Figure 1. Yangli in Shanghai and Tianjin, monthly data, Jan. 1898–March 1933

*Notes:* The upper panel shows deviation (in percent) from parity for the yangli series. The lower panel measures the yangli spread as the deviation between Tianjin and Shanghai.

*Sources:* Kong, *Nankai Jingji Zhishu*, pp. 475–8, pp. 495–6.

Figure 2. Standard deviations of domestic exchange rate and foreign exchange rate, 60-month moving window, Jan. 1898–March 1933

*Notes:* This figure shows the standard deviations of the yangli spread between Shanghai and Tianjin, and the standard deviations of the foreign exchange rate (deviation from parity) for the Shanghai tael against US dollars, in a moving window of 60 observations.

*Sources:* See Figure 1 for the yangli spread. Foreign exchange rates are taken from Wu, ‘Yige Xinde Waihui Zhishu’.

Figure 3. Threshold estimates in 10-year moving windows, Jan. 1898–March 1933

*Notes:* This figure shows the estimates of silver points from the restricted model and the general TAR model, respectively. The threshold in each sub-period is estimated in a moving window of 120 months. The window is shifted by 12 months each time.

*Sources:* See Figure 1.

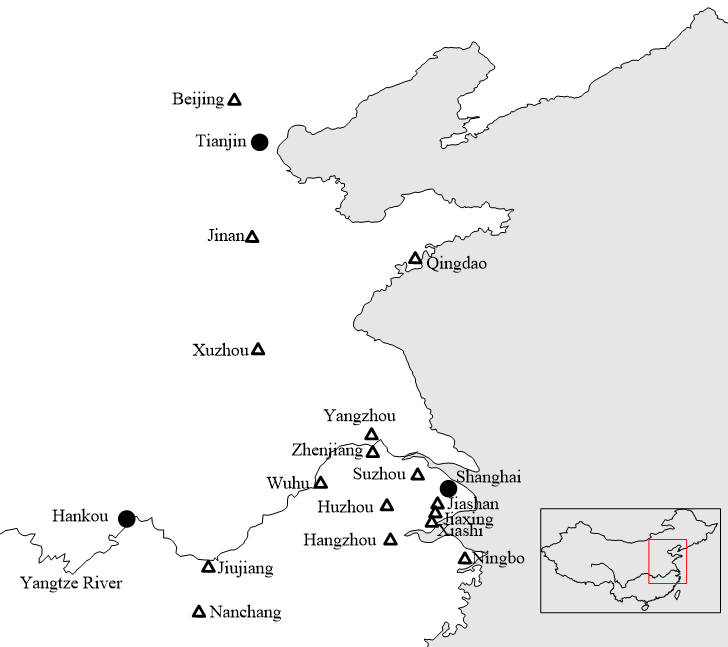
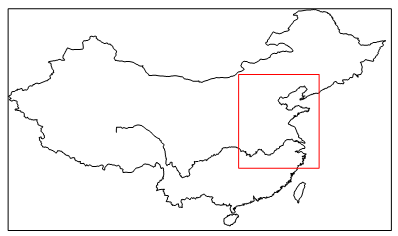
 

Figure 4. Spatial distribution of sample cities

*Notes:* The small chart shows the location of the map in present-day China.Each small triangle represents the location of a sample city. The larger circles show major commercial centers.

*Source:* The locations of cities are derived from Shangwu Yinshuguan, *Zhongguo Xinyutu*.

Figure 5. Silver points and distance

*Notes:* The silver point between shanghai and each of these cities is estimated from a general TAR model. Cities marked with sample period are available for two-separated periods.

*Source:* See Section II.

Figure 6. The yangli spread, estimated silver points, and silver dollar flows across Shanghai and Tianjin, Jan. 1922–Dec. 1929.

*Notes:* The silver point estimates (±0.974%) are from the general TAR model using daily data.

*Sources:* Yangli data is drawn from the *Shenbao* newspaper, the *Bankers’ Weekly* and the *Economic Statistics*. The volume of silver dollar movement obtained from the *North-China Daily News*.

Figure 7. The yangli spread, estimated silver points, and silver dollar flows across Shanghai and Hankou, Jan. 1923–Dec. 1926.

*Notes:* The silver point estimates (±0.650%) are from the general TAR model using daily data.

*Sources:* See Figure 6.

Figure 8. Seasonals in yangli, note issue and silver reserves of banks in Shanghai, 1928–36

*Notes:* Note issue represents the total volume of the ten biggest banks in Shanghai. Silver reserves is the total reserves of all banks in Shanghai.

*Sources:* The data for the seasonal patterns in note issue and silver reserves are taken from Wu and Hu, ‘Shanghai Jinrongzhi Jijie’. Seasonals in yangli are estimated by the authors.

Table 1. The silver content of Chinese currencies

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Silver currency | Description | Fine silver  (Troy oz.) | Fine silver  (gms) | Parity  (to Shanghai tael) |
| Shanghai tael | Unit of account | 1.0802 | 33.5989 | 1.0000 |
| Tianjin tael | Unit of account | 1.1398 | 35.4515 | 1.0551 |
| Hankou tael | Unit of account | 1.1169 | 34.7413 | 1.0340 |
| Eagle dollar1 | Coin | 0.7880 | 24.5101 | 0.7295 |
| National dollar2 | Coin | 0.7699 | 23.9475 | 0.7127 |

*Notes:* 1. According to an official assay made by the Chinese Mint, the eagle dollar contains oz. 0.7880 of fine silver, or Shanghai tale 0.7295 (Zhang, 2013, pp. 49–56). 2. The *National Currency Regulations* required that, the national dollar shall contain 23.9779 grams (or oz. 0.7709) of fine silver, and the ratio of the difference between the weight and fineness of silver coins and those of the legal tender shall not exceed 3/1000. Assay made by the Japanese Government Mint showed that it contains oz. 0.7699 of pure silver, with the error being 1.2/1000. See Kann, *The currencies of China*, p. 161–3; Yu, ‘Zhengjin Zhoubao’.

*Sources:* The silver content of Shanghai tael, and the parity of Tianjin tael and Shanghai tael are taken from Young, ‘The Shangai Tael’; Wu, ‘Yige Xinde Waihui Zhishu’. The parity of Hankou tael and Shanghai tael are taken from Jin, *Guonei Shangye*, p. 9.

Table 2. Restricted (TECM) model, monthly yangli spread between Shanghai and Tianjin

|  |  |  |  |
| --- | --- | --- | --- |
|  | Full period  (01/1898–03/1933) | Sub-periods | |
| Qing Empire  (01/1898–12/1911) | Republican era  (01/1912–03/1933) |
|  | 1.441 [0.393, 1.929] | 2.485 [2.375, 3.043] | 0.879 [0.327, 0.973] |
|  | 0.222  (0.215) | 0.250  (0.534) | 0.063  (0.286) |
|  | 0.746\*\*\*  (0.136) | 1.933\*\*\*  (0.383) | 0.707\*\*\*  (0.223) |
|  | −0.347  (0.281) | −0.864  (0.701) | 0.374\*\*  (0.150) |
|  | −0.377  (0.204)\* | −1.452  (0.522)\*\*\* | 0.164  (0.148) |
|  | 0.841 | 1.051 | 0.607 |
|  | 8.236\*\* | 9.585\*\* | 9.813\*\* |
| Chan test | 12.073\*\* | 3.666 | 8.060 |
| Log likelihood | −524.03 | −243.32 | −232.882 |
| Regime (*T*) |  |  |  |
| Upper | 21 | 6 | 34 |
| Middle | 360 | 147 | 192 |
| Lower | 42 | 15 | 30 |

*Notes:* Standard errors reported in parentheses. \*, \*\*, and \*\*\* denote 10%, 5%, and 1% levels of significance, respectively. The 90% asymptotic confidence intervals of threshold, , reported in brackets, which are calculated using the likelihood ratio approach given by Hansen, ‘Inference in TAR models’. is the Ljung-Box Q statistics up to order 3 for testing additional autocorrelation, and the Chan test for nonlinearities, in the residual series.

*Sources:* See Figure 1.

Table 3. TAR model, monthly yangli spread between Shanghai and Tianjin

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Full period  (01/1898–03/1933) | | | Sub-periods | | | | | |
| Qing Empire  (01/1898–12/1911) | | | Republican era  (01/1912–03/1933) | | |
|  | 1.441 [1.380, 1.461] | | | 2.211 [2.182, 2.275] | | | 0.744 [0.593, 1.237] | | |
| *T* | 423 | | |  | | |  | | |
| *logL* | −498.34 | | | −217.82 | | | −220.65 | | |
|  | 0.798 | | | 0.941 | | | 0.585 | | |
|  | 2.851 | | | 1.725 | | | 5.875 | | |
| Chan test | 1.733 | | | 3.121 | | | 6.770 | | |
| Regime | upper | middle | lower | upper | middle | lower | upper | middle | lower |
|  | 0.074  (0.527) | −0.016 (0.042) | −1.485\*\*\* (0.359) | 2.015  (1.67) | −0.146\* (0.082) | −4.319\*\*\* (0.826) | 0.069  (0.248) | 0.006 (0.046) | −0.483\* (0.257) |
|  | 1.033\*\*\* (0.212) | 0.673\*\*\* (0.073) | 0.413\*\* (0.16) | 0.544 (0.619) | 0.710\*\*\* (0.106) | 0.009  (0.263) | 0.715\*\*\*  (0.239) | 0.669\*\*\* (0.122) | 0.076 (0.214) |
|  | −0.427\*\*\* (0.094) | 0.015  (0.06) | −0.216\* (0.127) | −0.469\* (0.247) | 0.060 (0.115) | −1.460\*\*\* (0.267) | −0.037  (0.14) | −0.192\*\* (0.077) | 0.325\*\* (0.15) |
|  |  |  |  | 0.115 (0.213) | −0.052 (0.089) | 1.125\*\*\* (0.211) |  |  |  |
| T | 22 | 359 | 42 | 9 | 137 | 22 | 50 | 172 | 34 |
| 1− | 0.394 | 0.311 | 0.803 | 0.810 | 0.282 | 1.326 | 0.322 | 0.523 | 0.599 |

*Notes* and *Sources:* See Table 2.

Table 4. TAR model, daily yangli spread

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Shanghai-Tianjin  (01/1921–12/1929) | | | Shanghai-Hankou  (01/1923–12/1926) | | |
|  | 0.974 [0.713, 1.099] | | | 0.650 [0.646, 0.952] | | |
|  | 2589 | | | 1170 | | |
|  | −27.27 | | | −524.54 | | |
|  | 0.245 | | | 0.380 | | |
|  | 5.160 | | | 5.922 | | |
| Chan test | 4.462 | | | 3.325 | | |
|  |  |  |  |  |  |  |
| Regime | upper | middle | lower | upper | middle | lower |
|  | −0.020 (0.063) | −0.001 (0.005) | −0.028 (0.063) | 0.134\*\*  (0.056) | −0.003  (0.013) | 0.021 (0.054) |
|  | 0.730\*\*\* (0.064) | 0.840\*\*\* (0.024) | 0.817\*\*\* (0.066) | 0.898\*\*\*  (0.077) | 0.690\*\*\*  (0.061) | 0.705\*\*\*  (0.044) |
|  | 0.231\*\*\* (0.049) | 0.131\*\*\* (0.023) | 0.070 (0.057) | −0.173\*\*  (0.072) | 0.283\*\*\*  (0.048) | 0.228\*\*\*  (0.041) |
| T | 271 | 2167 | 151 | 202 | 834 | 133 |
| 1− | 0.039 | 0.029 | 0.113 | 0.275 | 0.027 | 0.067 |

*Notes:* See Table 2.

*Sources:* See Figure 6.

Table 5. Silver points and the distance from Shanghai

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Dependent variable:  *Silver point (mean=0.589%)* | Least-cost path | | Linear distance | |
| (1) | (2) | (3) | (4) |
|  | 0.066\*\*\*  (0.007) | 0.068\*\*\*  (0.007) | 0.090\*\*\*  (0.009) | 0.092\*\*\*  (0.008) |
|  |  | −0.149\*\*\*  (0.052) |  | −0.177\*\*\*  (0.048) |
|  |  | −0.077  (0.056) |  | −0.076  (0.051) |
|  |  | 0.155  (0.108) |  | 0.138  (0.098) |
|  |  | −0.038  (0.115) |  | −0.017  (0.106) |
|  | 0.245\*\*\*  (0.047) | 0.330\*\*\*  (0.059) | 0.224\*\*\*  (0.046) | 0.328\*\*\*  (0.054) |
|  | 0.844 | 0.907 | 0.843 | 0.922 |
| 𝜎 | 0.126 | 0.110 | 0.126 | 0.101 |

*Notes:* Standard errors reported in parentheses. \*, \*\*, and \*\*\* denote 10%, 5%, and 1% levels of significance, respectively. The dependent variable is the silver points between city and Shanghai. Distance variable ()—which scaled in 100 km units—denotes the least-cost path in columns (1) and (2), and the linear distance in columns (3) and (4), between city and Shanghai.

*Sources:* See Figure 5.

Table 6. Probit model

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | A. Shanghai-Tianjin  01/1921–12/1929 | | B. Shanghai-Hankou  01/1923–12/1926 | |
|  | ShanghaiTianjin | TianjinShanghai | ShanghaiHankou | HankouShanghai |
|  | 0.672\*\*\*  (0.119) | 0.401\*\*\*  (0.124) | 0.407\*\*\*  (0.153) | 0.728\*\*\*  (0.168) |
|  | 0.382\*\*\*  (0.106) | −0.521\*\*\*  (0.178) | 0.351\*  (0.211) | 0.168  (0.236) |
|  | 0.107  (0.128) | −0.356\*\*  (0.163) | 0.004  (0.318) | −0.269  (0.334) |
| Constant | −1.967\*\*\*  (0.062) | −1.761\*\*\*  (0.054) | −2.176\*\*\*  (0.105) | −2.201\*\*\*  (0.101) |
| McFadden- | 0.050 | 0.030 | 0.038 | 0.066 |
| LR | 44.72\*\*\* | 24.07\*\*\* | 11.71\*\*\* | 19.35\*\*\* |

*Notes:* The dependent variable is an indicator representing the occurrence of silver flow, and shows the direction of silver flow. is an indicator representing the instance of yangli spread which exceeds our preferred silver point estimate. and are indicators representing the agricultural trade season and major military conflicts. LR (Likelihood Ratio) statistic is used to test the joint null hypothesis of all the coefficients except the intercept are zeros. Standard errors reported in parentheses. \*\* and \*\*\* denote 5% and 1% levels of significance, respectively.

*Sources:* See Figure 5.