China's Industrial Economy in 2018
Q4 Highlights and Annual Report[1]

Gan Jie

Center on Finance and Economic Growth
Cheung Kong Graduate School of Business

[1] This report is based on a nationwide quarterly survey of industrial firms, which is implemented by Beijing Allinfo Co., based on the questionnaire and sample provided by Professor Gan Jie, Director of the Center on Finance and Economic Growth. We thank Beijing Allinfo for its hard work and professionalism. We acknowledge the able research assistance of Harry Leung and Jessy Yao who provided support to the data analysis.

Executive Summary

Despite wide spread pessimism about the Chinese economy, our Business Sentiment Index stood at 51 for four quarters during 2018, making it the first expansion since the survey was launched in 2014. Other signs of improvements included a slight expansion in production, electricity consumption, domestic orders and slight expansion in production of the private firms. These positive developments were attributable to the supply-side reform and curtailment of production capacity in the past two years. However, investment was still sluggish and overcapacity remained prevalent, involving two-thirds of the firms. 18% of firms were affected by the trade war in Q4; but the overall impact was limited. Merely 4% of firms reported a large impact.

It's worth noting that, in 2018, R&D spending declined noticeably, while the firms' confidence about country's legal environment dropped significantly.

Given a lack of confidence and the slowdown in consumption, there is substantial uncertainty in 2019. Policy should focus on promoting long-term growth. Loosening of monetary policy can only be a short-term tool to prevent financial instability. The government needs to formulate systematic policies to promote technology innovation, which is the only path to long-term growth of the industrial economy.

Introduction

This report is based on data collected from our quarterly surveys of around 2,000 industrial firms in China. Conducted through telephone interviews, this survey, launched in 2014 Q2, is now in its fourth year. Our results are important in understanding the Chinese economy, because, if we exclude real estate and finance, the industrial sector now accounts for about 50% of China's non-agricultural GDP.

Our survey design ensures that our sample fully represents industry, region and company size. As a result, we are able to construct business indices that are, to the best of our knowledge, the most informative ones available. Furthermore, our survey questions allow us to understand the underlying mechanisms behind the data and analyze why the economy is doing well or not.

There were a total of 2,027 firms surveyed in 2018 Q4, of which 1,709 firms were also polled in our 2018 Q3 survey. The initial survey sample was based on stratified random sampling by industry, region and size from the 2008 Economic Census. Starting from 2017 Q2, we have also surveyed additional firms from the 2013 Industrial Enterprises database, which allows us to cover firms founded after 2008. Appendix A details the sampling procedure and compares our sample with the population.

I. 2018 Q4 Key Findings

I.1 Operating Conditions Continued to Improve

In Q4, the Business Sentiment Index[2] stood at 51, indicating a slight expansion. This made 2018 the first expansion period since the survey was launched in 2014 Q2 (Figure 1)[3]. The operating conditions continued to improve, reaching a four-year high of 59 (Q3: 58). The diffusion index for investment timing also increased to a historical high of 45 (Q3: 44), although still below the turning point of 50.

[2] Our BSI is the simple average of three diffusion indices, including current operating conditions, expected change in operating conditions and investment timing. Compared with other economic indices, our BSI is more forward-looking and is a reflection of the absolute level of economic activities.

[3] Specifically, the three questions underlying our Business Sentiment Index are the following: 1. How are current operating conditions – “good”, “neutral” or “difficult”? 2. What is the expected change in operating conditions during the next quarter – “up”, “same” or “down”? 3. To what extent is it now a good time to invest – “good”, “medium” or “bad?” The diffusion index is based on answers to multiple-choice questions, with the choices in analog to “good,” “neutral” and “bad”, or “up,” “same” and “down.” The diffusion index is computed as 100 * % of firms answering “good” + 50 * % of firms answering “neutral”. The diffusion index ranges between 0 and 100. A larger value indicates better operating conditions, with 50 marking the turning point between expansion and contraction.

Similarly to last quarter, this quarter's expansion was mainly driven by state-owned and foreign firms, with the diffusion indices being 59 and 56 respectively (Q3: 60 and 56). Private firms – the vast majority of industrial firms – stayed flat (diffusion index: 50). Other signs of improvements included a slight expansion in production, electricity consumption, domestic and foreign orders, with diffusion indices ranging between 51 and 53 (Q3: 50-51). At the same time, the expected operating conditions stayed flat, with a diffusion index of 50 (Q1-Q3: 52-54).

Investments were still weak but continued to increase in Q4. 7% of the firms made expansionary investments (Q3: 4%) (Figure 2).

I.2 Cost Continued to Rise, but to a Lesser Extent

Costs continued to rise in Q4, but to a lesser extent. The diffusion index of unit costs was 61 (Q3: 64). Firms with a significant increase in costs (i.e. quarterly costs rise above 5%) decreased significantly from 6% in last quarter to 3% in Q4 (Figure 3).

Unit cost increases were driven by raw material costs: the diffusion index of which was 59 (Q3: 65), whereas the labor cost index was 54. Notably, however, the labor cost index increased by 4 percentage points. Given the seasonal difficulties in hiring around Lunar New Year, labor cost can be a challenge for the next quarter.

I.3 Impact of Trade War Continued to Emerge

The impact of the Sino-US trade war continued to emerge in Q4, although the overall impact was limited. The proportion of affected firms increased by 3 points to 18% (Figure 11), whereas the proportion of firms reporting a significant impact stayed flat at 4%. Moreover, 3% of firms expected to be affected significantly by the trade war within the next two years (Q3: 3%).

Affected firms were mainly export firms, which accounted for 34% of our sample. Among these export firms, 31% were affected in Q4 and 7% reported a significant impact (Q3: 29% and 8% respectively).

The top five most affected industries included Textile, Rubber & Plastic Products, Paper Products, Cultural & Sports Products and Transportation (Railways, Ships and aerospace). 29% to 42% of firms in these industries were affected. Among industries with a significant impact, the two most affected ones were Textile (12%) and Rubber & Plastic Products (10%).

In addition, the export stayed flat, with a diffusion index of 50 (Q3: 49)[4].

II. 2018 Annual Review

II.1 Overall Conditions and Industry & Regional Distribution

2018 marked the first expansion period since our survey was launched in 2014 Q2. The Business Sentiment Index stood at 51 for four consecutive quarters. This slight expansion during the year was mainly driven by state-owned and foreign firms. Private firms – the vast majority of industrial firms – stayed flat (50). Production volume, electricity consumption, and domestic orders also expanded slightly. Although fixed investment remained sluggish, it improved during the year. Each quarter, the proportion of firms making fixed investment increased from 8-10% in 2017 to 11-13% in 2018. The proportion of firms with expansionary investment rose from 1% at the beginning of 2017 to 7% in the fourth quarter of 2018.

Inflation continued to ease in 2018. The diffusion index of product prices dropped from 56 in 2017 Q4 to 51 in 2018 Q4.

The best-performing industries in 2018 were Gas Production & Supply (Q4: 64), Production & Supply of Water (Q4: 62) and Power Production & Supply (Q4: 58). All of them were among the top five best-performing industries for, respectively, seven, eight and eleven consecutive quarters, indicating strong persistency in industry performance. The most difficult industries included Non-metallic Mineral Products (Q4: 41) and Smelting and Pressing of Ferrous Metals (Q4: 43). Both of them were among the bottom five worst-performing industries for ten and six consecutive quarters. They were also among the industries with the most severe overcapacity.

Table 3.1 displays regional business conditions. In Q4, the BSI ranged from 44 (Ningxia) to 54 (Hubei & Gansu). The regional business conditions also exhibited persistency. Specifically, among the top-performing list of Q4, Gansu, Liaoning, Shanxi and Shanghai appeared for two quarters in 2018. The bottom five provinces were Ningxia (44), Hebei (45), Heilongjiang (48), Shaanxi (49) and Guizhou (49).

[4] This conclusion is in contrast to the PMI published by the National Bureau of Statistics (NBS), mainly due to the sampling methods. The NBS sample is based on size-weighted sampling, resulting in more large, state-owned firms, and thus differences in industry distribution. For example, some of the heavy industries in the NBS sample, such as chemical products, mining, communications equipment & computer industry (accounted for 11.1%, 6.4% and 6.8% respectively) have greater weight than those in our sample (6.5%, 2.5% and 2.9%, respectively). The share of some of the light industries in our sample, such as textiles (10.7%) and paper products (6.7%), were significantly higher than those of the NBS (7.0% and 3.4%, respectively). Given that diffusion indices are designed to reflect the prevalence of the issues in question, our equal-weighted sampling method has merit and provides a nice complement to the NBS sample.

Ningxia and Hebei have appeared on the list ten and eleven times, respectively, out of the 16 quarters since 2015 Q1.

II.2 Challenges and Priorities

Weak demand is still by far the biggest challenge for the industrial economy (Figure 5). In Q4, for example, 60% of the firms surveyed cited a lack of orders. Rising costs came the second, with raw material and labor costs cited by 23% and 14% of firms, respectively. 12% of firms cited macroeconomic and industrial policies as limiting factors. 14% of firms cited environmental concerns. In addition, financing was not found to be a bottleneck, with only 1% replying that financing was a limiting factor, a finding consistent with past surveys.

II.2.1 Overcapacity Still Near a Historical High

Overcapacity was still at historically high levels throughout the year. In each quarter, over 60% of the firms reported oversupply in the domestic market, with a diffusion index of above 80 (Figure 6A). Neither was there any substantial improvement in the severity of overcapacity, measured by the proportion of firms reporting supply over demand by 10% and 20%.

We categorize an industry as having severe excess capacity if more than 10% of firms report excess capacity of more than 20%. There are 38 industries and 31 regions in total. In Q4, the number of industries and regions with severe excess capacity accounted for about half of the total firms (15 industries and 18 regions) (Figure 6B).

It is also worth noting that overcapacity in the international market was substantially better than in the domestic market, with the diffusion index of about ten points lower in Q4 (Figure 6A).

Weak demand has not caused inventory problems: the finished-goods inventory stayed largely flat, thanks to the “order-based” production model adopted by many Chinese firms. In Q4, as many as 43% of firms said they did not have significant levels of inventory because they started production only after receiving orders. For those carrying inventories, 82% said they expected their inventory to be digested within three months, with a further 15% saying it would take between four to six months. This left only 3% of the whole sample carrying inventory for more than six months.

II.2.2 Curtailment of Overcapacity

Each quarter, we attempt to call back all the firms that have been surveyed in the previous quarter. The proportion of firms that had suspended production or were suspected to have suspended production ranged between 2.4% and 4.3% (2017: 4.1-4.9%) during the year (Figure 7A). Those suspected of having suspended production included cases where, after between five to nine attempts to reach them, the phone number was either wrong, suspended or did not exist, and the line could not be connected or was busy.

Employment reduction remained stable in 2018. The proportions of firms with 10% and 20% drops in employment were mostly below 1% (Figure 7B). Based on the size distribution of firms with employment reduction and the number of industrial workers in 2017 being 218 million, we estimate that about two million jobs were lost during the year.

Consistent with an improved industrial structure, firms with severe overcapacity are more likely to reduce employment and production. In Q4, among those with severe overcapacity (above 20%), the proportions of firms reducing production by more than 5% and 10% were 32% and 23%, respectively, both significantly more than that of the whole sample (9% and 5%). Moreover, the proportions of firms reducing employment by more than 5% and 10% were 2.5% and 1.7%, respectively, also higher than that of the whole sample (1.2% and 0.7%).

Capacity utilization exhibited greater dispersion in 2018. About 60% of firms in Q4 reported a capacity utilization rate above 90%, up from 54% in 2017 Q4. On the other hand, 16% of firms still reported levels of below 70% in Q4, 2 points higher than the 14% in 2017 Q4 (Figure 8). There is no consensus as to what level of capacity utilization should be considered healthy. However, if we take the examples of the two largest western industrial nations, the US and Germany, their monthly average capacity utilizations were 79% (1994-2015) and 83% (1992-2015), respectively. Their lowest points after the financial crisis in 2008 were 67% and 70%, respectively, both measured in June 2009. Given the low profit margin of Chinese industrial firms, their sustainable utilization rate may be higher than that of their western counterparts.

Consistent with overcapacity and the resulting lack of orders, the problem of overdue trade receivables was still quite serious in 2018. About 26-28% (2017: 25-30%) of firms reported difficulties in collecting trade receivables from their customers. This problem was more prominent among private firms and firms producing capital goods, cited by about 38% (versus 26% in the whole sample) of firms, respectively. SOEs were disproportionally more likely to delay payment, accounting for about 12% of all firms that did so in Q4 (SOE share in the overall sample: 5%).

II.2.3 Costs, Prices and Margins

Cost rises are the second biggest challenge facing the industrial economy. While easing gradually and persistently in 2018, it was still a prominent issue with a diffusion index ranging between 61 and 69 (2017: 66-75) (Figure 3).

Overcapacity, combined with rising costs, results in low profit margins in general. Profit margins in 2018 were similar to 2017. In Q4, there were about 2/3 of firms with gross margins below 15% (Figure 9). Taken together, low margins may make it difficult for firms to invest in R&D and industrial upgrading.

II.2.4 Financing is Not a Bottleneck

Our survey has consistently found, since its inception in the second quarter of 2014, that financing is not a bottleneck for the industrial economy. In each quarter of 2018, only 1-2% of firms cited financing as a constraining factor (2017: 2-3%). In Q4, 20% of firms said they had "sufficient" funds, 78% answered "neutral", while only 2% reported "insufficient" funds (Figure 10A). Of those, the vast majority (95%) reported insufficient funds for production – not for expansion.

Only 1.5-2.5% of firms obtained new loans in each quarter of 2018 (Table 6.1 and Figure 10B). When asked about the reasons, the vast majority of firms without new loans (about 99%) reported that they did not have the need for capital.

In line with the overall tightening of liquidity, however, the diffusion index reflecting an "accommodating" bank lending attitude declined substantially during the year, from 69 in 2017 Q4 to 55 in 2018 Q4 (Figure 10C). Moreover, the diffusion index for small firms was 48, below the threshold of 50 for the first time, and indicating tightened financing for small firms.

Table 6.2 provides an overview of how Chinese firms have been financed. Internally-generated funds were, by far, the most important source of financing, with 96% of surveyed firms reporting this as their primary funding source. In Q4, 4% of firms reported the founder's own capital as the primary source of funds, while 29% reported this as the second most important source of funds. 71% of firms indicated bank loans as their second most important source of funds. Sources of financing were highly concentrated in Chinese firms: in the case of internal funds, 97% of firms reported that this largest financing source accounted for more than 50% of their total funds. These patterns have been highly consistent over time.

Taken together, against the background of overcapacity, investment opportunity has

been scarce, resulting in low loan demand. Thus, financing is not a bottleneck for the industrial economy.

III. Going Forward: Outlook, Institutions and Innovation

III.1 Economic Outlook

There is a resilient optimism about the economic outlook over the next three to five years. 84% of firms were either "optimistic" (21%) or "cautiously optimistic" (63%) (2017: 12% and 70%) (Figure 12A). Among those who were "not optimistic", 48% said their top concern was competition and overcapacity (2017: 41%) (Figure 12B). 21% and 23% of firms cited concerns over environmental issues and macroeconomic environment respectively (2017: 29% and 20%).

III.2 Innovation

Figure 13A shows that R&D spending in 2018 was noticeably lower than that in 2017. Specifically, the proportion of firms without any R&D spending increased from 66% in 2017 to 70% in 2018. 6% of firms reported R&D spending totaled more than 5% of sales, as compared with 9% in 2017.

In our sample, 286 firms (14%) have obtained a high-tech status from their local government, enjoying significantly lower corporate taxes. Our data shows that high-tech firms were faring better than the whole sample in terms of operating conditions (68 versus 59). Their investments were also slightly better than the whole sample (17% versus 13%). Firms with R&D input exceeding 5% of their sales, though rare in number, also fared better in terms of operating conditions, with a diffusion index of 63 (versus 59 in the whole sample) and overcapacity (73 versus 83 in the whole sample) (Figure 13B).

III.3 Institutions

Contrary to the skeptical opinions of some in the west, the legal institutions in China have provided reasonably good protections for business operations. In 2018, however, there was a significant drop in confidence about the country's legal environment. Figure 14A displays firms' responses to the question "On a scale of 0-10, what is the likelihood that the legal system will uphold your contract and property rights in business disputes (0 being the worst)?" The average rating of the legal environment dropped from 7.9 in 2017 to 6.3 in 2018 while the proportion of firms which gave a rating above 7 dropped significantly from 89% to 61%. Furthermore, the proportion of firms which gave a rating below 5 increased substantially from 6% in 2017 to 31%

in 2018. There was not much variation in this rating across regions.

Compared with their western counterparts, Chinese firms rely more on informal procedures and on social networks than on formal legal action to handle business disputes (Figure 14B). 68% and 11% said they would use legal advisers to negotiate or rely on mutual friends or business partners to mediate respectively, respectively, while 20% would go to court.

The Chinese government plays an active role in promoting growth. Support from the government increased to 20% in 2018 (2017: 16%) (Figure 14C). This is at least partially attributable to the fact that the proportion of firms receiving funding for innovation increased, from 4% in 2017 to 6% in 2018. The most common form of support was tax reduction, which was cited by 12% of firms in 2018 (2017: 14%). Funding for innovation ranked second. Other forms of support included project-based funding, guarantees for loans, etc., and accounted for 9% of firms in total.

IV. Conclusion

Despite wide spread pessimism about the Chinese economy, our Business Sentiment Index stood at 51 for four quarters during 2018, making it the first expansion since the survey was launched in 2014. Other signs of improvements included a slight expansion in production, electricity consumption, domestic orders and slight expansion in production of the private firms. These positive developments were attributable to the supply-side reform and curtailment of production capacity in the past two years.

The biggest challenge facing the industrial economy was overcapacity. Its prevalence remained at historically high level, and there was not any substantial improvement in the severity of overcapacity, measured by the proportion of firms reporting supply over demand by 10% and 20%. Financing was not a main limiting factor for the industrial economy. In the fourth quarter, however, small firms faced tightened financing, due to the overall tightening of liquidity.

It's worth noting that, in 2018, R&D spending declined noticeably, while the firms' confidence about country's legal environment dropped significantly.

Given a lack of confidence and the slowdown in consumption, there is substantial uncertainty in 2019. Policy should focus on promoting long-term growth. Loosening of monetary policy can only be a short-term tool to prevent financial instability. The government needs to formulate systematic policies to promote technology innovation, which is the only path to long-term growth of the industrial economy.

Figure 1. Business Sentiment Index

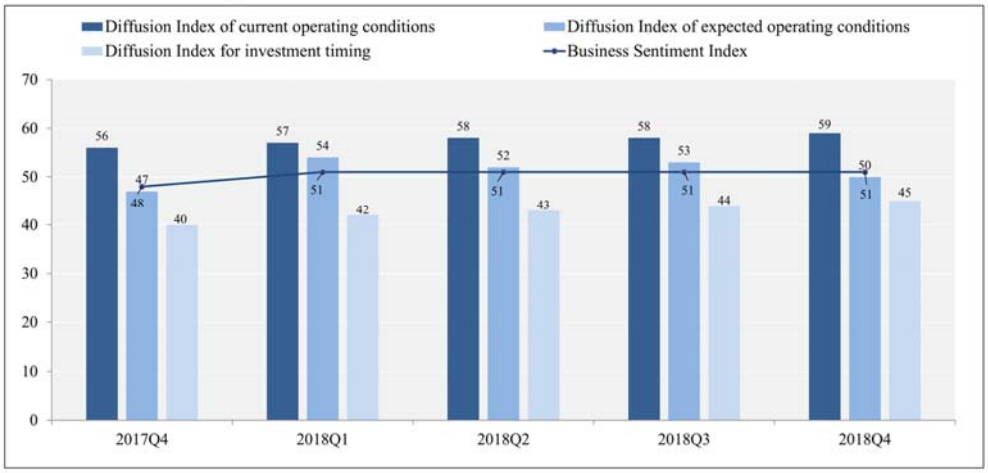

Figure 2. Investment

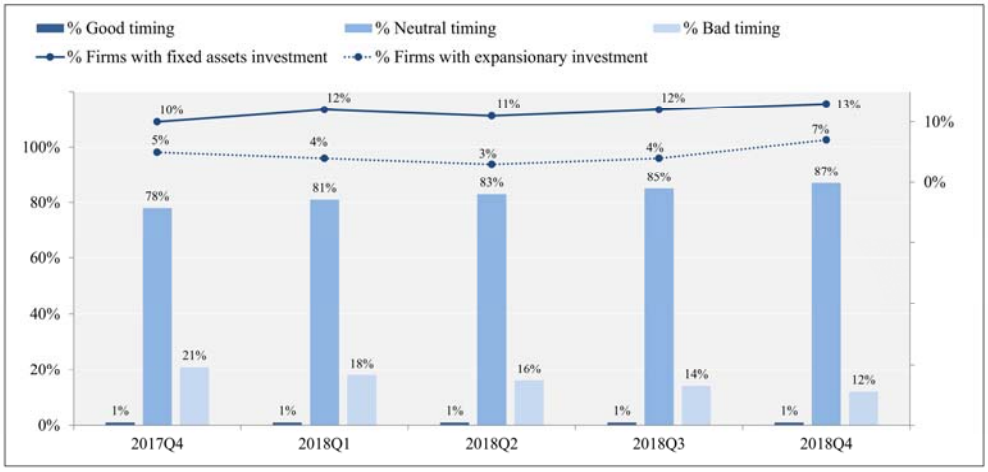

Figure 3. Costs

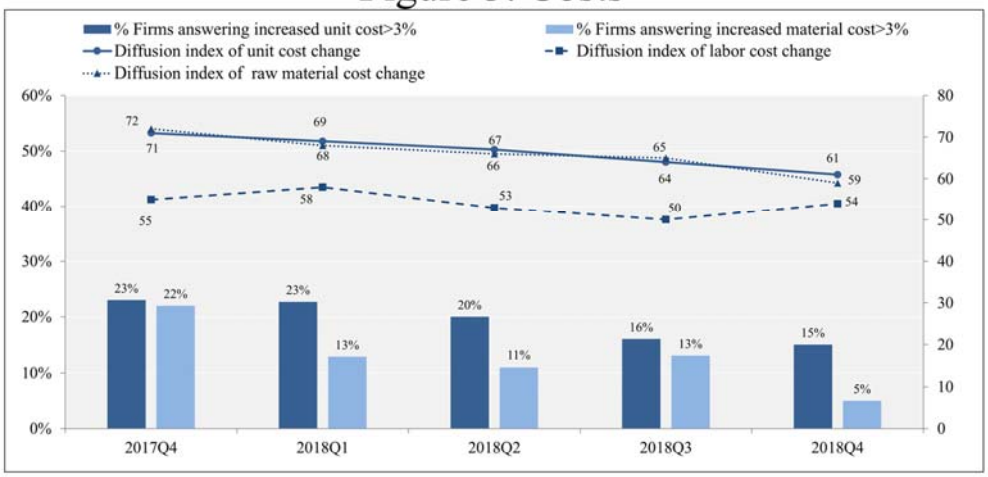

Figure 4. Other Main Economic Indices

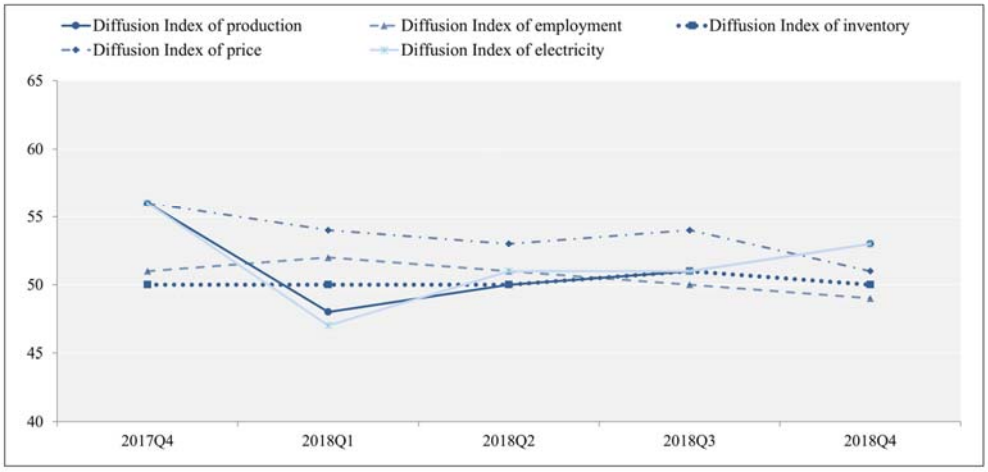

Figure 5. Factors Constraining Production of Next Quarter

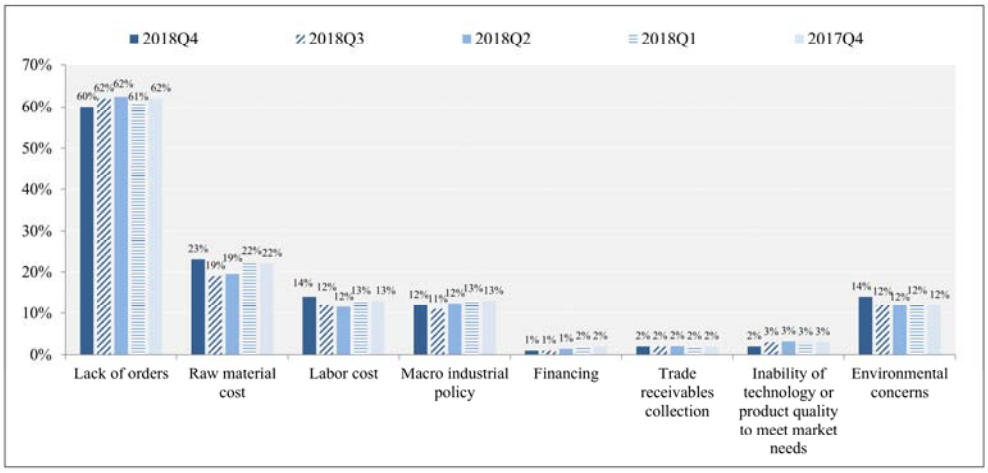

Figure 6A. Excess Capacity

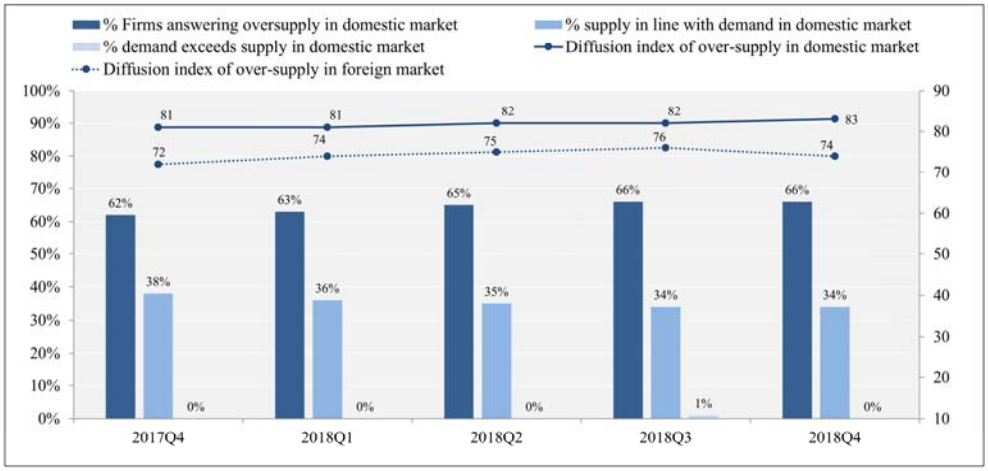

Figure 6B. Firms with Severe Excess Capacity

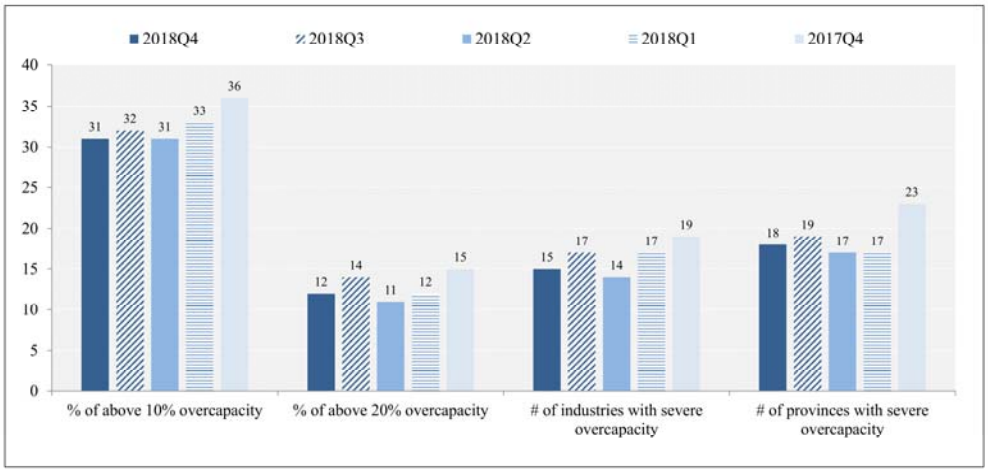

Figure 7A. Suspended Production

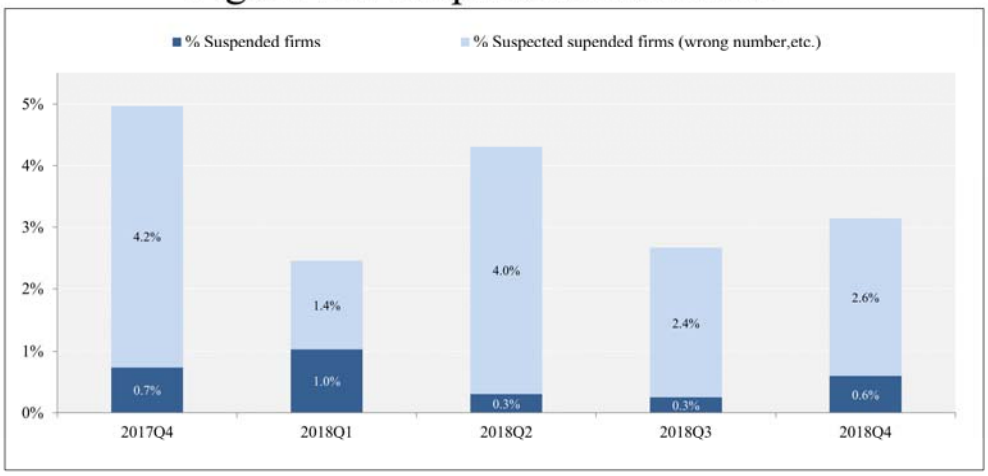

Figure 7B. Firms with Employment Reduction

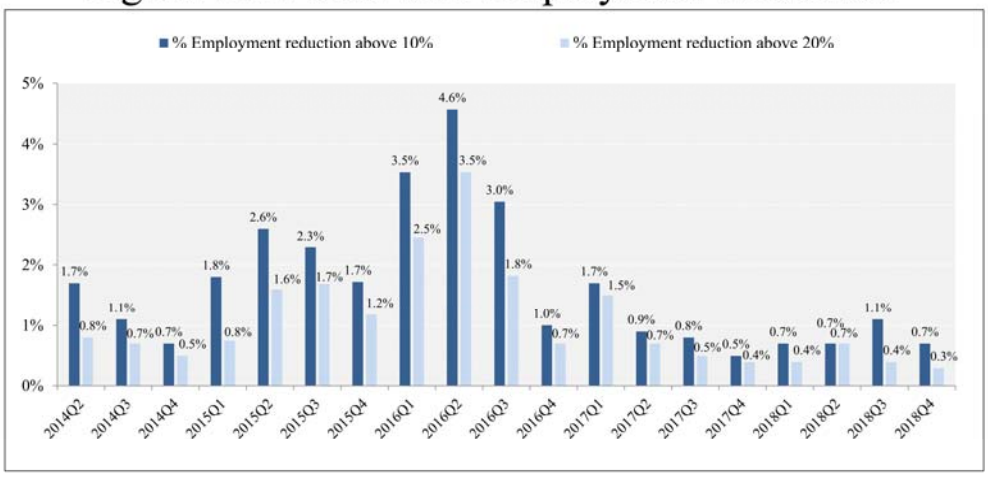

Figure 8. Capacity Utilization

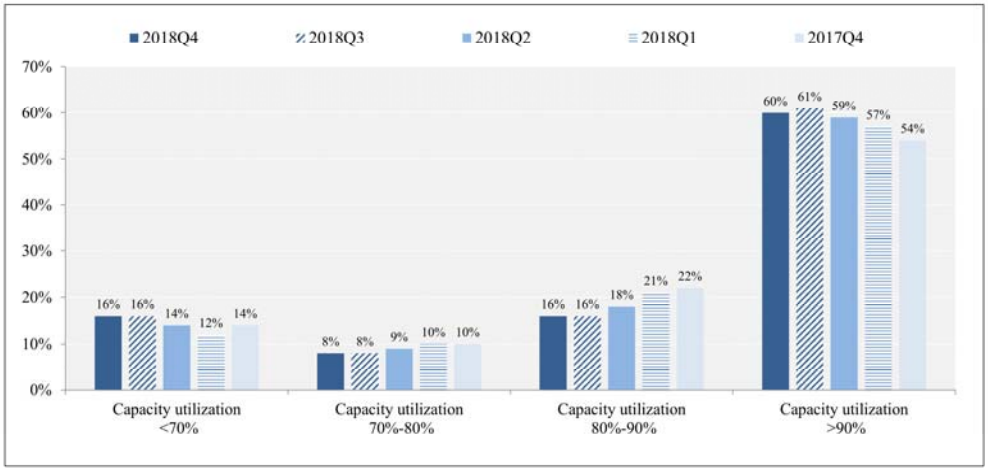

Figure 9. Gross Margins

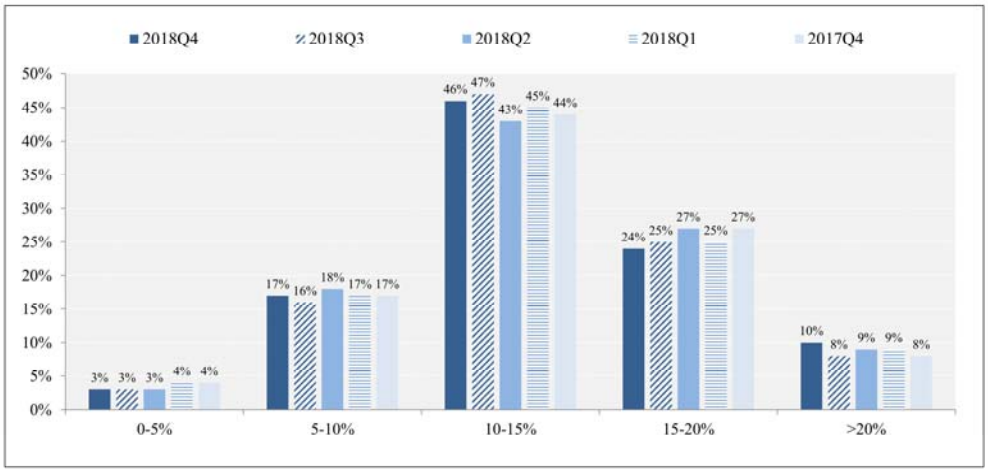

Figure 10. Financing

Figure 10A. Sufficient Capital

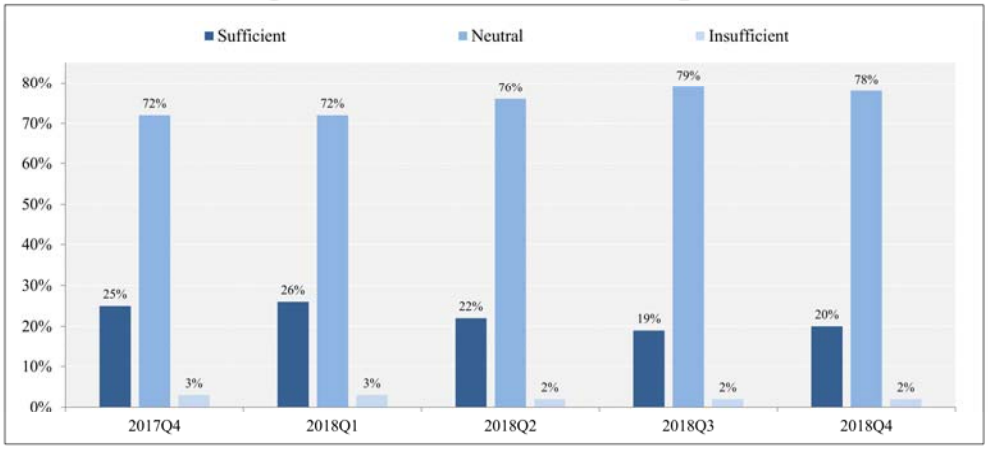

Figure 10B. New Loans

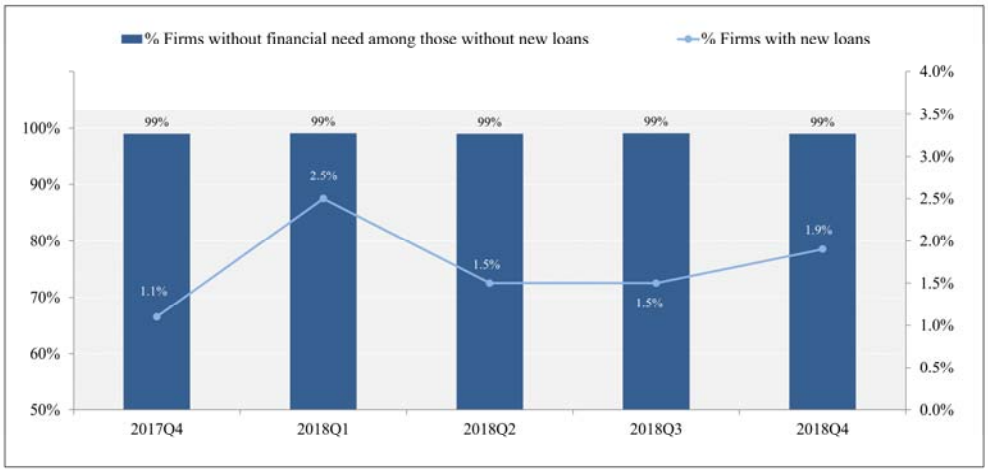

Figure 10C. Lending Attitude

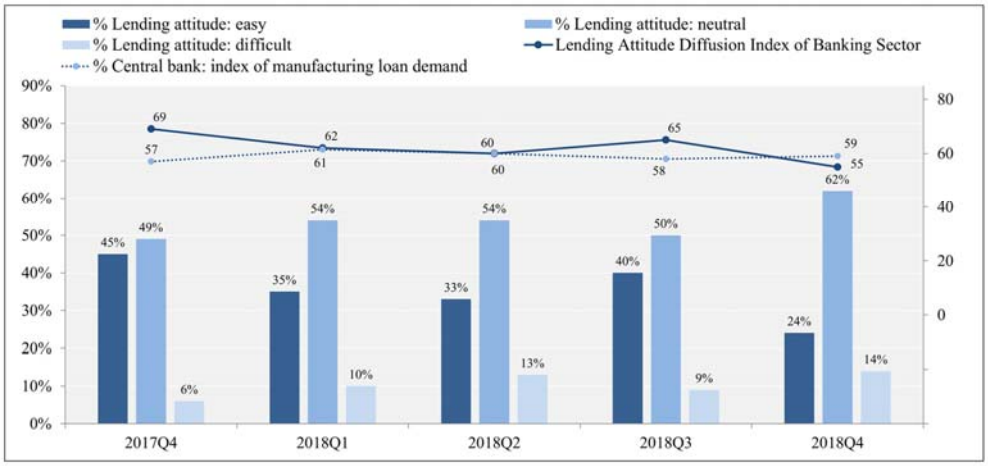

Figure 11. % of Firms Affected by Trade War

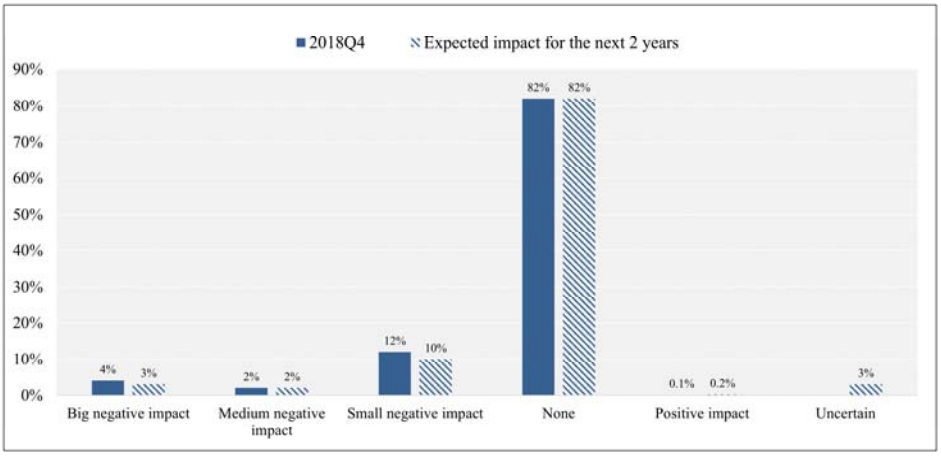

Figure 12. Business Outlook in 3-5 Years

Figure 12A. Business Outlook in 3-5 Years

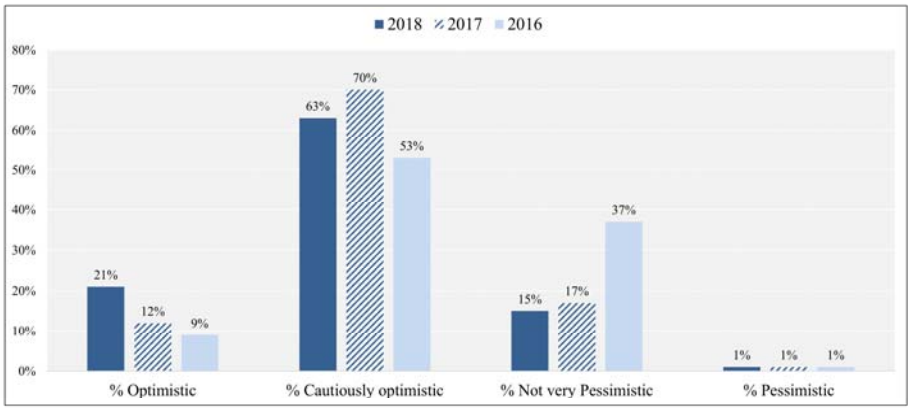

Figure 12B. Reasons for Pessimism

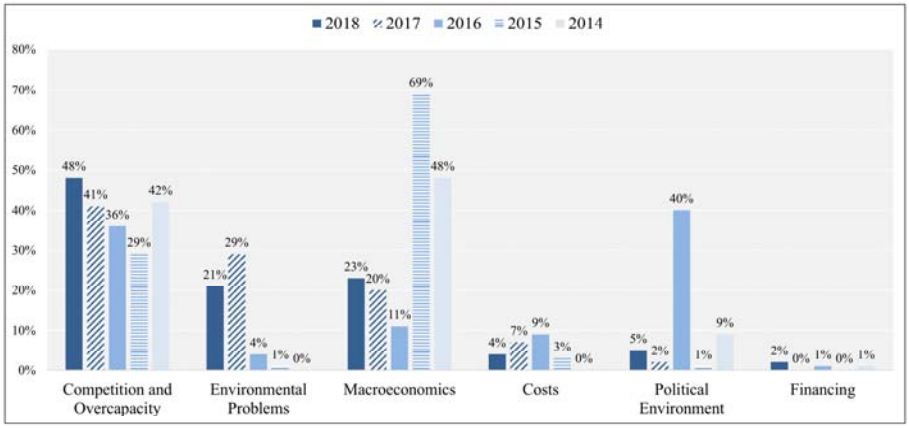

Figure 13. Innovation

Figure 13A. R&D Expenses of Chinese Firms

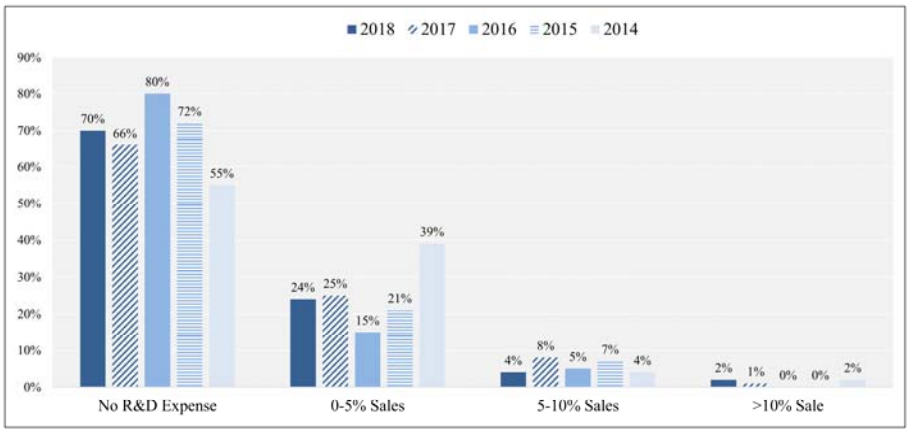

Figure13B. Performance of Firms with significant R&D Expense

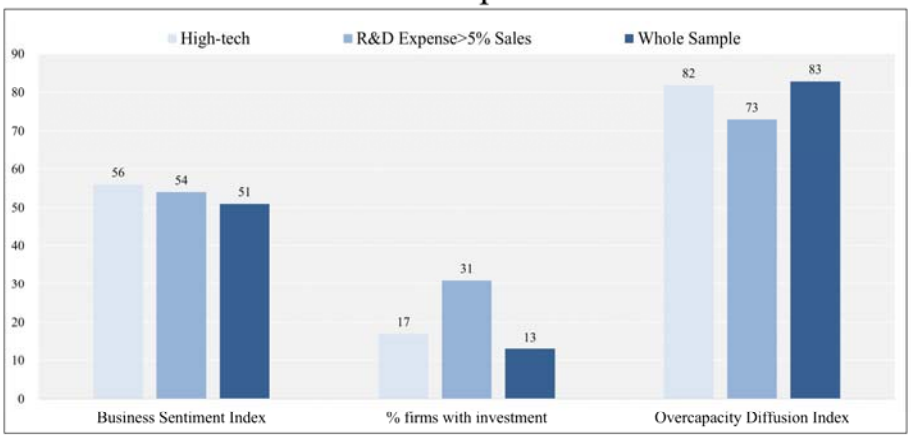

Figure 14. Legal Environment

Figure 14A. Rating of Legal Environment

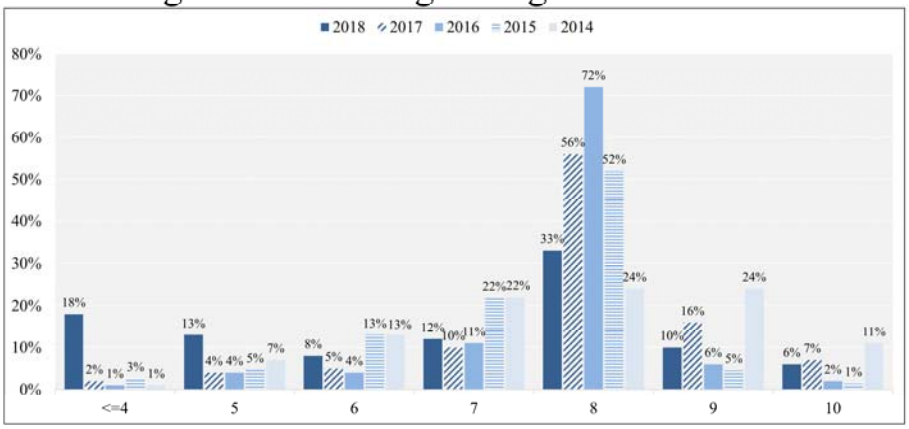

Figure 14B. Ways to Handle Business Disputes

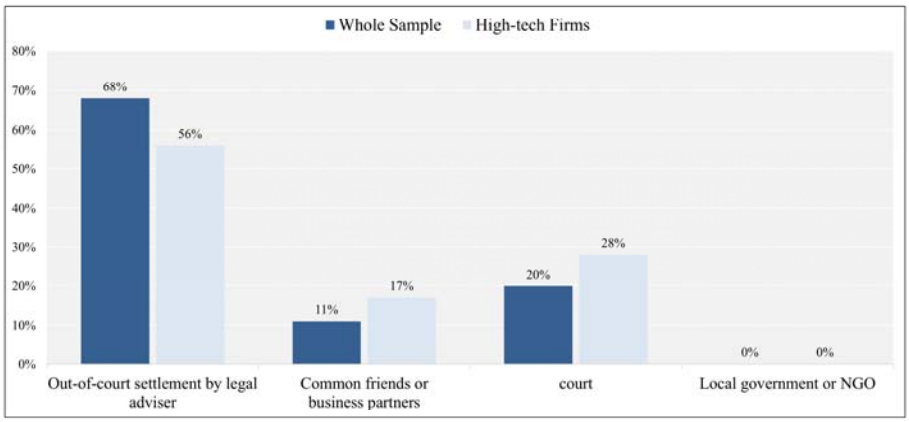

Figure 14C. Support from the Government

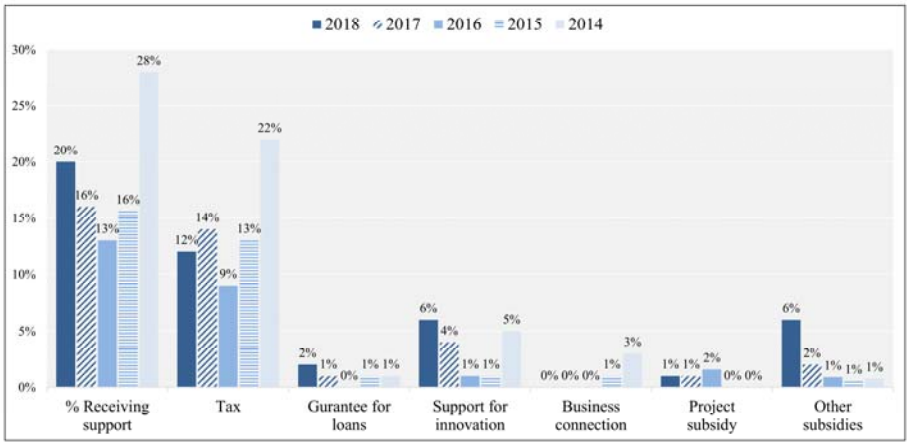

Table 1. Operating Conditions of Industrial Firms
Table 1.1

	Number of Firms		Business Sentiment Index		Diffusion Index - Operating Conditions		Diffusion Index - Expected Change in Operating Conditions		Diffusion Index - Good Timing for Investment	
	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3
Nation	2,027	2,040	51	51	59	58	50	53	45	44
By Size										
Large	676	680	53	53	64	60	49	53	46	46
Medium	675	680	51	52	58	59	50	53	46	44
Small	676	680	49	49	55	54	49	52	42	41
By Ownership										
State-owned	94	103	59	60	79	79	49	53	47	48
Collectively-owned	19	22	46	48	53	57	53	50	34	36
Private	1,706	1,719	50	50	57	56	49	52	44	43
Foreign-owned	208	196	56	56	69	67	50	56	47	46
By Product Type										
Consumer Goods - Durable	272	272	50	51	58	58	48	52	42	42
Consumer Goods - Nondurable	596	652	53	54	63	62	51	56	45	44
Capital Goods	131	140	54	53	62	60	52	51	47	47
Intermediate Goods	1,028	976	50	50	56	55	49	51	45	43

Table 1.2

	% of Firms with Fixed Investment		% of Firms with Expansionary Investment		Diffusion Index - Production		Diffusion Index - Employment		Diffusion Index - Price	
	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3
Nation	13	12	7	4	53	51	49	50	51	54
By Size										
Large	14	14	7	5	55	51	50	51	52	53
Medium	14	12	8	3	52	52	50	50	50	54
Small	10	11	6	4	51	50	49	49	52	54
By Ownership										
State-owned	11	15	2	3	55	55	51	50	52	50
Collectively-owned	5	18	5	5	58	48	50	45	50	50
Private	12	11	7	4	52	50	49	50	51	54
Foreign-owned	16	18	11	8	54	53	51	52	50	54
By Product Type										
Consumer Goods - Durable	13	8	8	3	51	50	47	49	51	55
Consumer Goods - Nondurable	11	15	4	4	57	53	51	51	51	53
Capital Goods	17	13	8	4	53	53	49	54	51	53
Intermediate Goods	13	11	9	4	50	49	49	49	51	54

Notes:

1. Diffusion Index (DI) is computed using the percentage of firms that answer "increase" (% increase) and "same" (% same) according to the formula: (% increase + 0.5 * % same). The index ranges between 0 and 100. A larger value indicates a better operating condition.

2. Business Sentiment Index is the average of DIs for Operating Conditions, Expected Operating Conditions and Good Timing for Investment.

Table 2. Operating Conditions by Industry
Table 2.1 Operating Conditions of All Industries

	Number of Firms		Business Sentiment Index		Diffusion Index - Operating Conditions		Diffusion Index - Expected Change in Operating Conditions		% of Firms with Fixed Investment		Diffusion Index - Good Timing for Investment	
	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3
Nation	2,027	2,040	51	51	59	58	50	53	13	12	45	44
Mining												
Coal Mining and Washing	18	22	45	42	36	41	50	34	11	5	50	50
Mining and Processing of Ferrous Metal Ores	14	13	51	36	61	31	46	35	36	8	46	42
Mining and Processing of Non-ferrous Metal	9	9	50	46	56	56	56	44	22	11	39	39
Mining and Processing of Nonmetal Ores	16	19	47	48	44	42	47	55	6	0	50	47
Production and Supply of Electricity, Heat, Gas and Water												
Power Production and Supply	55	58	58	60	72	76	51	54	11	14	50	50
Gas Production and Supply	13	13	64	74	92	92	50	81	0	0	50	50
Production and Supply of Water	23	22	62	58	91	91	48	36	13	27	46	45
Light Manufacturing												
Processing of Agricultural and Related Products	85	90	51	49	58	57	49	54	19	16	46	38
Manufacturing of Foods	71	71	54	58	64	63	54	66	4	17	45	45
Manufacturing of Beverage	32	39	57	57	63	60	64	68	9	8	44	42
Textiles	113	103	51	54	60	60	45	55	16	21	47	47
Textile Wearing and Apparel	70	63	50	50	57	57	45	48	16	16	46	46
Leather Related Products and Footwear	29	40	49	53	60	59	48	58	7	8	38	41
Processing of Wood Products	28	35	52	51	59	59	50	47	11	20	48	49
Manufacturing of Furniture	33	30	54	48	68	55	50	47	21	3	42	42
Paper and Paper Products	53	52	52	51	61	59	53	55	13	12	42	39
Printing, Reproduction of Recording Media	51	46	53	56	62	63	53	60	12	17	45	45
Cultural and Sports Products	48	52	51	52	58	53	49	53	13	2	45	49
Manufacturing of Medicines	67	70	54	56	65	64	49	54	7	24	49	50
Manufacturing of Others	13	11	47	42	54	45	50	50	8	0	38	32
Recycling and Disposal of Wastes	5	5	50	53	50	50	50	60	20	0	50	50
Chemical Industry												
Processing of Petroleum and Nuclear Fuel	16	13	58	53	72	54	53	58	31	0	50	46
Manufacturing of Chemical Products	131	126	49	49	50	49	50	51	8	11	48	47
Manufacturing of Chemical Fibers	9	9	54	54	56	56	56	56	11	0	50	50
Rubber and Plastic Products	92	113	52	54	62	64	52	54	14	13	43	42
Equipment Manufacturing												
General-purpose Machinery	102	105	50	50	55	52	49	51	31	8	45	45
Special-purpose Machinery	119	121	56	55	66	65	53	51	9	13	49	50
Manufacturing of Automotive	73	77	53	49	63	55	54	53	26	23	42	40
Manufacturing of Railways, Ships and Other Transportation	31	35	58	58	65	66	55	57	0	17	53	51
Electric Machinery and Apparatus	147	140	53	54	68	70	51	56	3	10	39	37
Computers, Communication and Electric Equipment	79	63	52	52	53	55	53	51	10	13	51	51
Manufacturing of Measuring Instruments	33	36	52	50	61	60	50	49	21	0	45	40
Repair of Metal Products, Machinery and Equipment	4	4	46	46	50	50	50	50	0	0	38	38
Other Heavy Manufacturing												
Non-metallic Mineral Products	135	110	41	42	44	42	38	45	5	5	41	39
Smelting and Pressing of Ferrous Metals	66	72	43	45	41	42	45	48	12	3	44	44
Smelting and Pressing of Non-ferrous Metals	33	33	52	49	61	55	48	47	36	9	45	45
Metal Products	111	120	45	46	54	55	50	50	9	17	33	33

Table 2.2 Industry Ranking of Operating Conditions

	Number of Firms		Business Sentiment Index		Diffusion Index - Operating Conditions		% of Firms with Fixed Investment		Diffusion Index - Good Timing for Investment	
	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3
Nation	2,027	2,040	51	51	59	58	13	12	45	44
Top Five										
Gas Production and Supply	13	13	64	74	92	92	0	0	50	50
Production and Supply of Water	23	22	62	58	91	91	13	27	46	45
Power Production and Supply	55	58	58	60	72	76	11	14	50	50
Manufacturing of Railways, Ships and Other Transportation	31	35	58	58	65	66	0	17	53	51
Processing of Petroleum and Nuclear Fuel	16	13	58	53	72	54	31	0	50	46
Bottom Five										
Non-metallic Mineral Products	135	110	41	42	44	42	5	5	41	39
Smelting and Pressing of Ferrous Metals	66	72	43	45	41	42	12	3	44	44
Coal Mining and Washing	18	22	45	42	36	41	11	5	50	50
Metal Products	111	120	45	46	54	55	9	17	33	33
Repair of Metal Products, Machinery and Equipment	4	4	46	46	50	50	0	0	38	38

Notes:
1. Ranking includes industries with more than three firms.

Table 3. Operating Conditions by Region

Table 3.1 Operating Conditions of All Regions

	Number of Firms		Business Sentiment Index		Diffusion Index - Operating Conditions		Diffusion Index - Expected Operating Conditions		% of Firms with Fixed Investment		Diffusion Index - Good Timing for Investment	
	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3
Nation	2,027	2,040	51	51	59	58	50	53	13	12	45	44
North China												
Beijing	31	36	49	51	55	57	52	54	3	8	42	43
Tianjin	45	49	50	48	56	55	49	48	13	10	44	42
Hebei	93	95	45	45	52	52	45	45	13	13	39	38
Northeast												
Liaoning	87	91	52	52	60	57	48	53	13	5	47	46
Jilin	18	22	51	52	61	61	50	52	17	18	42	41
Heilongjiang	25	24	48	52	52	54	50	60	8	29	42	42
Northwest												
Inner Mongolia	24	25	51	50	52	52	50	48	8	12	50	50
Shaanxi	32	31	49	49	56	55	47	52	13	3	45	42
Gansu	9	6	54	56	56	50	56	67	22	50	50	50
Qinghai	2	2	50	42	50	50	50	25	0	0	50	50
Ningxia	6	5	44	43	50	40	50	60	0	20	33	30
Xinjiang	12	12	50	57	58	58	42	63	17	25	50	50
Central North												
Shanxi	22	22	52	48	55	52	57	48	36	27	43	43
Shandong	223	217	51	52	60	60	48	52	12	7	46	44
Henan	87	89	50	51	59	58	48	53	14	8	44	43
Southwest												
Chongqing	32	36	51	51	56	56	50	54	16	6	45	44
Sichuan	73	73	52	51	59	53	51	55	4	7	47	46
Guizhou	14	13	49	53	50	54	46	54	14	8	50	50
Yunnan	21	25	51	51	60	64	52	46	14	12	40	42
East China												
Shanghai	70	63	52	53	63	62	51	54	10	8	43	42
Jiangsu	236	239	52	51	60	58	50	52	10	13	45	44
Zhejiang	222	227	51	51	60	59	50	52	21	20	42	43
South China												
Fujian	98	98	52	52	59	59	52	55	14	12	45	43
Guangdong	231	224	52	52	60	59	50	53	8	13	46	45
Guangxi	41	42	52	54	57	60	50	56	17	12	48	46
Hainan	2	2	58	58	75	100	50	50	0	0	50	25
Central South												
Anhui	92	93	52	53	60	59	51	55	11	19	45	45
Jiangxi	50	52	49	52	57	57	46	55	16	13	45	45
Hubei	71	69	54	50	66	57	51	51	15	4	44	42
Hunan	58	58	51	51	60	58	49	53	14	14	45	42

Table 3.2 Regional Ranking of Operating Conditions

	Number of Firms		Business Sentiment Index		Diffusion Index - Operating Conditions		% of Firms with Fixed Investment		Diffusion Index - Good Timing for Investment	
	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3
Nation	2,027	2,040	51	51	59	58	13	12	45	44
Top Five										
Hubei	71	69	54	50	66	57	15	4	44	42
Gansu	9	6	54	56	56	50	22	50	50	50
Shanghai	70	63	52	53	63	62	10	8	43	42
Liaoning	87	91	52	52	60	57	13	5	47	46
Shanxi	22	22	52	48	55	52	36	27	43	43
Bottom Five										
Ningxia	6	5	44	43	50	40	0	20	33	30
Hebei	93	95	45	45	52	52	13	13	39	38
Heilongjiang	25	24	48	52	52	54	8	29	42	42
Shaanxi	32	31	49	49	56	55	13	3	45	42
Guizhou	14	13	49	53	50	54	14	8	50	50

Notes:

1. Ranking includes regions with more than three firms.

Table 4. Oversupply

Table 4.1 Overall

	Number of Firms		Diffusion Index for Oversupply in Domestic Markets		Diffusion Index for Oversupply in Overseas Markets		Diffusion Index for Finished Goods	
	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3
Nation	2,027	2,040	83	82	74	76	50	51
By Size								
Large	676	680	80	79	75	73	51	50
Medium	675	680	83	82	73	77	49	52
Small	676	680	86	86	75	79	51	51
By Ownership								
State-owned	94	103	60	60	63	64	53	55
Collectively-owned	19	22	81	76	63	60	50	43
Private	1,706	1,719	84	84	75	77	50	51
Foreign -owned	208	196	82	80	74	75	52	51
By Product Type								
Consumer Goods - Durable	272	272	80	75	68	65	54	53
Consumer Goods - Nondurable	596	652	81	79	77	78	49	52
Capital Goods	131	140	77	79	63	67	46	53
Intermediate Goods	1,028	976	86	87	78	83	50	50

Table 4.2 Industries with Severe Excess Capacity

Industry	Number of Firms	% of Firms with 20% excess capacity and above	% of Firms with 10% excess capacity and above
Mining and Processing of Ferrous Metal Ores	14	71	79
Non-metallic Mineral Products	135	40	46
Mining and Processing of Nonmetal Ores	16	38	44
Processing of Petroleum and Nuclear Fuel	16	31	31
Processing of Wood Products	28	25	54
Smelting and Pressing of Ferrous Metals	66	24	42
Smelting and Pressing of Non-ferrous Metals	33	24	33
Mining and Processing of Non-ferrous Metal	9	22	44
Metal Products	111	17	41
Coal Mining and Washing	18	17	17
Electric Machinery and Apparatus	147	14	29
Manufacturing of Medicines	67	13	31
Manufacturing of Furniture	33	12	27
Printing, Reproduction of Recording Media	51	12	31
Manufacturing of Automotive	73	11	29

Notes:

1. This table reports industries that have at least 10% of firms with 20% or above excess capacity.
2. This table includes industries with more than three firms.

Table 4.3 Regions with Severe Excess Capacity

Province	Number of Firms	% of Firms with 20% excess capacity and above	% of Firms with 10% excess capacity and above
Ningxia	6	50	67
Shaanxi	32	25	38
Xinjiang	12	25	33
Henan	87	24	41
Sichuan	73	22	38
Inner Mongolia	24	21	33
Hebei	93	19	44
Jilin	18	17	39
Beijing	31	16	26
Tianjin	45	16	33
Shandong	223	15	32
Yunnan	21	14	24
Shanxi	22	14	27
Hubei	71	13	24
Liaoning	87	13	36
Heilongjiang	25	12	44
Jiangxi	50	12	28
Fujian	98	11	29

Notes:
1. This table reports regions that have at least 10% of firms with 20% or above excess capacity.
2. This table includes regions with more than three firms.

Table 5. Cost and Price

Table 5.1 Overall

	Number of Firms		Diffusion Indices							
			Unit Cost Index		Labor Cost Index		Raw Material Cost Index		Price Index	
	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3
Nation	2,027	2,040	61	64	54	50	59	65	51	54
By Size										
Large	676	680	61	62	55	51	59	63	52	53
Medium	675	680	60	64	54	50	58	65	50	54
Small	676	680	62	65	54	49	60	67	52	54
By Ownership										
State-owned	94	103	55	52	52	50	58	55	52	50
Collectively-owned	19	22	61	64	50	48	61	69	50	50
Private	1706	1719	61	65	54	50	59	66	51	54
Foreign -owned	208	196	60	61	56	52	58	63	50	54
By Product Type										
Consumer Goods - Durable	272	272	67	70	54	50	64	69	51	55
Consumer Goods - Nondurable	596	652	57	62	53	50	57	64	51	53
Capital Goods	131	140	63	69	52	54	62	69	51	53
Intermediate Goods	1028	976	62	63	55	50	59	64	51	54

Table 5.2 Industries with Unit Cost Increase More Significant than National Average

		Diffusion Indices			
	Number of Firms	Unit Cost Index	Labor Cost Index	Raw Material Cost Index	Price Index
Nation	2,027	61	54	59	51
Manufacturing of Chemical Fibers	9	78	56	78	56
General-purpose Machinery	102	74	68	70	51
Electric Machinery and Apparatus	147	72	70	61	51
Leather Related Products and Footwear	29	72	45	75	50
Manufacturing of Furniture	33	68	48	67	58
Mining and Processing of Non-ferrous Metal	9	67	61	67	50
Non-metallic Mineral Products	135	67	51	66	54
Manufacturing of Measuring Instruments	33	67	52	67	52
Cultural and Sports Products	48	66	54	63	53
Processing of Agricultural and Related Products	85	66	63	63	52
Computers, Communication and Electric Equipment	79	65	66	57	49
Manufacturing of Others	13	65	50	65	54
Textile Wearing and Apparel	70	64	57	61	50
Repair of Metal Products, Machinery and Equipment	4	63	50	63	50
Manufacturing of Automotive	73	62	50	62	51
Manufacturing of Chemical Products	131	61	54	61	55

Notes:

1. Industries are sorted by Diffusion Index for Unit Cost in descending order.
The table includes industries with more than three firms.

Table 5.3 Regions with Unit Cost Increase More Significant than National Average

		Diffusion Indices			
	Number of Firms	Unit Cost Index	Labor Cost Index	Raw Material Cost Index	Price Index
Nation	2,027	61	54	59	51
Beijing	31	66	53	65	52
Anhui	92	66	54	63	53
Henan	87	65	53	62	53
Fujian	98	63	57	61	54
Chongqing	32	63	63	62	56
Zhejiang	222	63	56	62	51
Guangdong	231	62	53	60	52
Shandong	223	62	56	61	53
Shanghai	70	62	56	60	54
Gansu	9	61	56	56	50
Jiangxi	50	61	54	61	50
Jiangsu	236	61	54	59	50

Notes:

1. Provinces are sorted by Diffusion Index for Unit Cost in descending order.
The table includes provinces with more than three firms.

Table 6. Financing Environment
Table 6.1 Overall

	Number of Firms		% Firms with Loans		% Firms with New Loans		Diffusion Index - Lending Attitude		Diffusion Index - Interest Rate	
	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3
Nation	2,027	2,040	26	24	2	2	55	65	51	52
With or Without Investment										
Firms with Investment	257	250	33	32	5	2	60	68	50	51
Firms without Investment	1,770	1,790	25	23	1	1	52	64	52	52
By Size										
Large	676	680	28	25	1	2	62	68	50	52
Medium	675	680	26	23	2	1	55	62	53	52
Small	676	680	25	25	2	1	48	65	52	51
By Ownership										
State-owned	94	103	20	21	1	1	50	60	50	60
Collectively-owned	19	22	26	18	0	0	100	NA	50	NA
Private	1,706	1,719	27	25	2	2	53	65	52	52
Foreign -owned	208	196	23	21	2	1	63	70	50	50
By Product Type										
Consumer Goods - Durable	272	272	27	24	0	1	80	73	50	50
Consumer Goods - Nondurable	596	652	27	26	2	2	54	61	52	54
Capital Goods	131	140	38	36	1	1	25	57	50	50
Intermediate Goods	1,028	976	24	21	2	1	53	70	52	50

Notes:
1. A higher Diffusion Index for lending attitude reflects easier lending.
2. A higher Diffusion Index for interest rate reflects higher interest rate.

Table 6.2 Sources of Financing

The most important source of financing

Sources	Number of Firms	% of Firms
Internal Funds	1949	96
Founder	79	4
Relatives and friends	0	0
Bank	9	0
Stock market	1	0
Non-official finance institution	0	0
Others	0	0

The second most important source of financing

Sources	Number of Firms	% of Firms
Bank	525	71
Founder	218	29
Others	1	0
Internal Funds	1	0
Stock market	1	0
Non-official finance institution	0	0
Relatives and friends	0	0

Appendix 1. Industry and Regional Ranking of Excess Capacity

Table A1.1 Industry Ranking of Excess Capacity

Industry	Number of Firms		% of Firms with 20% excess capacity and above		% of Firms with 10% excess capacity and above	
	Q4	Q3	Q4	Q3	Q4	Q3
Mining and Processing of Ferrous Metal Ores	14	13	71	85	79	92
Non-metallic Mineral Products	135	110	40	35	46	45
Mining and Processing of Nonmetal Ores	16	19	38	42	44	47
Processing of Petroleum and Nuclear Fuel	16	13	31	54	31	54
Processing of Wood Products	28	35	25	26	54	49
Smelting and Pressing of Ferrous Metals	66	72	24	25	42	36
Smelting and Pressing of Non-ferrous Metals	33	33	24	30	33	36
Mining and Processing of Non-ferrous Metal	9	9	22	0	44	22
Metal Products	111	120	17	16	41	42
Coal Mining and Washing	18	22	17	36	17	45
Electric Machinery and Apparatus	147	140	14	20	29	34
Manufacturing of Medicines	67	70	13	19	31	30
Manufacturing of Furniture	33	30	12	13	27	23
Printing, Reproduction of Recording Media	51	46	12	13	31	35
Manufacturing of Automotive	73	77	11	13	29	35
Manufacturing of Foods	71	71	10	10	23	23
Manufacturing of Measuring Instruments	33	36	9	8	9	8
Manufacturing of Others	13	11	8	18	46	64
Rubber and Plastic Products	92	113	8	9	29	27
Textile Wearing and Apparel	70	63	7	11	13	17
Processing of Agricultural and Related Products	85	90	7	11	41	31
General-purpose Machinery	102	105	7	6	28	39
Cultural and Sports Products	48	52	6	0	10	8
Special-purpose Machinery	119	121	6	2	17	15
Paper and Paper Products	53	52	4	4	28	33
Textiles	113	103	4	10	21	20
Leather Related Products and Footwear	29	40	3	3	31	25
Manufacturing of Railways, Ships and Other Transportation	31	35	3	3	26	29
Manufacturing of Beverage	32	39	3	5	13	8
Computers, Communication and Electric Equipment	79	63	3	2	22	32
Manufacturing of Chemical Products	131	126	2	5	46	46
Power Production and Supply	55	58	2	5	2	5
Manufacturing of Chemical Fibers	9	9	0	0	33	33
Repair of Metal Products, Machinery and Equipment	4	4	0	0	25	25
Recycling and Disposal of Wastes	5	5	0	0	20	0
Production and Supply of Water	23	22	0	0	4	0
Gas Production and Supply	13	13	0	0	0	0

Notes:

Industries are sorted based on the percentage of firms with over 20% excess capacity in descending order. The ranking includes industries with more than three firms.

Table A1.2 Regional Ranking of Excess Capacity

Province	Number of Firms		% of Firms with 20% excess capacity and above		% of Firms with 10% excess capacity and above	
	Q4	Q3	Q4	Q3	Q4	Q3
Ningxia	6	5	50	20	67	40
Shaanxi	32	31	25	23	38	39
Xinjiang	12	12	25	8	33	17
Henan	87	89	24	25	41	42
Sichuan	73	73	22	23	38	37
Inner Mongolia	24	25	21	28	33	36
Hebei	93	95	19	19	44	47
Jilin	18	22	17	23	39	45
Beijing	31	36	16	17	26	28
Tianjin	45	49	16	14	33	35
Shandong	223	217	15	16	32	30
Yunnan	21	25	14	4	24	20
Shanxi	22	22	14	27	27	36
Hubei	71	69	13	13	24	28
Liaoning	87	91	13	12	36	31
Heilongjiang	25	24	12	13	44	29
Jiangxi	50	52	12	10	28	31
Fujian	98	98	11	11	29	31
Anhui	92	93	10	9	22	27
Jiangsu	236	239	9	13	28	32
Guangxi	41	42	7	7	20	26
Guizhou	14	13	7	15	29	38
Shanghai	70	63	7	6	29	24
Guangdong	231	224	6	9	25	24
Chongqing	32	36	6	11	19	25
Hunan	58	58	5	10	24	28
Zhejiang	222	227	5	7	23	24
Gansu	9	6	0	0	22	33

Notes:

Provinces are sorted based on the percentage of firms with over 20% excess capacity in descending order.

Appendix 2. Industry and Regional Diffusion Index for Cost and Price

Table A2.1 Industry Diffusion Index for Cost and Price

	Diffusion Indices									
	Number of Firms		Unit Cost Index		Labor Cost Index		Raw Material Cost Index		Price Index	
	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3
Nation	2027	2040	61	64	54	50	59	65	51	54
Mining										
Coal Mining and Washing	18	22	53	45	44	48	53	45	53	45
Mining and Processing of Ferrous Metal Ores	14	13	50	54	50	50	50	54	46	46
Mining and Processing of Non-ferrous Metal	9	9	67	67	61	44	67	67	50	50
Mining and Processing of Nonmetal Ores	16	19	56	53	50	50	50	53	50	53
Other Ancillary Activities of Mining										
Production and Supply of Electricity, Heat, Gas and Water										
Power Production and Supply	55	58	52	52	53	50	50	54	50	51
Gas Production and Supply	13	13	50	50	65	50	NA	NA	50	50
Production and Supply of Water	23	22	50	50	52	50	NA	NA	50	50
Light Manufacturing										
Processing of Agricultural and Related Products	85	90	66	63	63	51	63	58	52	49
Manufacturing of Foods	71	71	56	78	56	54	56	78	50	54
Manufacturing of Beverage	32	39	59	59	50	47	59	63	55	55
Textiles	113	103	53	62	47	47	53	67	49	59
Textile Wearing and Apparel	70	63	64	60	57	48	61	62	50	52
Leather Related Products and Footwear	29	40	72	79	45	44	75	80	50	53
Processing of Wood Products	28	35	55	61	50	50	55	61	50	56
Manufacturing of Furniture	33	30	68	80	48	50	67	80	58	65
Paper and Paper Products	53	52	56	59	50	48	56	61	50	50

Table A2.1 Industry Diffusion Index for Cost and Price（Continued）

	Diffusion Indices									
	Number of Firms		Unit Cost Index		Labor Cost Index		Raw Material Cost Index		Price Index	
	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3
Printing, Reproduction of Recording Media	51	46	55	62	49	52	55	71	49	53
Cultural and Sports Products	48	52	66	66	54	53	63	65	53	54
Manufacturing of Medicines	67	70	53	64	54	50	51	64	50	54
Manufacturing of Others	13	11	65	73	50	55	65	77	54	59
Recycling and Disposal of Wastes	5	5	50	50	50	50	50	50	50	50
Chemical Industry										
Processing of Petroleum and Nuclear Fuel	16	13	56	62	47	50	53	62	50	38
Manufacturing of Chemical Products	131	126	61	63	54	50	61	61	55	56
Manufacturing of Chemical Fibers	9	9	78	83	56	56	78	78	56	78
Rubber and Plastic Products	92	113	57	64	46	50	55	68	51	56
Equipment Manufacturing										
General-purpose Machinery	102	105	74	67	68	51	70	66	51	53
Special-purpose Machinery	119	121	58	65	47	55	58	66	50	50
Manufacturing of Automotive	73	77	62	73	50	49	62	74	51	51
Manufacturing of Railways, Ships and Other Transportation	31	35	58	66	48	49	58	66	50	50
Electric Machinery and Apparatus	147	140	72	59	70	51	61	66	51	56
Computers, Communication and Electric Equipment	79	63	65	57	66	51	57	56	49	50
Manufacturing of Measuring Instruments	33	36	67	69	52	50	67	70	52	54
Repair of Metal Products, Machinery and Equipment	4	4	63	50	50	38	63	50	50	50
Other Heavy Manufacturing										
Non-metallic Mineral Products	135	110	67	71	51	51	66	69	54	57
Smelting and Pressing of Ferrous Metals	66	72	54	65	50	51	53	63	52	55
Smelting and Pressing of Non-ferrous Metals	33	33	59	67	52	45	59	67	52	55
Metal Products	111	120	55	60	54	52	54	61	51	52

Notes: The table includes industries with more than three firms.

Table A2.2 Regional Diffusion Index for Cost and Price

	Diffusion Indices									
	Number of Firms		Unit Cost Index		Labor Cost Index		Raw Material Cost Index		Price Index	
	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3
Nation	2,027	2,040	61	64	54	50	59	65	51	54
North China										
Beijing	31	36	66	65	53	47	65	65	52	56
Tianjin	45	49	53	64	48	49	53	62	47	58
Hebei	93	95	59	68	52	51	56	67	49	53
Northeast										
Liaoning	87	91	59	64	53	50	57	65	50	52
Jilin	18	22	58	64	53	52	59	60	53	52
Heilongjiang	25	24	48	58	50	58	48	60	46	52
Northwest										
Inner Mongolia	24	25	54	56	52	52	52	57	44	48
Shaanxi	32	31	59	73	58	52	59	73	47	53
Gansu	9	6	61	67	56	50	56	70	50	58
Ningxia	6	5	42	50	50	50	42	50	50	50
Xinjiang	12	12	50	50	54	54	50	58	46	46
Central North										
Shanxi	22	22	59	59	57	48	59	57	57	45
Shandong	223	217	62	65	56	52	61	65	53	56
Henan	87	89	65	68	53	51	62	69	53	54
Southwest										
Chongqing	32	36	63	64	63	50	62	66	56	50
Sichuan	73	73	60	60	54	51	59	64	52	54
Guizhou	14	13	57	54	54	50	58	50	54	50
Yunnan	21	25	55	60	48	48	56	64	50	52
East China										
Shanghai	70	63	62	66	56	47	60	67	54	52
Jiangsu	236	239	61	63	54	50	59	65	50	53
Zhejiang	222	227	63	64	56	49	62	67	51	55
South China										
Fujian	98	98	63	63	57	54	61	65	54	55
Guangdong	231	224	62	62	53	49	60	64	52	52
Guangxi	41	42	54	61	55	52	53	60	50	50
Central South										
Anhui	92	93	66	67	54	50	63	66	53	54
Jiangxi	50	52	61	63	54	50	61	69	50	54
Hubei	71	69	59	64	56	50	59	67	51	53
Hunan	58	58	60	65	55	50	59	67	52	54

Notes:

The table includes provinces with more than three firms.

Appendix 3. Survey Sampling

3.1 The Population

Staring from 2017Q2, we have included firms in the 2013 Industrial Enterprises database in our sampling. This is the most complete and reliable economic census data available.

Although the 2013 Industrial Enterprises database is our best option, it was still compiled four years ago. A firm's core characteristics, such as industry, might have changed significantly in that time. Thus, we also surveyed firms about their main products and product types.

3.2 Sampling Procedure

Previously, our sampling was based on the population of sizable industrial firms (with sales above 5 million RMB) in the 2008 Economic Census. In order to ensure the comparability of this quarter's survey with those in the previous quarters, we used a sampling procedure as described below:

1. We started from the 2040 firms in our last response sample, which was the result of a random sampling stratified by industry, region and size (see our previous reports for details). Of those, we obtained responses from 1709 firms. Steps 2-3 below describe how we obtain a supplement sample of 1455 firms from the 2013 Industrial Enterprise database, which, assuming a 20% response rate, would yield an additional 291 firms so that the total size of the survey sample is 2,000 firms.

2. We stratified by three size categories, 41 industries and 31 provinces to obtain 3,813 strata in both the 2008 Economic Census and 2013 Industrial Enterprises database populations. Then we compute, in each stratum, the percentage of new firms founded after 2008.

3. Assuming random responses across the above 3,813 strata, we compute the number of firms across strata and the proportion of new firms (founded after 2008) in each stratum, so that the final response sample could match (or approach) the population in terms of industry, region and size, as well as the proportion of new firms. Out of the 1455 firms in our supplementary sample, we obtained 318 responses, resulting in a total of 2027 firms in our final survey sample.

However, we note that to ensure a smooth transition across quarters, this quarter's sample does not match well with the 2013 Industrial Enterprise database population in two dimensions. First, the weight of new firms founded after 2008 is lower. Second, given that the National Bureau of Statistics changed its definition of sizable firms between 2008 and 2013, from sales totaling 5 million RMB up to 20 million RMB, the average firm size is between the two databases. We will resolve these discrepancies gradually in the coming surveys. Moreover, in our data analysis, we have cross-checked that the results relative to those of the last quarter have not been driven by the new sample.

3.3 Survey Process

The survey is conducted through phone interviews. Figure A1 reports the distribution of the number of phone calls, duration of the calls and the interviewees' positions in their companies.

3.4. Sample Representativeness

Tables A3.1-A3.3 show the distribution of the population and the Q4 response sample, as well as the 1709 firms that were also in the Q3 sample, in terms of industry, region and size. Note that as we are sampling 2.1% of the population, some small strata may not be sampled. Specifically, Tibet is a region that has not been sampled, while Mining of other Ores, Extraction of Petroleum & Natural Gas and Manufacture of Tobacco are three industries not sampled. Overall, however, we feel our response sample represents the population quite well.

3.5 Seasonality

Theoretically, there are no obvious ways to adjust for seasonality, especially given the relatively small number of surveys we have conducted. We deal with this issue by directly asking the firms about seasonality and its impact. As shown in Figure A1.4, the majority of firms (87%) reported no seasonality, while for 8% of the firms, the seasonality impact was below 5%. Most importantly, the impact of seasonality is roughly distributed symmetrically. Thus, in aggregate, seasonality is not likely to bias our results and we do not adjust for seasonality.

Figure A1. Phone Interviews – number of calls, duration and interviewees

Figure A1.1 Number of Calls

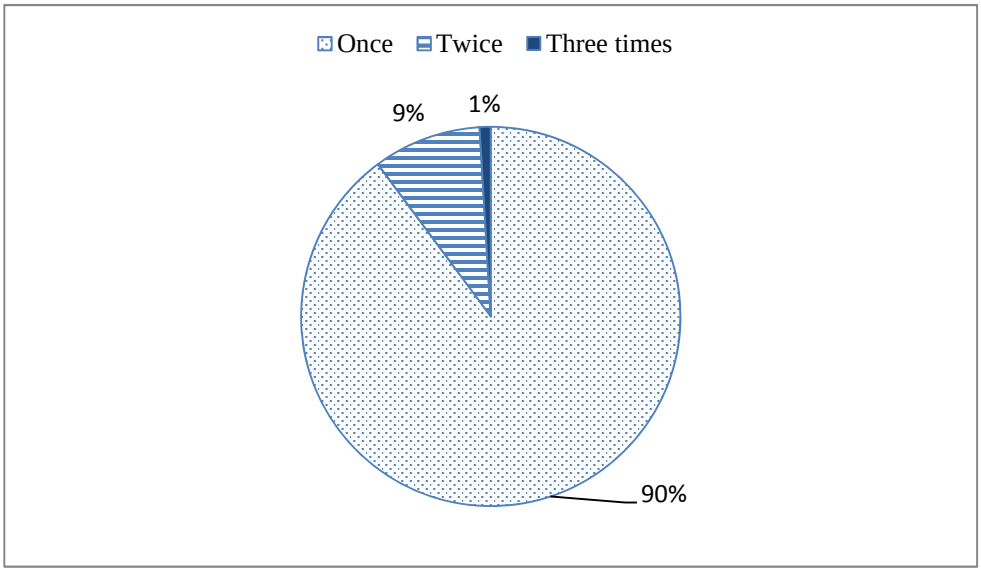

Figure A1.2 Duration of Calls

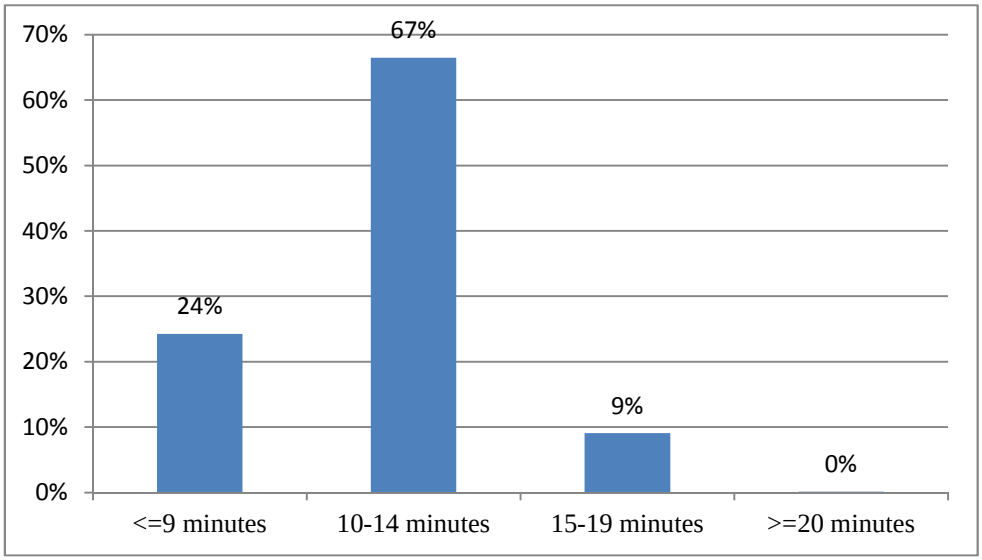

Figure A1.3 Interviewees' Positions

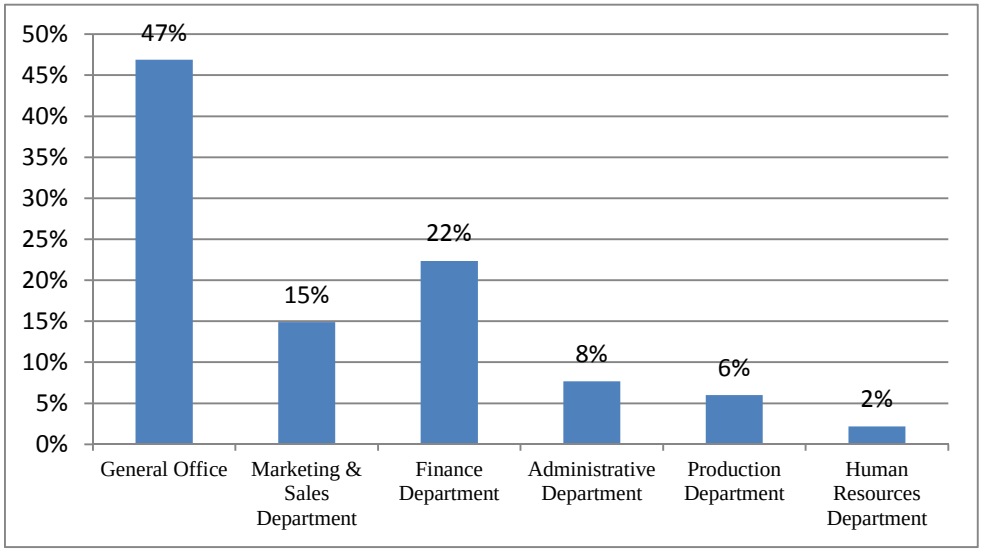

Figure A1.4 Seasonality

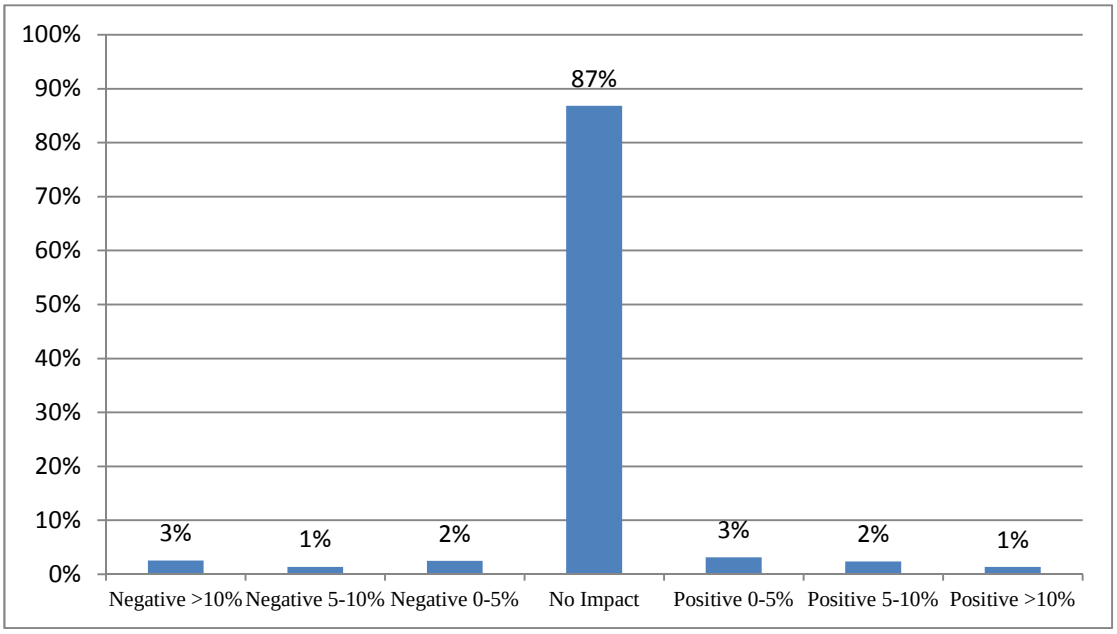

Table A3. Comparisons between Survey Sample and the Population

Table A3.1 Industry Distribution

Industry	Population		1709 Firms From Q3 Survey		Final Q4 Response Sample	
	Number of Firms	Percent	Number of Firms	Percent	Number of Firms	Percent
Power Production and Supply	5,701	1.7	50	2.9	55	2.7
Electric Machinery and Apparatus	21,012	6.2	128	7.5	147	7.3
Textile Wearing and Apparel	14,147	4.2	53	3.1	70	3.5
Textiles	19,591	5.8	91	5.3	113	5.6
Mining and Processing of Nonmetal Ores	3,363	1.0	16	0.9	16	0.8
Non-metallic Mineral Products	29,429	8.7	100	5.9	135	6.7
Recycling and Disposal of Wastes	1,256	0.4	4	0.2	5	0.3
Mining and Processing of Ferrous Metal Ores	3,100	0.9	12	0.7	14	0.7
Smelting and Pressing of Ferrous Metals	10,190	3.0	60	3.5	66	3.3
Manufacturing of Chemical Fibers	1,859	0.6	9	0.5	9	0.4
Manufacturing of Chemical Products	23,402	6.9	107	6.3	131	6.5
Computers, Communication and Electric Equipment	12,540	3.7	47	2.8	79	3.9
Manufacturing of Furniture	4,656	1.4	23	1.4	33	1.6
Repair of Metal Products, Machinery and Equipment	381	0.1	4	0.2	4	0.2
Metal Products	18,498	5.5	100	5.9	111	5.5
Manufacturing of Beverage	5,496	1.6	27	1.6	32	1.6
Other Ancillary Activities of Mining	153	0.1	0	0.0	0	0.0
Coal Mining and Washing	6,680	2.0	13	0.8	18	0.9
Processing of Wood Products	8,154	2.4	28	1.6	28	1.4
Processing of Agricultural and Related Products	22,485	6.7	53	3.1	85	4.2
Leather Related Products and Footwear	7,714	2.3	29	1.7	29	1.4
Mining of other Ores	17	0.0	0	0.0	0	0.0
Manufacturing of Others	1,527	0.5	10	0.6	13	0.6
Manufacturing of Automotive	11,733	3.5	58	3.4	73	3.6
Gas Production and Supply	1,095	0.3	13	0.8	13	0.6
Extraction of Petroleum and Natural Gas	135	0.0	0	0.0	0	0.0
Processing of Petroleum and Nuclear Fuel	1,941	0.6	9	0.5	16	0.8
Manufacturing of Foods	7,388	2.2	68	4.0	71	3.5
Production and Supply of Water	1,310	0.4	22	1.3	23	1.1
Manufacturing of Railways, Ships and Other Transportation	4,277	1.3	30	1.8	31	1.5
General-purpose Machinery	22,163	6.6	84	4.9	102	5.0
Cultural and Sports Products	7,513	2.2	38	2.2	48	2.4
Rubber and Plastic Products	16,327	4.8	92	5.4	92	4.5
Manufacture of Tobacco	122	0.0	0	0.0	0	0.0
Manufacturing of Medicines	6,483	1.9	57	3.3	67	3.3
Manufacturing of Measuring Instruments	3,805	1.1	31	1.8	33	1.6
Printing, Reproduction of Recording Media	4,734	1.4	42	2.5	51	2.5
Mining and Processing of Non-ferrous Metal	1,552	0.5	9	0.5	9	0.4
Smelting and Pressing of Non-ferrous Metals	3,728	1.1	30	1.8	33	1.6
Paper and Paper Products	6,580	2.0	50	2.9	53	2.6
Special-purpose Machinery	15,443	4.6	112	6.6	119	5.9
Total	337,680	100	1,709	100	2,027	100

Table A3.2 Regional Distribution

Province	Population		1709 Firms From Q3 Survey		Final Q4 Response Sample	
	Number of Firms	Percent	Number of Firms	Percent	Number of Firms	Percent
Anhui	14,533	4.3	75	4.4	92	4.5
Beijing	3,506	1.0	31	1.8	31	1.5
Fujian	15,206	4.5	87	5.1	98	4.8
Gansu	1,723	0.5	6	0.4	9	0.4
Guangdong	37,831	11.2	190	11.1	231	11.4
Guangxi	4,919	1.5	33	1.9	41	2.0
Guizhou	2,901	0.9	12	0.7	14	0.7
Hainan	358	0.1	2	0.1	2	0.1
Hebei	12,818	3.8	85	5.0	93	4.6
Henan	18,410	5.5	73	4.3	87	4.3
Heilongjiang	3,882	1.2	20	1.2	25	1.2
Hubei	13,520	4.0	56	3.3	71	3.5
Hunan	12,170	3.6	46	2.7	58	2.9
Jilin	5,136	1.5	16	0.9	18	0.9
Jiangsu	45,138	13.4	200	11.7	236	11.6
Jiangxi	7,424	2.2	41	2.4	50	2.5
Liaoning	15,591	4.6	70	4.1	87	4.3
Inner Mongolia	3,975	1.2	21	1.2	24	1.2
Ningxia	940	0.3	5	0.3	6	0.3
Qinghai	448	0.1	2	0.1	2	0.1
Shandong	37,272	11.0	185	10.8	223	11.0
Shanxi	3,433	1.0	19	1.1	22	1.1
Shaanxi	4,103	1.2	27	1.6	32	1.6
Shanghai	9,101	2.7	57	3.3	70	3.5
Sichuan	11,753	3.5	62	3.6	73	3.6
Tianjin	4,972	1.5	41	2.4	45	2.2
Tibet	54	0.0	0	0.0	0	0.0
Xinjiang	2,031	0.6	9	0.5	12	0.6
Yunnan	3,147	0.9	20	1.2	21	1.0
Zhejiang	36,363	10.8	193	11.3	222	11.0
Chongqing	5,022	1.5	25	1.5	32	1.6
Total	337,680	100	1,709	100	2,027	100

Table A3.3 Comparison of Company Characteristics

	Population 2008		Population 2013		1709 Firms From Q3 Survey		Final Q4 Response Sample	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Assets	90,050	12,920	243,118	45,165	235,008	58,737	235,065	56,339
Sales	104,697	20,072	295,142	85,344	241,719	76,175	252,861	76,430
Total	488,017		337,680		1,709		2,027	