FIRM HETEROGENEITY, MARKET RELATEDNESS AND GEOGRAPHICAL DIVERSIFICATION OF EXPORT FROM CHINA

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Summary: Based on traditional international theories, exporters always expand their export markets in an incremental way. However, there are many exporters who do not obey the traditional path and enter foreign markets at the beginning of their internationalization, so called 'born globals (BGs)'. It seems that the BGs are more path-breaking, but the relative influence of local export network on both types of exporters remains an open question. Using firm-market level database of Chinese custom statistics during 2002-2011, we confirm that local export network of markets facilitates firms including BGs to enter the markets that are more related to the network. And the BGs even benefit more from the local export network of markets than traditional exporters (TEs).

Zusammenfassung: Nach vorherrschender internationaler Theorien erweitern Exporteure ihre internationalen Märkte schrittweise, nach erfolgreicher Etablierung auf dem heimischen Markt. Es gibt jedoch viele Firmen, die sich nicht an den traditionellen Weg halten und bereits von Beginn an in ausländische Märkte eintreten, so genannte 'born globals (BGs)'. Es scheint, dass die BGs zielgerichteter vorgehen, aber der relative Einfluss des lokalen Exportnetzes auf beide Arten von Exporteuren bleibt eine offene Frage. Auf der Grundlage einer Datenbankanalyse chinesischer Zollstatistiken auf Firmenmarktebene für den Zeitraum 2002-2011 bestätigen wir, dass das lokale Exportnetzwerk den Firmen, einschließlich der BGs, den Eintritt in Märkte erleichtert, die stärker mit dem Netzwerk verbunden sind. Und die BGs profitieren sogar mehr vom lokalen Exportnetzwerk der Märkte als traditionelle Exporteure (TEs).

Keywords: Economic geography, traditional exporters, born globals, market diversification, relatedness of export market, China

1 Introduction

The process of regional market[1] expansion is the process of diversification of firms' markets (Guo 2016). Literature on export diversification mainly focuses on the differences in export markets and export industries, as well as the impact of 'multiple proximity' or 'psychical distance' on the expansion of firms' export markets. Although Melitz (2003) pointed out the possible impact of firm heterogeneity on export expansion, follow-up studies just went further on the difference of productivity or ownership. More discussion concentrated on 'where to export' and 'when to export', and took it for granted that firms export in an incremental pace (Gabrielsson et al. 2008). Nevertheless, it is found that some firms follow a different process. These firms, so called BGs, tend to enter many foreign markets within a short time after starting export while focusing their

relatively constrained resources on commercialization rather than production (Burgel and Murray 2000; Knight and Cavusgil 2004).

When looking back, the idea of the gradual evolution appears in many evolutionary economic geography (EEG) researches, which highlights the importance of 'proximity' (Boschma 2005, Hidalgo et al. 2007; Rigby 2015; Mao and He 2019). Proximity reduces the cost of acquiring associated new knowledge (Neffke et al. 2011). Thus, for a region, the existing set of capabilities determines which direction will be feasible to develop in the future (Boschma et al. 2013). From traditional international business literature, experiential knowledge is considered a critical determinant of market expansion (García-Cabrera et al. 2017). For instance, the lack of experiential knowledge about foreign markets means that most firms, especially SMEs, first establish a solid domestic market to acquire resources and, eventually, enter foreign markets that are similar to the domestic market during later stages step by step (Johanson and Vahlne 1977).

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[1] 'Market' or 'export market' in this paper specially refer to the market in the export destinations geographically.

From this perspective, BGs seem to show a path-breaking pattern in their internationalization process as a counterpart of the traditional process. However, there is few direct empirical evidences to support this opinion. On the contrary, as many of the BGs are inexperienced SMEs with limited resources and information (CAVUSGIL and KNIGHT 2009), they may be more dependent on external networks. Therefore, we first propose a new opinion that BGs tend to keep closer ties with local export network[2], leading to a path-dependent characteristic.

The difference of firms' internationalized pace leads us to the thinking of the possible heterogeneity of knowledge production and transfer among different kinds of firms. Alongside the economic geography studies, it has been clear that firms can benefit in many ways by their local interactions with one another (DURANTON and PUGA 2004). However, when it comes to export evolution, it somehow overlooks the role of extra-linkage and the role of overseas demand (MAO and HE 2019). Global linkages, the knowledge pipelines that connect economic agents in different countries is an important solution to promoting knowledge transfer and replenishing place-bound stocks of knowledge (BATHELT et al. 2004; LYU et al. 2019; ESPOSITO and RIGBY 2019). According to this, we propose our further opinion that the different export pace among firms reflects their different priority towards global linkages. Thus, we track the influence of local and global linkages across years after firms export beginnings and apply interactors of local linkages and global linkages to see if there develops any difference between TEs and BGs.

Our contribution to the literature is two-fold. The first contribution we seek to make is thus to analyze and compare BGs with TEs on the diversification of markets to make sure if BGs are more path-dependent than the other at regional scale. Second, on this basis, we form a frame to understand why some firms can do faster than other firms on geographical diversification of export from the perspective of market relatedness and local-global interactions.

The rest of the paper is structured as follows. The next section develops a literature review followed by an introduction of the variables and specifications for empirical analysis. Section four discusses the econometric results and the last section concludes.

2 Literature review

2.1 Relatedness and local-based diversification

With knowledge production increasingly conceived as a process of recombining existing ideas (WEITZMAN 1998), regional development is imagined to move along place-based trajectories. The tacit nature of much knowledge means that geography continues to play a critical role in the transfer and production of knowledge (BALLAND and RIGBY 2017). When knowledge subsets are close substitutes for one another, they are regarded to be related or proximate to one another in some form of 'knowledge space' (BRESCHI et al. 2003). The relatedness concept rests on such an idea that knowledge has an architecture that is based upon similarities and differences in the way that different types of knowledge can be used (BALLAND et al. 2019).

From knowledge production to regional development, this evolutionary theoretical perspective has widely accepted and applied to capture the likely path dependence of regional dynamics by economic geographers. Overall, according to evolutionary economic geographers, new evolution in one region benefits from its relatedness to the pre-existing bases. Alongside this method, HIDALGO et al. (2007) introduce a measure based on co-occurrence analysis, denoting the likelihood of one region having a comparative advantage over two products simultaneously, which captures the relatedness implicitly since the co-occurrence can spring from multiple factors. The following researches extended this approach to the co-occurrence of products in plants (NEFFKE and HENNING 2013), to the co-citation of patents (RIGBY 2015) and to the co-occurrence of sectors in regions (HE et al. 2018). Furthermore, because the export diversification involves two spatial dimensions, not only the export origin, but also the export market. The co-occurrence approach is also extended to the co-occurrence of export markets (MAO and HE 2019), so called market relatedness to depict the proximity of different export markets.

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[2] Knowledge is easier to be spread and produced locally, the agglomeration of exporters in the same region can stimulate export knowledge spillover (BLOMSTROM and KOKKO 1998; MARTIN 2010). These local-based linkages among these firms form a kind of 'local buzz'. In this paper, we call it local export network to highlight its effect on export diversification.

2.2 Global linkages and BGs

Many studies emphasize that firms' own export experience has an impact on their export dynamics in the international market. One of the most common views emphasizes the positive role of prior export activities and believes that exporters can learn from their previous experience in exporting and predict unknown market demand to decide whether to export, which facilitates their access to new markets more easily and to increase their export capacity (Fafchamps et al. 2007; Arkolakis 2010; Morales et al. 2019). From the perspective of exporters, the market relatedness in the region offers a certain form of 'market knowledge space'. However, exporters need to acquire accesses from their own knowledge to the regional 'market knowledge space'. Especially for new exporters without export experience, the local-based knowledge is crucial to help stride over the threshold of export market and achieve a breakthrough in export volume from scratch (He et al. 2018).

According to EEG, knowledge is easier to be spread and produced locally, exporters can benefit from their local neighbors (such as other local exporters) (Shaver et al. 1997; Blomstrom and Kokko 1998; Ma 2006; Koenig et al. 2010). Bathelt et al. (2004) proposed the concept of 'Local Buzz' and visualized its role. The agglomeration of existing exporters in the same region can stimulate export knowledge spillover, thus giving new exporters huge information advantages, making it more convenient to access successful export experience, reducing the sunk cost of searching export information (Maskell and Malmberg 2007; Martin 2010).

In recent years, there is increasing awareness of the impacts of inter-regional/global linkages (Miguelez and Moreno 2018). The export behavior of an exporter from the origin to the export market is not only related to itself, but also involves the governments, consumers, intermediaries and other stakeholders, which together constitute a global production network. Trade links the main bodies of regional and economic activities worldwide and promotes knowledge flow among them (Rinallo et al 2010). In this process, local firms can acquire knowledge through external accesses which they do not have. Bathelt et al. (2004) called these accesses 'Global Pipelines'. The realization of trade activities in the production network promotes the transfer of knowledge such as product technology, institutions of foreign countries and market preference beyond geographical distance (Bathelt and Schuldt 2010).

When it comes to the firm level, BGs are such kind of firms that focus on the global linkages. And the internationalization process of BGs is a matter of learning through external networks (Sharma and Blomstermo 2003). This kind of firms internationalize soon after forming and enter different markets at the same time with rapid expanding speed (Lopez et al. 2009). The BGs regard the world as one global market, they always enter many markets at the beginning of their internationalization, which allows these firms to establish many ties with different markets. As the market selection and entry strategies of BGs are more likely to be influenced by global linkages and global industry trends, rather than by the geographic or 'psychological' proximity of foreign markets (Fernhaber and Li 2013), many studies consider that the BGs are more path-breaking than the traditional exporters in the local export pattern (Bell et al. 2004; Murray and Robert 2016). However, BGs also care more about the external knowledge, because they are typically smaller firms with limited tangible resources. They always face numerous constraints in internationalization, including insufficient economies of scale, often inexperience in export, and general dearth of financial and human resources (Cavusgil and Knight 2009; Freeman et al. 2006). Thus, the BGs may show tighter connections with local export networks, leading to an unexpected path-dependent characteristic with the local export pattern.

Besides smaller size, engaged in numerous weak ties is another feature of BGs. Majority of these ties are indirect and weak. Within these ties, intermediaries help otherwise disconnected units to communicate and forge relationship (Eriksson et al. 2015). As weak ties are less cumbersome and less expensive to maintain, through them, BGs develop internationalization knowledge and an absorptive capability that are more versatile and diversified and that consist of a large variety of cues in foreign markets (Boorman 1975; Hansen 1999; Sharma and Blomstermo 2003). Therefore, the internationalization process of BGs is characterized by the strategy of exploration (March 1991). This process is co-evolutionary, gradual, and based on feedback. McNaughton (2003) finds that most of the BGs experience a rapid market expansion process that nearly half of their markets are entered in the first two years. The rapid market expansion of the BGs may be less path-dependent and show ignorance of geographical factors and local export structure and help BGs build many global linkages as well. The pre-existing linkages allow BGs to acquire resources and abilities to serve international markets (Eriksson et al. 2015; Lin and Wang 2019). New linkages, through

a feedback process, increase the current stock of business and institutional knowledge in BGs. This increased stock of resources and knowledge allows them to make better use of the local export network for further internationalization. Thus, we propose two related hypotheses:

Hypothesis 1: The BGs show more path-dependence with local export networks after they begin exporting than TEs.

Hypothesis 2: More global linkages can help BGs make better use of local-based linkages for market diversification.

3 Data and research design

3.1 Data source

Using the Chinese customs database, we construct a pool data for Chinese firms' entering the international market from 2002 to 2011 at the firm-market level. The database provides detailed information about firms' identification, export market, firm location, export value, among others.

This paper uses the unique identification of the exporter code in the customs database to identify companies which enter the export market. A firm will be treated as a new export firm if it does not exist in the database in T years but exists in (T+1) years. T years will be regarded as t0, and (T+1) years will be regarded as t1. In this article, BGs are not limited to companies that have entered the international market since the beginning of the new establishment, but also include those 'Born-again Globals' which are firms that have been well established in their domestic markets, but have suddenly embraced rapid export expansion (BELL et al. 2001). Therefore, we take the number of export markets that an exporter enters in the first year of its internationalization, a proxy of the early expansion speed of exporters, as a criterion to identify BGs. According to the investigation of BGs in Canada (McNaughtion 2003) and the distribution of the data, we choose n > 5 as the threshold, which means that if a firm entered more than 5 markets in t1, it will be regarded as a BG in the coming empirical part.

3.2 Relatedness of markets

The measurement of proximity between countries has always been a difficult point in the field of international trade. MORALES et al. (2019) use four dummy variables - common boundary, common continent, official language, similar per capita GDP - to measure the similarity between markets and to study the interpretation of similarity between markets to exporting new markets (Extended gravity equation). These four variables are more explanatory for the inter-country trade at the aggregate level, but the explanatory power for the national trade of specific products needs to be verified. This literature has not achieved the desired results. Among the four variables, only the destination country using the same official language can significantly increase the probability of exporting new markets. Guo (2016) was inspired by Hidalgo et al. (2007) and uses the co-occurrence approach to calculate the conditional probability of two markets being exported by the same city. This paper uses this co-existence analysis method to calculate the conditional probability, that is, if the two markets are used by the same city as the export destination country at a high frequency, indicating that the information required for exporting the two markets is similar or the costs to be paid overlap, then after exporting one market, it is much easier to obtain market information or the cost need to pay will be less when exporting another market. Therefore, when this conditional probability is high enough, it means that the two markets are related to each other. The calculation formula is similar to the product association,

$$\theta_{ij} = min\{P(V_{ci} > 0 | V_{cj} > 0),\ P(V_{cj} > 0 | V_{ci} > 0)\}$$

$$RCA_{ci} = \frac{V_{ci}/\Sigma_i V_{ci}}{\Sigma_c V_{ci}/\Sigma_{ci} V_{ci}}$$

Among them, c represents the city, i and j represent the markets, V_{ci} is the export value of city c in the current year, RCA_{ci} indicates the comparative advantage of city c in the market i. According to the above formula (1), the high value of O_{ij} indicates that the market i and the market j are frequently exported by the same city, which means that the two markets are highly correlated in the export network; On the contrary, the degree of association is low. This paper refers to the collection of the two-two correlation between markets as the market association network, which is a 225 * 225 symmetric matrix. Each item in the matrix is the degree of correlation between a pair of markets. In addition, taking the minimum of two conditional probabilities could avoids overestimating market correlations. In this paper, considering the kernel density distribution and the selection criteria of threshold value, we set the threshold of market relatedness to 0.30 to judge if two certain markets are related.

The O_{ij} calculated above is the degree of relatedness between 'market-market'. In order to put this technology relatedness on the spatial scale, we also refer to the idea of GUO (2016) to calculate the degree of relatedness between the market and the local export network (also seen as 'market-city' relatedness).

$$Density_{ci} = \frac{\Sigma_i x_{ci} \theta_{ij}}{\Sigma_i \theta_{ij}}$$

In this formula, x_{ci} is a dummy variable. If i is the dominant export market of city c ($RCA_{ci} > 1$), the value is 1 and vice versa. The larger $Density_{ci}$ is, the closer the market i is to the local export network of city c.

3.3 Econometric strategy

In order to analyze the impact of local export network on TEs and BGs entering export markets, this paper selects 2002-2011 as the research period. We construct a Probit regression model in firm-market dimension and explores the market expansion of firms in their first year in the international market as a baseline regression.

$Entry_{fi} = \beta_0 + \beta_1 Density_{ci} + \beta_2 Spilover_{ic}$
$+ \beta_3 Country_i + \beta_4 City_c + \beta_5 City\_PGDP_c$
$+ \beta_6 Dis_i + \beta_7 Country\_pop_i +$
$\beta_8 Country\_Ins_i + \varepsilon_{ci}$

where $Entry_{fi}$ is a dummy variable, which represents whether the new firm f enters the market i in t1. If the export value of firm f to the i market in t1 is larger than 0, the variable takes a value of 1, otherwise it is 0. $Density_{ci}$ is the 'market-city' relatedness of c city with market i. $Spillover_{ci}$ refers to the export volume to the same market by other exporters in the same city in the previous year. Exporters can learn from the export behavior of their neighbors, so that they can collect more information about the potential markets, reduce the export cost (GREENAWAY et al. 2004; FERNANDES and TANG 2014), making it easier to enter new export markets.

We also add some control variables in different dimensions. $City_c$ and $Country_i$ are the export experience of city c and Chinese export experience in market i, and both are expressed in terms of exports. $City\_PGDP_c$ is the per capita GDP of city c. It controls the influence of the level of social and economic development on the entry of new exporters. The data source is Chinese Regional

Economic Statistical Yearbook. DIS_s is the distance between biggest cities in China and the foreign market. It controls the impact of geographical distance on export spillover. The data source is CEPII database. $Country\_Pop_{st}$ is the population of the target market and controls the impact of the market size and the data source is CEPII database. $Country\_Ins_{st}$ is the degree of social stability of the foreign markets. It controls the impact of the institutional environment of foreign markets on the entry of new firms. The data are collected from the Worldwide Governance Indicators of World Bank.

Furthermore, this paper cares more about the dynamic impact of local export network on the expansion of export market after their first entering the international market. A large number of markets were entered in the first 3 years after the firm entered international markets (KNIGHT and LIESCH 2016), so we track these firms' diversification of markets during the second to the fourth year to see if BGs become more path-dependent with the local export network. Moreover, with exposure to international markets, firms accumulate institutional knowledge, business knowledge and internationalization knowledge through their global linkages (ERIKSSON et al. 2015). The more the exporter has already export to the existing markets in the previous year, the more information and knowledge the exporter can acquire (FERNANDES and TANG 2014). The knowledge accumulation process forms the absorption capability of firms, which may help firms make better use of the local export network. To test our hypotheses, we add export experience and its interactor with $Density_{ci}$ into the empirical models of this stage.

$Entry_{fi} = \beta_0 + \beta_1 Density_{ci} + \beta_2 Exp_f + \beta_3 Exp_f \times Density_{ci} + \beta_4 Spillover_{ic} + \beta_5 Country_i$
$+ \beta_6 City_c + \beta_7 City\_DP_c + \beta_8 Dis_i$
$+ \beta_9 Country\_Pop_i + \beta_{10} Country\_ins_i + \varepsilon_{ci}$

where $Entry_{fi}$ stands for a similar meaning with the former one, which represents whether firm f enters the market i in t_k (k=2,3,4). If the export volume in t_{k-1} is 0, but more than 0 in t_k, the variable takes a value of 1, otherwise it is 0. Exp_f stands for the export experience of firm f, expressed by the export volume of firm f in t_{k-1}. $Exp_f \times Density_{ci}$ is the interactor of Exp_f and $Density_{ci}$. The rest of the variables have the same meaning as the former, which is not explained here again.

4 Empirical results

We empirically analyzed the relationship between the local export network and the market expansion in the first year of their internationalization with Probit method. We standardized independent variables to facilitate comparison of effect differences. In order to eliminate endogeneity caused by possible reverse causality and take it into consideration that it takes time to make the effects happen, we lagged the explanatory variables by one year. MOULTON (1990) and WOOLDRIDGE (2003) showed that regressing individual variables on aggregate variables could induce a downward bias in the estimation of standard-errors. All regressions in this table and the following are thus clustered at the prefecture level.

As the Tab. 1 shows, Density always has a significant positive effect on the entry of new market. This illustrates that the local export network of markets improves local firms to export and enter the markets that are more related to the network, which is consistent with our expectation. What we are interested in is the possible different effects between TEs and BGs. Based

on the results in Column (2) and Column (3) and the coefficient difference test, however, we find that both TEs and BGs are positively influenced by Density with no significant difference between them. On the one hand, this implies that both TEs and BGs can take advantages of the local export network to go out of the domestic market easily, and some markets with a higher density are easier for these new exporters to enter than others. On the other hand, this also illustrates that BGs do not show a more path-dependent characteristic than TEs in their first year of export. This is not unexpected because those BGs have not accumulated more internationalization knowledge as well as a stronger absorptive capability in the first year of their market expansion. Moreover, these new BGs may always focus on those developed markets such as the US and EU first on account of the larger market scale and better institutional environment, regardless of the local network and other geographical factors (GARCÍA-CABRERA et al. 2017; ZHOU et al. 2007). To some extent, this supposition is supported by our empirical results, as the geographical distance (*Dis*) has significant negative influence on the choice of market expansion of

Tab. 1: Empirical results for the first year in international markets

	(1)	(2)	(3)
	Baseline	**TEs**	**BGs**
Density	0.786***	0.830***	0.757***
	(0.0921)	(0.105)	(0.0993)
Spillover	0.168***	0.155***	0.142**
	(0.0482)	(0.0542)	(0.0692)
Country	0.0298	0.0329	0.0312
	(0.0413)	(0.0432)	(0.0519)
City	0.127**	0.105*	0.110
	(0.0612)	(0.0623)	(0.0721)
City_PGDP	0.887	0.861*	0.875
	(0.683)	(0.507)	(0.544)
Dis	-0.0206*	-0.0287**	-0.0142
	(0.0117)	(0.0144)	(0.0169)
Country_Pop	0.0612***	0.0581***	0.0627***
	(0.0212)	(0.0242)	(0.0245)
Country_Ins	0.196***	0.132***	0.238***
	(0.0722)	(0.0645)	(0.0675)
Heterogeneity		year, city	
Observations	275,268	173,924	101,344
R-squared	0.293	0.297	0.302

Robust standard errors clustered at the city level appear in parentheses.

*** $p<0.01$, ** $p<0.05$, * $p<0.1$

TEs, but no significant influence on that of BGs, and the institutional environment (*Country_Ins*) and market scale (*Country_Pop*) seemingly have more positive effects on BGs with larger coefficients. Besides the export spillover from other local exporters to the same market (*Spillover*) also has significantly positive effect on the market expansion of these firms with no surprise, while at a larger scale, the spillover of all local exporters regardless of the export market or the spillover of all the export to the same country of all cities have little effect on the market expansion of these firms.

As we explained above, the reason why the BGs do not behave a more path-dependent characteristic compared with the TEs may derive from the fact that it takes time for the BGs to acquire internationalization knowledge and absorptive capability from external sources after their initial expansion in foreign markets. To go further of this issue and prove the supposition above, we then track the process of the two types of exporters by analyzing their market diversification in following 3 years.

As shown in Tab.2, the empirical results of the main variables are generally consistent with that in the first year. Differently, these firms are also influenced by their own export experience because they have exported for 1 year at least. The export experience shows significantly positive effect on the market expansion of TEs and BGs, which illustrates that the experience will not only improve their export capability but also reduce the risks as well as cost (FAFCHAMPS et al. 2007; ARKOLAKIS 2010; MORALES et al. 2019). More importantly, we find significant difference of the effects of Density in the 3rd and the 4th year according to the coefficient difference test, that is the coefficients of Density of BGs are significantly larger than that of TEs. This implies that the market diversification of the BGs benefits more from the local export network than that of the TEs, which in turn proves the hypothesis 1 that the market diversification of BGs is more path-dependent in the 3rd year and the 4th year after their first step of internationalization.

Tab. 2: Empirical results for the 2nd-4th year in international markets

	2nd year		3rd year		4th year	
	TEs	**BGs**	**TEs**	**BGs**	**TEs**	**BGs**
Density	0.755***	0.892***	0.702***	1.044***	0.710***	1.158***
	(0.0971)	(0.0915)	(0.0845)	(0.0834)	(0.0745)	(0.0776)
Exp	0.583***	0.645***	0.536***	0.655***	0.539***	0.684***
	(0.0771)	(0.0555)	(0.0791)	(0.0577)	(0.0794)	(0.0590)
Spillover	0.165***	0.162***	0.175***	0.182**	0.178***	0.191**
	(0.0521)	(0.0632)	(0.0544)	(0.0617)	(0.0602)	(0.0583)
Country	0.0345	0.0326	0.0331	0.0314	0.0351	0.0342
	(0.0457)	(0.0522)	(0.0462)	(0.0539)	(0.0442)	(0.0553)
City	0.109*	0.118	0.113*	0.123*	0.112*	0.121*
	(0.0607)	(0.0730)	(0.0616)	(0.0735)	(0.0647)	(0.0708)
City_PGDP	0.842*	0.851	0.841	0.855	0.837	0.868
	(0.511)	(0.552)	(0.514)	(0.554)	(0.515)	(0.548)
Dis	-0.0263**	-0.0135	-0.0247**	-0.0137	-0.0268**	-0.0124
	(0.0150)	(0.0178)	(0.0155)	(0.0182)	(0.0135)	(0.0146)
Country_Pop	0.0563***	0.0643***	0.0562***	0.0675***	0.0577***	0.0673***
	(0.0213)	(0.0233)	(0.0216)	(0.0235)	(0.0212)	(0.0252)
Country_Ins	0.135***	0.221***	0.142***	0.228***	0.144***	0.236***
	(0.0626)	(0.0668)	(0.0628)	(0.0683)	(0.0625)	(0.0673)
Heterogeneity	year, city					
Observations	142,154	83672	107424	68,396	72,988	40,596
R-squared	0.295	0.301	0.294	0.299	0.292	0.298

Robust standard errors clustered at the city level appear in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

With regards to the hypothesis 2, we add the interactor of Exp_f and $Density_{ci}$ to see if the experiences from more various global linkages help BGs make better use of local-based linkages for market diversification. As shown in Tab.3, the interactor in BGs group always shows significant positive from the 2nd to the 4th year, while the interactor in TEs group shows no significance. It supports the prediction that the experiences from various global linkages help BGs make better use of local-based linkages for market diversification. Since BGs export to more markets and form weak ties rapidly after their first movement, the BGs can internalize more internationalization knowledge and develop a stronger absorptive capability from these external accesses (SHARMA and BLOMSTERMO 2003). This, as a form of experience, helps the BGs take better use of local export network.

As shown above, the dynamic changes of the effects from the 1st year to the 4th year depict the pace of market diversification of the BGs as well as the process of knowledge accumulation and capability improvement (PARK et al. 2015). We admit that in the first 2 years, most of the BGs experience a rapid market expansion process that nearly half of their markets are entered in this period (MCNAUGHTON 2003). The rapid market expansion of the BGs may be less path-dependent and show ignorance of geographical factors and local export structure. Nevertheless, when the BGs build a basic and diversified market portfolio, they will become better at collecting information and knowledge and identifying business opportunities from local export network. And as SMEs with limited resources, they also rely on the local network to support their further market expansion, leading to a gradually path-dependent way.

Moreover, we also do some robustness checks in different ways, and the empirical results generally lead to consistent conclusions. More details are listed in Appendix 1.

5   Conclusions

An increasing number of BGs are engaging in international markets from the beginning of their establishment (BURGEL and MURRAY 2000). The internationalization process of BGs deviates from that of TEs. However, few studies empirically discuss on the difference of their performance and what makes BGs different in export market diversification. In this context, we empirically analyzed the relationship between the local export network and the market expansion in the first year of the internationalization of both BGs and TEs with Probit method using the Chinese custom database during 2002-2011. We confirm that the local export network of markets facilitates local firms, both TEs and BGs, to export and enter the markets that are more related to local-based linkages, which implies that not only TE, but BGs show a path-dependent characteristic. To go further of this topic and check if the BGs show a more path-dependent characteristic than the TEs, we then track the process of the two types of exporters by analyzing their market diversification in

Tab.3: Empirical results for the 2nd-4th year in international markets with the interactor

	2nd year		3rd year		4th year	
	TEs	BGs	TEs	BGs	TEs	BGs
Density	0.687***	0.744***	0.688***	0.978***	0.693***	1.011***
	(0.0956)	(0.0901)	(0.0839)	(0.0842)	(0.0720)	(0.0761)
Exp	0.533***	0.621***	0.517***	0.635***	0.526***	0.659***
	(0.0757)	(0.0566)	(0.0743)	(0.0562)	(0.0788)	(0.0591)
Exp×Density	0.078	0.067*	0.079	0.070*	0.087	0.074**
	(0.0741)	(0.0402)	(0.0769)	(0.0376)	(0.0782)	(0.0346)
Spillover	0.165***	0.162***	0.175***	0.182**	0.178***	0.191**
	(0.0512)	(0.0633)	(0.0551)	(0.0614)	(0.0598)	(0.0572)
Controls	√	√	√	√	√	√
Heterogeneity			year, city			
Observations	142,154	83672	107424	68,396	72,988	40,596
R-squared	0.303	0.308	0.301	0.305	0.297	0.299

Robust standard errors clustered at the city level appear in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

following 3 years. We also take the firms' export experience into account and the positive effect of the local export network is still significant. More importantly, we find significant difference of the effects of Density in the 3rd and the 4th year according to the coefficient difference test, that is the coefficients of Density of BGs are significantly larger than that of TEs. This implies that the market diversification of the BGs benefits more from the local export network of markets that TEs, which in turn illustrate that the market diversification of BGs is more path-dependent in the 3rd year and the 4th year after their first step of internationalization.

Furthermore, we also the experiences from various global linkages help BGs make better use of local-based linkages for market diversification. Since BGs export to more markets and form weak ties rapidly after their first movement, the BGs can internalize more internationalization knowledge and develop a stronger absorptive capability from a wider range. The changes of the effects from the 1st year to the 4th year depict the process of market diversification of BGs can be divided into two stages. In the first 1-2 years, the BGs most of the BGs always experience a rapid market expansion process (MCNAUGHTON 2003), which may be less path-dependent and show ignorance of geographical factors and local export structure. After the BGs build a basic and diversified market portfolio, they become better at absorbing knowledge and identified business opportunities from local export network, leading to a gradually path-dependent way.

As BGs become more and more common nowadays, it is of great importance to tell and understand their behavioral logic and the drivers of their export expansion. In the theoretical aspect, this paper first offers a dynamic perspective for the relationship between market diversification and the linkages of BGs as well as TEs. BGs also possess (even more) locality in some period. As this paper illustrates, not only TEs but BGs can benefit from the local export network and spillover, and after the early rapid market expansion, the BGs may rely more on the local export network. This brings us to possible policy implications that can be drawn from our study. As local export networks can be the soil for both BGs and TEs to achieve further market diversification, it would be wise to target policy intervention and design at the local level. And this would bring us a step forward in the design of policies to consider how to further reduce the communication cost among exporters locally and construct a friendly and inclusive 'local atmosphere' for trade. Moreover, the managers of exporters, especially BGs, should realize the important of interaction of globality and locality for their development. Local embeddedness may lead to further internationalization.

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Appendix 1: Robustness checks

Different from developed countries, process-ing trade accounts for a big part of export in China. Thus, Chinese customs database contains many trading firms, and they do not produce but behave as an intermediary to help other firms complete export declarations and other jobs. These trading firms can export hundreds of products for different firms to a number of markets at the same time, which will af-fect our empirical results, so we exclude them now to make our results more reliable. Based on the meth-ods of Aʜɴ et al. (2011) and Mᴀɴᴏᴠᴀ and Zʜᴀɴɢ (2012), we exclude firms whose names contain the words 'trade (贸易)', 'export (出口)' and 'import (进口)'. We also exclude firms whose names include 'for-eign trade (外贸)', 'trade and commerce (商贸)' and 'logistics (物流)' which indicate that the firm obvi-ously does not engaged in production.

The effects of *Density* from the 1ˢᵗ year to the 4ᵗʰ year are picked and set together in the Column 1 of Tab. A1. We can find that the positive influence still

exists. The dynamic changes are the same with the results in Tab. 2, that is, the local export network does not have heterogeneous effects on the BGs and the TEs in the first two years, however, the BGs show more path-dependent in the third year with a significant larger coefficient.

Some exporters may have discontinuous exports during the research period. In order to avoid that this kind of cases are identified as new exporters in our study to a greater extent, we make a stricter definition of new exporters, that is, an exporter can only be identified as a new exporter if it does not exist in the database during T-2 to T year and ap-pears in T+1 year. The main empirical results from this recalculation are shown in Column 2 of Tab. 3. On the other hand, we redefine the BGs as well. We tighten the criterion that a firm can be regarded as a BG by increase the benchmark form 5 markets in the first year to 8 markets. As shown in Column 2 and Column 3 of Tab. 3, the main results of *Density* are consistent with that in original definition. Thus, we will not dwell on the analysis of the results again.

Tab. A1: Empirical results of robustness check

		No processing trade		New definition of new exporters		New definition of BGs	
1st year	TEs	0.926*** (0.103)	+	0.782*** (0.091)	+	0.847*** (0.113)	+
	BGs	0.869*** (0.093)		0.760*** (0.087)		0.842*** (0.010)	
2nd year	TEs	0.945*** (0.099)	+	0.823*** (0.097)	+	0.941*** (0.106)	+
	BGs	1,135*** (0.091)		0.980*** (0.088)		1.029*** (0.093)	
3rd year	TEs	0.913*** (0.085)	+**	0.862*** (0.085)	+	1.026*** (0.094)	+**
	BGs	1.328*** (0.081)		1.104*** (0.080)		1.389*** (0.087)	
4th year	TEs	1.062*** (0.075)	+**	0.920*** (0.071)	+**	1.115*** (0.084)	+**
	BGs	1.458*** (0.098)		1.289*** (0.086)		1.537*** (0.082)	

Robust standard errors clustered at the city level appear in parentheses.

*** p<0.01, ** p<0.05, * p<0.1

+** the coefficient of BGs is significantly larger than that of TEs.