

# **China's Industrial Economy**

## **2015 Annual Report<sup>1</sup>**

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

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<sup>1</sup> This survey is implemented by Beijing Allinfo Co., based on the questionnaire and sample provided by Professor Jie Gan, 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 Du Ding, who provided support to the data analysis and presentation, and Tiffany Luo, who provided support for text revision.

## Executive Summary

In 2015, the industrial economy was in slight contraction and the problem of overcapacity worsened. Our Business Sentiment Index dropped from 50 in Q1 to 45 in Q4. Investments continued to be sluggish. The proportion of firms that made fixed investments dropped from 11% in Q1 to 5% in Q4. Expansionary investment (that is, investment above 3% of assets) was even more rare, involving only 2-3% of firms each quarter throughout 2015. Production and employment were relatively stable, but production of capital goods dropped substantially with a diffusion index of 37. Product prices have been in a deflationary phase since Q2. Due to overcapacity and sluggish investment, financing is still not a bottleneck for industrial growth at this stage.

Despite the difficulties in the economy, the vast majority of firms remain “optimistic” (6%) or “cautiously optimistic” (51%) about their economic outlook over the next three to five years. Among those who are “not optimistic”, the main concerns cited include the macro economy (69%), competition and overcapacity (29%), and the political environment (1%). Almost no firms mentioned financing to be a major concern.

Contrary to widespread perception in the west, the legal institutions in China do provide basic protections for business operations. 80% of firms give the legal environment a rating above 7, and the average rating is 7.3. Meanwhile, the Chinese government plays an active role in promoting growth: 16% of firms reported that they have received help and support from the government, including tax reduction, help in obtaining loans, funding for innovation, business connections and project subsidies. However, industrial firms seemed to have obtained less support from the government in 2015 than they did in 2014.

At present, a main challenge to policy is the weakening of market expectations, which reduces the multiplier effect of monetary and fiscal policies, and thus makes these policies less effective. This further supports our earlier recommendation that long-term industrial policy is the key to reviving these industries. The government should put forth policies that aim to directly improve the real economy.

## Introduction

Since 2014 Q2, we have conducted seven quarterly large-sample surveys of about 2,000 industrial firms in China. Our survey design ensures that our sample fully represents industry, region (provinces) 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 about the Chinese economy. Furthermore, our survey questions allow us to understand the underlying mechanisms, and analyze why the economy is doing well or not.

There were a total of 2,038 firms in our 2015 Q4 survey, of which 1,551 firms were also questioned in our 2015 Q3 survey. The initial survey sample was based on a stratified random sampling by industry, region and size from the National Bureau of Statistics' population of about 488,000 industrial firms that have sales of more than five million RMB. Appendix A details the sampling procedure and compares our sample with the NBS population.

### I. China's Industrial Economy Continues to Contract

The industrial economy was in slight contraction throughout 2015. The Business Sentiment Index dropped from 50 in Q1 to 45 in Q4. Our BSI is the simple average of three diffusion indices, including current operating conditions, expected change in operating conditions and investment timing.<sup>1,2</sup> The index construction resembles that of the US Consumer Sentiment Index, hence its name. It not only contains information on current operating conditions, but also includes measures that are forward-looking and reflects the absolute level of economic activities.<sup>3</sup> The decline of the BSI in Q4 was mainly attributable to a weakening of expected operating conditions.

As shown in Figure 1, there are significant variations among the three sub-indicators that constitute the BSI. On current operating conditions (Figure 2), the percentage of firms that replied "good" declined from 27% in Q1 to 18% in Q4. The diffusion index dropped from 61 to 56. Meanwhile, the diffusion index for the expected change in

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<sup>1</sup> 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"?

<sup>2</sup> 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 % of firms answering "good" + 0.5 \* % of firms answering "neutral". The diffusion index ranges between 0 and 100. A larger value indicates better operating conditions and 50 is the turning point between expansion and contraction.

<sup>3</sup> Most existing indices, including the well-known PMI, are ex-post and relative (to last quarter). Even when the absolute level of business conditions is gloomy, one may still observe a high diffusion index, as long as it is an improvement over the previous quarter.

operating conditions dropped 53 to 48, sending it into a contraction mode for the first time.

Fixed investment remained sluggish throughout the year. When asked to what extent it is now a good time to make fixed investments, only 2-3% of the firms considered the timing to be “good” over the last three quarters of the year, yielding a diffusion index of 32, far below the turning point of 50 (Figure 3). The percentage of firms that actually made fixed investments dropped from 11% in Q1 to 5% in Q4. The proportion of firms that made expansionary investment (that is, an investment rate above 3% of assets) remained within the 2-3% range in 2015. The sluggish pace of investment will not improve in the near future: only 10 firms (0.5%) planned to make investment in the next quarter, while only about a quarter of the firms (27%) planned to make expansionary investment in 2016.

Overall, production and employment were stable. The diffusion index stood at 48 in Q4 (Figure 4). But production of capital goods declined significantly, with a diffusion index of 37. Product prices have been in deflation since Q2. The diffusion index in Q4 was 44, up slightly from 42 in Q3. The decline in demand for capital goods was the most significant, which is clearly related to sluggish investment.

Table 1 shows the performance of different types of firms over the last two quarters. Except for better performance by SOEs, there was no significant difference among firm sizes and product types.

Table 2 further analyzes the business conditions of different industries, where industry classification is based on the 35 two-digit industries of the National Bureau of Statistics. Variations across industries were substantial, with the BSI ranging from 30 to 63. The top three industries included Medicines (with a BSI of 63), Manufacture of Handicrafts & Others (55) and Manufacture of Cultural & Sports Products (54). The bottom five were Coal Mining & Washing (30), Processing of Agricultural & Related Products (35), Processing of Wood Products (36), Smelting & Pressing of Ferrous Metals (36) and Manufacture of Leather-Related Products & Footwear (37). Coal Mining & Washing has been on the worst-performing list four times since 2014 Q2; Smelting & Pressing of Ferrous Metals has been on the list five times since 2014 Q2; Processing of Wood Products and Manufacture of Leather-Related Products & Footwear have each appeared on the list three times since 2014 Q4; Agricultural & Related Products has been on the list since 2015 Q1.

Table 3 displays regional business conditions. Regional variations were much less pronounced than industrial variations, with the BSI ranging from 36 to 53. The bottom six comprised of Guizhou (36), Shanxi (41), Heilongjiang (42), Inner Mongolia (42), Liaoning (42) and Hebei (42). Among these provinces, Guizhou has been on the list since 2014 Q3.<sup>4</sup>

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<sup>4</sup> In our regional ranking, we include regions with more than three firms. Ningxia, Xinjiang and

## **II. Understanding the Economy: Challenges and Priorities**

Weak demand is still by far the biggest challenge for the industrial economy. 78% of the firms surveyed in Q4 cited a lack of orders, a further increase from 70% in the last quarter (Figure 5). Costs come second, with labor and raw material costs listed by 17% and 13% of firms, respectively. Other significant factors include macro and industrial policies (10%) and difficulties in collecting trade receivables (6%). Financing is not a bottleneck, with only 2% replying that financing is a limiting factor. These factors are highly consistent with findings in our previous surveys. Finally, when asked about factors constraining next years' production, 16% considered macro and industrial policies to be an important factor.

### **II.1 The Biggest Challenge: Overcapacity Worsened Further**

The problem of excess capacity worsened in 2015 as compared to 2014. Since Q2, more than half of the firms (53-56%) have reported that supply exceeded demand for their products in the domestic market (Figure 6A). The diffusion index reflecting oversupply was between 76-77, the highest range since our survey began in 2014 Q2. All the five worst-performing industries are on the list of industries with severe overcapacity.

Firms fare worse in domestic markets than in overseas ones, with diffusion indices roughly 10 points higher in the past quarters. In Q4, the gap between domestic and international markets widened, when the diffusion index for international markets declined from 68 in Q3 to 63.

In Q4, 21% of the firms reported that their excess capacity was above 10% (32% in Q3), while 8% reported that their excess capacity was above 20% (18% in Q3) (Figure 6B). We categorize an industry as having severe excess capacity if more than 10% of the firms reported excess capacity of more than 20%. In Q4, the number of the industries and regions with severe excess capacity account for about one third of the total, down substantially from 21 (out of 35) in Q3 to 11 in Q4 for industries and from 24 (out of 31) to 11 for regions.

It is worth noting that, while the number of firms with severe excess capacity declined, the overall diffusion index remained high. This indicates that many of the firms with severe excess capacity had to be shut down. But it also suggests that demand declined further, harming more firms. It is also possible that some of the firms expanded their production despite the problem of overcapacity in the hope of squeezing competitors.

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Hainan have a BSI of 33, 39 and 42, respectively, but have been excluded from the ranking because they contained no more than three firms in Q3.

As of 2015 Q4, the top three industries with severe overcapacity were Coal Mining & Washing, Processing of Petroleum & Nuclear Fuel, and Mining & Processing of Nonmetal Ores.

Consistent with overcapacity and the resulting tight cash position, 31% of firms reported that they face difficulties in collecting trade receivables from their customers. This problem is more prominent among private-sector firms as well as firms producing capital goods and intermedium goods. State-owned enterprises are disproportionately more likely to delay payment, accounting for 19% of firms that have delayed payment. Therefore, the difficulty in collecting trade receivables is mainly due to a sluggish economy and the resulting lack of pricing power.

Weak demand has not caused inventory problems, thanks to the “order-based” production model adopted by many Chinese firms. As shown earlier, finished-goods inventory stayed largely flat. As many as 45% of firms said they did not have significant levels of inventory because they produce only after taking orders. For those with inventories, nearly 80% (79%) expected the inventory to be digested within three months, with a further 15% saying it would take between three to six months. This leaves only 6% of the whole sample carrying inventory for more than six months.

## **II.2 Costs Stabilized**

The second challenge facing the industrial economy has been cost rises. This problem, however, was not a main concern in 2015, especially in the last three quarters. Unit costs remained stable in Q4 with a diffusion index of 54 (Figure 7). The labor cost index was 53 (56 in Q3), whereas the cost of raw materials declined, with a diffusion index of 45. Cost rises mainly occurred in firms which increased investment or employment. In other words, costs stabilized in Q4 due to a weakened economy.

Chronic overcapacity implies a lack of pricing power and, thus, thin margins. 27% of firms reported extremely low gross margins (below 10%). 71% of the firms had gross margins below 15%, with just 8% of the firms reporting gross margins above 20% (Figure 8).

## **II.3 Financing is Not a Bottleneck**

The most surprising result from our survey has been that financing is not a constraining factor for industrial growth. Consistent with the results in the previous quarters, only 2% of the firms cited financing as the constraining factor. Correspondingly, 34% of the firms reported that funds were sufficient, 60.4% replied “neutral”, while only 5.4% reported insufficient funding. A vast majority of the firms

(91%) reported insufficient funds for production, not for expansion. Another 7% reported insufficient funds due to operating losses.

As shown in Table 6.1 and Figure 9A, only a small proportion of firms obtained new loans in the past quarters. In Q4, this number was 2%, a further decline from Q3 (6%). Among the firms without new loans, the vast majority (92%) reported that they did not have the need for capital. Moreover, firms found the banks' lending attitude to be generally accommodating, resulting in a diffusion index of 73. The proportion of firms reporting a "difficult" lending attitude, however, increased moderately to 16% in Q4, from 10% in Q3.

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 98% of the firms reporting this as their primary funding source. About 3% of the firms reported the founder's own capital as the primary source of funds, while 50% reported this as the second most important source of funds. 47% of the 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, 84% of the firms reported that this largest financing source accounts for more than 50% of their total funds.

New industrial loans in the third quarter were all collateralized. The most common source of collateral was land and plants, used by 90% of the firms. Machine and equipment was another popular source of collateral, used by 19% of the firms.

It was rare for firms to borrow from sources other than banks. In Q4, only 5 firms (0.25%) reported borrowing from other financing institutions. Interest rates are all below 20%.

While our finding that financing is not a bottleneck contrasts with conventional wisdom, it is perfectly consistent with the central bank's "Financial Institutions Lending Statistics" reports. During 2014, new loans to industrial firms declined by, on average, 30% each quarter. The net amount of new industrial loans issued in 2015 was only 5% of loan balances in Q4 2014. Moreover, the central bank's index of loan demand, after reaching its previously lowest level in Q4 2014 (58%), then declined further in each of the last three quarters in 2015 (48% in Q4) (Figure 9B).

Overall, the fact that financing is not a bottleneck must be set against the backdrop of a declining industrial economy. Investment opportunity is scarce; as long as a firm is profitable, retained earnings are generally sufficient for operation.

It should be emphasized that, although our survey includes industrial companies with sales above 5 million RMB, given that 5 million is not a high threshold, we cover the vast majority of companies. Excluding agriculture, real estate and finance, the

industrial sector now accounts for 50% of China's GDP. Thus, the findings from this sample should not be ignored.

### **III Going Forward: Institutions and Innovation**

#### **III.1 Economic Outlook**

Despite the difficulties in the economy, the vast majority of firms remain “optimistic” (6%) or “cautiously optimistic” (51%) about their economic outlook over the next three to five years (Figure 10A). Among those who are “not optimistic”, the main concerns cited include the macro economy (69%), competition and overcapacity (29%), and the political environment (1%) (Figure 10B). Almost no firms mentioned financing as a major concern.

#### **III.2 Innovation**

Technology innovation and industrial upgrading are necessary in dealing with the problems of oversupply and cost rises. Figure 11A reports the state of innovative activities by Chinese industrial firms. The majority of the firms (72%) do not have any R&D spending, 21% spend 0-5% of sales on R&D, and a mere 7% of firms have R&D spending more than 5%.<sup>5</sup>

In our sample, 200 firms, or 10%, have obtained a high-tech status from the local government so that their corporate taxes are significantly lower. To be granted a high-tech status, the firms have to (1) be located in one of the high-tech areas specified by the central government; (2) own a sufficient number of patents. Somewhat surprisingly, although high-tech firms are more likely to make fixed investment, its sentiment index and overcapacity problem are not significantly better when compared with other firms. But firms with R&D input exceeding 5% of their sales, though rare in number, fare significantly better in terms of operating conditions (diffusion index: 54 vs. 45 in the whole sample) and are less likely to have overcapacity problems (diffusion index: 66 vs. 77 in the whole sample) (Figure 11B).

#### **III.3 Institutions**

Contrary to the skeptical opinions of some in the west, the legal institutions in China do provide basic protections for business operations. Figure 12A displays firms' responses to the question “On a scale of 0-10, what is the likelihood that the legal

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<sup>5</sup> Not surprisingly, there is a wide variation of innovative activities across industries and regions. For example, medical, computer and special equipment sectors are among the ones with the largest R&D input, whereas inland provinces have the least R&D spending. For the sake of brevity, we do not report the results here; but they are available upon request.



system will uphold your contract and property rights in business disputes (0 being the worst)?”. 80% of firms give the legal environment a rating above 7, and the average rating is 7.3 (7.7 in 2014). Compared to last year, the average rating is similar, but the variation is lower. Finally, there is little variation across industries and regions in terms of the quality of the legal environment.

Compared with their western counterparts, Chinese firms rely more on informal procedures and on social networks than on formal legal actions to handle business disputes. 41% say they would use legal advisers to negotiate or settle by themselves outside court, 21% would rely on mutual friends or business partners to mediate, while 5% would go to court. Interestingly, high-tech firms are more likely to use court (8%) (Figure 12C).

The Chinese government plays an active role in promoting growth. 16% of firms reported that they have received help and support from the government. The most common support was tax reduction, which was cited by 13% of firms (22% in 2014). Other forms of support include help in obtaining loans, funding for innovation, business connections, and project subsidies (about 1% each) (Figure 12D). Not surprisingly, high-tech firms are substantially more likely to receive government support (35% vs. 55% in 2014). Industrial firms, however, seemed to have obtained less support from the government in 2015 than in 2014. Part of the reason is likely that the firms, mostly in traditional manufacturing, do not belong to industries that the government intends to promote. But this cannot fully explain why high-tech firms also received less support.

#### **IV. Conclusion**

In 2015, the Chinese industrial economy faced greater difficulties than in 2014. The problem of overcapacity worsened. Our Q4 survey also indicated that firms’ expectations about the future have weakened and that the government’s support to firms has declined. Despite the difficulties, more than half of the firms remained optimistic or cautiously optimistic about the prospects in the next three to five years. The legal institutions in China also provide basic support for business operations.

At present, a main challenge to policy is the weakening of market expectations, which reduces the multiplier effect of monetary and fiscal policies, and thus makes these policies less effective. This further supports our earlier recommendation that long-term industrial policy is the key to reviving these industries. The government should put forth reform policies that aim to directly improve the real economy. The government should also ensure social and financial stability in the process of reducing excess capacity.

### *Policy recommendations*

The current problem in China's industrial economy is due to over-investment and a lack of core competitiveness over many years. To solve the problem of overcapacity and to attain a full recovery will be a long-term process.

#### 1. Long-term industrial policy is the key

For the industry to move out of the bottom, overcapacity has to be fully absorbed, which means that a significant proportion of firms would need to be closed or allowed to go bankrupt. The remaining companies can then have enough profit margins for R&D and industrial upgrading. Therefore, industrial policy should focus on three aspects: to ensure an orderly bankruptcy process, to help the remaining companies to upgrade their products, and to increase income and, thus, to enhance domestic demand.

Factory closings and bankruptcies mean lay-offs and foreclosures. If these are concentrated in any particular region, they might cause social instability. The local government should proactively help laid-off workers be redeployed. Regarding debt problems, our data shows that bank loans may not be a significant problem as industrial firms do not borrow much and, even if they do, loans are generally collateralized. Repaying trade credit is likely to be a bigger problem.

With regards to industrial upgrading, it should be noted that China's technology, in most areas, is far behind that of western countries. This requires careful study in each industry on how China might catch up. The government should then encourage technological innovation and product upgrade which can truly create markets and employment.

Income growth requires high-paid jobs, as well as skilled workers, to fill these jobs. This calls for a deepening of economic reform to move the economy out of low-end manufacturing, for example encouraging the growth of the private sector in industries with higher margins and lowering the entry barrier in certain monopolistic industries. The government should also encourage and support programs that produce and train skilled workers. The "One Belt, One Road" policy can potentially export the country's excess capacity and, thus, is a wise long-term policy.

#### 2. Fiscal policy should aim to increase domestic demand

In the short run, we do not suggest uniform tax cuts, as these cannot solve the core problem of overcapacity. A more effective strategy is to improve social welfare through fiscal spending, which will reduce households' savings for retirement and medical expenses and, thus, increase domestic demand.

Value-added taxes, a main corporate tax burden, mean that firms would need to pay taxes even if they do not earn profits. This may discourage investment. Therefore, the government should consider selectively reducing value-added tax for industries that are technologically advanced or can increase employment. Value-added taxes are levied based on sales volume, which may weaken the local governments' incentive to reduce excess capacity of local firms. In such cases, national policies are needed to rectify local incentives and one possibility is to push towards profit taxes.

The tax burden of Chinese firms is large by international standards. Thus, in the long run, reducing the overall tax burden would encourage private investment and consumption. This, however, can only be achieved through comprehensive and systematic reform, which involves redefining the role of government in the economy and, accordingly, careful planning of fiscal spending.

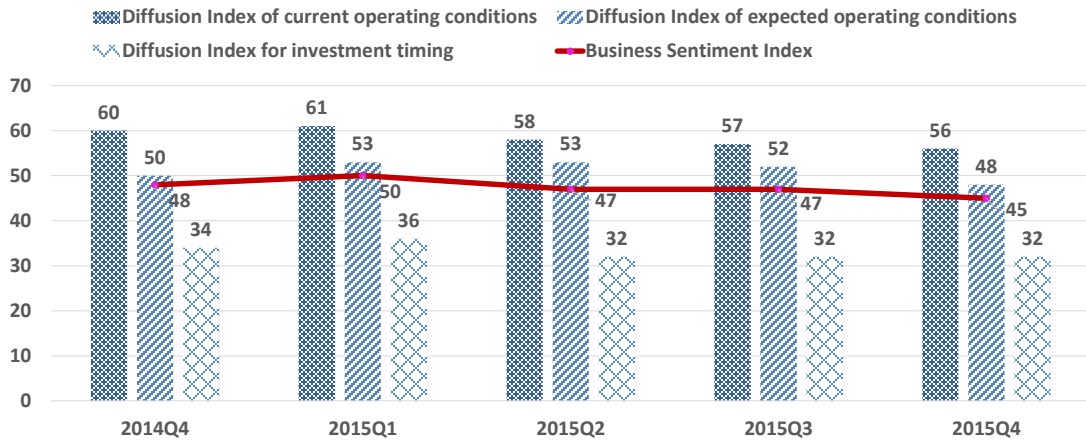
### 3. Loosening monetary policy should only be a short-term policy

Our Q4 survey further confirms that financing is not a bottleneck and that loosening monetary policy cannot revive the industry. Judging from the current state of the industrial economy, the loosening policies in place since last year have not reversed the decline of the industries. Loosening monetary policy should, at most, be a short-term policy to prevent a hard landing. At present, weakened market expectations are likely to reduce the multiplier effect of monetary policies and thus make them less effective.

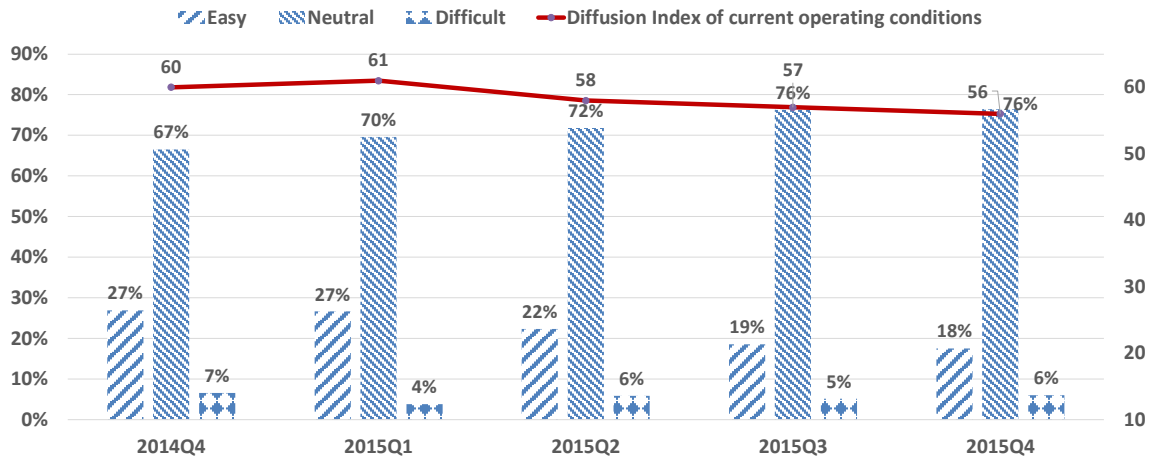
Of course, it is possible that firms that are outside our survey, such as those in the service industry and so-called "micro-firms", may face a financing bottleneck. But this should be further confirmed through similar systematic and large-sample surveys. Even if financing is a bottleneck for these firms, given that they are not the regular borrowers of the state-owned banks, loosening policies alone is not sufficient.

Finally, the fact that financing is not a bottleneck doesn't mean that financial reform is not important. If the existing financial system cannot allocate resources in an efficient manner, financing will become a bottleneck as and when the economy recovers. Opening up the banking industry to the private sector, especially small and medium-sized banks, as well as lowering the entry barrier for foreign banks, can potentially introduce competition and innovation, which would not only fill up the gaps in lending, but also force existing banks to transform themselves.

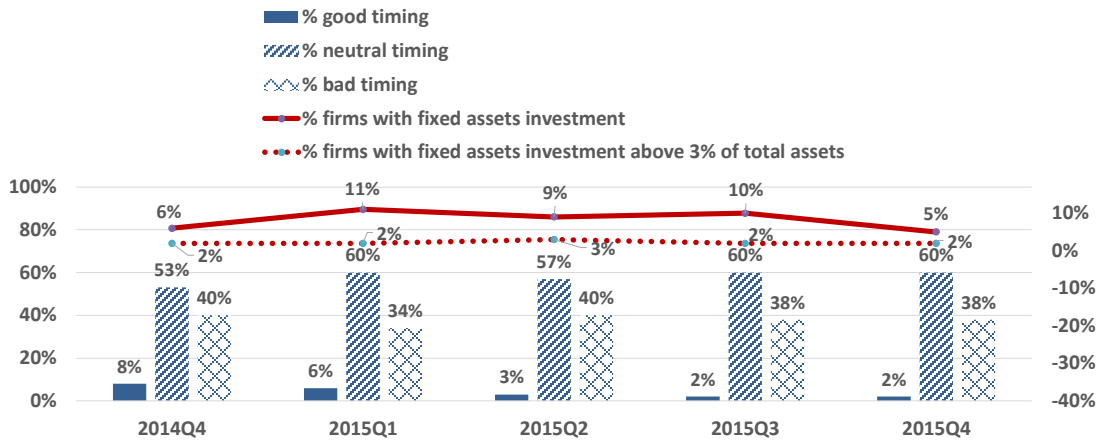
# Figure 1. Business Sentiment Index



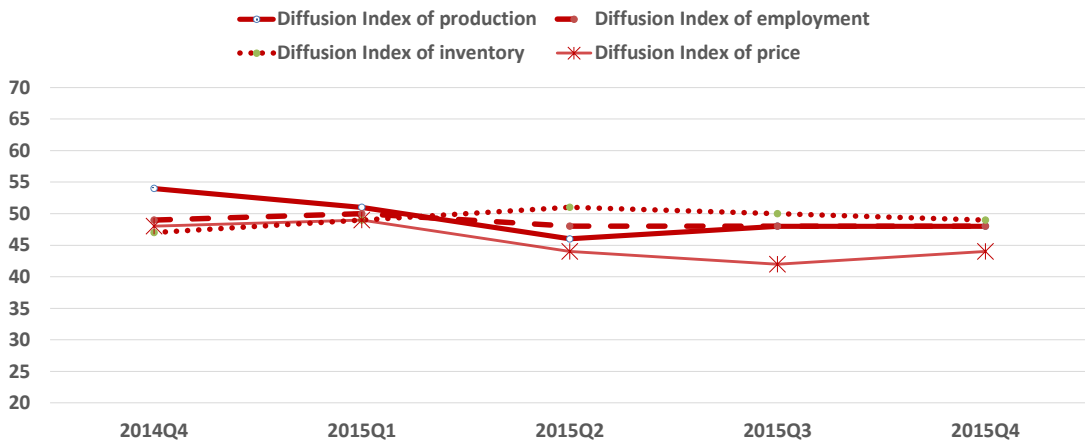
# Figure 2. Current Operating Conditions



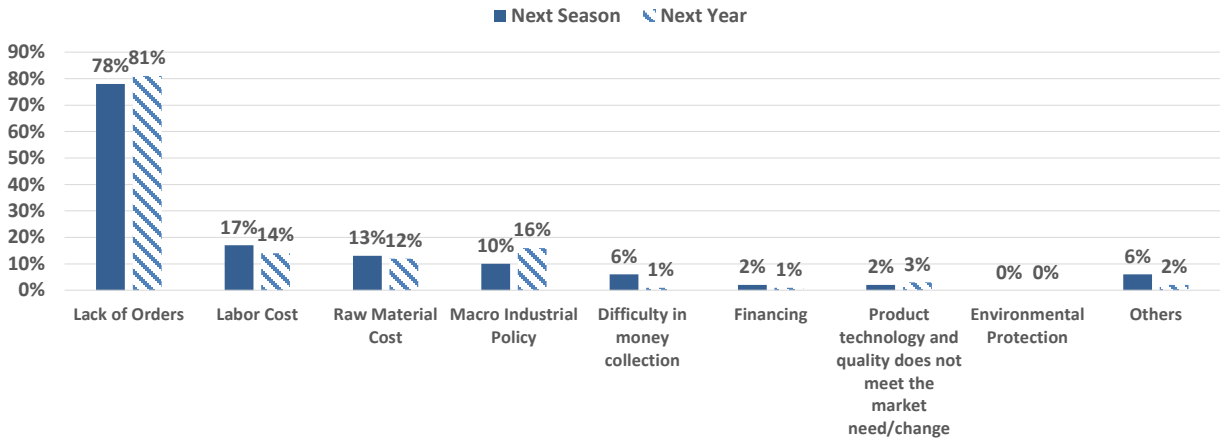
### Figure 3. Investment



### Figure 4. Other Main Economic Indices



# Figure 5. Factors Constraining Production



# Figure 6A. Excess Capacity in Domestic Market

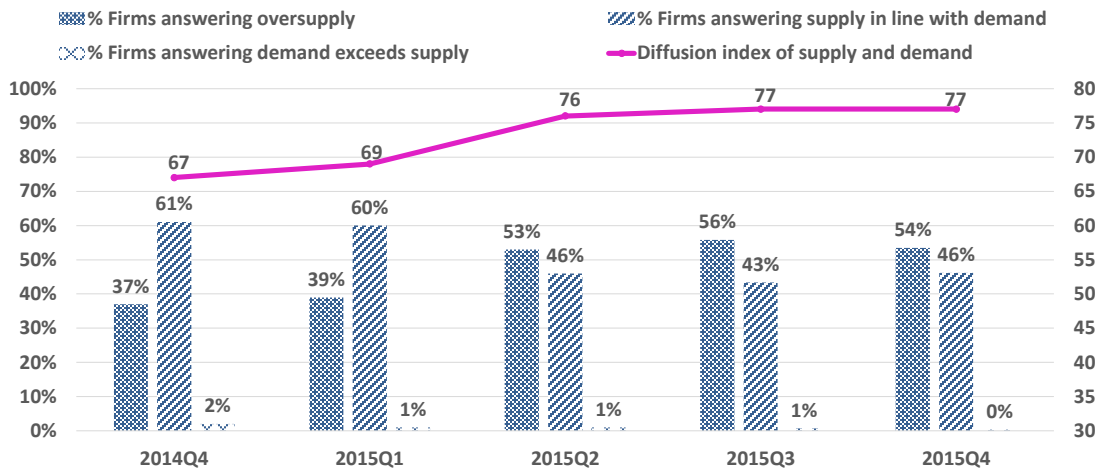


Figure 6B. Firms with Severe Excess Capacity

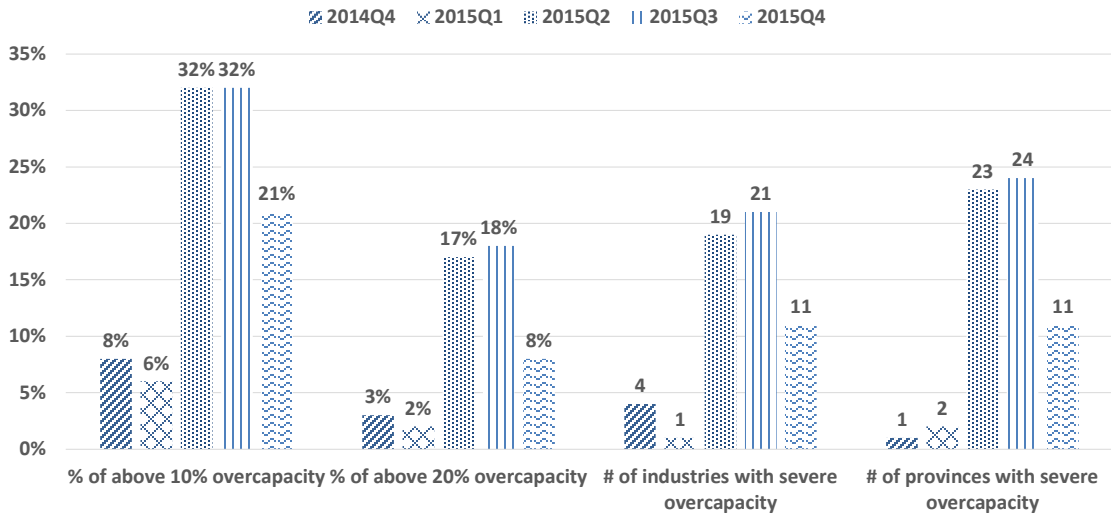
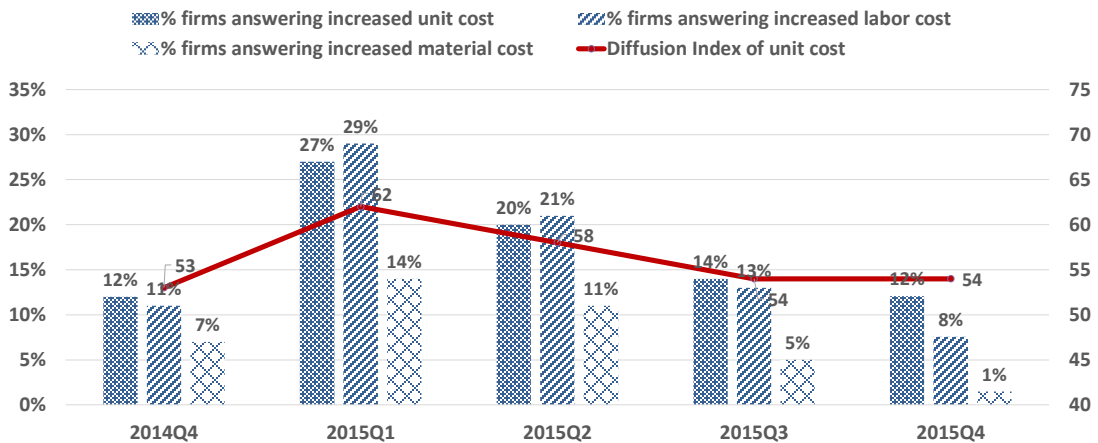
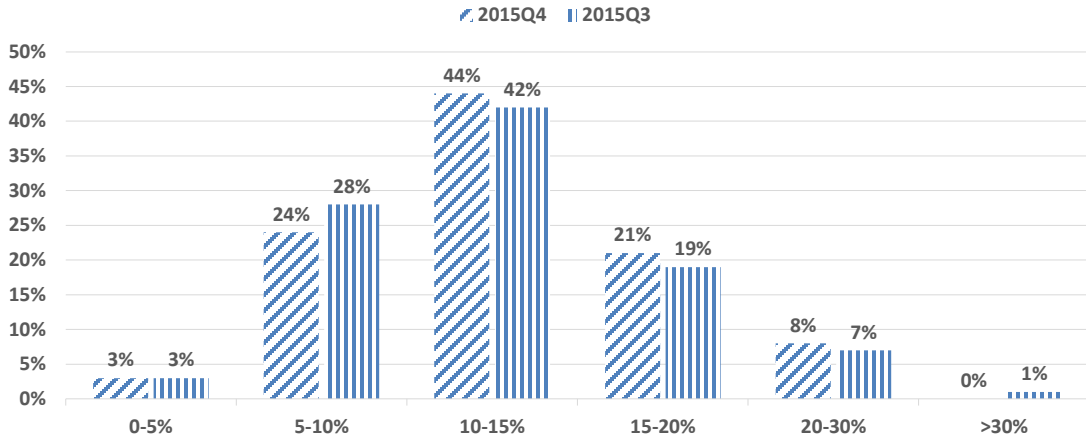


Figure 7. Unit Cost, Labor Cost, and Material Cost



### Figure 8. Gross Margins



### Figure 9. Financing Figure 9A. Lending Attitude

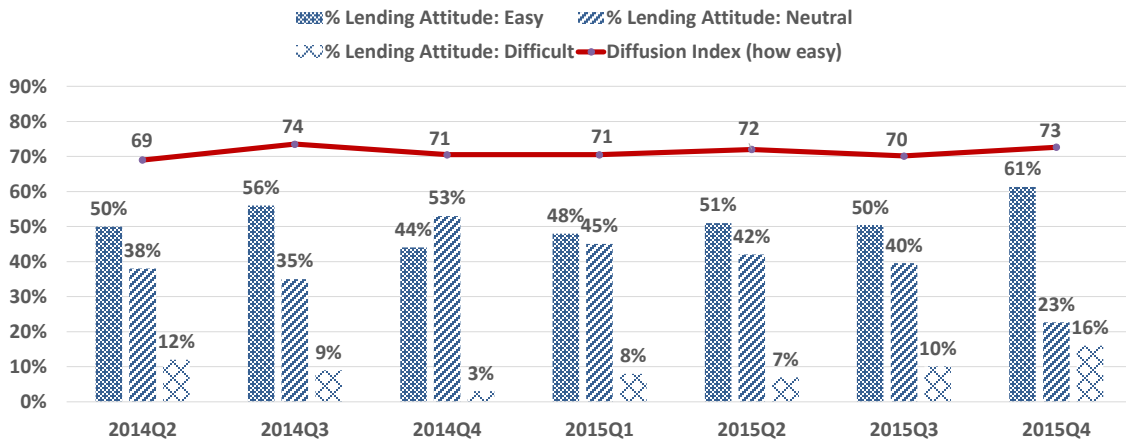
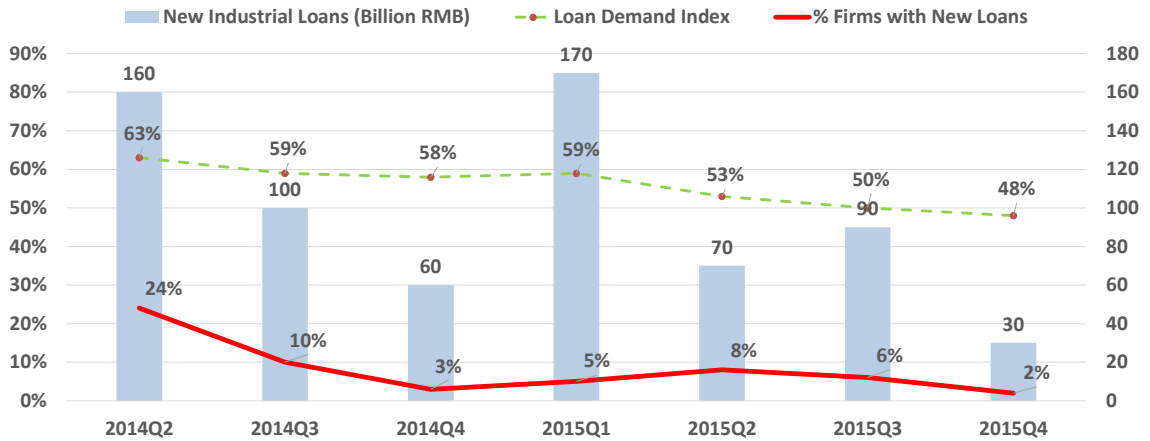


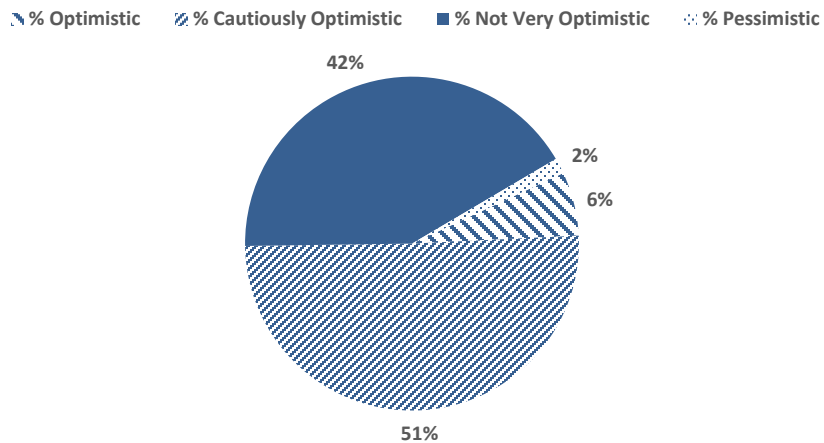


Figure 9B. Proportion of Firms with New Loans vs. Central Bank Data

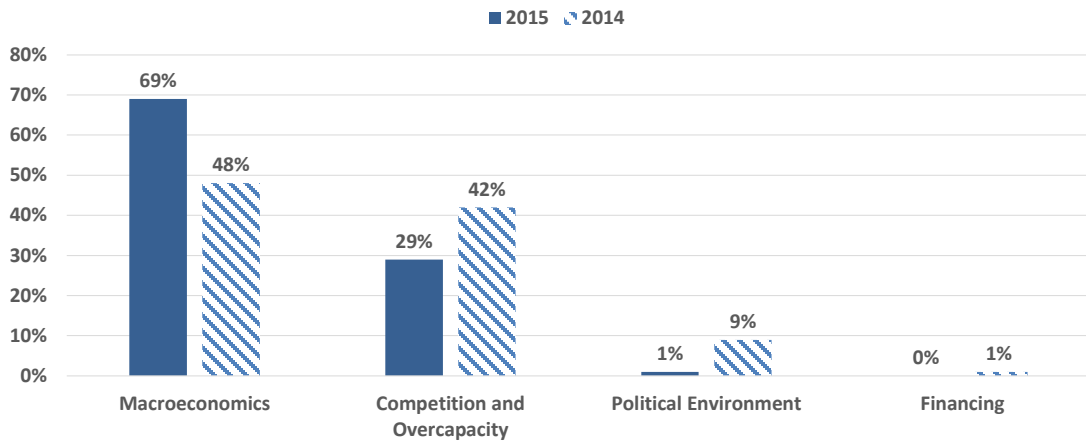


Note: New Industrial Loans and Loan Demand Index are from the quarterly reports by the Central Bank.

Figure 10. Outlook in 3-5 Years  
 Figure 10A. Business Outlook in 3-5 Years



# Figure 10B. Reasons for Pessimism



# Figure 11. Innovation

## Figure 11A. R&D Expenses of Chinese Firms

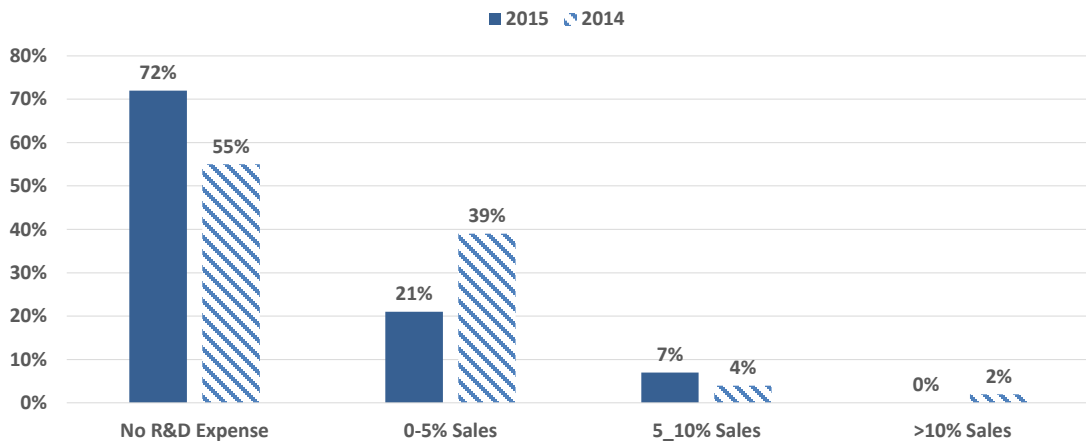


Figure 11B. Performance of Firms with significant R&D Expense

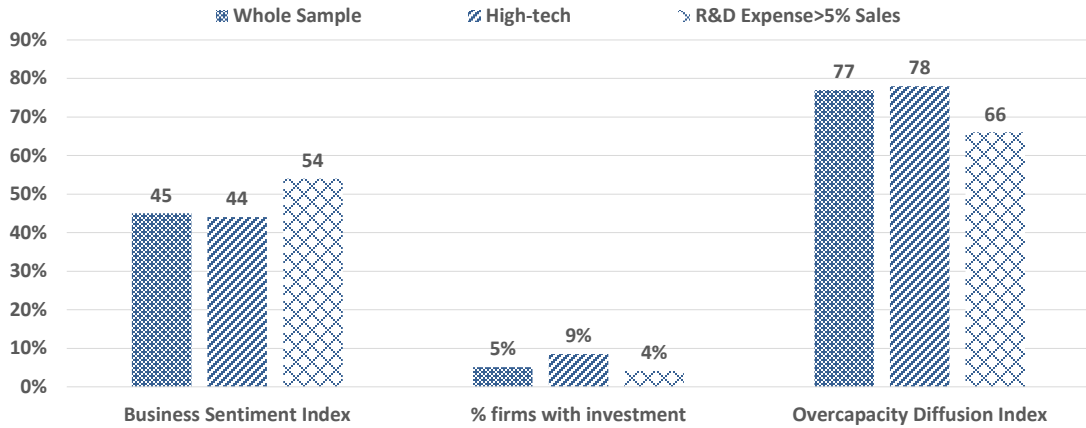


Figure 12. Legal Environment  
Figure 12A. Rating of Legal Environment (Whole Sample)

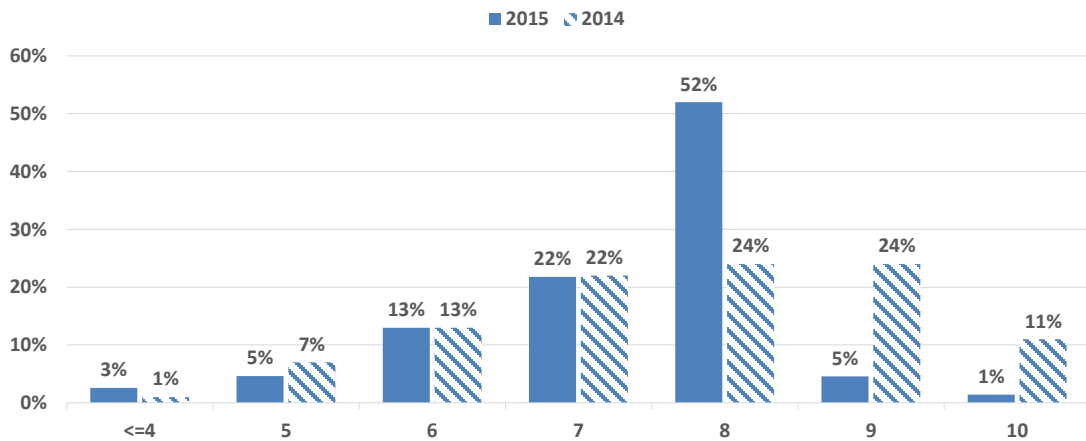


Figure 12B. Rating of Legal Environment  
(Hi-tech Enterprise)

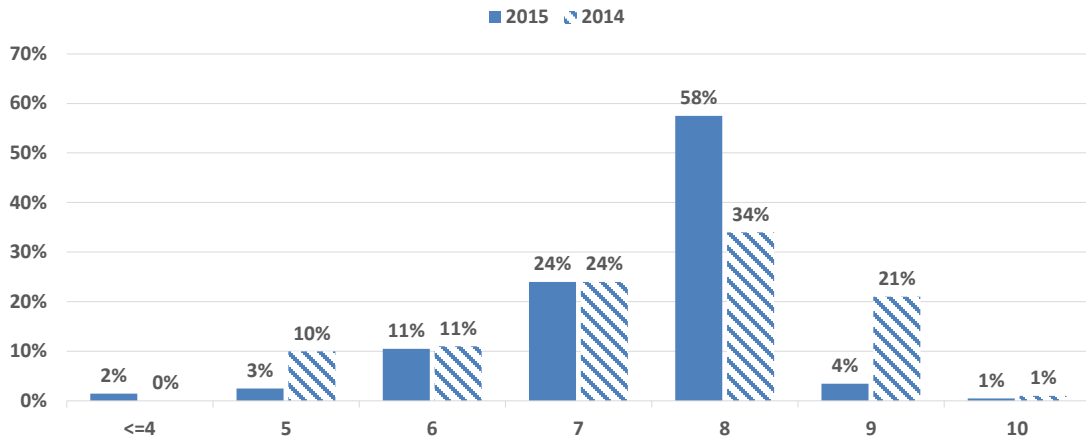


Figure 12C. Ways to Handle Business Disputes

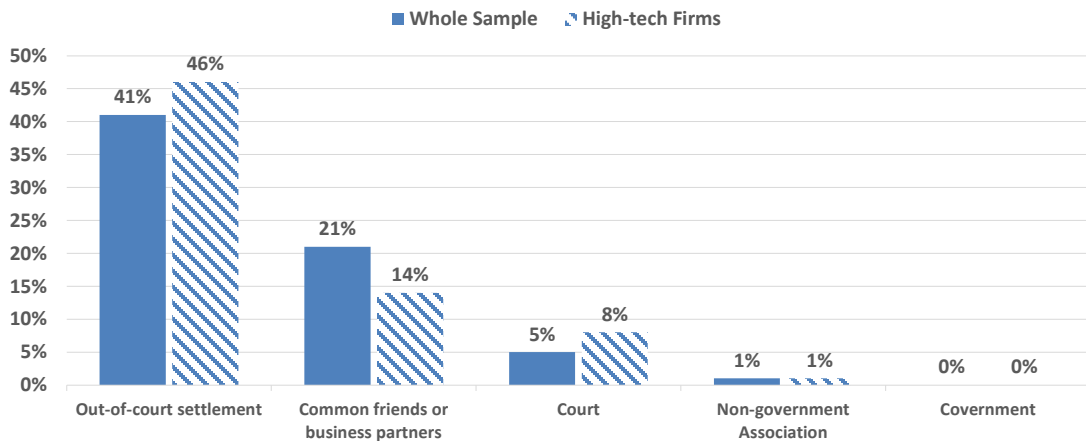
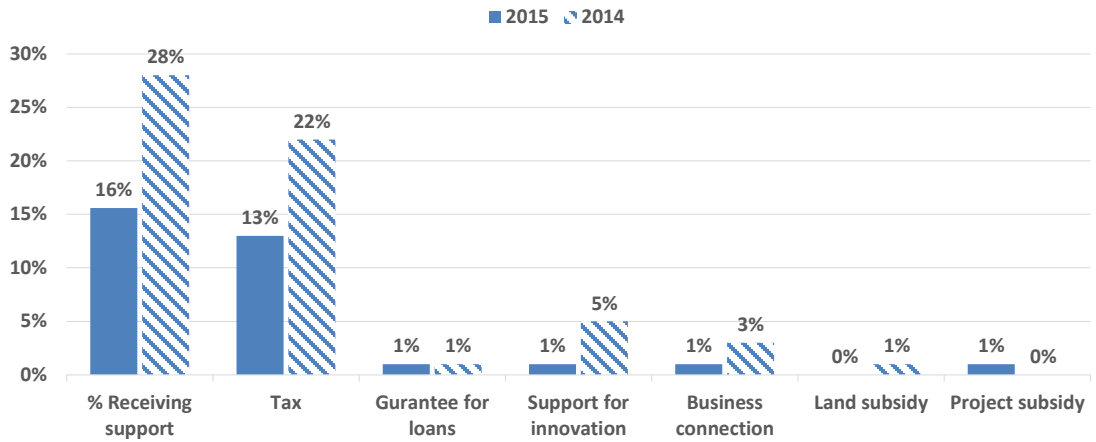


Figure 12D. Support from the Government



**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	2038	2007	45	47	56	57	48	52	32	32
<i>By Size</i>										
Large	747	723	47	47	57	59	49	51	34	33
Medium	672	690	45	47	56	56	49	54	32	32
Small	619	594	44	46	54	55	47	51	31	31
<i>By Ownership</i>										
State-owned	81	83	51	52	68	69	48	50	37	38
Collectively-owned	37	31	43	44	50	53	45	47	35	32
Private	1637	1598	45	46	55	55	48	52	31	31
Foreign-owned	332	336	49	50	60	62	49	54	36	35
<i>By Product Type</i>										
Consumer Goods - Durable	438	439	45	47	55	55	49	54	32	32
Consumer Goods - Nondurable	626	614	47	48	60	60	50	55	31	30
Capital Goods	199	173	44	45	53	55	46	47	34	31
Intermediate Goods	776	784	45	46	54	55	47	49	33	33

**Table 1.2**

	% of Firms with Fixed Investment		Diffusion Index - Production		Diffusion Index - Employment		Diffusion Index - Price	
	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3
Nation	5	10	48	48	48	48	44	42
<i>By Size</i>								
Large	6	12	48	51	47	48	44	42
Medium	5	10	48	46	48	48	44	41
Small	5	8	49	47	48	48	45	42
<i>By Ownership</i>								
State-owned	11	12	56	53	49	50	43	44
Collectively-owned	8	13	51	47	46	50	43	47
Private	5	10	47	48	48	48	44	41
Foreign-owned	8	9	53	50	49	48	47	44
<i>By Product Type</i>								
Consumer Goods - Durable	5	8	50	47	48	47	45	41
Consumer Goods - Nondurable	5	12	55	54	48	50	47	46
Capital Goods	7	13	37	41	47	47	40	36
Intermediate Goods	4	9	45	45	48	48	42	40

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	2038	2007	45	47	56	57	48	52	5	10	32	32
<i>Mining</i>												
Coal Mining and Washing	5	2	30	8	20	0	25	25	0	0	20	0
Mining and Processing of Ferrous Metal Ores	1	1	50	17	50	0	50	50	0	0	50	0
Mining and Processing of Non-ferrous Metal	5	3	47	44	50	50	50	50	20	33	40	33
Mining and Processing of Nonmetal Ores	14	14	42	36	39	36	50	39	14	0	36	32
<i>Production and Supply of Electricity, Heat, Gas and Water</i>												
Power Production and Supply	36	34	53	52	67	68	46	41	11	18	47	47
Production and Supply of Water	9	9	52	43	89	83	50	39	0	0	17	6
<i>Light Manufacturing</i>												
Processing of Agricultural and Related Products	111	114	35	39	52	53	50	61	2	5	2	2
Manufacture of Foods	51	52	50	53	59	57	50	63	16	4	41	38
Manufacture of Beverage	43	44	47	50	64	64	57	67	2	9	19	18
Manufacture of Textiles	135	130	40	40	48	49	47	47	3	1	27	23
Manufacture of Textile Wearing and Apparel	73	69	50	53	57	58	48	58	16	22	45	43
Manufacture of Leather, Fur, Feather, Related Products and Footwear	33	41	37	40	58	59	50	60	6	12	3	2
Processing of Wood Products	43	43	36	39	53	53	51	59	5	12	5	5
Manufacture of Furniture	29	31	49	56	62	56	48	68	14	0	36	45
Manufacture of Paper and Paper Products	57	57	49	53	58	61	45	54	2	33	43	45
Printing, Reproduction of Recording Media	55	53	53	57	62	63	48	60	4	13	48	47
Manufacture of Cultural and Sports Products	19	22	54	51	63	68	50	48	0	0	47	36
Manufacture of Medicines	62	71	63	64	81	78	51	56	8	25	57	58
Manufacture of Handicrafts and Others	40	46	55	51	69	60	48	49	0	4	50	45
Recycling and Disposal of Waste	2	2	50	42	50	50	50	50	0	0	50	25
<i>Chemical Industry</i>												
Processing of Petroleum and Nuclear Fuel	7	8	38	42	50	56	64	69	0	0	0	0
Manufacture of Chemical Products	128	125	50	48	54	51	50	51	2	12	45	42
Manufacture of Chemical Fibers	10	9	47	48	50	50	45	56	0	11	45	39
Manufacture of Rubber Products	25	27	48	51	64	65	48	57	4	0	32	31
Manufacture of Plastics	82	78	47	47	54	56	51	46	2	3	35	38
<i>Equipment Manufacturing</i>												
Manufacture of General-purpose Machinery	190	182	39	43	46	49	46	49	5	3	24	31
Manufacture of Special-purpose Machinery	118	113	48	48	58	61	47	47	3	19	39	36
Manufacture of Transport Equipment	77	74	51	49	55	55	50	49	12	20	47	44
Manufacture of Electric Machinery and Apparatus	151	135	45	45	62	61	47	51	3	18	26	23
Computers, Communication and Electric Equipment	79	83	52	54	58	63	51	54	8	10	49	47
Manufacture of Measuring Instruments	41	33	48	46	56	53	50	48	10	0	38	38
<i>Other Heavy Manufacturing</i>												
Manufacture of Non-metallic Mineral Products	114	97	40	42	46	54	46	42	2	4	28	30
Smelting and Pressing of Ferrous Metals	27	26	36	38	35	40	50	58	7	0	24	15
Smelting and Pressing of Non-ferrous Metals	17	37	46	47	50	49	47	55	12	0	41	38
Manufacture of Metal Products	148	142	42	43	58	58	45	48	5	11	23	24

**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	2038	2007	45	47	56	57	5	10	32	32	
<i>Top Five</i>											
Manufacture of Medicines	62	71	63	64	81	78	8	25	57	58	
Manufacture of Handicrafts and Others	40	46	55	51	69	60	0	4	50	45	
Manufacture of Cultural and Sports Products	19	22	54	51	63	68	0	0	47	36	
Power Production and Supply	36	34	53	52	67	68	11	18	47	47	
Printing, Reproduction of Recording Media	55	53	53	57	62	63	4	13	48	47	
<i>Bottom Five</i>											
Coal Mining and Washing	5	2	30	8	20	0	0	0	20	0	
Processing of Agricultural and Related Products	111	114	35	39	52	53	2	5	2	2	
Processing of Wood Products	43	43	36	39	53	53	5	12	5	5	
Smelting and Pressing of Ferrous Metals	27	26	36	38	35	40	7	0	24	15	
Manufacture of Leather, Fur, Feather, Related Products and Footwear	33	41	37	40	58	59	6	12	3	2	

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	2038	2007	45	47	56	57	48	52	5	10	32	32
<i>North China</i>												
Beijing	40	38	48	50	58	59	44	53	8	5	41	39
Tianjin	50	49	44	46	55	56	43	51	4	6	35	32
Hebei	87	82	42	43	55	57	45	48	3	6	25	25
<i>Northeast</i>												
Liaoning	86	81	42	45	52	56	46	49	3	12	30	31
Jilin	30	24	44	44	55	60	45	44	3	8	32	29
Heilongjiang	27	22	42	50	54	66	48	59	4	5	24	25
<i>Northwest</i>												
Inner Mongolia	15	15	42	48	47	53	40	53	7	7	40	37
Shaanxi	21	23	48	49	57	61	52	52	5	0	33	33
Gansu	6	5	53	57	67	60	58	60	17	40	33	50
Ningxia	3	3	33	39	50	50	50	50	0	33	0	17
Xinjiang	3	3	39	39	50	50	50	50	0	0	17	17
<i>Central North</i>												
Shanxi	23	22	41	43	48	55	48	52	4	9	22	23
Shandong	196	183	44	45	54	56	48	48	5	8	31	31
Henan	65	70	44	43	55	53	48	48	8	13	28	29
<i>Southwest</i>												
Chongqing	31	35	46	46	56	53	50	54	6	3	31	30
Sichuan	54	59	43	47	56	57	44	52	9	17	28	33
Guizhou	6	7	36	40	42	43	50	64	0	14	17	14
Yunnan	16	15	49	50	63	60	53	63	0	7	31	27
<i>East China</i>												
Shanghai	89	88	47	49	58	59	47	53	6	9	35	35
Jiangsu	303	311	45	46	55	56	49	51	5	9	32	32
Zhejiang	299	299	46	46	57	56	49	54	5	11	33	30
<i>South China</i>												
Fujian	81	83	46	47	56	57	49	52	5	7	34	33
Guangdong	271	260	47	50	57	60	50	53	4	9	35	35
Guangxi	33	36	46	49	58	61	50	53	3	22	30	33
Hainan	2	2	42	50	75	75	50	75	0	50	0	0
<i>Central South</i>												
Anhui	74	71	45	45	57	54	49	53	5	17	31	29
Jiangxi	42	38	48	49	62	58	49	55	12	11	35	34
Hubei	51	50	46	48	51	54	53	56	6	20	34	33
Hunan	34	33	49	48	57	55	53	55	6	18	37	36

**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	2038	2007	45	47	56	57	5	10	32	32
<i>Top Five</i>										
Gansu	6	5	53	57	67	60	17	40	33	50
Hunan	34	33	49	48	57	55	6	18	37	36
Yunnan	16	15	49	50	63	60	0	7	31	27
Shaanxi	21	23	48	49	57	61	5	0	33	33
Beijing	40	38	48	50	58	59	8	5	41	39
Jiangxi	42	38	48	49	62	58	12	11	35	34
<i>Bottom Five</i>										
Guizhou	6	7	36	40	42	43	0	14	17	14
Shanxi	23	22	41	43	48	55	4	9	22	23
Heilongjiang	27	22	42	50	54	66	4	5	24	25
Inner Mongolia	15	15	42	48	47	53	7	7	40	37
Liaoning	86	81	42	45	52	56	3	12	30	31
Hebei	87	82	42	43	55	57	3	6	25	25

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	2038	2007	77	77	63	68	49	50	
<i>By Size</i>									
Large	747	723	75	76	63	67	49	50	
Medium	672	690	77	79	63	68	49	50	
Small	619	594	77	78	66	69	49	51	
<i>By Ownership</i>									
State-owned	81	83	64	65	55	55	51	53	
Collectively-owned	37	31	71	77	71	80	53	50	
Private	1637	1598	78	79	64	69	49	51	
Foreign -owned	332	336	69	71	62	65	46	48	
<i>By Product Type</i>									
Consumer Goods - Durable	438	439	78	78	63	67	50	51	
Consumer Goods - Nondurable	626	614	72	72	62	66	47	50	
Capital Goods	199	173	73	78	61	68	48	50	
Intermediate Goods	776	784	80	81	65	70	51	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
Coal Mining and Washing	5	60	60
Processing of Petroleum and Nuclear Fuel	7	57	100
Mining and Processing of Nonmetal Ores	14	29	36
Smelting and Pressing of Ferrous Metals	27	22	41
Processing of Wood Products	43	21	51
Manufacture of Metal Products	148	20	38
Manufacture of Non-metallic Mineral Products	114	18	32
Processing of Agricultural and Related Products	111	17	56
Manufacture of Electric Machinery and Apparatus	151	16	30
Manufacture of Leather, Fur, Feather, Related Products and Footwear	33	12	52
Manufacture of Chemical Fibers	10	10	30

## 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
Guizhou	6	33	33
Jilin	30	20	33
Beijing	40	15	28
Heilongjiang	27	15	26
Shanxi	23	13	30
Chongqing	31	13	19
Yunnan	16	13	50
Henan	65	12	31
Shandong	196	12	25
Tianjin	50	12	32
Liaoning	86	10	30

## 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**

		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
<i>Nation</i>		2038	2007	54	54	53	56	45	44	44	42
<i>By Size</i>											
	Large	747	723	53	54	53	56	45	43	44	42
	Medium	672	690	54	54	53	56	44	44	44	41
	Small	619	594	54	54	53	57	45	44	45	42
<i>By Ownership</i>											
	State-owned	81	83	50	46	53	53	47	44	45	44
	Collectively-owned	37	31	54	55	53	53	42	52	43	47
	Private	1637	1598	54	54	53	57	44	43	44	41
	Foreign -owned	332	336	53	55	53	56	48	45	47	44
<i>By Product Type</i>											
	Consumer Goods - Durable	438	439	52	55	54	58	47	44	45	41
	Consumer Goods - Nondurable	626	614	52	55	51	55	46	47	47	46
	Capital Goods	199	173	62	54	59	56	41	36	40	36
	Intermediate Goods	776	784	53	53	53	56	43	42	42	40

**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	2038	54	53	45	44
Manufacture of Textiles	135	83	58	40	40
Manufacture of General-purpose Machinery	190	67	68	33	34
Manufacture of Furniture	29	62	60	50	48
Coal Mining and Washing	5	60	60	38	25
Manufacture of Leather, Fur, Feather, Related Products and	33	56	50	56	52
Manufacture of Textile Wearing and Apparel	73	55	53	50	50
Manufacture of Foods	51	55	53	51	51
Manufacture of Rubber Products	25	54	58	42	42
Manufacture of Transport Equipment	77	54	51	50	49

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	2038	54	53	45	44
Inner Mongoli	15	63	60	39	40
Hubei	51	58	54	50	50
Shanxi	23	57	57	43	43
Zhejiang	299	57	53	45	43
Shanghai	89	57	56	46	44
Jiangsu	303	56	55	44	43
Guangdong	271	56	53	46	47
Hebei	87	54	55	43	42

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**

	% Firms with Loans		% Firms with New Loans		Collateralization Rate %		Diffusion Index - Lending Attitude		Diffusion Index - Interest Rate		
	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3	Q4	Q3	
Nation	2038	2007	24	24	2	6	73	70	42	45	
<i>With or Without Investment</i>											
Firms with Investment	105	203	33	33	5	14	44	69	36	47	
Firms without Investment	1933	1804	24	22	2	5	76	71	42	44	
<i>By Size</i>											
Large	747	723	28	26	4	7	79	69	39	43	
Medium	672	690	25	24	2	6	67	76	46	48	
Small	619	594	19	19	1	5	64	65	41	43	
<i>By Ownership</i>											
State-owned	81	83	25	24	0	4	69	90	46	45	
Collectively-owned	37	31	22	23	3	6	50	50	50	25	
Private	1637	1598	26	25	3	7	72	70	41	45	
Foreign -owned	332	336	17	15	2	5	75	72	43	47	
<i>By Product Type</i>											
Consumer Goods - Durable	438	439	23	23	2	6	77	71	46	48	
Consumer Goods - Nondurable	626	614	26	22	3	5	71	70	34	41	
Capital Goods	199	173	22	27	2	7	64	71	30	25	
Intermediate Goods	776	784	24	25	2	7	74	69	48	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**

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*The most important source of financing*

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Sources	Number of Firms		% of Firms
Internal Funds	2001	#	98
Founder	66	#	3
Bank	11	#	0
Stock market	3	#	0
Non-official finance institution	3	#	0
Relatives and friends	1	#	0
Others	3	#	0

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*The second most important source of financing*

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Sources	Number of Firms		% of Firms
Founder	511	#	1
Bank	474	#	26
Internal Funds	19	#	21
Relatives and friends	6	#	0
Stock market	1	#	0
Non-official finance institution	1	#	0
Others	4		0

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## Appendix A1. Industry and Regional Ranking of Excess Capacity

### Appendix 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
Coal Mining and Washing	5	2	60	100	60	100
Processing of Petroleum and Nuclear Fuel	7	8	57	38	100	75
Mining and Processing of Nonmetal Ores	14	14	29	43	36	71
Smelting and Pressing of Ferrous Metals	27	26	22	27	41	46
Processing of Wood Products	43	43	21	2	51	30
Manufacture of Metal Products	148	142	20	35	38	43
Manufacture of Non-metallic Mineral Products	114	97	18	14	32	30
Processing of Agricultural and Related Products	111	114	17	17	56	32
Manufacture of Electric Machinery and Apparatus	151	135	16	43	30	52
Manufacture of Leather, Fur, Feather, Related Products and Footwear	33	41	12	0	52	7
Manufacture of Chemical Fibers	10	9	10	33	30	44
Printing, Reproduction of Recording Media	55	53	9	23	15	25
Manufacture of Plastics	82	78	7	4	52	6
Manufacture of Foods	51	52	6	8	27	13
Manufacture of Transport Equipment	77	74	4	26	13	31
Manufacture of Furniture	29	31	3	16	17	23
Manufacture of Textile Wearing and Apparel	73	69	3	13	19	25
Computers, Communication and Electric Equipment	79	83	3	11	23	52
Manufacture of Measuring Instruments	41	33	2	9	7	12
Manufacture of Chemical Products	128	125	2	28	15	40
Manufacture of Beverage	43	44	2	11	16	18
Manufacture of General-purpose Machinery	190	182	2	16	3	62
Manufacture of Special-purpose Machinery	118	113	2	28	4	36
Manufacture of Medicines	62	71	2	13	8	17
Manufacture of Textiles	135	130	1	2	1	7
Smelting and Pressing of Non-ferrous Metals	17	37	0	11	29	24
Manufacture of Handicrafts and Others	40	46	0	9	15	28
Manufacture of Paper and Paper Products	57	57	0	14	2	14
Manufacture of Rubber Products	25	27	0	15	0	37
Manufacture of Cultural and Sports Products	19	22	0	0	0	23
Power Production and Supply	36	34	0	9	0	12
Mining and Processing of Non-ferrous Metal	5	3	0	33	0	33
Production and Supply of Water	9	9	0	0	0	0

#### Notes:

1. 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.

## **Appendix 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
Guizhou	22	19	41	32	55	42
Jilin	23	22	35	23	48	32
Beijing	70	70	29	24	49	39
Heilongjiang	38	35	29	17	37	26
Shanxi	36	37	28	19	42	30
Chongqing	22	22	27	18	32	32
Yunnan	71	62	24	16	38	26
Henan	59	55	22	22	36	33
Shandong	81	84	21	24	42	45
Tianjin	33	35	21	20	30	37
Liaoning	15	16	20	31	47	50
Jiangxi	49	47	20	17	20	23
Sichuan	183	186	19	22	34	35
Hebei	38	33	18	21	39	42
Shanghai	50	51	18	18	22	33
Inner Mongolia	82	82	17	21	29	33
Jiangsu	299	293	17	15	32	33
Fujian	35	34	17	15	31	32
Hunan	88	91	16	13	34	30
Hubei	311	311	15	17	34	33
Anhui	7	8	14	13	29	50
Shaanxi	260	258	14	11	26	25
Guangdong	15	14	13	14	13	21
Zhejiang	83	96	11	8	19	21
Guangxi	24	23	8	4	17	17
Gansu	5	7	0	0	0	0

Notes:

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

## Appendix A2. Industry and Regional Diffusion Index for Cost and Price

### Appendix A2.1 Industry Diffusion Index for Cost and Price

	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	2038	2007	54	54	53	56	45	44	44	42	
<i>Mining</i>											
Coal Mining and Washing	5	2	60	50	60	50	38	50	25	0	
Mining and Processing of Ferrous Metal Ores	1	1	100	50	100	50	50	50	50	50	
Mining and Processing of Non-ferrous Metal	5	3	50	33	50	33	50	33	50	67	
Mining and Processing of Nonmetal Ores	14	14	50	50	57	54	43	50	43	43	
<i>Production and Supply of Electricity, Heat, Gas and Water</i>											
Power Production and Supply	36	34	50	50	50	50	50	50	50	49	
Production and Supply of Water	9	9	50	50	50	50	50	50	50	50	
<i>Light Manufacturing</i>											
Processing of Agricultural and Related Products	111	114	42	50	49	51	43	50	48	49	
Manufacture of Foods	51	52	55	60	53	56	51	57	51	52	
Manufacture of Beverage	43	44	43	50	49	50	44	50	50	50	
Manufacture of Textiles	135	130	83	75	58	78	40	29	40	24	
Manufacture of Textile Wearing and Apparel	73	69	55	64	53	61	50	50	50	44	
Manufacture of Leather, Fur, Feather, Related Products and Footwear	33	41	56	49	50	50	56	49	52	44	
Processing of Wood Products	43	43	45	51	50	52	47	49	40	47	
Manufacture of Furniture	29	31	62	61	60	58	50	56	48	48	
Manufacture of Paper and Paper Products	57	57	48	54	49	50	48	54	46	48	
Printing, Reproduction of Recording Media	55	53	48	51	48	50	50	50	49	48	
Manufacture of Cultural and Sports Products	19	22	53	59	55	61	47	50	45	50	
Manufacture of Medicines	62	71	50	51	50	50	51	50	51	51	
Manufacture of Handicrafts and Others	40	46	51	50	51	51	50	50	49	49	
Recycling and Disposal of Waste	2	2	50	50	50	50	50	50	50	50	
<i>Chemical Industry</i>											
Processing of Petroleum and Nuclear Fuel	7	8	0	0	36	50	0	0	7	25	
Manufacture of Chemical Products	128	125	53	56	51	52	46	49	44	48	
Manufacture of Chemical Fibers	10	9	50	50	50	56	40	44	35	39	
Manufacture of Rubber Products	25	27	54	63	58	63	42	54	42	46	
Manufacture of Plastics	82	78	41	59	51	71	38	23	38	21	
<i>Equipment Manufacturing</i>											
Manufacture of General-purpose Machinery	190	182	67	48	68	62	33	18	34	16	
Manufacture of Special-purpose Machinery	118	113	50	46	50	52	49	45	46	45	
Manufacture of Transport Equipment	77	74	54	57	51	53	50	51	49	47	
Manufacture of Electric Machinery and Apparatus	151	135	50	50	50	50	48	49	49	49	
Computers, Communication and Electric Equipment	79	83	51	57	52	55	48	49	47	47	
Manufacture of Measuring Instruments	41	33	52	59	52	61	52	55	50	48	
<i>Other Heavy Manufacturing</i>											
Manufacture of Non-metallic Mineral Products	114	97	50	55	50	58	50	48	46	44	
Smelting and Pressing of Ferrous Metals	27	26	52	44	61	52	37	30	31	29	
Smelting and Pressing of Non-ferrous Metals	17	37	50	50	62	66	34	33	32	32	
Manufacture of Metal Products	148	142	50	50	50	50	36	47	35	48	

Notes:

1. The table includes industries with more than three firms.

## Appendix 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	2038	2007	54	54	53	56	45	44	44	42
<i>North China</i>											
	Beijing	40	38	50	57	50	54	44	53	43	53
	Tianjin	50	49	47	56	51	55	40	46	41	45
	Hebei	87	82	54	54	55	57	43	41	42	37
<i>Northeast</i>											
	Liaoning	86	81	51	48	53	53	39	41	42	39
	Jilin	30	24	45	58	52	56	43	50	43	50
	Heilongjiang	27	22	50	48	52	52	43	43	43	41
<i>Northwest</i>											
	Inner Mongolia	15	15	63	57	60	57	39	50	40	43
	Shaanxi	21	23	48	50	48	57	45	46	43	48
	Gansu	6	5	33	40	50	50	25	40	33	30
	Ningxia	3	3	50	50	50	50	50	50	50	50
	Xinjiang	3	3	33	50	33	50	50	50	33	33
<i>Central North</i>											
	Shanxi	23	22	57	55	57	55	43	41	43	41
	Shandong	196	183	53	52	54	55	45	42	44	42
	Henan	65	70	50	49	51	53	44	39	45	39
<i>Southwest</i>											
	Chongqing	31	35	48	53	50	56	45	44	47	43
	Sichuan	54	59	50	50	51	52	45	45	44	45
	Guizhou	6	7	50	43	50	50	50	42	50	42
	Yunnan	16	15	50	50	50	47	50	50	50	50
<i>East China</i>											
	Shanghai	89	88	57	55	56	57	46	47	44	44
	Jiangsu	303	311	56	55	55	58	44	39	43	38
	Zhejiang	299	299	57	56	53	58	45	41	43	37
<i>South China</i>											
	Fujian	81	83	53	56	54	57	47	49	46	45
	Guangdong	271	260	56	57	53	57	46	47	47	44
	Guangxi	33	36	52	54	52	57	47	50	45	49
	Hainan	2	2	50	50	50	50	50	50	50	50
<i>Central South</i>											
	Anhui	74	71	52	51	52	54	43	47	43	46
	Jiangxi	42	38	48	51	50	57	44	40	44	36
	Hubei	51	50	58	57	54	57	50	45	50	44
	Hunan	34	33	51	52	50	52	49	45	43	39

Notes:

1. The table includes provinces with more than three firms.

## Appendix 3. Sampling Procedure

### 3.1 The Population

The initial sample of our panel is taken from the 2008 Economic Census. This is the most complete and reliable economic census data available. A new round of Economic Census is currently ongoing.

Although the 2008 Economic Census is our best choice, it is done seven years ago. There are two specific concerns. First, if many firms no longer exist and if those that disappear are concentrated in certain industry, region, or size categories, our final response sample may not be representative of the population. In our 2015Q4 survey, we find that 28 firms, or 1.37% of the initial sample, went out of business or no longer exist (2015Q3: 0.55%, 2015Q2: 1.151%, 2015Q1: 0.349%). The second concern is that firm characteristics, such as industry, might have changed significantly. We deal with this concern by explicitly asking firms about their main products and product types.

2008 Economic Census database is made of provincial databases each containing two sets of data: one uses industrial units and the other uses legal person units.<sup>1</sup> We start with the legal person units in 2008 Economic Census database. We then drop non-industrial firms and firms with sales below five million RMB to obtain the population of what NBS terms as “sizable” industrial firms.

### 3.2 Sampling Procedure

Below is a step-by-step description of the procedure to obtain our initial survey sample in our first survey, that is, the 2014 Q2 survey.

1. Simplify industrial classification code. Using Industrial classification for national economic activities (GBT4754-2002)<sup>2</sup> as the standard, we only define firms' industry up to major groups (two digit code from 01 to 98)<sup>3</sup>.
2. Simplify area code. We use the first two digits to place firms in 31 provinces and municipalities.
3. Remove nonindustrial firms: using industry code specified in step 1, we remove those with code smaller than 6 or larger than 46, retaining 39 industry categories. Those left are mining (06-11), manufacturing (13-43) and electricity, gas and water production and processing (44-46).
4. Remove below-scale firms: we remove those with less than 5,000,000RMB in annual main business income, this step removed about  $\frac{3}{4}$  of total firms. As of

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<sup>1</sup> Legal person units are composed of industrial activity units, industrial activity units are all under management and control of legal person units.

<sup>2</sup> Since the original database is based on census conducted in 2008, we use GBT4754-2002 industry classification rather than the newer GBT4754-2011 classification.

<sup>3</sup> Industrial classification for national economic activities (GBT4754-2002) classifies firms into division, major group, minor group, subgroup, in order of increasing detail. For example, the subgroup 1361 seafood frozen processing belongs in division A (manufacturing), major group 13 (agriculture and by-product processing), and minor group 136 (seafood processing).

this step, we obtain the population of sizable industrial firms, which consists of 488,052 firms.

5. Classify firms by size into 3 categories using 33% and 66% percentiles in main business income.
6. Take a stratified random sample using size, region and industry as strata, taking 2.1% of the population. The final sample consists of 10,139 firms.

In our Q4 survey, we started from the 2,007 firms in our last response sample, and obtain responses from 1,551 firms. These firms match the population in terms of industry, region, and sizes reasonably well. Nevertheless, we draw an additional survey samples with an industry-region-size distribution such that the final response sample would match the population, assuming (1) random responses and (2) a 20% response rate. We obtained 487 responses from this new sample, resulting in a total of 2,038 firms in our final response sample.

### **3.3 Survey Process**

The survey is through phone interviews. Figure A3 reports the distribution of the number of phone calls, duration of the calls, and the interviewees' positions in the companies.

### **3.4. Sample Representativeness**

Tables A3.1-A3.3 show that the distribution of the population and the Q4 response sample, as well as the 1,551 firms that were also in the Q3 sample, in terms of industry, region, and sizes. Note that as we are sampling 2.1% of the population, some small strata may not be sampled. Specifically, Mining of other Ores, Extraction of Petroleum and Natural Gas and Manufacture of Tobacco are three industries not sampled; and Qinghai and Tibet are two regions not sampled. Overall, our response sample represents the population well.

### **3.5 Seasonality**

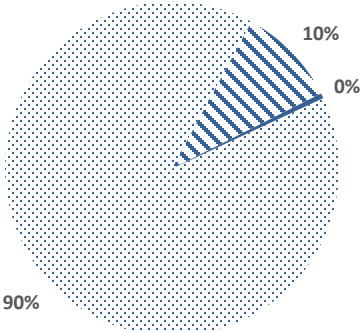
There are no obvious ways to adjust for seasonality, especially given the relatively small number of surveys we have. We deal with this issue by asking directly the firms about seasonality and its impact. As shown in Figure A4, the majority (75%) of firms report no seasonality. For 14% of the firms, seasonality impact is below 5%. Most importantly, the impact of seasonality is roughly equally likely to be positive or negative. Thus, in aggregate, seasonality is not likely to bias our results and we do not adjust for seasonality.



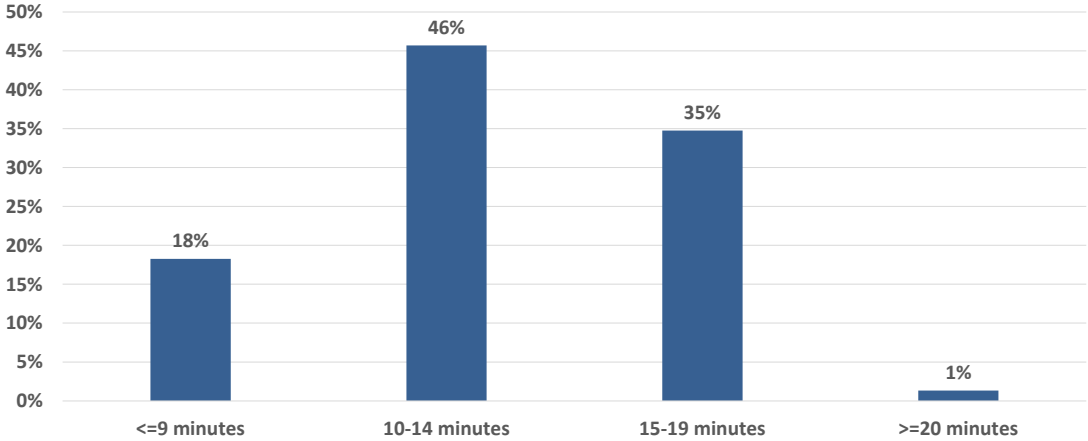
Figure A3. Phone Interviews - number of calls, duration and interviewees

### A3.1 Number of Calls

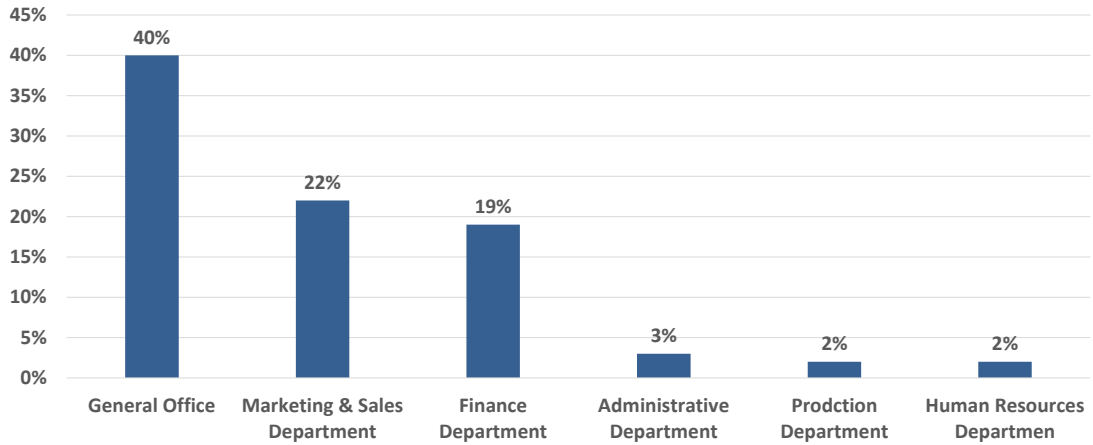
● Once    ▨ Twice    ■ Three times and above



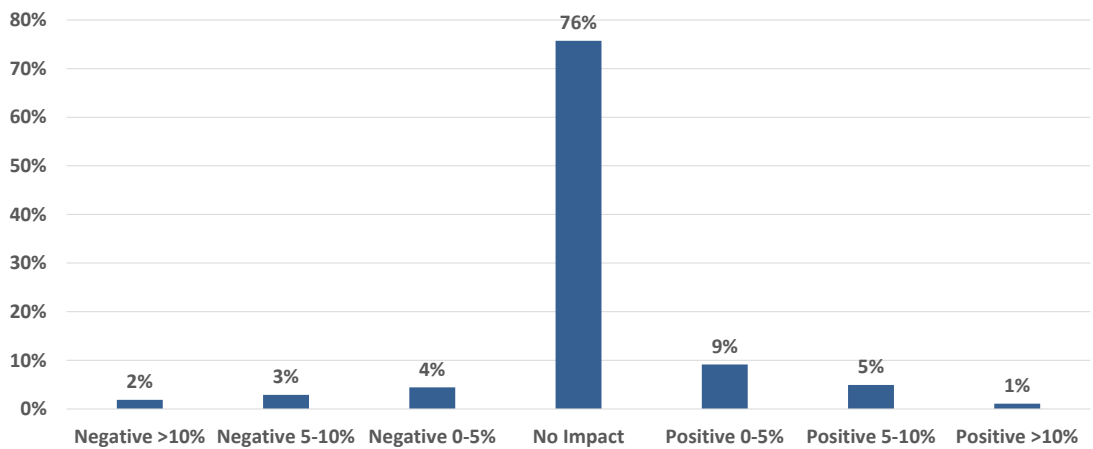
### A3.2 Duration of Calls



### A3.3 Interviewees' Positions



### A4 Seasonality



**Table A. Comparisons between Survey Sample and the Population**

**Table A1. Industry Distribution**

	Population		1527 Firms From Q3 Survey		Final Q4 Response Sample	
	Number of Firms	Percent	Number of Firms	Percent	Number of Firms	Percent
Power Production and Supply	6,719	1.38	29	1.90	36	1.77
Manufacture of Electric Machinery and Apparatus	28,972	5.94	99	6.48	151	7.41
Manufacture of Textile Wearing and Apparel	21,271	4.36	51	3.34	73	3.58
Manufacture of Textiles	38,945	7.98	92	6.02	135	6.62
Mining and Processing of Nonmetal Ores	4,900	1.00	10	0.65	14	0.69
Manufacture of Non-metallic Mineral Products	34,710	7.11	77	5.04	114	5.59
Recycling and Disposal of Waste	1,363	0.28	1	0.07	2	0.10
Manufacture of Handicrafts and Others	8,588	1.76	36	2.36	40	1.96
Mining and Processing of Ferrous Metal Ores	5,390	1.10	0	0.00	1	0.05
Smelting and Pressing of Ferrous Metals	8,893	1.82	23	1.51	27	1.32
Manufacture of Chemical Fibers	2,374	0.49	9	0.59	10	0.49
Manufacture of Chemical Products	30,568	6.26	89	5.83	128	6.28
Computers, Communication and Electric Equipment	16,338	3.35	65	4.26	79	3.88
Manufacture of Furniture	6,114	1.25	26	1.70	29	1.42
Manufacture of Transport Equipment	20,878	4.28	56	3.67	77	3.78
Manufacture of Metal Products	29,039	5.95	122	7.99	148	7.26
Manufacture of Beverage	5,824	1.19	35	2.29	43	2.11
Coal Mining and Washing	12,266	2.51	1	0.07	5	0.25
Processing of Wood Products	11,469	2.35	35	2.29	43	2.11
Processing of Agricultural and Related Products	25,501	5.23	87	5.70	111	5.45
Manufacture of Leather, fur, feather, related products and Furniture	9,932	2.04	24	1.57	33	1.62
Mining of other Ores	46	0.01	0	0.00	0	0.00
Production and Supply of Gas	1,024	0.21	0	0.00	1	0.05
Extraction of Petroleum and Natural Gas	322	0.07	0	0.00	0	0.00
Processing of Petroleum and Nuclear Fuel	2,667	0.55	6	0.39	7	0.34
Manufacture of Foods	8,723	1.79	42	2.75	51	2.50
Production and Supply of Water	2,326	0.48	5	0.33	9	0.44
Manufacture of Plastics	22,984	4.71	48	3.14	82	4.02
Manufacture of General-purpose Machinery	42,879	8.79	148	9.69	190	9.32
Manufacture of Cultural and Sports Products	5,310	1.09	12	0.79	19	0.93
Manufacture of Rubber Products	5,277	1.08	19	1.24	25	1.23
Manufacture of Tobacco	163	0.03	0	0.00	0	0.00
Manufacture of Medicines	6,801	1.39	60	3.93	62	3.04
Manufacture of Measuring Instruments	6,474	1.33	25	1.64	41	2.01
Printing, Reproduction of Recording Media	7,681	1.57	37	2.42	55	2.70
Mining and Processing of Non-ferrous Metal	2,885	0.59	3	0.20	5	0.25
Smelting and Pressing of Non-ferrous Metals	9,175	1.88	16	1.05	17	0.83
Manufacture of Paper and Paper Products	11,389	2.33	47	3.08	57	2.80
Manufacture of Special-purpose Machinery	21,837	4.47	92	6.02	118	5.79
<b>Total</b>	<b>488,017</b>	<b>100</b>	<b>1,527</b>	<b>100</b>	<b>2,038</b>	<b>100</b>

**Table A2. Regional Distribution**

	Population		1527 Firms From Q3 Survey		Final Q4 Response Sample	
	Number of Firms	Percent	Number of Firms	Percent	Number of Firms	Percent
Anhui	13,600	2.79	54	3.54	74	3.63
Beijing	7,911	1.62	33	2.16	40	1.96
Fujian	19,528	4.00	61	3.99	81	3.97
Gansu	2,113	0.43	4	0.26	6	0.29
Guangdong	59,050	12.10	204	13.36	271	13.30
Guangxi	5,699	1.17	29	1.90	33	1.62
Guizhou	3,497	0.72	6	0.39	6	0.29
Hainan	657	0.13	2	0.13	2	0.10
Hebei	17,731	3.63	65	4.26	87	4.27
Henan	19,395	3.97	49	3.21	65	3.19
Heilongjiang	4,919	1.01	19	1.24	27	1.32
Hubei	13,058	2.68	38	2.49	51	2.50
Hunan	12,378	2.54	23	1.51	34	1.67
Jilin	5,328	1.09	23	1.51	30	1.47
Jiangsu	80,695	16.54	223	14.60	303	14.87
Jiangxi	10,145	2.08	27	1.77	42	2.06
Liaoning	22,335	4.58	66	4.32	86	4.22
Inner Mongolia	5,268	1.08	9	0.59	15	0.74
Ningxia	1,288	0.26	3	0.20	3	0.15
Qinghai	519	0.11	0	0.00	0	0.00
Shandong	43,369	8.89	153	10.02	196	9.62
Shanxi	7,128	1.46	18	1.18	23	1.13
Shaanxi	4,398	0.90	16	1.05	21	1.03
Shanghai	20,253	4.15	66	4.32	89	4.37
Sichuan	14,795	3.03	37	2.42	54	2.65
Tianjin	7,901	1.62	42	2.75	50	2.45
Tibet	112	0.02	0	0.00	0	0.00
Xinjiang	2,126	0.44	2	0.13	3	0.15
Yunnan	5,291	1.08	12	0.79	16	0.79
Zhejiang	69,935	14.33	218	14.28	299	14.67
Chongqing	7,595	1.56	25	1.64	31	1.52
<b>Total</b>	<b>488,017</b>	<b>100</b>	<b>1,527</b>	<b>100</b>	<b>2,038</b>	<b>100</b>

**Table A3. A Comparison of Company Characteristics**

	Population		1527 Firms From Q3 Survey		Final Q4 Response Sample	
	Mean	Median	Mean	Median	Mean	Median
Assets	90,050	12,920	106,714	17,654	136,894	17,486
Sales	104,697	20,072	104,365	24,102	130,793	23,787
Employment	182	70	196	85	238	84
Sales Per Capita	687	310	531	290	540	292
<b>Total</b>	488,017	100	1,527	100	2,038	100