Data Article

Survey data on inter-firm linkages and innovation activities of Chinese manufacturing SMEs

Liang Mei a, Tao Zhang b,*, Jin Chen c, d

a National School of Development, Peking University, Beijing, 100871, China
b Loughborough University London, Here East, Queen Elizabeth Olympic Park, London, E15 2GZ, UK
c Research Centre for Technological Innovation, Tsinghua University, Beijing, 100084, China
d School of Economics and Management, Tsinghua University, Beijing, 100084, China

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ABSTRACT

The data presented in this article is based on a questionnaire survey regarding the inter-firm linkages and innovation activities of Chinese manufacturing SMEs. A valid sample of 420 SMEs was collected, covering six manufacturing industries. The data involves the inter-firm linkages, innovation performance, R&D intensity, IT adoption, and other demographic indicators of the sampling firms. In this data article, we also briefly present the subject area, background of data source, survey process, scale of data, value of data, and main methods used to analyze the data.

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1. Data

The data described in the paper provides information about manufacturing firms' innovation activities in a particular region - Zhejiang Province - of China, a region where SMEs and relevant private firms are the economic pillars. Data was collected by a sample survey, with the questionnaires and...
relevant items constructed according to prior innovation literature. Statistical methods based upon large scale sample data were adopted to analyze both full-sample data set (targeting SMEs) sub-sample data set (targeting medium-sized firms). A paper that investigated the effects of inter-firm linkages on SME’s innovation performance was published in Technological Forecasting and Social Change [1].

Descriptive statistics of the data file can be found in Tables 1–4.

1.1. Distribution by the firm ownership

Table 1 shows that most of the SMEs in the dataset were private firms (79.3%).

1.2. Distribution by the firm export orientation

Table 2 shows that most of the SMEs in the dataset did export on international market (62.9%).
1.3. Distribution by the industrial background of firms

Table 3 shows that six types of manufacturing industries were covered by the sampling firms, involving Bio Instruments and Equipment Industry (6.0%), Electronics Equipment Industry (11.9%), Hardware & Software Industry (6.4%), Light Industry (36.9%), Machinery Industry (29.3%), and Textiles Industry (9.5%).

1.4. Distribution by the firm size

Table 4 shows the distribution of the firm size, indicating that most of the firms were medium-sized firms (76.0%), while small part of them were small-sized firms (24.0%).

2. Experimental design, materials and methods

2.1. Ethical statements

The research was approved by the Research Ethics Committee of Tsinghua University and was carried out in accordance with the code of ethics governing questionnaire surveys.

Table 1
Distribution by the firm ownership.

|                | Frequency | Percent | Valid Percent | Cumulative Percent |
|----------------|-----------|---------|---------------|--------------------|
| Non-private    | 87        | 20.7    | 20.7          | 20.7               |
| Private        | 333       | 79.3    | 79.3          | 100.0              |
| Total          | 420       | 100.0   | 100.0         |                    |

Table 2
Distribution by the firm export orientation.

|                | Frequency | Percent | Valid Percent | Cumulative Percent |
|----------------|-----------|---------|---------------|--------------------|
| No export      | 156       | 37.1    | 37.1          | 37.1               |
| Do export      | 264       | 62.9    | 62.9          | 100.0              |
| Total          | 420       | 100.0   | 100.0         |                    |

Table 3
Distribution by the industries.

| Industry                     | Frequency | Percent | Valid Percent | Cumulative Percent |
|------------------------------|-----------|---------|---------------|--------------------|
| Bio Instruments and Equipment Industry | 25        | 6.0     | 6.0           | 6.0                |
| Electronics Equipment Industry | 50        | 11.9    | 11.9          | 17.9               |
| Hardware & Software Industry  | 27        | 6.4     | 6.4           | 24.3               |
| Light Industry                | 155       | 36.9    | 36.9          | 61.2               |
| Machinery Industry            | 123       | 29.3    | 29.3          | 90.5               |
| Textiles Industry             | 40        | 9.5     | 9.5           | 100.0              |
| Total                         | 420       | 100.0   | 100.0         |                    |

Table 4
Distribution by the firm size.

| Size            | Frequency | Percent | Valid Percent | Cumulative Percent |
|-----------------|-----------|---------|---------------|--------------------|
| Medium-sized    | 319       | 76.0    | 76.0          | 76.0               |
| Small-sized     | 101       | 24.0    | 24.0          | 100.0              |
| Total           | 420       | 100.0   | 100.0         |                    |
2.2. Data collection

The data was collected via a questionnaire survey in Zhejiang Province, China. The data was filtered based on the requirements of the statistical analysis method (i.e. structural equation modelling). We only kept the variables that are relevant to the analysis in the data file and removed other irrelevant variables. The filtering was carried out manually by using SPSS.

Specific variables in the data file were derived in the following ways:

Firm ownership was calculated by the item (Private), firm scale was calculated by the item (Person) with the item (lnperson) be transferred by natural logarithm algorithm, firms’ export orientation was measured by the item (export).

IP was calculated by set (p1-p4), representing the innovation performance of firms.

LPO presented in the full model was calculated by set (a1-a4), representing the linkages with competitors, suppliers, lead users and customers, and complementors; LSI was calculated by set (a5-a8), representing the linkages with universities, research institutes, governance agencies, and finance and law service agencies.

AC in one model was calculated by the standardized value of R&D expenditures (represented by ZRD), and in the other mode directly calculated by the item (IT), indicating the firm engaging information technology activities or not.

The item (industry) represented the industry background of samples.

Upon the measurements above, general statistical analysis approaches were used via software SPSS, which involve descriptive analysis, factor analysis, reliability and validity tests, and regression analysis. In addition, Structural Equation Model was adopted for data analysis via statistical software AMOS.

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Conflict of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.dib.2019.104671.

References

[1] L. Mei, T. Zhang, J. Chen, Exploring the effects of inter-firm linkages on SMEs’ open innovation from an ecosystem perspective: an empirical study of Chinese manufacturing SMEs, Technol. Forecast. Soc. Chang. 144 (2019) 118–128, https://doi.org/10.1016/j.techfore.2019.04.010.