## Online Appendix

**Appendix 1: Composition of Assets of Banking System in 2008 and 2014**

This appendix provides details on how we calculate the composition of the assets of the Chinese banking system, which we define as banks and trusts. Table A1 provides these numbers for 2008 and 2014. Figure 8 in the paper plots a subset of these numbers for all years between 2008 and 2014.

**Table A1: Decomposition of Total Assets of China's Banking Sector (trillion Yuan)**

|  | 2008 | 2014 | Data Source |
|---|---|---|---|
| **Total Assets** | 58.2 | 160.8 |  |
| (1) Reserve Assets | 9.4 | 23.3 | Balance sheet of other depository corporations (from Central Bank) |
| (2) Central Bank Bonds | 5.3 | 9.6 | Balance sheet of other depository corporations (from Central Bank) |
| (3) Domestic Government Bonds | 4.3 | 0.7 | China Statistical Yearbook |
| (4) Lending to Non-Financial Sector | 39.2 | 127.2 | National Bureau of Statistics |
| (4.1) Lending to Households | 5.7 | 22.9 | Balance sheet of other depository corporations (from Central Bank) |
| (4.2) Total Lending to LFVs | 9.4 | 38.4 | WIND |
| "Official" Lending to LFVs | 5.6 | 21.5 | National Audit Office and Ministry of Finance |
| (4.3) Lending to Firms (excluding LFVs) | 24.1 | 65.9 | Residual of lending to households and LFVs |

Total assets are the sum of reserve assets (1), central bank bonds (2), domestic government bonds (3), and lending to the non-financial sector (4). To be clear, lending to the non-financial sector includes loans to local financing vehicles. The data on holdings of reserve assets (1) and central bank bonds (2) are provided by the central bank's data on the balance sheet of "other depository institutions." We assume that only "other depository institutions" hold reserve assets and central bank bills. The numbers on the financial system's holdings of government bonds (3) are from the China Statistical Yearbook. Total lending to non-financial

institutions (4) are imputed from estimates of "social financing" provided by China's National Bureau of Statistics, where "social financing" is defined as the annual net flow of bank loans, bonds, trust loans, undiscounted bank acceptances, and equity financing. We use the stock of bank loans in 2001 and the ratio of new bank loans to social financing in 2002 (about 90%) to infer the stock of total lending to non-financial institutions in 2001. We exclude equity financing, which is less than 3% of social financing.

We further decompose total lending to non-financial institutions (4) into lending to households (4.1), local financial vehicles (4.2), and firms (4.3). Lending to households (4.1) is from the central bank's data on balance sheet of "other depository institutions." We assume that only "other depository institutions" lend to households. Total Lending to LFVs (4.2) is imputed from the WIND micro-data (see Appendix 2 below). Official LFV Lending (which is a subset of total lending to LFVs) is measured by the data from National Audit Office and the Ministry of Finance (see the text for details). Finally, lending to firms (4.3) is calculated as the residual of lending to non-financial institutions after subtracting lending to households and local financing vehicles.

**Appendix 2: Total Debt of Local Financial Vehicles**

The WIND dataset collects the public information of firms that have issued or will issue bonds.[1] WIND defines a LFV as a firm where the (i) shareholder of the bond issuer is a local government or a subsidiary of local government; and (ii) the business of the bond issuer includes local infrastructure or public utilities. Debt is measured as total liabilities (including non-bond debt) on the issuer's consolidated balance sheet. Notice that total liabilities includes the debt of the holding company and their subsidiaries. We drop LFVs that are owned by other LFVs in the dataset. We identify parent-subsidiary relationship by the ownership information provided by WIND and manually checking the names of all LFVs in the dataset. There are a total of 157 LFVs in the WIND data (out of 1884) that are subsidiaries of other LFVs. We refer to the remaining LFVs in the WIND dataset as WIND LFVs. Table A2 provides the summary statistics of the WIND LFVs. Remember that there were a total of 6,576 LFVs in 2011 and 7,170 LFVs in 2013 (as reported by the audits of the National Audit Office). Table A2 indicates there were about 1,700 WIND LFVs in these two years.

Table A2: Summary Statistics

| | (1) | (2) | (3) | (4) | (5) | (6) |
|---|---|---|---|---|---|---|
| | # WIND LFVs | Total Debt (trillion Yuan) | # of New WIND LFVs | Average Debt of New LFVs (billion Yuan) | # Incumbent WIND LFVs | Average Debt of Incumbent WIND LFVs (billion Yuan) |
| 2006 | 263 | 2.4 | 263 | 9.2 | 0 | - |
| 2007 | 413 | 3.8 | 154 | 5.2 | 259 | 11.7 |
| 2008 | 576 | 5.4 | 163 | 4.2 | 413 | 11.4 |
| 2009 | 901 | 9.3 | 326 | 4.8 | 575 | 13.4 |
| 2010 | 1155 | 12.5 | 256 | 3.8 | 899 | 12.9 |
| 2011 | 1445 | 15.6 | 290 | 2.7 | 1155 | 12.8 |
| 2012 | 1652 | 19.6 | 209 | 2.4 | 1443 | 13.3 |
| 2013 | 1701 | 24.0 | 65 | 4.6 | 1636 | 14.5 |
| 2014 | 1711 | 29.9 | 22 | 20.7 | 1689 | 17.4 |
| 2015 | 1688 | 35.2 | 6 | 6.1 | 1682 | 20.9 |

Note: New WIND LFVs are defined as those that appear in the WIND dataset for the first time. Incumbent LFVs are those that existed in the WIND dataset in the previous year.

Our goal is to back out the debt of the LFVs that are not in the WIND dataset. To do this, we will use information from LFVs that show up in the WIND database for the first time in each year – these are the so-called "new" LFVs in Table A2. Columns (4) and (6) shows that rapid entry of LFVs until 2012 is associated with a decline in the relative size of the new LFVs. This is consistent with a model where there is a fixed cost of issuing bonds and larger LFVs thus self-select into issuing bonds. And when the fixed cost of issuing bonds declines, there is more entry of smaller LFVs.

Specifically, assume that the CDF of LFV debt is given by $F(d)$ where $d$ stands for debt. There is a fixed cost for bond issuance such that only LFVs with $d > \underline{d}$ issue bonds. The number of WIND LFVs as a share of the number of all LFVs is thus equal to $1 - F(\underline{d})$. The proportion of the new WIND LFVs in period $t$ is equal to $F(\underline{d}_{t-1}) - F(\underline{d}_t)$, while the proportion of the incumbent WIND LFVs that enter into the dataset at period $t - i$ is equal to

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$F\left(\underline{d}_{t-i-1}\right) - F\left(\underline{d}_{t-i}\right)$. For notational convenience, the WIND LFVs that enter into the dataset at period $t - i$ are referred to as group $(t, i)$. We use the sample from 2007 to 2015. There are two groups in 2007, one entering in 2006 and the other entering in 2007. The number of groups increases to 9 in 2015. There are a total of 54 groups in the sample.

We next impose the assumption that that $F(d)$ follows a Pareto distribution. We estimate the shape parameter of the Pareto distribution of each group $(t, i)$. On average a regression of the log debt on the log of the rank yields a coefficient of -1.12 with a R-squared of 0.9. With the estimate of the shape parameter of the Pareto distribution, we then back out the mean of the change in the fixed cost over time. We assume the number of all LFVs is given by the numbers reported by the National Audit office. We can then use the estimate of the fixed cost of issuing bonds in each period and the shape of the Pareto distribution to estimate the debt of the LFVs NOT in the WIND database. The ratio of the total debt of the LFVs not in the WIND database to the total debt of all LFVs is given by Figure A1. This is the ratio we use to impute the total debt of LFVs shown in Figures 5 and 6.

Figure A1: Total Debt of the Non-Bond Issuing LFVs as a Share of Total Debt of the WIND LFVs