

The Impact of Customer Concentration for Asset Utilization Efficiency in China's Manufacturing Sector

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Abstract

In this paper, empirical researches are conducted based on data collected manually of top 5 customers that disclosed by listed companies in manufacturing industry from 2009-2014, to explore effects from customer concentration on assets utilization efficiency in enterprises and the further corrective impact from ownership and size of enterprises on Customer Concentration-Assets Utilization Efficiency relation. The result of those empirical researches show us that in manufacturing industry, there is a notable negative correlation between customer concentration and asset utilization efficiency and it is more significant when enterprises is private owned and is small-scaled. Findings in this paper give a new direction to the research of customer relationship management and provide a salutary lesson for asset management of enterprises.

Keywords: Customer concentration, Asset utilization efficiency, Supply chain

1. Introduction

With development of supply chain management, it is necessary for enterprises to understand different roles that Customer Relationship Management (CRM) and Supplier Relationship Management (SRM) play in production process (Nazari-Shirkouhi and Keramati et al., 2015). From the level of customer management, profitability of an enterprise and stability of its development depend directly on relationship between enterprises and customers (Lustgarten, 1975). In this paper, we discuss the effect from changes of customer concentration on asset utilization efficiency. CRM enables enterprises to know the needs of customers better. Strategy of customer concentration can bring opportunity for a company as well as risks. If a larger proportion of sales volume is determined by small customers, we may consider this company has a high customer concentration. In-depth study of customer concentration helps us better to master performance management method, management of asset utilization efficiency and risk management, etc. Researches, about effect from customer concentration on customer concentration, have been arranged and conducted by domestic and foreign scholars from different angles. Customer characteristics have an influence on value activities and strategies of a company, such as cash holding policy, transaction cost (Williamson, 1995), control of earnings and inventory control (Kalwani and Narayandas, 1995). Domestic researches hardly discussed effects from customer concentration on asset utilization efficiency of enterprises. (Patatoukas, 2011) posed a standpoint that customer concentration is proportional to utilization ratio of stocks after he pointed out that customer concentration would be beneficial to increase inventory utilization efficiency (Ak and Patatoukas, 2015). This conclusion may be not available in new markets, like the one in China, due to the industry features. In China, enterprise property right is obvious and there are imperfect competitions in the market. In addition, market concentration degree difference is also relatively large.

Here, taking manufacturing industry in China as the point of penetration, we explore the relationship between customer concentration and total asset utilization efficiency, on basis of sales volume for main customers disclosed in listing annual report 2009-2014 in manufacturing industry in China. In addition, the author examines the corrective action from property right nature and size of an enterprise over relationship between customer concentration and asset utilization efficiency. Results show that it is negative correlation between customer concentration and asset utilization efficiency. And this negative correlation will be more apparent if the enterprise is a private enterprise or a smaller scale enterprise. Findings in this paper have proved the significance of CRM to SRM and provide a salutary lesson for asset management of enterprises.

The rest of this paper consists of Section 2: Literature Review and Hypotheses of the study; Section 3: Sample and descriptive analysis; Section 4: Empirical results and analysis and Section 5: Conclusions and implications.

2 . Literature Review and Hypotheses of the study

2.1 Literature Review

Lustgarten (1975) Found Negative effects from big customer on operating profit in early studies. When customer concentration stays high, amount of orders placed by customers tends to be larger with their requirement of a lower price. The higher customer concentration is, the harder enterprises keep price greater than marginal cost,

i.e., it is more difficult for enterprises to obtain profits. The way that customer concentration reduces profits is to request discount price and prolong the credit period.

Baron and Berman(2015) suggested that, profit or extra profit will be distributed based on proportion of negotiation in supply chain, which indicated that negotiation will have influence on profitability of enterprise in supply chain. They also proposed that enterprises shall take into account the profit distribution ratio in supply chain when entering into a contract to determine prices, quantities and other decision-making.

Pang and Wu et al.,(2015) introduced the theory of income distribution contract form aspect of supply chain integration. They advocated a number of contracts, including lump-sum contract, repurchase contract, revenue sharing contract and quality flexibility contract, shall be entered between enterprises and customers.

Williamson (1995) put forward that the long-term relationship with specific customers will reduce cost through a good inventory controlling , rather than result in a decline of sales growth. However, this reduction of cost will be offset by customers' continuous bargaining and request of lower price since they are in surging status.

Patatoukas(2011) proposed that customer concentration is proportional to increase of asset utilization efficiency, and then pointed out that customer concentration is proportional to inventory utilization rate(Ak and Patatoukas, 2015).

Balakrishnan and Venkatachalam(1996)found the effect of customer concentration on the firm who accept the JIT adoption to reduce the inventory costs. He suggested the customer concentration will reduce the consequence of inventory cost reduction by JIT adoption.

Kalwani and Narayandas(1995)studied the relationship between customer concentration and firm performance, he found that the increase ratio if customer concentration will not reduce the sales growth of the firm. On the contrary, customer concentration will reduce the cost by inventory management. But the power of reducing the inventory cost will disappear with the bargaining power from the major customers. At the same time, the high ratio of customer concentration may lead the firm to give up serving other potential clients and loss the market position.

Cowley(1985)mentioned the position relationship between firm performance and sell's concentration ,and the negative relationship between performance and buyer's concentration cause the customer concentration had a great influence on the change fixed costs (SG&A).

2.2 Customer concentration and asset utilization efficiency

With the increasing customer concentration, customers gradually seize the initiative, which directly causes a rise of bargaining power of customers. As a result, they may require a lower price and a longer credit period. Requirement of credit period and credit policies from key customers will force enterprises to prolong payback period, when both parties negotiating to enter in to an agreement or a contract. As for average companies, a majority of accounts receivable come from minority customers who are able to compel enterprise to make a concession on gathering accounts receivable and laying down credit policies when they have priority. This will go against the asset management, stores fund, etc. Under this case, the overall asset utilization efficiency will decrease. Based on analysis above, we assume that,

H1 : Customer concentration is negatively correlated to overall asset utilization efficiency.

2.3 Firm ownership and Relationship between customer concentration and asset utilization efficiency

Due to the characters of national conditions and market development process, state-owned enterprises have born advantages in market dealing in contrast with non-state enterprises under China's economic system. On one hand, state owned enterprises possess rich resources with a priority to loan from banks, so they can choose customers freely. When developing business strategies, state-owned enterprises not only take in to account the economic interest, but also consider their social responsibilities and government risks. Thus, the status of state owned enterprises won't be slacked down when creating relationship with customers. On the other hand,

Chinese market is characterized by relationship orientation and there are imperfect competitions in this market. Relying on their sizes and market status, state owned enterprises have a stronger bargaining power, so that they are in a stronger rivalry to customers when determining credit period, mode of payment, etc. Conversely, status and size of private enterprises are nothing like that of state-owned enterprises. Customer relations created between private enterprises and customers depend on maintaining the relationship and yielding to customers. So private enterprises are weaker in negotiations. As a result, assumption 2 is proposed as follow:

H2: As for private enterprises, negative correlation between customer concentration and overall asset utilization efficiency is more notable

2.4 Firm size and the relationship between Customer concentration and asset utilization efficiency

In the view of size, large scale enterprises have abilities to forecast future development accurately. The larger the

scale is, the likelier they are treated on equal terms. Large scale enterprises can estimate their production capacity and customer need in order to response fast to changes from customers, even based on which scale effects would be produced. They can reduce cost through cutting down the cost of raw material, working hours and cost of possession (Ak and Patatoukas, 2015). In particular, enterprises with a huge scale may create their brand effects, well-established inventory control system and production of various products. Relative to enterprise size, purchasing power of customer is small, which means buyer's bargaining power is at a low level. Therefore, influence of customer concentration on asset utilization efficiency may be reduced. However, the fixed cost of large scale enterprises is relatively higher; the fixed sales management expense per annum will also result in a decline in asset utilization efficiency.

In contrast, small scale enterprises are aimed at achieving profit on sales in a short term and enhancing market position. When entering into an agreement with customers or in other negotiations else, it is likely to make a concession for small scale enterprises to make up for the cost of production and sales, which will aggravate the decline in asset utilization efficiency. Meanwhile, small scale enterprises conduct production with un-advanced techniques, as well as their poor capacity and diversification. So influence of customer concentration on asset utilization efficiency may be inconspicuous. Thus we pose the assumption 3 below:

H3: The smaller the size of a company is, the more notable the negative correlation between customer concentration and overall asset utilization efficiency is more significant.

3. Sample and descriptive analysis

3.1 Sample source and processing

Data in this paper is quoted from annual reports 2009-2014 of listed companies of manufacturing industry from a share market Shanghai and Shenzhen stocks of china. We use sales volumes of the top five customers and computed HHI which is the sales volume-to-total returns ratio, adapting HHI as the variable of customer concentration. Other parameters, data and ownership information are acquired by CSMAR and Google search.

In the light of experience from domestic studies, data is processed as follow: companies whose asset-liability rate less than 1 or ownership information is incomplete are removed. In addition, all data is winsorized with 5% to reduce effect from outlier on results. Then total 3172 sample data is obtained.

3.2 Model and variable

Here we use model of (Patatoukas, 2011), (Ak and Patatoukas, 2015) for reference to obtain equations, and examine assumption 1,2 and 3 through the following model:

$$ato = \beta_0 + \beta_1 hhi / topcus + \beta_2 sg + \beta_3 roa + \beta_4 dta + \beta_5 length + \beta_6 win + \beta_7 ownership + year$$

Assumption 1 is testified if coefficient β_1 of HHI in regression results and is notable. If β_1 of private enterprise is higher and more significant than that of state-owned enterprise, then assumption 2 is proved true. If the β_1 of small scale enterprises is more negative and notable, then assumption 3 is validated.

See Table 1 for definition of variables.

Table 2. Variable Definition

Variable	Definition
hhi	Herfindahl-Hirschman Index of top5 customers sales ratio
topcus	Sales from the biggest customer/total revenue
ato	Total revenue/ average balance of Total assets
roa	Ratio of income before extraordinary items to beginning of year book value of assets
sg	Annual percentage sales growth of the firm
dta	Ratio of liabilities to assets
length	Log (firm age)
win	An indicator variable equal to 1 if the profit of the firm that year is a positive number, equal to 0 if not
ownership	An indicator variable equal to 1 if the firm is state owned, equal to 0 if private owned
size	log (total assets)

3.3 descriptive statistics

Descriptive statistics of variables used in this paper are shown in table 2.

Table 2 .Descriptive statics

	n	std.dev	mean	min	max
hhi	3172	0.1025	0.0456	0.0001	1
topcus	3172	0.1382	0.1256	0.0041	1
ato	3172	0.4347	0.7471	0.0398	2.6445
roa	3172	0.0457	0.0313	-0.0604	0.126
sg	3170	0.2827	0.1236	-0.3347	0.9796
dta	3172	0.1832	0.5171	0.1674	0.8333
length	3172	0.3341	2.5920	1.5926	3.0366
win	3172	0.3437	0.8632	0	1
ownership	3130	0.4862	0.6169	0	1
size	3172	1.1781	22.0078	19.9893	24.5945

3.4 person(spearman) pair wise correlations

Key variables are experienced Pearson related test, and result is concordant with assumption. See result in table 3.

Table 3 .Pearson(spearman) correlations

	hhi	ato
hhi	1.0000	
ato	-0.1572*	1.0000

4. Empirical results and analysis

4.1 Effect form customer concentration on asset utilization efficiency

Table 3 shows result of customer concentration and asset utilization efficiency based on regression analysis, where coefficient of turnover of total capital (ato) in column 1 is -0.245 and notable at level1%. This result examined assumption 1 , which indicated that customer concentration (hhi) is negatively correlated to overall asset utilization efficiency, that is , a rise of customer concentration may bring down the overall asset utilization efficiency.

Table 4 .Customer concentration and asset utilization efficiency

	1
	ato
hhi	-0.245*** (-3.25)
roa	2.494*** (10.57)
size	0.0167** (2.28)
sg	0.121*** (4.15)
dta	0.348*** (7.34)
list	0.0611** (2.49)
win	-0.0455 (-1.60)
ownership	0.0726*** (4.54)
_cons	0.143 (0.68)
Year F.E.	Yes
N	3128
r2	0.098
F	19.934
p	0

Number in () is the value of t; *, **, *** indicate significance at level 10%, 5% and 1%, respectively

4.2 Test for robustness of assumption 1

Table 5 shows the significant negative correlation between biggest custom sales ratio (topcus) and assets activity ratio after regression analysis, if HHI is replaced by biggest custom sales ratio (topcus). This proved the assumption 1.

Table 5. Replace hhi with topcus

	1
	ato
topcus	-0.159*** (0.056)
roa	2.486*** (0.236)
sg	0.120*** (0.029)
dta	0.347*** (0.047)
list	0.0602** (0.025)
win	-0.0449 (0.029)
ownership	0.0741*** (0.016)
Year F.E.	YES
_cons	0.159 (0.212)
N	3128
r2	0.098
F	19.779
p	0.000

Number in () is the value of t; *, **, *** indicate significance at level 10%, 5% and 1%, respectively

4.3 Effect from ownership on relation of customer concentration and asset utilization efficiency.

Table 6 present the test to assumption 2. From column 1 and 2, we may find that coefficient of turnover of total capital in private enterprise is -0.279, and is notable at level 1%; that coefficient of turnover of total capital in state-owned enterprise is -0.178 and is not notable. This result proved assumption 2 as for private enterprises, negative correlation between customer concentration and overall asset utilization efficiency is more significant.

Table 6. Customer concentration and asset utilization efficiency with different enterprise ownership

	1	2
	Private owned	State owned
	ato	ato
hhi	-0.279*** (-0.107)	-0.178 (-0.109)
roa	3.064*** (-0.364)	1.974*** (-0.311)
size	-0.01 (-0.013)	0.0318*** (-0.009)
sg	0.066 (-0.045)	0.181*** (-0.039)
dta	0.486*** (-0.076)	0.251*** (-0.061)
length	-0.0583 (-0.037)	0.159*** (-0.033)
win	-0.0682 (-0.049)	-0.0225 (-0.035)
_cons	0.72 (-0.508)	-0.276 (-0.247)
<i>Year F.E.</i>	Yes	
<i>N</i>	1199	1929
<i>r2</i>	0.11	0.095
<i>F</i>	9.096	12.493

Number in () is the value of t; *, **, *** indicate significance at level 10%, 5% and 1%, respectively

4.4 Effect from enterprise size on relation of customer concentration and asset utilization efficiency

Table 7 shows test result of assumption 3. Customers are divided into two groups, according to mean value of company size. From column 1 and 2, we may find that coefficient of turnover of total asset is -0.3796 if firm size is less than the mean size value and is significant at level 1%; The coefficient of turnover of total asset is 0.0762 if firm size is less than the mean size value and is not significant. Therefore, negative correlation between customer concentration and overall asset utilization efficiency is more notable if company size is less than the mean value. So, assumption 3 is proved true.

Table 7 customer concentration and asset utilization efficiency with different enterprise size

	1	2
	Less Than Average Size	Others
	ato	ato
hhi	-0.37957*** (-0.0833)	0.0762 (-0.1549)
roa	2.273*** (-0.2898)	3.349*** (-0.4154)
sg	0.173*** (-0.0357)	0.0315 (-0.0502)
dta	0.293*** (-0.0524)	0.595*** (-0.0975)
length	0.0266 (-0.0322)	0.0843** (-0.0371)
win	-0.0664* (-0.0352)	-0.00648 (-0.0487)
ownership	0.0486** (-0.019)	0.107*** (-0.0273)
_cons	0.54990*** (-3.43)	0.581* (-1.77)
Year F.E.	YES	
N	1811	1317
r2	0.09614	0.09487
F	11.92673	8.5162

Number in () is the value of t; *, **, *** indicate significance at level 10%, 5% and 1%, respectively

To minimize effects from enterprise heterogeneity, individual effect and time effect in panel data that uncovered in this study, fixed effect model and random effect model are used to test stability. The result is concordant with conclusion in preceding part of the text, which means conclusion of this paper is stable.

5. Conclusion and implications

In this paper, based on the studies and analysis, in the manufacturing sector of China, relationship between customer concentration and asset utilization efficiency of a company, we conclude that relationship between customer concentration and asset utilization efficiency of a company varies inversely, i.e., enterprises are likely to be affected by bargaining power and negotiating ability of customers if customer concentration of enterprises stays high. Enterprises will be thrown in passivity to accept some requirements or arrangements relating to cash and inventories, which will finally reduce the total asset utilization efficiency of enterprises. Further researches suggest that relationship between customer concentration and asset utilization efficiency is subject to ownership and size of enterprises. If enterprises are private owned, the negative correlation of that is more notable. Also, if scale of enterprises is less than the mean value, the negative correlation of that is more remarkable; this means asset utilization efficiency of small enterprises is more easily affected by customer concentration. The study supplements the domestic researches in this field and all above, provides a reliable reference for asset management of enterprises and more explanations for effects from customer concentration on asset utilization efficiency. It presents a new conclusion and direction for further studies on this issue. Results here not only confirm assumptions but also expand the literature of China and overseas and abroad about enterprise & customer management, proposing a reliable basis for enterprise to act and make policies in supply chain management, as well as reference for them to choose customers. That is, enterprise shall consider both the yield returns and asset utilization efficiency that may be affected by customers, in order to make the best choice based on their own sizes and ownerships while creating a long term relationship with big customers.

There are shortcomings in this paper. First, data of customer concentration is limited, for China listed companies may not publish the detailed information in their annual reports. In addition, data is not complete for lack of a large number of samples. Second, this paper discusses the issue that is just from aspect of manufacturing enterprises, and analyzes effects from ownership and size.

For further studies, relationship between customer concentration and firm performance, or that between customer concentration and cash holding level may be as a direction to explore. At the same time, we can use life cycle model to test if the relationship between customer concentration and assets utilization still significant as time goes on. Also, researchers may start to discuss effects from supplier concentration on enterprises in the whole supply chain and the combined action of supplier concentration on enterprise performance, asset

utilization efficiency, control of earnings in supply chain management, to improve the theory of supply chain management. On the other hand, corrective action of accounts receivable on enterprise-customer relation could also be studied, according to regional features (such as in the North or in the South China), industry concentration, degree of monopoly. In addition, effect from customer size and customer ownership on customer concentration of enterprises also is a new subject.

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