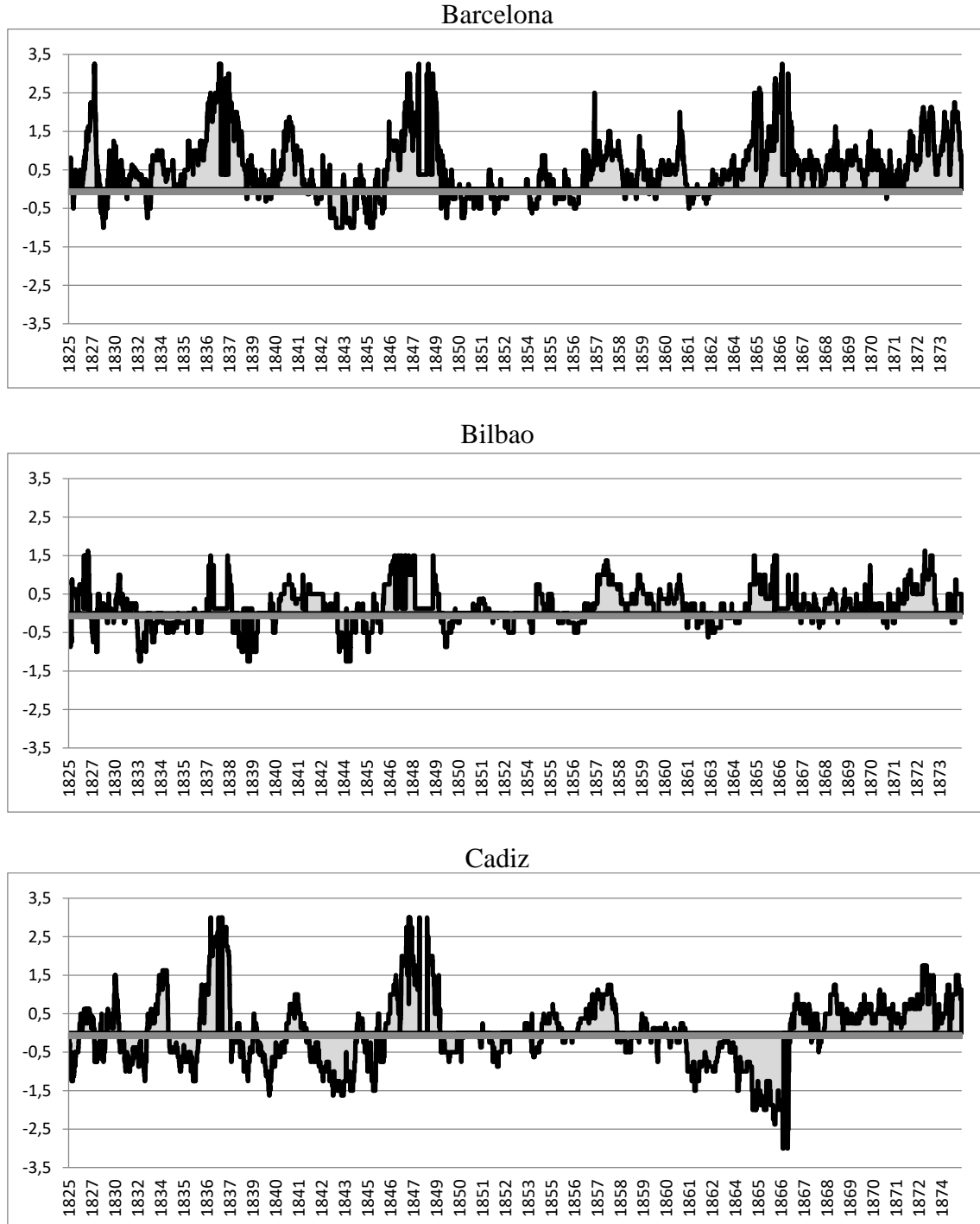


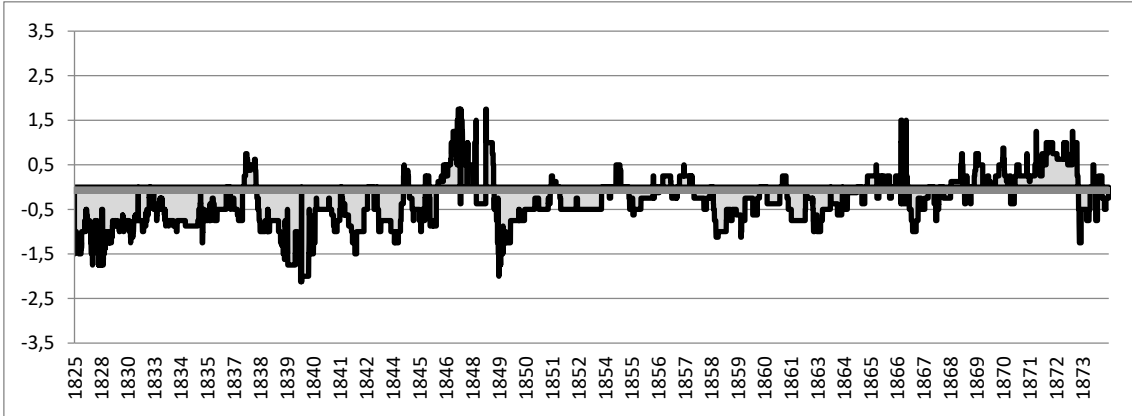
APPENDIX. BILLS OF EXCHANGE PRICE DATA

APPENDIX

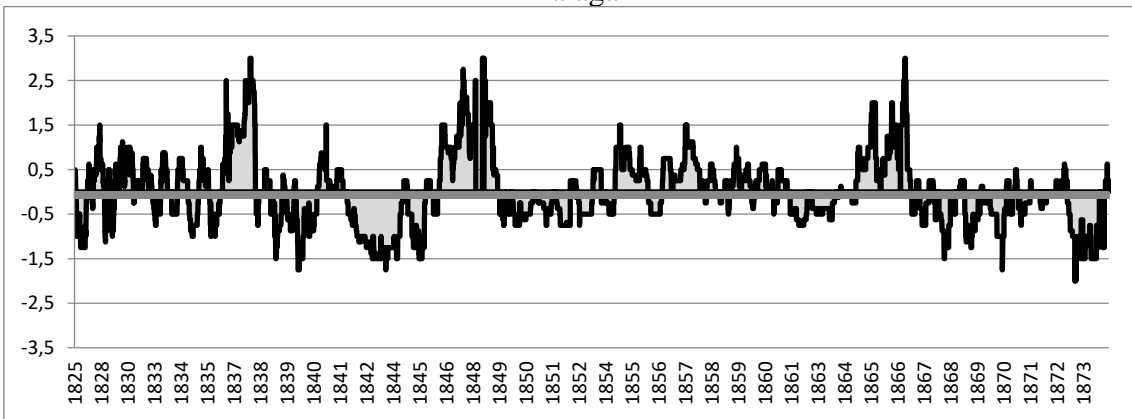
Figure A1. Prices in Madrid of bills of exchange payable in each city (percentage points of distance from official parity)



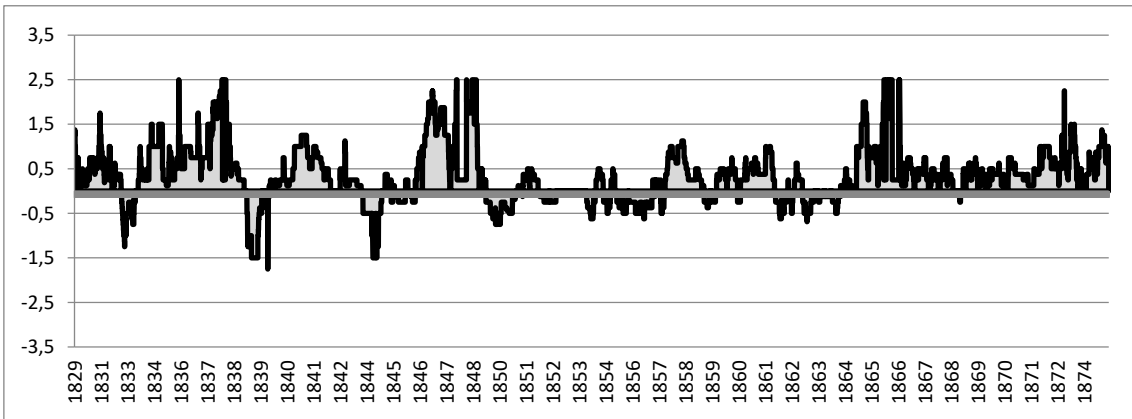
Corunna



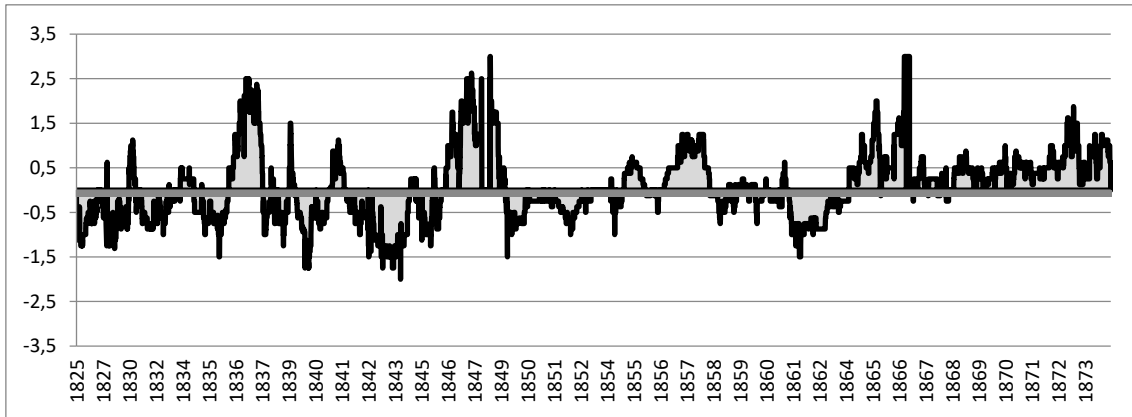
Malaga



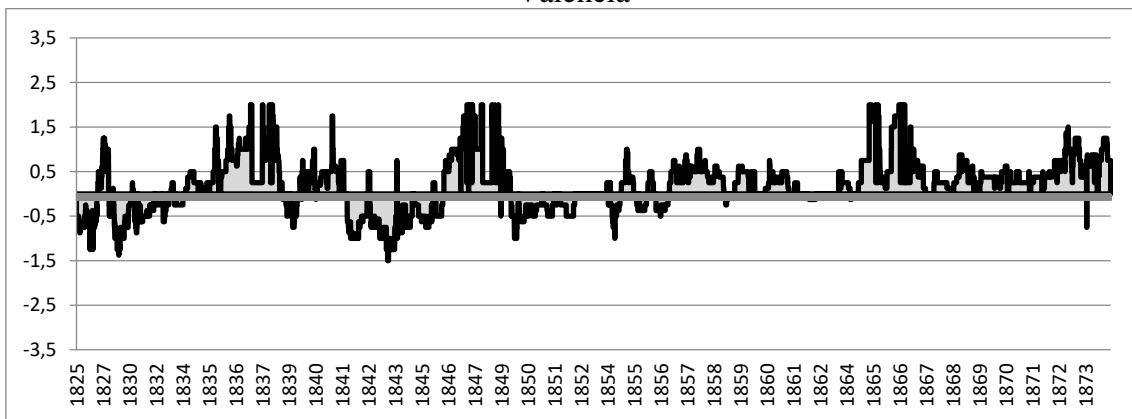
Santander



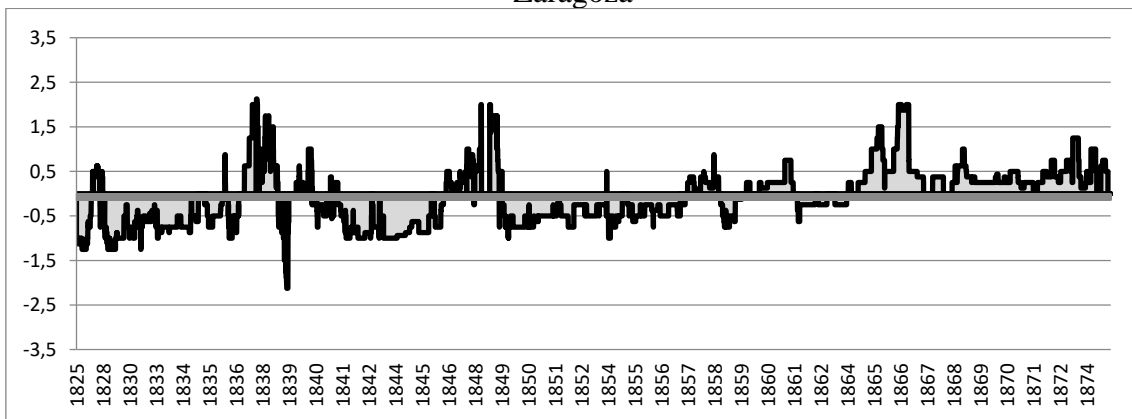
Seville



Valencia



Zaragoza



Notes: The published data are the quotations reported by brokers at the end of the day. They are sometimes reported as a range, which represented the bid-ask price (Castaño 1862, p. 99). In those cases, we have used the range midpoint (Canjels *et. al.* 2004, p. 870). Data plotted in Figure A1 exclude outliers. These correspond to periods of financial crises (especially those of 1848 and 1866), in which the Bank of Spain delayed the conversion of banknotes into specie. Under those circumstances, private bankers and money dealers kept exchanging banknotes for metallic currency, after applying a discount to the face value of the banknote (see Santillán 1865, T1, pp. 281-83; and Tedde 1999, p. 222, and 2015, pp. 18-27, for the 1848 crisis; and Tedde 2015, pp. 304-27, for the 1866 crisis). During these episodes of “pseudo-convertibility”, some bills of exchange circulated with a special clause indicating: “payable in gold or silver, excluding all paper money” (Historical Archive of the Bank of Spain, *Cartas de los Comisionados del Reino y Sucursales*, file 1125 –Corunna, 1847 and 1848-, and file 1307 –Santander, 1848) and exchange rate quotations were divided in two: nominal exchange rates (in the case of bills payable in notes), whose

quotation incorporated the depreciation of banknotes; and metal exchange rates (in the case of bills payable in gold or silver). We have found some anecdotal evidence of provincial bulletins which published both nominal and metal exchange rates with Madrid. For instance, in the case of Bilbao, on 2 December 1848, bills payables in notes were quoted at 3.5%, whereas those payables in metal were quoted at 1.5%. The Zaragoza Discount Bank (*Caja de Descuentos*) indicated in April-June 1848 that: “all changes must be made in notes due to shortage of money”. In April 1848, the commissioner of the Bank of San Fernando in Zaragoza complained that: “it was impossible to find takers for bills of exchange even at a discount of 2.5, and silver is extremely scarce. Having bills today is useless, since silver is impossible to find.” In the same town, in August 1848, the exchange was 4 to 4.5% in the case of notes and 1% in the case of metal (Historical Archive of the Bank of Spain, *Cartas de los Comisionados del Reino y Sucursales*, file 1079, Bilbao; file 1380, Zaragoza; and file 1125, Cadiz). Unfortunately, Madrid brokers only reported the nominal exchange rate (published in the *Gaceta de Madrid* and the *Official Bulletin of the Madrid Stock Exchange*). Because the specie-point mechanism measures transaction costs in convertible specie-systems, and free convertibility is an absolute requirement for the proper estimation of the model, we must exclude those observations. To identify outliers, we proceed as in Stock and Watson (2005) and define outliers as those observations with absolute median deviations larger than 3 times the interquartile range. Following these authors’ recommendations, to carry out the estimation, outliers have been replaced by the median value of the series.

Data for Cadiz were misreported from 13 August 1866 to 19 October 1866 (exchange rates were quoted with premium instead of discount). To certify and correct the quotation, we have calculated the indirect exchange rate in Madrid on Cadiz as the exchange rate in Madrid on London multiplied by the exchange rate in London on Cadiz (data from *The Economist*).