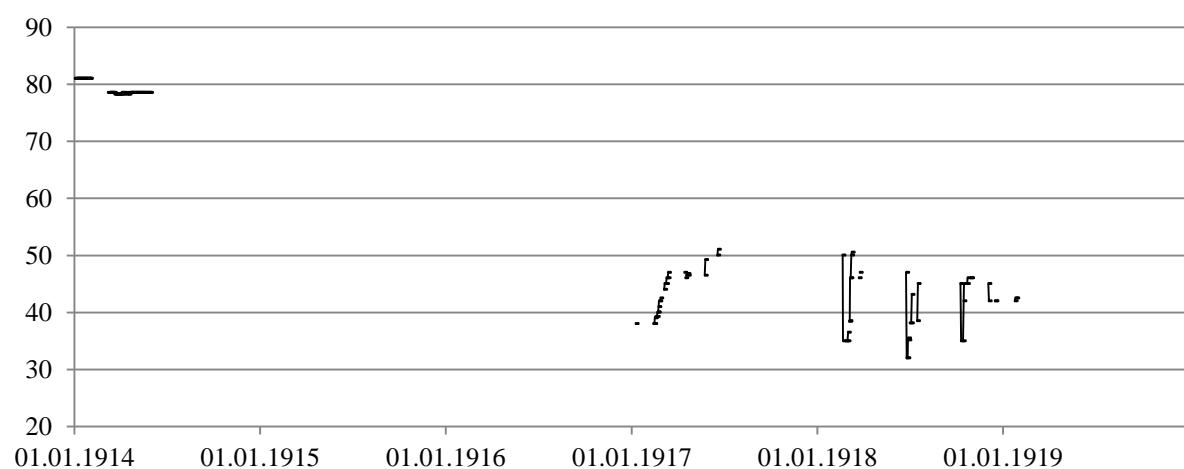
(67) Dutch East Indies – 5.0 % of 1917 (1 000)



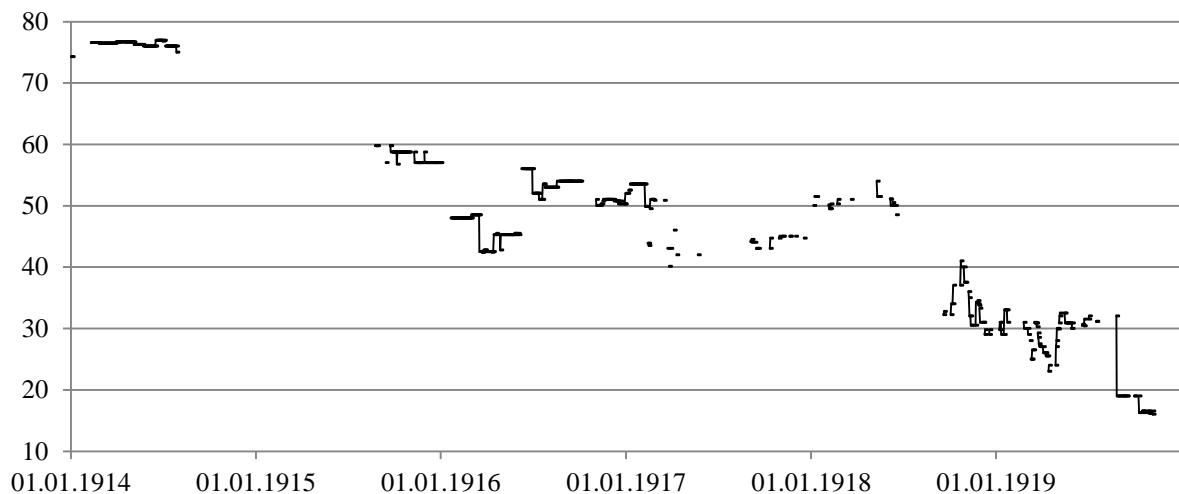
(68) Egypt – 4.0 % of 1876



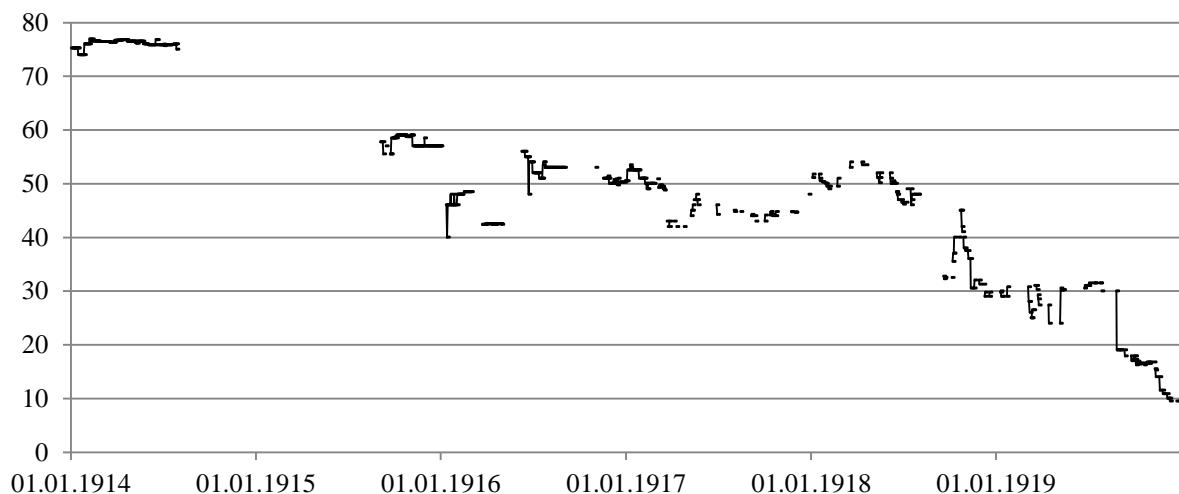
(69) Finland – 3.5 % of 1889



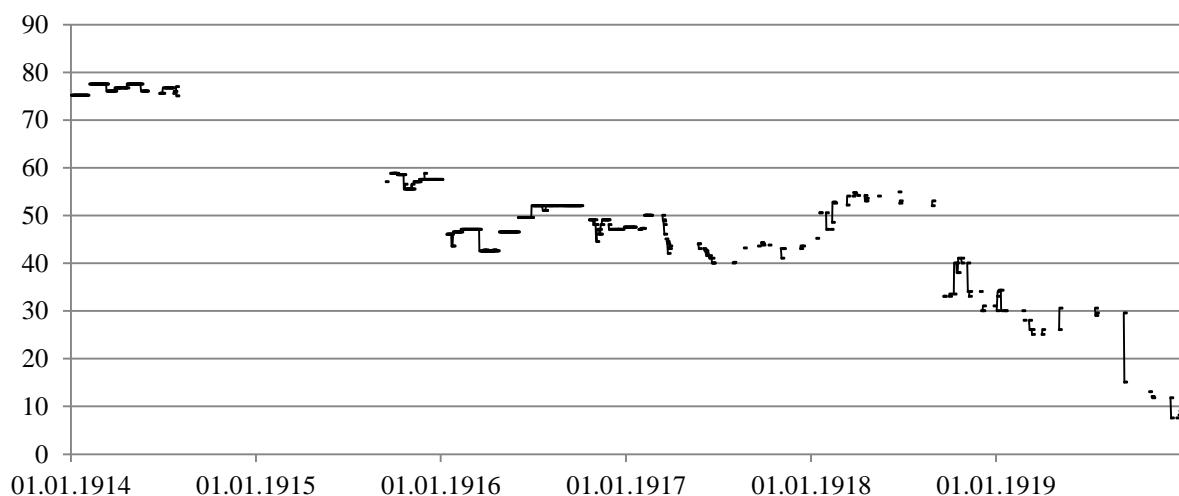
(70) Germany – 3.0 % Reich of 1890–1901 (Jan/Jul)



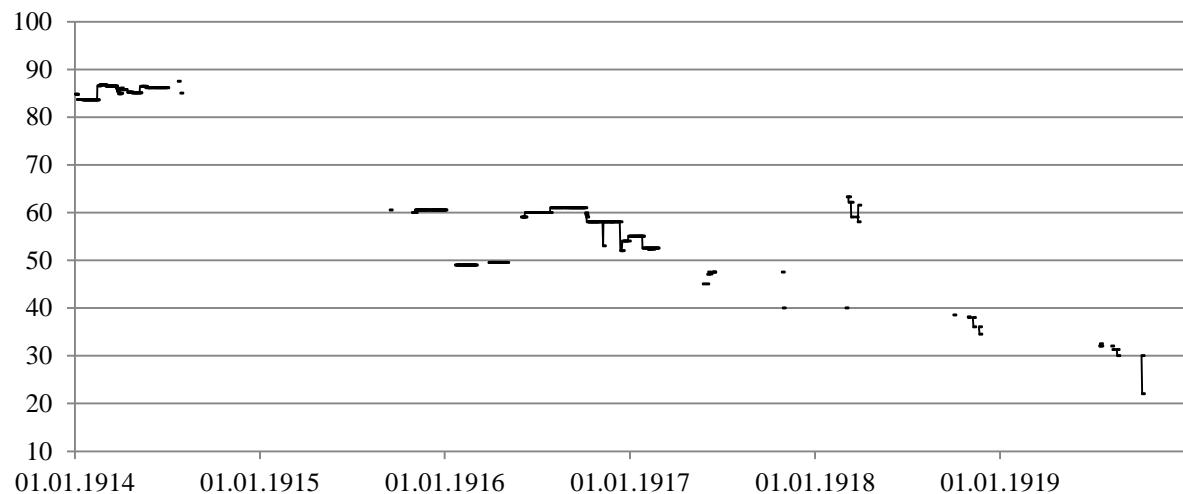
(71) Germany – 3.0 % Reich of 1890–1901 (Apr/Oct)



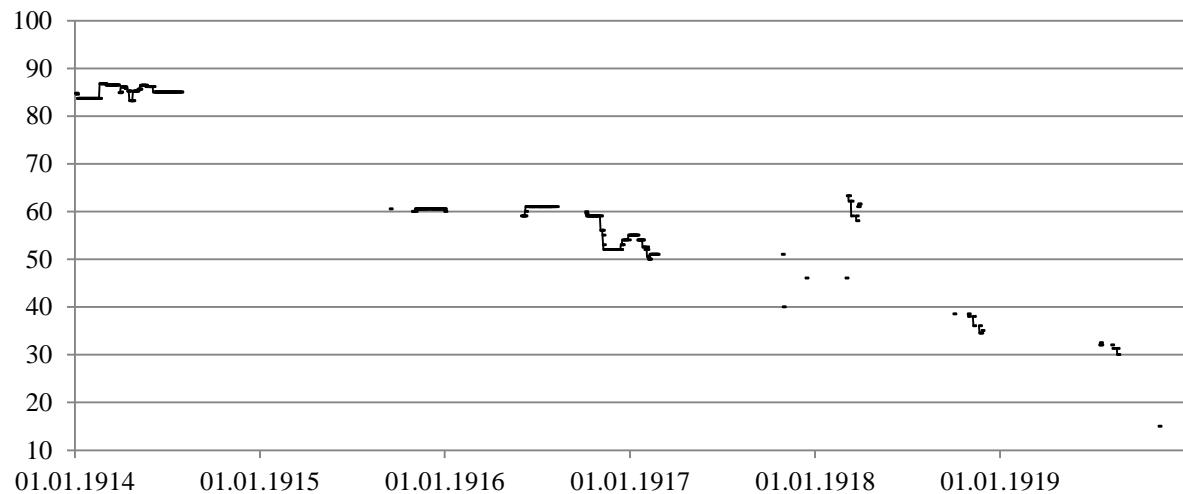
(72) Germany – 3.0 % Prussia of 1890–1901



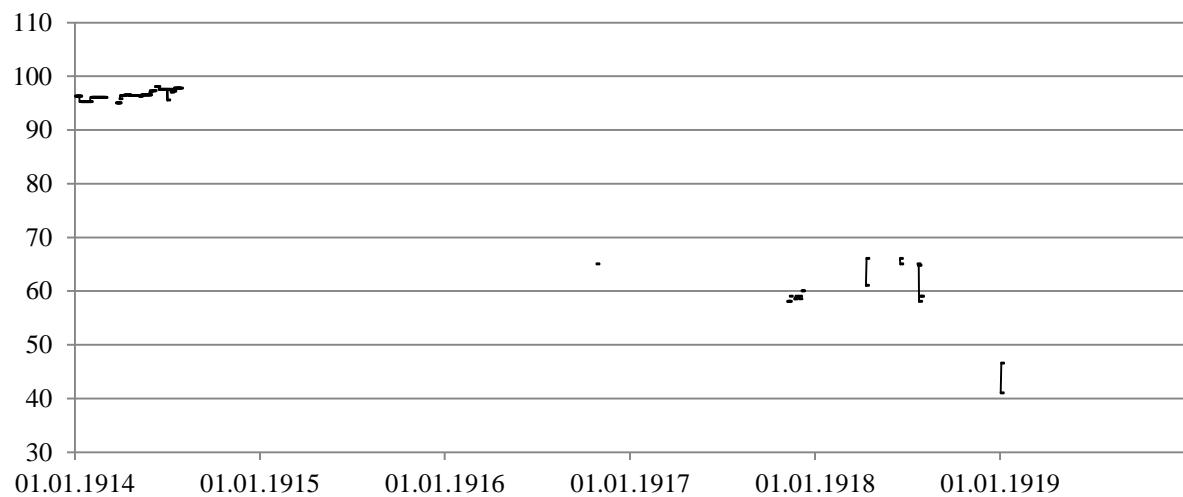
(73) Germany – 3.5 % Prussia of 1896 (200/1 000)



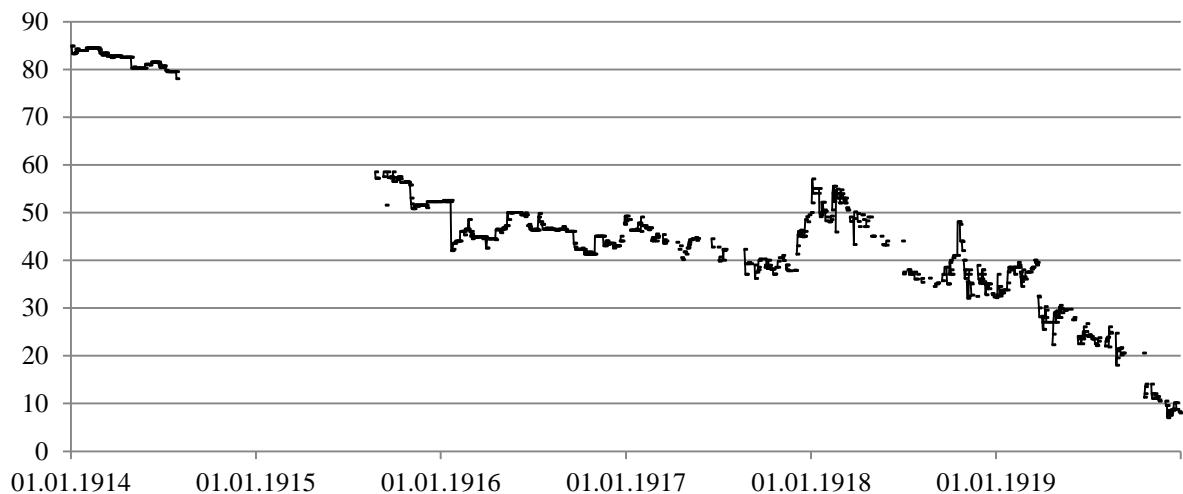
(74) Germany – 3.5 % Prussia of 1896 (2 500/5 000)



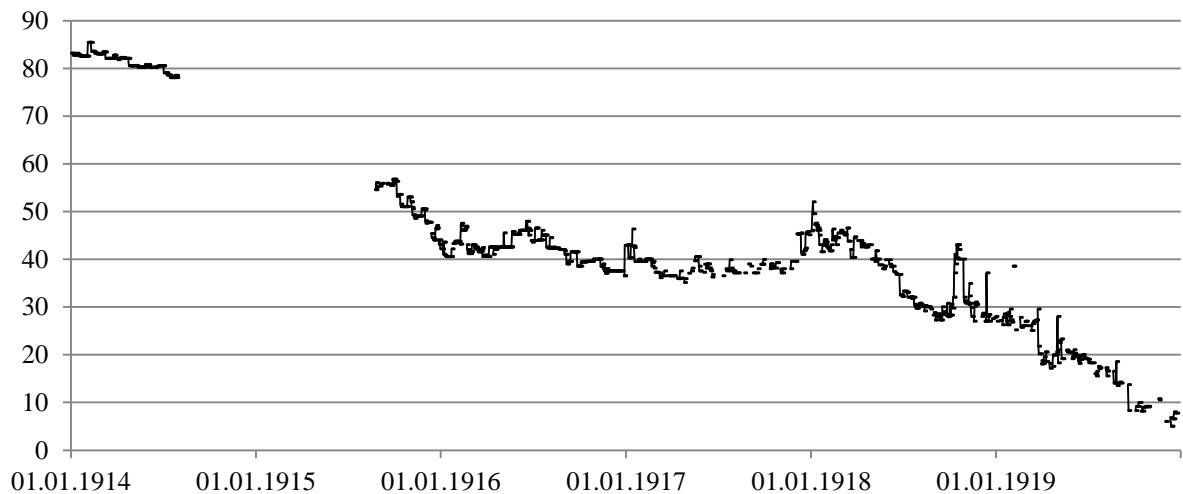
(75) Germany – 4.0 % Hamburg of 1900



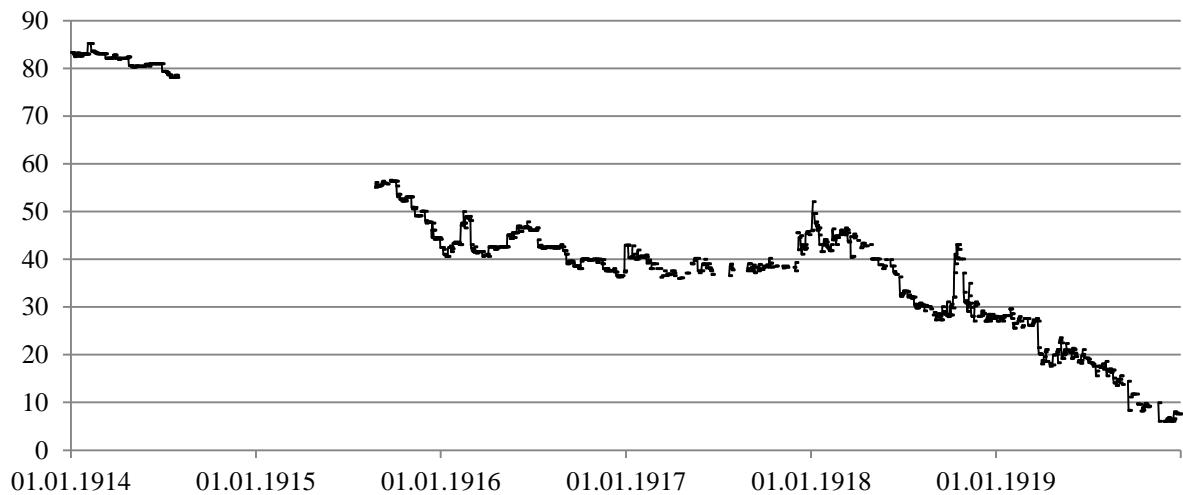
(76) Hungary – 4.0 % of 1881–93



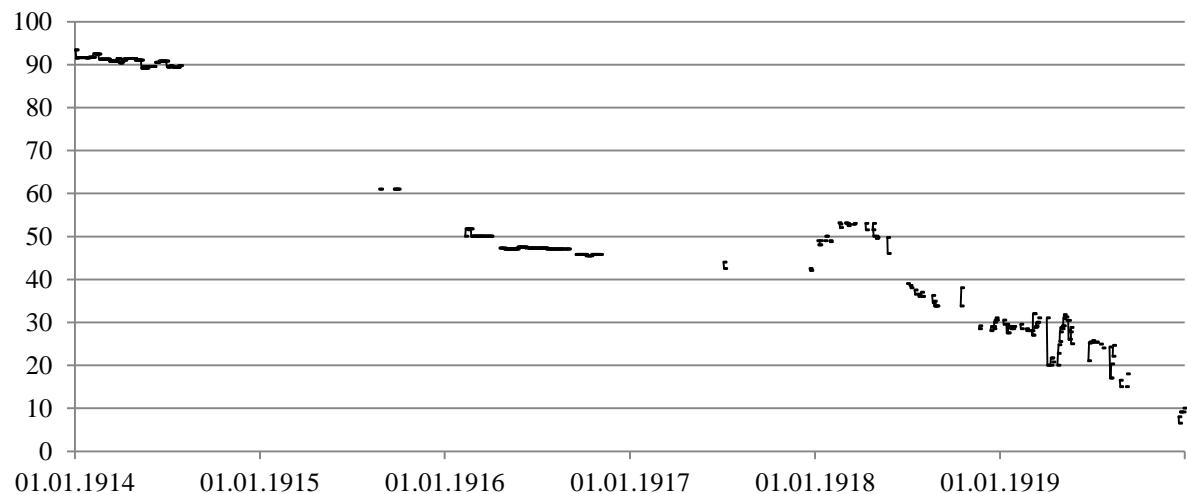
(77) Hungary – 4.0 % of 1892–1910 (100/1 000)



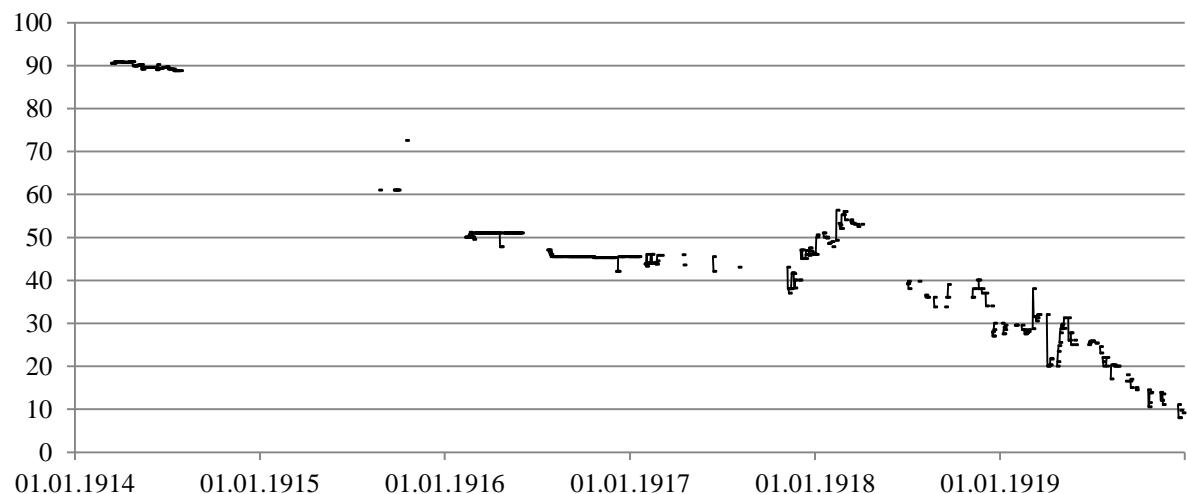
(78) Hungary – 4.0 % of 1892–1910 (2 000)



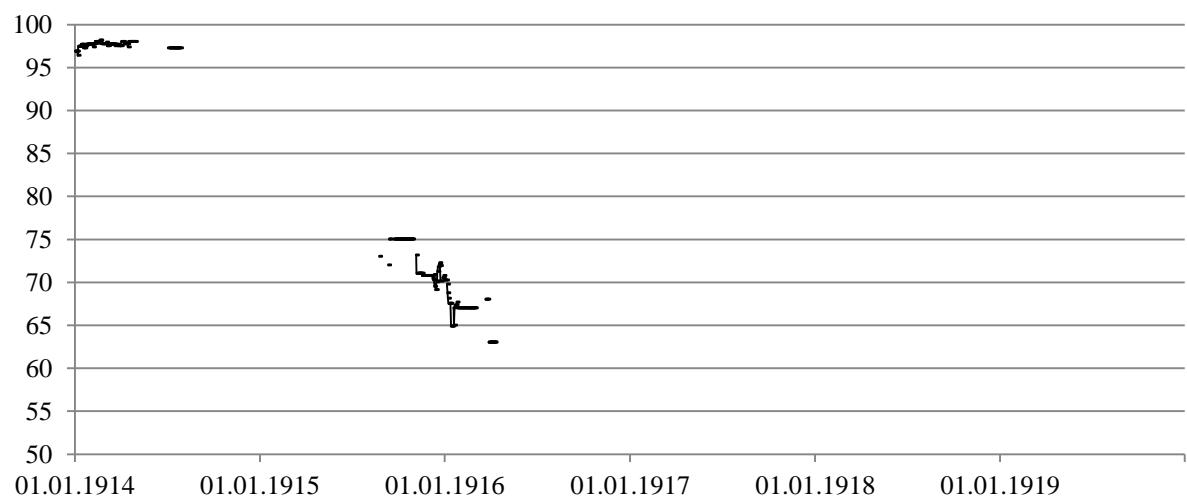
(79) Hungary – 4.5 % of 1913



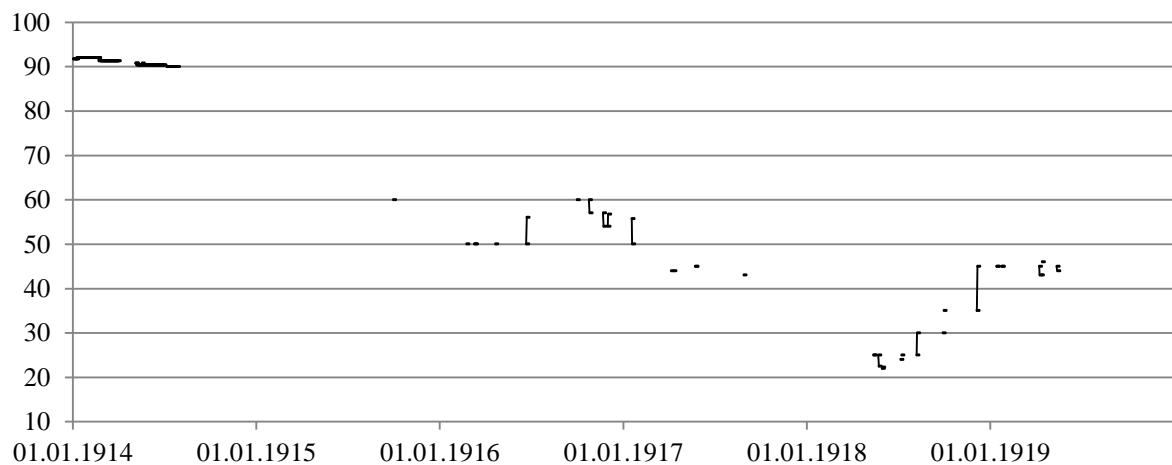
(80) Hungary – 4.5 % of 1914



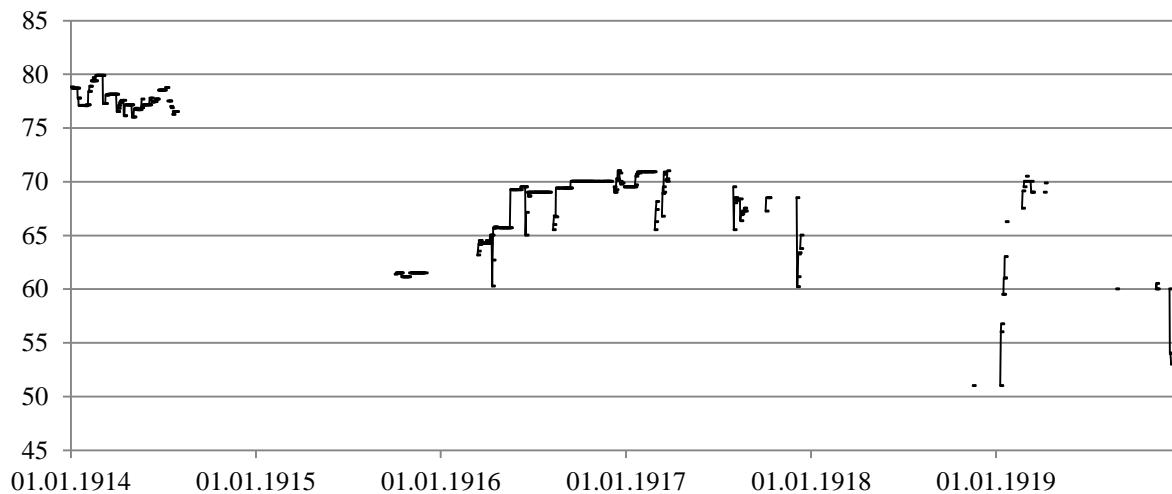
(81) Hungary – 4.5 % of 1916



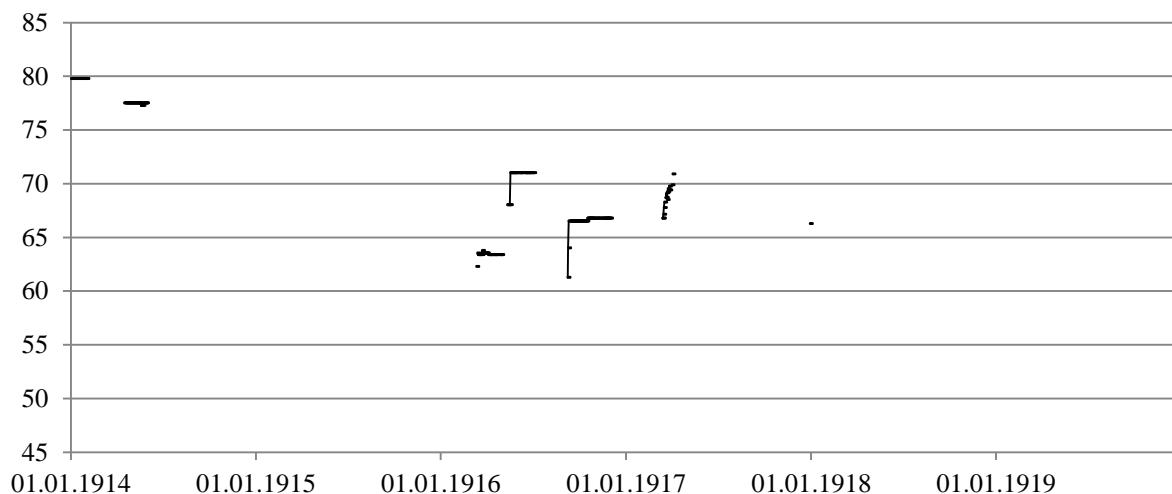
(82) Italy – 3.5 % of 1861–82



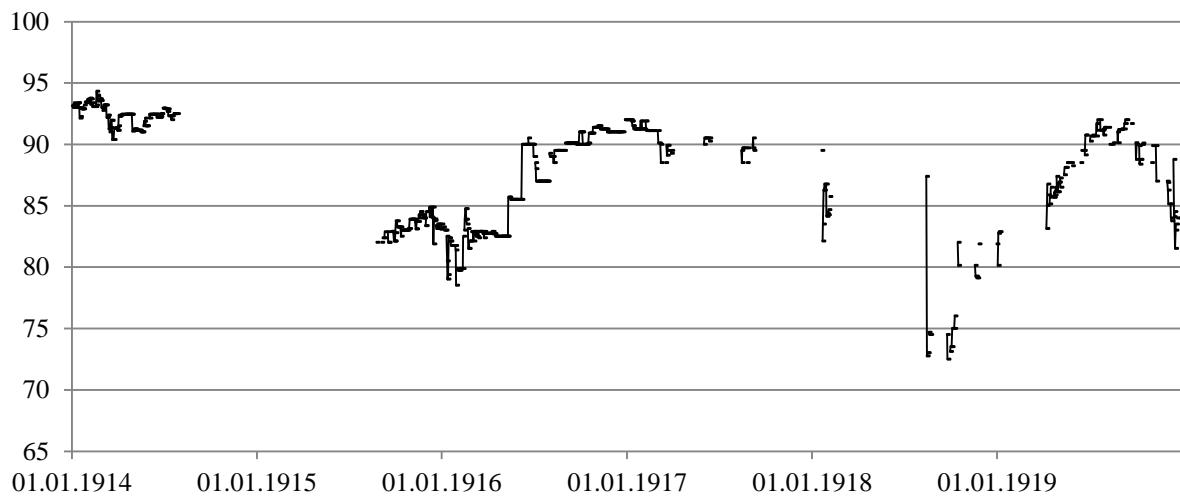
(83) Japan – 4.0 % of 1899



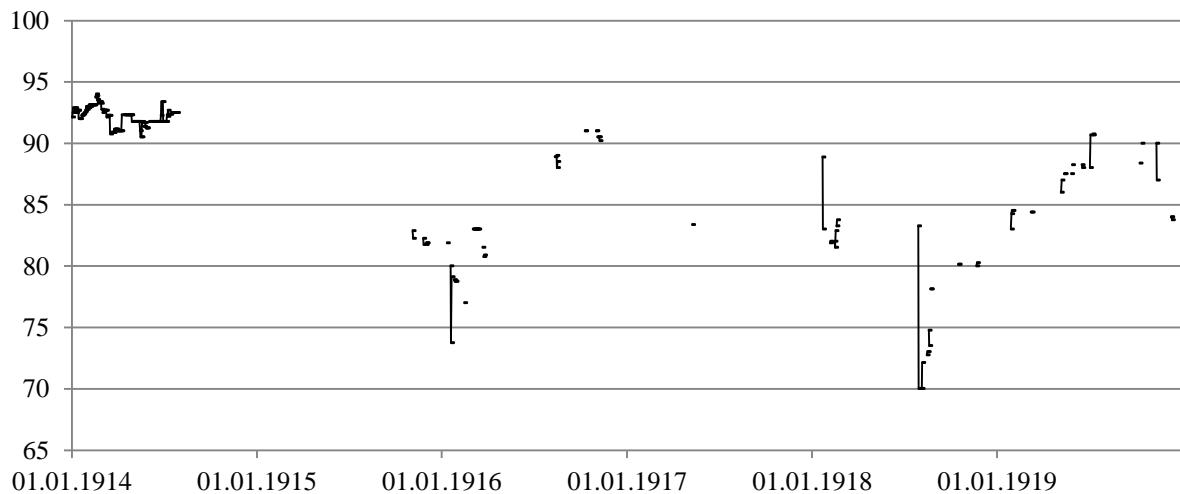
(84) Japan – 4.0 % of 1910



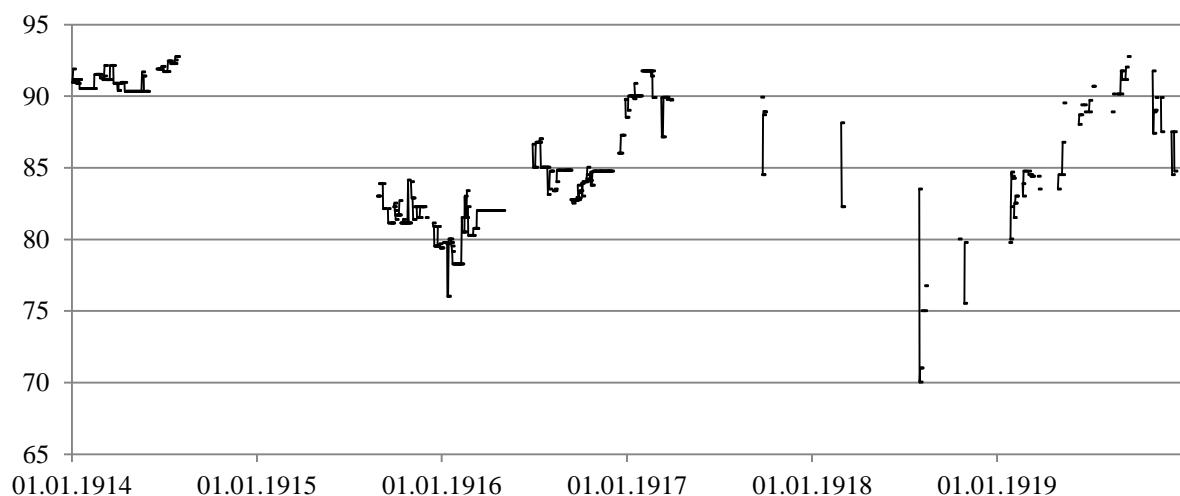
(85) Japan – 4.5 % 1st series (100)



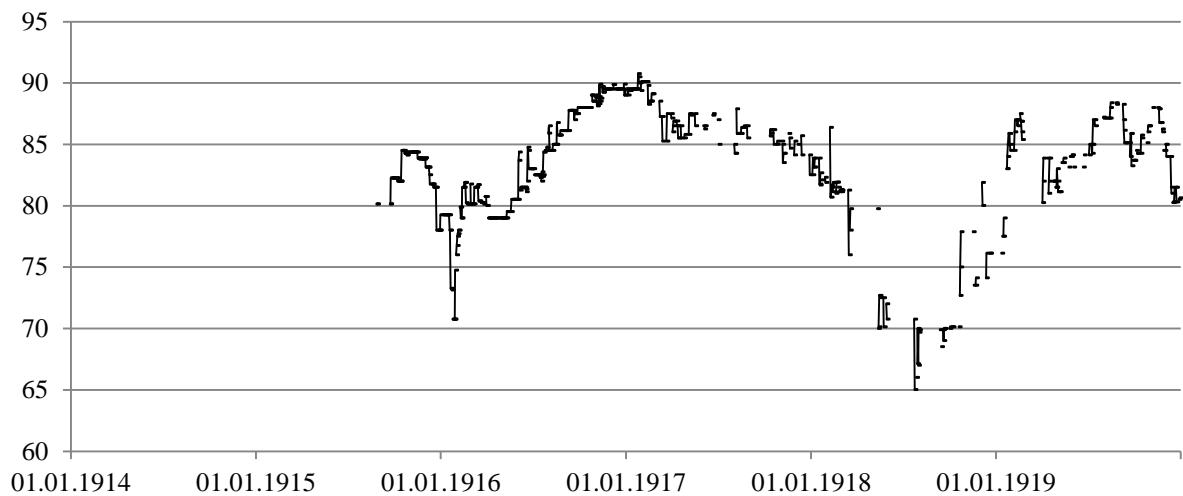
(86) Japan – 4.5 % 1st series (200/500)



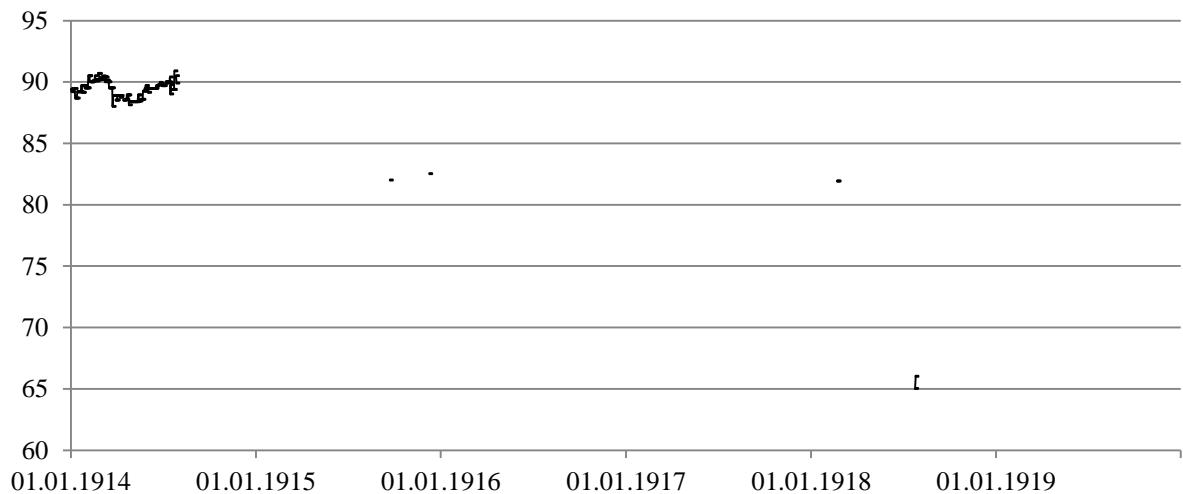
(87) Japan – 4.5 % 2nd series



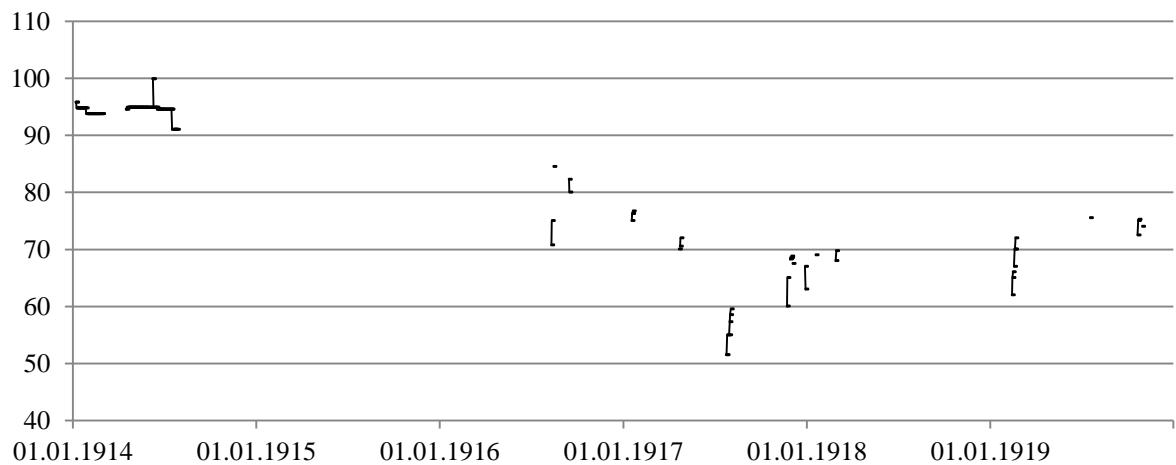
(88) Japan – 5.0 % of 1908/09 (500/1 000)



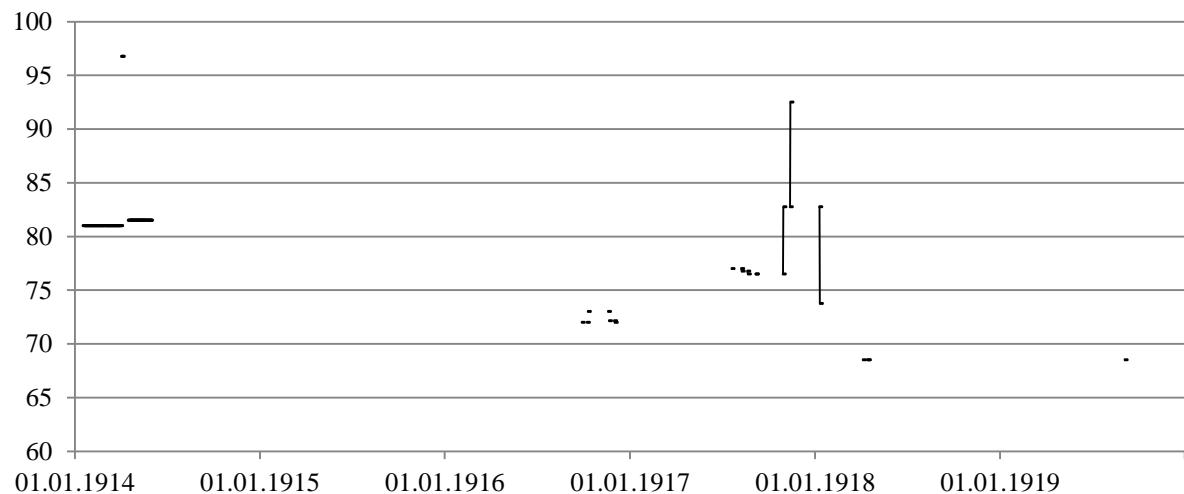
(89) Japan – 5.0 % of 1908/09 (5 000/10 000)



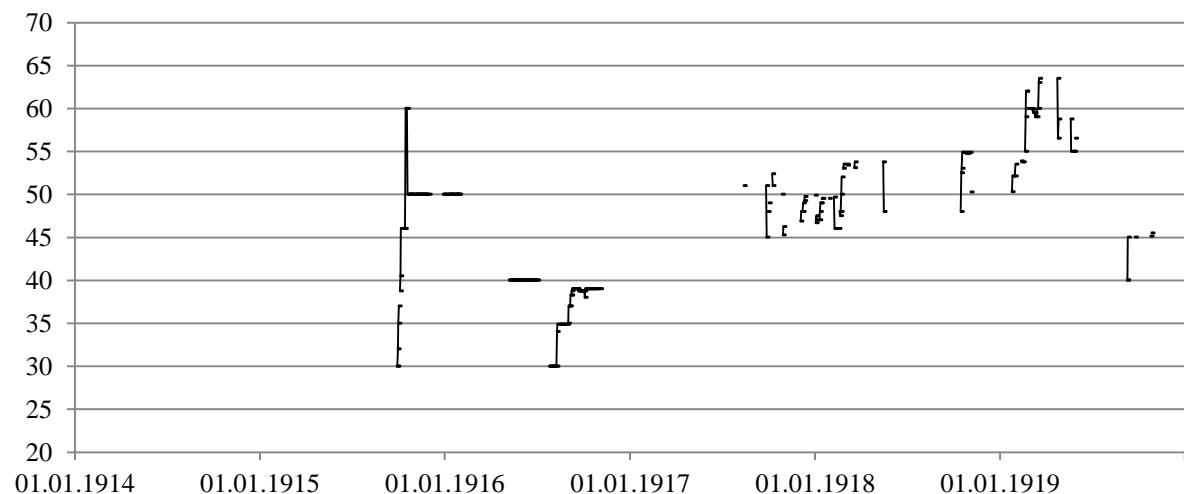
(90) Liberia – 5.0 % of 1913



(91) Mexico – 3.0 % of 1886 (1st ser.)



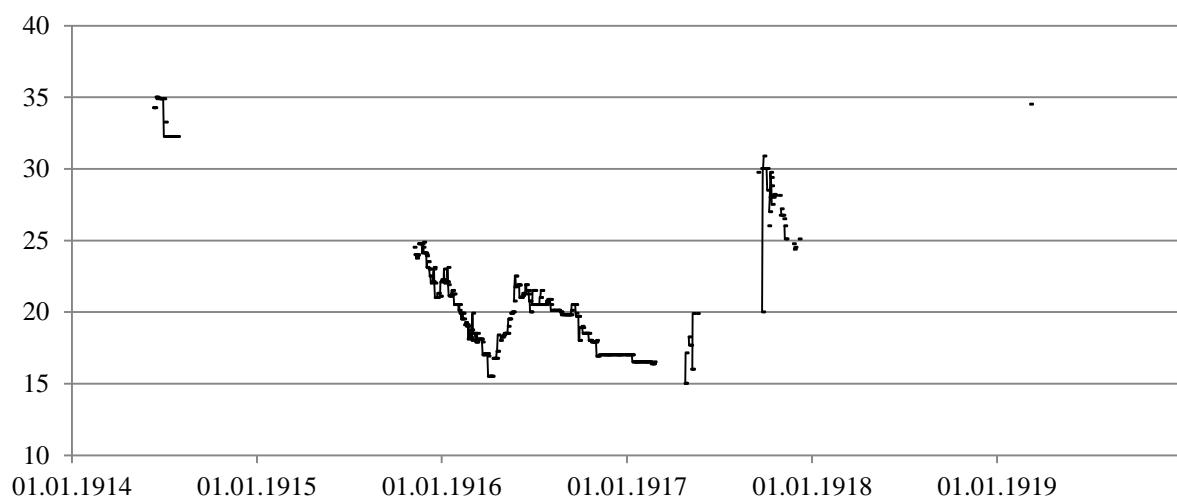
(92) Mexico – 4.0 % of 1904



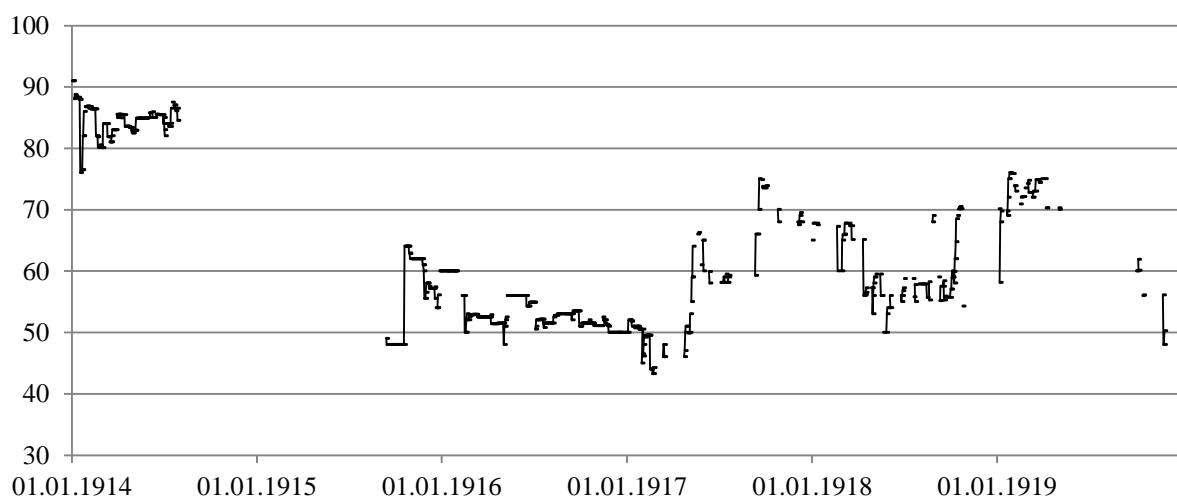
(93) Mexico – 5.0 % 1st-4th series (100/1 000)



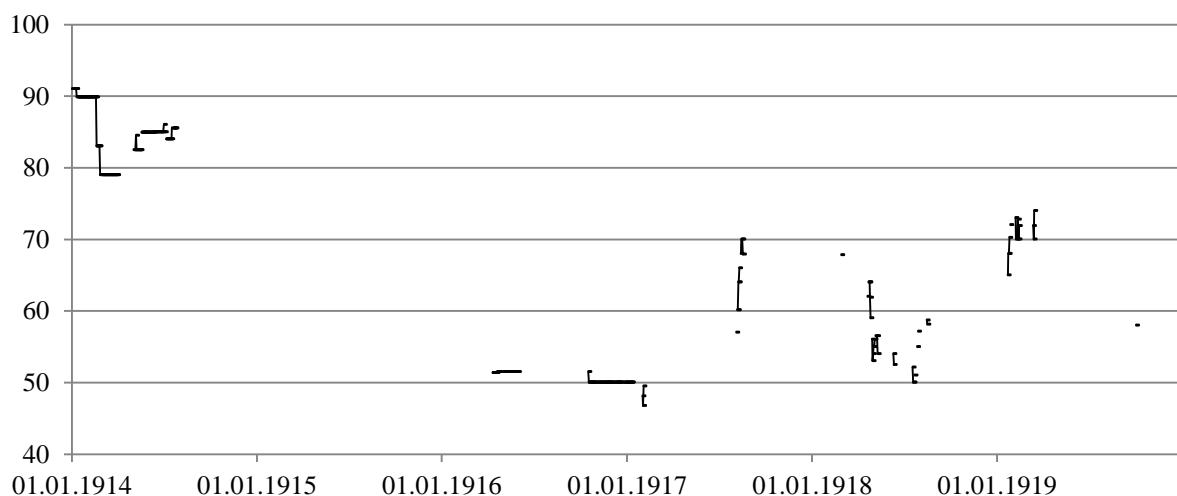
(94) Mexico – 5.0 % 5th series



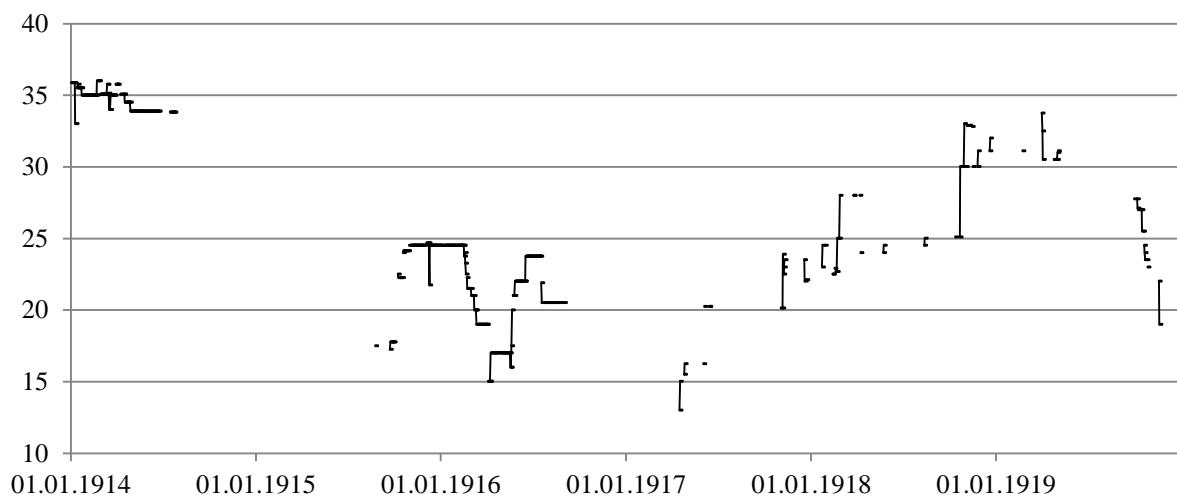
(95) Mexico – 5.0 % of 1899 (20/100)



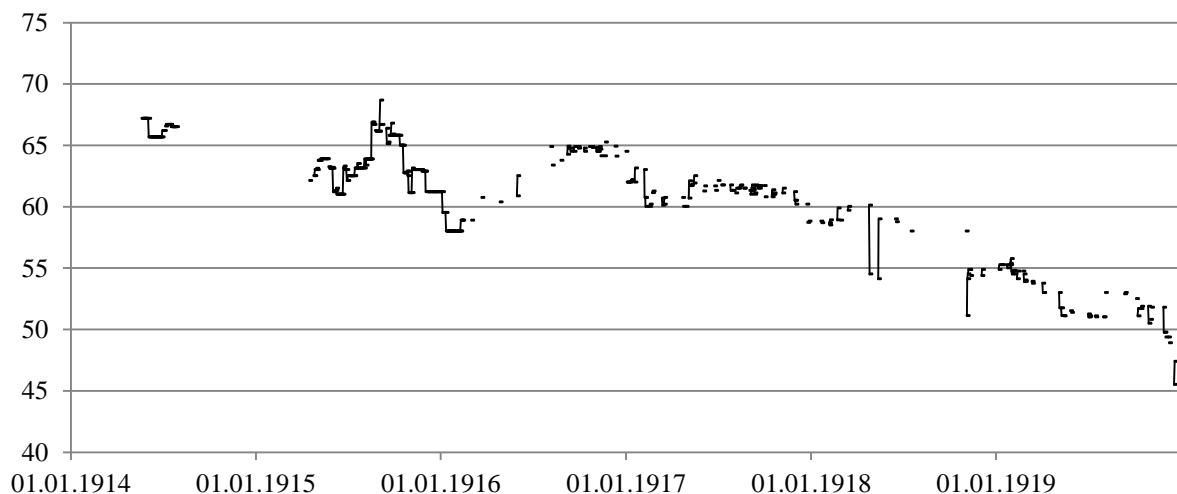
(96) Mexico – 5.0 % of 1899 (200/1 000)



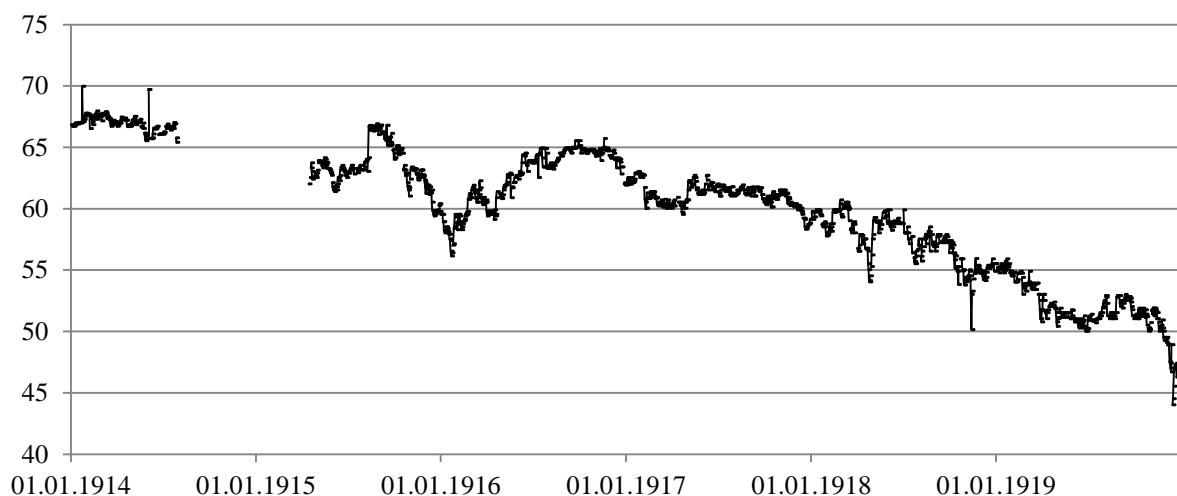
(97) Mexico – 5.0 % Vera Cruz



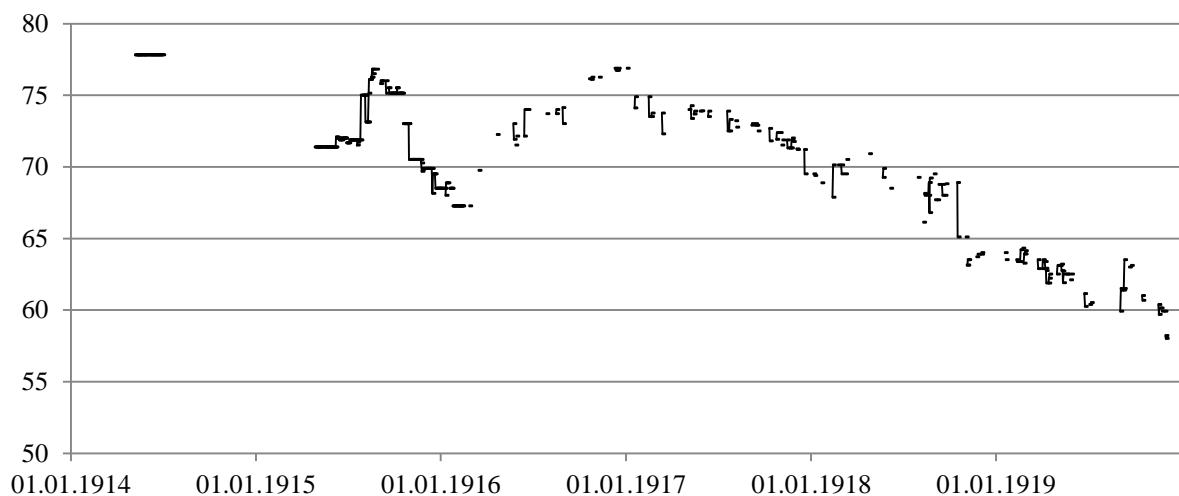
(98) Netherlands – 2.5 % grootboek



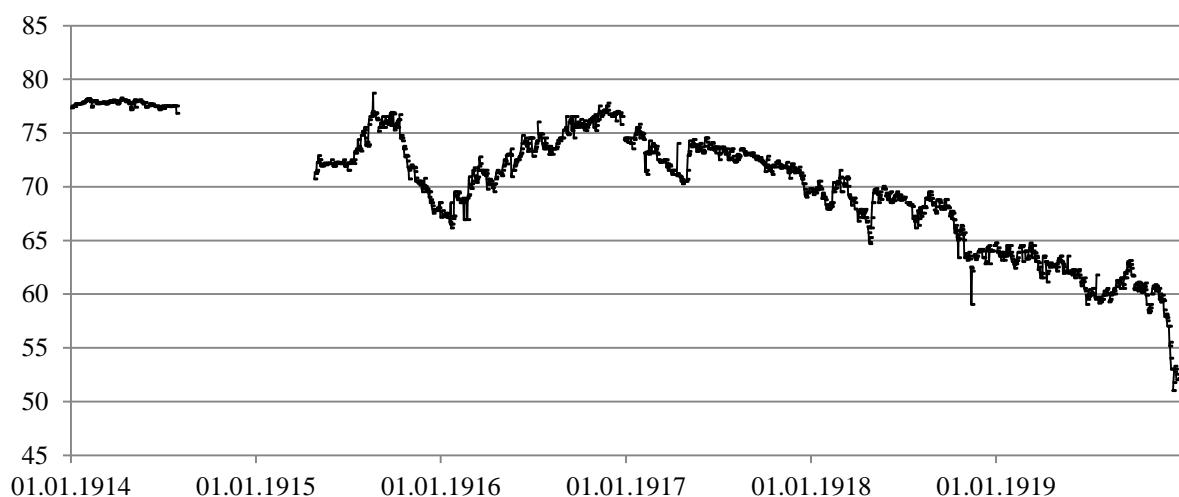
(99) Netherlands – 2.5 % certificates



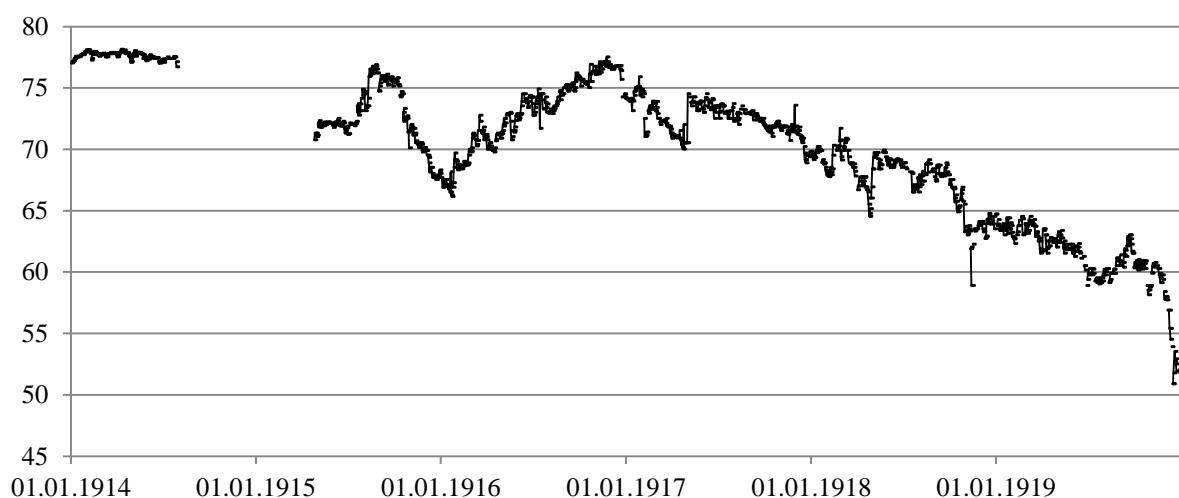
(100) Netherlands – 3.0 % grootboek



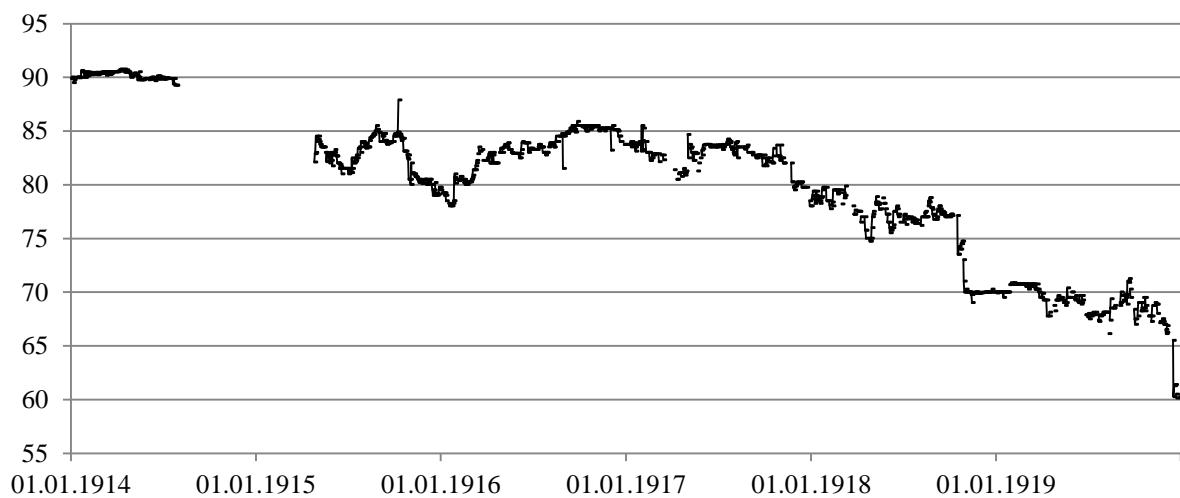
(101) Netherlands – 3.0 % NWS



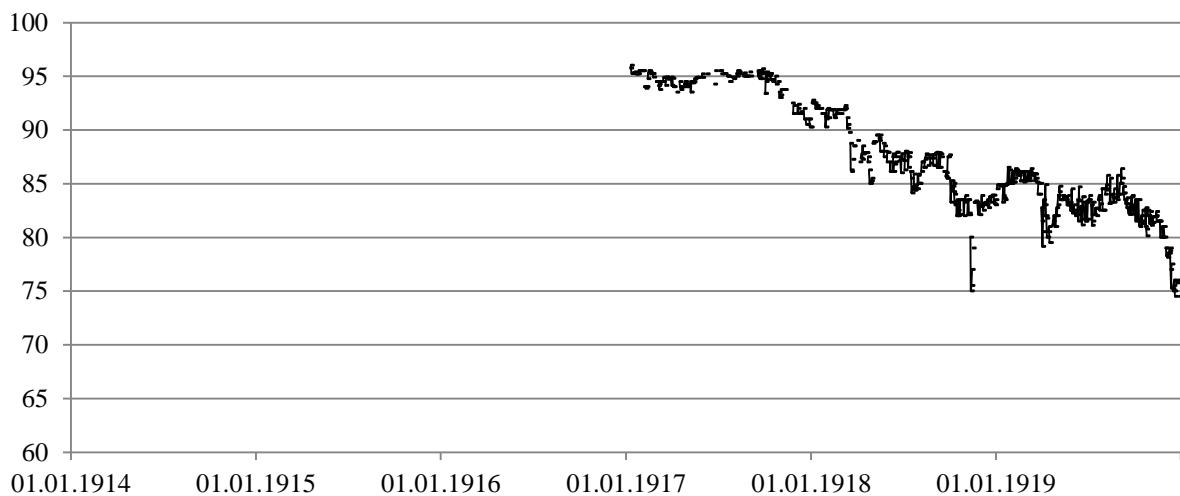
(102) Netherlands – 3.0 % certificates



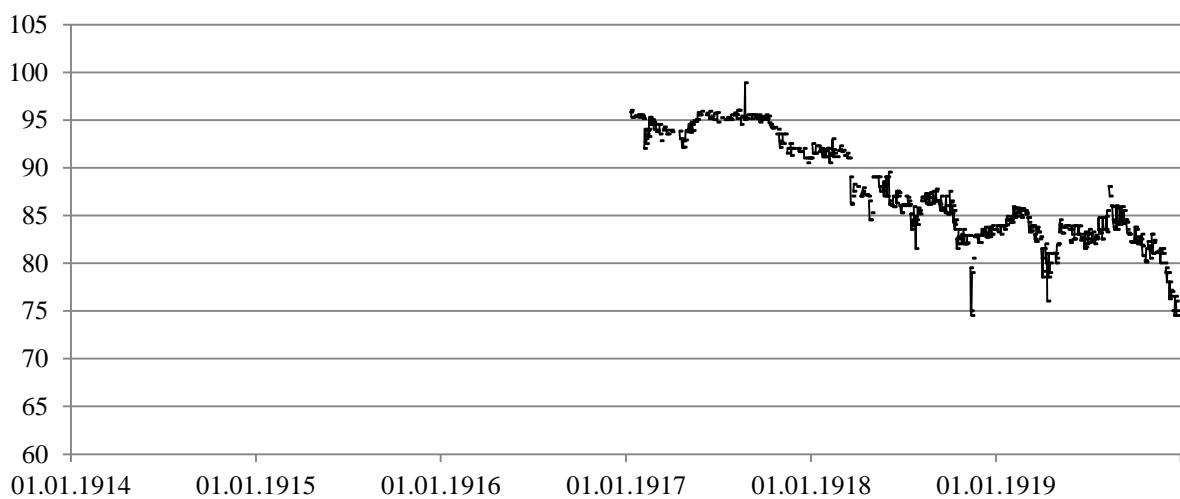
(103) Netherlands – 3.5 % NWS



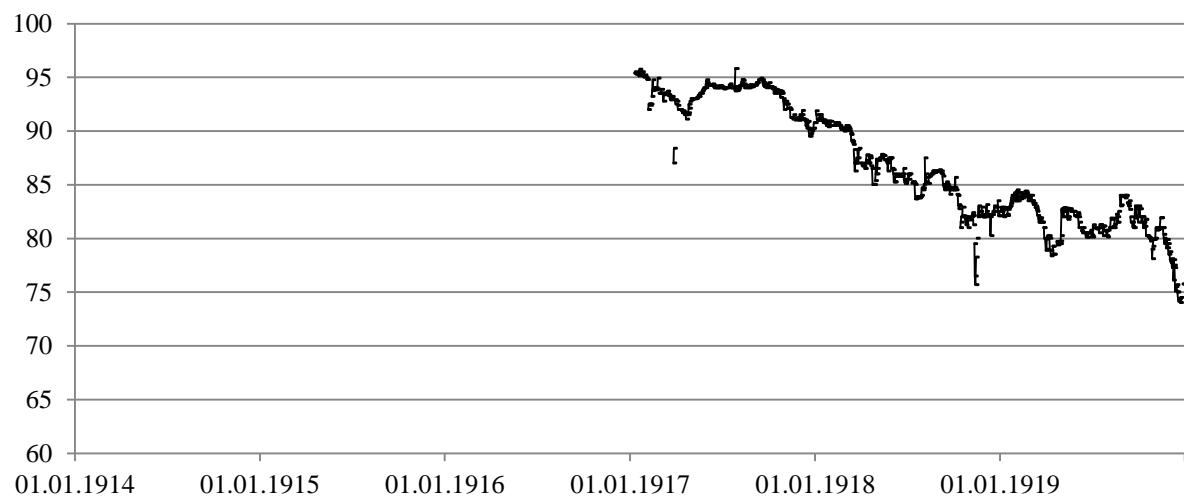
(104) Netherlands – 4.0 % of 1916 (100)



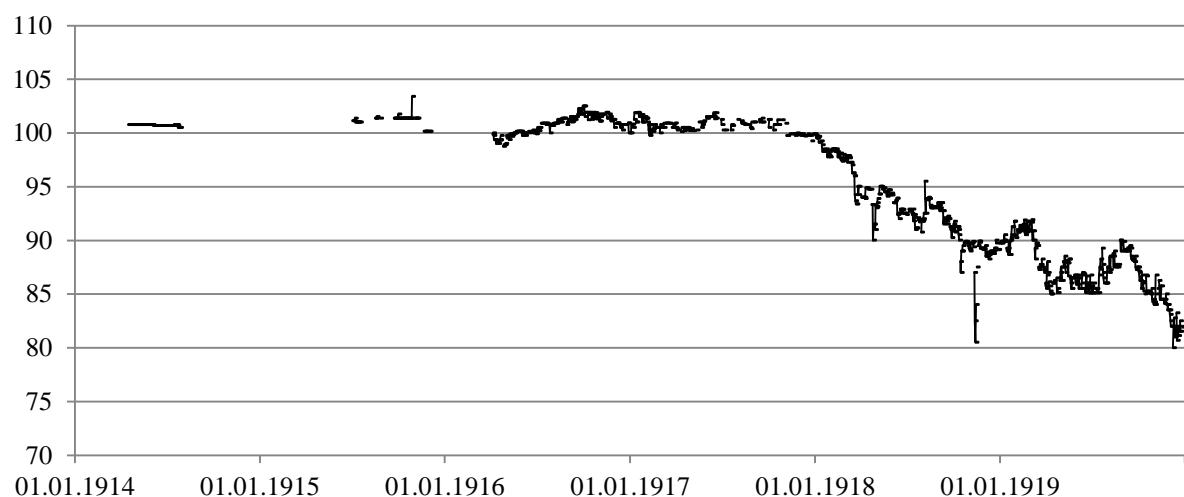
(105) Netherlands – 4.0 % of 1916 (500)



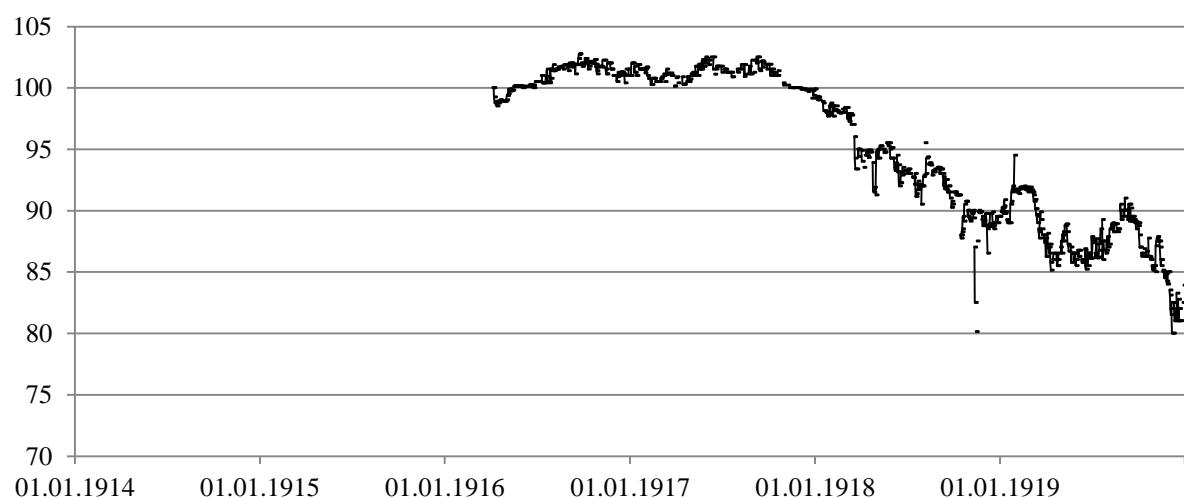
(106) Netherlands – 4.0 % of 1916 (1 000)



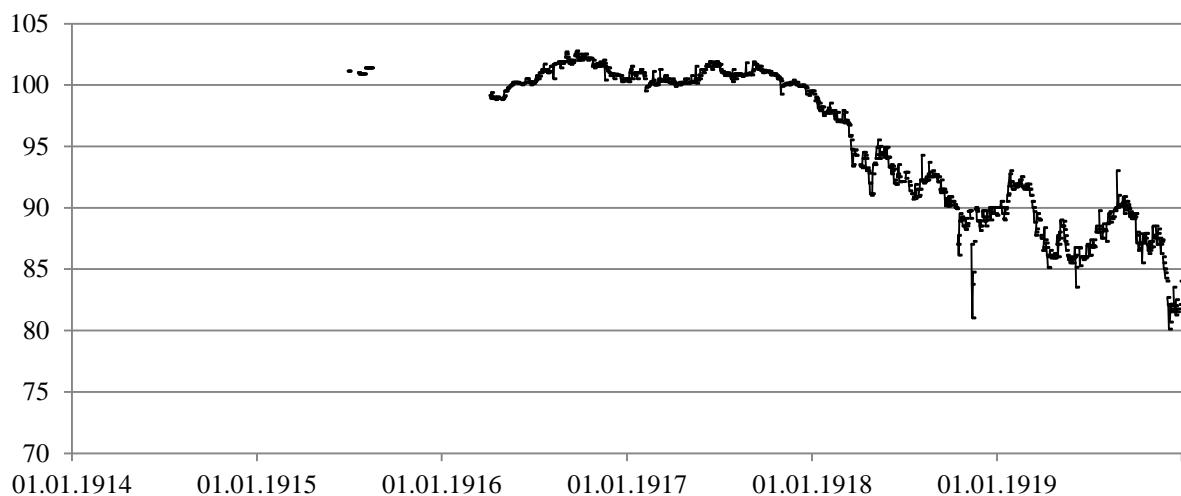
(107) Netherlands – 4.5 % NWS (100)



(108) Netherlands – 4.5 % NWS (500)



(109) Netherlands – 4.5 % NWS (1 000)



(110) Netherlands – 4.5 % of 1917 (100)



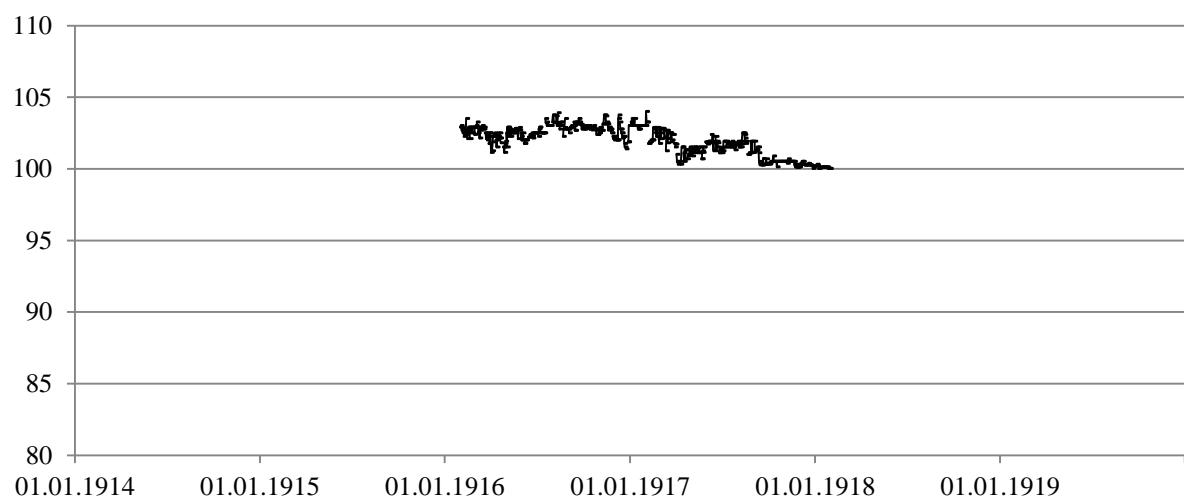
(111) Netherlands – 4.5 % of 1917 (500)



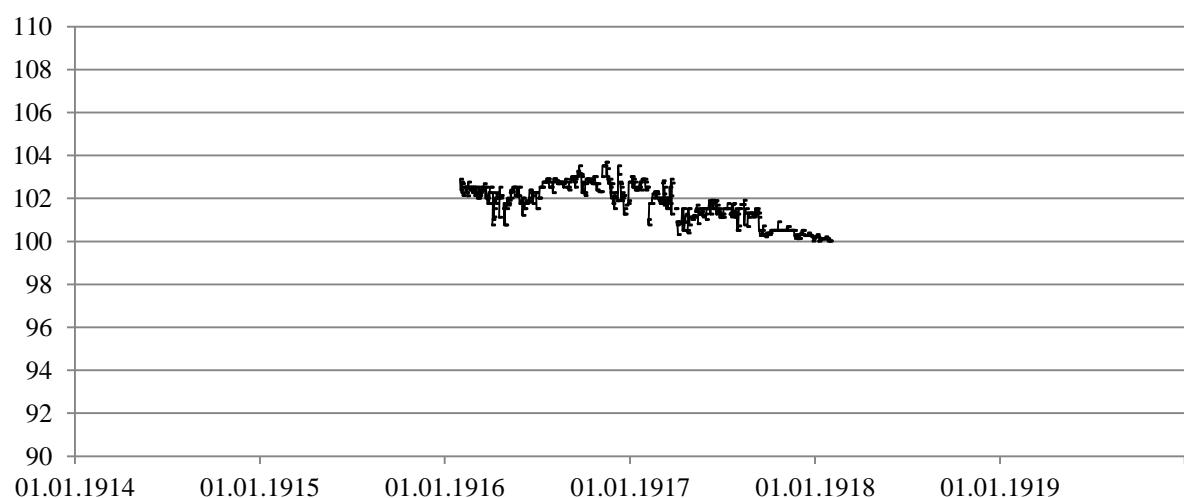
(112) Netherlands – 4.5 % of 1917 (1 000)



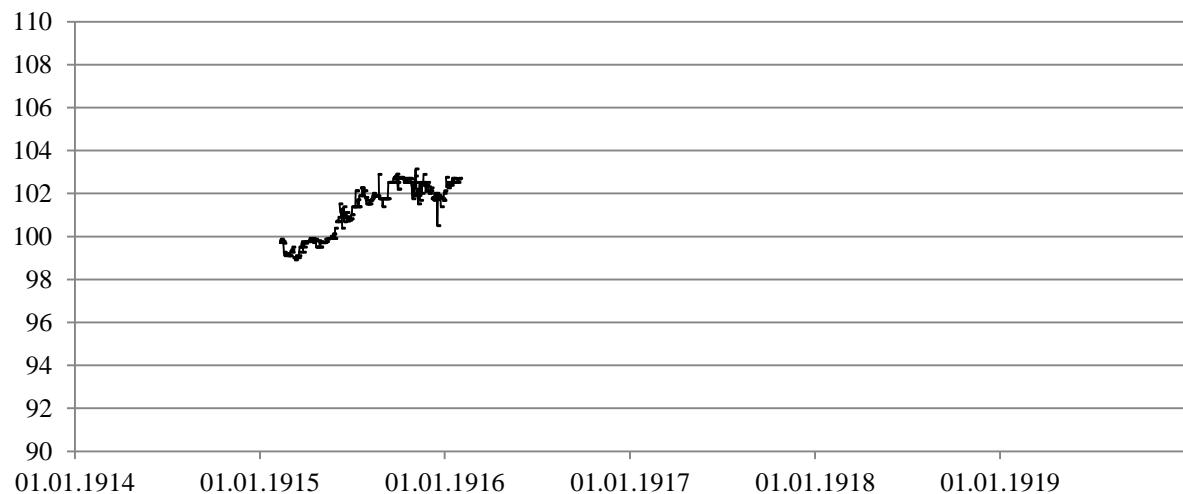
(113) Netherlands – 5.0 % NWS (100)



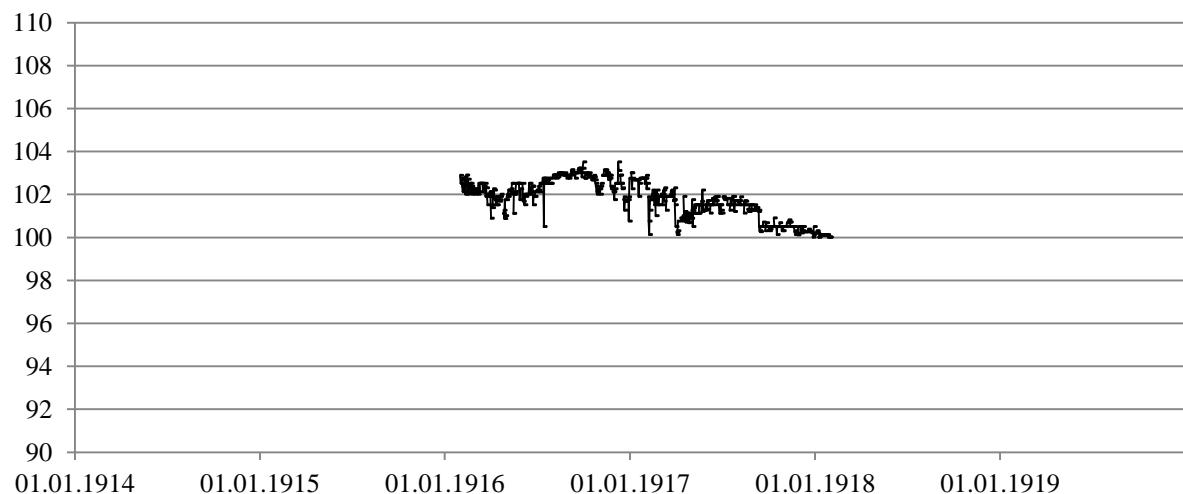
(114) Netherlands – 5.0 % NWS (200)



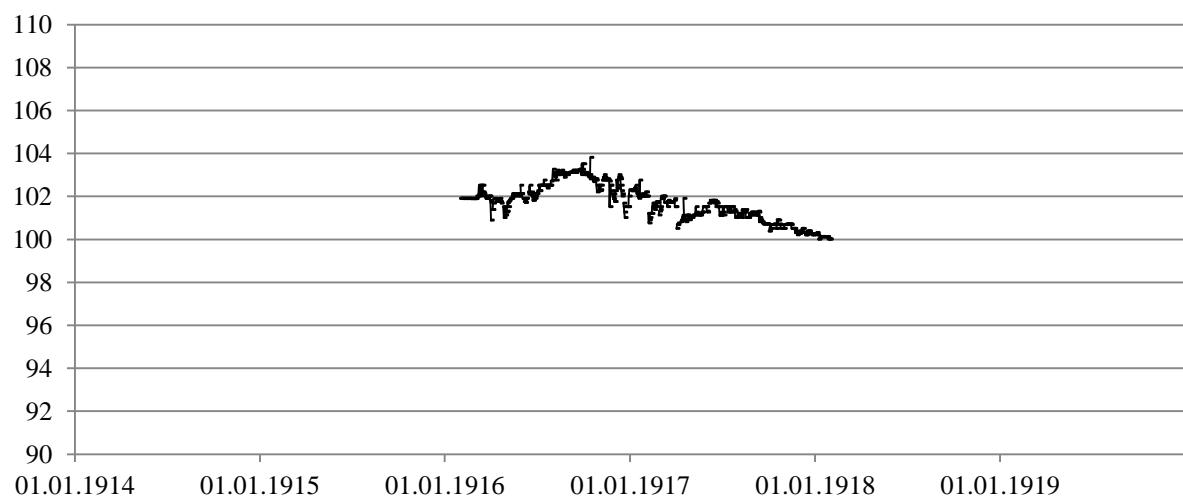
(115) Netherlands – 5.0 % NWS (100/200)



(116) Netherlands – 5.0 % NWS (500)



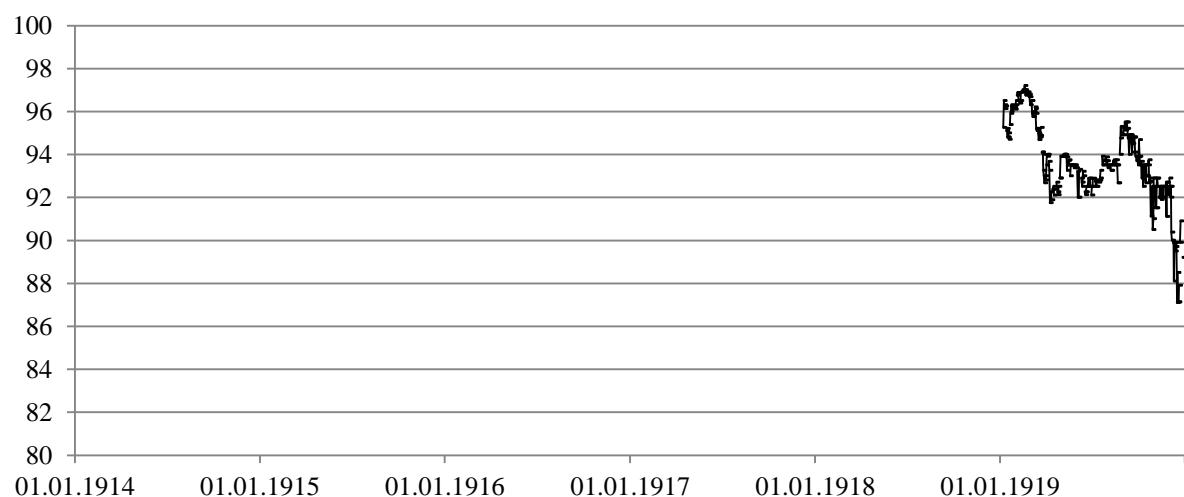
(117) Netherlands – 5.0 % NWS (1 000)



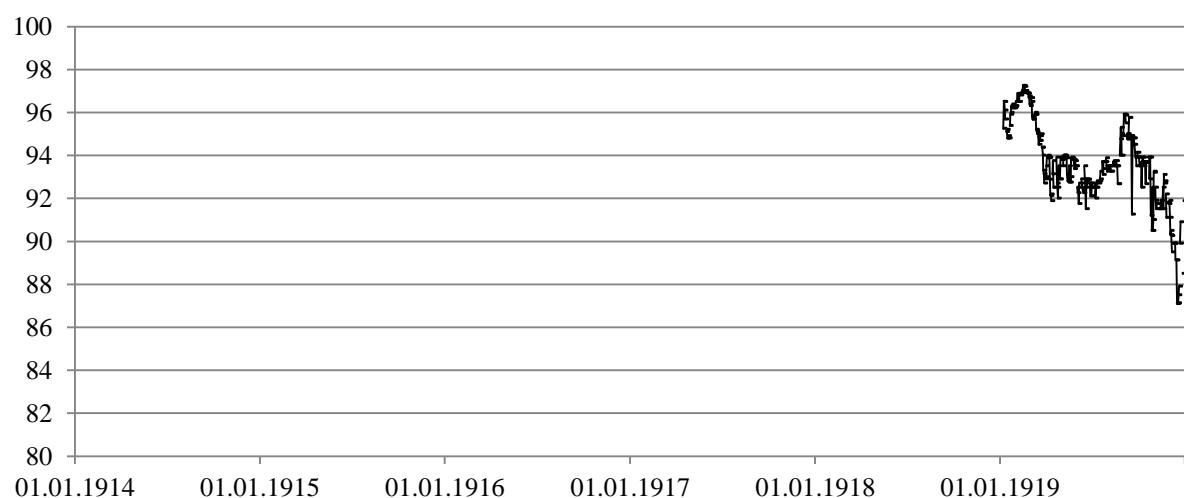
(118) Netherlands – 5.0 % NWS (500/1 000)



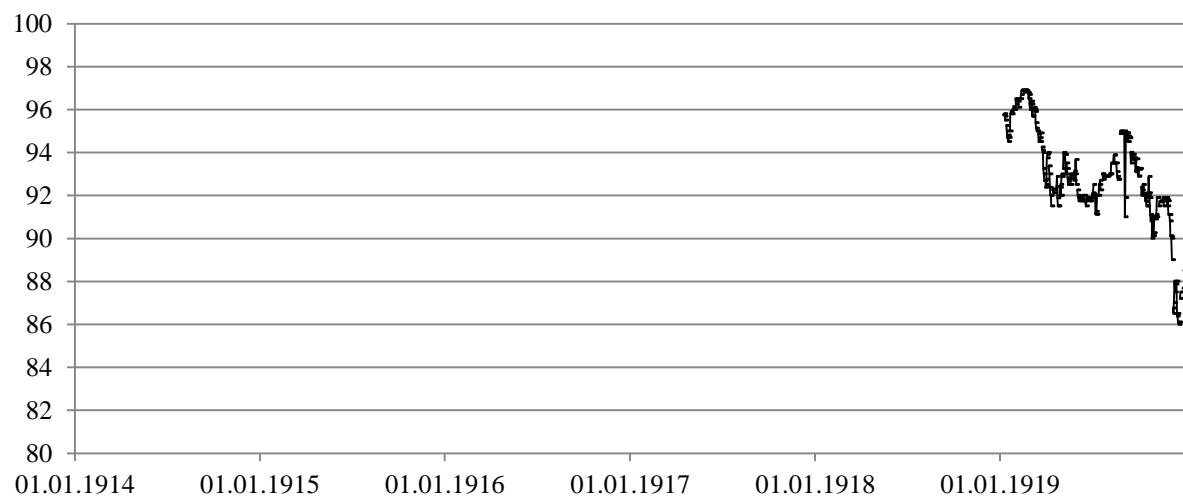
(119) Netherlands – 5.0 % of 1918 (100)



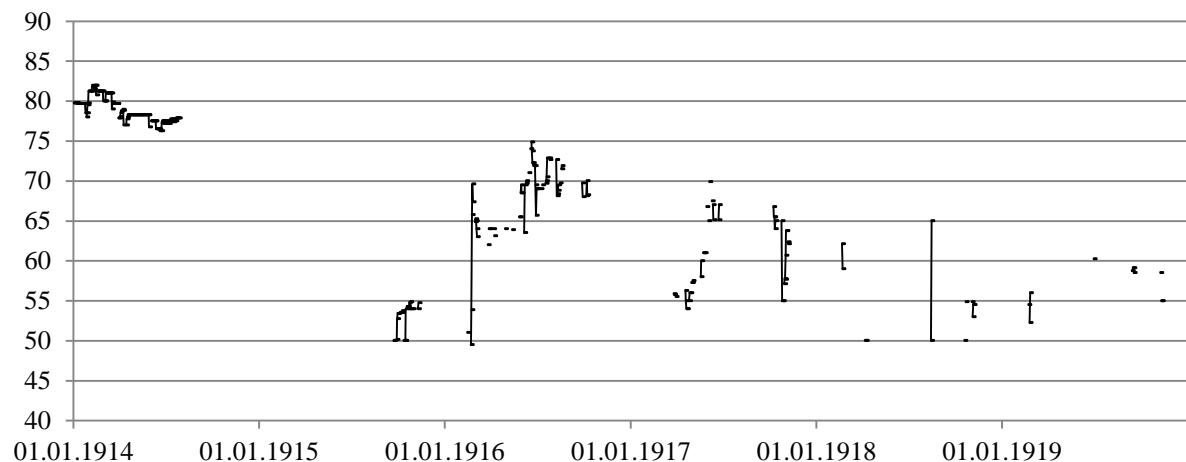
(120) Netherlands – 5.0 % of 1918 (500)



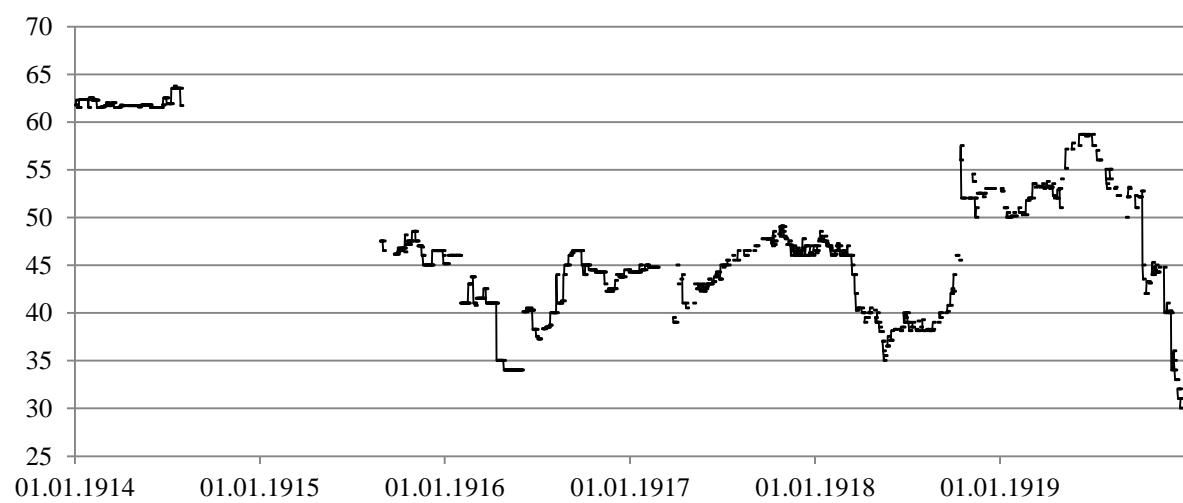
(121) Netherlands – 5.0 % of 1918 (1 000)



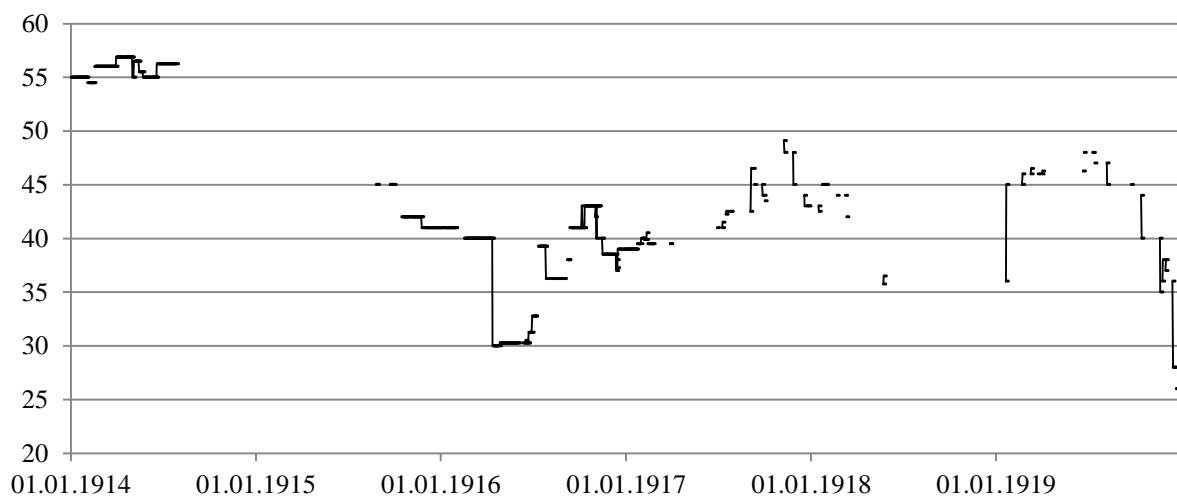
(122) Nicaragua – 5.0 % of 1909



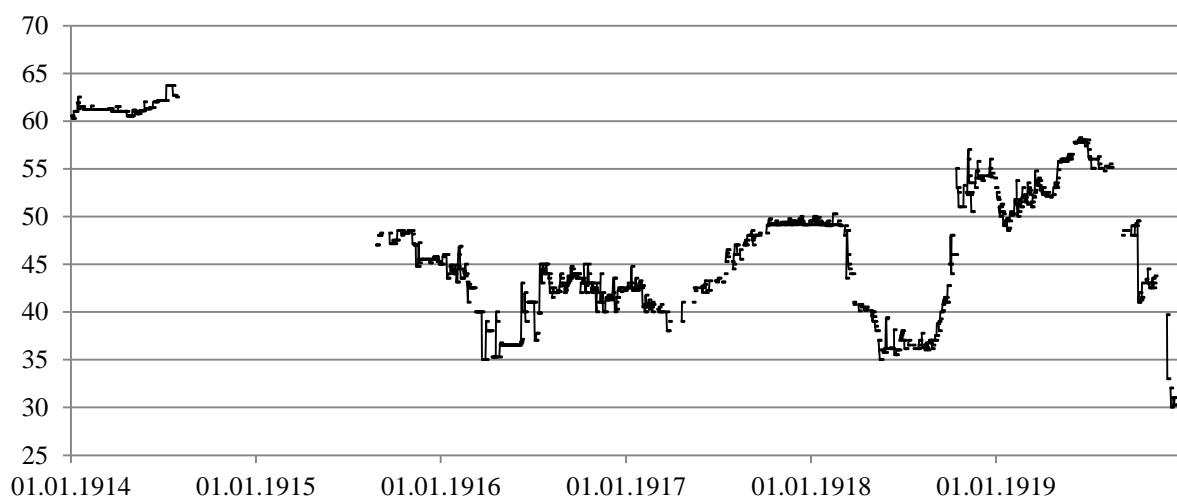
(123) Portugal – 3.0 % 1st series



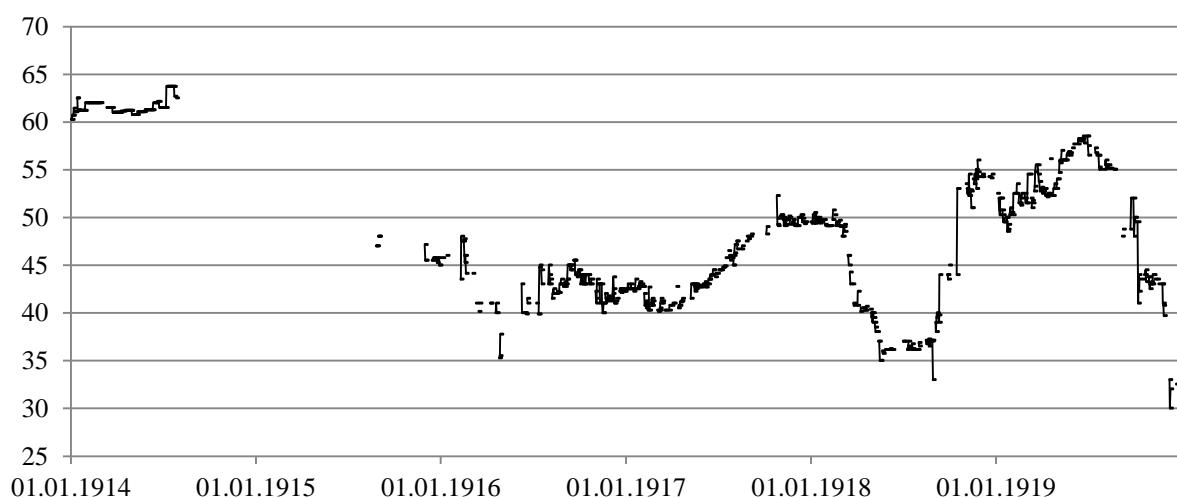
(124) Portugal – 3.0 % 2nd series



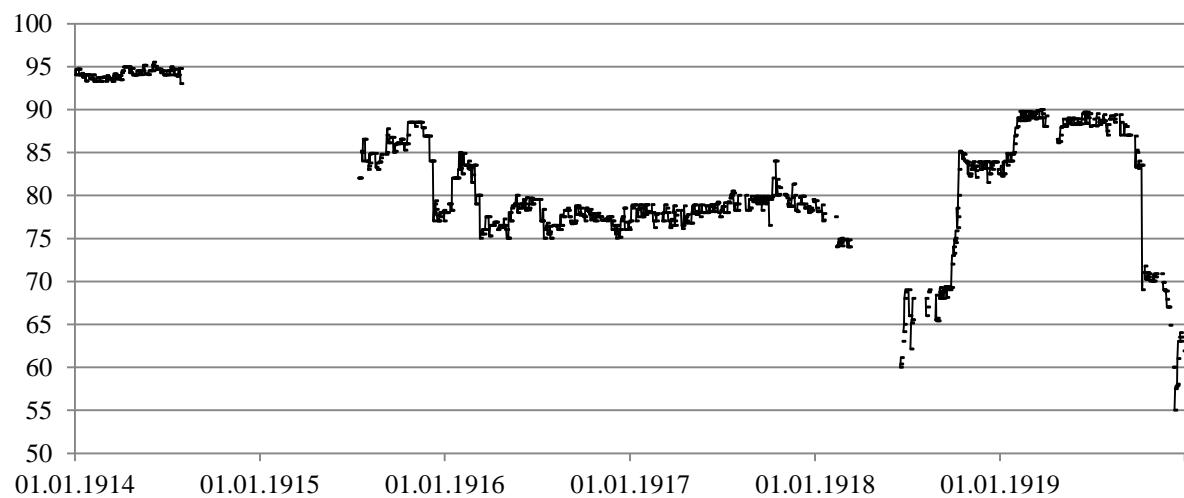
(125) Portugal – 3.0 % 3rd series (500)



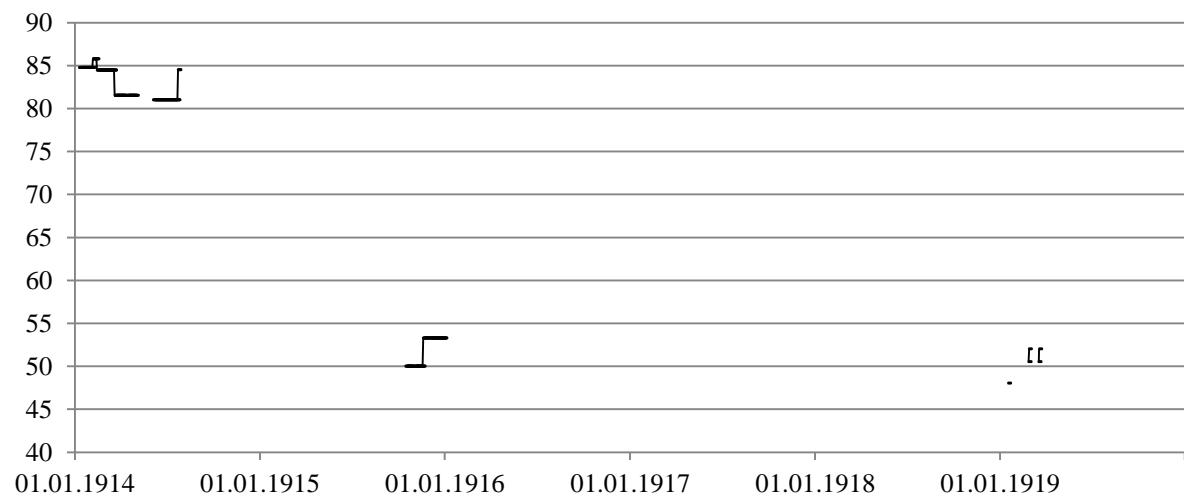
(126) Portugal – 3.0 % 3rd series (2 500)



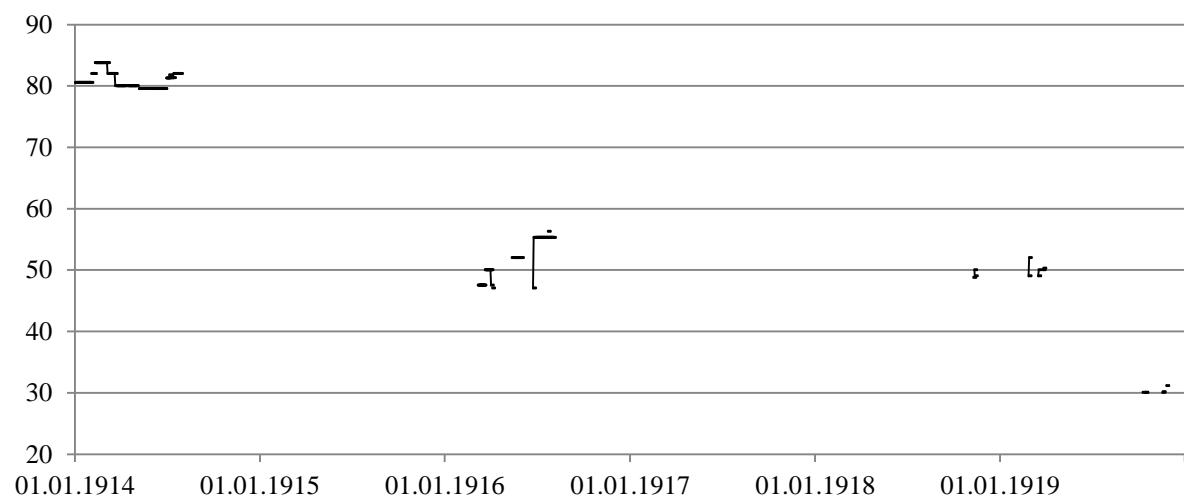
(127) Portugal – 4.5 % of 1890



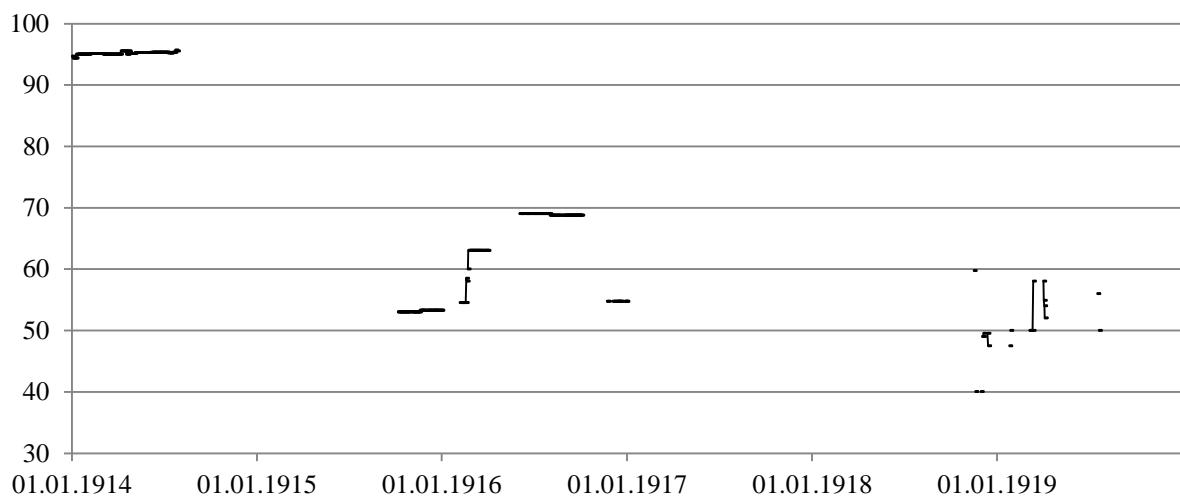
(128) Romania – 4.0 % of 1894 (2 500/5 000)



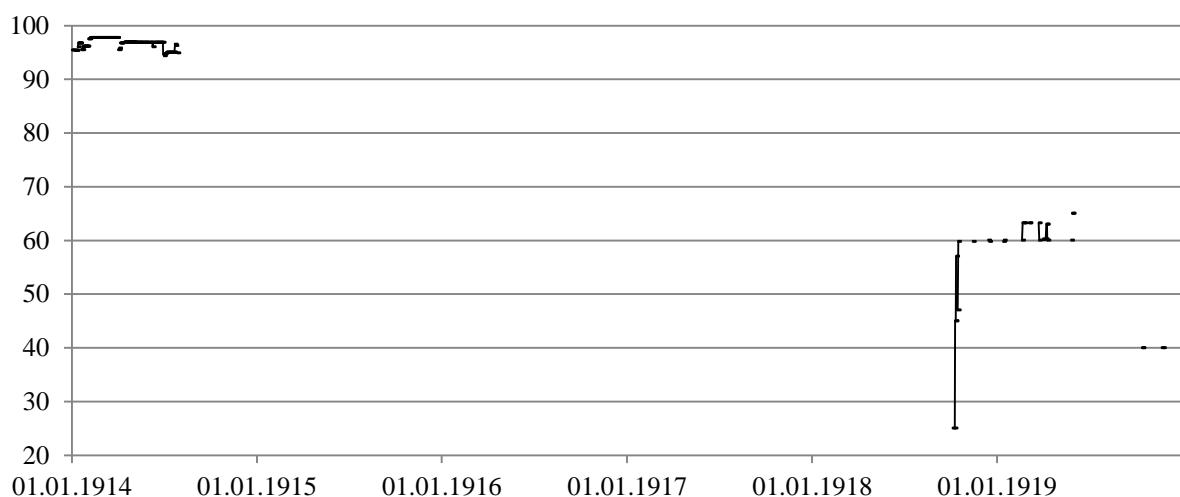
(129) Romania – 4.0 % of 1910 (2 500/5 000)



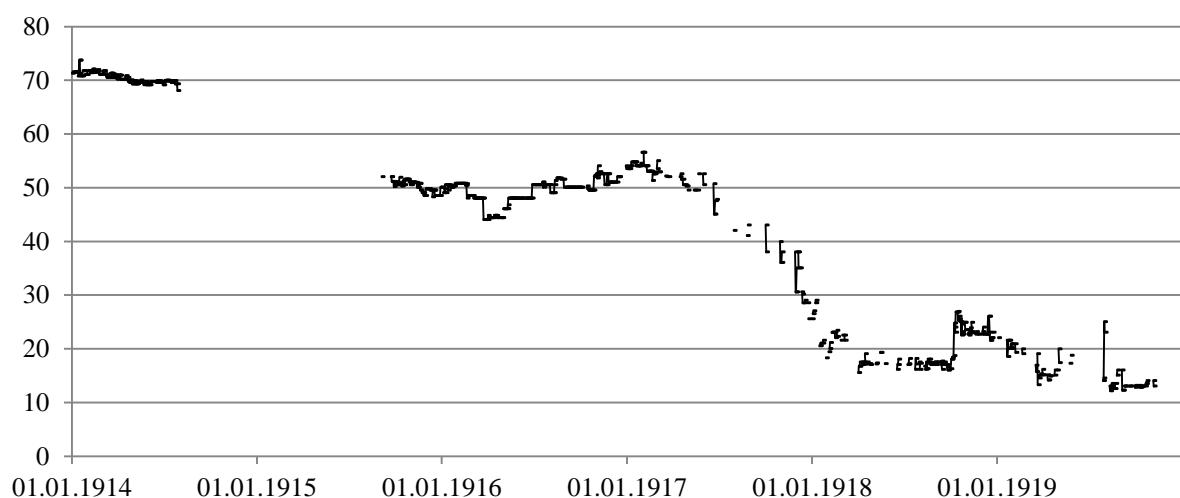
(130) Romania – 4.5 % of 1913



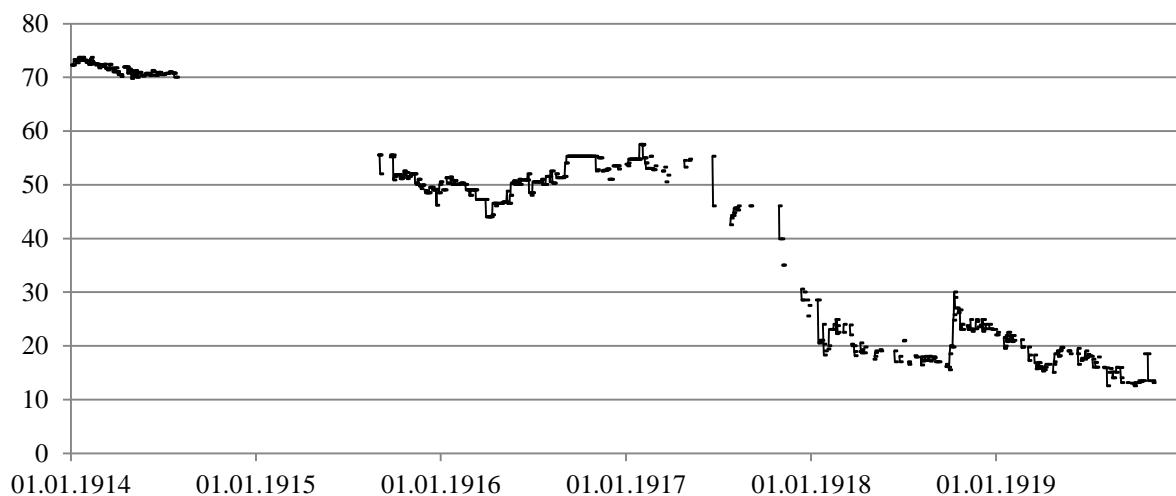
(131) Romania – 5.0 % of 1903 (2 500/5 000)



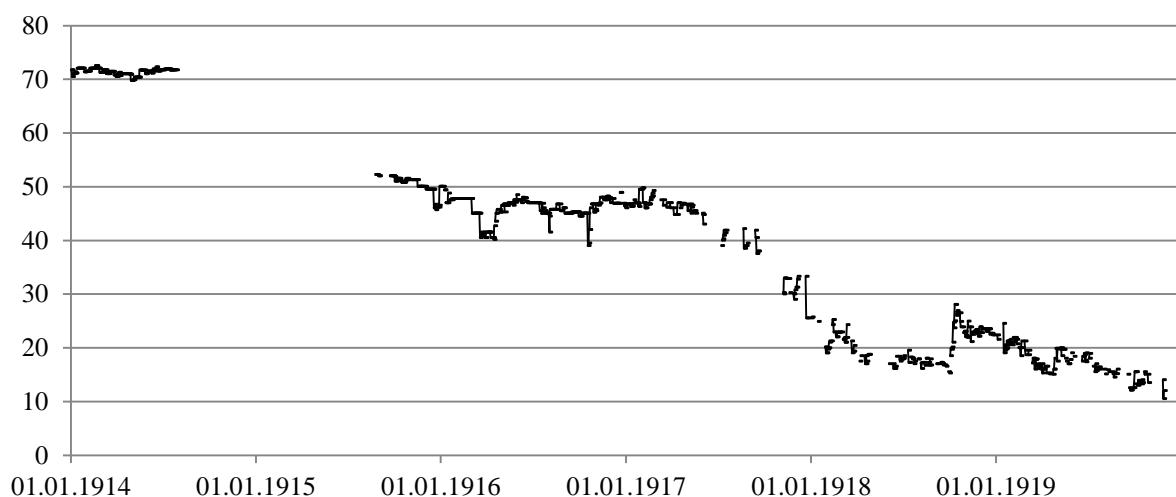
(132) Russia – 3.0 % of 1880 (125)



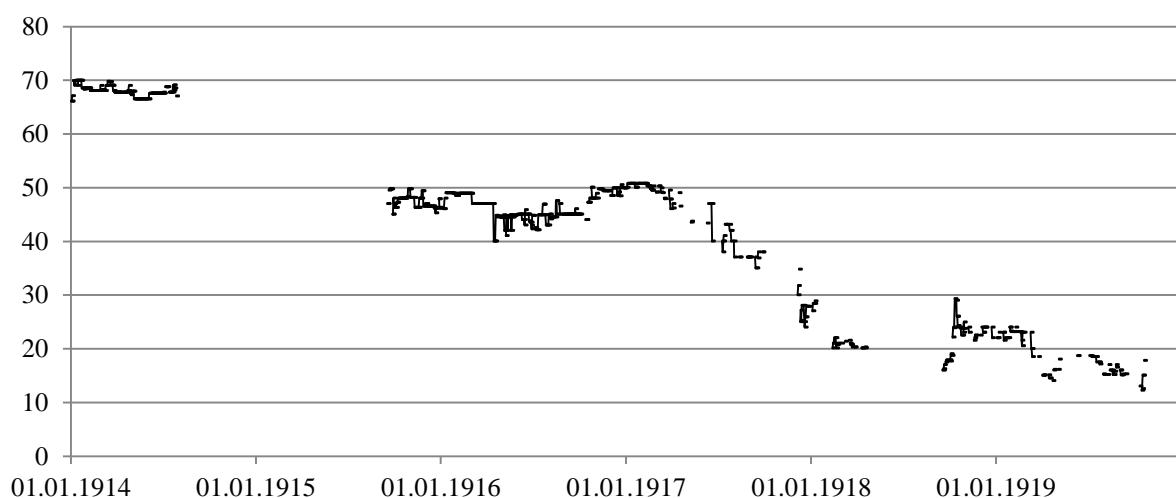
(133) Russia – 3.0 % of 1880 (625)



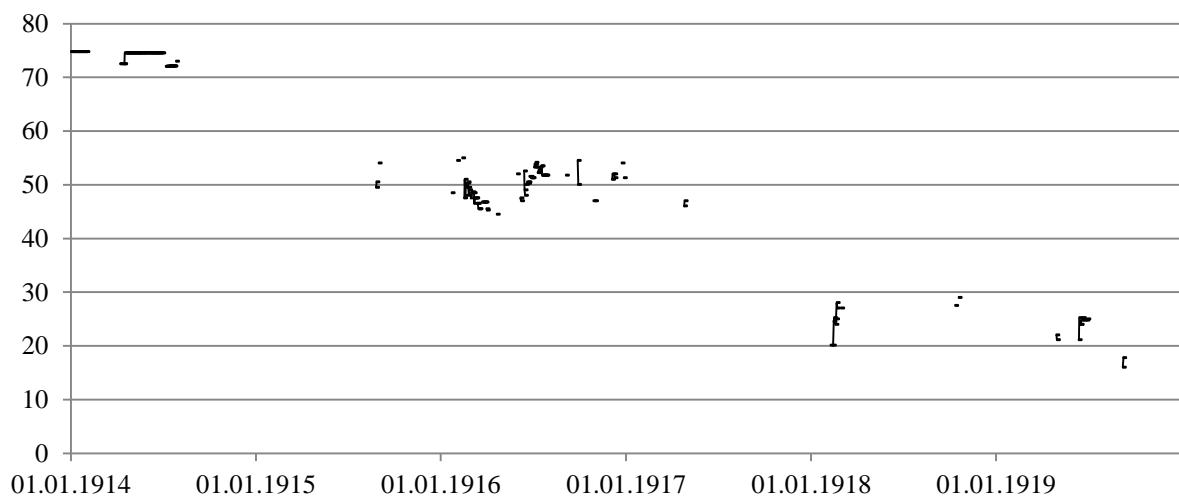
(134) Russia – 3.0 % of 1882



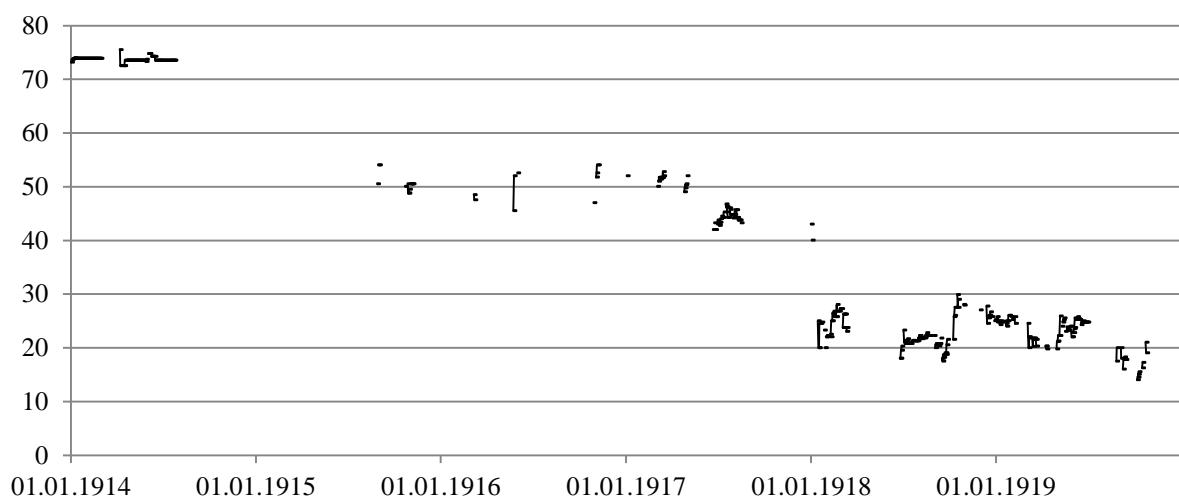
(135) Russia – 3.0 % of 1889



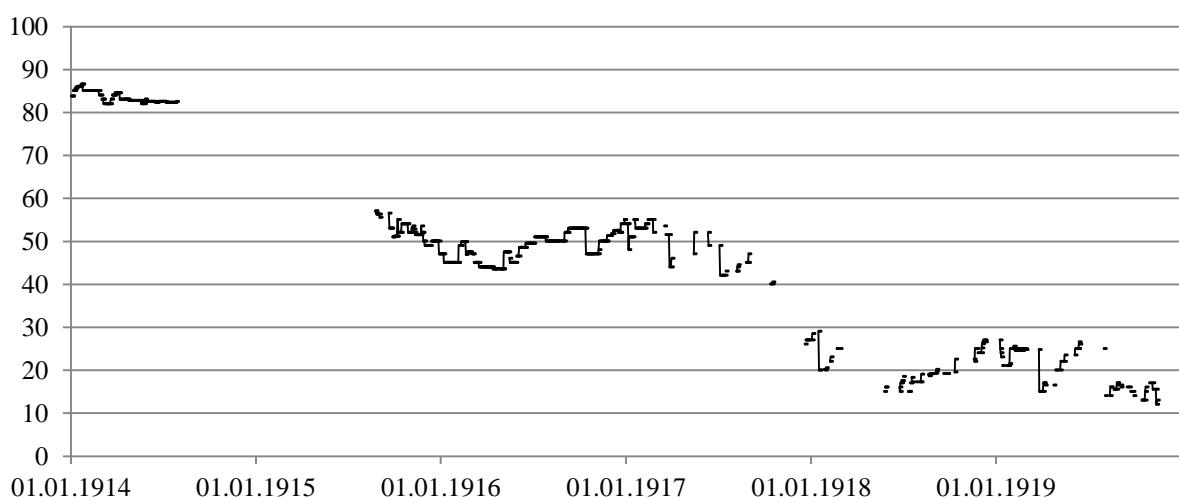
(136) Russia – 3.5 % (125) of 1894



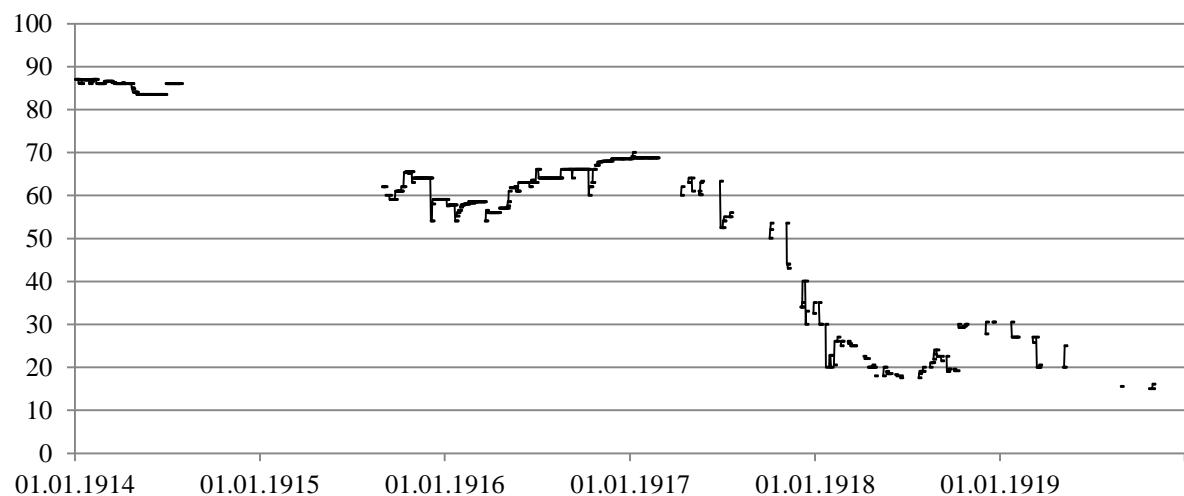
(137) Russia – 3.5 % (625) of 1894



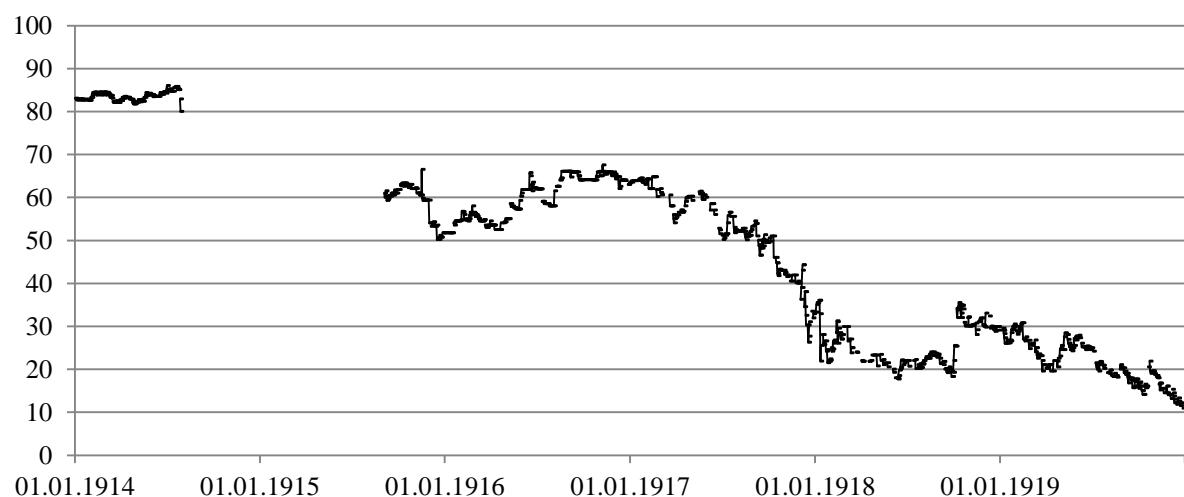
(138) Russia – 3.8 % of 1898



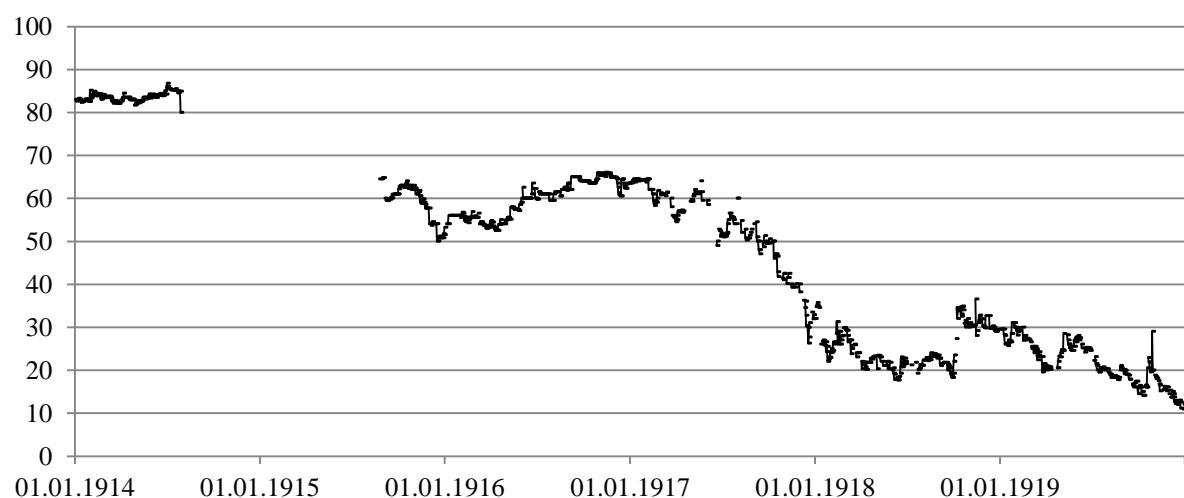
(139) Russia – 4.0 % of 1861



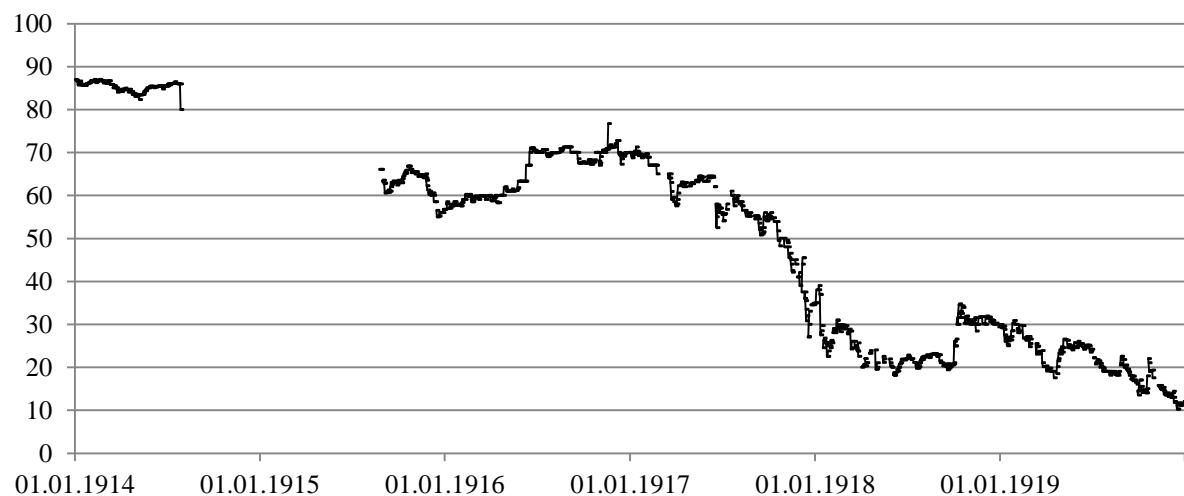
(140) Russia – 4.0 % of 1888



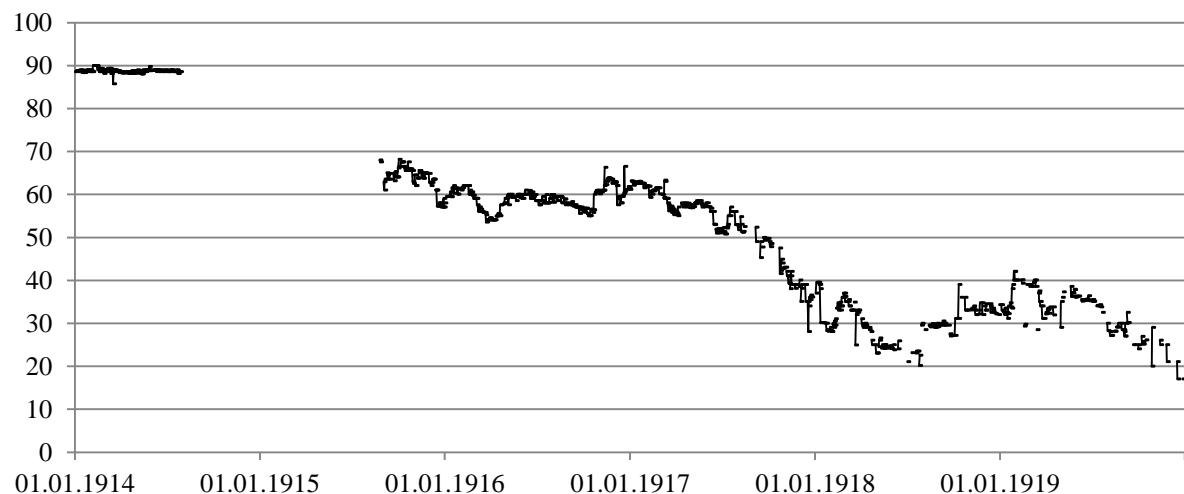
(141) Russia – 4.0 % of 1890



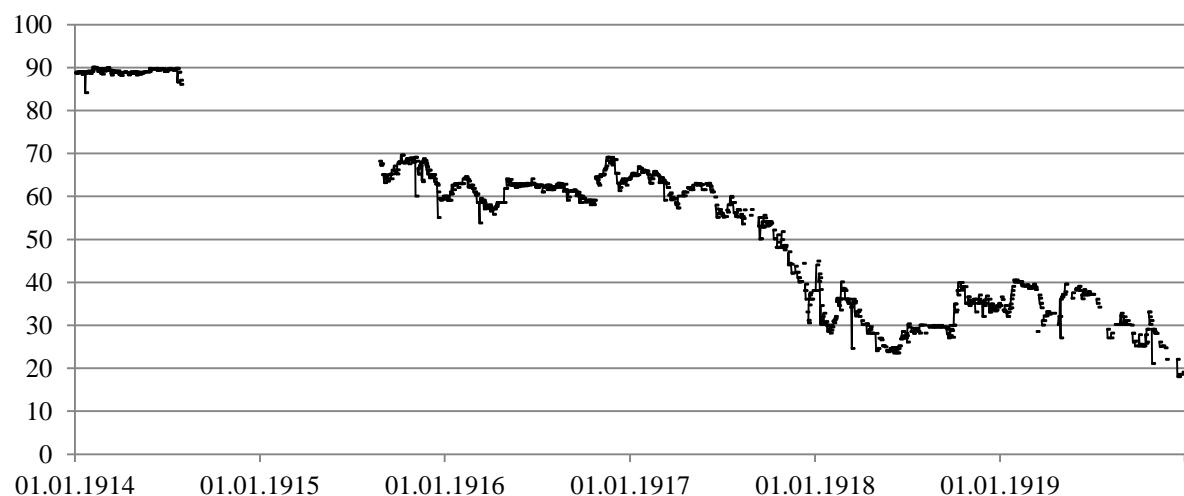
(142) Russia – 4.0 % of 1898



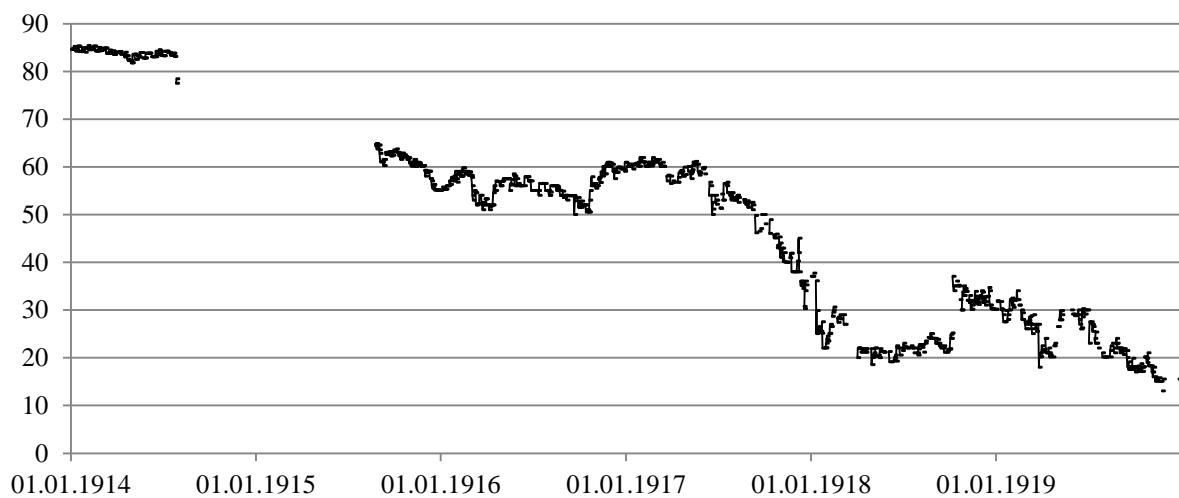
(143) Russia – 4.0 % of 1867–69 (Nicolai Railway, 20)



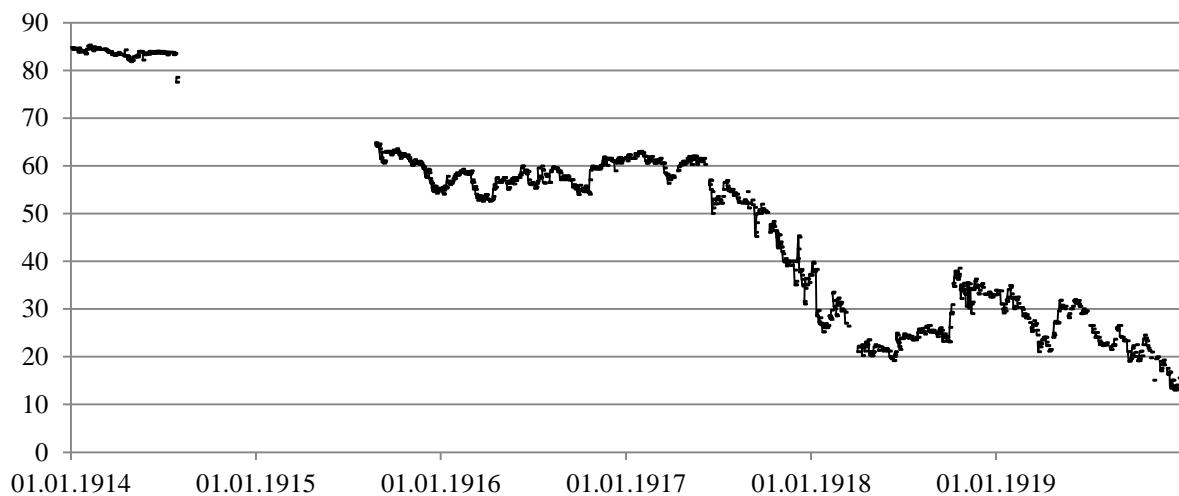
(144) Russia – 4.0 % of 1867–69 (Nikolai Railway, 100)



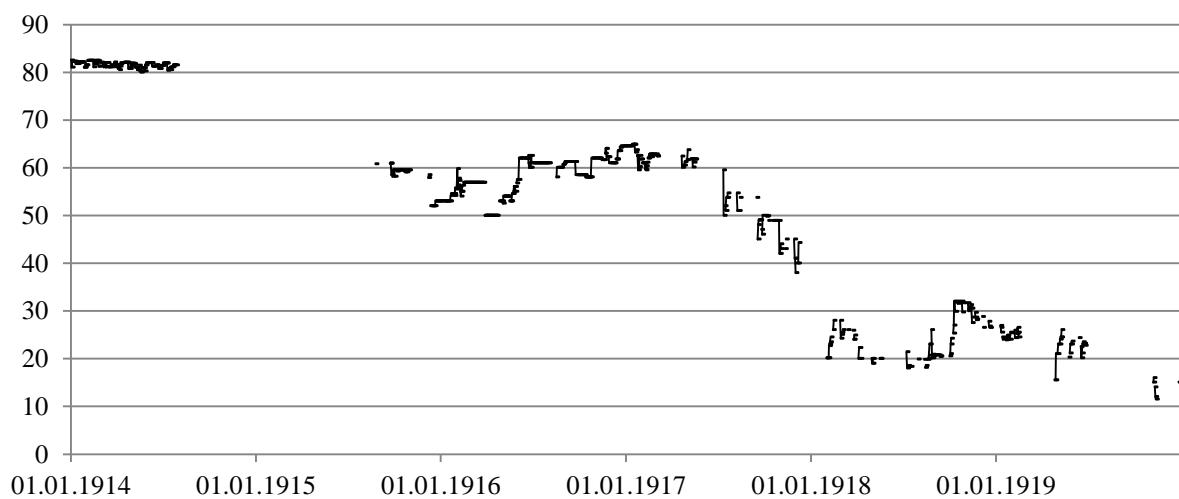
(145) Russia – 4.0 % of 1880 (125)



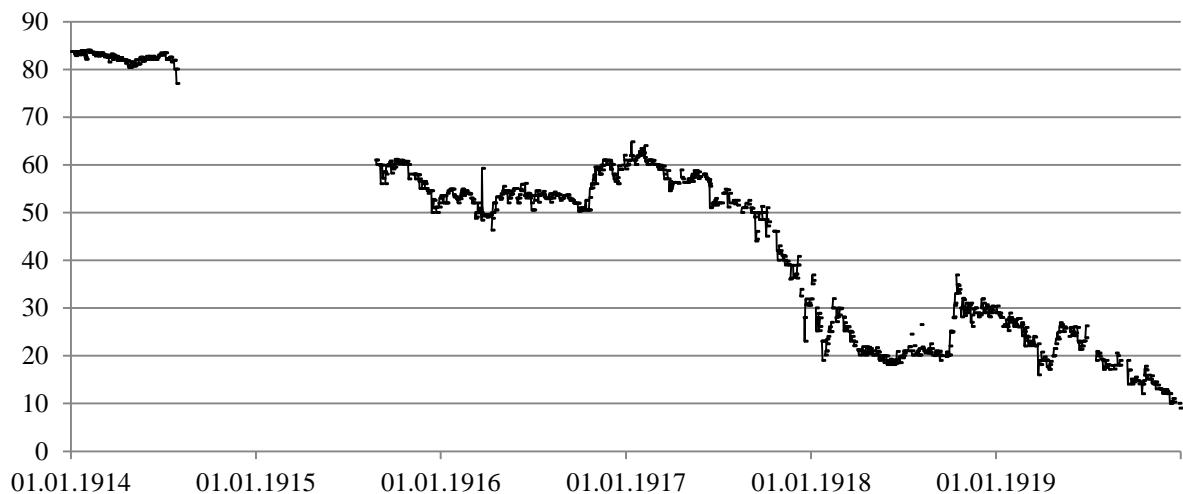
(146) Russia – 4.0 % of 1880 (625)



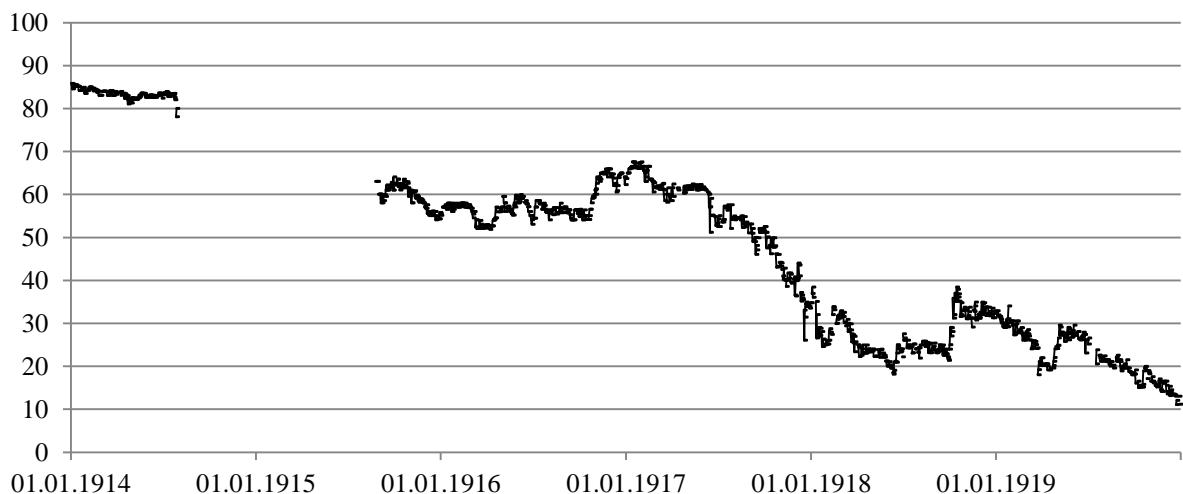
(147) Russia – 4.0 % Tambov-Saratov railway



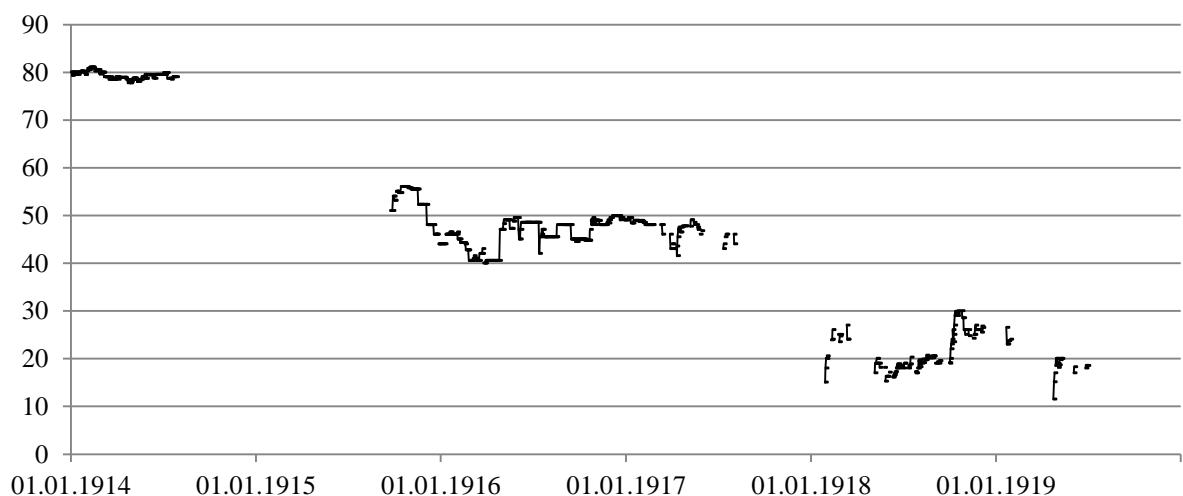
(148) Russia – 4.0 % Southwest railway (125)



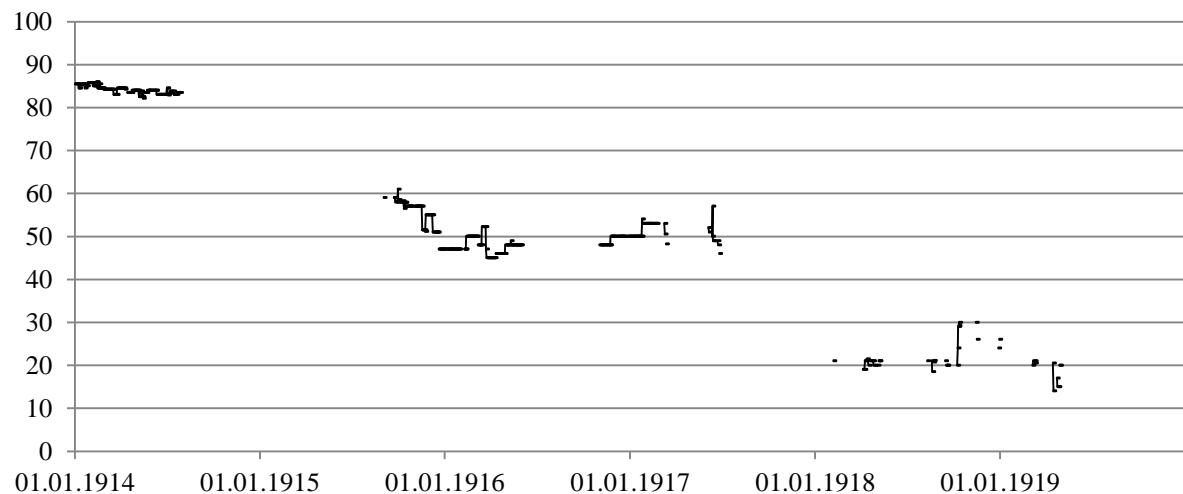
(149) Russia – 4.0 % Southwest railway (625)



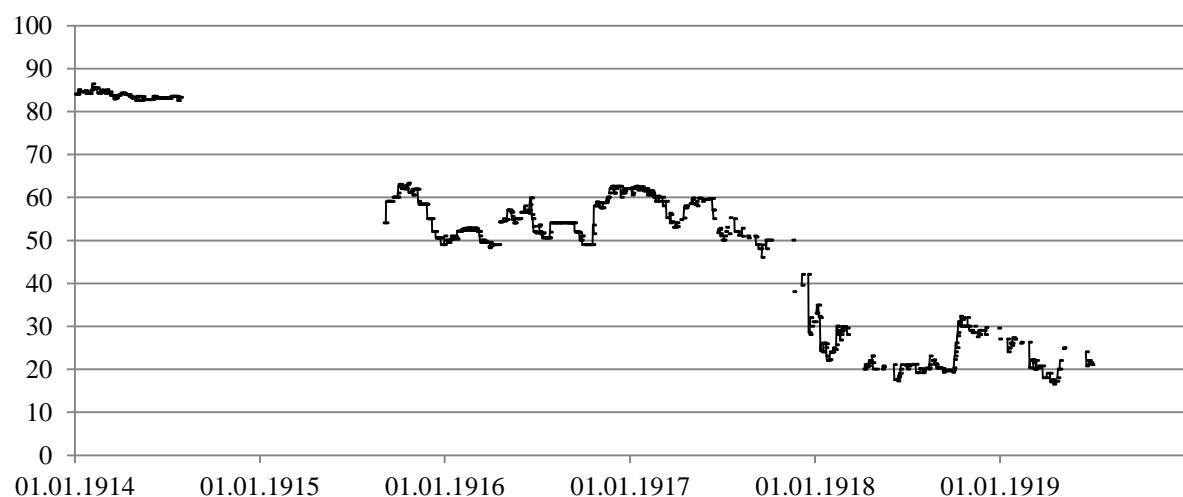
(150) Russia – 4.0 % Moscow-Kursk railway



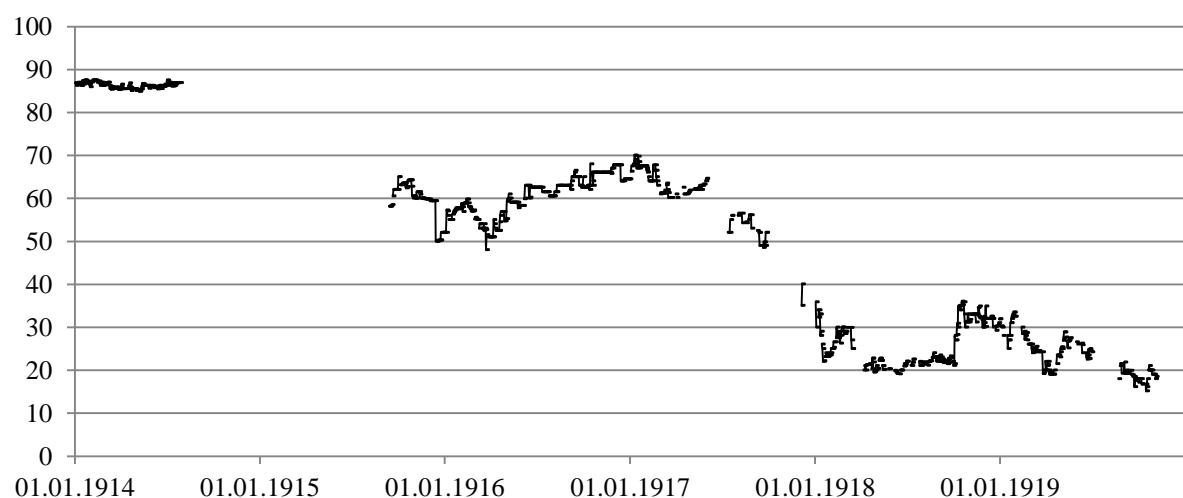
(151) Russia – 4.0 % Orel-G. railway of 1887



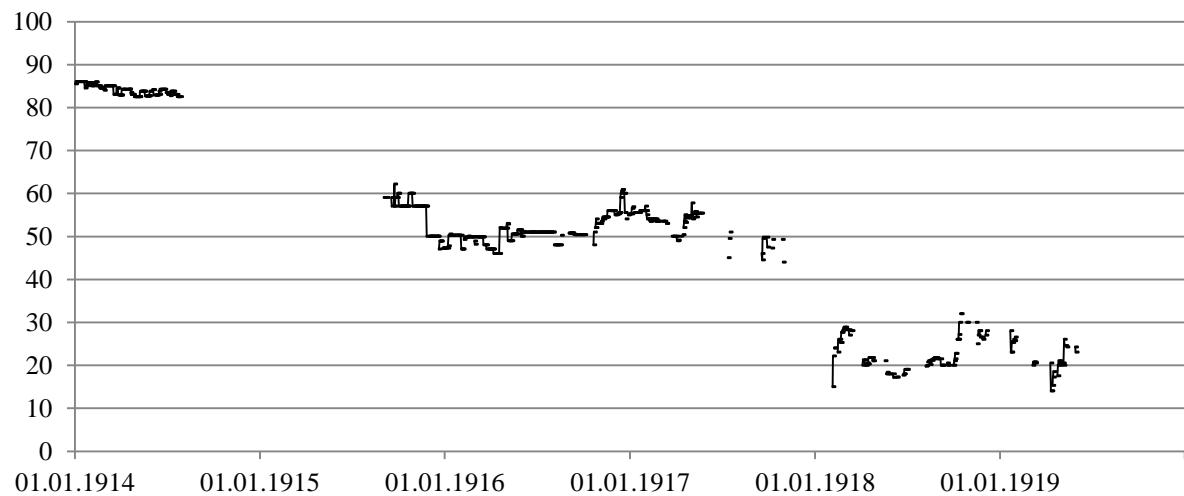
(152) Russia – 4.0 % Orel-G. railway of 1889



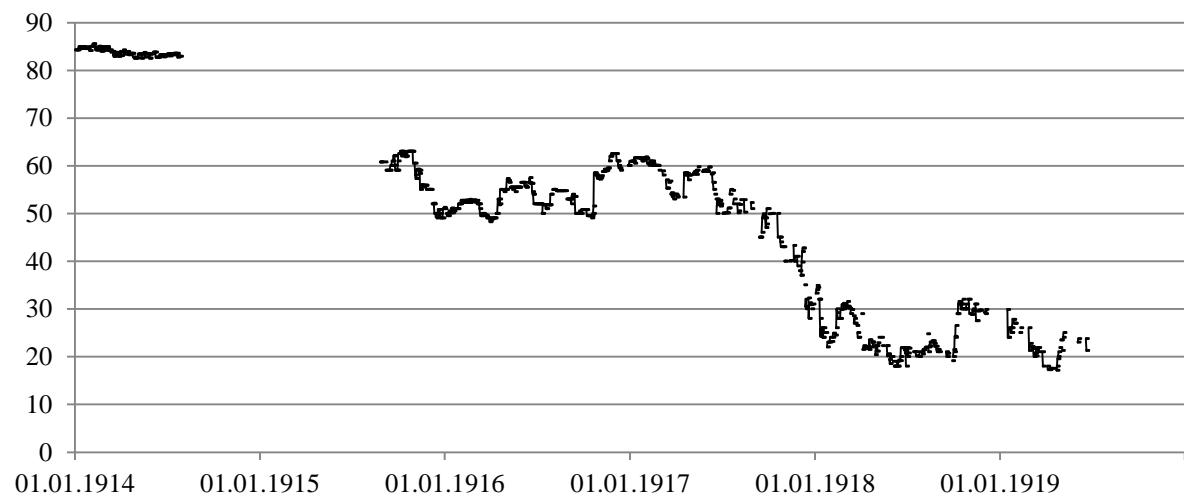
(153) Russia – 4.0 % Kursk-Charkow railway (100)



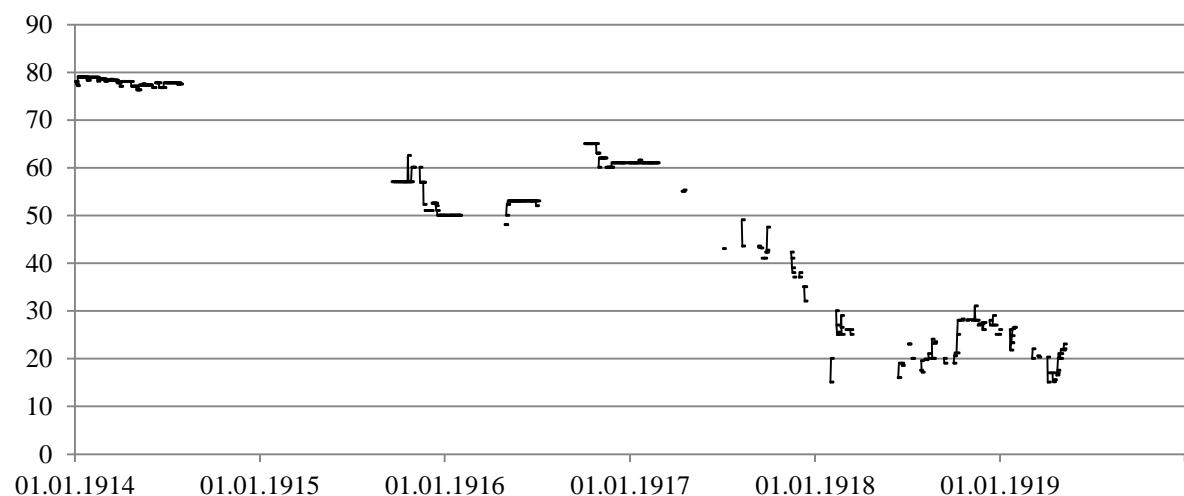
(154) Russia – 4.0 % Kursk-Charkow Railway (600)



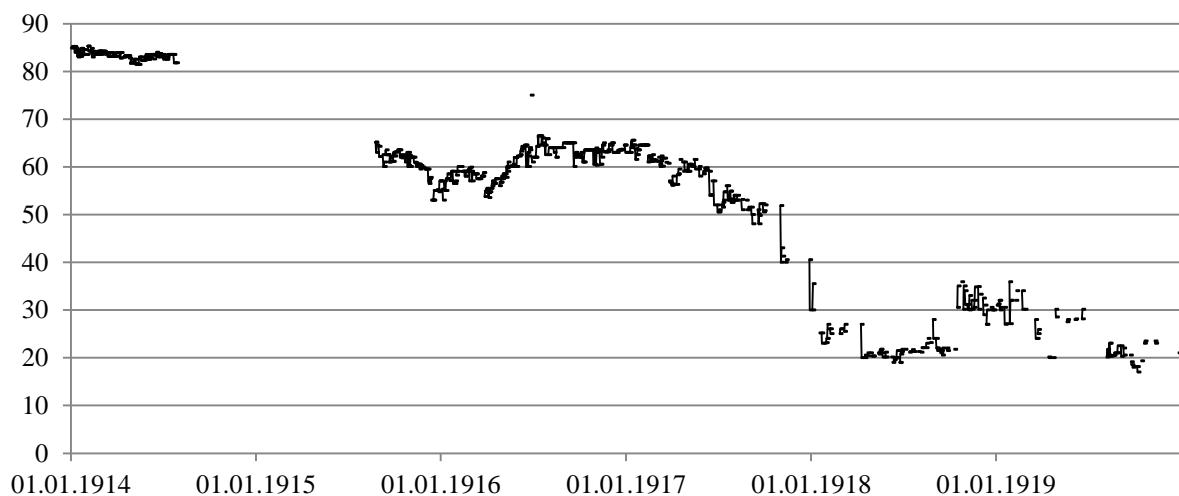
(155) Russia – 4.0 % Kursk-Charkow railway (500/2 000)



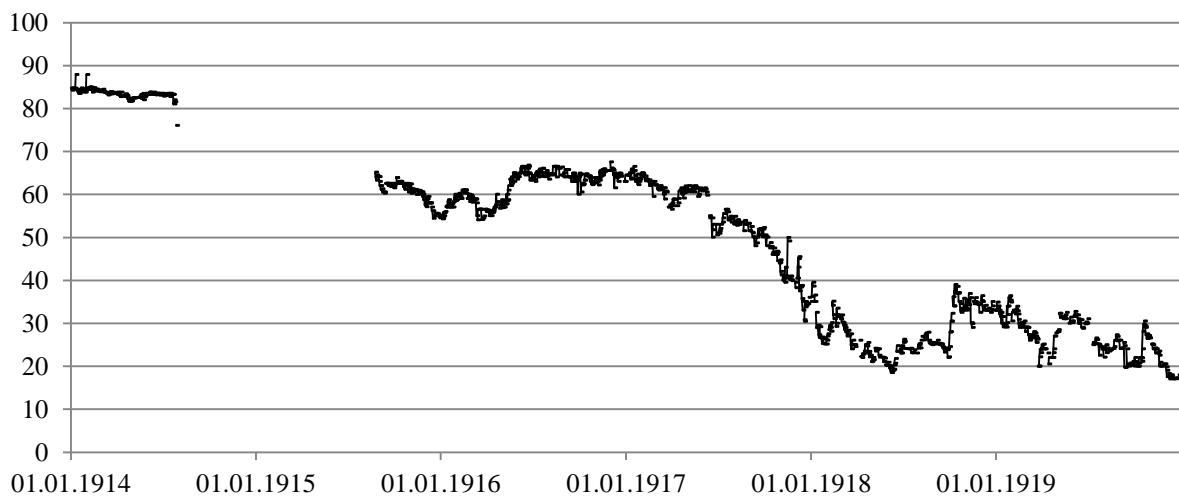
(156) Russia – 4.0 % Kursk-Charkow railway (125)



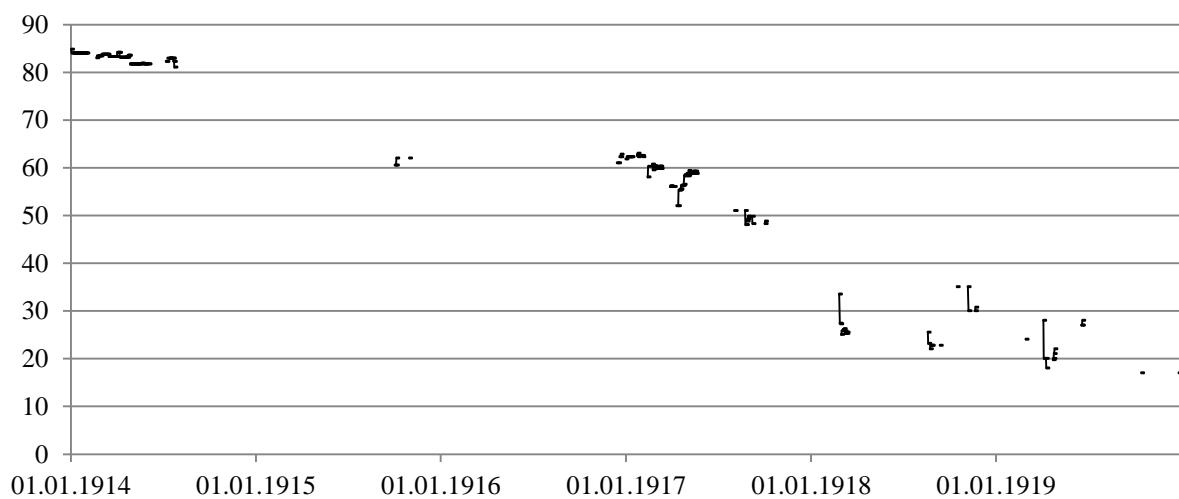
(157) Russia – 4.0 % Rothschild (125) of 1889



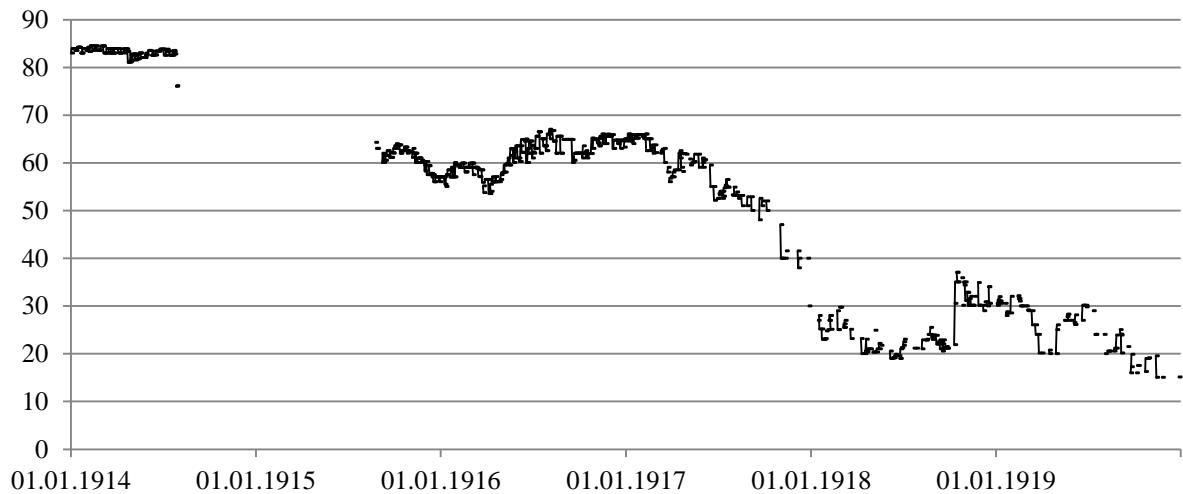
(158) Russia – 4.0 % Rothschild (625) of 1889



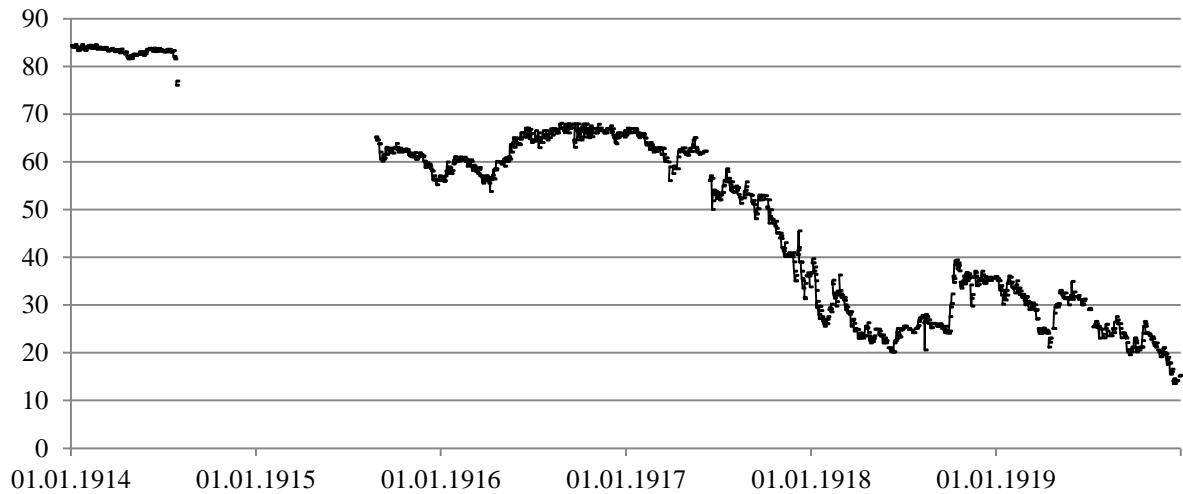
(159) Russia – 4.0 % Rothschild (1 250/3 125) of 1889



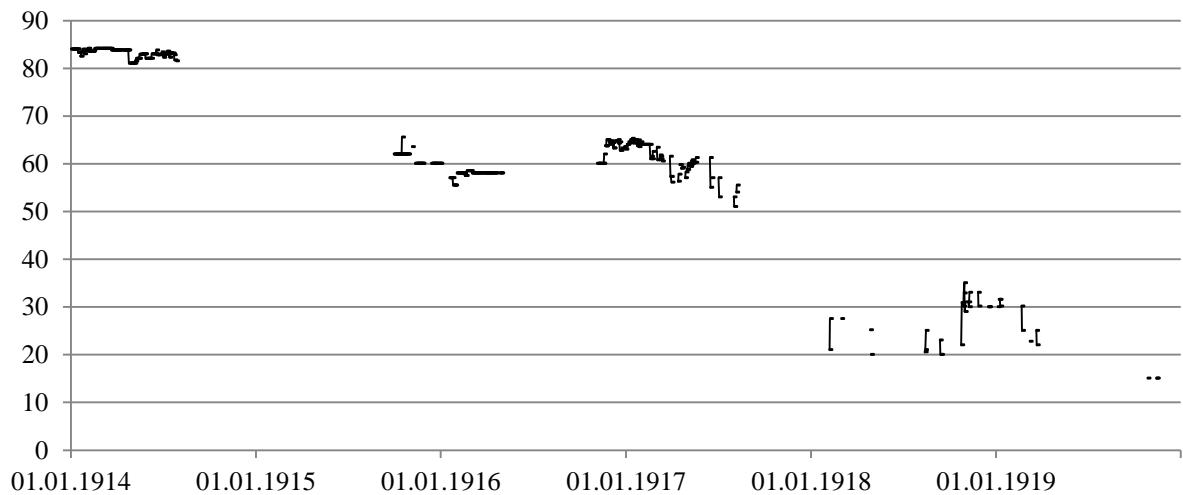
(160) Russia – 4.0 % Hope & Co (125) of 1889/90



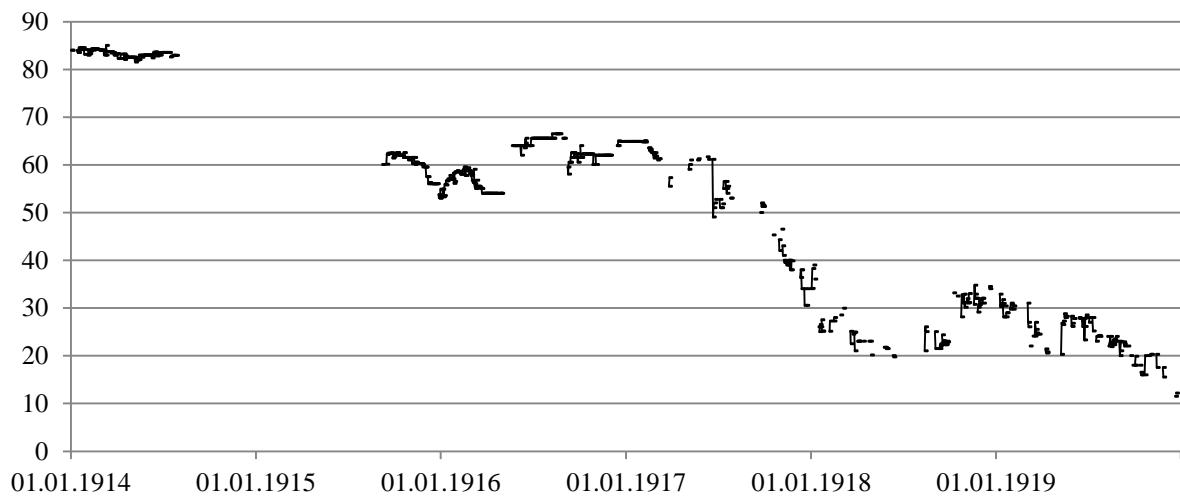
(161) Russia – 4.0 % Hope & Co (625) of 1889/90



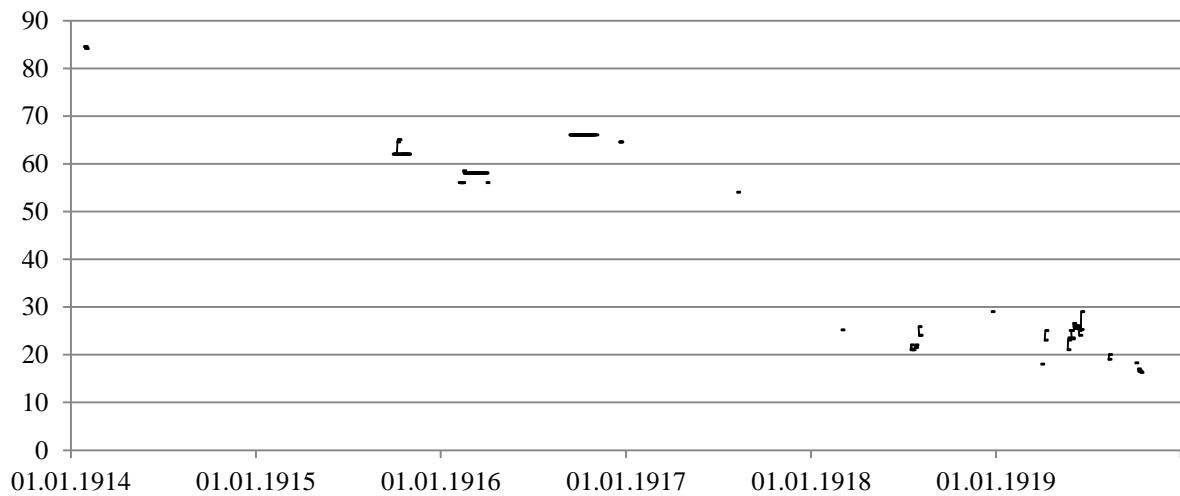
(162) Russia – 4.0 % Rothschild 3rd series (125) of 1890



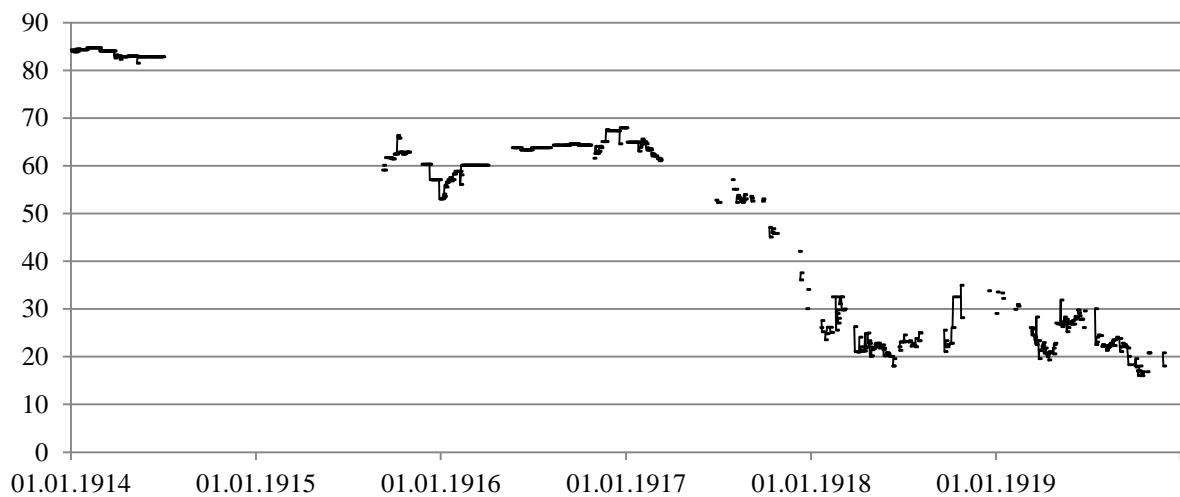
(163) Russia – 4.0 % Rothschild 3rd series (625) of 1890



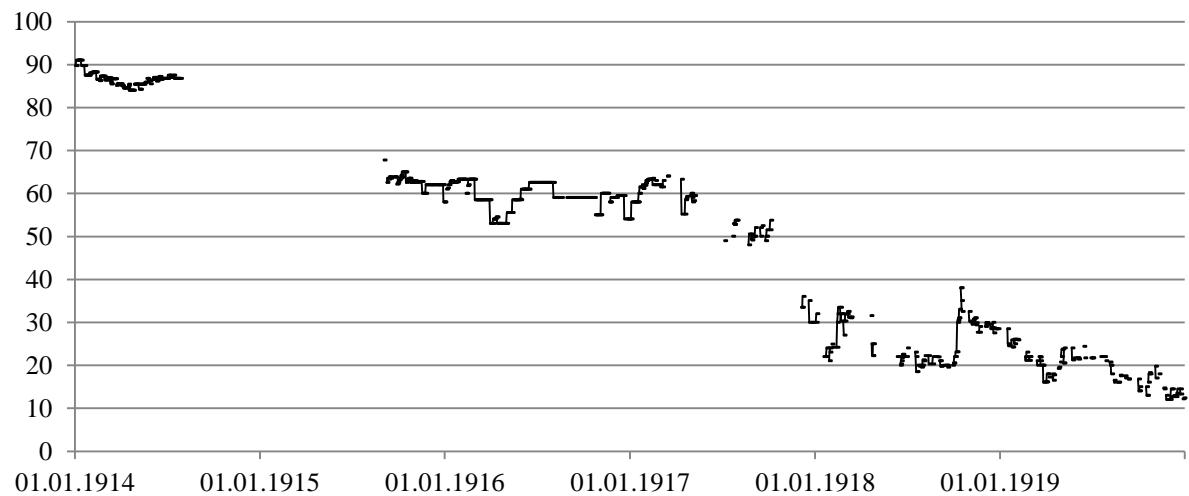
(164) Russia – 4.0 % Rothschild 4th series (125) of 1890



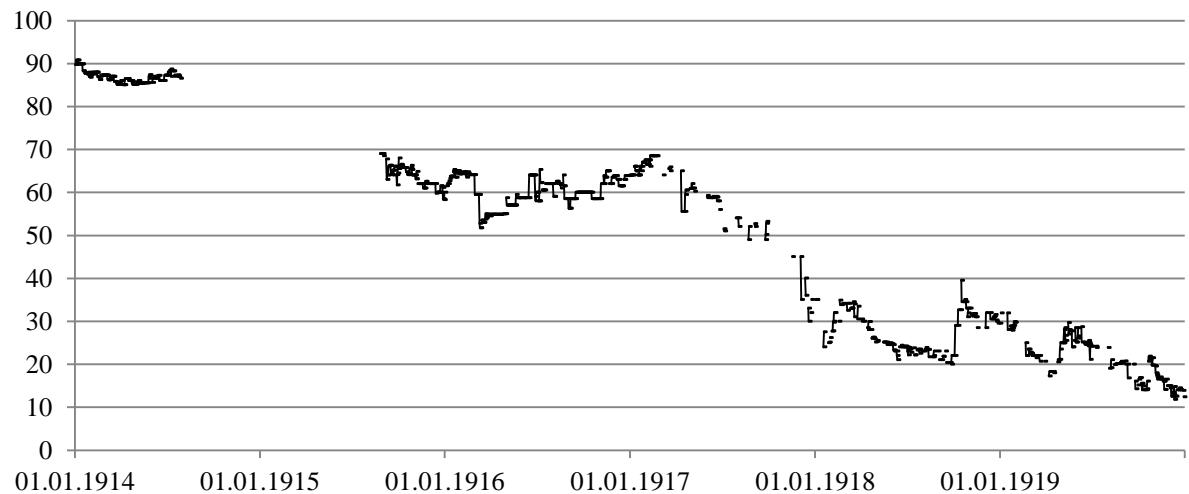
(165) Russia – 4.0 % Rothschild 4th series (625) of 1890



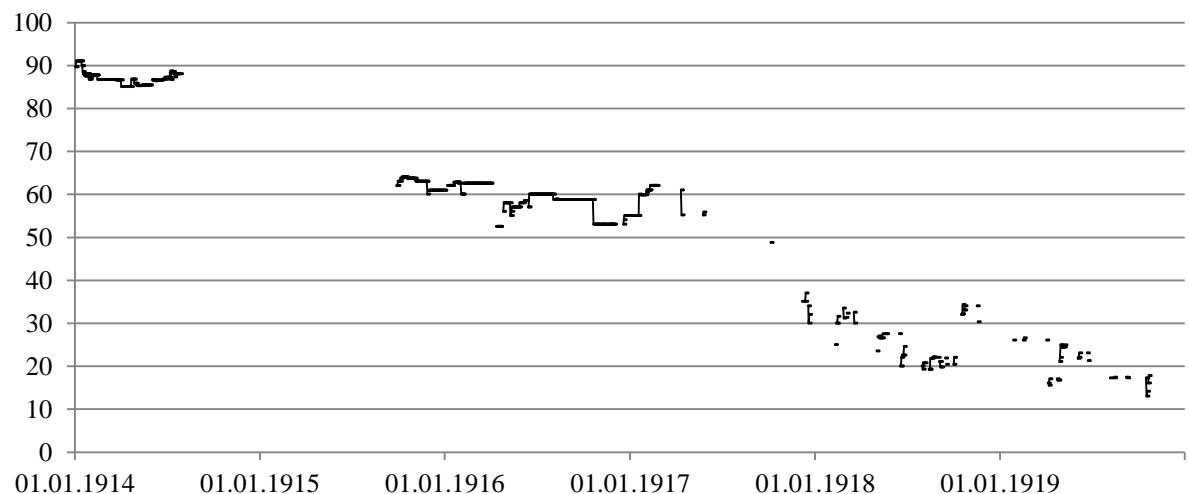
(166) Russia – 4.0 % Warsaw-We. railway (125)



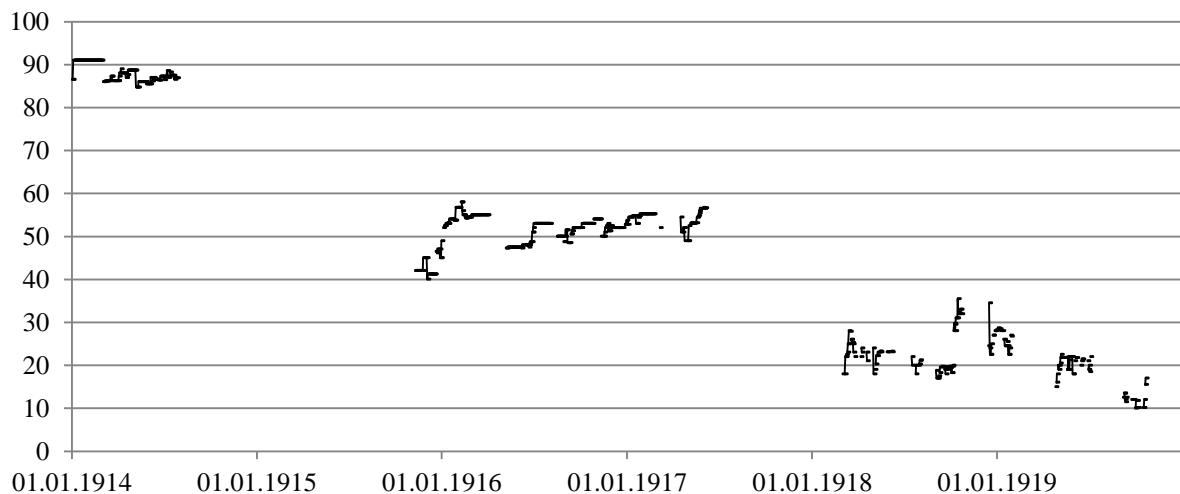
(167) Russia – 4.0 % Warsaw-We. railway (625)



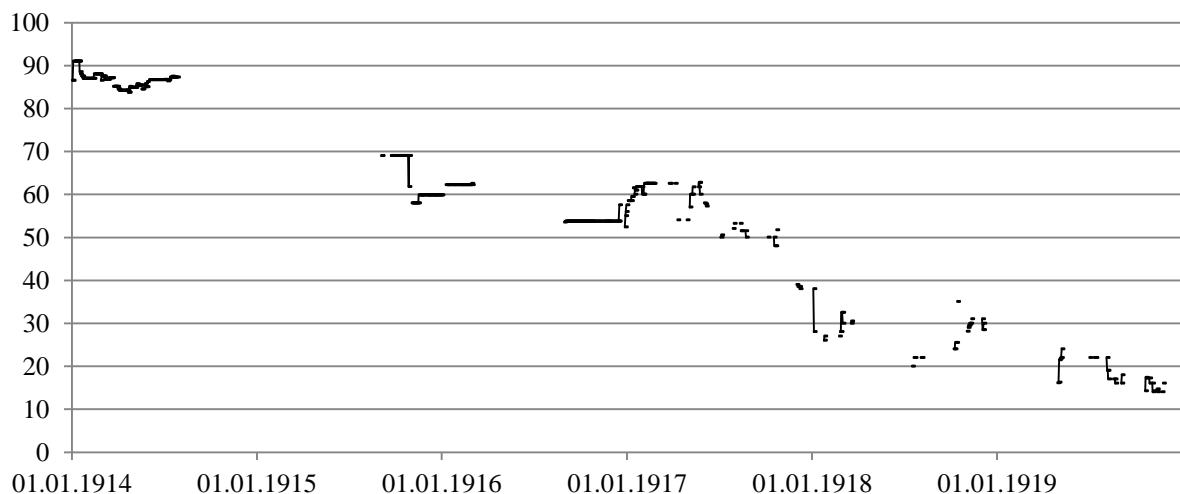
(168) Russia – 4.0 % Warsaw-We. railway (1 250)



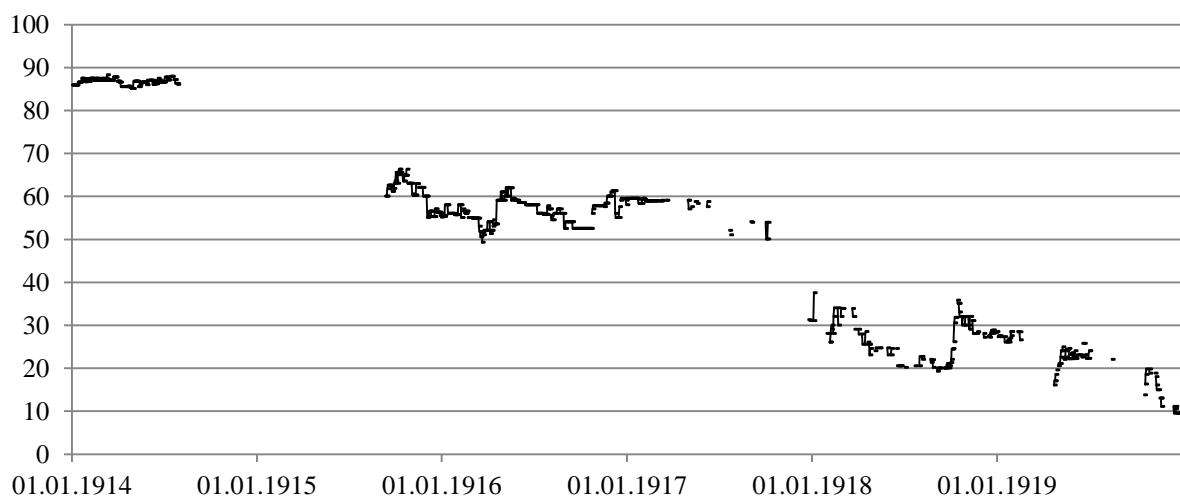
(169) Russia – 4.0 % Warsaw-We. railway 7th series



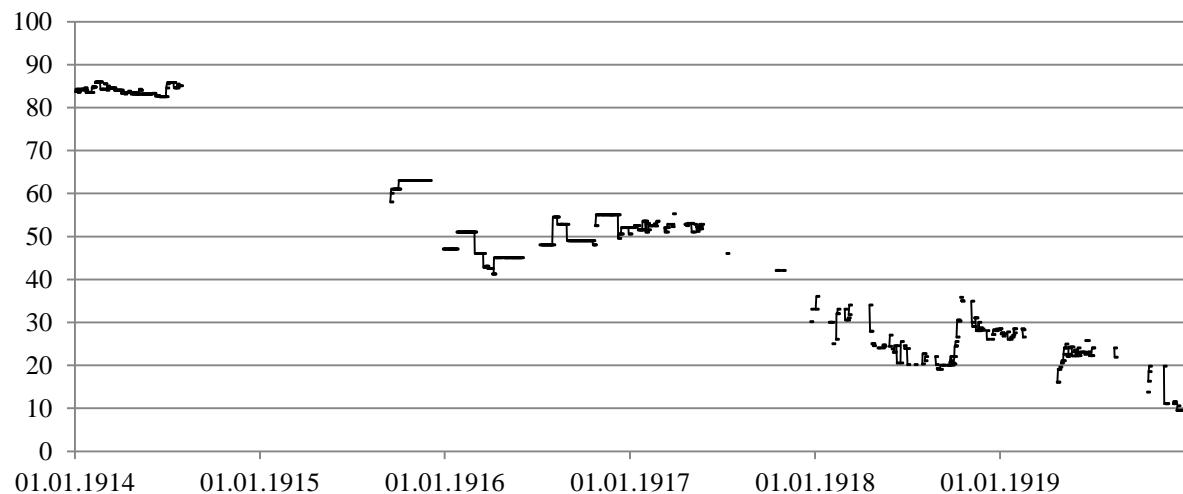
(170) Russia – 4.0 % Warsaw-We. railway 9th series



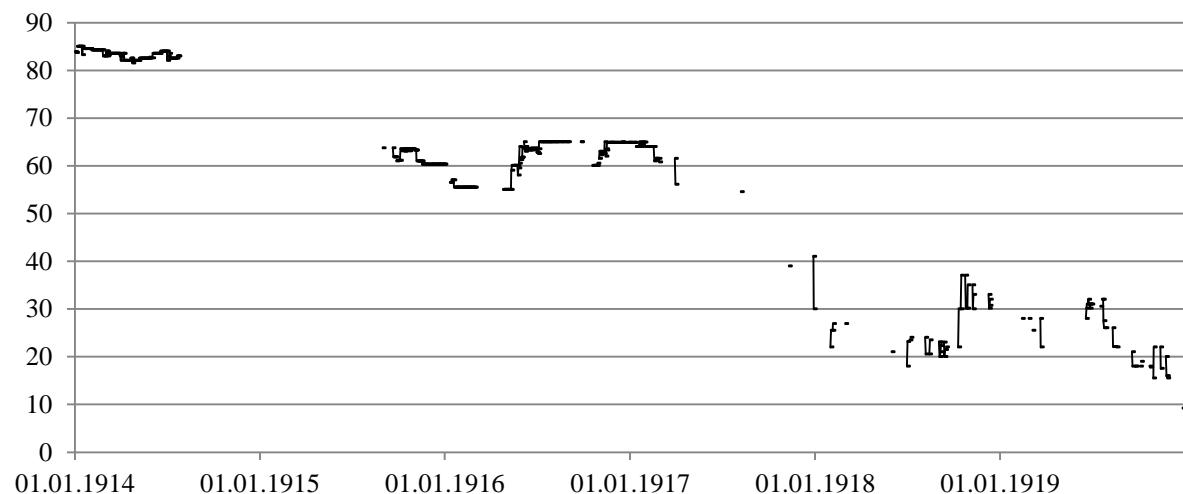
(171) Russia – 4.0 % Warsaw-We. railway 10th series



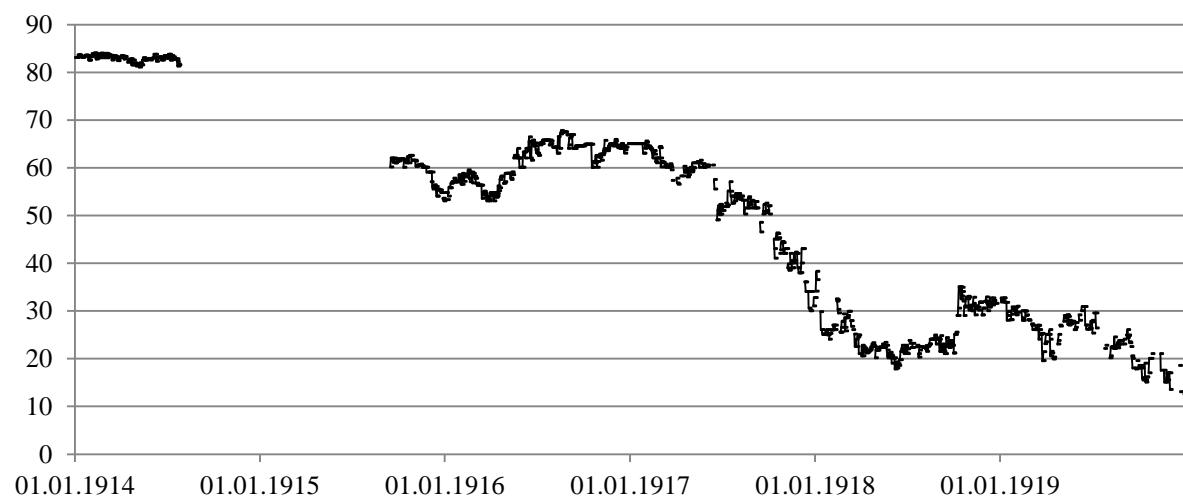
(172) Russia – 4.0 % Warsaw-We. railway 11th series



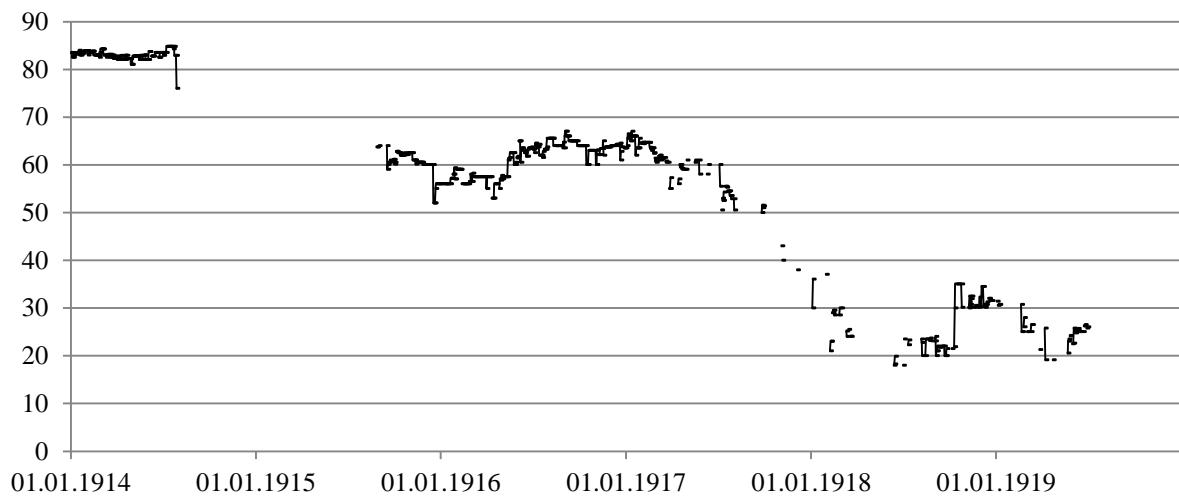
(173) Russia – 4.0 % Rothschild 3rd series (125) of 1891



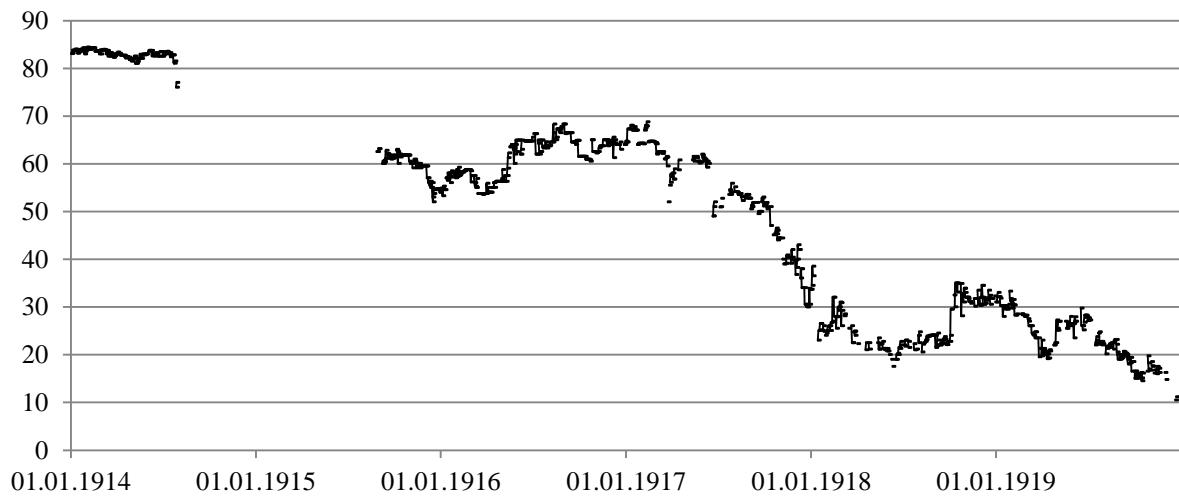
(174) Russia – 4.0 % Rothschild 3rd series (625) of 1891



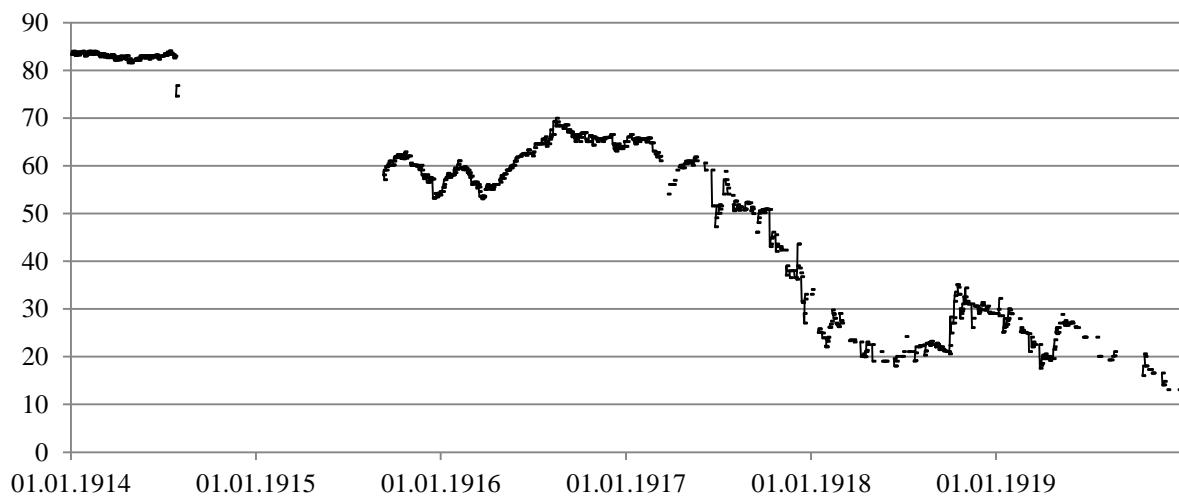
(175) Russia – 4.0 % Rothschild 5th series (125) of 1893



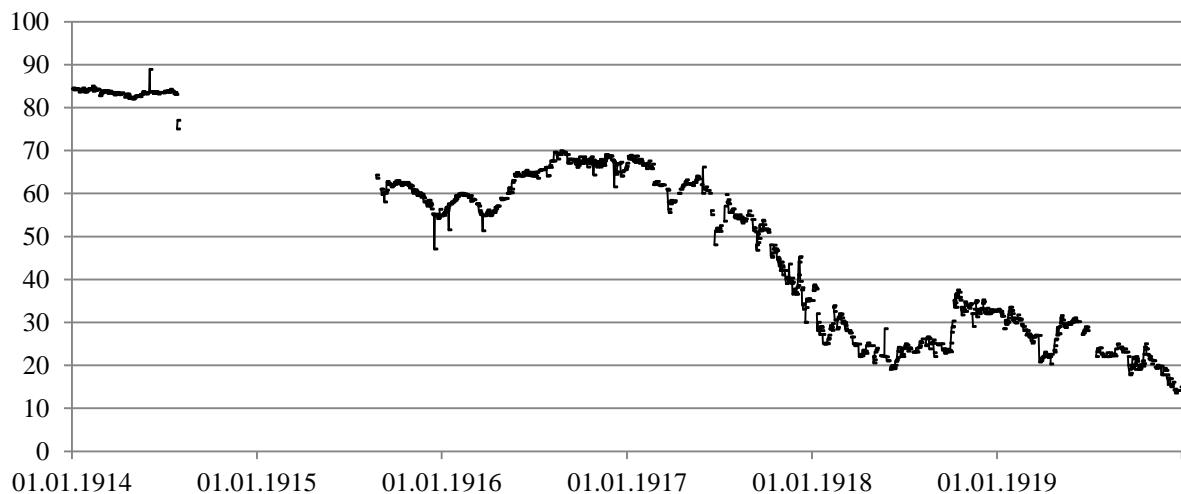
(176) Russia – 4.0 % Rothschild 5th series (625) of 1893



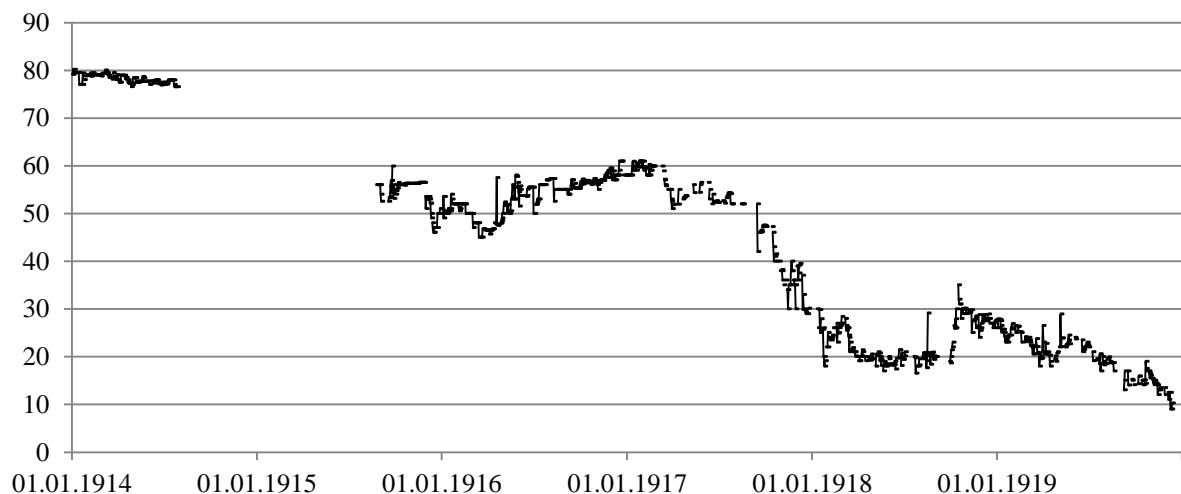
(177) Russia – 4.0 % Rothschild 6th series (125) of 1894



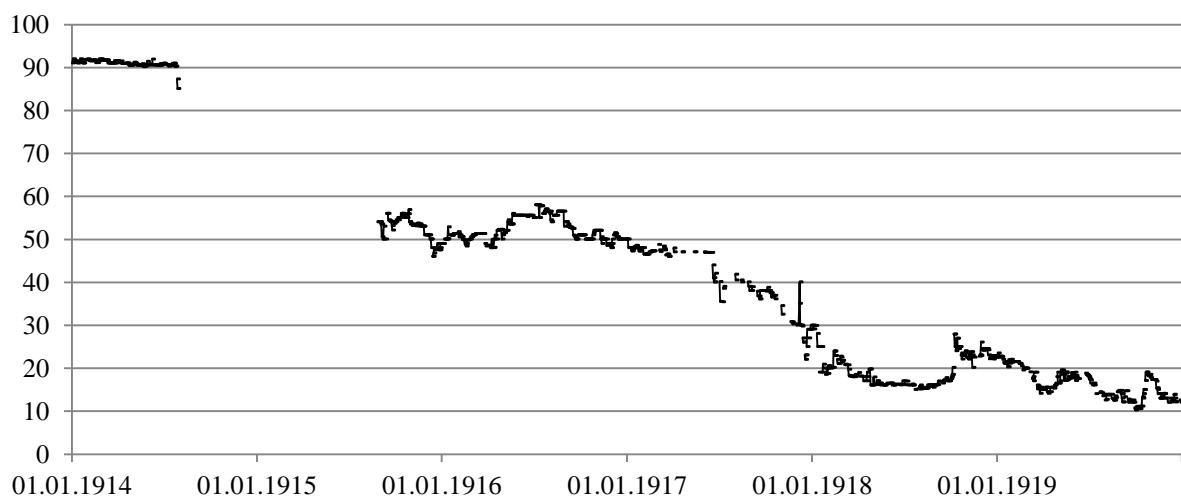
(178) Russia – 4.0 % Rothschild 6th series (625) of 1894



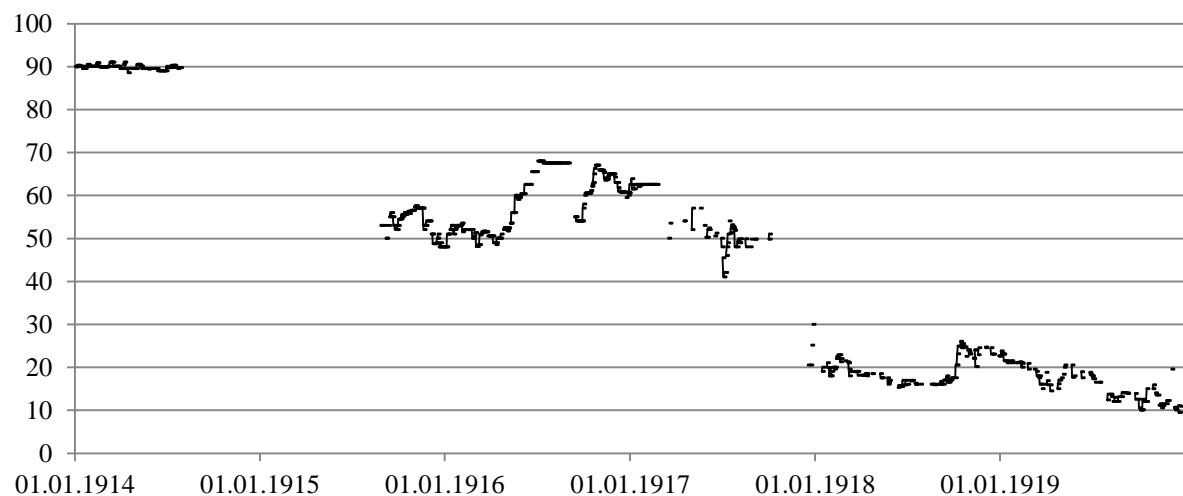
(179) Russia – 4.0 % Donetsk railway of 1894



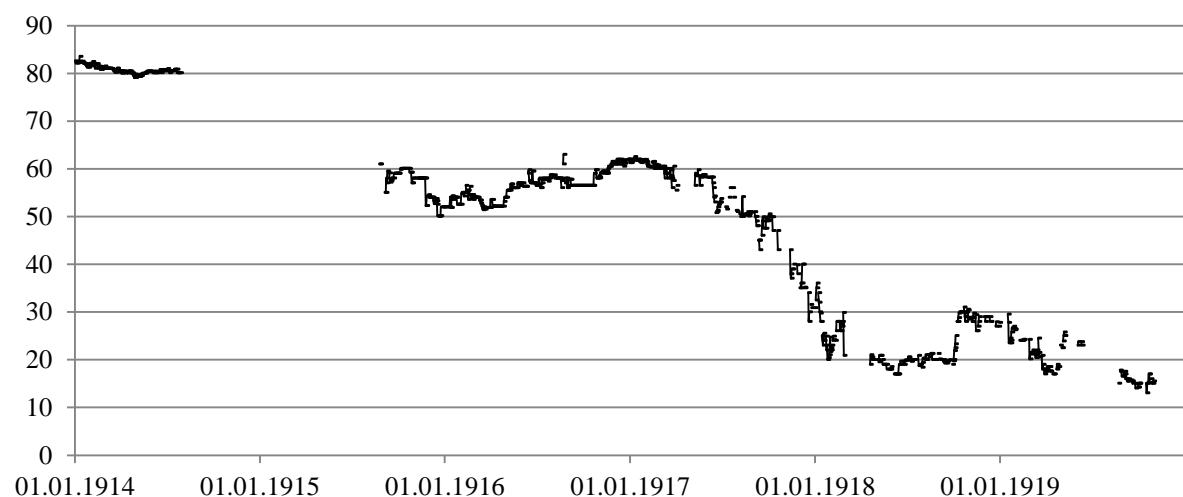
(180) Russia – 4.0 % of 1894 (domestic debt)



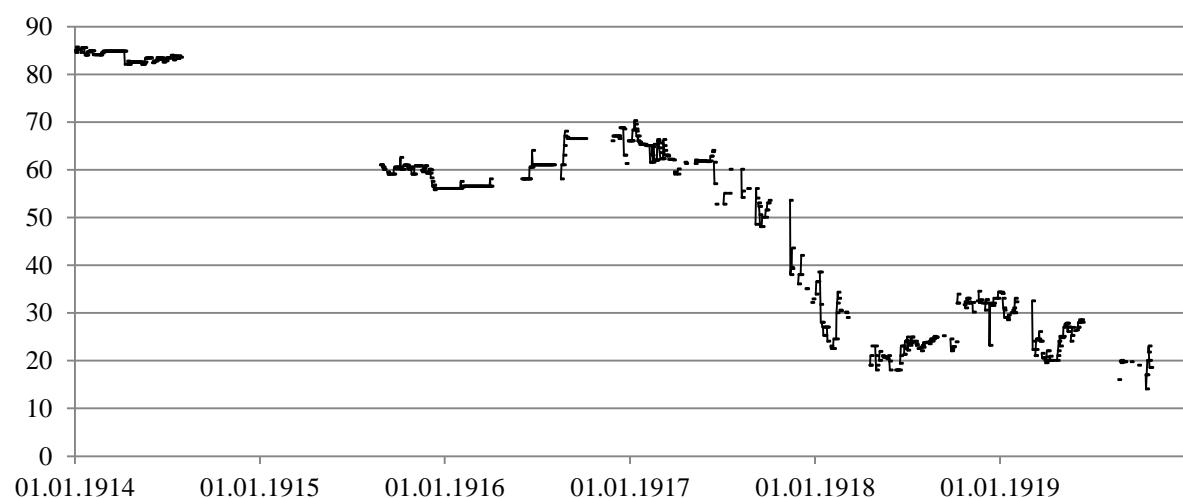
(181) Russia – 4.0 % of 1894 (certificates)



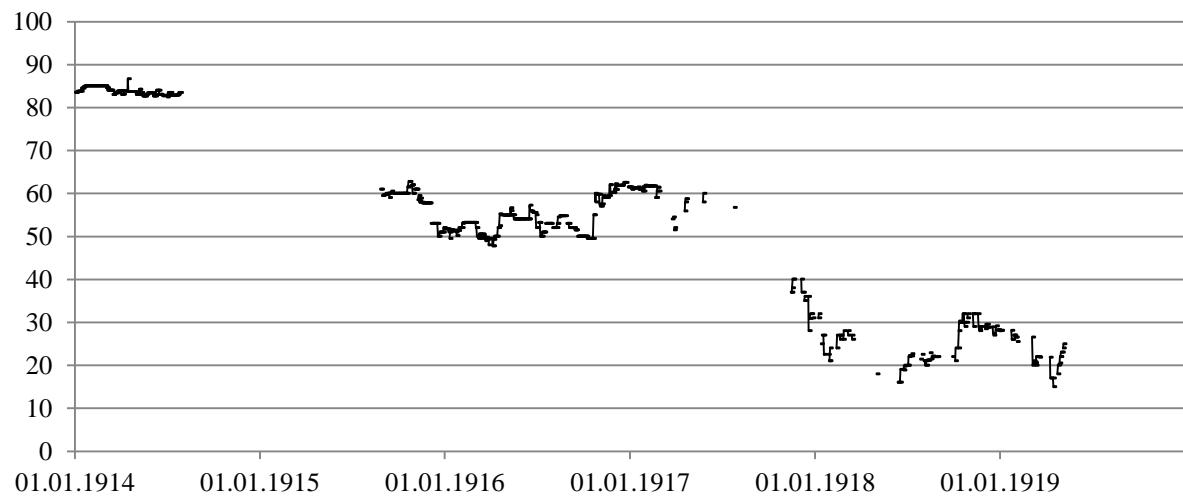
(182) Russia – 4.0 % Orel-Viterbsk railway (125) of 1894



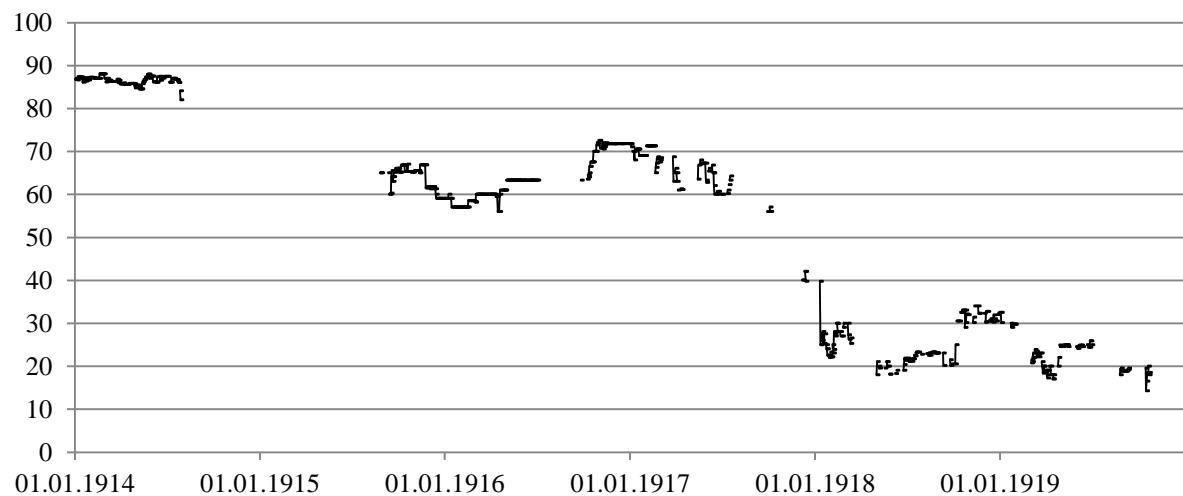
(183) Russia – 4.0 % Orel-Viterbsk railway (625) of 1894



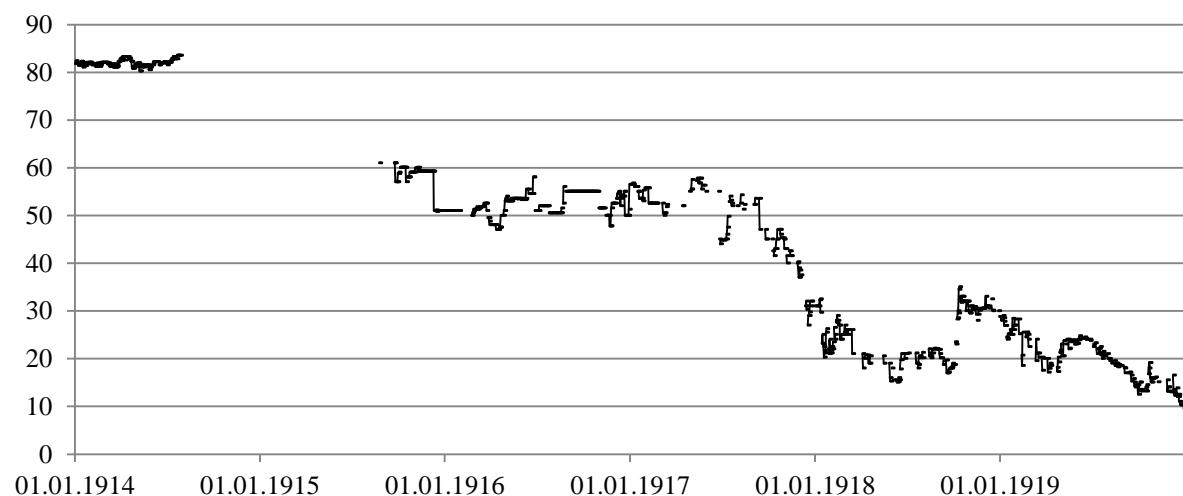
(184) Russia – 4.0 % Moscow-Jaros. railway of 1897



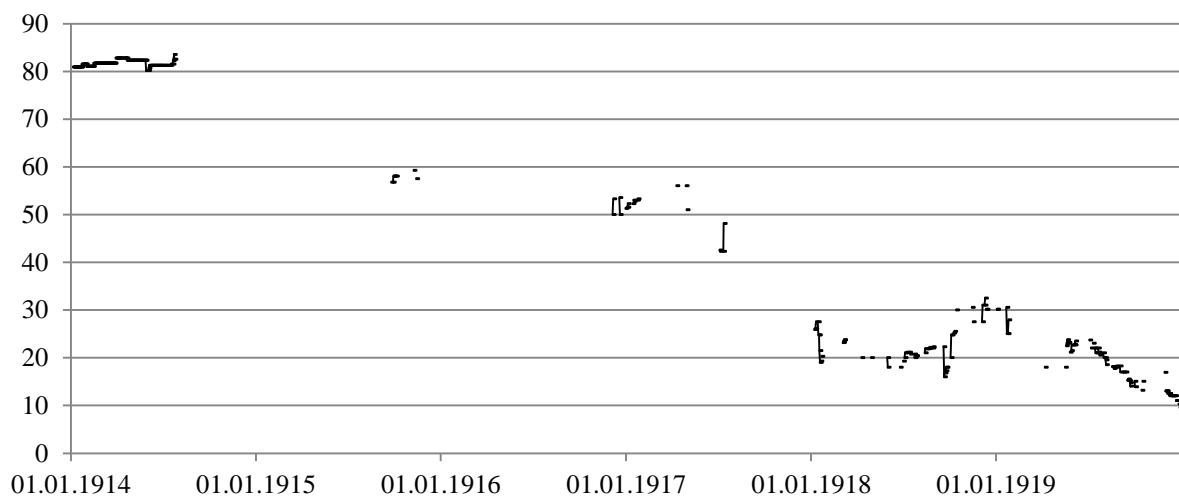
(185) Russia – 4.0 % Moscow-Smolensk railway of 1899



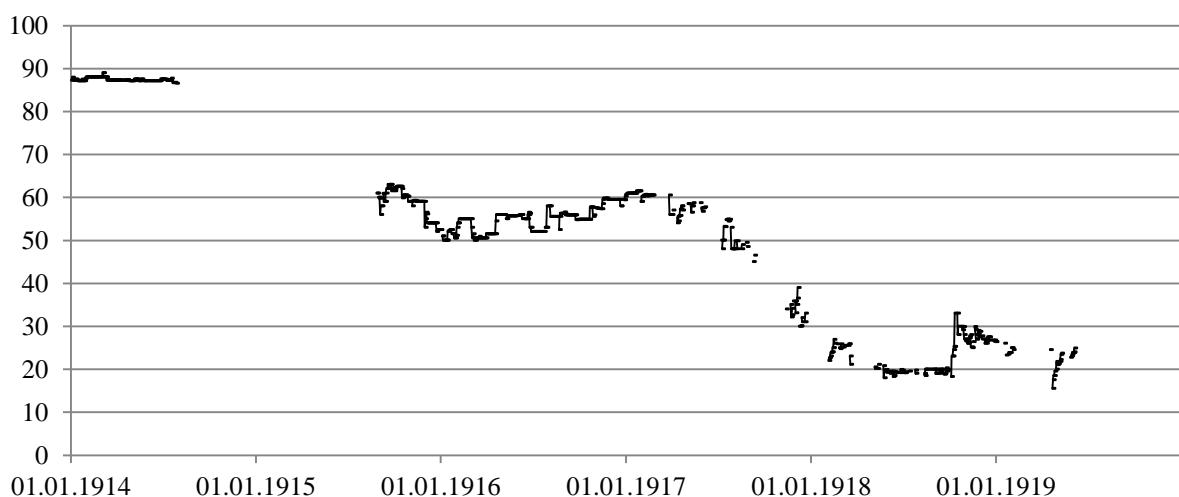
(186) Russia – 4.0 % Transssiberian railway 1st series of 1898



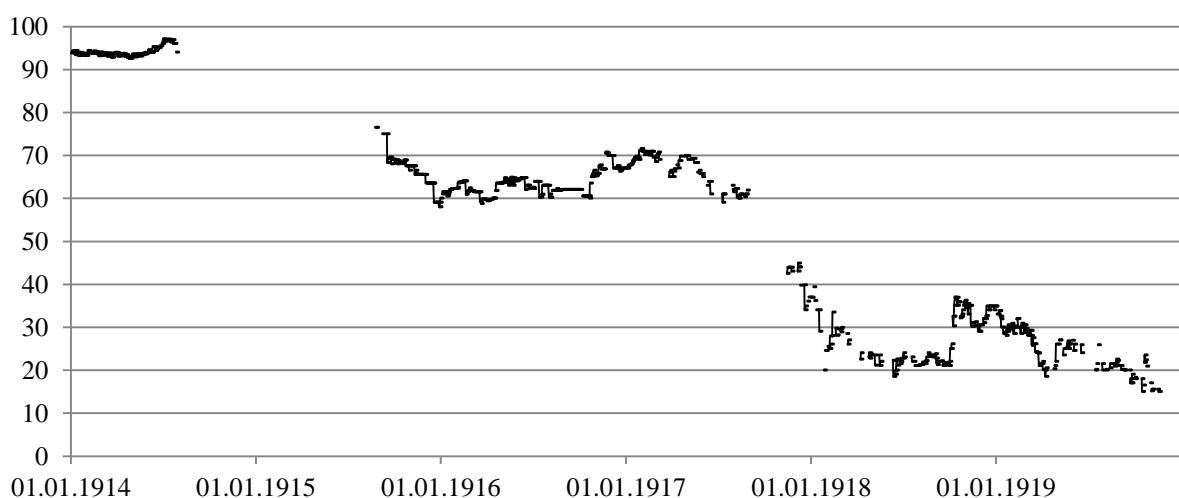
(187) Russia – 4.0 % Transsiberian railway 2nd series of 1898



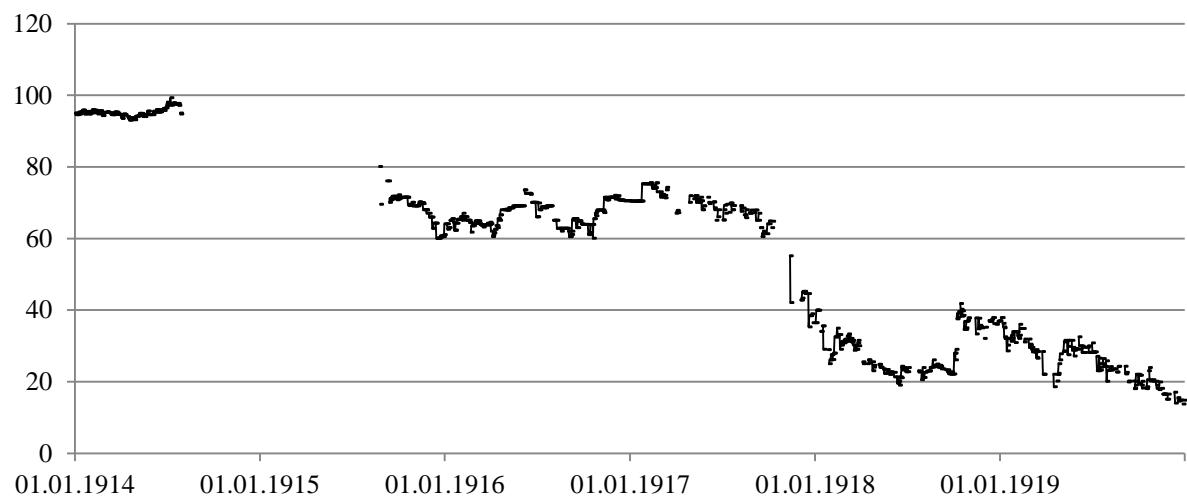
(188) Russia – 4.0 % Transsiberian railway of 1902



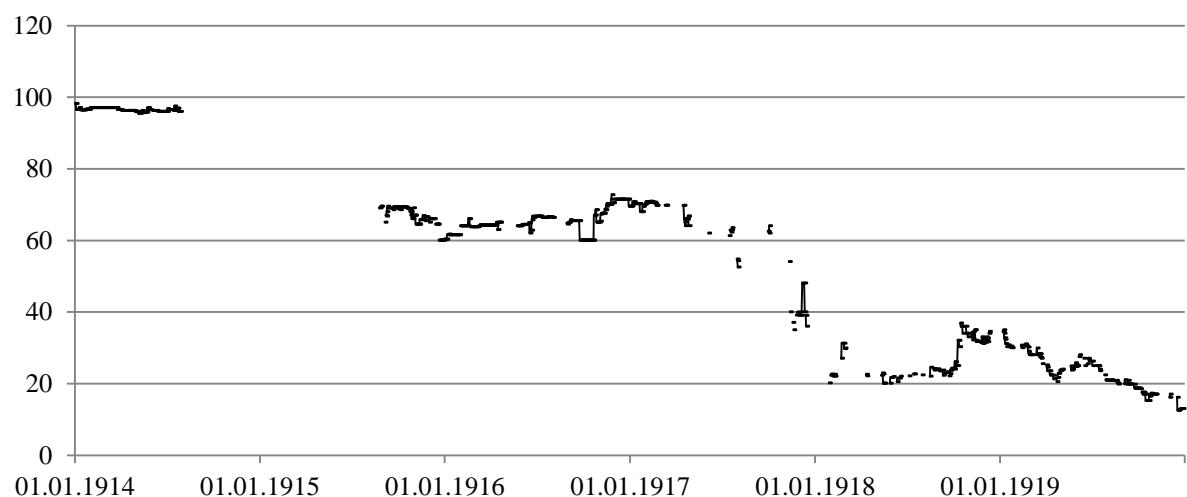
(189) Russia – 4.5 % Iwang.-Domb. railway (125)



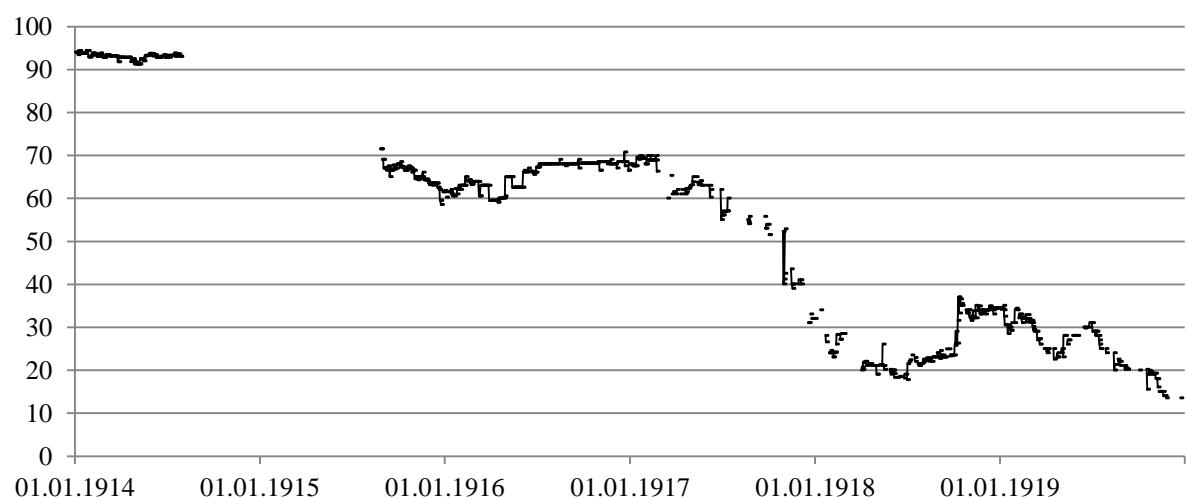
(190) Russia – 4.5 % Iwang.-Domb. railway (625)



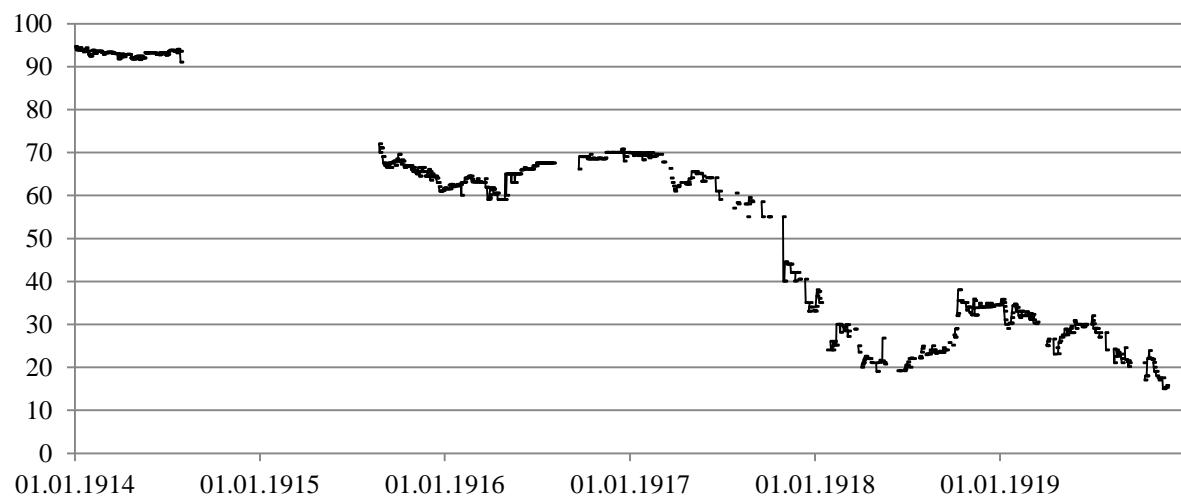
(191) Russia – 4.5 % of 1905



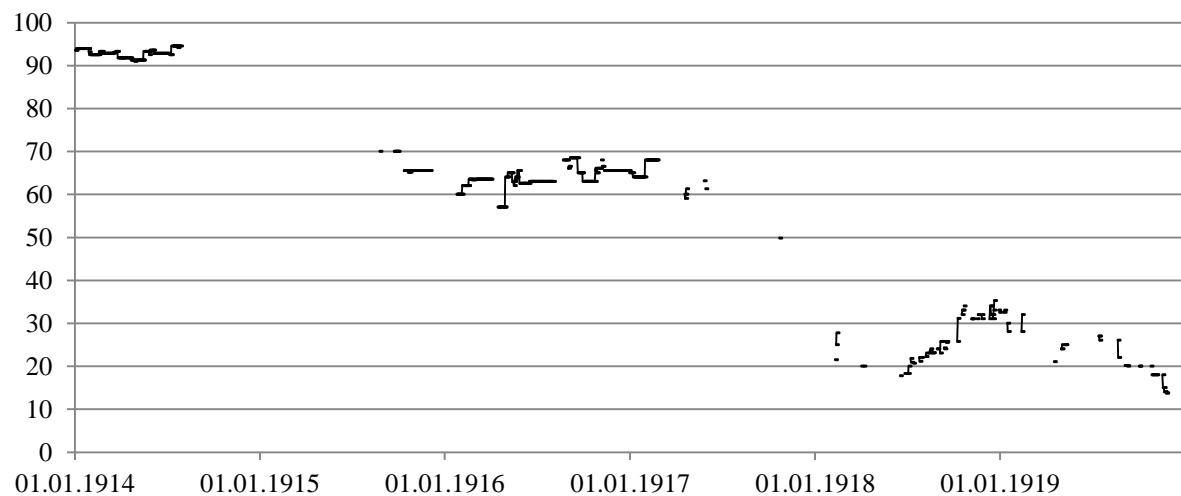
(192) Russia – 4.5 % series 31–36 (500) of 1909



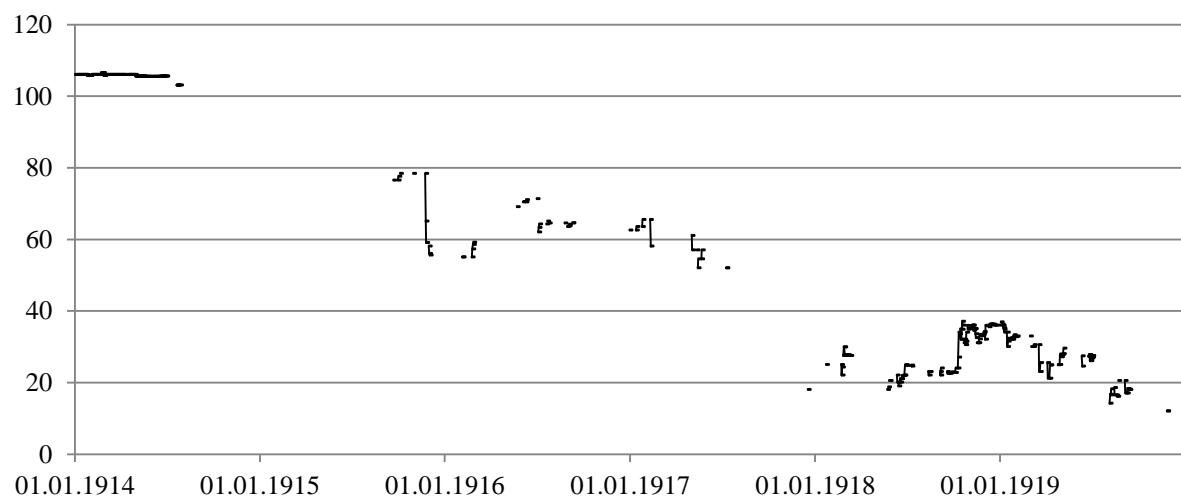
(193) Russia – 4.5 % series 31–36 (2 500) of 1909



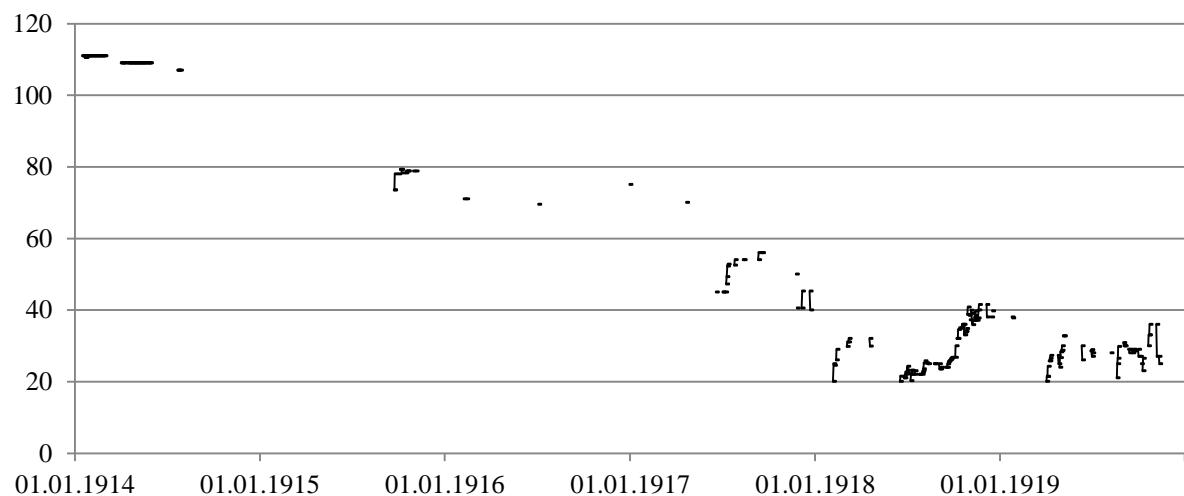
(194) Russia – 4.5 % series 37 of 1909



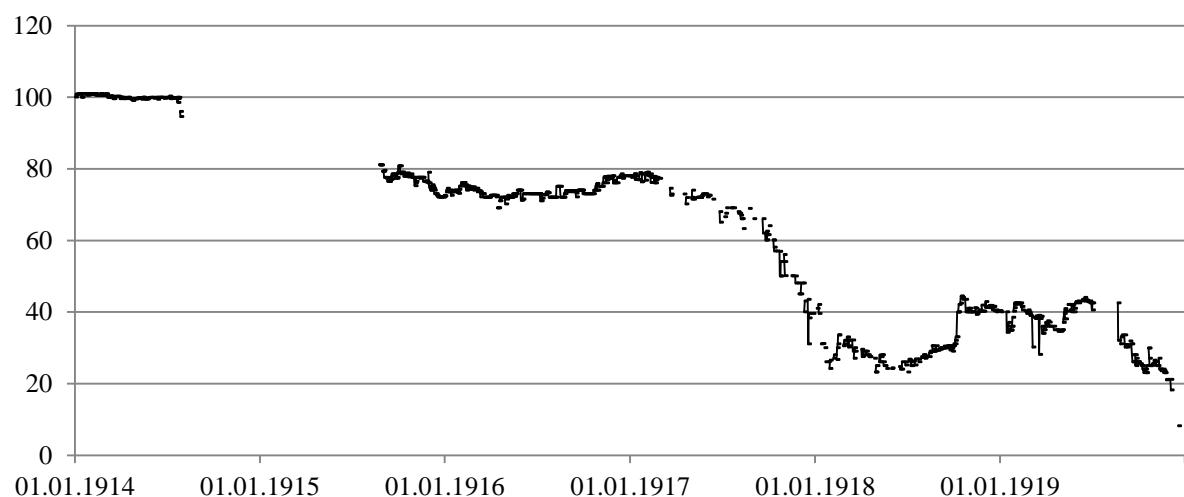
(195) Russia – 5.0 % Hamburg of 1820



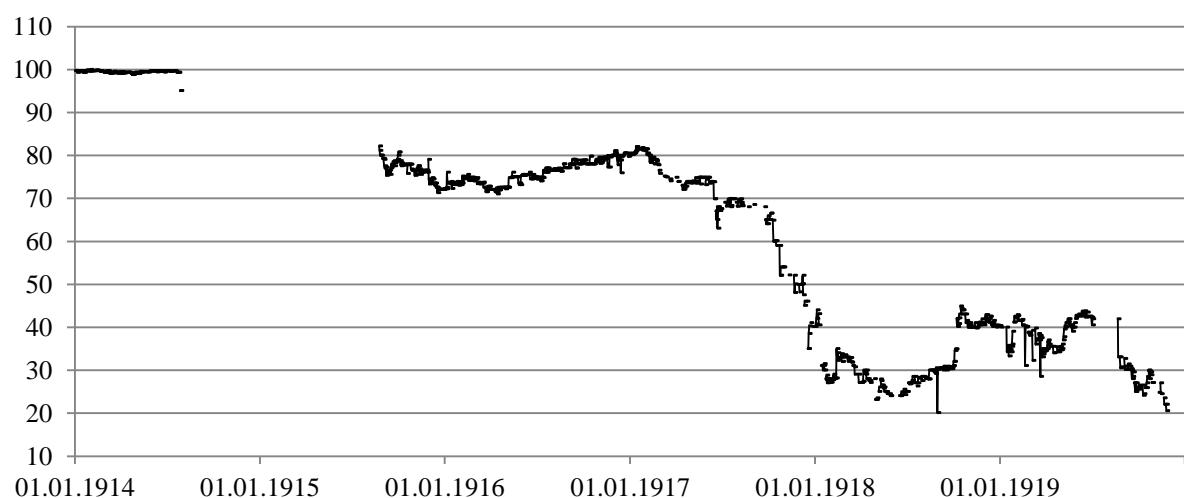
(196) Russia – 5.0 % London of 1822



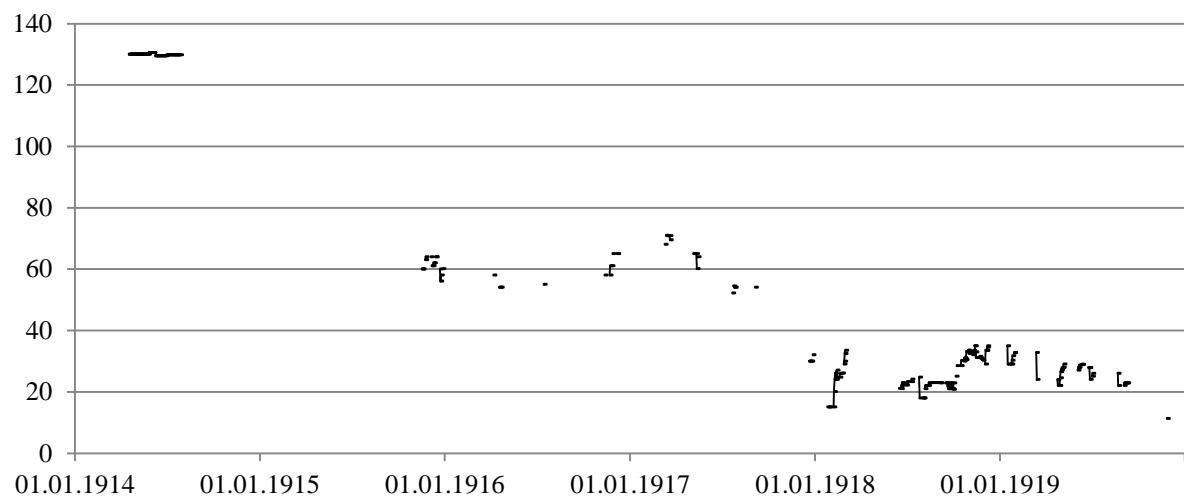
(197) Russia – 5.0 % of 1906 (500)



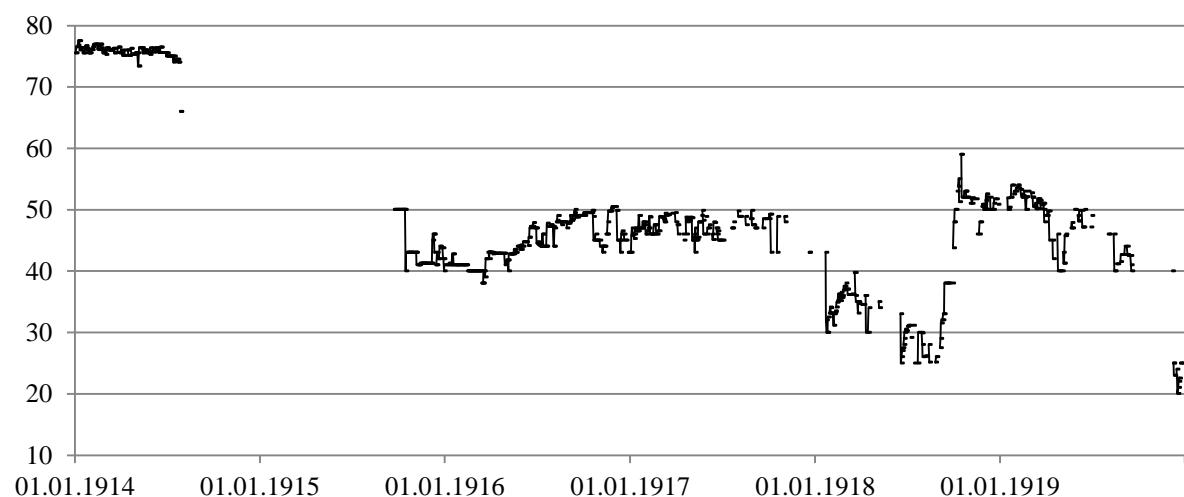
(198) Russia – 5.0 % of 1906 (2 500/5 000)



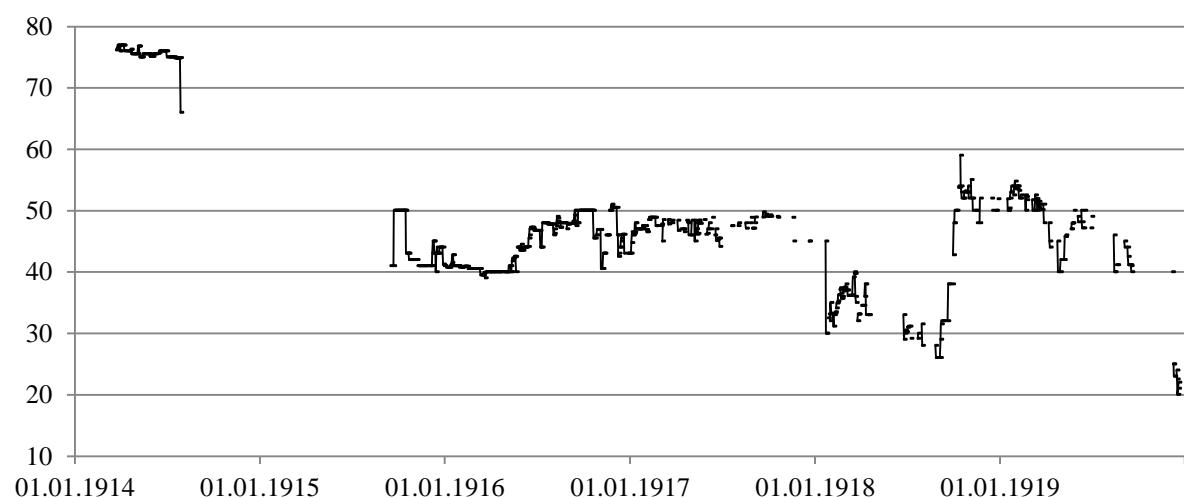
(199) Russia – 6.0 % certificates



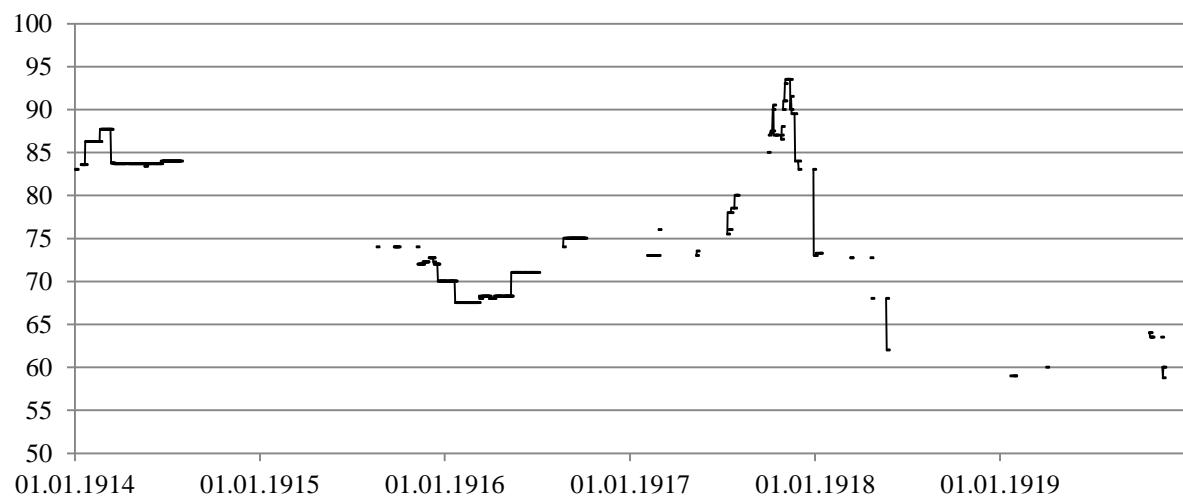
(200) Serbia – 4.0 % of 1895 (500)



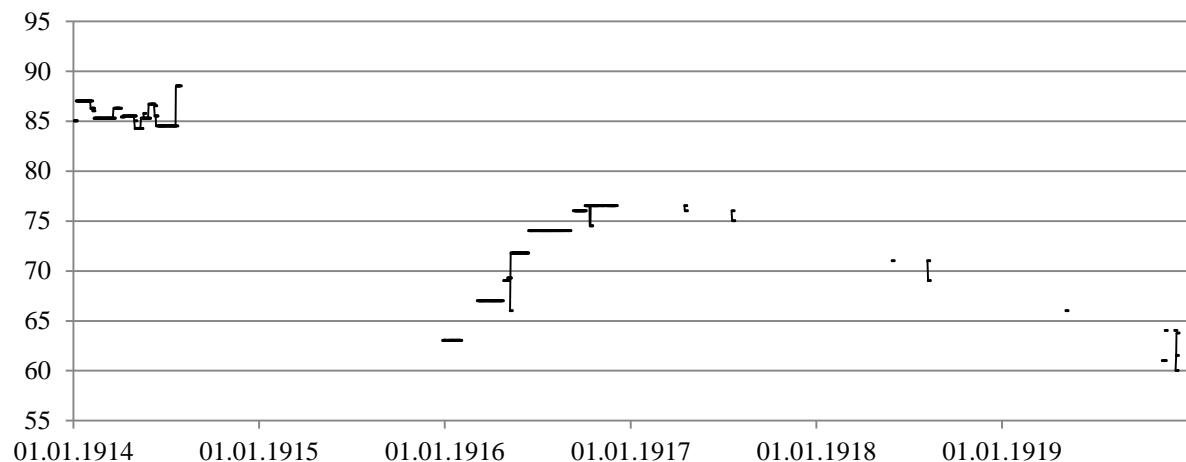
(201) Serbia – 4.0 % of 1895 (2 500)



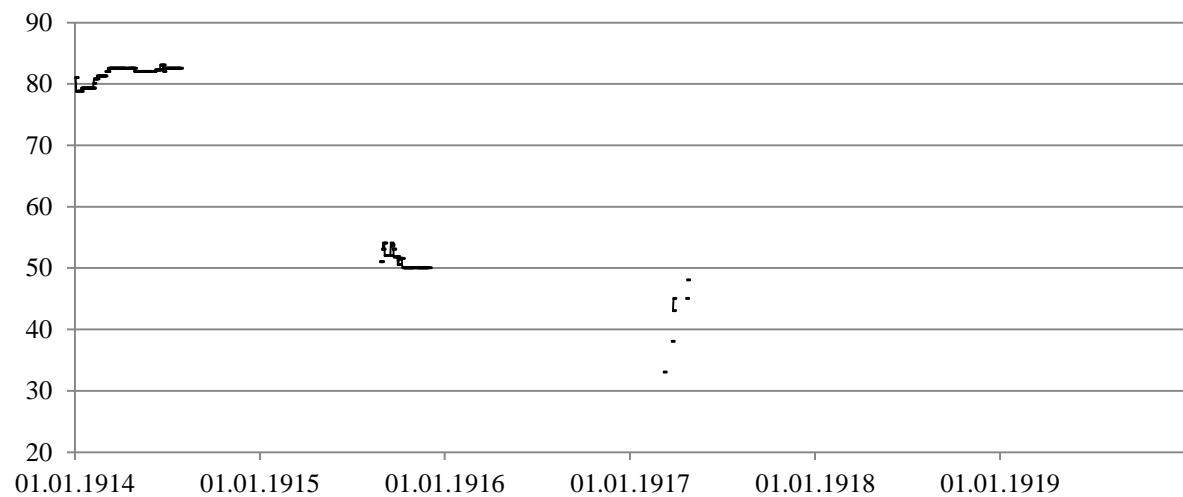
(202) Sweden – 3.5 % of 1890



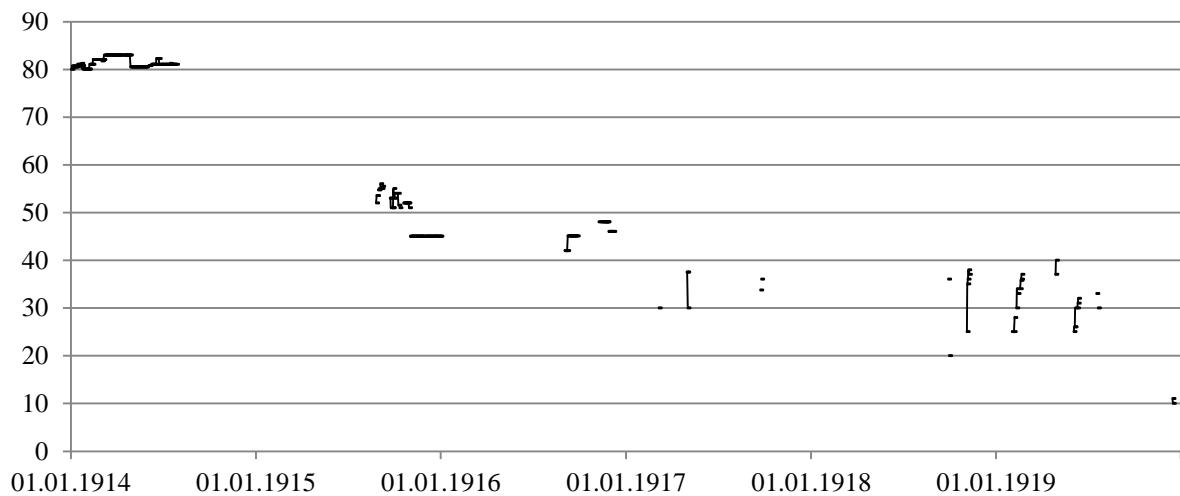
(203) Switzerland – 3.5 % of 1899–1902



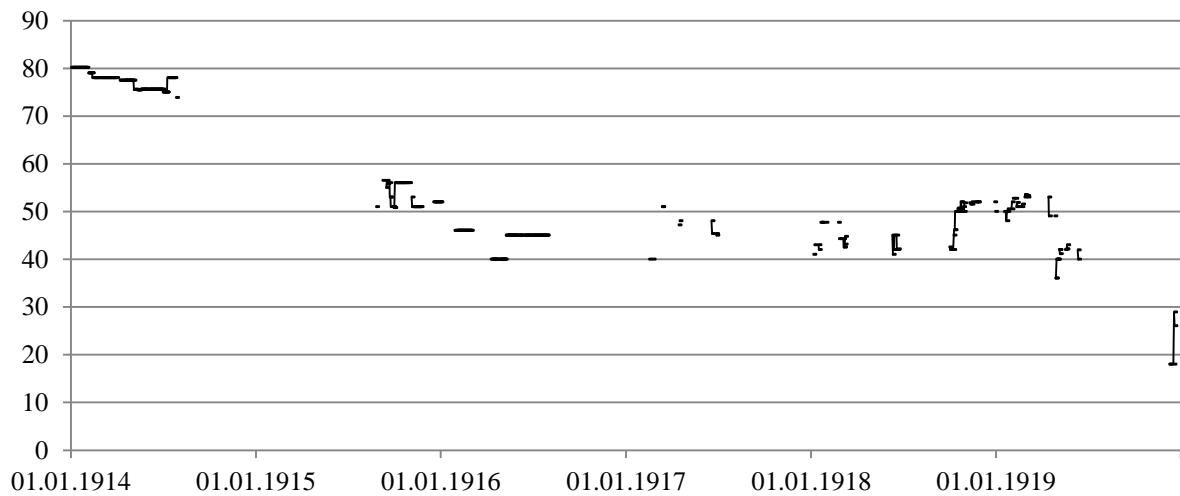
(204) Turkey – 4.0 % of 1890



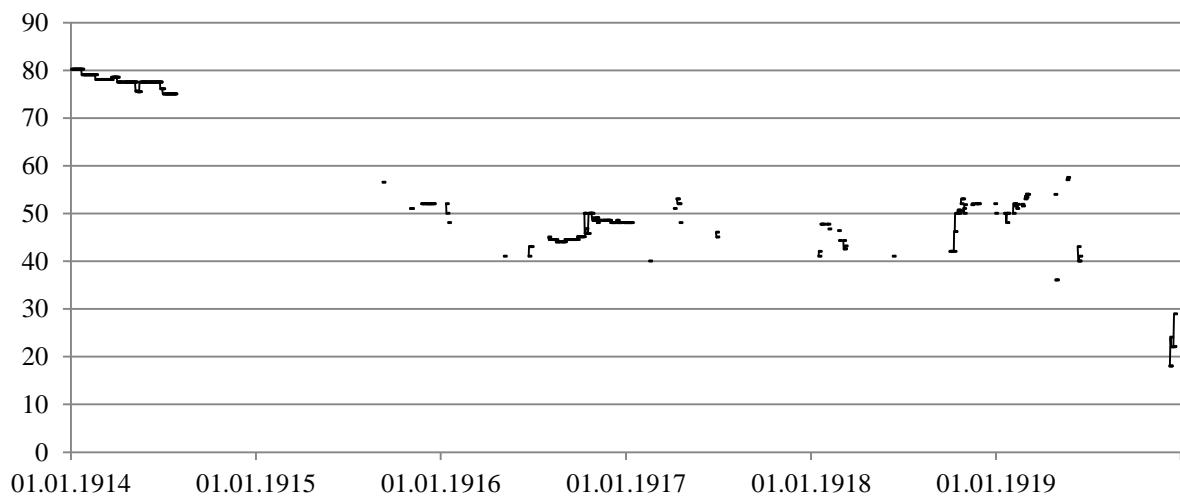
(205) Turkey – 4.0 % of 1902



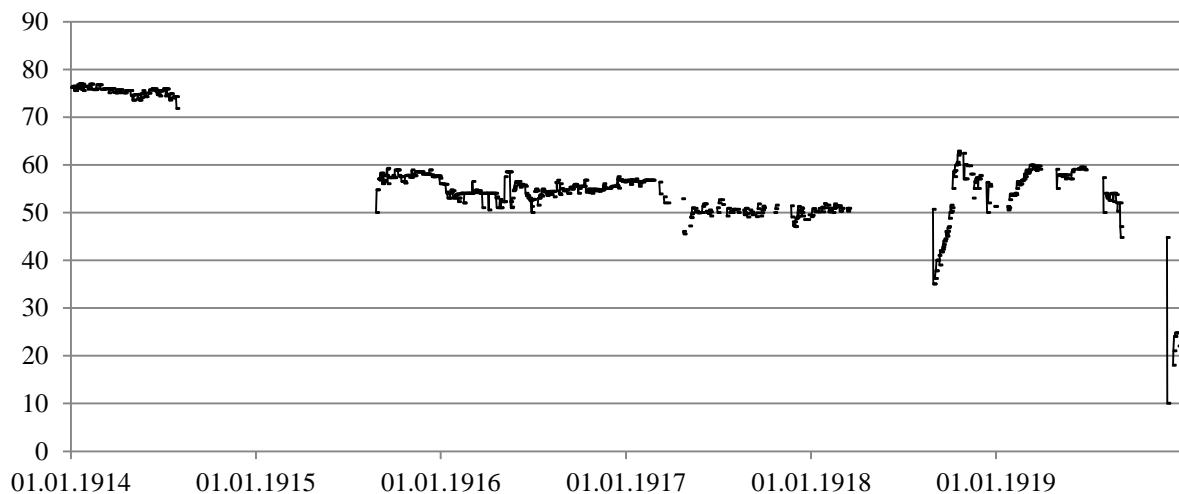
(206) Turkey – 4.0 % of 1903 (500)



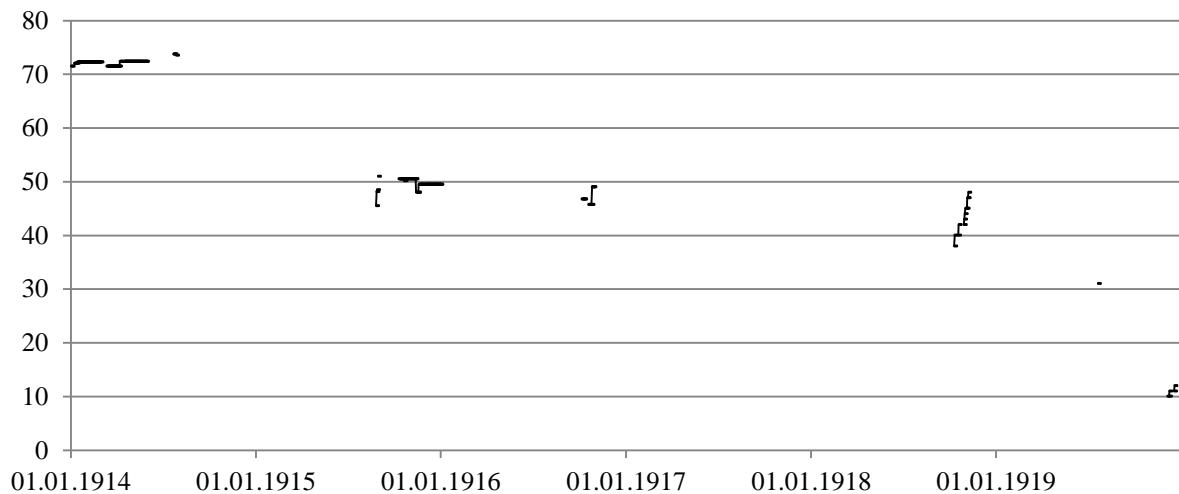
(207) Turkey – 4.0 % of 1903 (2 500)



(208) Turkey – 4.0 % Baghdad 1st series of 1904



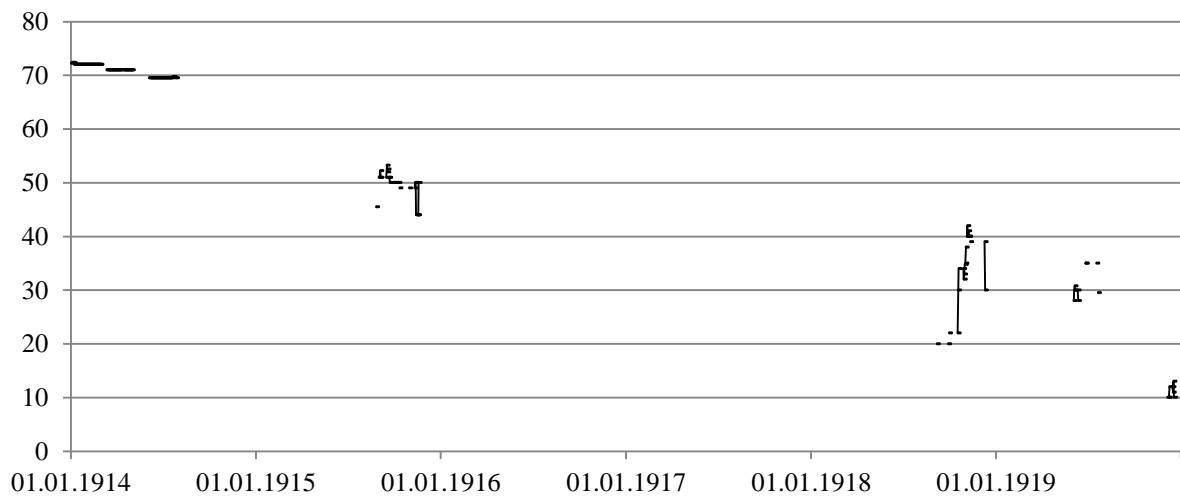
(209) Turkey – 4.0 % of 1905



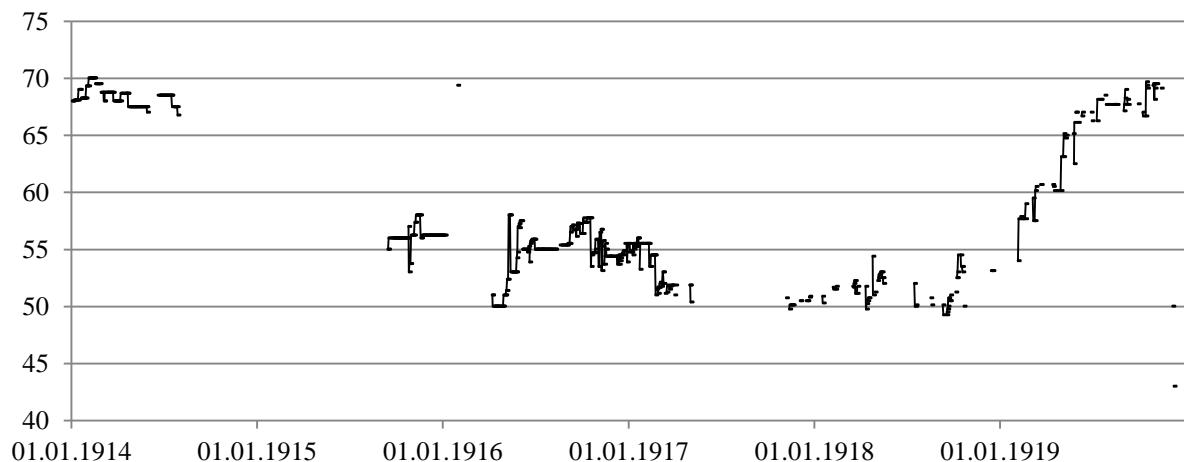
(210) Turkey – 4.0 % Baghdad 2nd series of 1910



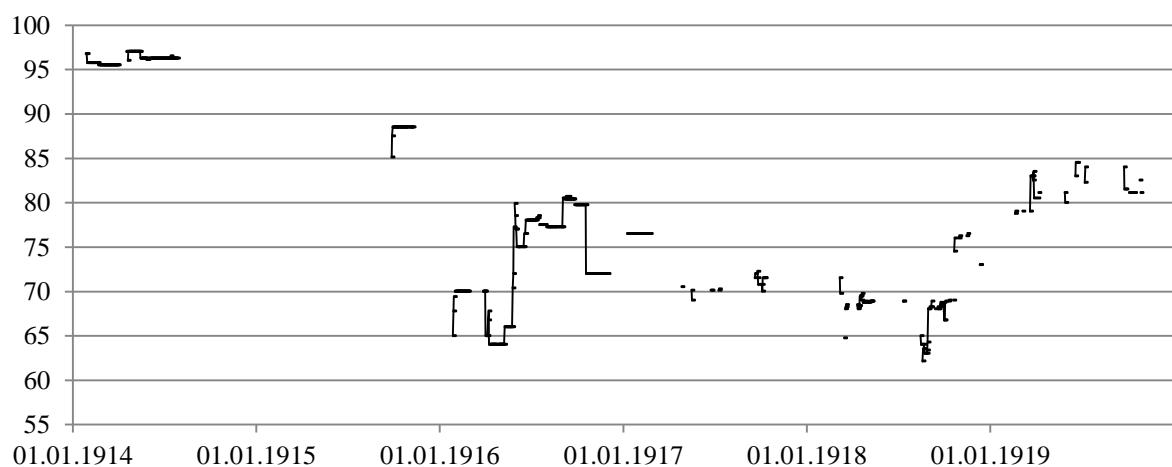
(211) Turkey – 4.0 % of 1911



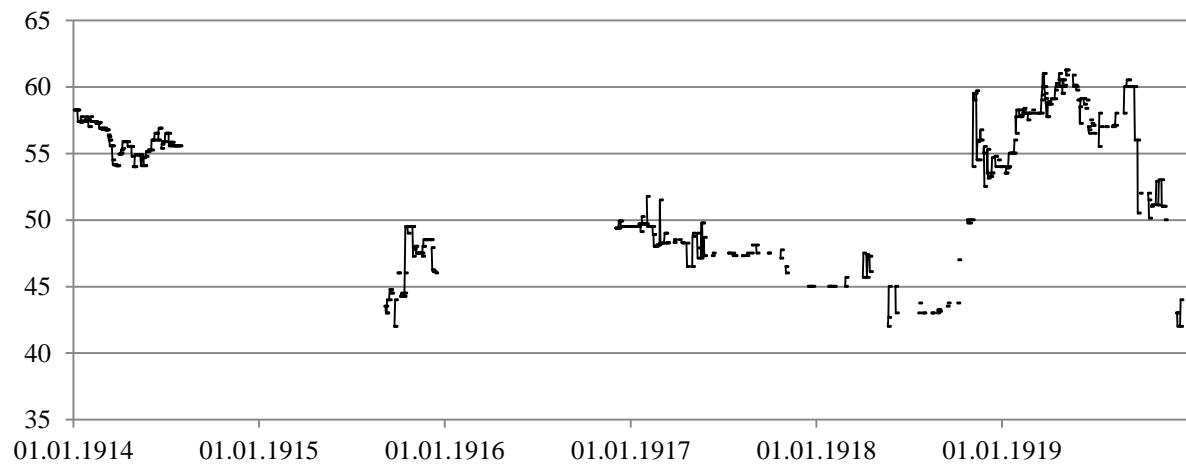
(212) Uruguay – 3.5 % of 1892



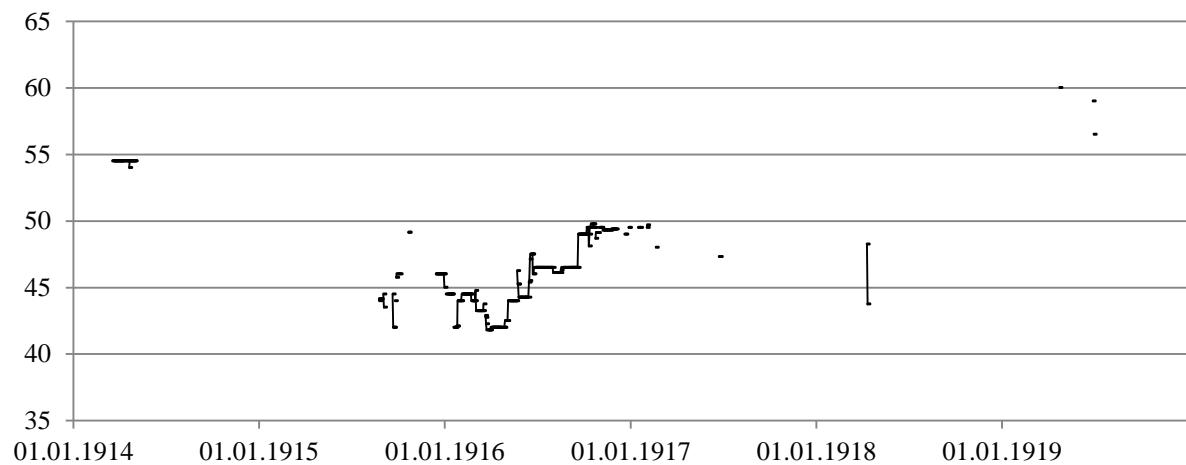
(213) Uruguay – 5.0 % of 1896



(214) Venezuela – 3.0 % of 1905 (20–100)



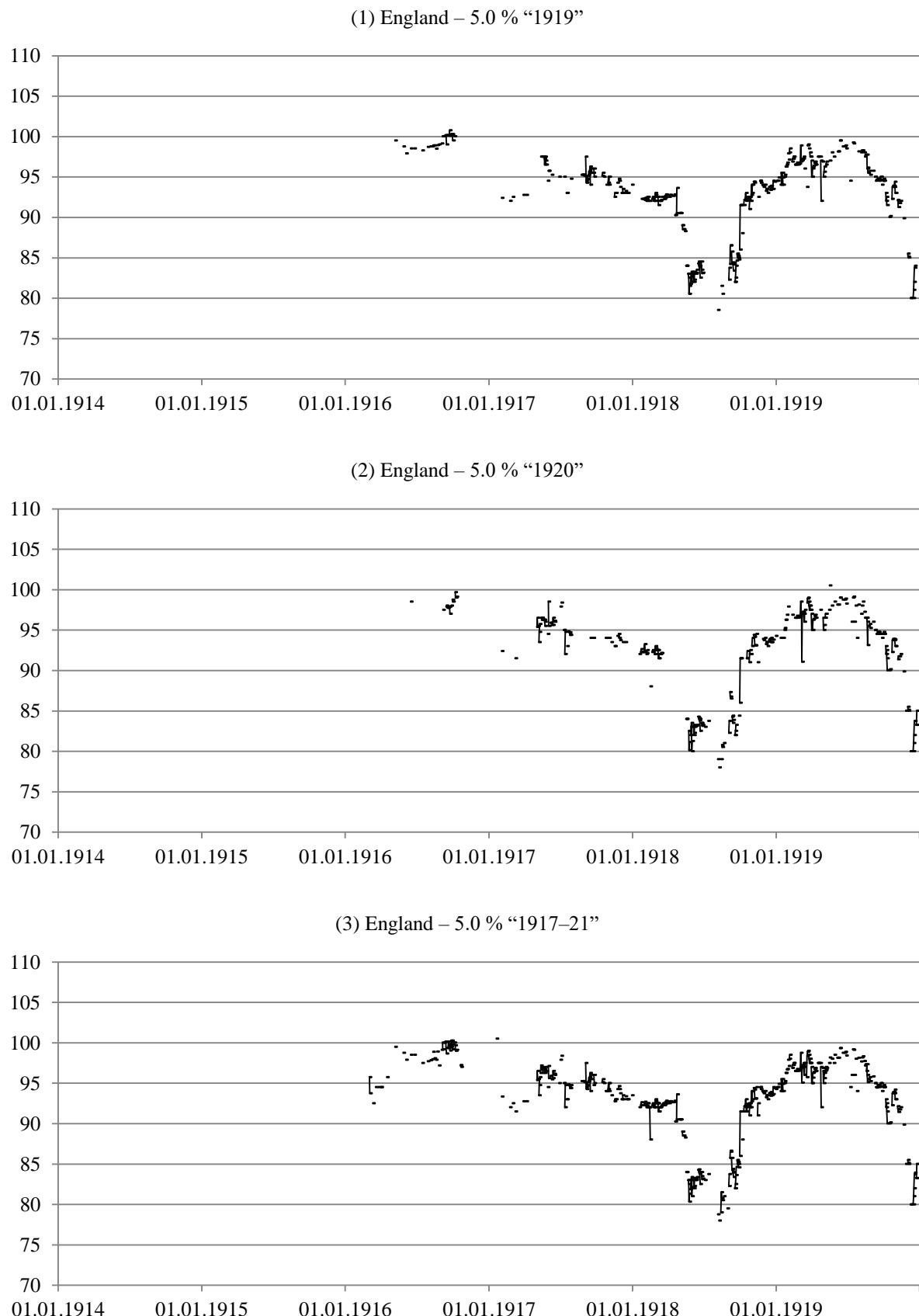
(215) Venezuela – 3.0 % of 1905 (500)



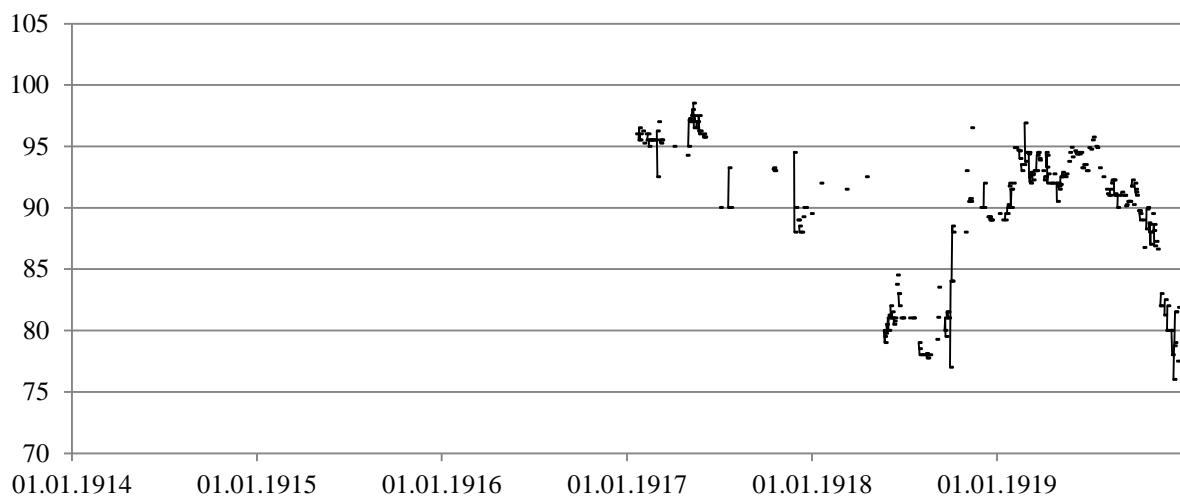
Notes: Y-axis is cut for better readability.

Sources: Cf. Chapter II.

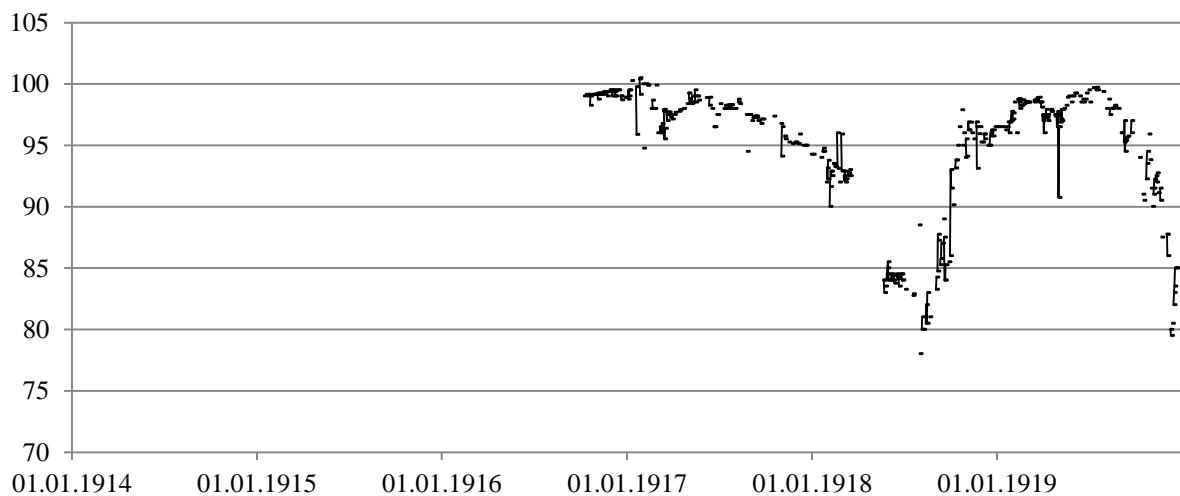
Figure A.2: Raw price development of English and French war bonds unofficially traded in Amsterdam over 1915-1919



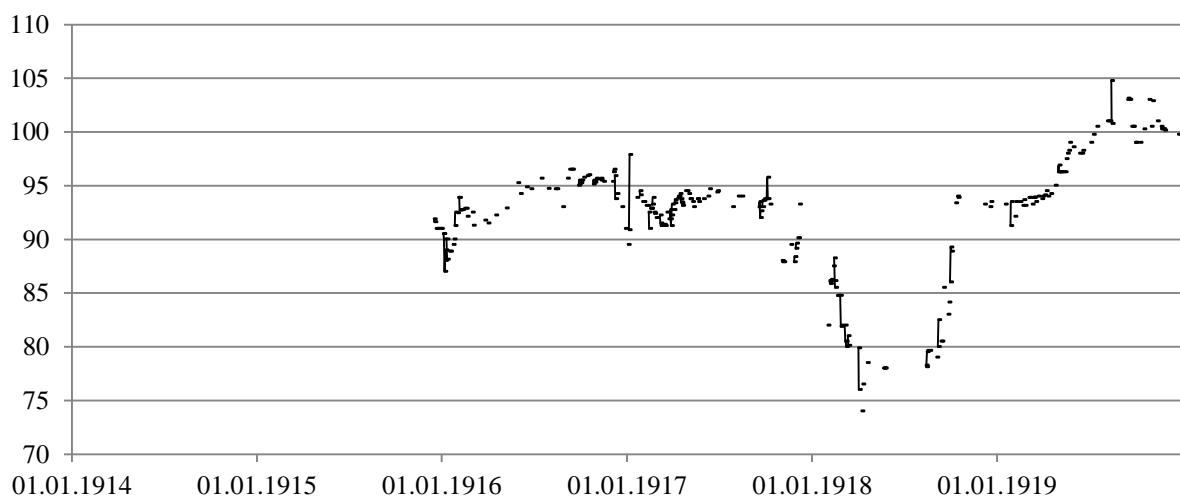
(4) England – 5.0 % “1929–47”



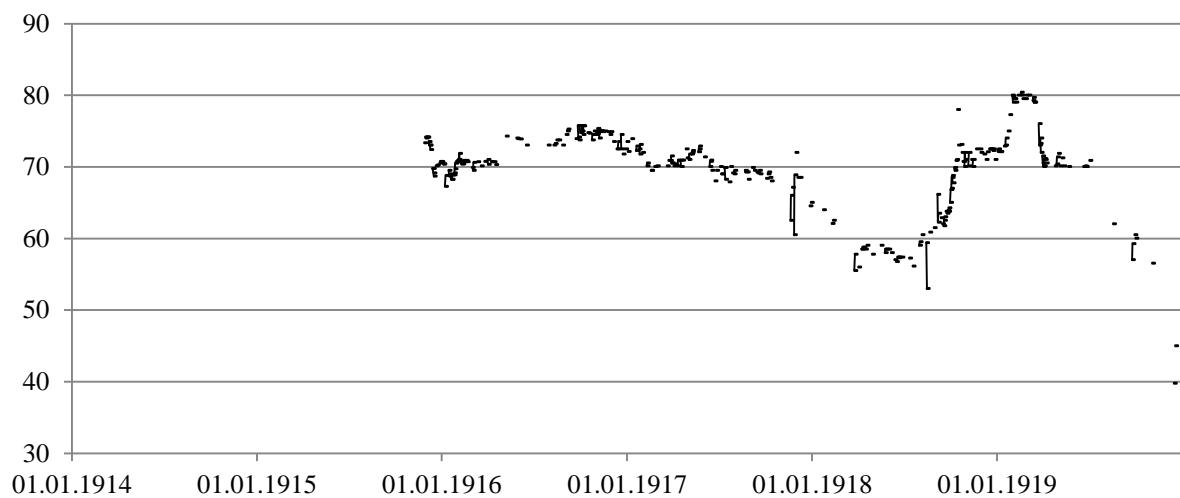
(5) England – 6.0 % “1920”



(6) England/France – 5.0 %



(7) France – 5.0 % of 1915

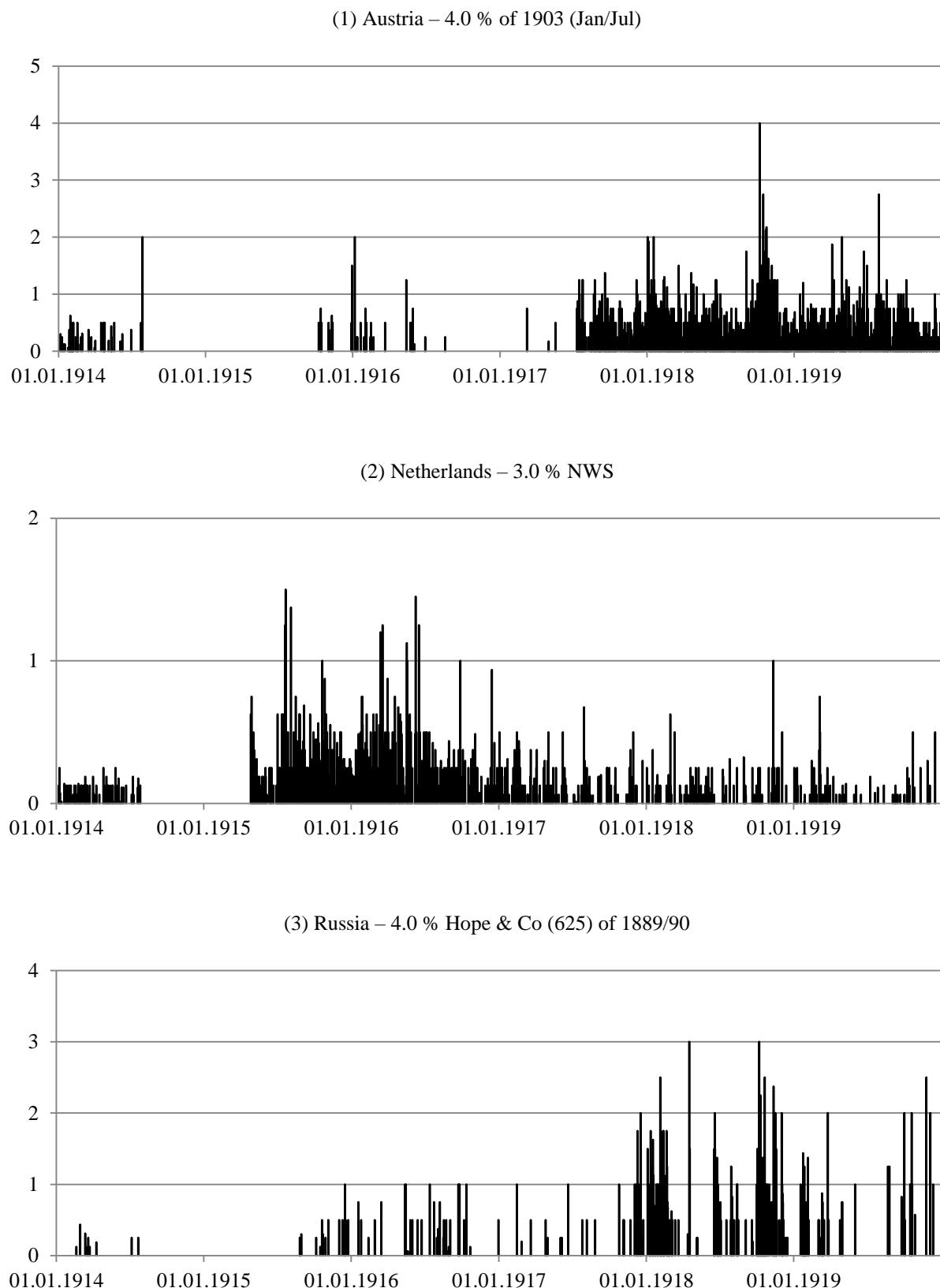


Sources: Cf, Chapter II.

1.4. Lowest and highest prices for selected bonds

I was able to gather the lowest and highest prices of the actual trading day for five bonds. Figure A.3 depicts in three panels the daily effective spread – i.e., the highest minus the lowest price – for the Austrian, Dutch, and Russian bonds for which I gathered combined 1 266, 1 394, and 470 observations, respectively. The Hungarian and Ottoman bonds are not depicted as the number of observations is just too low (42 and 110, respectively). As can be gathered from the figure, the distribution of observations differs. While, for the Austrian and Russian bonds, observations lie closer to the end of the observation period, they cover the first half of the observed wartime for the Dutch bond.

Figure A.3: The effective daily price spread for three bonds



Notes: Cf. the Appendix text.

Sources: Cf. Chapter II.

1.5. Selected bonds' monthly raw price series in tabular form

Tables A.4 to A.7 provide monthly time series of the most liquid bond per selected country *during the war*. The series are ordered by fighting status – that is, separate for the two war factions and the group of neutral countries. For the calculation and discussion of the bonds' liquidity, I refer the reader to this study's main body, especially Chapter II. The bond series are named according to the way they are named in Table A.2.

What needs to be briefly discussed here is the choice of method to collapse the daily price series, as gathered, into monthly series. There are several possibilities for doing so: Firstly, one could compute the average price per month over all available price observations. This method has the appeal that it incorporates all available price information into a single monthly price. Gaps in the resulting series will only occur for months with not a single recorded daily price and, thus, only for exceptionally illiquid bonds. However, on the downside, monthly averages are susceptible for outliers and blur the information on the timing inherent in the prices. Secondly, one could take a month's highest or lowest observed price, regardless on which day of the month it effectively occurred. The effort to create a series based on this principle is lower than in the former case. But it may complicate comparisons in the cross-section of bonds, as prices will likely not fall on the same day within a month. Thus, this procedure also blurs information on time inherent in the data. As in the former case, gaps in the series would only occur if there was not a single recorded price. Thirdly, one could take the first or the last trading day's or the mid-month day's price as being representative for the month. Prices would refer to the same exact day within a month. But the more infrequent a bond was traded, the more likely would there be gaps in the monthly series, even for month with a denser price account. Fourthly, one could just take the last recorded price for a month, no matter on which day of the month it falls or whether it is the highest or lowest price. This method reduces the occurrence of gaps in the series compared to the third method. But on the downside it may also complicate cross-sectional comparisons, as the calendar dates of the selected prices may differ.

I decided to combine methods three and four. Basically, the depicted series show the prices recorded for the stock exchange's last trading day of the respective month. If no price was recorded for the respective month at all, the last available price is given (that is, the last day with a trade); it is printed in italics, with the day of this price added in parentheses (e.g., the “14th” of the month). Gaps in the series only occur whenever a bond had not been traded at least for once in the respective month. Prices are rounded to one decimal place.

Table A.4: Monthly prices on selected Central Powers' bonds (1914–1919)

Month/ Year	German 3 % (Apr/Oct)	Austrian 4 % Kroner Perpetual 1892 (Jan/Jul)	Ottoman 4 % Baghdad Railway 2 nd series 1910	Bulgarian 5 % Tobacco
1/1914	76.0	84.6	74.9	91.7
2/1914	76.4	83.5	73.5	93.0
3/1914	76.7	82.8	74.4	93.7
4/1914	76.5	82.5	73.5	91.5
5/1914	76.0	81.7	73.5	92.7
6/1914	75.8	80.7	74.0	92.9
7/1914	75.0	72.0	73.8 (27 th)	92.0 (27 th)
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...	—	—	—	—
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...	—	—	—	—
2/1915	—	—	—	—
3/1915	—	—	—	—
4/1915	—	—	—	—
5/1915	—	—	—	—
6/1915	—	—	—	—
7/1915	—	—	—	—
8/1915	—	56.0	54.0 (27 th)	75.0
9/1915	58.5	57.0	55.0	74.7
10/1915	58.7	49.5	54.0	70.0 (28 th)
11/1915	57.0	50.0	58.7	70.0
12/1915	57.0	43.5	53.5	54.0
1/1916	46.0	44.0	51.2	57.5
2/1916	48.5	45.2	52.7	61.0
3/1916	42.5	43.9	50.0	60.0
4/1916	42.4	44.2	51.2	61.9
5/1916	—	48.7	55.7	66.7 (30 th)
6/1916	52.0	44.2	51.5	73.7
7/1916	53.0	45.5	53.4	71.4
8/1916	53.0	43.0	55.0	69.0
9/1916	—	41.4	55.0	—
10/1916	—	42.5	54.2	59.9 (28 th)
11/1916	50.0	39.0	56.0	61.0
12/1916	50.5	43.5	56.5	65.9
1/1917	51.0	43.5	56.4	66.9 (30 th)
2/1917	50.0 (24 th)	39.5	56.7 (22 nd)	64.7 (22 nd)
3/1917	43.0 (27 th)	39.0	53.2	61.9
4/1917	42.0 (24 th)	37.7	49.0	62.2
5/1917	46.0 (22 nd)	38.0 (30 th)	50.3 (22 nd)	63.0
6/1917	44.2 (29 th)	35.7	48.5	62.9
7/1917	—	38.0	49.5 (30 th)	62.9

Table A.4 continued

Month/ Year	German 3 % (Apr/Oct)	Austrian 4 % Kroner Perpetual 1892 (Jan/Jul)	Ottoman 4 % Baghdad Railway 1 st series 1904	Bulgarian 5 % Tobacco
8/1917	44.7 (14 th)	37.8 (30 th)	49.7 (30 th)	65.0 (21 st)
9/1917	43.0 (13 th)	38.3	48.0	64.0 (28 th)
10/1917	44.7 (23 rd)	37.4	50.7 (29 th)	64.5
11/1917	44.7	39.5	47.2	64.7
12/1917	48.0 (27 th)	44.7	49.5	64.2
1/1918	49.5	43.9	51.2 (25 th)	68.2 (22 nd)
2/1918	51.0 (22 nd)	46.5	50.9	65.0
3/1918	54.0 (19 th)	43.6	50.1 (18 th)	65.9 (15 th)
4/1918	53.5 (18 th)	40.5	—	61.5 (15 th)
5/1918	52.0 (17 th)	38.7	—	—
6/1918	46.5 (28 th)	32.1	46.0 (3 rd)	59.7 (5 th)
7/1918	48.0	30.5	—	52.0 (25 th)
8/1918	—	27.5	36.1	48.0 (23 rd)
9/1918	32.5 (21 st)	29.7	48.2	49.0
10/1918	38.0	32.9	57.0	60.0
11/1918	31.2 (29 th)	28.5	57.0	62.0
12/1918	29.7 (19 th)	26.8	51.2	62.0 (16 th)
1/1919	30.7 (23 rd)	31.1	53.9	56.0
2/1919	—	28.5	58.7	52.5
3/1919	27.4 (26 th)	23.4	59.2 (29 th)	55.9 (25 th)
4/1919	24.0 (15 th)	26.5	58.9	—
5/1919	30.2 (13 th)	27.5	58.5 (30 th)	—
6/1919	31.0 (25 th)	21.7	59.2	—
7/1919	30.0 (28 th)	17.7	59.2	43.0
8/1919	19.0 (29 th)	16.5 (28 th)	52.0 (29 th)	40.4 (19 th)
9/1919	17.9	11.7	47.0 (3 rd)	—
10/1919	16.7	8.5	—	28.5
11/1919	10.9 (27 th)	6.1	—	34.5 (28 th)
12/1919	9.5 (27 th)	5.7 (29 th)	—	26.9 (16 th)

Sources: Cf. Chapter II.

Table A.5: Monthly prices on selected main Allied Powers' bonds (1914–1919)

Month/ Year	Russian 4 % Hope & Co 1889/90 (625r)	French 5 % War Bond 1915	English 5 % War Bond (1915/16?)	Italian 3.5 % 1862/81
1/1914	84.0	—	—	92.0
2/1914	83.7	—	—	91.2
3/1914	83.1	—	—	91.2
4/1914	82.1	—	—	—
5/1914	83.5	—	—	90.4
6/1914	83.2	—	—	90.4
7/1914	76.9	—	—	90.0 (27 th)
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...	—	—	—	—
...	—	—	—	—
...	—	—	—	—
...	—	—	—	—
...	—	—	—	—
2/1915	—	—	—	—
3/1915	—	—	—	—
4/1915	—	—	—	—
5/1915	—	—	—	—
6/1915	—	—	—	—
7/1915	—	—	—	—
8/1915	63.7	—	—	—
9/1915	62.7	—	—	60.0
10/1915	61.2	—	—	—
11/1915	58.7	74.0	—	—
12/1915	56.9	70.7	—	—
1/1916	60.1	70.9	—	—
2/1916	60.0	69.9	—	50.0 (23 rd)
3/1916	56.5	71.0	—	50.0 (11 th)
4/1916	59.5	70.3 (15 th)	—	50.0 (20 th)
5/1916	63.7	73.9 (29 th)	99.5 (6 th)	—
6/1916	64.3	73.0 (15 th)	98.5 (24 th)	56.0 (22 nd)
7/1916	65.9	73.0 (28 th)	98.7 (28 th)	—
8/1916	66.1	73.0 (25 th)	99.0 (25 th)	—
9/1916	66.9	74.7	99.5	60.0
10/1916	66.0 (28 th)	74.5	100.0 (4 th)	57.0 (25 th)
11/1916	67.5	74.9 (29 th)	—	54.0
12/1916	65.5	73.5	—	56.7 (1 st)
1/1917	65.7	72.0 (30 th)	—	50.0 (18 th)
2/1917	62.1	70.1	92.0 (22 nd)	—
3/1917	58.9 (27 th)	70.5 (30 th)	92.7 (28 th)	—
4/1917	61.5	71.2 (28 th)	92.7 (5 th)	44.0 (10 th)
5/1917	61.8 (29 th)	72.9 (23 th)	95.7	45.0 (24 th)
6/1917	52.5	69.5 (25 th)	95.0 (27 th)	—
7/1917	53.5	69.5	94.7 (27 th)	—
8/1917	53.1 (28 th)	68.2 (27 th)	95.1 (30 th)	43.0 (28 th)
9/1917	52.9 (26 th)	69.0 (19 th)	95.0 (25 th)	—
10/1917	45.0	68.0 (11 th)	95.0	—
11/1917	35.0	72.0 (29 th)	93.7 (29 th)	—

Table A.5 continued

Month/ Year	Russian 4 % Hope & Co 1889/90 (625r)	French 5 % War Bond 1915	English 5 % War Bond (1915/16?)	Italian 3.5 % 1862/81
12/1917	36.7	65.0 (29 th)	94.0 (29 th)	—
1/1918	26.0	64.0 (22 nd)	92.1	—
2/1918	31.5	62.5 (11 th)	92.7	—
3/1918	25.0	57.7 (26 th)	92.7	—
4/1918	22.3	57.7 (29 th)	90.5	—
5/1918	22.5 (28 th)	58.5	82.0	22.2
6/1918	25.0	57.4 (26 th)	83.1 (27 th)	—
7/1918	26.5	59.0	—	25.0 (8 th)
8/1918	26.0	61.5 (29 th)	80.5 (16 th)	30.0 (8 th)
9/1918	24.5	65.0	86.0	35.0
10/1918	35.5	71.0 (30 th)	93.0	—
11/1918	35.0 (29 th)	72.0 (29 th)	93.7 (29 th)	—
12/1918	35.9	71.0 (27 th)	94.4 (27 th)	45.0 (6 th)
1/1919	33.7	79.9	97.9 (30 th)	45.0 (24 th)
2/1919	31.5	80.0 (27 th)	96.6	—
3/1919	24.1	71.5	97.0	—
4/1919	30.1	71.4 (29 th)	96.9 (28 th)	46.0 (14 th)
5/1919	31.1	70.0 (21 st)	97.5 (26 th)	44.0 (14 th)
6/1919	31.2 (23 rd)	70.0 (25 th)	98.5 (27 th)	—
7/1919	23.8	70.9 (2 nd)	98.1 (28 th)	—
8/1919	26.0 (29 th)	62.0 (18 th)	95.2 (27 th)	—
9/1919	23.0	60.5 (29 th)	94.7	—
10/1919	23.5 (30 th)	60.0 (1 st)	93.0	—
11/1919	19.5	56.5 (3 rd)	89.9 (20 th)	—
12/1919	15.2 (29 th)	45.0 (18 th)	84.0 (19 th)	—

Sources: Cf Chapter II.

Table A.6: Monthly prices on selected minor Allied Powers' bonds (1914–1919).

Month/ Year	Serbian 4 % 1895 (500)	Romanian 4 % 1910 (2 500–5 000)	Portuguese 4.5 % Tobacco 1890
1/1914	76.0	80.5	93.6
2/1914	76.0	83.7	93.7
3/1914	75.5	80.0	93.4
4/1914	75.5	80.0	94.0
5/1914	76.4	79.5	94.5
6/1914	75.0	81.2	94.0
7/1914	66.0	82.0 (27 th)	93.0
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...	—	—	—
...	—	—	—
...	—	—	—
...	—	—	—
...	—	—	—
2/1915	—	—	—
3/1915	—	—	—
4/1915	—	—	—
5/1915	—	—	—
6/1915	—	—	—
7/1915	—	—	84.0
8/1915	—	—	84.7 (28 th)
9/1915	50.0	—	86.0
10/1915	43.0	—	88.5
11/1915	41.2	—	86.9
12/1915	41.0	—	78.0
1/1916	41.0 (29 th)	—	83.1
2/1916	40.0	—	83.5
3/1916	43.0	50.0	76.5
4/1916	41.4	47.0 (3 rd)	76.0
5/1916	44.0	52.0 (30 th)	79.0 (30 th)
6/1916	44.5	55.2 (29 th)	79.5 (29 th)
7/1916	47.2	55.2	76.5
8/1916	44.7	55.2 (1 st)	78.2
9/1916	49.5	—	77.5
10/1916	45.0 (28 th)	—	77.5
11/1916	50.5	—	76.5
12/1916	43.0	—	77.0
1/1917	46.0	—	77.7
2/1917	48.9 (27 th)	—	77.9 (22 nd)
3/1917	48.0	—	77.7
4/1917	48.7	—	76.7
5/1917	48.9 (29 th)	—	78.0
6/1917	45.0	—	78.7
7/1917	48.0 (23 rd)	—	78.2
8/1917	47.2 (30 th)	—	79.2 (30 th)
9/1917	48.5 (25 th)	—	79.7
10/1917	48.9 (18 th)	—	80.9 (22 nd)
11/1917	48.0 (2 nd)	—	79.7

Table A.6 continued

Month/ Year	Serbian 4 % 1895 (500)	Romanian 4 % 1910 (2 500–5 000)	Portuguese 4.5 % Tobacco 1890
12/1917	43.0 (20 th)	—	79.4 (29 th)
1/1918	34.0	—	77.9 (17 th)
2/1918	37.5	—	74.7 (23 rd)
3/1918	34.7	—	—
4/1918	34.0 (16 th)	—	—
5/1918	34.0 (7 th)	—	—
6/1918	30.2	—	69.0 (29 th)
7/1918	28.0	—	68.0 (12 th)
8/1918	26.0 (28 th)	—	65.4
9/1918	43.7	—	74.0
10/1918	52.0 (29 th)	—	82.2
11/1918	50.0	49.0 (12 th)	83.9
12/1918	50.9 (27 th)	-	82.5
1/1919	53.0	-	87.9
2/1919	53.0 (24 th)	52.0 (27 th)	89.0
3/1919	49.0	50.2 (27 th)	88.0
4/1919	40.0 (29 th)	—	87.9
5/1919	50.0 (29 th)	—	88.9
6/1919	49.0	—	88.0 (27 th)
7/1919	—	—	87.0
8/1919	42.7 (27 th)	—	88.5 (27 th)
9/1919	40.0 (17 th)	—	83.1
10/1919	—	30.0 (15 th)	70.0
11/1919	—	31.1 (25 th)	67.0
12/1919	25.0 (27 th)	—	61.9 (29 th)

Table A.6 continued

Month/ Year	Chinese 4.5 % 1898	Japanese 5.0 % 1908/09 (500/1 000)	Brazilian 5.0 % 1914 (20/100)
1/1914	92.0	—	—
2/1914	92.5	—	—
3/1914	90.7	—	—
4/1914	89.9	—	—
5/1914	90.0	—	—
6/1914	90.9 (29 th)	—	—
7/1914	91.5 (27 th)	—	—
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...	—	—	—
...	—	—	—
...	—	—	—
...	—	—	—
...	—	—	—
2/1915	—	—	—
3/1915	—	—	—
4/1915	—	—	—
5/1915	—	—	—
6/1915	—	—	—
7/1915	—	—	(65.7 27 th)
8/1915	75.0 (27 th)	80.1 (29 th)	66.1
9/1915	74.25	82.2	68.7
10/1915	75.9	84.4	71.0
11/1915	75.7	83.9	71.1
12/1915	75.2	79.2	67.5
1/1916	68.0 (29 th)	76.0	63.5
2/1916	67.0	81.7	65.8
3/1916	620.	80.0	60.5
4/1916	64.7	79.0	61.4
5/1916	70.0 (30 th)	80.5 (30 th)	70.7
6/1916	69.0 (29 th)	83.0	70.7 (29 th)
7/1916	69.0	85.9	71.4
8/1916	69.0 (1 st)	86.1	72.9
9/1916	61.5	88.0	76.5
10/1916	62.7	88.9 (30 th)	73.4
11/1916	66.9	89.5	74.1
12/1916	68.2	89.5	70.5
1/1917	68.2 (30 th)	90.1	72.9
2/1917	66.0 (22 nd)	89.1 (22 nd)	70.9 (22 nd)
3/1917	67.7 (23 rd)	87.1	69.2 (30 th)
4/1917	67.4 (17 th)	85.8 (26 th)	68.5 (28 th)
5/1917	68.5 (25 th)	86.5 (17 th)	72.9
6/1917	68.2	87.0	72.4 (28 th)
7/1917	66.4	85.0 (2 nd)	74.7
8/1917	66.7 (1 st)	85.5 (28 th)	75.7 (28 th)
9/1917	—	—	75.7
10/1917	62.0 (23 rd)	85.2 (26 th)	74.5 (29 th)
11/1917	—	85.2 (29 th)	70.0

Table A.6 continued

Month/ Year	Chinese 4.5 % 1898	Japanese 5.0 % 1908/09 (500/1 000)	Brazilian 5.0 % 1914 (20/100)
12/1917	62.0	82.5 (29 th)	71.7
1/1918	63.5	81.9 (29 th)	70.7 (22 nd)
2/1918	63.4 (1 st)	81.3	71.5
3/1918	—	79.7 (19 th)	70.9 (19 th)
4/1918	—	—	65.6 (22 nd)
5/1918	54.0 (13 th)	70.7 (30 th)	65.6 (24 th)
6/1918	53.1 (10 th)	—	66.7
7/1918	—	67.0	65.1
8/1918	58.9	69.9 (2 nd)	67.75
9/1918	51.7 (26 th)	70.0 (21 st)	67.7
10/1918	63.7	77.9 (23 rd)	75.9 (29 th)
11/1918	65.1 (22 nd)	74.1 (22 nd)	74.9
12/1918	—	76.1 (20 th)	74.1
1/1919	69.2 (25 th)	84.5 (29 th)	79.2
2/1919	65.1 (25 th)	85.4 (21 st)	81.0
3/1919	69.7	—	82.9
4/1919	71.1 (26 th)	81.5	80.1
5/1919	72.7 (8 th)	84.1	81.1 (29 th)
6/1919	71.0 (27 th)	84.1 (23 rd)	81.4
7/1919	71.1 (11 th)	87.2	80.0 (28 th)
8/1919	70.5 (27 th)	88.2 (26 th)	80.7 (19 th)
9/1919	70.7 (4 th)	83.7	74.5 (25 th)
10/1919	66.9 (29 th)	86.4 (30 th)	69.9
11/1919	62.0 (28 th)	84.5	66.0 (28 th)
12/1919	55.5 (29 th)	80.6 (29 th)	63.9 (29 th)

Sources: Cf. Chapter II.

Table A.7: Monthly prices on selected neutral countries' bonds (1914–1919)

Month/ Year	Dutch 3.0 % NWS	Finnish 3.5 % 1889	Swedish 3.5 % 1890	Swiss 3.5 %
1/1914	78.1	81.0	86.2	87.0
2/1914	77.8	—	87.7	85.2
3/1914	77.7	78.2	83.7	86.2
4/1914	77.7	78.5	83.7	85.0
5/1914	77.4	78.5	83.7	86.7
6/1914	77.5	—	84.0	84.5
7/1914	76.8	—	84.0 (27 th)	88.5 (27 th)
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...	—	—	—	—
...	—	—	—	—
...	—	—	—	—
...	—	—	—	—
...	—	—	—	—
2/1915	—	—	—	—
3/1915	—	—	—	—
4/1915	71.5	—	—	—
5/1915	72.1	—	—	—
6/1915	72.2	—	—	—
7/1915	75.0	—	—	—
8/1915	75.5	—	74.0 (19 th)	—
9/1915	75.2	—	74.0	—
10/1915	70.7	—	—	—
11/1915	70.0	—	72.7	—
12/1915	67.1	—	70.0	63.0
1/1916	69.2	—	67.5 (29 th)	63.0 (29 th)
2/1916	69.8	—	67.5	—
3/1916	70.7	—	68.0	67.0
4/1916	71.0	—	68.2	69.0
5/1916	72.5	—	71.0 (30 th)	71.7 (30 th)
6/1916	72.8	—	71.0 (29 th)	74.0 (29 th)
7/1916	73.0	—	71.0 (1 st)	74.0
8/1916	75.2	—	75.0	74.0
9/1916	75.9	—	75.0	76.0
10/1916	76.5	—	75.0 (2 nd)	76.5 (28 th)
11/1916	76.7	—	—	76.5
12/1916	74.5	—	—	—
1/1917	74.7	38.0 (8 th)	—	—
2/1917	73.7	42.5 (26 th)	76.0 (26 th)	—
3/1917	71.1	47.0 (13 th)	—	—
4/1917	70.7	46.5 (21 st)	—	76.0 (17 th)
5/1917	73.4	49.2 (25 th)	73.5 (12 th)	—
6/1917	73.5	51.0 (19 th)	—	—
7/1917	72.4	—	80.0 (30 th)	75.0 (19 th)
8/1917	73.0 (30 th)	—*	—	—
9/1917	72.0	—	85.0	—
10/1917	72.0	—	91.0 (30 th)	—
11/1917	71.5	—	83.0 (29 th)	—

Table A.7 continued

Month/ Year	Dutch 3.0 % NWS	Finnish 3.5 % 1889	Swedish 3.5 % 1890	Swiss 3.5 %
12/1917	69.8	—	73.0	—
1/1918	67.9	—	73.2 (10 th)	—
2/1918	69.5	35.0 (26 th)	—	—
3/1918	67.9	47.0 (25 th)	72.7 (12 th)	—
4/1918	67.1	—	68.0 (22 nd)	—
5/1918	68.7	—	62.0 (22 nd)	71.0 (29 th)
6/1918	69.0	35.1	—	—
7/1918	66.4	45.0 (17 th)	—	—
8/1918	67.8	—	—	69.0 (8 th)
9/1918	67.2	—	—	—
10/1918	63.4	46.0 (30 th)	—	—
11/1918	64.0	—	—	—
12/1918	64.7	42.0 (17 th)	—	—
1/1919	63.2	42.5 (27 th)	59.0 (29 th)	—
2/1919	63.2	—	—	—
3/1919	61.9	—	—	—
4/1919	62.1	—	60.0 (2 nd)	—
5/1919	62.2	—	—	66.0 (6 th)
6/1919	59.5	—	—	—
7/1919	59.9	—	—	—
8/1919	61.0 (29 th)	—	—	—
9/1919	60.4	—	—	—
10/1919	58.7	—	63.5 (27 th)	—
11/1919	57.9	—	60.0 (19 th)	64.0 (17 th)
12/1919	52.0 (29 th)	—	—	63.7 (10 th)

Sources: Cf Chapter II.

1.6. Selected monthly exchange rates in tabular form

Tables A.8 displays five important exchange rates which were reported in the newspapers, namely the guilder-to-mark, guilder-to-pound, guilder-to-(French)franc, guilder-to-dollar, and guilder-to-(Austrian)kroner exchange rates. In line with the procedure in Appendix 1.5, values in normal print refer to the last trading day of the month. Values in italic print do not refer – due to lacking observations – to the last trading day but fall on a day within the preceding six trading days.

Table A.8: Exchange rates of Dutch guilder to main currencies (1914–1919)

Month/ Year	Guilder to mark	Guilder to pound	Guilder to franc	Guilder to dol- lar	Guilder to kro- ner
2/1914	59.03	12.07	47.86	2.48	50.18
3/1914	59.09	12.08	47.99	2.48	50.27
4/1914	59.01	12.09	48.08	2.48	50.18
5/1914	59.15	12.12	48.15	2.48	50.22
6/1914	59.12	12.12	48.16	2.47	50.14
7/1914	59.15	12.16	49.40	2.45	47.00
8/1914	58.00	12.40	50.00	2.43	49.00
9/1914	54.85	12.04	48.00	2.41	46.00
10/1914	53.90	11.97	47.60	2.44	43.50
11/1914	52.70	12.04	48.25	2.45	41.90
12/1914	54.25	11.99	47.85	2.46	42.80
1/1915	54.12	12.05	47.95	2.48	42.25
2/1915	51.30	12.03	47.40	2.50	39.50
3/1915	51.97	12.17	47.75	2.52	38.85
4/1915	51.95	12.13	47.60	—	38.85
5/1915	51.60	12.01	46.22	—	38.20
6/1915	50.70	11.95	44.60	—	37.85
7/1915	50.42	11.81	43.80	—	37.25
8/1915	50.42	11.62	42.10	—	37.15
9/1915	50.65	11.53	42.25	—	36.20
10/1915	48.92	11.15	40.40	—	34.55
11/1915	47.05	11.25	40.92	—	33.10
12/1915	42.35	10.79	38.75	—	29.90
1/1916	43.15	11.26	40.20	—	28.65
2/1916	42.32	11.21	40.05	—	29.75
3/1916	41.70	11.18	39.20	—	28.85
4/1916	44.20	11.38	40.25	—	30.60
5/1916	44.62	11.49	40.82	—	31.15
6/1916	43.77	11.49	40.85	—	30.40
7/1916	43.17	11.51	40.95	—	29.95
8/1916	42.60	11.61	41.45	—	29.40
9/1916	42.52	11.66	41.87	—	29.00
10/1916	42.50	11.62	41.85	—	27.60
11/1916	40.15	11.67	42.00	—	25.15
12/1916	41.20	11.68	42.10	—	25.75
1/1917	41.37	11.70	42.07	—	26.67
2/1917	40.55	11.80	42.40	—	25.25
3/1917	38.92	11.76	42.35	—	24.52
4/1917	37.65	11.64	42.82	—	23.60
5/1917	36.47	11.59	42.65	—	23.45
6/1917	34.75	11.57	42.35	—	21.90
7/1917	33.75	11.44	41.80	—	21.60
8/1917	33.17	11.33	42.25	—	21.15
9/1917	32.80	11.31	40.92	—	20.85
10/1917	32.55	10.91	39.75	—	20.65
11/1917	36.10	11.00	40.55	—	22.20

Table A.8 continued

Month/ Year	Guilder to mark	Guilder to pound	Guilder to franc	Guilder to dol- lar	Guilder to kro- ner
12/1917	45.30	11.00	40.75	—	27.32
1/1918	42.10	10.90	40.25	—	27.15
2/1918	43.52	10.61	38.75	—	28.70
3/1918	42.60	10.22	37.75	—	27.45
4/1918	40.69	9.88	36.15	—	26.15
5/1918	38.97	9.47	35.00	—	24.00
6/1918	34.25	9.34	34.42	—	20.40
7/1918	32.80	9.14	33.75	—	18.95
8/1918	31.22	9.33	35.95	—	17.50
9/1918	32.05	10.11	38.75	—	17.65
10/1918	34.60	11.25	43.12	—	18.60
11/1918	30.25	11.33	43.55	—	15.75
12/1918	30.00	11.15	42.90	—	15.15
1/1919	28.15	11.50	44.30	—	14.20
2/1919	24.27	11.57	44.35	—	11.55
3/1919	22.50	11.47	41.60	—	9.00
4/1919	21.97	11.65	41.40	—	10.50
5/1919	18.40	11.87	41.00	—	10.40
6/1919	18.50	11.83	39.95	—	9.25
7/1919	14.45	11.58	36.45	—	6.50
8/1919	12.20	11.32	33.50	—	5.70
9/1919	12.40	11.19	33.75	—	4.20
10/1919	8.45	11.02	29.70	—	2.50
11/1919	6.10	10.57	27.02	—	1.85
12/1919	5.50	10.18	24.90	—	1.52

Sources: Cf. Chapter II.

1.7. The monthly *prolongatie koers* in tabular form

Tables A.9 reports on the so-called *prolongatie koers*, the most important short-term interest rate in the Dutch market. As this interest rate was very volatile, under peace and war conditions alike, I decided to display the monthly median *prolongatie koers* instead of the rate for the last trading day. Note that the rates are rounded to one decimal place.

Table A.9: A monthly *prolongatie koers* series (1914–1919)

Month	<i>prolongatie koers</i>	Month	<i>prolongatie koers</i>
1/1914	4.4 %	1/1917	2.7 %
2/1914	4.4 %	2/1917	4.2 %
3/1914	3.6 %	3/1917	2.9 %
4/1914	3.7 %	4/1917	2.7 %
5/1914	2.9 %	5/1917	2.2 %
6/1914	3.1 %	6/1917	2.7 %
7/1914	3.1 %	7/1917	3.0 %
...	—	8/1917	2.2 %
...	—	9/1917	2.5 %
...	—	10/1917	2.5 %
...	—	11/1917	4.0 %
...	—	12/1917	4.7 %
...	—	1/1918	3.7 %
2/1915	5.0 %	2/1918	4.2 %
3/1915	4.6 %	3/1918	4.3 %
4/1915	4.5 %	4/1918	4.2 %
5/1915	4.0 %	5/1918	3.5 %
6/1915	3.5 %	6/1918	3.2 %
7/1915	2.7 %	7/1918	3.0 %
8/1915	2.5 %	8/1918	2.5 %
9/1915	3.1 %	9/1918	2.7 %
10/1915	3.1 %	10/1918	3.7 %
11/1915	3.5 %	11/1918	4.0 %
12/1915	3.2 %	12/1918	3.7 %
1/1916	2.2 %	1/1919	3.2 %
2/1916	2.2 %	2/1919	3.7 %
3/1916	2.2 %	3/1919	4.0 %
4/1916	4.0 %	4/1919	4.2 %
5/1916	3.6 %	5/1919	3.2 %
6/1916	2.5 %	6/1919	3.0 %
7/1916	2.4 %	7/1919	3.7 %
8/1916	1.7 %	8/1919	4.5 %
9/1916	1.5 %	9/1919	4.0 %
10/1916	2.5 %	10/1919	4.5 %
11/1916	2.7 %	11/1919	4.2 %
12/1916	4.0 %	12/1919	4.7 %

Sources: Cf. Chapter II.

2. Technical Appendix

2.1. Structural break methodology

The procedure developed by Jushan Bai and Pierre Perron (1998, 2003a, 2003b, 2006) to detect structural breaks in a time series starts from the following general formulation with m possible breaks and, thus, $m+1$ regimes – that is, periods between the breaks:

$$y_t = \beta_j * z'_t + u_t, \quad t = T_{j-1} + 1, \dots, T_j, \quad j = 1, \dots, m+1, \quad (\text{Equation A.1})$$

with t denoting the time index, y denoting the dependent variable, z' denoting the vector of explanatory variables, β_j denoting the coefficients to be estimated with least squares, and u denoting the error term. The T_j 's are the unknown breakpoints to be estimated without *a priori* knowledge of their location. The Bai-Perron-method allows for up to ten breakpoints to be estimated over a number of T observations. The principle appeal of the procedure lies in the fact that breakpoints and coefficients on the explanatory variables possibly included are estimated simultaneously. Estimating (A.1) with least squares labels under the implicit assumption that the errors, u , may be distributed with different variance over the $m+1$ regimes, but that any break in the variance falls on the same date as a breakpoint, T_j .

In determining the number of breaks and their location, one can basically follow two strategies. The first strategy is called “global maximization”. This procedure chooses the optimal number of breaks over the whole range of the data such that the sums-of squared-residuals is minimized. If the number of breakpoints is pre-specified, the sums-of-squared residuals is minimized by choosing the optimal location of the breaks. If the number of breakpoints is left unspecified, a number of alternative tests may be applied to determine their number *and* location. The second strategy is a “sequential determination” of breaks where breakpoint tests are applied sequentially on subsets of the data. This procedure somewhat seems to resemble the approach of the slightly older method of Anindya Banerjee et al. (1992).

In this study, the sequential test of $l+1$ versus l breaks is applied where the number of potential breaks l is increased one by one until the null of l breaks cannot be rejected any longer. While the first test on one breakpoint vs. none is performed for the whole range of data, tests for two breakpoints versus one, three breakpoints versus two and so forth are performed for subsamples until the whole range of data is screened and/or the number of ten

breaks is reached. Technically, a $\sup F_T(l+1|l)$ test is performed for each subsample. The optimal number of breaks, l , is found when the sums-of-squared residuals for the $l+1$ specification is lower than for the l breaks specification. Identification of the optimal number of breaks critically depends on the so-called trimming parameter, that is, the number of observations cut at the beginning and at the end of the series. It is expressed as a proportion of T , namely as $\varepsilon = 0.05, 0.10, 0.15, 0.20$, or 0.25 . Using $\varepsilon = 0.05$, for example, on $T = 1\,000$ days means that the first breakpoint is allowed to occur, at the earliest, on day 51 (and the last break on day 950). In addition, the trimming parameter determines the minimum segment length between any two breaks.

The Bai-Perron-method is very flexible in that it allows the errors as well as the regressors to follow different distributions within the $m+1$ regimes. Furthermore, it is possible to correct standard errors for serial correlation and heteroscedasticity.

2.2. Unit root tests on bond yields and additional variables

Table A.10 displays the result of a Dickey-Fuller Generalized Least Squares (DFGLS) unit root test for the series used in the analysis in Chapter III. The test is performed on the war period and on the combined war and immediate post-war period.

Table A.10: DFGLS test on bond yields

Country and bond	War period		War and post-war	
	H1:stationary around trend	H1: Stationary around mean	H1:stationary around trend	H1: Stationary around mean
<i>A. Bond yields</i>				
Austrian 4.0 %	-2.90 (18)**	-0.05 (21)	-0.12 (23)	6.06 (18)
Bulgarian 5.0 %	-3.09 (22)**	-0.94 (19)	-1.76 (23) ^a	0.58 (23)
German 3.0 %	-2.29 (22)**	-0.44(22)	-0.17 (16)	3.23 (18)
Ottoman 4.0 %	-3.14 (13)**	-2.88 (13)***	-3.14 (13)**	-1.84 (23)*
English 5.0 %	-2.30 (20)	-1.02 (11)	-1.83 (18)	-0.51 (18)
French 5.0 %	-1.32 (15)	-0.98 (15)	-0.92 (6)	1.15 (6)
Italian 3.5 %	-2.54 (11) ^b	-0.76 (11)	-2.34 (11)	-1.43 (11)
Romanian 4.0 %	-0.97 (12)	0.06 (12)	-0.98 (1) ^c	-0.71 (1) ^c
Russian 4.0 %	-1.51 (19)	-0.49 (19)	-1.51 (20)	0.84 (8)
Serbian 4.0 %	-2.35 (17) ^a	-1.31 (17)	-2.26 (17) ^a	-0.99 (17)
<i>B. Additional variables</i>				
Interest rate	-2.13 (19) ^a	-1.47 (23)	-2.30 (18) ^a	-1.88 (18) ^a
Market liquidity	-1.92 (23) ^a	0.21 (21)	-2.00 (21) ^a	-0.50 (21) ^a
Guilder-mark exch. rate	-2.54 (23)*	0.23 (23)	-1.43 (24)	1.98 (24)
Guilder-pound exch. Rate	-1.65 (15)	-1.02 (15)	-1.88 (15)	-0.65 (15)
Guilder-franc exch. Rate	-0.93 (17)	-0.65 (17)	-1.20 (23)	1.40 (23)
Guilder-kroner exch. Rate	-1.79 (23)	0.99 (23)	-1.73 (23)	2.46 (23)
Guilder-rouble exch. rate	-2.83 (23)**	0.08 (23)	-2.99 (23)**	0.93 (23)
Municipal bond index	-0.90 (20)	-0.93 (20)	-0.06 (11)	0.64 (11)
Share index	-0.41 (14)	0.66 (14)	-0.68 (20)	1.11 (20)
Inflation guilder	-10.7 (20)***	-10.0 (20)***	-12.0 (20)***	-11.7 (20)***
Inflation mark	-11.4 (23)***	-9.95 (22)***	-13.5 (14)***	-12.2 (14)***
Inflation pound	-16.5 (7)***	-15.8 (7)***	-18.2 (7)***	-11.8 (13)***
Inflation franc	-7.10 (20)***	-5.78 (20)***	-7.12 (20)***	-6.78 (20)***
Inflation rouble	-4.61 (23)***	-4.02 (23)***	-4.93 (23)***	-4.02 (23)***

Notes: ***, **, * denote significance on the one-, five- and ten-percent levels. Optimal truncation lags according to Ng-Perron sequential t in parentheses. ^a Stationary for lower lag number. ^b Stationary for higher lag number. ^c According the NG-Perron sequential t , the optimal lag order is zero; however, given is the test statistic for lag order one.

Sources: Author's own calculations.

2.3. Pairwise correlations among representative bonds

Table A.11 reports the pairwise zero-order correlation coefficients for the correlation between the original raw yield series – that is, the series with gaps. The dark grey-shaded fields mark the correlations between bonds the issuers of which belonged to the same faction. The light grey-shaded fields mark the correlations across factions.

Table A.11: Within- and cross-alliance correlations of representative bonds (raw yields)

Country	AUT	GER	TUR	BUL	SER	RUS	FRA	ENG	JAP	ITA	POR	ROM	CUB	CHN	BRA	NIC
Austria	1.00	.97	.78	.88	.48	.67	.53	.22	-.05	.15	.45	.93	-.00	.25	.02	.09
Germany	.97	1.00	.63	.88	.35	.75	.12	-.05	.01	-.09	.31	.94	.07	.24	-.00	.05
Ottoman Empire	.78	.63	1.00	.49	.76	.49	.88	.65	.16	.71	.63	-.23	.13	.44	.22	-.55
Bulgaria	.88	.88	.49	1.00	.53	.73	.59	.34	.05	.62	.47	.94	.03	.46	.03	.06
Serbia	.48	.35	.76	.53	1.00	.61	.83	.77	.37	.81	.69	.58	.23	.46	.48	.10
Russia	.67	.75	.49	.73	.61	1.00	.66	.59	.22	.72	.28	.83	.27	.48	-.01	.29
France	.53	.12	.88	.59	.83	.66	1.00	.73	.39	.96	.63	.55	.34	.50	.42	.29
England	.22	-.05	.65	.34	.77	.59	.73	1.00	.66	.94	.74	.98	.30	.84	.71	.70
Japan	-.05	.01	.16	.05	.37	.22	.39	.66	1.00	.89	.01	-.42	.40	.10	.56	.17
Italy	.15	-.09	.71	.62	.81	.72	.96	.94	.89	1.00	.70	n/a	.83	.84	.56	-.14
Portugal	.45	.31	.63	.47	.69	.28	.63	.74	.01	.70	1.00	.56	.04	.63	.44	-.70
Romania	.93	.94	-.23	.94	.58	.83	.55	.98	-.42	n/a	.56	1.00	-.20	.22	.13	.50
Cuba	-.00	.07	.13	.03	.23	.27	.34	.30	.40	.83	.04	-.20	1.00	.25	.01	-.32
China	.25	.24	.44	.46	.46	.48	.50	.84	.10	.84	.63	.22	.25	1.00	.25	-.27
Brazil	.02	-.00	.22	.03	.48	-.01	.42	.71	.56	.56	.44	.13	.01	.25	1.00	.12
Nicaragua	.09	.05	-.55	.06	.10	.29	.29	.70	.17	-.14	-.70	.50	-.32	-.27	.12	1.00

Sources: Author's own calculations.

2.4. An alternative DFGLS test on step one

This alternative test on step 1 merges the war and post-war periods. The results on the pre-war period are the same as displayed in Table 38.

Table A.12: Alternative DFGLS unit root test on representative bonds' yield spread

Country and bond	Pre-war		War and post-war	
	H1:stationary around trend	H1: Stationary around mean	H1:stationary around trend	H1: Stationary around mean
A. Central Powers				
Austrian 4.0 %	-0.35 (12)	1.37 (12)	-0.98 (23)	5.91 (18)
Bulgarian 5.0 %	-1.84 (3)	-1.79 (3)	-4.57 *** (14)	-1.49 (23)
German 3.0 %	-1.24 (10)	-0.79 (10)	0.17 (23)	3.49 (23)
Ottoman 4.0 %	-1.83 (11)	-0.61 (11)	-4.22*** (22)	-5.28*** (22)
B. Allied Powers				
Brazilian 5.0 %	-	-	-0.28 (22)	3.51 (22)
Chinese 4.5 %	-2.45** (1) ^a	-2.39** (1) ^a	-0.39 (11)	-0.17 (11)
Cuban 5.0 %	-1.99 (13)	-0.36 (7)	0.32 (24)	2.74 (24)
English 5.0 %	n/a	n/a	0.28 (22)	2.55 (22)
French 5.0 %	n/a	n/a	-2.32 (11)	-1.77* (11)
Italian 3.5 %	-2.05 (2)	-1.99 (2)	-1.41 (17)	-1.45 (17)
Japanese 5.0 %	-1.69 (8)	-0.54 (12)	0.46 (23)	3.95 (23)
Nicaraguan 5.0 %	-1.95 (14)	-1.46 (14)	-1.39 (17)	0.42 (2)
Portuguese 4.5 %	-1.40 (14)	-1.30 (14)	-0.57 (21)	2.89 (20)
Romanian 4.0 %	-1.36 (13)	-1.06 (13)	-3.56*** (23)	-2.22** (23)
Russian 4.0 %	-1.56 (5)	0.16 (5)	-2.75* (8)	0.27 (11)
Serbian 4.0 %	-0.71 (13)	0.13 (13)	-2.77* (18)	-2.59*** (18)

Notes: ***, **, * denote significance on the one-, five- and ten-percent levels. Optimal truncation lags according to Ng-Perron sequential t in parentheses. "n/a" is "not available". ^a According the NG-Perron sequential t , the optimal lag order is zero; however, given is the test statistic for lag order one.

Sources: Author's own calculations.

2.5. Intermediate cointegration results on the “global test” on alliance integration

Cointegration analysis is a convenient statistical approach to examine relationships among nonstationary time series. These are time series which do not have the property of mean reversion – a property that, in fact, many economic variables do not have (cf. Figures 1 and 2 in the main body of my study; the GDP figures “explode”, or wander considerably, in the long term). Many regression techniques, however, require time series to have this property. In order to apply standard regression techniques, when dealing with nonstationary time series, time series are often first-differenced, as many time series have the property of being first-difference stationary. Alternatively, one might call a first-difference stationary time series as being integrated of order one or, simply, I(1). A time series stationary in levels is then I(0). The basic idea of cointegration is that two (or more) non-stationary time series can still be connected in that they do not drift away too much from each other in the long term. They are said to be in equilibrium. Unit root tests help to determine if a time series is nonstationary. If a unit root is present in the time series, it is nonstationary.

Tables A.13 to A.17 illustrate how going through several statistical steps can determine whether two yield spreads as defined in the analysis in Chapter IV are connected in a long-term equilibrium. Thus, the first step of my testing procedure is to eliminate stationary time series as there can be no long-term equilibrium relationship with a non-stationary time series. The second step makes use of basic pre-tests for two time series likely being cointegrated. In order for being conintegrated, they both have to be (in our case) I(1) or, which is equivalent, be of rank one. If not, at least, one of the two pre-tests says both time yield series are of rank one, I likewise suppose that they cannot be cointegrated. Finally, in the case that both series are of rank one, I estimate Johansen-type vector error correction models to determine the equilibrium relationship. Most basically, a VECM is based (in our case) on a two-equation VAR model with one equation per series. A VAR model explains each series by its own past observations and by past observations of the other yield series. This is why we need an idea of how many lagged observations we have to include in the model. The precise parameters of the statistical relationship are not important for my approach which is why I only depict the parameters of the cointegrating vector. The cointegrating vector can be understood as being the stationary *linear combination* of the two non-stationary yield series. The vector can be defined in terms of the one or the other series’ values. This is reflected in the fact that there are two ways of normalizing the vector’s equation. I chose to impose the double-normalization restriction to work in order for two yield series to be reliably (enough) cointe-

grated. I also applied additional post-estimation tests for the cointegrating vector's stability. If the vector is indicated to be unstable, I dropped the pair. The tables show the country pairs addressed, the number of lags included in the pre-tests on cointegration in the VECMs, and the decisions made at each step.

Note that the lag order per country pair is specified using the “varsoc” command in STATA. The lag order is chosen according to the Akaike information criterion (AIC) and extended thereupon by one lag, as suggested by the literature. Further note that for each country pair two rows of information are depicted. The upper row is for the model with unrestricted mean, and the second for the model with unrestricted trend. One of these two models should be suggesting a valid cointegrating relationship, meaning that the double-normalization restriction is holding. I chose the model according to a comparison of the AIC (i.e., I chose the model with the lower AIC). This model is given in italics.

Table A.13: A global test on cointegrated alliance partners – estimation summary for pairs among the Central Powers

Series 1	Series 2	Lags used in the VAR	Significant rank of Trace test	Significant rank of Maximum Eigenvalue test	Hypothesis test on cointegrating vector in VECM (Model suggested by AIC in italics)	Final stage judgement
<i>A. Pre-war</i>						
Austrian 4.0 %	German 3.0 %	2	0 0	0 0	Pair drops out due to rank tests	
Austrian 4.0 %	Ottoman 4.0 %	2	1 1	1 1	[1; -3.33***]; [-0.30***; 1] [1; -7.73***]; [-0.13; 1]	Pair drops out due to double normali- zation restriction violated
Austrian 4.0 %	Bulgarian 5.0 %	2	0 0	0 0	Pair drops out due to rank tests	
German 3.0 %	Ottoman 4.0 %	3	0 0	0 0	Pair drops out due to rank tests	
German 3.0 %	Bulgarian 5.0 %	2	1 0	0 0	[1; -0.88***]; [-1.13***; 1] [1; -0.89***]; [-1.12***; 1]	Valid cointegration relationship
Ottoman 4.0 %	Bulgarian 5.0 %	3	0 1	0 0	[1; -0.60*]; [-1.67***; 1] [1; -0.28**]; [495.65***; 1]	Valid cointegration relationship
<i>B. War</i>						
Austrian 4.0 %	German 3.0 %	24	0 1	0 1	[1; -1.58**]; [413.72***; 1] [1; -0.92***]; [466.19**; 1]	Valid cointegration relationship
Austrian 4.0 %	Ottoman 4.0 %				Pair drops out due to unit root test	
Austrian 4.0 %	Bulgarian 5.0 %				Pair drops out due to unit root test	
German 3.0 %	Ottoman 4.0 %				Pair drops out due to unit root test	
German 3.0 %	Bulgarian 5.0 %				Pair drops out due to unit root test	

Table A.13 continued

Series 1	Series 2	Lags used in the VAR	Significant rank of Trace test	Significant rank of Maximum Eigenvalue test	Hypothesis test on cointegrating vector in VECM (Model suggested by AIC in italics)	Final stage judgement
Ottoman 4.0 %	Bulgarian 5.0 %				Pair drops out due to unit root test	
<i>C. Post-war</i>						
Austrian 4.0 %	German 3.0 %	7	1 1	1 1	[1; -3.05***]; [134.33***; 1] [1; -2.63***]; [-0.38***; 1]	Valid cointegration relationship
Austrian 4.0 %	Ottoman 4.0 %		Pair drops out due to unit root test			
Austrian 4.0 %	Bulgarian 5.0 %	20	1 1	1 1	[1; -59.38***]; [-41.12***; 1] [1; -71.93***]; [-0.01; 1]	Pair drops out due to double normalization restriction violated
German 3.0 %	Ottoman 4.0 %		Pair drops out due to unit root test			
German 3.0 %	Bulgarian 5.0 %	2	0 0	0 0	Pair drops out due to rank tests	
Ottoman 4.0 %	Bulgarian 5.0 %		Pair drops out due to unit root test			

Notes: Trace- and Maximum Eigenvalue-statistics not shown (statistical significance on the one-percent level assumed for these tests). *, **, *** denote statistical significance on the one-, five-, and ten-per cent levels.

Table A.14: A global test on cointegrated alliance partners – Estimation summary for pairs involving the major Allied Powers

Series 1	Series 2	Lags used in the VAR	Significant rank of Trace test	Significant rank of Maximum Eigenvalue test	Hypothesis test on cointegrating vector in VECM (Model suggested by AIC in italics)	Final stage judgement
<i>A. Pre-war</i>						
Russian 4.0 %	Serbian 4.0 %	3	1 1	1 1	[1;-0.72***]; [-1.39***;1] [1;-0.74***]; [-1.34***;1]	Valid cointegration relationship
Russian 4.0 %	Italian 3.5 %	2	0 0	0 0	Pair drops out due to rank tests	
Russian 4.0 %	Romanian 4.0 %	3	0 0	0 0	Pair drops out due to rank tests	
Russian 4.0 %	Portuguese 4.5 %	3	0 0	0 0	Pair drops out due to rank tests	
Russian 4.0 %	Japanese 5.0 %	7	0 0	0 0	Pair drops out due to rank tests	
Russian 4.0 %	Chinese 4.5 %		Pair drops out due to unit root test			
<i>B. War</i>						
French 5.0 %	English 5.0 %	9	1 1	1 1	[1;-163.64***]; [-171.33***;1] [1;-11.10***]; [-0.09;1]	Valid cointegration relationship
French 5.0 %	Russian 4.0 %	9	1 1	1 1	[1;-0.10***]; [-10.26***;1] [1;-0.14***]; [-7.14***;1]	Valid cointegration relationship
French 5.0 %	Serbian 4.0 %	10	1 0	0 0	[1;-0.26***]; [-3.80***;1] [1;-0.20***]; [-4.97***;1]	Valid cointegration relationship
French 5.0 %	Italian 3.5 %	13	0 0	0 0	Pair drops out due to rank tests	

Table A.14 continued

Series 1	Series 2	Lags used in the VAR	Significant rank of Trace test	Significant rank of Maximum Eigenvalue test	Hypothesis test on cointegrating vector in VECM (Model suggested by AIC in italics)	Final stage judgement
French 5.0 %	Romanian 4.0 %	9	1 1	1 0	[1;0.95***]; [1.05***;1] <i>[1;0.12]; [8.22***;1]</i>	Pair drops out due to double normalization restriction violated
French 5.0 %	Portuguese 4.5 %	16	0 0	0 0	Pair drops out due to rank tests	
French 5.0 %	Japanese 5.0 %	Pair drops out due to unit root test				
French 5.0 %	Chinese 4.5 %	17	1 1	0 1	[;-1.90***]; [-0.52***;] <i>[;-4.73***]; [-0.21;]</i>	Pair drops out due to double normalization restriction violated
English 5.0 %	Russian 4.0 %	3	1 1	1 1	<i>[;0.01]; [105.43***;]</i> [;0.01]; [153.27***;]	Pair drops out due to double normalization restriction violated
English 5.0 %	Serbian 4.0 %	2	1 1	1 1	<i>[1;0.03**]; [31.76***;1]</i> [1;0.02]; [41.45***;1]	Valid cointegration relationship
English 5.0 %	Italian 3.5 %	2	1 1	1 1	<i>[1;0.03**]; [35.47***;1]</i> [1;0.03*]; [31.03***;1]	Valid cointegration relationship
English 5.0 %	Romanian 4.0 %	4	1 0	1 0	<i>[1;-0.22***]; [-4.53***;1]</i> <i>[1;-0.30***]; [-3-33***;1]</i>	Valid cointegration relationship
English 5.0 %	Portuguese 4.5 %	3	0 0	0 0	Pair drops out due to rank tests	
English 5.0 %	Japanese 5.0 %	Pair drops out due to unit root test				
English 5.0 %	Chinese 4.5 %	4	0 0	0 0	Pair drops out due to rank tests	

Table A.14 continued

Series 1	Series 2	Lags used in the VAR	Significant rank of Trace test	Significant rank of Maximum Eigenvalue test	Hypothesis test on cointegrating vector in VECM (Model suggested by AIC in italics)	Final stage judgement
Russian 4.0 %	Serbian 4.0 %	24	0 0	0 0	Pair drops out due to rank tests	
Russian 4.0 %	Italian 3.5 %	13	0 0	0 0	Pair drops out due to rank tests	
Russian 4.0 %	Romanian 4.0 %	4	0 0	0 0	Pair drops out due to rank tests	
Russian 4.0 %	Portuguese 4.5 %	3	1 1	1 1	<i>[1;65.58***]; [0.01;1]</i> <i>[1;177.41***]; [0.00;1]</i>	Pair drops out due to double normali-zation restriction violated
Russian 4.0 %	Japanese 5.0 %	Pair drops out due to unit root test				
Russian 4.0 %	Chinese 4.5 %	11	1 1	1 1	<i>[1;-11.83***]; [-0.08***;1]</i> <i>[1;-23.12***]; [-0.04*;1]</i>	Valid cointegration relationship
<i>C. Post-war</i>						
French 5.0 %	English 5.0 %	20	0 0	0 0	Pair drops out due to rank tests	
French 5.0 %	Russian 4.0 %	20	0 0	0 0	Pair drops out due to rank tests	
French 5.0 %	Serbian 4.0 %	Pair drops out due to unit root test				
French 5.0 %	Italian 3.5 %	4	1 1	1 1	<i>[1;-0.36***]; [-2.80***;1]</i> <i>[1;-0.36***]; [4490.19***;1]</i>	Valid cointegration relationship
French 5.0 %	Romanian 4.0 %	Pair drops out due to unit root test				

Table A.14 continued

Series 1	Series 2	Lags used in the VAR	Significant rank of Trace test	Significant rank of Maximum Eigenvalue test	Hypothesis test on cointegrating vector in VECM (Model suggested by AIC in italics)	Final stage judgement
French 5.0 %	Portuguese 4.5 %	14	0 0	0 0	Pair drops out due to rank tests	
French 5.0 %	Japanese 5.0 %	18	0 0	0 0	Pair drops out due to rank tests	
French 5.0 %	Chinese 4.5 %	24	0 0	0 0	Pair drops out due to rank tests	
English 5.0 %	Russian 4.0 %	20	0 0	0 0	Pair drops out due to rank tests	
English 5.0 %	Serbian 4.0 %		Pair drops out due to unit root test			
English 5.0 %	Italian 3.5 %	2	0 0	0 0	Pair drops out due to rank tests	
English 5.0 %	Romanian 4.0 %		Pair drops out due to unit root test			
English 5.0 %	Portuguese 4.5 %	21	0 0	0 0	Pair drops out due to rank tests	
English 5.0 %	Japanese 5.0 %	21	0 0	0 0	Pair drops out due to rank tests	
English 5.0 %	Chinese 4.5 %	24	0 0	0 0	Pair drops out due to rank tests	
Russian 4.0 %	Serbian 4.0 %		Pair drops out due to unit root test			
Russian 4.0 %	Italian 3.5 %	2	0 0	0 0	Pair drops out due to rank tests	

Table A.14 continued

Series 1	Series 2	Lags used in the VAR	Significant rank of Trace test	Significant rank of Maximum Eigenvalue test	Hypothesis test on cointegrating vector in VECM (Model suggested by AIC in italics)	Final stage judgement
French 5.0 %	Portuguese 4.5 %	14	0 0	0 0	Pair drops out due to rank tests	
French 5.0 %	Japanese 5.0 %	18	0 0	0 0	Pair drops out due to rank tests	
French 5.0 %	Chinese 4.5 %	24	0 0	0 0	Pair drops out due to rank tests	
English 5.0 %	Russian 4.0 %	20	0 0	0 0	Pair drops out due to rank tests	
English 5.0 %	Serbian 4.0 %		Pair drops out due to unit root test			
English 5.0 %	Italian 3.5 %	2	0 0	0 0	Pair drops out due to rank tests	
English 5.0 %	Romanian 4.0 %		Pair drops out due to unit root test			
English 5.0 %	Portuguese 4.5 %	21	0 0	0 0	Pair drops out due to rank tests	
English 5.0 %	Japanese 5.0 %	21	0 0	0 0	Pair drops out due to rank tests	
English 5.0 %	Chinese 4.5 %	24	0 0	0 0	Pair drops out due to rank tests	
Russian 4.0 %	Serbian 4.0 %		Pair drops out due to unit root test			
Russian 4.0 %	Italian 3.5 %	2	0 0	0 0	Pair drops out due to rank tests	

Table A.14 continued

Series 1	Series 2	Lags used in the VAR	Significant rank of Trace test	Significant rank of Maximum Eigenvalue test	Hypothesis test on cointegrating vector in VECM (Model suggested by AIC in italics)	Final stage judgement
Russian 4.0 %	Romanian 4.0 %	Pair drops out due to unit root test				
Russian 4.0 %	Portuguese 4.5 %	20	0	0	Pair drops out due to rank tests	
Russian 4.0 %	Japanese 5.0 %	19	0	0	Pair drops out due to rank tests	
Russian 4.0 %	Chinese 4.5 %	23	0	0	Pair drops out due to rank tests	

Notes: Trace- and Maximum Eigenvalue-statistics not shown (statistical significance on the one-percent level assumed for these tests). *, **, *** denote statistical significance on the one-, five-, and ten-per cent levels.

Table A.15: A global test on cointegrated alliance partners – Estimation summary for pairs among the minor Allied Powers

Series 1	Series 2	Lags used in the VAR	Significant rank of Trace test	Significant rank of Maximum Eigenvalue test	Hypothesis test on cointegrating vector in VECM (Model suggested by AIC in italics)	Final stage judgement
<i>A. Pre-war</i>						
Serbian 4.0 %	Italian 3.5 %	2	0 0	0 0	Pair drops out due to rank tests	
Serbian 4.0 %	Romanian 4.0 %	2	0 0	0 0	Pair drops out due to rank tests	
Serbian 4.0 %	Portugal 4.5 %	3	0 0	0 0	Pair drops out due to rank tests	
Serbian 4.0 %	Japanese 5.0 %	5	0 0	0 0	Pair drops out due to rank tests	
Serbian 4.0 %	Chinese 4.5 %		Pair drops out due to unit root test			
Italian 3.5 %	Romanian 4.0 %	2	0 0	0 0	Pair drops out due to rank tests	
Italian 3.5 %	Portugal 4.5 %	3	0 0	0 0	Pair drops out due to rank tests	
Italian 3.5 %	Japanese 5.0 %	3	0 0	0 0	Pair drops out due to rank tests	
Italian 3.5 %	Chinese 4.5 %		Pair drops out due to unit root test			
Romanian 4.0 %	Portugal 4.5 %	3	0 0	0 0	Pair drops out due to rank tests	
Romanian 4.0 %	Japanese 5.0 %	2	0 0	0 0	Pair drops out due to rank tests	
Romanian 4.0 %	Chinese 4.5 %		Pair drops out due to unit root test			

Table A.15 continued

Series 1	Series 2	Lags used in the VAR	Significant rank of Trace test	Significant rank of Maximum Eigenvalue test	Hypothesis test on cointegrating vector in VECM (Model suggested by AIC in italics)	Final stage judgement
Portugal 4.5 %	Japanese 5.0 %	3	0 0	0 0	Pair drops out due to rank tests	
Portugal 4.5 %	Chinese 4.5 %		Pair drops out due to unit root test			
Japanese 5.0 %	Chinese 4.5 %		Pair drops out due to unit root test			
<i>B. War</i>						
Serbian 4.0 %	Italian 3.5 %	2	0 0	0 0	Pair drops out due to rank tests	
Serbian 4.0 %	Romanian 4.0 %	4	1 0	1 0	[1;3.09***]; [0.32***;1] [1;2.74***]; [0.36***;1]	Pair drops out due to cointegrating vector being unstable
Serbian 4.0 %	Portugal 4.5 %	4	1 1	1 1	[1;25.97***]; [0.04;1] [1;42.91***]; [0.02;1]	Pair drops out due to double normalization restriction violated
Serbian 4.0 %	Japanese 5.0 %		Pair drops out due to unit root test			
Serbian 4.0 %	Chinese 4.5 %	25	0 1	0 0	[1;-5.40***]; [-0.18**;1] [1;-14.72***]; [207.59*;1]	Pair drops out due to cointegrating vector being unstable
Italian 3.5 %	Romanian 4.0 %	4	0 0	0 0	Pair drops out due to rank tests	
Italian 3.5 %	Portugal 4.5 %	2	1 1	1 1	[1;25.01***]; [0.04*;1] [1;15.49***]; [0.06*;1]	Pair drops out due to cointegrating vector being unstable
Italian 3.5 %	Japanese 5.0 %		Pair drops out due to unit root test			
Italian 3.5 %	Chinese 4.5 %	13	1 1	1 0	[1;-6.24***]; [-0.16***;1] [1;-8.58***]; [-0.12**;1]	Valid cointegration relationship

Table A.15 continued

Series 1	Series 2	Lags used in the VAR	Significant rank of Trace test	Significant rank of Maximum Eigenvalue test	Hypothesis test on cointegrating vector in VECM (Model suggested by AIC in italics)	Final stage judgement
Italian 3.5 %	Chinese 4.5 %	13	1 1	1 0	[1;-6.24***]; [-0.16***;1] [1;-8.58***]; [-0.12**;1]	Valid cointegration relationship
Romanian 4.0 %	Portugal 4.5 %	4	1 1	1 1	[1;-6.71***]; [-0.15;1] [1;16.04***]; [0.06;1]	Pair drops out due to double normalization restriction violated
Romanian 4.0 %	Japanese 5.0 %		Pair drops out due to unit root test			
Romanian 4.0 %	Chinese 4.5 %	4	1 1	1 1	[1;2.21***]; [0.45***;1] [1;4.85***]; [0.21;1]	Valid cointegration relationship
Portugal 4.5 %	Japanese 5.0 %		Pair drops out due to unit root test			
Portugal 4.5 %	Chinese 4.5 %	5	1 1	1 1	[1;0.31**]; [3.24***;1] [1;9.71***]; [0.10;1]	Valid cointegration relationship
Japanese 5.0 %	Chinese 4.5 %		Pair drops out due to unit root test			
<i>C. Post-war</i>						
Serbian 4.0 %	Italian 3.5 %		Pair drops out due to unit root test			
Serbian 4.0 %	Romanian 4.0 %		Pair drops out due to unit root test			
Serbian 4.0 %	Portugal 4.5 %		Pair drops out due to unit root test			
Serbian 4.0 %	Japanese 5.0 %		Pair drops out due to unit root test			
Serbian 4.0 %	Chinese 4.5 %		Pair drops out due to unit root test			
Italian 3.5 %	Romanian 4.0 %		Pair drops out due to unit root test			
Italian 3.5 %	Portugal 4.5 %	3	0 0	0 0	Pair drops out due to rank tests	

Table A.15 continued

Series 1	Series 2	Lags used in the VAR	Significant rank of Trace test	Significant rank of Maximum Eigenvalue test	Hypothesis test on cointegrating vector in VECM (Model suggested by AIC in italics)	Final stage judgement
Italian 3.5 %	Japanese 5.0 %	4	0 0	0 0	Pair drops out due to rank tests	
Italian 3.5 %	Chinese 4.5 %	2	0 1	0 1	[1;-1.26***]; [-0.79***;1] [1;-1.89***]; [-0.53***;1]	Valid cointegration relationship
Romanian 4.0 %	Portugal 4.5 %		Pair drops out due to unit root test			
Romanian 4.0 %	Japanese 5.0 %		Pair drops out due to unit root test			
Romanian 4.0 %	Chinese 4.5 %		Pair drops out due to unit root test			
Portugal 4.5 %	Japanese 5.0 %	19	0 0	0 0	Pair drops out due to rank tests	
Portugal 4.5 %	Chinese 4.5 %	9	0 0	1 0	[1;-0.86***]; [-1.16***;1] [1;-0.89***]; [-1.12***;1]	Pair drops out due to cointegrating vector being unstable
Japanese 5.0 %	Chinese 4.5 %	6	0 0	0 0	Pair drops out due to rank tests	

Notes: Trace- and Maximum Eigenvalue-statistics not shown (statistical significance on the one-percent level assumed for these tests). *, **, *** denote statistical significance on the one-, five-, and ten-per cent levels.

Table A.16: A global test on cointegrated alliance partners – cross-alliance relationships among the major powers

Series 1	Series 2	Lags used in the VAR	Significant rank of Trace test	Significant rank of Maximum Eigenvalue test	Hypothesis test on cointegrating vector in VECM (Model suggested by AIC in italics)	Final stage judgement
<i>A. Pre-war</i>						
Austria 4.0 %	Russian 4.0 %	7	0 0	0 0	Pair drops out due to rank tests	
German 3.0 %	Russian 4.0 %	3	0 0	0 0	Pair drops out due to rank tests	
Austria 4.0 %	Serbian 4.0 %	4	1 1	1 0	[1;-2.34***]; [-0.43***;1] [1;-1.27***]; [-0.78***;1]	Valid cointegration relationship
Austria 4.0 %	Italian 3.5 %	2	0 0	0 0	Pair drops out due to rank tests	
Austria 4.0 %	Romanian 4.0 %	2	0 0	0 0	Pair drops out due to rank tests	
Austria 4.0 %	Portuguese 4.5 %	3	0 0	0 0	Pair drops out due to rank tests	
Austria 4.0 %	Japanese 5.0 %	6	0 0	0 0	Pair drops out due to rank tests	
Austria 4.0 %	Chinese 4.5 %		Pair drops out due to unit root test			
German 3.0 %	Serbian 4.0 %	2	0 0	0 0	Pair drops out due to rank tests	
German 3.0 %	Italian 3.5 %	2	0 0	0 0	Pair drops out due to rank tests	

Table A.16 continued

Series 1	Series 2	Lags used in the VAR	Significant rank of Trace test	Significant rank of Maximum Eigenvalue test	Hypothesis test on cointegrating vector in VECM (Model suggested by AIC in italics)	Final stage judgement
<i>A. Pre-war</i>						
German 3.0 %	Romanian 4.0 %	2	0 0	0 0	Pair drops out due to rank tests	
German 3.0 %	Portuguese 4.5 %	3	0 0	0 0	Pair drops out due to rank tests	
German 3.0 %	Japanese 5.0 %	3	0 0	0 0	Pair drops out due to rank tests	
German 3.0 %	Chinese 4.5 %		Pair drops out due to unit root test			
<i>B. War</i>						
Austria 4.0 %	English 5.0 %	21	0 1	0 1	[1;0.87]; [1.15**;1] [1;2.00***]; [0.50***;1]	Valid cointegration relationship
Austria 4.0 %	French 5.0 %	10	1 1	1 1	[1;17.15***]; [0.06***;1] [1;18.62***]; [0.05**;1]	Valid cointegration relationship
Austria 4.0 %	Russian 4.0 %	11	0 0	0 0	Pair drops out due to rank tests	
German 3.0 %	English 5.0 %	23	1 1	1 1	[1;-9.49***]; [-0.10***;1] [1;-9.70***]; [-0.10***;1]	Valid cointegration relationship
German 3.0 %	French 5.0 %	20	1 1	0 1	[1;0.75**]; [1.33***;1] [1;1.49***]; [0.67***;1]	Valid cointegration relationship
German 3.0 %	Russian 4.0 %	3	0 1	0 1	[1;0.05]; [18.43***;1] [1;0.26***]; [3.86***;1]	Valid cointegration relationship
Austria 4.0 %	Serbian 4.0 %	10	0 0	0 0	Pair drops out due to rank tests	

Table A.16 continued

Series 1	Series 2	Lags used in the VAR	Significant rank of Trace test	Significant rank of Maximum Eigenvalue test	Hypothesis test on cointegrating vector in VECM (Model suggested by AIC in italics)	Final stage judgement
Austria 4.0 %	Italian 3.5 %	13	0 0	0 0	Pair drops out due to rank tests	
Austria 4.0 %	Romanian 4.0 %	9	0 0	0 0	Pair drops out due to rank tests	
Austria 4.0 %	Portuguese 4.5 %	12	0 0	0 0	Pair drops out due to rank tests	
Austria 4.0 %	Japanese 5.0 %	Pair drops out due to unit root test				
Austria 4.0 %	Chinese 4.5 %	23	0 1	0 1	<i>[1;-4.01***]; [-0.25***;1]</i> <i>[1;212.31***]; [0.00;1]</i>	Pair drops out due to cointegrating vector being unstable
German 3.0 %	Serbian 4.0 %	2	1 1	1 1	<i>[1;0.47***]; [2.11***;1]</i> <i>[1;0.49***]; [2.01***;1]</i>	Valid cointegration relationship
German 3.0 %	Italian 3.5 %	2	0 0	0 0	Pair drops out due to rank tests	
German 3.0 %	Romanian 4.0 %	23	1 1	1 1	<i>[1;-0.86***]; [404.35***;1]</i> <i>[1;-1.18***]; [179.53***;1]</i>	Valid cointegration relationship
German 3.0 %	Portuguese 4.5 %	2	1 0	1 0	<i>[1;7.47***]; [0.13*;1]</i> <i>[1;7.81***]; [0.13*;1]</i>	Pair drops out due to cointegrating vector being unstable
German 3.0 %	Japanese 5.0 %	Pair drops out due to unit root test				
German 3.0 %	Chinese 4.5 %	5	0 0	0 0	Pair drops out due to rank tests	

Table A.16 continued

Series 1	Series 2	Lags used in the VAR	Significant rank of Trace test	Significant rank of Maximum Eigenvalue test	Hypothesis test on cointegrating vector in VECM (Model suggested by AIC in italics)	Final stage judgement
<i>C. Post-war</i>						
Austria 4.0 %	English 5.0 %	23	0 0	0 0	Pair drops out due to rank tests	
Austria 4.0 %	French 5.0 %	11	1 0	1 0	[1;188.32***]; [-5.89***;1] [1;25.76***]; [0.04***;1]	Pair drops out due to cointegrating vector being unstable
Austria 4.0 %	Russian 4.0 %	13	0 0	0 0	Pair drops out due to rank tests	
Austria 4.0 %	English 5.0 %	25	0 0	0 0	Pair drops out due to rank tests	
German 3.0 %	French 5.0 %	3	0 0	1 1	[1;7.42***]; [0.13***;1] [1;9.19***]; [0.11***;1]	Valid cointegration relationship
German 3.0 %	Russian 4.0 %	3	0 0	0 0	Pair drops out due to rank tests	
Austria 4.0 %	Serbian 4.0 %	Pair drops out due to unit root test				
Austria 4.0 %	Italian 3.5 %	12	0 0	0 0	Pair drops out due to rank tests	
Austria 4.0 %	Romanian 4.0 %	Pair drops out due to unit root test				
Austria 4.0 %	Portuguese 4.5 %	24	0 1	0 1	[1;15.05***]; [0.07***;1] [1;20.91***]; [0.05***;1]	Valid cointegration relationship
Austria 4.0 %	Japanese 5.0 %	18	0 0	0 0	Pair drops out due to rank tests	

Table A.16 continued

Series 1	Series 2	Lags used in the VAR	Significant rank of Trace test	Significant rank of Maximum Eigenvalue test	Hypothesis test on cointegrating vector in VECM (Model suggested by AIC in italics)	Final stage judgement
<i>C. Post-war</i>						
Austria 4.0 %	Chinese 4.5 %	23	0 0	0 0	Pair drops out due to rank tests	
German 3.0 %	Serbian 4.0 %		Pair drops out due to unit root test			
German 3.0 %	Italian 3.5 %	2	0 0	0 0	Pair drops out due to rank tests	
German 3.0 %	Romanian 4.0 %		Pair drops out due to unit root test			
German 3.0 %	Portuguese 4.5 %	3	0 1	0 1	[1;5.00***]; [0.20***;1] [1;7.74***]; [0.13***;1]	Valid cointegration relationship
German 3.0 %	Japanese 5.0 %	3	0 0	0 1	[1;3.11***]; [0.32***;1] [1;4.30***]; [0.23***;1]	Valid cointegration relationship
German 3.0 %	Chinese 4.5 %	2	0 0	0 0	Pair drops out due to rank tests	

Notes: Trace- and Maximum Eigenvalue-statistics not shown (statistical significance on the one-percent level assumed for these tests). *, **, *** denote statistical significance on the one-, five-, and ten-per cent levels.

Table A.17: A global test on cointegrated allies – cross-alliance relationships in major power-minor power pairs

Series 1	Series 2	Lags used in the VAR	Significant rank of Trace test	Significant rank of Maximum Eigenvalue test	Hypothesis test on cointegrating vector in VECM (Model suggested by AIC in italics)	Final stage judgement
<i>A. Pre-war</i>						
Ottoman 4.0 %	Russian 4.0 %	3	0 1	1 1	[11;-0.74***]; [265.18***;1] [1;-0.47*]; [238.14***;1]	Pair drops out due to cointegrating vector being unstable
Bulgarian 5.0 %	Russian 4.0 %	3	0 0	0 0	Pair drops out due to rank tests	
Ottoman 4.0 %	Serbian 4.0 %	2	1 1	1 1	[1;-0.54***]; [526.94***;1] [1;-0.2914]; [335.55***;1]	Pair drops out due to double normalization restriction violated
Ottoman 4.0 %	Italian 3.5 %	2	0 1	0 0	[1;-0.96***]; [-1.04***;1] [1;-0.33]; [133.81***;1]	Pair drops out due to double normalization restriction violated
Ottoman 4.0 %	Romanian 4.0 %	2	0	0	Pair drops out due to rank tests	
Ottoman 4.0 %	Portuguese 4.5 %	3	0	0	Pair drops out due to rank tests	
Ottoman 4.0 %	Japanese 5.0 %	3	0	0	Pair drops out due to rank tests	
Ottoman 4.0 %	Chinese 4.5 %	Pair drops out due to unit root test				
Bulgarian 5.0 %	Serbian 4.0 %	2	0	0	Pair drops out due to rank tests	
Bulgarian 5.0 %	Italian 3.5 %	2	0	0	Pair drops out due to rank tests	
Bulgarian 5.0 %	Romanian 4.0 %	3	0	0	Pair drops out due to rank tests	

Table A.17 continued

Series 1	Series 2	Lags used in the VAR	Significant rank of Trace test	Significant rank of Maximum Eigenvalue test	Hypothesis test on cointegrating vector in VECM (Model suggested by AIC in italics)	Final stage judgement
Bulgarian 5.0 %	Portuguese 4.5 %	3	0 0	0 0	Pair drops out due to rank tests	
Bulgarian 5.0 %	Japanese 5.0 %	3	0 0	0 0	Pair drops out due to rank tests	
Bulgarian 5.0 %	Chinese 4.5 %	Pair drops out due to unit root test				
<i>B. War</i>						
Ottoman 4.0 %	English 5.0 %	Pair drops out due to unit root test				
Ottoman 4.0 %	French 5.0 %	Pair drops out due to unit root test				
Ottoman 4.0 %	Russian 4.0 %	Pair drops out due to unit root test				
Bulgarian 5.0 %	English 5.0 %	Pair drops out due to unit root test				
Bulgarian 5.0 %	French 5.0 %	Pair drops out due to unit root test				
Bulgarian 5.0 %	Russian 4.0 %	Pair drops out due to unit root test				
Ottoman 4.0 %	Serbian 4.0 %	Pair drops out due to unit root test				
Ottoman 4.0 %	Italian 3.5 %	Pair drops out due to unit root test				
Ottoman 4.0 %	Romanian 4.0 %	Pair drops out due to unit root test				
Ottoman 4.0 %	Portuguese 4.5 %	Pair drops out due to unit root test				
Ottoman 4.0 %	Japanese 5.0 %	Pair drops out due to unit root test				
Ottoman 4.0 %	Chinese 4.5 %	Pair drops out due to unit root test				
Bulgarian 5.0 %	Serbian 4.0 %	Pair drops out due to unit root test				
Bulgarian 5.0 %	Italian 3.5 %	Pair drops out due to unit root test				

Table A.17 continued

Series 1	Series 2	Lags used in the VAR	Significant rank of Trace test	Significant rank of Maximum Eigenvalue test	Hypothesis test on cointegrating vector in VECM (Model suggested by AIC in italics)	Final stage judgement
Bulgarian 5.0 %	Romanian 4.0 %		Pair drops out due to unit root test			
Bulgarian 5.0 %	Portuguese 4.5 %		Pair drops out due to unit root test			
Bulgarian 5.0 %	Japanese 5.0 %		Pair drops out due to unit root test			
Bulgarian 5.0 %	Chinese 4.5 %		Pair drops out due to unit root test			
<i>C. Post-war</i>						
Ottoman 4.0 %	English 5.0 %		Pair drops out due to unit root test			
Ottoman 4.0 %	French 5.0 %		Pair drops out due to unit root test			
Ottoman 4.0 %	Russian 4.0 %		Pair drops out due to unit root test			
Bulgarian 5.0 %	English 5.0 %	23	1 1	1 1	[1;0.36*]; [2.75***;1] [1;0.08]; [11.94***;1]	Pair drops out due to double normalization restriction violated
Bulgarian 5.0 %	French 5.0 %	8	1 1	0 1	[1;1.70***]; [0.59***;1] [1;1.19**]; [0.84***;1]	Valid cointegration relationship
Bulgarian 5.0 %	Russian 4.0 %	2	0 0	0 0	[1;-0.42**]; [-2.40***;1] [1;0.16]; [6.38***;1]	Pair drops out due to double normalization restriction violated
Ottoman 4.0 %	Serbian 4.0 %		Pair drops out due to unit root test			
Ottoman 4.0 %	Italian 3.5 %		Pair drops out due to unit root test			
Ottoman 4.0 %	Romanian 4.0 %		Pair drops out due to unit root test			
Ottoman 4.0 %	Portuguese 4.5 %		Pair drops out due to unit root test			
Ottoman 4.0 %	Japanese 5.0 %		Pair drops out due to unit root test			
Ottoman 4.0 %	Chinese 4.5 %		Pair drops out due to unit root test			

Table A.17 continued

Series 1	Series 2	Lags used in the VAR	Significant rank of Trace test	Significant rank of Maximum Eigenvalue test	Hypothesis test on cointegrating vector in VECM (Model suggested by AIC in italics)	Final stage judgement
Bulgarian 5.0 %	Serbian 4.0 %		Pair drops out due to unit root test		Pair drops out due to rank tests	
Bulgarian 5.0 %	Italian 3.5 %	2	0 0	0 0		
Bulgarian 5.0 %	Romanian 4.0 %		Pair drops out due to unit root test			
Bulgarian 5.0 %	Portuguese 4.5 %	15	0 0	0 0	Pair drops out due to rank tests	
Bulgarian 5.0 %	Japanese 5.0 %	2	0 0	0 0	Pair drops out due to rank tests	
Bulgarian 5.0 %	Chinese 4.5 %	2	0 0	0 0	Pair drops out due to rank tests	

Notes: Trace- and Maximum Eigenvalue-statistics not shown (statistical significance on the one-percent level assumed for these tests). *, **, *** denote statistical significance on the one-, five-, and ten-per cent levels.