

# E-commerce Expands the Bandwidth of Entrepreneurship

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## **Abstract:**

Personal trade is widespread in developing countries. Social networks are cornerstones of personal trade. However, it is costly to build and maintain social networks. The high cost of social capital imposes an entry barrier for people who lack social networks, such as those from outside local communities. In this paper, using a primary survey in Baigou, one of the largest industrial and e-commerce clusters in China, we show that e-commerce reduces transaction costs and results in vertical disintegration, thereby lowering capital entry barriers. Moreover, the timely payment of e-commerce reduces the reliance on the network-based trade credit that is prevalent in traditional trades, easing the need for social networks. Using the administrative universe firm registry dataset, we show that the spread of e-commerce has enabled more people, who used to lack financial and social capital, to become entrepreneurs.

## 1. Introduction

In the early stage of development, impersonal trade is less common due to the lack of formal institutions to enforce trade contracts. Instead, people rely more on relational contracts to conduct trades (Grief, 1993; Fafchamps, 2004). Social networks based on hometown, kinship, religion, caste, or tribes have been widely used in personal trade in developing countries (Munshi, 2014). Although the trust-based network lowers transaction costs among people within the network, it is costly to build and maintain social networks. In addition, the club nature of networks prohibits those outside the network from entering the business. Network-based impersonal trade is the second-best response to imperfect institutions. Building sound institutions have been regarded as a necessary condition for transforming personal trade to impersonal trade.

Without denying the importance of institutions, we want to show that technology, such as e-commerce, can also play a role in facilitating the transition from personal to impersonal trade. In the past decade, e-commerce has taken off in many countries, especially in China. China has overtaken the US as the largest e-commerce market in the world with online sales accounting for more than 10% of retail sales, compared to 7% in the US (Economist, 2013). Alibaba, the major online platform in China, has become the largest IPO in history and been listed on NASDAQ since 2014.

E-commerce has transformed domestic trade in at least two ways. First, it has greatly reduced the number of intermediaries between producers and consumers. Traditional trades have to go through multiple intermediaries from producers to consumers, involving a large amount of working capital. Traders often rely on trade credit to ease working capital constraints. However, it takes a long time for traders to establish trust and extend trade credit to each other. Disintermediation resulted from e-commerce weakens the reliance on trade credit.

Secondly, e-commerce has solved the delayed payment problems that plague traditional trade, especially long-distance trade. For example, Alibaba has set up Alipay as an escrow account to certify trade and process payments. Sellers can quickly receive payment from Alipay after it certifies that a transaction is successful. With speedy payment,

trade credit is no longer needed, thereby diluting the value of social networks underlying trade credit.

E-commerce lowers capital entry barriers and reduces the need for social networks, thereby opening up space for many potential entrepreneurs. It will particularly benefit those from outside the production centers or marketplaces, who would otherwise be impossible to enter the trading business. Using the administrative universe firm registry dataset from the State Administration of Industry and Commerce (SAIC) in China, we tested this idea and found that the spread of e-commerce has enabled more people, who were previously constrained by financial and social capital, to become entrepreneurs and start a business. In short, e-commerce has indeed expanded the bandwidth of entrepreneurship.

The remainder of the paper is organized as follows. Section 2 briefly reviews the history of e-commerce in China. Based on a primary survey, we also describe the inner workings of Baigou, one of the top “Taobao Towns” in China and show how e-commerce has resulted in disintermediation and less dependence on social capital. Section 3 presents empirical results using an administrative dataset from SAIC to demonstrate that e-commerce boosts entrepreneurship in China. Section 4 further explores underlying mechanisms. Section 5 concludes.

## **2. Background of China’s E-commerce**

### *2.1. Brief Review of E-commerce in China*

E-commerce has rapidly taken off in China in the past decade. Alibaba, the largest e-commerce company, has set up two major platforms for e-commerce. Taobao.com, a Consumer to Consumer (C2C) platform, was established in 2003. Tmall.com was set up in 2008 to promote Business to Consumer (B2C) trade. JD.com, established in 2004, is another major e-commerce platform. Although it has grown more rapidly than Alibaba in the past several years, its market share is still dwarfed by Alibaba.

China’s brick and mortar businesses have been much less developed than those in the United States. The rudimentary nature of China’s retails provides an opportunity for e-commerce to flourish. In addition, the spread of smartphones has made online shopping

much easier than before. The express delivery industry, one of the most competitive industries in China, has penetrated to almost all corners of China. In all, e-commerce has quickly spread out in China.

On the supply side, it is less costly to open an online shop than a real store. The online payment systems ensures online sellers can receive timely payment from buyers, greatly reducing their reliance on trade credit, which has been an enormous barrier in the traditional “wholesale and retail” business. E-commerce lowers the requirements of financial and social capital to start a business, opening doors to many potential entrepreneurs. This is a point we will test in the later sections.

## 2.2. A Case Study of “Taobao Town”: Baigou

In order to understand the inner workings of e-commerce, we first provide an anatomy of Baigou, a top “Taobao Town” based on our field work and primary surveys. Alibaba published a list of “Taobao Towns” in China in 2013 according to Taobao online sales. Baigou, one of the largest suitcase and bags clusters in Hebei Province, ranks among the top.

Baigou is located near Lake Baiyangdian, the largest lake in Hebei Province, and is about two hours away from Beijing. It used to be a major port by the lake and an important market town. In the past three decades, it has evolved into one of the largest suitcase/bag production and market centers in the world. It houses more than 3,000 luggage enterprises and ten thousand family workshops. More than half a million people in the area work in this sector (Xing, 2009). By 2013, Baigou housed at least 3,000 online shops (Alibaba Research, 2013b).

In order to better understand how e-commerce has shaped the real economy, we conducted a field survey in Baigou in 2015. We focused on three major groups: traditional stores in the suitcase/bag wholesale market, suppliers to online shops, and online shops. Because of the presence of physical shops, wholesale stores and suppliers to online shops can be easily spotted and interviewed. We randomly sampled stores in the wholesale market based on the store list provided by the wholesale market administration. The suppliers of

online shops are concentrated in streets near the online shops. We first counted all of them and mapped them out before drawing a random sample for an interview.

Most online shops are hidden in ordinary apartment buildings and many of them have not registered with the government. Therefore, it is impossible to get a complete list of online shops. Even the major platforms, such as Taobao.com and JD.com, have only the IP addresses of the online shops but not their physical addresses. According to local informants, most online shops are concentrated in apartment buildings near online suppliers. After talking to suppliers of online shops, we mapped out the major apartment buildings that host online shops. Then we randomly selected a few buildings, knocked on all the doors in the chosen buildings and interviewed the owners of online shops.

There is a concern that the sample for online shops lacks representativeness. To respond to the concern, we compared the sales of online shops in our sample with those listed online in the major platforms. We found that our sample reports greater sales than the average from the major platforms. This is probably because many online shop owners operate more than one online shop, some of them were inactive. Online shop owners tend to primarily report the sales of active shops at the interview. When excluding the inactive online shops of major platforms, as shown in Figure 2, the distribution of our sample closely mirrors that of online shops listed in major platforms for the same type of suitcase/bag business.

### *2.3 Business Models of Online Shops and Wholesale Stores*

In Baigou, the traditional wholesale stores and online shops have different business models. As shown in Figure 3, many store owners in the wholesale market also operate a production workshop or factory nearby. Their products have to pass through several layers of intermediaries before reaching consumers. By comparison, very few online shop owners own a workshop or factory. Rather, they visit suppliers to online shops, select a few favorite samples displayed in the stores of online suppliers, and upload the photos of chosen products to their online shops. After receiving an order online, they go to the stores of online suppliers, buy the merchandise by cash, and have it shipped directly to consumers. Because online shop owners do not need to operate a workshop or factory and rent a physical store, their

cost of doing business is lower than a traditional store in the wholesale market. Moreover, payments are guaranteed by Alipay or other third-party payment systems, it is no longer necessary for online shop owners to spend time building connections with other intermediaries to secure trade credit, as what traditional wholesalers normally do. The lower operational cost and more timely payment reduce the reliance of online shops on both financial and social capital.

Table 1 further compares the mode of operation between online shops and traditional wholesale stores. Several features are apparent from the table. Firstly, as shown in the first row, the fraction of online shop owners from outside Baigou is much higher than that of wholesalers, suggesting a less need for social networking in online retail businesses.

Secondly, it is less costly to run an online shop than a real shop in the wholesale market. As indicated in the second and third rows, online shops maintain lower monthly inventories and require smaller amounts of starting capital. It takes 15 times more starting capital to start a wholesale store than an online shop.

Thirdly, it involves much more social trust to run a traditional wholesale business than an online shop. Thanks to the third-party payment system, more than 65% of transactions online do not even need trade credit as shown in row 4. Row 5 asks how many transactions are needed to obtain the first trade credit from customers or suppliers. A traditional wholesaler reports more than six times the amount of successful transactions, compared to four times for an online shop. On average, it takes more than a year (14 months) of repeated business before two parties in the traditional wholesale sector have enough trust to extend trade credit. The length shortens to three months for an online shop shown in row 6. Moreover, most of them do not need credit at all in the first place. As a matter of fact, 67% of them receive full payment within one month, as shown in the last row. By comparison, the percentage for traditional stores is much lower with only 38% of them reporting to receive full payment within one month. Online sales have a much quicker cash flow than traditional trade.

Thanks to the less need on financial capital, as Figure 4 shows, outsiders can play fairly with local people in online business. While in the traditional wholesale business, insiders start their business with a greater advantage. The case study in Baigou demonstrates how online trade has diminished the role of social networking in the trade business, making

it easier for outsiders to enter the business of online sales. However, it is not clear whether the observation in Baigou holds true for China as a whole. This is a hypothesis we are going to test in the next section.

### **3. Empirical Analysis of E-commerce on Entrepreneurship**

We first examine the impact of e-commerce on three outcome variables related to entrepreneurship, growth in number of new firms, growth in total number of firms, and growth in firm entry rate over five-year or ten-year period. Next, we show that the effect mainly runs through the channel of lowering entry barriers (starting capital and education level). Finally, we demonstrate the effect on the emergence of new firms is particularly strong for outsiders, **firms in downstream, low-skill, relationship-specific, and labor-intensive industries.**

#### *3.1. Data Description*

We employ a unique database from the State Administration of Industry and Commerce (SAIC) in China to calculate the number of new firms and survival firms in each county each year. The administrative database of SAIC include information about a firm's starting date, 4-digit industry code, location, registered capital, and legal representative, and major shareholders. If a firm goes bankruptcy or its business license is revoked, the exit date is marked in the database. Unlike the traditional survey database, this database covers all the registered firms, including small and medium enterprises (SME).

Using the starting and exit dates, we can compute the number of new firms and survival firms at the county or industry level each year. The database includes the personal IDs of all the investors. The first six digits of their IDs reveal the place, mostly hometowns, of obtaining their IDs prior to 18 years old. By comparing the addresses with the current firm registration addresses, we can infer whether entrepreneurs come from local areas or not. Using this method, we can count the number of new firms and survival firms by established by inside or outside local area.

In addition, we can use the initial registered capital and education level of investors to measure entrepreneurs' financial capital and human capital level. Registered capital is likely positively correlated with investors' capital stock and their confidence about their firms' potential profitability. In addition, banks look at firms' registered capital when approving loan applications. When filing the annual inspection form, firms also need to fill their legal representatives' education level. However, only half of firms report the education data. We compare the characteristics of firms with and without reporting education data and do not find any systematic difference.

Ali research released China's E-commerce index in 2013 at the county level. We transform it to z-score. The index is a simple average of two separate measures, e-commerce business density and the average size of online shops. The e-commerce business density takes the average of the ratio of the number of business-to-consumers e-shops (B2C) to the total number of registered corporations and the ratio of the number of consumers-to-consumers e-shops (C2C) over the total number of self-employed entrepreneurs. The average size of online shops is defined as the total online sales divided by the total number of online shops.

We also use three measures — relationship-intensity index, downstream index, capital intensity index and skill intensity index, to capture industry-specific characteristics at the SIC-3 level. The downstream index is defined as the share of value added for an industry which directly or indirectly flows to final consumers according to the input-output table in the U.S. (Antràs and Chor, (2013). The capital intensity and skill intensity are obtained from the NBER-CES Manufacturing Industry Database (Becker et al., 2009). Capital intensity is the log of the real capital stock per worker. Skill intensity is the log of the number of non-production workers divided by total employment. Table 2 reports summary statistics of all the variables.

### *3.2. Empirical Estimations*

We follow the estimate strategy laid out in Ghani, Goswami and Kerr (2016) to examine the impact of e-commerce on the growth in new firms, survival firms, and entry rate at the county level:



$$\Delta \log(Y_{it}) = a * \log(Y_{i0}) + \beta * Ecommerce_i + \gamma * X_{i0} + \varepsilon_i$$

The outcome variable  $Y_{it}$  refers to total number of newly registered firms, total number of firms, and the entry rate of new firms (the ratio of newly registered firms to total number of firms in the previous year). Ecommerce is standardized e-commerce sales index. Coefficient  $\beta$  measures the impact on outcome variables if the e-commerce index increases by one standard deviation. Our sample includes rural counties which have reported new firms in both 2009 and 2014 as well as the e-commerce sales index in 2013.

The number of new firms (total firms or entry rate) in the initial year is included to capture the phenomenon of “mean reversion” across counties (when the initial base is low, naturally the subsequent growth rate is high). In addition, the vector  $X_i$  contains other factors which may affect the outcome variables, including population size, share of prime-age population (15-64), the male-female sex ratio in the age between 0 and 14, share of urban population, illiteracy rate among population older than 15, and clustering index.<sup>1</sup>

Firstly, we estimate the effect of e-commerce on the 5-year growth and long 10-year growth in the number of new firms. Table 2 reports the estimation results with the first three columns referring to the five-year period of 2009-2014 and the last three for the 10-year period of 2004-2014. The first column is the most parsimonious specification including only the e-commerce index and the initial value of number of new firms in logarithmic form. The coefficient for the e-commerce is 0.057, highly significant, indicating that the number of new firms will increase by 5.7% if a county’s e-commerce index increases by one standard deviation. In the second column, we add a set of control variables at the county level. The coefficient for e-commerce index increases slightly to 0.06 and remains highly significant. In the third column, we further control for province fixed effects. There are some advantages and disadvantages of including province fixed effects. On the positive side, including provinces effects can help capture province-specific growth trajectory. However, since the growth regressions are essentially dynamic models with the lagged values on the right hand side, the estimates may become biased when including province fixed effects. Nonetheless,

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<sup>1</sup> For the period 2009-2014, the demographic variables are from China Population Census 2010; the clustering measure is based on China Economic Census 2008. For the period 2004-2014, the demographic variables are obtained from China Population Census 2000 and the clustering measure is computed based on China Economic Census 2004.

it is worthwhile to check the robustness of the results to the inclusion of province fixed effects. As shown in the third column, the coefficient remains the same as in column (2). AIC is the lowest in third column, indicating it has the best fit.

In the last three columns, we repeat the exercise of the first three columns except that the sample period is now from 2004 to 2014. In the fourth column (most parsimonious specification) and fifth column (with county controls but without province fixed effect), the coefficient for e-commerce is around 0.03 and 0.04, smaller than the short-run effect as shown in columns (1) and (2). However, the coefficient for e-commerce doubles to 0.08 after controlling for province fixed effects, greater than the five-year effect.

Secondly, we look at the effect of e-commerce on changes in total number of firms. Even though e-commerce brings about more new firms, it may also lead to more severe competition and more failures. Therefore, it is useful to evaluate the impact on the growth in total number of survival firms, which excludes the number of failed firms. Table 4 presents the estimation results on growth in total number of firms over five-year and ten-year period. The coefficient for the e-commerce index ranges from 0.03 to 0.05, still highly significant at 1% level. In general, the coefficient in Table 4 is smaller than that in Table 3 probably because e-commerce has also yielded higher failure rate than before although on balance there is a positive effect on the net increase in number of firms.

Thirdly, we examine the effect on entry rate. The entry rate is defined as the ratio of number of new firms to total number of survival firms on Dec 31 in the previous year. Entry rate takes the stock of firms into account. Because firm entry rate is not in level, as the same as in total number of firms in Tables 3 and 4, we use the growth rate in firm entry rate as a dependent variable by controlling for initial firm entry rate on the right hand side.<sup>2</sup> In the first column, the coefficient for the e-commerce index is -0.087, significant at 1% level. After adding more control variables in the second column, it is no longer significant. When province fixed effects are included in column (3), the coefficient is 0.03 and statically significant. The results are largely robust in columns (4)-(6) for the growth over a longer ten-year period. Because the entry rate already takes the size effect (total number of firms)

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<sup>2</sup> The results remain the same when using exactly the same specification as in Tables 3 and 4.

into consideration, the coefficient for the initial value is much smaller in Table 5 than that in Tables 3 and 4.

Although we have controlled for province fixed effects and some initial characteristics at the county level, there is still a possibility that the e-commerce index actually captures some omitted variables, which happen to be associated with extensive firm growth. To remedy this concern, we run a falsification test in Table 6. In China, e-commerce did not start until 2003, the year when Taobao.com was established. In addition, the development of e-commerce was quite slow before 2009. Therefore, the annual growth of newly registered firms (or total number of firms) from 1999 to 2004 should have little to do with the e-commerce index observed in 2013. If the e-commerce index captures some unobserved factors contributing to firm growth in a county, we should observe that the index matters to firm growth from 1999 to 2004 prior to the e-commerce era. We repeat the estimations in Tables 3-5 but using the sample period of 1999-2004 prior to the era of e-commerce. None of coefficient for e-commerce in Table 6 is significantly positive. In the firm column of Panels A and B, the coefficient is even statistically negative. It is insignificant in all other regressions. The results in Table 6 mutes the concerns of omitted variable bias.

## 4. Underlying Mechanisms

### *4.1. Heterogeneous Effects on Outsiders and Insiders*

Our hypothesis predicts that e-commerce provides great benefit to outsiders than local people because of lower entry barriers and less reliance on social capital. In general, outsiders lack the necessary social network which underpins personal trade (Munshi, 2002). Therefore, it is harder for them to penetrate in traditional trade business. Thanks to more timely payment and impersonal trade embedded in e-commerce, network is not as important as before, opening space for outsiders to enter the business. Next we examine if the penetration of e-commerce particularly benefits those people who are from other areas.,

In Table 7, we repeat the third column in Table 2 for the subsamples of new firms established by local people (insiders) and people from other areas (outsiders). As shown in the first two columns in Table 7, the coefficient for the e-commerce index in both regressions is statistically positive, but it is larger in the regression on outsiders (0.07) than the one on insiders (0.04). To check if the difference is statistically difference, in the third column, we combine the subsample and add a dummy for outsiders and its interaction with e-commerce index. The positively significant coefficient for the interaction term implies that the outsiders gain a greater advantage in areas with more developed e-commerce.. E-commerce has indeed played a favorable role in promoting the growth in number of new firms established by people outside the local area.

#### ***4.2. The Impact of E-commerce on Firm Starting Capital and Education Level of Entrepreneurs***

Have shown that e-commerce promotes extensive firm growth, next we directly test if e-commerce lowers the threshold of starting a business, in particular for outsiders. We mainly focus on two types of thresholds, firm starting capital and education level of entrepreneurs.

Table 8 examines the effect of e-commerce on starting capital of newly registered firms and the education level of the largest shareholders based on firm registry data in 2014. For each outcome variable, we present two specifications. In the first specification, we include e-commerce index, province fixed effects and SIC-3 industry fixed effects. In the second specification, we add a set of country-level control variables same as in column 3 in Table 5. The interaction term between e-commerce index and the dummy for outsiders is significant and negative in all the regressions. In areas with more developed e-commerce, new firms' starting capital and entrepreneurs' average education are lower than in regions with lower degree of e-commerce development. With lowered entry barriers, more potential entrepreneurs can fulfill their dreams to start their business. Consequently, more firms emerge in areas with high degree of e-commerce development.

#### ***4.3. Heterogeneous Effects across Different Industries***

Considering that there are large heterogeneities across industries in many dimensions, such as degree of downstream, capital intensity and skill intensity, the impact

of e-commerce likely differ by industries. For instance, the production technologies in downstream (such as footwear) are generally more divisible than upstream firms, such as mining. Therefore, it is very likely that e-commerce has a bigger effect on downstream firms than upstream firms. Similar, division of labor is easier in labor-intensive or low-skill manufacturing industries than capital-intensive or skill intensive industries. Thereby we would expect to see a more noticeable effect of e-commerce on the growth of new firms in labor-intensive industries or low skilled industries. Table 9 presents the regressions on the growth of new firms in each county at the SIC-3 industry level from 2009 to 2014 by taking into account three types of heterogeneity. In columns (1)-(3), we separately include the industry measure of downstream, capital intensity, or skill intensity and its interaction with e-commerce index at the county level. The regressions also contain a set of control variables at the county level (same as in column 3 in Table 5), industry fixed effects, and province fixed effects. As shown in Table 8, e-commerce is more conducive to the growth of new firms in downstream, labor-intensive, or low-skill industries experience a faster extensive growth.

## **5. Conclusion**

In history, the transition from personal trade to impersonal trade takes a long time. Sound institutions are foundations for impersonal trade. However, it is a daunting task to build up sound institutions in the first place. In this paper, we used China as an example to show how e-commerce has offered a faster route for the transition to impersonal trade.

E-commerce has lowered the entry barriers to capital and weakened the reliance on social networks in business. Therefore, it offers a new opportunity for potential entrepreneurs who were previously constrained by a lack of financial and social capital. Using the universe firm registry database, we have shown that e-commerce has particularly benefited non-local entrepreneurs, taping the previously constrained entrepreneurial talent. In addition, e-commerce is more favorable to the growth of new firms in downstream, low skill, and labor intensive industries.

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**Table 1: The Characteristics of Online Shops and Traditional Wholesales**

	(1)		(2)		T-test
	Online		Traditional		
	Obs.	Mean	Obs.	Mean	(1)-(2)
Outsiders (%)	180	79%	107	42%	0.37***
Inventory (piece)	113	515.62	95	1,145.35	-629.73***
Start capital (10 thousand Yuan)	181	2.48	108	39.71	-37.23***
Fraction of businessman without trade credit	180	66%	108	0%	66%***
No. of deals before obtaining trade credit	52	4.42	44	6.16	-1.74
Length before obtaining trade credit (Month)	42	3.21	31	13.77	-10.57***
Receiving full payment in a month (%)	181	67%	108	38%	0.29***

Source: Authors' survey in Baigou.



**Table 2: Descriptive statistics**

VARIABLES	N	Mean	S.D.
No. of new firms in 2014 (log)	1,831	5.687	1.148
No. of new firms in 2009 (log)	1,834	4.596	1.248
No. of new firms in 2004 (log)	1,808	4.121	1.279
No. of new firms in 1999 (log)	1,682	2.821	1.454
No. of survival firms in 2014 (log)	1,833	7.140	1.152
No. of survival firms in 2009 (log)	1,834	6.218	1.247
No. of survival firms in 2004 (log)	1,826	5.396	1.398
No. of survival firms in 1999 (log)	1,777	3.909	1.630
Entry rate in 2014(%)	1,833	32.80	17.23
Entry rate in 2009(%)	1,834	26.03	15.52
Entry rate in 2004(%)	1,822	41.78	40.75
Entry rate in 1999(%)	1,760	57.21	116.8
Log(new firms in 2014/new firms in 2009)	1,831	1.085	0.583
Log(new firms in 2014/new firms in 2004)	1,806	1.602	0.730
Log(new firms in 2004/new firms in 1999)	1,681	1.458	0.850
Log(survival firms in 2014/survival firms in 2009)	1,833	0.921	0.374
Log(survival firms in 2014/survival firms in 2004)	1,825	1.761	0.590
Log(survival firms in 2004/survival firms in 1999)	1,777	1.588	0.709
Growth of entry rate 2009-2014	1,833	0.487	0.971
Growth of entry rate 2004-2014	1,807	0.0192	0.761
Growth of entry rate 1999-2004	1,682	0.164	1.500
Initial capital (million Yuan)	1,082,215	2.751	6.112
Education length (Year)	454,581	12.333	2.638
E-commerce(standardized)	1,834	0.0102	1.011
Log(population2010)	1,834	12.73	0.809
Cluster Index: 2008	1,834	-0.191	0.828
Share of urban population (%)	1,834	34.69	13.80
Illiteracy rate (%)	1,834	6.643	5.921
Share of prime age (15-64) (%)	1,834	72.62	4.457
Male/female sex ratio (0-14)	1,834	1.163	0.350

Notes: Number of firms are aggregated based on China firm registry database. Number of new firms refers to the number of the newly established firms. Number of survival firms is defined as the total number of firms shown active status in the firm registration database during a calendar year. Entry rate is defined as the ratio of number of new firms to the total number of survival firms on December 31 in the previous year. Initial capital refers to the self-reported registry capital at the time of establishment. Education length is the years of education of a firm's current legal representative. E-commerce index is obtained from Ali-research and we have transformed it into z-score. Cluster index is taken from Ruan and Zhang (2015) based on China Economic Census 2008. Total population, the share of the urban population, illiteracy rate, the share of the prime-age population, and male/female sex ratio are obtained from aggregate data at the county level of China Population Census 2010.

**Table 3: The short/long-run effect of e-commerce on growth in number of new firms**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Log(no. of new firms 2014/ no. of new firms 2009)			Log(no. of new firms 2014/ No. of new firms 2004)		
No. of firms in initial year (log)	-0.202*** (0.013)	-0.299*** (0.023)	-0.442*** (0.025)	-0.220*** (0.022)	-0.369*** (0.032)	-0.526*** (0.043)
E-commerce (standardized)	0.057*** (0.011)	0.063*** (0.012)	0.064*** (0.012)	0.031** (0.016)	0.041*** (0.015)	0.082*** (0.016)
Log (population)		0.247*** (0.028)	0.351*** (0.028)		0.354*** (0.033)	0.420*** (0.038)
Cluster index		-0.023 (0.025)	0.063** (0.026)		-0.004 (0.034)	0.074** (0.036)
Share of urban population (%)		0.002* (0.001)	0.004*** (0.001)		0.222* (0.130)	0.392** (0.155)
Illiteracy rate (%)		0.004 (0.004)	-0.010*** (0.003)		-0.003 (0.003)	-0.011*** (0.003)
Share of prime age (15-64) (%)		-0.005 (0.004)	0.004 (0.005)		-0.001 (0.005)	0.001 (0.006)
Male/female sex ratio (0-14)		0.016 (0.021)	0.005 (0.013)		0.002 (0.003)	-0.000 (0.003)
Province fixed effect	No	No	Yes	No	No	Yes
Observations	1,831	1,831	1,831	1,831	1,831	1,831
Adjusted R-squared	0.156	0.217	0.449	0.145	0.247	0.409
AIC	2915	2783	2110	3844	3618	3144

Notes: For variable definitions, please see Table 1. Robust standard errors are in parentheses. The symbols \*, \*\*, and \*\*\* denote statistical significance at the 10%, 5%, and 1% levels, respectively.

**Table 4: The short/long-run effect of e-commerce on growth in the number of total firms**

VARIABLES	(1) Log(total no. of firms in 2014/ total no. of firms in 2009)	(2)	(3)	(4)	(5)	(6)
				Log(total no. of firms in 2014/ total number of firms in 2004)		
No. of firms in initial year (log)	-0.131*** (0.010)	-0.197*** (0.016)	-0.223*** (0.022)	-0.284*** (0.010)	-0.421*** (0.017)	-0.486*** (0.020)
E-commerce (standardized)	0.026*** (0.007)	0.030*** (0.007)	0.040*** (0.007)	0.050*** (0.010)	0.031*** (0.009)	0.049*** (0.010)
Log(population)		0.157*** (0.017)	0.177*** (0.020)		0.266*** (0.022)	0.295*** (0.024)
Cluster index		-0.005 (0.017)	0.001 (0.018)		0.114*** (0.021)	0.136*** (0.023)
Share of urban population (%)		0.002*** (0.001)	0.001* (0.001)		0.263*** (0.092)	0.253** (0.104)
Illiteracy rate (%)		0.004 (0.002)	-0.001 (0.002)		0.001 (0.002)	-0.002 (0.002)
Share of prime age (15-64) (%)		-0.008*** (0.002)	0.001 (0.003)		-0.003 (0.003)	-0.003 (0.004)
Male/female sex ratio (0-14)		0.021 (0.017)	0.003 (0.005)		0.002 (0.002)	-0.000 (0.001)
Province fixed effect	No	No	Yes	No	No	Yes
Observations	1,831	1,831	1,831	1,824	1,824	1,824
Adjusted R-squared	0.163	0.239	0.510	0.405	0.515	0.626
AIC	1263	1095	258.8	2306	1938	1438

Notes: See Table 1. Robust standard errors are in parentheses. The symbols \*, \*\*, and \*\*\* denote statistical significance at the 10%, 5%, and 1% levels, respectively.

**Table 5: The short/long-run effect of e-commerce on the growth the new firm entry rate**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	Growth of entry rate 2009-2014			Growth of entry rate 2004-2014		
Entry rate in initial year	-0.025*** (0.004)	-0.026*** (0.004)	-0.024*** (0.004)	-0.006*** (0.002)	-0.006*** (0.002)	-0.005*** (0.002)
E-commerce (standardized)	-0.087*** (0.020)	0.010 (0.019)	0.051** (0.020)	-0.014 (0.014)	0.013 (0.015)	0.052*** (0.019)
Log(population)		-0.009 (0.049)	-0.038 (0.045)		0.054* (0.030)	0.051 (0.036)
Cluster index		-0.121*** (0.038)	-0.016 (0.046)		-0.044 (0.029)	-0.051 (0.033)
Share of urban population (%)		-0.007*** (0.002)	-0.006*** (0.002)		-0.241* (0.131)	-0.111 (0.124)
Illiteracy rate (%)		0.011** (0.005)	-0.011* (0.006)		0.005** (0.003)	-0.003 (0.003)
Share of prime age (15-64) (%)		-0.003 (0.007)	-0.016 (0.012)		-0.000 (0.004)	-0.004 (0.006)
Male/female sex ratio (0-14)		-0.018 (0.018)	-0.002 (0.020)		-0.002 (0.002)	-0.002 (0.002)
Province fixed effect	No	No	Yes	No	No	Yes
Observations	1,831	1,831	1,831	1,831	1,831	1,831
Adjusted R-squared	0.162	0.192	0.319	0.097	0.103	0.212
AIC	4767	4704	4363	4017	4011	3744

Note: See Table 1. Robust standard errors are in parentheses. The symbols \*, \*\*, and \*\*\* denote statistical significance at the 10%, 5%, and 1% levels, respectively.

**Table 6: Falsification test: the effect of e-commerce on growth in number of new firms, total number of firms, and the entry rate from 1999 to 2004**

VARIABLES	(1)	(2)	(3)
Panel A: Log(new firms in 2004/new firms in 1999)			
E-commerce (standardized)	-0.050** (0.022)	-0.003 (0.020)	0.004 (0.021)
Panel B: Log(total firms in 2004/total firms in 1999)			
E-commerce (standardized)	-0.050*** (0.018)	-0.010 (0.017)	0.000 (0.017)
Panel C: Growth of entry rate from 1999 to 2004			
E-commerce (standardized)	-0.008 (0.018)	-0.008 (0.020)	0.002 (0.026)
Control variables	No	Yes	Yes
Province fixed effect	No	No	Yes
Observations	1,831	1,831	1,831

Notes: See table 1. When there was not a single new firm in 1999 in a country, we assume the growth rate from 1999 to 2014 in the county is the same as the average value of the bottom 1% of counties in terms of growth rate in the period to ensure the sample size is the same as the main specifications in Tables 2-4. We assign the minimum 1% value of growth rate where zero entry is observed in 1999, in order to maintain a consistent sample. The results are robust if we do not make the adjustment on the sample.

**Table 7: The effect of e-commerce on the growth in number of new firms by outsiders or insiders from 2009 to 2014**

Variables	(1) Outsiders	(2) Insiders	(3) Combined
E-commerce (standardized)	0.070*** (0.014)	0.040** (0.016)	0.022* (0.013)
Outsiders			-0.324*** (0.026)
E-commerce * Outsiders			0.067*** (0.014)
Control variables	Yes	Yes	Yes
Province fixed effect	Yes	Yes	Yes
Observations	1,832	1,832	3,664
Adjusted R-squared	0.275	0.386	0.310

Notes: The specification in (1) and (2) is the same as in Table 2 except that the dependent variable is the growth of log new firms established by outsiders or insiders, respectively. The third column is based on a combined sample of firms set up by insiders and outsiders and includes a dummy for outsiders and an interaction term between outsiders and e-commerce index. We define a firm as “outsider” if its largest shareholder’ birth county is different from the firm’s registered location.

**Table 8: The effect of e-commerce on the growth in number of new manufacturing firms at SIC-3 level from 2009 to 2014**

Index	(1) Downstream	(2) Capital intensity	(3) Skill intensity
E-commerce (standardized)	0.010 (0.015)	0.220*** (0.040)	-0.013 (0.023)
Index	0.040 (0.047)	-0.191*** (0.013)	-0.056** (0.028)
E-commerce*Index	0.048** (0.024)	-0.042*** (0.009)	-0.041** (0.018)
Control variables	Yes	Yes	Yes
Province fixed effect	Yes	Yes	Yes
Observations	16,420	16,393	15,741
Adjusted R-squared	0.180	0.193	0.179

Notes: See notes above. The dependent variable is the growth of log new manufacturing firms for each county at the SIC-3 level each 3-digit industry level. The downstreamness index is from Antras and Chor (2013). The capital intensity and skill intensity are obtained from the NBER-CES Manufacturing Industry Database (Becker et al., 2009). Capital intensity is the log of the real capital stock per worker. Skill intensity is the log of the number of non-production workers divided by total employment. The concordance between NAICS system and the Chines Industry System (CIS) is in the appendix.

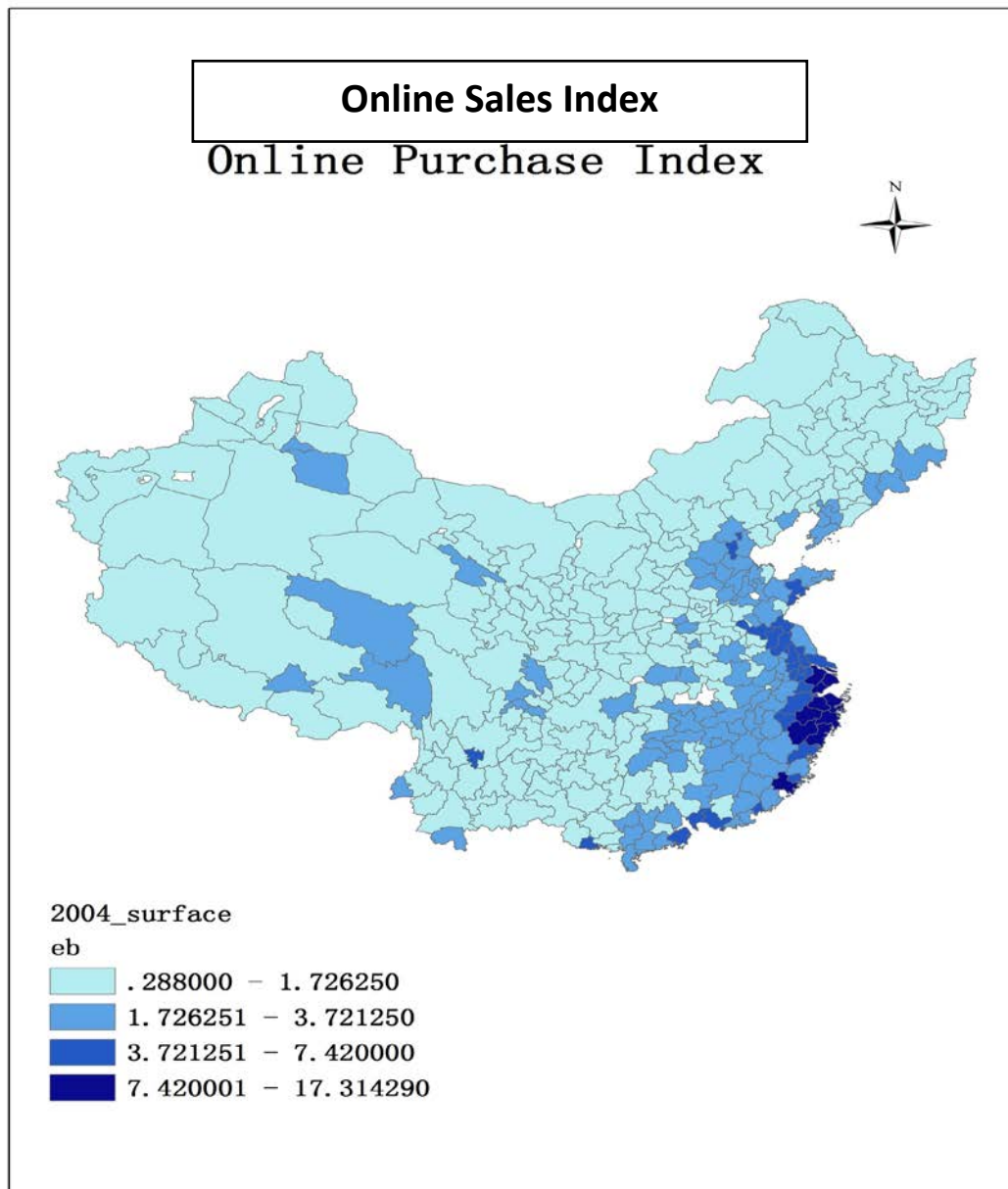
**Table 9: The effect of e-commerce on the initial capital and education level of the legal representative of new firms in 2014**

VARIABLES	(1) Capital	(2) Capital	(3) Capital	(4) Capital	(5) Education	(6) Education	(7) Education	(8) Education
E-commerce (standardized)	-0.072*** (0.027)	-0.047** (0.023)	0.017 (0.027)	0.022 (0.022)	0.037* (0.021)	0.028 (0.019)	0.055* (0.031)	0.040 (0.027)
Outsiders			1.695*** (0.061)	1.436*** (0.052)			0.624*** (0.046)	0.446*** (0.041)
E-commerce * Outsiders			-0.195*** (0.042)	-0.156*** (0.033)			-0.048** (0.022)	-0.034* (0.019)
Log(population)	0.046 (0.063)	0.130** (0.054)	0.151** (0.065)	0.219*** (0.055)	0.139 (0.090)	0.168** (0.081)	0.175** (0.089)	0.193** (0.080)
Cluster index	-0.131** (0.058)	-0.258*** (0.051)	-0.241*** (0.061)	-0.337*** (0.053)	-0.036 (0.109)	-0.094 (0.099)	-0.063 (0.106)	-0.109 (0.098)
Share of urban population (%)	0.002 (0.003)	0.002 (0.002)	-0.003 (0.003)	-0.001 (0.002)	0.005* (0.003)	0.002 (0.003)	0.004 (0.003)	0.001 (0.003)
Illiteracy rate (%)	-0.010 (0.009)	-0.008 (0.008)	-0.012 (0.010)	-0.011 (0.009)	-0.052** (0.020)	-0.046** (0.020)	-0.050** (0.020)	-0.045** (0.019)
Share of prime age (15-64) (%)	-0.015 (0.011)	-0.010 (0.010)	-0.029** (0.012)	-0.023** (0.011)	0.040** (0.020)	0.043** (0.018)	0.036* (0.020)	0.039** (0.018)
Male/female sex ratio (0-14)	0.006 (0.018)	0.019* (0.011)	0.006 (0.014)	0.019* (0.010)	0.003 (0.086)	0.006 (0.077)	0.009 (0.080)	0.009 (0.073)
Industry fixed effect	No	Yes	No	Yes	No	Yes	No	Yes
Province fixed effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,076,719	1,070,030	1,076,719	1,070,030	452,233	450,652	452,233	450,652
Adjusted R-squared	0.014	0.093	0.025	0.101	0.311	0.335	0.319	0.339

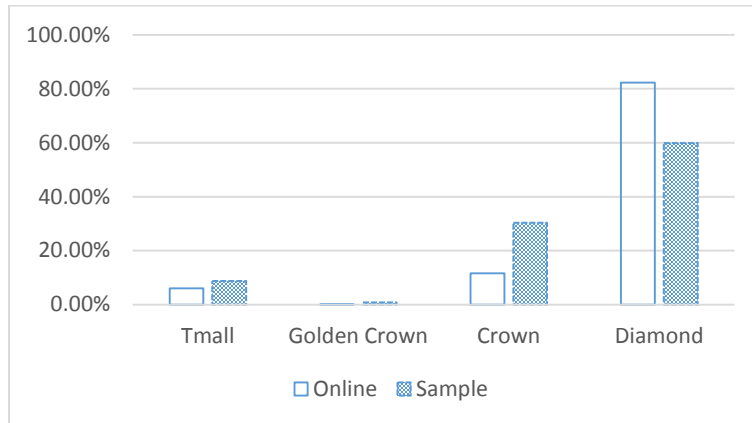
Notes: Initial capital refers to the self-reported registry capital at the time of registration. Education length is of the current legal representative of each firm and this variable is from the annual inspection data of China firm registry database and around half of the firms don't report this information. We define a firm as "outsider" if its largest shareholder's birth county is different from the firm's registered location. Robust standard error is clustered in the county level.



**Figure 1: The Spatial Distribution of Online Sales Index**

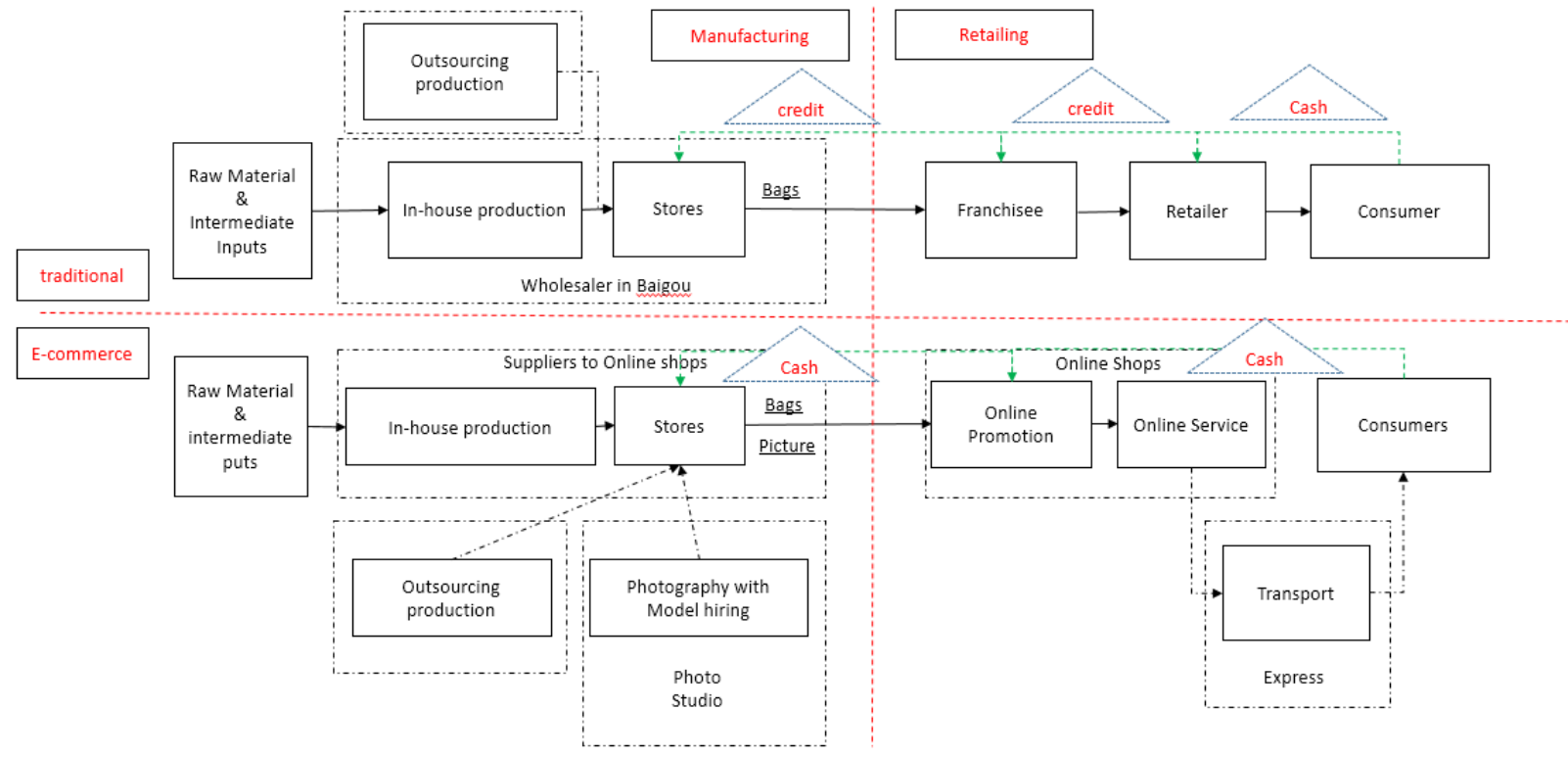


Source: Ali-research

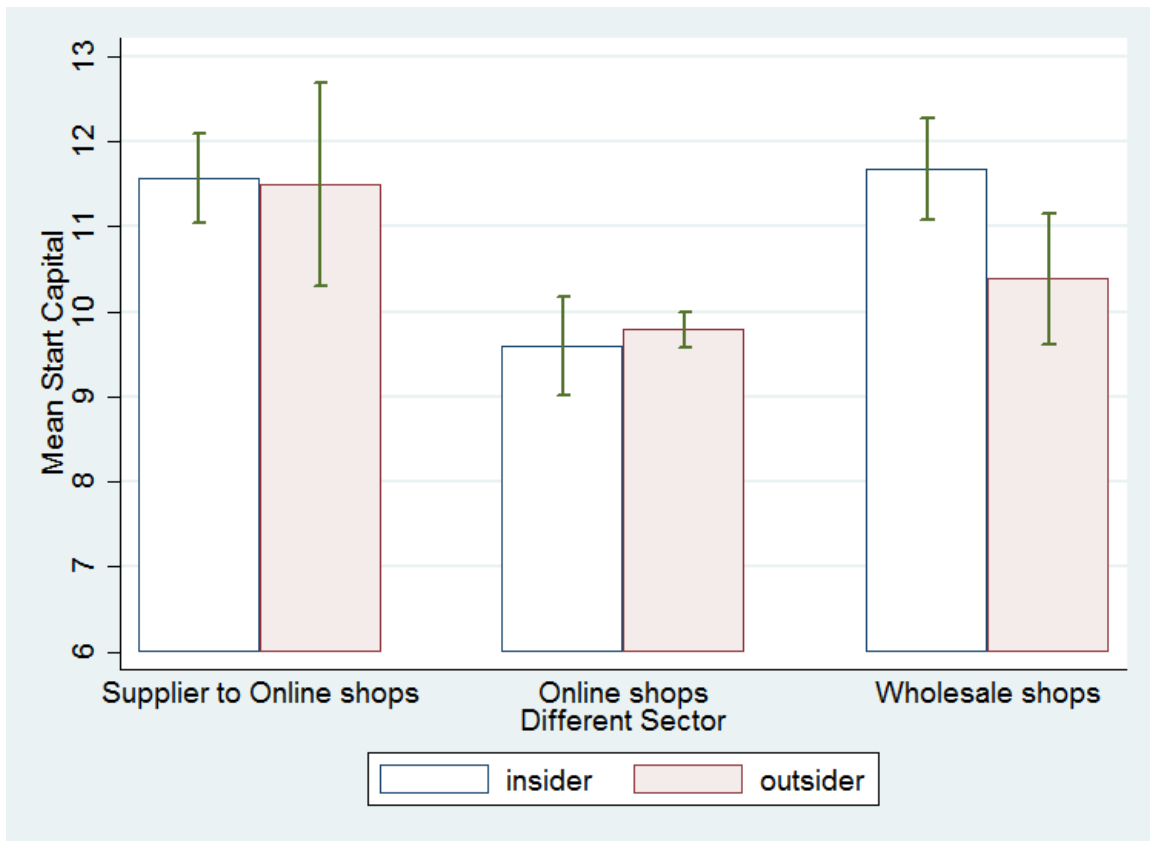
**Figure 2: Distribution of online shops by rating**

Source: The online shops include all the online bag\suitcase shops opened in Taobao.com with an IP address in Baigou.

**Figure 3: The structure of production for the traditional and online suitcase/bag business**



**Figure 4: The starting capital for outsiders and insiders for Different Types of Business**



Note: Outsiders means that shop owners are born in counties outside Baigou.