ORIGINAL ARTICLE

The relationship between foreign direct investment and domestic entrepreneurship: The impact and scale of investments in China

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Abstract

Both entrepreneurship and foreign direct investment (FDI) are frequently identified as being sources of local and regional economic growth. However, the relationship between the two is not always clear, with a negative competition effect and a positive demand effect potentially present. China provides an interesting case to study with its large state-owned sector, combined with a recent history of successfully attracting considerable FDI. This study examines the relationship between self-employment and different elements of foreign influence (FI) at a provincial level. The results imply that foreign investment reduces the level of self-employment, whilst the number of foreign enterprises and foreign exports have positive effects. The results therefore show the importance in considering multiple perspectives in terms of FI. It appears that policies that attract individual large investments suppress the development of domestic enterprise as predicted by the competition effect, but where more foreign enterprises are present, and a cluster starts to develop, a demand effect appears to take over. This means that provincial government policy may need to be more nuanced to avoid economies being

Abbreviations: AIC, Akaike information criterion; EU, European Union; FDI, foreign direct investment; IPR, Intellectual Property Rights; IV, instrumental variables; OECD, Organisation for Economic Co-operation and Development; R&D, research and development; SCC, State Council of China; VAR, vector autoregressive.

> highly reliant on a limited number of what might be quite footloose larger foreign employers.

1 | INTRODUCTION

Both entrepreneurship and foreign direct investment (FDI) are frequently identified as being sources of local and regional economic growth. However, the relationship between the two is not always clear, with a negative competition effect and a positive demand effect potentially present. There is a large body of empirical research on the impact of FDI on domestic entrepreneurship. While some studies suggest a positive link (Albulescu & Tămăşilă, 2014; Ayyagari & Kosová, 2010; Görg & Strobl, 2002; Herrera-Echeverri et al., 2014; Kim & Li, 2014; Wach & Wojciechowski, 2016), other studies indicate a negative effect (Danakol et al., 2017; Goel, 2018; Pathak et al., 2015; Roman et al., 2018; Rusu & Roman, 2017). Most of the current studies focus on country level data (Albulescu & Tămăşilă, 2014, 2016; Danakol et al., 2017; Goel, 2018; Kim & Li, 2014; Pathak et al., 2015; Roman et al., 2018; Rusu & Roman, 2017; Wach & Wojciechowski, 2016) or concentrate on industry level data (Ayyagari & Kosová, 2010; Barbosa & Eiriz, 2009; Danakol et al., 2017; De Backer & Sleuwaegen, 2003; Görg & Strobl, 2002). However, very few studies examine the link at the regional level in a country (Lee et al., 2014). Knowledge spillovers of FDI are more likely to occur close to the knowledge source as there are advantages of learning created by geographic proximity (Jaffe et al., 1993) and the cost of transmitting knowledge increases with distance (Audretsch & Feldman, 1996). Jaffe et al. (1993) find empirical evidence that citations to local patents are more likely to come from the same state as the originating patent, therefore supporting the above argument. Therefore, knowledge flow is often constrained by geographic boundaries. In addition, Rocha and Sternberg (2005) emphasise that entrepreneurship and clusters are essentially regional phenomena. This makes a regional perspective important to consider when investigating the effect of FDI on domestic entrepreneurship.

This paper examines the relationship between domestic entrepreneurship and different elements of foreign influence (FI) at a provincial level in China. Self-employment is used to measure domestic entrepreneurship as it has become the standard measure for domestic entrepreneurial activity (Parker, 2004) and many studies have used this measure (Acs et al., 2012; Carree et al., 2002; Dvouletý, 2018, 2019; Koellinger & Thurik, 2012). This measure captures all those running business including smaller businesses such as own-account workers through to those owning larger businesses and employing others, and therefore provides a broader measure of Chinese enterprise activity. China provides an interesting case to study with its large state-owned sector, combined with a recent history of successfully attracting considerable FDI, it being the largest FDI recipient among the developing and emerging economies. The State Council of China also issued a circular concerning measures on expanding its opening up and utilisation of foreign investment in 2017, which allows local governments to provide incentive policies to foreign investors in order to promote FDI within their areas of responsibility (SCC, 2017). This paper contributes to the existing literature in several ways. First, there are very few papers studying the impact of FDI on entrepreneurship in China. Of these studies no simple relationship is confirmed with Anwar and Sun (2012) finding that FDI has no significant effect on the entry rate of domestic firms, but may harm existing enterprise by raising the exit rate of domestic firms in China's manufacturing sector. Anwar and Sun (2015) find very similar results between FDI in Research and Development (R&D) and the domestic entry/exit rate in China. Second, it is argued that the spillover effect of FDI arises at the industry or regional levels (Haskel et al., 2007). However, most studies investigate this effect at the industry level (Ayyagari &

Kosová, 2010; Barbosa & Eiriz, 2009; Danakol et al., 2017; De Backer & Sleuwaegen, 2003; Görg & Strobl, 2002), and few studies at the regional level (Lee et al., 2014). Third, three different variables are used to measure FI, namely FDI inflows, foreign owned enterprises and exports by foreign owned firms. This allows the study to consider the impact that different motivations and patterns of foreign investment have on domestic enterprise. Fourth, we employ an instrumental variable (IV) technique to deal with the potential problem of reverse causality and use a panel causality technique to test the direction of causality. Finally, unlike some studies we use self-employment as the measure of enterprise rather than focussing on a minority of larger private enterprises and/or firms from particular sectors (Anwar & Sun, 2012; Liu et al., 2014). Fritsch and Wyrwich (2015) emphasise the advantage of using self-employment data as it shows the social acceptance of entrepreneurship and the availability of supporting services in a region. Self-employment is one of the most widely used measures (Blanchflower, 2004), allowing our results to be compared more easily with international studies. A broader perspective is important for China as Lin et al. (2020) highlight the role that entrepreneurship potentially has in alleviating poverty, particularly in developed urban areas which have grown in part due to the presence of FDI. Self-employment is also recognised as having grown in importance for Chinese rural areas as a greater proportion of the workforce moves off-farm (Jia et al., 2013). Some of this self-employment may reflect disguised unemployment where the formal sector cannot absorb all of those wishing to work within it, but a wider definition captures these alternative sources of jobs that have the potential to lead to further job creation (Ma, 2016).

Using data spanning the period 2000–2015 in 31 Chinese provinces, the results imply that foreign investment reduces the level of self-employment, whilst the number of foreign enterprises and foreign exports have positive effects. The results therefore show the importance in considering multiple perspectives in terms of FI. It appears that policies that attract individual large investments suppress the development of domestic enterprise as predicted by the competition effect, but where more foreign enterprises are present a demand effect, where a cluster starts to develop, appears to take over. This means that provincial government policy may need to be more nuanced to avoid economies being highly reliant on a limited number of what might be quite footloose larger foreign employers.

The paper is organised as follows. Section 2 discusses the theory and empirical evidence covering the relationship between domestic enterprise and FDI in the existing literature. Within this review a focus is also turned to the context specific factors that may be relevant for the relationship in developing or emerging economies. The role of clusters on the relationship and the potential for a bidirectional relationship between domestic enterprise and FDI are explored. The literature covered is used to develop hypotheses that will be tested within the paper. The data and methods used in the study to explore the theoretical relationships identified in Section 2 are then described in Section 3. This includes a description of the different measures of FDI used and approaches adopted to reduce the potential for endogeneity and reverse causality to mask the true relationships present. Section 4 presents the results of the analysis, before Section 5 summarises and draws conclusions in relation to the implications for regional policy development in respect to FDI.

2 | DOMESTIC ENTERPRISE AND FOREIGN DIRECT INVESTMENT

As outlined in the introduction there is no overall agreement as to the nature of the relationship that exists between FDI and domestic enterprise. As is outlined in the following subsection this in part reflects FDI having a number of different theoretical influences on domestic enterprise, some of these positive in nature and others negative. However as discussed in the second part of this review, it is also possible that contextual factors may affect the strength of these effects, in particular, the dominance of a small number of FDI investments or otherwise.

As well as the size and number of investments, the motivation behind investments can influence the relationship they have with domestic enterprise. Numerous studies have found that considerable differences in terms of integration and knowledge spillovers occur depending on whether investments are made for cost reasons or innovation (Driffield & Love, 2007). In addition, when looking for a relationship between FDI and domestic enterprise our focus here is on the impact that FDI has on domestic enterprise, but as the final part of the literature review notes it is not guaranteed that domestic enterprise does not also affect the extent to which FDI is drawn into a regional economy.

2.1 | Competition, demand and knowledge spillover effects in an emerging economy context

When considering the impact of FDI on self-employment we draw upon Grossman's (1984) model of entrepreneurship as an occupational choice. This model considers that an individual's choice to start or remain running a business in the position of self-employment rather than working for others reflects the relative rewards of each choice. This means that FDI can influence self-employment through either altering the profitability of businesses started or run by the self-employed, or by affecting the availability of alternative employment opportunities. Thompson and Zang (2022) outline how different types of FDI, in terms of their knowledge intensity, can alter the relative rewards of each choice through a number of different mechanisms. As discussed in more detail below, in the Chinese context, there is evidence of both with well-remunerated jobs being created that lock-up the potential self-employed (Zhang, 2022), and knowledge spillovers creating opportunities for profitable enterprises to be created drawing more into self-employment (Zhao, Forthcoming).

FDI might positively encourage the formation and retention of domestic enterprise due to the demand effect. Opportunities for the local firms to supply intermediate goods to foreign affiliates may boost the demand for existing intermediate goods, or generate demand for new inputs and a desire for variety (Ayyagari & Kosová, 2010; Barbosa & Eiriz, 2009). The increase in demand and variety will result in a rise in profit for producers of intermediate goods, which will encourage entry into self-employment to create domestic firms in upstream industries, demonstrating the backward linkage and vertical spillover effect of FDI (Ayyagari & Kosová, 2010; Görg & Strobl, 2002). Foreign firms might provide new or better-quality intermediate goods and increase the demand for domestic products in downstream industries demonstrating the forward linkages and vertical spillover effect of FDI (Ayyagari & Kosová, 2010). Moreover, FDI might bring new products and services into the local economy, generating new demand and new markets for new local firms, which shows the horizontal effect of FDI (Albulescu & Tămăşilă, 2014). New and existing self-employed can create or re-orientate domestic firms to take advantage of this opportunity by producing similar products as the foreign firms, producing niche products that foreign firms have overlooked, or by improving on the foreign firms' products by tailoring them to local preferences (Kim & Li, 2014).

However, the relationship could be negative due to the competition effect. Foreign firms compete with the local firms in the product market for customers and in the factor market for labour and other inputs (Barbosa & Eiriz, 2009). The market price for the final goods might be reduced due to the output produced by foreign firms, which might encourage the self-employed to exit and become waged employees (Görg & Strobl, 2002). Although foreign affiliates can be a source of managerially and technically proficient entrepreneurs, they can also lock up potential entrepreneurs as their relatively highly remunerated employees (De Backer & Sleuwaegen, 2003; Grossman, 1984). Zhang (2022) find evidence that the characteristics of foreign firm employment are sufficiently attractive to crowd out entrepreneurship in the manner suggested above. Therefore, FDI decreases both the quantity and

quality of domestic entrepreneurs. This may explain why Feng (2021) finds that FDI has a negative effect on entrepreneurship in China, specifically more innovative entrepreneurship, which might be regarded as higher quality. In addition, local firms might have to compete with foreign firms in terms of securing capital, sharing common infrastructure and locating land (Lee et al., 2014). Moreover, foreign firms might raise the technological barriers for domestic firms preventing the potential self-employed from entering the industry in order to protect their own technology (Ayyagari & Kosová, 2010). This applies in particular to developing countries as foreign firms are more technologically advanced and can reduce production costs by exploiting economies of scale (Ayyagari & Kosová, 2010).

Looking at the empirical literature, Barbosa and Eiriz (2009) find a weak positive impact of the first foreign investment and a strong negative impact of the subsequent cumulative foreign investment on the creation of domestic firms in Portugal. These results suggest that the demand effect dominates initially and is erased by the competition effect as the number of foreign firms increase. Görg and Strobl (2002) analyse data for 68 Irish manufacturing industries and find that the entry of domestic firms is positively affected by the foreign firms in the same industry and the foreign firms in downstream industries. Similar to the results of Ayyagari and Kosová (2010), Görg and Strobl (2002) find both horizontal and vertical spillovers in the Czech Republic. Foreign presence encourages domestic firm entry in the same industry. Foreign presence in upstream (downstream) industries increase domestic firm entry in downstream (upstream) industries. In the contrary, Eren et al. (2019) find that FDI does not affect business creation in pro-business or Right-to-Work US states. However, the effect of FDI is negative in non-Right-to-Work US states.

Another positive effect of FDI on entrepreneurship is through the knowledge spillover effect. The knowledge spillover theory of entrepreneurship suggests that regions with more knowledge resources and capacity will experience a greater availability of entrepreneurship opportunities unexploited by incumbent firms (Audretsch & Lehmann, 2005; Knoben et al., 2011). FDI brings knowledge, innovation and technology to the host country, but at the same time increases the competition faced (Blomstrom & Kokko, 1997; Dunning, 1994; OECD, 2002). Increased competition may force local firms to use resources more efficiently, to develop product and process innovation and to promote technological upgrading (Javorcik, 2004; OECD, 2002; Zhang, 2001). Foreign firms can transfer knowledge and technology to local firms when they demand intermediate goods from local suppliers and supply inputs to domestic customers creating backward and forward linkages (Blomstrom & Kokko, 1997; OECD, 2002; Saggi, 2000; Zhang, 2001). Equally managerial and technical training provided by foreign affiliates to their domestic employees allows further knowledge spillovers to occur when these employees move from foreign to local firms or set up their own businesses (Ayyagari & Kosová, 2010; Blomstrom & Kokko, 1997; OECD, 2002; Saggi, 2000). Demonstration effects might also occur as the local firms observe and learn from the practices of foreign firms (Kim & Li, 2014). In addition, foreign firms might give access to financial resources and develop collaborations with local firms (Albulescu & Tămăşilă, 2014). Liu et al. (2014) test the knowledge spillover effect in China and find that private firms run by entrepreneurs with experience of working in foreign companies perform better than other private firms. By increasing efficiency, all of these factors are likely to increase the relative rewards of self-employment due to rising profitability of domestic firms compared to alternative pre-existing employment opportunities working for others.

Considering the combined impact of all the above effects, Albulescu and Tămăşilă (2014) examine the effect of FDI on the entrepreneurial activity of necessity and opportunity driven entrepreneurs in 16 European countries from 2005 to 2011. They find that inward FDI has a positive impact on the entrepreneurial activity of opportunity driven entrepreneurs. However, the result is not robust across different estimations for the necessity driven entrepreneurs. Kim and Li (2014) find that FDI increases new firm creation for 104 developed and developing countries from 2000 to 2009. In addition, FDI

has a stronger positive effect for countries with poor institutional support for private enterprise, poor political stability and low human capital. This is consistent with Herrera-Echeverri et al.'s (2014) finding in the developing and emerging economy context that FDI has a positive impact on business creation. Similarly, Munemo (2015) finds a positive link between FDI and domestic entrepreneurship in Africa. In particular, FDI leads to a higher increase in entrepreneurship for countries with fewer business start-up regulations. Looking at the sectoral FDI over 96 countries, Doytch (2016) finds that overall FDI, services and mining FDI have a positive impact on new firm creation, while manufacturing FDI has a negative impact. Using data in 10 European Union (EU) countries and 20 industries, Amoroso and Müller (2018) find that knowledge intensive greenfield FDI increases new firm entry if the domestic industry is either highly technology intensive or is dynamic in terms of a higher churn rate. Contrary to the previous studies' results, Anwar and Sun (2012) find that FDI has no significant effect on the entry rate of domestic firms, but it significantly encourages the exit rate of domestic firms in China's manufacturing sector. Anwar and Sun (2015) find very similar results between FDI in Research and Development (R&D) and the domestic entry/exit rate in China. Pathak et al. (2015) find that inward FDI has a negative impact in 38 developed and developing countries on 5 types of entrepreneurs including nascent, new, early-stage, established and high growth entrepreneurs. Roman et al. (2018) and Rusu and Roman (2017) find a similar negative effect in EU countries. Using cross-national data for 127 developed and developing countries, Goel (2018) analyses the effect of FDI on entrepreneurship and finds that FDI crowds out entrepreneurship for the whole sample. However, when dividing the whole sample into countries with different prevalence of entrepreneurship, FDI only has a significant and negative impact on entrepreneurship for countries with a middling prevalence of entrepreneurship. Similarly, Danakol et al. (2017) find a negative relationship between FDI and entrepreneurship for 70 developed and developing countries. In addition, the negative effect of FDI is stronger in developed countries than in developing countries. At the regional level, Lee et al. (2014) analyse firm level data in 234 regions of South Korea and find an inverted U-shaped relationship between FDI and newly created small firms. This suggests there may be an optimal level of FDI beyond which domestic enterprise may be negatively influenced. Finally, Dvoulety (2018) finds that FDI does not significantly affect domestic entrepreneurship using four different measures of entrepreneurship including self-employment.

Although some studies suggest a more positive effect where institutions are weaker, overall more of those studies focussing on developing or emerging economies, including China, suggest FDI's competition effect is most likely to dominate leading to a negative relationship with domestic enterprise.

Hypothesis 1. FDI investment will be associated with a weakening of domestic enterprise manifested in lower self-employment.

2.2 | FDI and clusters

A cluster is defined by Rocha and Sternberg (2005) as a geographically proximate group of interconnected firms and associated institutions in related industries, which includes not only agglomeration of firms, but also inter-firm networks and inter-organisational networks within geographical boundaries. Clusters promote local entrepreneurship by: reducing entry barriers; creating a competitive environment for the local firms to innovate; providing role models; sharing technologies, skills and knowledge; improving efficiency and productivity (Delgado et al., 2010; Rocha, 2004). Delgado et al. (2010) and Rocha and Sternberg (2005) find a positive effect of clusters on new firm creation.

Whether regions benefit from the presence of FDI may be affected by their ability to absorb the knowledge spillovers that are present. De Propris and Driffield (2006) note that whilst domestic enterprise can gain from knowledge spillovers these only occur when a cluster is already in existence. In effect the foreign firms must locate in a domestic cluster rather than to hope that the presence of the foreign firm will lead to a cluster of firms forming around it. However, Chinese economic policy associated with the creation of special economic zones, more open to investments by foreign firms, has led to the creation of some Chinese clusters (Fetscherin et al., 2010). Once infrastructure was developed to serve this foreign investment, for a time at least, this created a reinforcing cycle whereby further FDI was attracted to the same locations (Head & Ries, 1996). According to Fritsch and Wyrwich (2015), new business formation is affected by the regional entrepreneurship culture such as norms, values and codes of conduct regarding entrepreneurship. A cluster of dynamic foreign firms in a region would therefore be expected to promote the entrepreneurial culture (Thompson, 2002), particularly where there is a churn of educated labour between foreign and domestic businesses (Todo et al., 2009). Moreover, FDI contributes to cluster development as the networks with foreign firms help local firms access new markets and resources, acquire new skills and develop international competitive advantage (Rocha & Sternberg, 2005). A number of studies have examined the impact of FDI on industry agglomeration. Ge (2009), Zhang et al. (2014) and Zhao et al. (2020) find a positive effect in China, while Ramachandran et al. (2020) find a negative effect in India. However, Rocha and Sternberg (2005) criticise studies looking at industry agglomeration alone, as this does not take into account inter-firm networks and inter-organisational networks. In the Chinese context though, there are examples of clusters where close ties have formed between foreign investors, but not with domestic enterprises (Chou et al., 2014). For example, it is found by Debaere et al. (2010) that South Korean FDI is linked to the presence of other upstream and downstream firms from South Korea, but not upstream and downstream firms more broadly. This would be consistent with foreign firms being concerned about appropriation of knowledge by domestic partners (Caves, 2007; Feng, 2021). It is also suggested that the benefits from FDI knowledge spillovers decline as the stock of FDI increases (Zhang, 2017). However, Chen and Zhou (2023) find that where foreign firms conduct more innovative activities this is associated with domestic innovative entrepreneurship.

However, an extension to this is to consider whether differences exist between single large investments, which might lead to the domestic firms serving dominant firms and becoming dependent, resulting in a loss of entrepreneurial drive (Fritsch & Wyrwich, 2015; Román et al., 2011), or whether a number of foreign firms investing in the area generates competition both between foreign firms and those seeking to serve them. Zheng and Zhao (2017) suggest that entrepreneurship in China is greater where the economy is characterised by more smaller firms rather than dominance of a single large firm. They suggest that this is consistent with Chinitz's (1961) argument that smaller firms are more likely to be willing to support and trade with new entrants. On the domestic enterprise side, Wang et al. (2016) find that less specialisation is associated with greater innovative outcomes from knowledge spillovers from FDI, potentially reflecting less lock-in. It might be expected that this would also be reflected from the FDI side with broader knowledge sources allowing more innovation opportunities rather than tying production chains into a singular approach.

In addition to the clustering effect of foreign firms, FDI might have a positive long-term effect on domestic enterprises due to learning, demonstration, networking and linkage effects between foreign and domestic firms (De Backer & Sleuwaegen, 2003). Two studies test the long-run effect. De Backer and Sleuwaegen (2003) find that the entry of foreign firms crowds out domestic entrepreneurs by reducing the entry rate and increasing the exit rate of local firms in the short run. However, the foreign presence measured as the number of foreign firms is found to have the opposite effect on the entry rate and exit rate of domestic firms. Similarly, Kosová (2010) finds that foreign firm entry

encourages the exit rate of domestic firms in the short run. However, in the long run foreign sales increase both the growth rate and the survival rate of domestic firms. Therefore, we develop the following hypothesis.

Hypothesis 2. Knowledge spillovers will be strengthened where more foreign firms invest creating potential clustering effects leading to a positive effect on self-employment.

2.3 | Motivations behind FDI in China and its relationship with FDI

FDI in China has been undertaken for a number of reasons. There are also differences in the nature of the FDI from different countries. For example, traditionally a large proportion of FDI in China comes from Hong Kong and Taiwan rather than the Triad group of countries, the EU, Japan and US, which dominate Global FDI flows. However, there are also distinct differences in the motivations behind these investments. Whereas Hong Kong and Taiwan have traditionally invested in China to access cheap labour in order to reduce costs when producing export goods, the triad investments are associated with market access (Zhang, 2005). Investments for cost reasons are likely to have less potential for knowledge spillovers with investment in capital-embodied technology rather than labour intensive processes linked to spillovers (Driffield et al., 2010). Benefits could come from demand effects, but Yang and Liao (2010) suggest that in the Pearl River Delta supplies are frequently not sought from domestic firms, but rather from the home country. Just because there may be fewer benefits from backward linkages does not mean that export focussed FDI will not affect domestic enterprise as the competition for resources is also likely to be intense (Liao & Chan, 2011). However, accessing R&D related spillovers from foreign firms will also be determined by the absorptive capacity of domestic enterprises and entrepreneurs (Belitz & Mölders, 2016; Fu, 2008).

Even between triad countries, Todo et al. (2009) suggest that differences can be found. They consider investments made in one Chinese science park where Japanese firms were found to employ a much lower share of educated labour than US investors. This has the effect of reducing the knowledge spillovers that are produced. More recent studies have suggested that FDI is becoming less focussed on production activity, but instead has seen an increase in R&D activity, which is shown to have positive effects on both productivity and innovation of Chinese domestic firms (Ito et al., 2012). In part this has been encouraged by changes in the laws governing the protection of intellectual property rights (IPR), which has attracted more knowledge intensive investments (Awokuse & Yin, 2010).

This has been particularly apparent in areas that traditionally attracted high levels of FDI in labour intensive industries such as Guangdong. In recent years policies such as environmental regulations and less support for FDI combined with rising wages and labour shortages have led to labour intensive production relocating from the Pearl River Delta to other parts of Guangdong or alternative low cost locations in China or other countries (Liao & Chan, 2011). However, proximity and agglomeration concerns are still important (Liao & Chan, 2011) and investments from Hong Kong and Taiwan are still argued to be less strongly influenced by IPR concerns (Awokuse & Yin, 2010). However, in general it is likely to remain the case that export orientated FDI will less positively affect domestic enterprise.

Hypothesis 3. Weaker knowledge spillovers and greater competition effects from export orientated investments will reduce (increase) the positive (negative) effect on self-employment.

2.4 | Reverse causality from entrepreneurship to FDI

Although the literature discussed above focuses on the impact of FDI on local enterprise activity, there is potential for reverse causality from entrepreneurship to FDI. Promotion of entrepreneurship creates good competition in the local market, new innovation and a competitive advantage, which forms the appropriate conditions to attract FDI (Fahed, 2013). The advantages associated with clustering can attract FDI as they are sufficient to overcome uncertainty associated with government policy (Yehoue, 2009). In Italy Majocchi and Presutti (2009) find that although industrial clusters and existing foreign investments attract FDI. It is the entrepreneurial resources that firms will be able to access that are fundamental to their location decision.

In addition, a high level of entrepreneurship indicates a better quality of local firms, suppliers and distributors, encouraging the foreign firms to build cooperative alliances with the local firms (Fahed, 2013). Moreover, entrepreneurship can also signal to the foreign firms the high quality of the local business environment, economic system, legislation and infrastructure (Dilanchiev, 2013; Fahed, 2013). As such empirical studies have found not just the competition and demand effects running from FDI to enterprise, but also significant and positive effects of entrepreneurship on FDI in developing countries (Dilanchiev, 2013; Fahed, 2013).

Figure 1 below summarises the different influences from the nature of FDI that might affect the strength of the effects that encourage or hinder domestic enterprise. The figure also shows how the relationship is not necessarily unidirectional with domestic enterprise affecting both the 'quantity' and quality of foreign investments made.

3 | DATA AND METHOD

In the review of the literature above the need to consider subnational patterns of entrepreneurship and FDI is clearly demonstrated. Knowledge spillovers and competition effects, for example, are likely to be most acute at the local or regional level (Xu & Sheng, 2012), although positive effects can spillover to other regions (Ouyang & Fu, 2012). It is also important to consider the form that FDI takes with regard to a dominant large investment or multiple smaller investments. This section outlines the data used to examine these issues in the Chinese context and the analysis approaches adopted to overcome difficulties associated with relationships also running from entrepreneurship to FDI in terms of location choices.

3.1 | China statistical year book data

The data used in this study is drawn from the China Statistical Yearbooks. These data reflect one of the main official statistical releases. The yearbooks cover a huge array of different aspects of life in China, ranging from demographics, such as population, through business activities such as the number of self-employed individuals and innovation, to social aspects such as the availability of health care organisations and community organisations.

Critically, as will be discussed in more detail below, data is included in terms of those who can be classed as self-employed to represent the small business owners and representatives of domestic enterprise, and also statistics on the various investments and activities of foreign firms based in China. This data is collected on an annual basis and covers all of the 31 mainland Chinese provinces.

These provide data at the province level, although there are instances of missing data for some of the smaller provinces such as Tibet for some years. In this study we use the different editions of the data to produce a panel allowing the impact of FI over time to be examined. The period covered varies
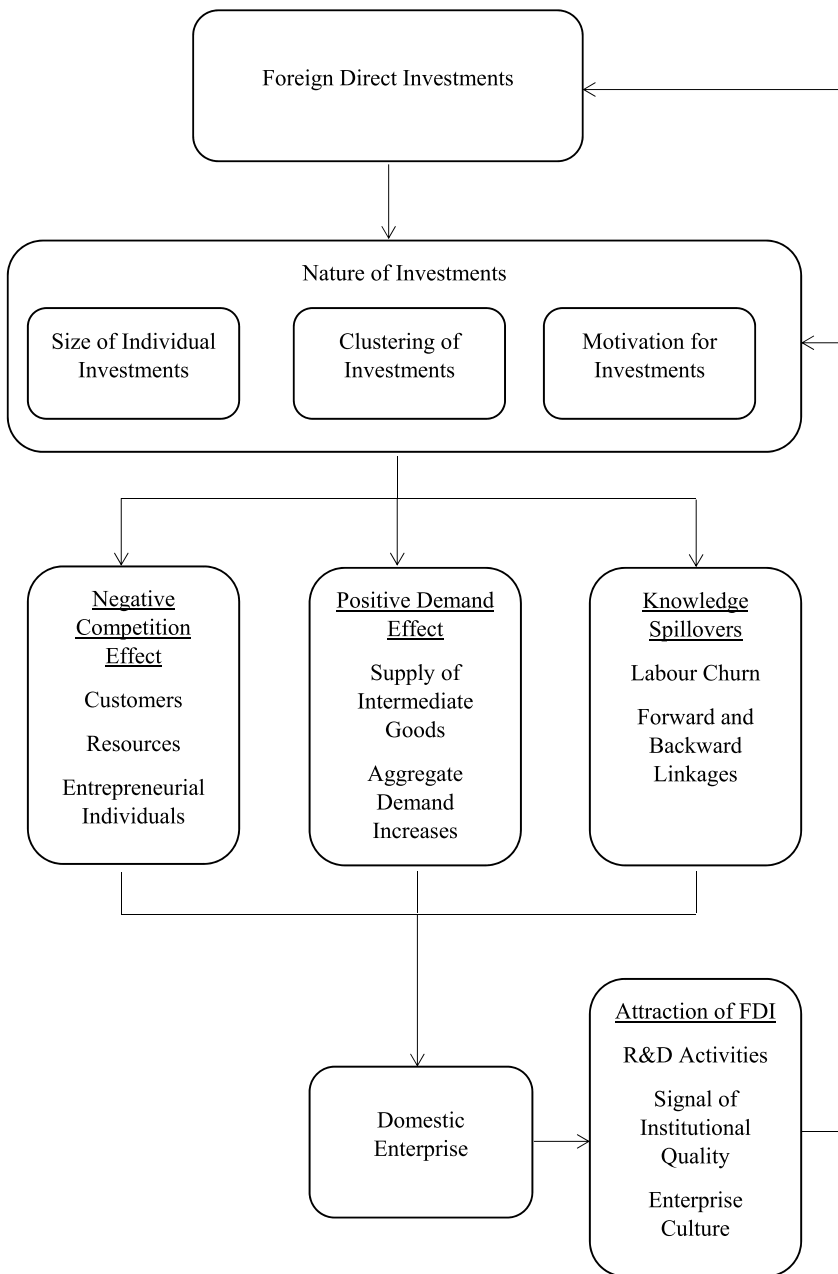
FIGURE 1   Foreign direct investment (FDI) and domestic enterprise.

depending on the measure of FI being investigated (see below). For all data the measures run up to 2015, but the starting date when comparable data is available varies from measure to measure.

3.2 | Self-employment

The variable used to reflect domestic enterprise is the number of self-employed people, which covers employers, own account workers, members of producers' cooperatives and contributing

family workers. We adopt this measure as it is one of the most widely used in international studies (Blanchflower, 2004) and has become the standard measure for domestic entrepreneurial activity (Parker, 2004). It should be noted therefore that the measure includes both sole traders and own account workers, but also those running much larger domestic enterprises. A large number studies have used self-employment to measure domestic entrepreneurship (Acs et al., 2012; Carree et al., 2002; Dvoulety, 2018, 2019; Koellinger & Thurik, 2012). This allows our results to be compared more easily with international studies, although some care must be taken as Bjuggren et al. (2012) highlight that some self-employment series have changed definitions over time and are not comparable with those in other nations. However, it is worth noting that whilst self-employment provides a reasonable measure of the domestic enterprise culture as a whole, it includes lifestyle and subsistence employment (Parker, 2004). As such it is an imperfect measure of entrepreneurship. However, although alternative measures of entrepreneurship may be obtained for China as a whole (He et al., 2019), or individual cities, no equivalent broad measure is present that allows changes through time as well as across all of China to be investigated. In addition, Fritsch and Wyrwich (2015) emphasise the advantage of using self-employment data as it shows the social acceptance of entrepreneurship and the availability of supporting services in a region.

3.3 | Foreign influence

In terms of FI, the data from the China Statistical Yearbook is better than that available for many countries. Frequently official figures do not allow for the disaggregation of data to the regional level, with just national figures being reported on a regular basis (Billington, 1999). In some instances, such as for the UK, one off or irregular estimations of regional levels of FDI have been produced (Hill & Munday, 1991), but not on a basis that allows a panel of data to be created. Thompson and Zang (2015, 2016) exploring the influence of FDI in the UK use the proportion of employment in foreign owned businesses on the basis that this reflects the route through which a competition effect might manifest itself. As domestic firms have to compete with foreign firms for skilled labour (Spencer, 2008), entrepreneurial individuals are drawn away from self-employment and business ownership into working for highly rewarded positions in large foreign owned businesses (Girma et al., 2001; Martins, 2011). In addition, Thompson and Zang (2020) use the ratio of foreign firms over all firms to capture the opportunity for local firms to innovate with foreign firms.

FDI inflows and data on foreign owned enterprises, plus exports by foreign owned firms are all available in the yearbook data. In terms of the theory being investigated each provides different advantages and disadvantages. In terms of FDI inflows, this may represent the scale of investments and is commonly used in previous studies (Kim & Li, 2014). However, where investments are capital intensive it does not provide an insight into the number of foreign affiliates for domestic enterprises to serve and for spillovers to occur (Amoroso & Müller, 2018). This may be particularly important for China as Sun et al. (2002) find that FDI inflows into China are negatively associated with existing foreign investments, indicating a desire to avoid competition. Therefore a second alternative considered is the number of foreign owned firms operating in the province.

This allows a comparison with the results generated by FDI inflows to consider the extent a potential FDI cluster effect exists. As noted earlier much of the FDI in China has been established with the intention of accessing the ready supply of cheap labour to produce goods for export (Zhang, 2005). As discussed in Section 2 this may mean that there is little opportunity for domestic entrepreneurs to benefit from any demand created, or positive technological spillovers, but they will still suffer as wages are competed upwards (Huggins et al., 2014; Zhou et al., 2011). To capture the focus on serving external markets the third measure of FI is therefore considered, exports by foreign owned firms.

According to Davies (2013), the share of China's trade by foreign firms has increased dramatically in the last 4 decades, from nothing in early 1980s to over 50% in 2010.

3.4 | Estimation procedure

The data from the China Statistical Yearbooks allow a panel to be formed covering all 31 provinces and covering the period 2000–2015. As noted above there are large differences in the economies of the Chinese provinces, with the eastern coastal areas being more developed and innovation based (Huggins et al., 2014). In terms of trying to interpret what drives changes in domestic enterprise as captured by self-employment data, examination of data in levels is unlikely to be insightful as most variance will be across provinces rather than how FI hinders or promotes domestic enterprise. This is confirmed by unit-root tests that do not reject the null of the presence of a unit root for both the self-employment and some of the control variables that are discussed in more detail below (Table 1). The regressions are therefore run on the first differences of logged data to understand how the change in the growth rate of FI alters that for domestic enterprise.

Equations are estimated that regress self-employment (SE) for province i in period t on each of the three measures of FI as below:

$$SE_{it} = \alpha_{10} + \beta_{11}FI_{it-1} + \gamma_1 X_{it-1} + \varepsilon_{1it} \tag{1}$$

where X is a matrix of province characteristics associated with domestic enterprise as discussed in Section 3.5 below. To clarify interpretations the independent variables are lagged one period to reduce problems associated with temporal causality. Theoretically this also reflects the fact that changes in foreign investment and province characteristics are unlikely to have just an immediate effect, but rather there is likely to be a relatively short-term positive lasting spillover or competition impact on domestic enterprise (Kim & Li, 2014). Regressions are run with a single measure of FI used in each estimation. This reflects the fact that although the different measures will capture a different perspective of FI, they are theoretically linked and there will be double counting if all three measures are included. In other words some investments will create new foreign firms, that will go on to export.

It was noted in Section 2 that foreign investments may be drawn to those areas with strong domestic enterprise (Dilanchiev, 2013; Fahed, 2013). If this is the case any relationship between FI and self-employment may not reflect the competition or demand effects postulated earlier. In order to account for this, an instrumental variables approach is adopted. Much of the foreign investment in the Chinese mainland is from Taiwan and Hong Kong and is concentrated in those provinces that are geographically proximate to their source to allow supply of components (Cheng & Kwan, 2000; Eng, 1997; Zhang, 2005; Zhou et al., 2011). Therefore, the instruments considered are based on the inverse of the geographical distance between the province administrative centres and Taipei and Hong Kong City. As these instruments would be invariable through time it is important to capture what may drive changes in foreign investment over time. As national accounting indicates that net outward foreign investment should be paid for with a balance of payments surplus the variable used is the product of the inverse distance and the balance of payments for each source of FDI. The instrument is correlated with FI variables, but not related with domestic entrepreneurship. The relationship between the instrument and the measure of FI will depend on whether the measure represents current investments (FDI or foreign owned enterprises) or the income from previous investments (exports by foreign owned firms).

In the instrumental variables regressions FI is regressed on the control variables and the instrument BOPT[1]:

$$\widehat{FI}_{it} = \alpha_{20} + \beta_{21}BOPT_{it} + \gamma_2 X_{it} + \varepsilon_{2it} \tag{2}$$

TABLE 1 Levin-Lin-Chu unit-root test (null of presence of unit root).

	Levels	First difference
Self-employment	4.259	−6.406
	(1.000)	(0.000)
Inward foreign investment	−5.599	−3.849
	(0.000)	(0.000)
Foreign enterprises	−5.118	−8.779
	(0.000)	(0.000)
Foreign exports	−7.238	−5.259
	(0.000)	(0.000)
Average wage	−8.746	−6.483
	(0.000)	(0.000)
Community services	−0.427	−2.840
	(0.335)	(0.002)
Exports by origin	−9.636	−6.210
	(0.000)	(0.000)
Health care institutions	−1.880	−11.200
	(0.030)	(0.000)
Patents granted	5.609	−12.231
	(1.000)	(0.000)
College qualifications	−2.120	−11.385
	(0.017)	(0.000)
Length of good quality road	−3.484	−5.337
	(0.000)	(0.000)
State owned enterprises liabilities	0.146	−5.040
	(0.558)	(0.000)

Note: All variables are in natural logarithm forms. *p*-values are in parentheses.

where BOPT reflects the product of the inverse distance and balance of payments of Taiwan. This should provide a measure of FI that can be accounted for by the instrument, which should not itself directly influence the levels of self-employment in the Chinese provinces.

The estimate of FI is then included in the regression of self-employment:

$$SE_{it} = \alpha_{30} + \beta_{31}\widehat{FI_{it-1}} + \gamma_3 X_{it-1} + \varepsilon_{3it} \tag{3}$$

As noted above the main results are run with a single measure of FI included in each equation to avoid double counting. A further motivation for this approach is that it would be difficult to identify three potential instruments to allow the inclusion of all three FI variables in the IV regressions.

3.5 | Control variables

As FI is unlikely to be the only factor influencing the level of self-employment in the provinces we control for a number of social, economic and infrastructure factors that may influence self-employment. In terms of the social factors, the presence of community and health care institutions are included as those factors which may provide the support where individuals take the risk of starting their own enterprises, particularly

those that are necessity driven (Chelekis & Mudambi, 2010). The presence of large investments by the state in terms of the liabilities of state-owned enterprises may suppress the self-employment present. Directly, employment in large businesses, which state owned enterprises typically are, increases the opportunity cost of starting your own business (Gimeno et al., 1997; Lu & Tao, 2010; Moy & Lee, 2002). Moreover, culturally it may also provide a climate where workers are less exposed to the rigours of the market and less willing to take on risks or responsibility for innovation (Obschonka et al., 2018; Stuetzer et al., 2016). However, it is also possible a positive relationship might be present as in recent years headcount reductions have led to ex-employees having to seek to create their own employment (Hassard et al., 2010).

Economic factors not only account for the level of prosperity, but also the level of innovation and exporting activity present. In the case of prosperity this might have either a negative or positive relationship with self-employment. Where average wages are higher there is a greater opportunity cost of starting a business or retaining ownership of existing businesses (Gimeno et al., 1997), particularly when compared to that for those out of work (Evans & Leighton, 1989), but the domestic market is likely to display higher levels of demand (Blanchflower & Oswald, 1990). This means that the effect on self-employment is likely to be a combination of a prosperity pull (Storey & Johnson, 1987) and a recession push (Congregado et al., 2012). The alternative would have been to include unemployment, but with more recent studies highlighting how rising wage costs are a key factor in foreign investment moving to less developed Chinese provinces (Zheng, 2011), average wages were felt to be most appropriate for not only equations estimating self-employment (Equations 1 and 3), but also those for FI (Equation 2).

The knowledge spillover theory of entrepreneurship suggests that entrepreneurial activity may be greater where there are large levels of uncommercialised knowledge that can be exploited (Acs et al., 2013). In order to capture the level of knowledge creation in provinces the patents granted are included. Whilst this is a measure of the knowledge that has been captured by firms and individuals in the province, it would be expected that the uncaptured knowledge created will be higher where there is evidence of innovation taking place. Domestic entrepreneurs may also be encouraged where exports are greater, so the value of exports originating in the province is also included. For foreign investment both of these factors may also be seen as beneficial where existing knowledge creation can be accessed (De Propris et al., 2005).

Lastly we control for the amount of good quality road present in kilometres to help reflect the logistical advantages present that will help entrepreneurs to access their customers (Dollar, 2008; Naudé & Rossouw, 2010). Again this is likely to be just as important if not more so for foreign investors (Cheng & Kwan, 2000; Donaubauer et al., 2015; UNCTAD, 1999). Although, Chan et al. (2014) suggest that infrastructure has a positive effect only because it boosts growth which has a direct effect on attracting FDI. The definitions of all variables are shown in Table A1.

3.6 │ Vector error correction model and panel causality test

Although, in Section 3.4 we outline how we account for the possibility of reverse causality, we also check for this possibility in a variety of other ways. We use Dumitrescu and Hurlin's (2012) approach to test the panel causality between foreign investment variables and self-employment. The test is applied to stationary data in a vector autoregressive model. The null hypothesis is that there is no causality in any cross-sections. The alternative hypothesis is that causality exists for at least one cross-section. The Wald statistic for each cross-section is computed individually before calculating the average of all individual statistics. Z-bar tilde statistics are preferred to Z-bar statistics when the time period is relatively small compared with the number of cross-sections (Lopez & Weber, 2017). Dumitrescu and Hurlin (2012) find evidence that the test has good finite sample properties for small number of cross sections and time periods. Moreover, the cross-sectional dependence has been taken into account by using Bootstrapped *p*-values. Another approach we utilise is to re-estimate the relationship using a vector error correction model to allow for causality to be

tested in the long and short-run. It should be noted that the Granger causality test has potential problems. Liu and Molenaar (2016) find that the statistical power of the Granger causality test is low due to higher type II error rate when both the effect is small and the number of time points is short. In addition, insufficient observations might lead to spurious causality relationships as the movements of economic variables are not captured (McCrorie & Chambers, 2006). Moreover, the causality test result is sensitive to the lag specification (Vilasuso, 2001) and the maximum lag order might be large in reality (Osborn, 1984).

4 | RESULTS

Figure A1 in the Appendix illustrates the time-series graph of self-employment and FDI variables for each province. Table A2 in the Appendix shows the descriptive statistics. Table 2 presents the simple correlations of self-employment, the measures for FI and control variables. Although it will be important to control for other influences on self-employment it is clear that the different forms of FI are related to self-employment in different ways. While foreign investment has a negative relationship, the opposite is true for the presence of foreign enterprises. This fits with the arguments made in Section 2 in relation to large dominant investments curtailing enterprise, while a clustering effect is more positive (Fritsch & Wyrwich, 2015; Todo et al., 2009; Zheng & Zhao, 2017). Foreign exports have no significant relationship, which although not reducing enterprise suggests any positive demand effect is being offset by a negative competition effect and the nature of the investment limits potential knowledge spillovers (Driffield et al., 2010; Liao & Chan, 2011).

In terms of the other controls the presence of state owned enterprises is found to promote self-employment, which may reflect opportunities to service these large businesses or ex-employees seeking to create new employment (Hassard et al., 2010), rather than it negatively affecting the enterprise culture (Obschonka et al., 2018). The increased opportunity cost of higher wages reduces self-employment rather than there being a prosperity pull.

For the regression analysis, we use three different variables to measure FI, namely foreign investment, foreign enterprises and foreign exports. Tables 3–5 report the impact of each FI variable in turn on self-employment. Model 1 in each table shows the estimation results in Equation (1) and model 2 in each table shows the estimation results in Equations (2) and (3) using the instrumental variables approach. All IV regressions passed the Anderson under-identification test.

The Model 1 results from Table 3 show that the relationship between foreign investment and self-employment is negative and significant at the 5% level supporting Hypothesis 1. Thus, as found by prior studies of emerging and developing economies the competition effect appears to dominate (Anwar & Sun, 2012, 2015; Kosová, 2010). The liabilities of state-owned enterprises increase self-employment consistent with the correlation matrix result.

The IV estimates display 10% level of significance of the coefficient estimated, providing further confidence in the results that imply that FDI investments weaken domestic enterprise by absorbing potential entrepreneurial talent and financial capital from domestic enterprise (Ali et al., 2019; De Backer & Sleuwaegen, 2003; Huang & Zhang, 2017). State owned enterprises only have a positive effect on domestic enterprise at the 10% level.

Table 4 provides results for an alternative FI measure: the number of foreign enterprises. The coefficient of foreign enterprises variable is positive and significant at 5% level in Model (1), which supports Hypothesis 2. However, the significance level increases when accounting for potential endogeneity using the IV estimations. This result is very similar with De Backer and Sleuwaegen's (2003) findings of a positive long-term effect of FDI on domestic enterprises, particularly, where a cluster of foreign firms forms promoting the enterprise culture and is aided by considerable churn of high skilled labour (Thompson, 2002; Todo et al., 2009). The results therefore show the importance of considering

TABLE 2 Correlation matrix.

	1. Self-employment	2	3	4	5	6	7	8	9	10	11	12
2. Inward foreign investment	−0.118 (0.014)											
3. Foreign enterprises	0.130 (0.007)	0.063 (0.189)										
4. Foreign exports	−0.026 (0.595)	0.069 (0.150)	−0.007 (0.881)									
5. Average wage	−0.166 (0.001)	0.070 (0.149)	−0.031 (0.525)	0.066 (0.171)								
6. Community services	0.063 (0.194)	−0.056 (0.248)	0.121 (0.012)	−0.017 (0.719)	−0.014 (0.769)							
7. Exports by origin	−0.017 (0.726)	0.191 (0.000)	−0.034 (0.480)	0.389 (0.000)	−0.014 (0.765)	−0.064 (0.183)						
8. Health care institutions	0.035 (0.469)	0.034 (0.481)	−0.009 (0.851)	−0.133 (0.005)	0.016 (0.738)	−0.042 (0.387)	−0.355 (0.000)					
9. Patents granted	0.047 (0.328)	0.071 (0.139)	−0.093 (0.053)	0.038 (0.429)	−0.044 (0.362)	−0.133 (0.006)	−0.063 (0.190)	0.227 (0.000)				
10. College qualifications	0.011 (0.813)	−0.019 (0.701)	−0.039 (0.421)	−0.077 (0.110)	0.043 (0.375)	0.037 (0.441)	0.028 (0.561)	0.044 (0.360)	−0.074 (0.122)			
11. Length of good quality road	−0.011 (0.819)	−0.024 (0.620)	0.077 (0.109)	−0.041 (0.395)	0.130 (0.007)	−0.027 (0.574)	−0.006 (0.908)	0.020 (0.677)	0.068 (0.155)	0.153 (0.001)		
12. State owned enterprise liabilities	0.128 (0.008)	0.015 (0.763)	0.110 (0.022)	−0.184 (0.000)	−0.080 (0.096)	0.018 (0.705)	−0.019 (0.689)	0.137 (0.004)	0.059 (0.219)	−0.006 (0.903)	0.107 (0.026)	
13. Balance of payments Taiwan * Inverse of distance	−0.158 (0.001)	0.072 (0.134)	−0.336 (0.000)	−0.165 (0.001)	0.338 (0.000)	0.049 (0.306)	−0.287 (0.000)	0.234 (0.000)	0.124 (0.010)	0.115 (0.016)	0.147 (0.002)	−0.065 (0.180)

Note: All variables are the first differences of logged data; *p*-values are in parentheses.

TABLE 3 The impact of inward foreign investment on self-employment.

| | | Model 2 | |
	Model 1	1st stage	2nd stage
Inward foreign investment	−0.0678**		−0.7442*
	(0.019)		(0.065)
Balance of payments Taiwan * Inverse of distance		0.0704**	
		(0.027)	
Average wage	−0.3884	0.1906	−0.1447
	(0.002)	(0.400)	(0.546)
Community services	0.0158	−0.0155	0.0075
	(0.212)	(0.466)	(0.701)
Exports by origin	0.0103	0.2258***	0.1467
	(0.705)	(0.000)	(0.105)
Health care institutions	0.0060	0.0356	0.0346
	(0.652)	(0.114)	(0.187)
Patents granted	0.0247	0.0437	0.0617
	(0.330)	(0.304)	(0.159)
College qualifications	0.0104	−0.0318	−0.0036
	(0.713)	(0.501)	(0.932)
Length of good quality road	−0.0099	−0.0706	−0.0472
	(0.812)	(0.314)	(0.477)
State owned enterprises liabilities	0.1250**	0.0409	0.1409*
	(0.020)	(0.649)	(0.081)
N	433	433	433
Groups	31	31	31
Anderson under-identification test			4.984**
			(0.026)

Note: All variables are on the first differences of logged data. The values in brackets are *p* values. *, ** and *** indicate 10%, 5% and 1% significance levels respectively.

the measure of FI when examining the impact on domestic enterprise. As suggested by the literature covered in Section 2 there are likely to be both positive effects from demand effects and knowledge spillovers (Liu et al., 2014; Todo et al., 2009), but dominance of the market by large foreign investments will counter these through a competition effect (Chang & Xu, 2008; Zhang, 2017). This is consistent with Zheng and Zhao's (2017) finding that more generally the presence of more small firms rather than a large dominant player makes for a more suitable environment for new firm creation.

Initially, it is a little surprising that the instrument associated with the Taiwanese balance of payments is negatively related to the number of foreign owned enterprises. However, as studies such as Li et al. (2017) and Sun et al. (2002) find that FDI tends to try to avoid competing for resources with other foreign investments this could explain the result. In addition, a negative and significant coefficient is found for the average wage variable reflecting the higher opportunity cost of starting a business or retaining ownership of existing businesses (Gimeno et al., 1997).

Table 5 shows the impact of exports by foreign owned firms on the self-employment rate in the host region. Although a positive coefficient is estimated for foreign exports it is only statistically significant

TABLE 4 The impact of foreign enterprises on self-employment.

| | | Model 2 | |
	Model 1	1st stage	2nd stage
Foreign enterprises	0.0580**		0.1740***
	(0.017)		(0.007)
Balance of payments Taiwan * Inverse of distance		−0.3009***	
		(0.000)	
Average wage	−0.4022***	0.5414**	−0.3808***
	(0.002)	(0.032)	(0.003)
Community services	0.0134	0.0705***	0.0068
	(0.294)	(0.003)	(0.613)
Exports by origin	−0.0015	−0.1359***	0.0023
	(0.955)	(0.007)	(0.931)
Health care institutions	0.0034	0.0255	0.0037
	(0.801)	(0.308)	(0.783)
Patents granted	0.0268	−0.0524	0.0383
	(0.292)	(0.267)	(0.147)
College qualifications	0.0159	−0.0231	0.0240
	(0.574)	(0.659)	(0.406)
Length of good quality road	−0.0151	0.2198***	−0.0329
	(0.718)	(0.005)	(0.450)
State owned enterprises liabilities	0.1104**	0.1503	0.0843
	(0.041)	(0.133)	(0.135)
N	433	433	433
Groups	31	31	31
Anderson under-identification test			63.688***
			(0.000)

Note: All variables are on the first differences of logged data. The values in brackets are *p* values. *, ** and *** indicate 10%, 5% and 1% significance levels respectively.

at 10% level. This is potentially reflective of businesses that are export orientated and focussed on accessing cheap labour. While historically this has led to considerable regional economic growth for regions receiving such export focussed FDI, a smaller proportion of the benefits have flowed to domestic enterprise in terms of linkages formed with domestic enterprises (Yang & Liao, 2010). The nature of the investments also mean that knowledge transfer is more limited than where there are greater R&D based activities (Ito et al., 2012). Although, economic development around the Pearl River Delta in particular has benefited greatly from such flows (Huggins et al., 2014), it does not necessarily have a benefit in terms of generating a wider entrepreneurial ecosystem. It confirms support of Hypothesis 3 that the export orientated FDI less positively affects domestic enterprise as the positive effect of the number of foreign firms has weakened. However, the negative effect of FDI inflows has not been strengthened by an export orientation. With these conflicting results data on export orientated investment and export orientated firms would be required to establish the impact of export orientation fully and how it interacts with the other results. Surprisingly, exports originating in the province negatively influence self-employment. In addition, similar to the results in Tables 3 and 4, the average wage has a negative impact and state-owned enterprises liabilities have a positive impact on self-employment.

TABLE 5 The impact of foreign exports on self-employment.

	Model 1	Model 2	
		1st stage	2nd stage
Foreign exports	0.0035		0.3694*
	(0.816)		(0.076)
Balance of payments Taiwan * Inverse of distance		−0.1417**	
		(0.023)	
Average wage	−0.4150***	0.9771**	−0.6475***
	(0.001)	(0.028)	(0.007)
Community services	0.0166	0.0305	0.0078
	(0.194)	(0.463)	(0.702)
Exports by origin	−0.0060	0.6997***	−0.2798*
	(0.836)	(0.000)	(0.082)
Health care institutions	0.0031	0.0336	−0.0042
	(0.817)	(0.446)	(0.841)
Patents granted	0.0205	0.1509*	−0.0265
	(0.421)	(0.070)	(0.576)
College qualifications	0.0124	−0.1565*	0.0778
	(0.663)	(0.091)	(0.175)
Length of good quality road	−0.0060	−0.0297	0.0163
	(0.886)	(0.828)	(0.804)
State owned enterprises liabilities	0.1259**	−0.7366***	0.3825**
	(0.022)	(0.000)	(0.023)
N	433	433	433
Groups	31	31	31
Anderson under-identification test			5.262**
			(0.022)

Note: All variables are on the first differences of logged data. The values in brackets are p values. *, ** and *** indicate 10%, 5% and 1% significance levels respectively.

As noted in Section 3, as the different measures of FI are theoretically linked and to some degree overlap empirically the main results were presented with only one measure of FI included in each equation. As a robustness check, and not reported in full for preservation of space, the analysis was rerun with all three FI variables entering in Equation (1). Inward foreign investment was found to be negative and significant at 1% level and the foreign enterprises variable is positive and significant at 1% level. However, the foreign exports variable is not statistically significant.

To consider if regional development more broadly affects the relationships, we have divided the provinces into 3 regions (Eastern region, Central region and Western region) according to the approach of He and Duchin (2009). Tables A3–A5 in the appendices present the analysis of the impact of different measures of FI in the 3 regions respectively. Although some caution must be taken when interpreting these results given reduced sample sizes, inward foreign investment, foreign enterprises and foreign exports don't significantly affect self-employment in the Eastern region although the foreign export model failed the Anderson under-identification test. In the Central region, foreign enterprises have a positive and significant impact on self-employment at 5% level and it passed the Anderson under-identification test. Similar to the

TABLE 6 Panel causality test between foreign investment variables and self-employment.

	Z-bar tilde
Inward foreign investment → Self-employment	0.0171
	(0.977)
Self-employment → Inward foreign investment	1.9177*
	(0.081)
Foreign enterprises → Self-employment	1.9991*
	(0.076)
Self-employment → Foreign enterprises	0.0690
	(0.960)
Foreign exports → Self-employment	1.7197
	(0.103)
Self-employment → Foreign exports	−0.6811
	(0.493)

Note: All variables are on the first differences of logged data. The values in brackets are *p* values using the Bootstrap procedure. *, ** and *** indicate 10%, 5% and 1% significance levels respectively. The appropriate lag length is chosen based on AIC.

results of the Eastern region, none of the FDI measures are significantly related with self-employment in the Western region, although 2 models failed the Anderson under-identification test. The important result is that foreign enterprises have a positive relationship with self-employment only in the Central region, the effect is not significant in the Eastern and Western regions. This is consistent with studies, which find that FDI, and knowledge spillovers in general, only have a positive impact on domestic entrepreneurship when it reaches a minimum level of development (Kirschning & Mrożewski, 2022; Munemo, 2018).

Table 6 estimates the causal relationships between foreign investment variables (inward FDI, foreign enterprises and foreign exports) and self-employment. The test is applied to the first differences of the variables and the optimal lag lengths is chosen based on the Akaike information criterion. The findings show the presence of one-way causality running from self-employment to inward foreign investment. This shows the importance of accounting for endogeneity with the IV estimates when considering this measure of FI. In addition, foreign enterprises Granger cause self-employment, but no evidence of reverse causality is detected. No issue of reverse causality is picked up for foreign exports. The long-run and short-run causality test based on the cointegration test and vector error correction model are also shown in Appendix Table A6. There is a one-way causality running from inward foreign investment to self-employment in the short run and the reverse causality is found in the long-run. In terms of foreign exports, self-employment granger causes foreign exports in the long-run. In addition, there is no cointegration relationship between foreign enterprises and self-employment in the long-run.

5 | SUMMARY AND IMPLICATIONS FOR POLICY

This paper has sought to provide a deeper understanding of the relationship between FDI and domestic enterprise in China. In particular, by using different measures of FDI the factors driving both positive demand and knowledge spillover effects aided by clustering might be contrasted with the outcomes associated with export motivated and dominant large firm investments. The focus of this study has been on self-employment rather than a subsample of larger domestic enterprises. This is both a reflection on a vast majority of business ownership in most countries being dominated by smaller businesses, but also a recognition that as China's economy develops and becomes less reliant on large scale production the existence of an enterprise culture is likely to become more important (Lin et al., 2020).

In analysing the association between FI and self-employment in China, this paper presents evidence suggesting that foreign investment has a negative effect on self-employment, whilst the number of foreign enterprises and foreign exports have positive effects. The results therefore show the importance in considering multiple perspectives in terms of FI. It appears that policies that attract individual large investments suppress the development of domestic enterprise as predicted by the competition effect, but where more foreign enterprises are present, so that a cluster starts to develop, a demand effect appears to take over. This means that provincial government policy may need to be more nuanced to avoid economies being highly reliant on a limited number of what might be quite footloose larger foreign employers. Evidence suggests that this result might be combined with that relating to export focussed investments. Regions that were previously successful accessing such investments have started to see a reversal as access to cheap labour has become more problematic (Liao & Chan, 2011).

Future research may consider alternative measures of entrepreneurship by taking a wider view of domestic enterprise as many studies recognise the often forgotten majority of extremely small businesses. These businesses might not create large amounts of employment, but are important for poverty alleviation (Lin et al., 2020). However, if they are marginal and precarious, further assistance may be required. Therefore, the impact on domestic enterprise's performance will need to be examined. Similarly, studies have found that particular activities by foreign affiliates are associated with different types of entrepreneurship, or have stronger competition or demand effects (Chen & Zhou, 2023; Thompson & Zang, 2022). Data that allows a more detailed analysis of the activities of both the self-employed and foreign affiliates would therefore provide more insight. Associated with this, the current data does not allow the direct examination of the links between foreign affiliates and domestic enterprise. This means that the overall effects of the mechanisms identified in the literature can be examined, but not the individual mechanisms. Firm level data with details of the industries of both domestic enterprise and the foreign affiliates would aid this. Longitudinal data of this type would be particularly informative as knowledge spillovers may take time to affect domestic enterprises. Individual level data would also have value in following not only those who gain experience working for foreign affiliates and may use this to start their own enterprises (O'Malley & O'Gorman, 2001; Zhang, 2022), but even those being forced out of self-employed due to additional competition may return as serial entrepreneurs having learnt from the experience (Lin et al., 2019). Equally although we attempt to control for reverse causality and endogeneity, measures directly capturing the motivation for FDI would help to examine this more precisely.

As found in other studies the results show a need to obtain a better understanding of FDI as it clearly has both a light and dark side to it. Balancing these may not always be straight forward. However, as both developed and emerging regional economies have found to their cost attracting large amounts of FDI is not necessarily a guarantee of long-term resilience in particular (Simmie & Martin, 2010). This makes it imperative to plan for the likely consequences for existing and future domestic enterprise when attracting such investment.

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ENDNOTE

[1] The product of the inverse distance and balance of payments of Hong Kong is not used as an instrument. Some model specifications in Tables 3–5 failed the Sargan over-identification test when both Taiwan and Hong Kong are used as instruments. Some model specifications in Tables 3–5 failed the Anderson under-identification test when only Hong

Kong is used as the instrument. All model specifications in Tables 3–5 passed the Anderson under-identification test when only Taiwan is used as the instrument.

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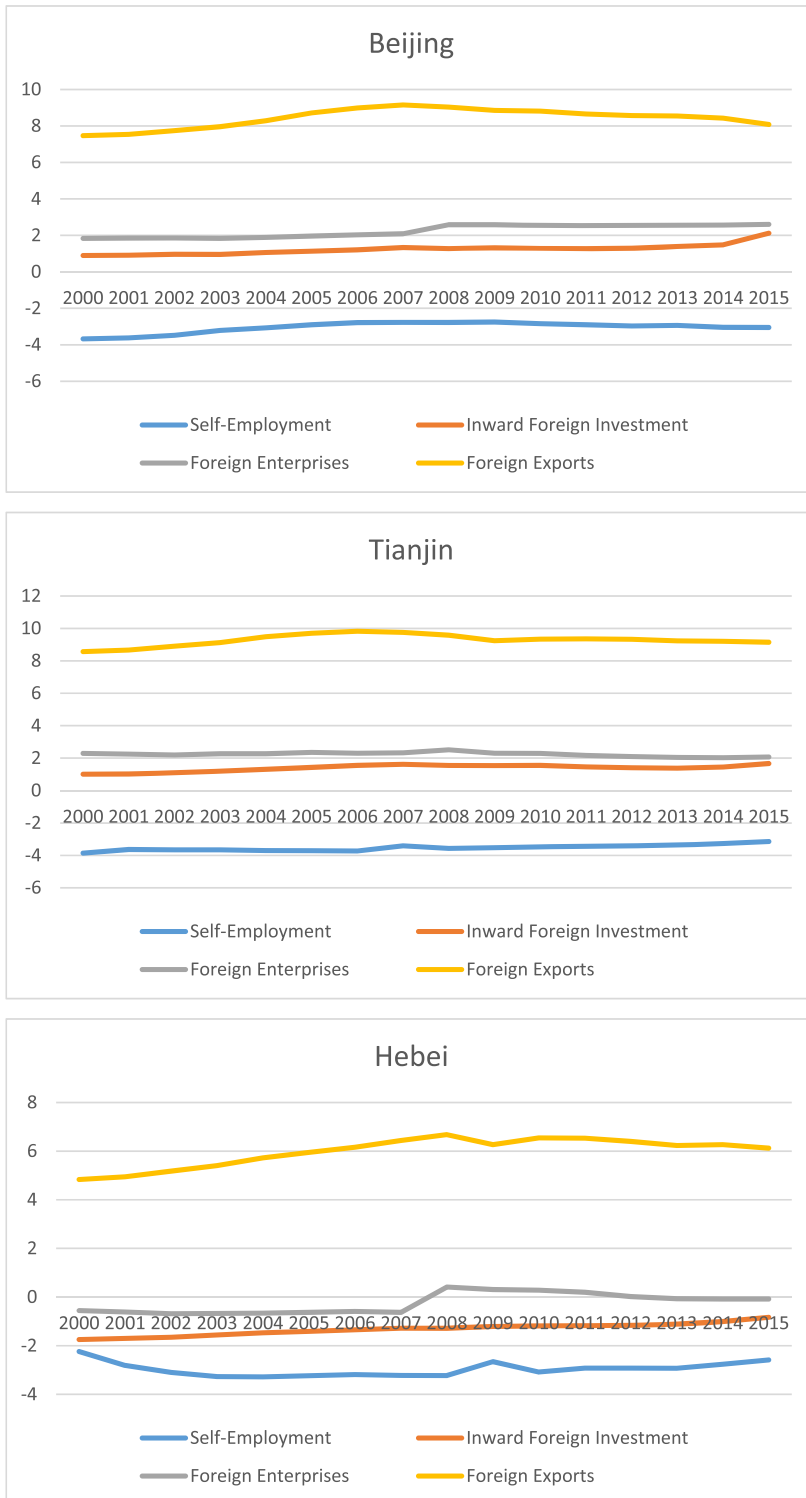
APPENDIX

FIGURE A1 Time-series graphs for all provinces (all variables are in the natural logarithm forms).

FIGURE A1 (Continued)

FIGURE A1 (Continued)

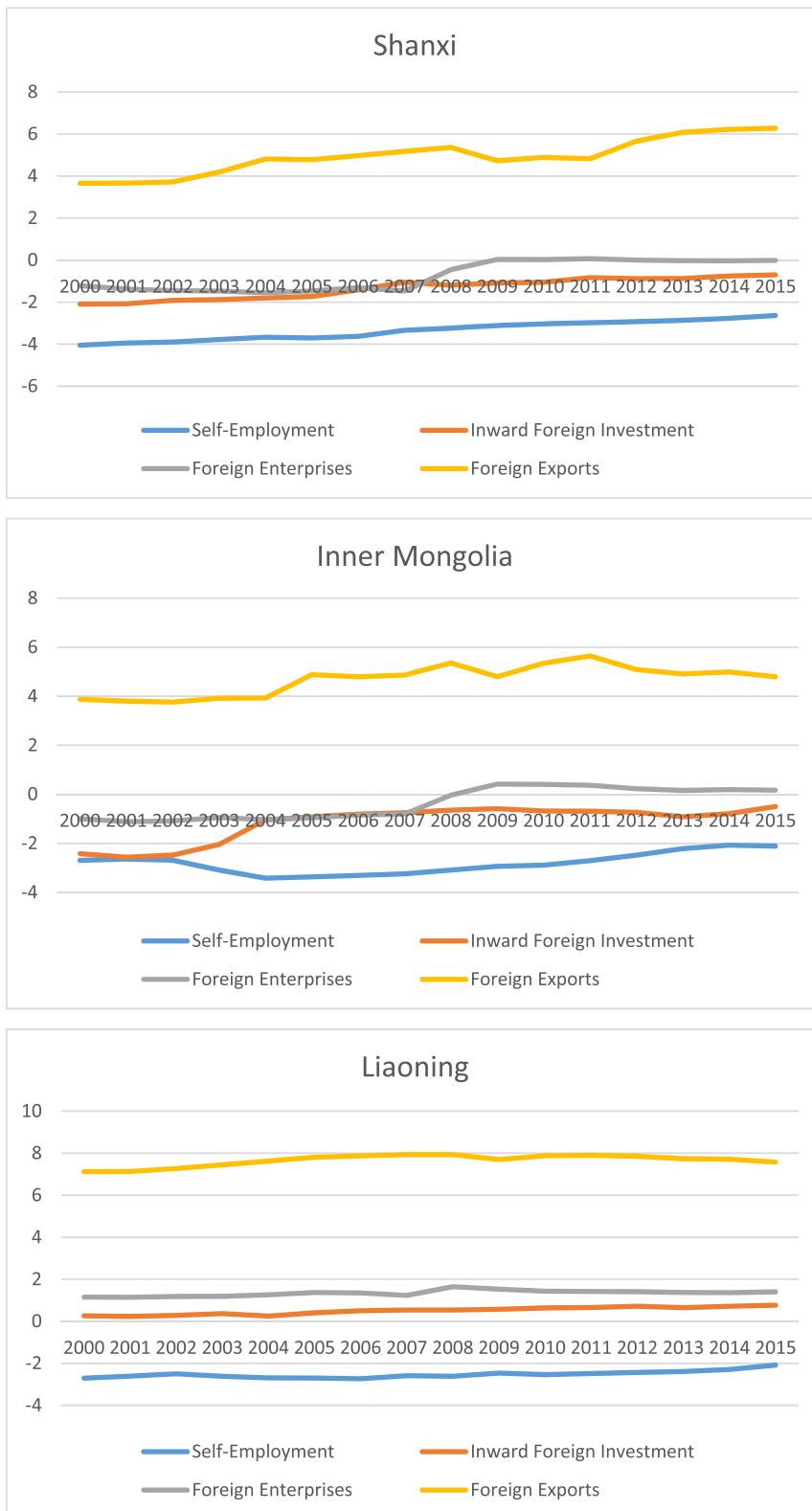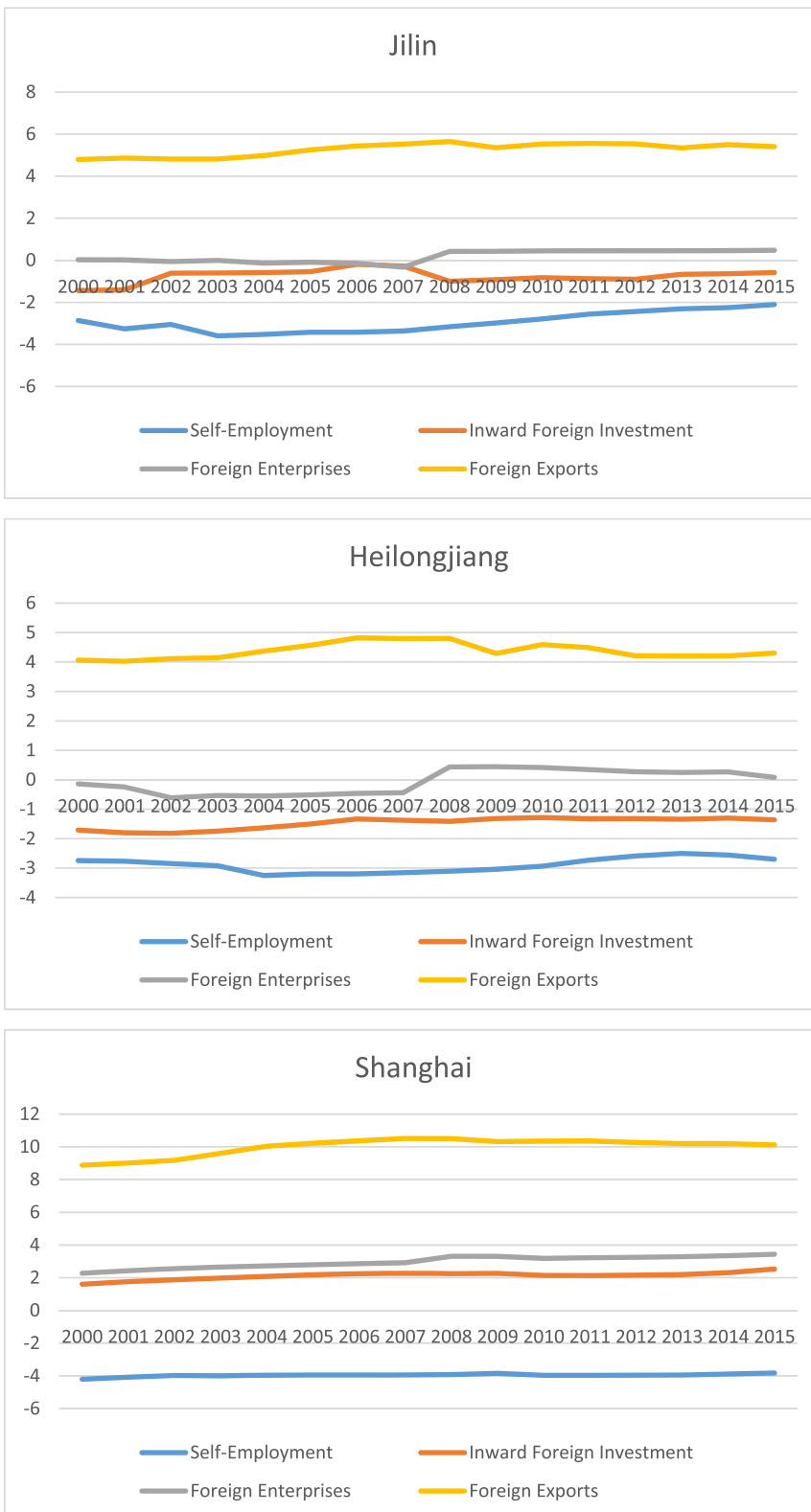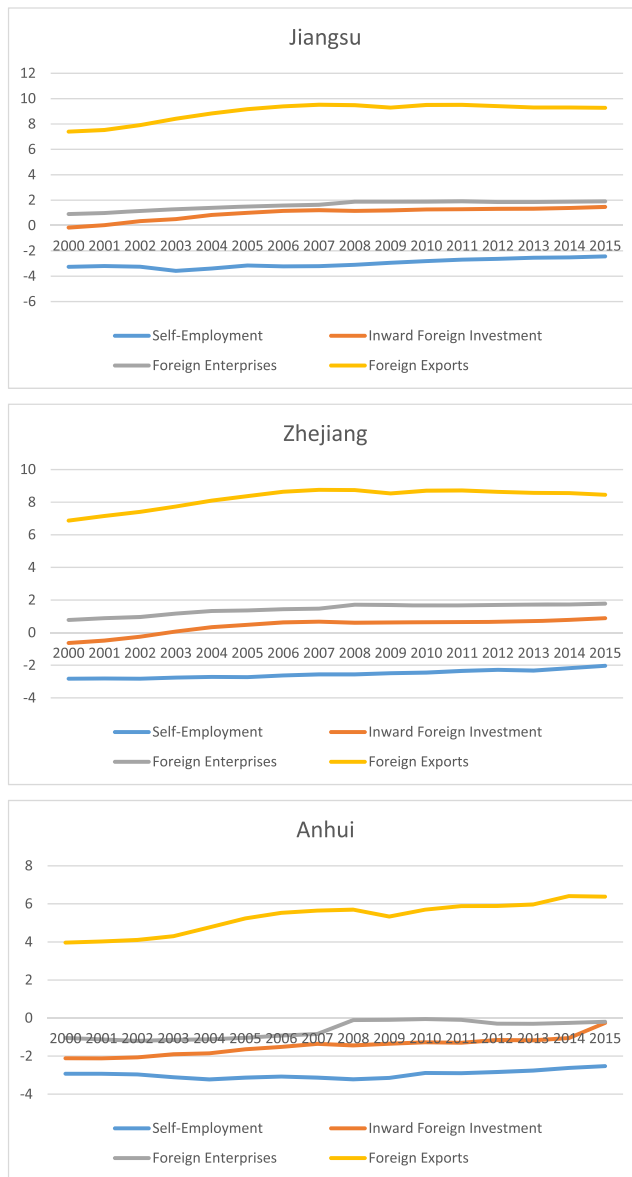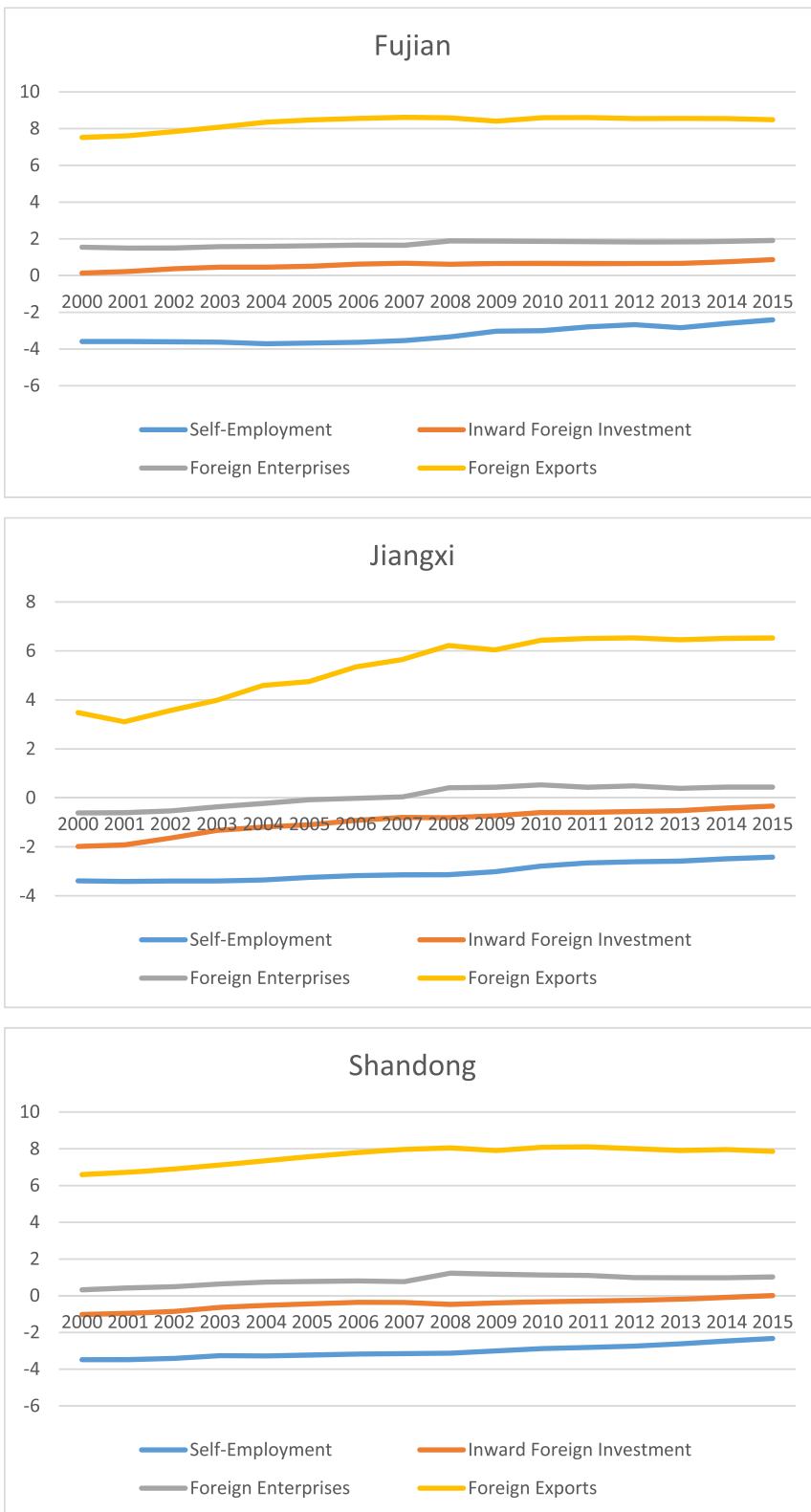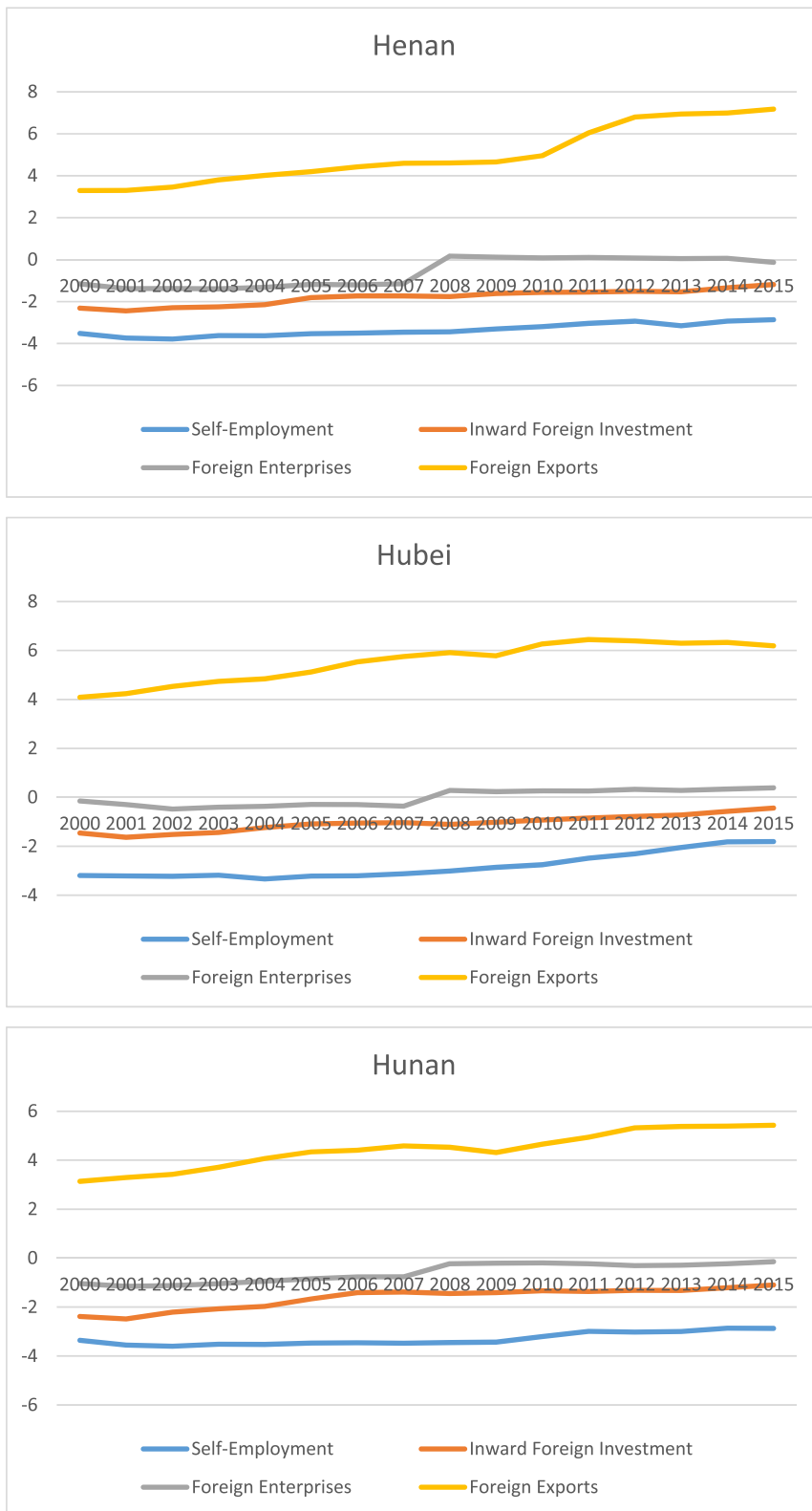**Jiangsu**

Zhejiang

Anhui

FIGURE A1 (Continued)

FIGURE A1 (Continued)
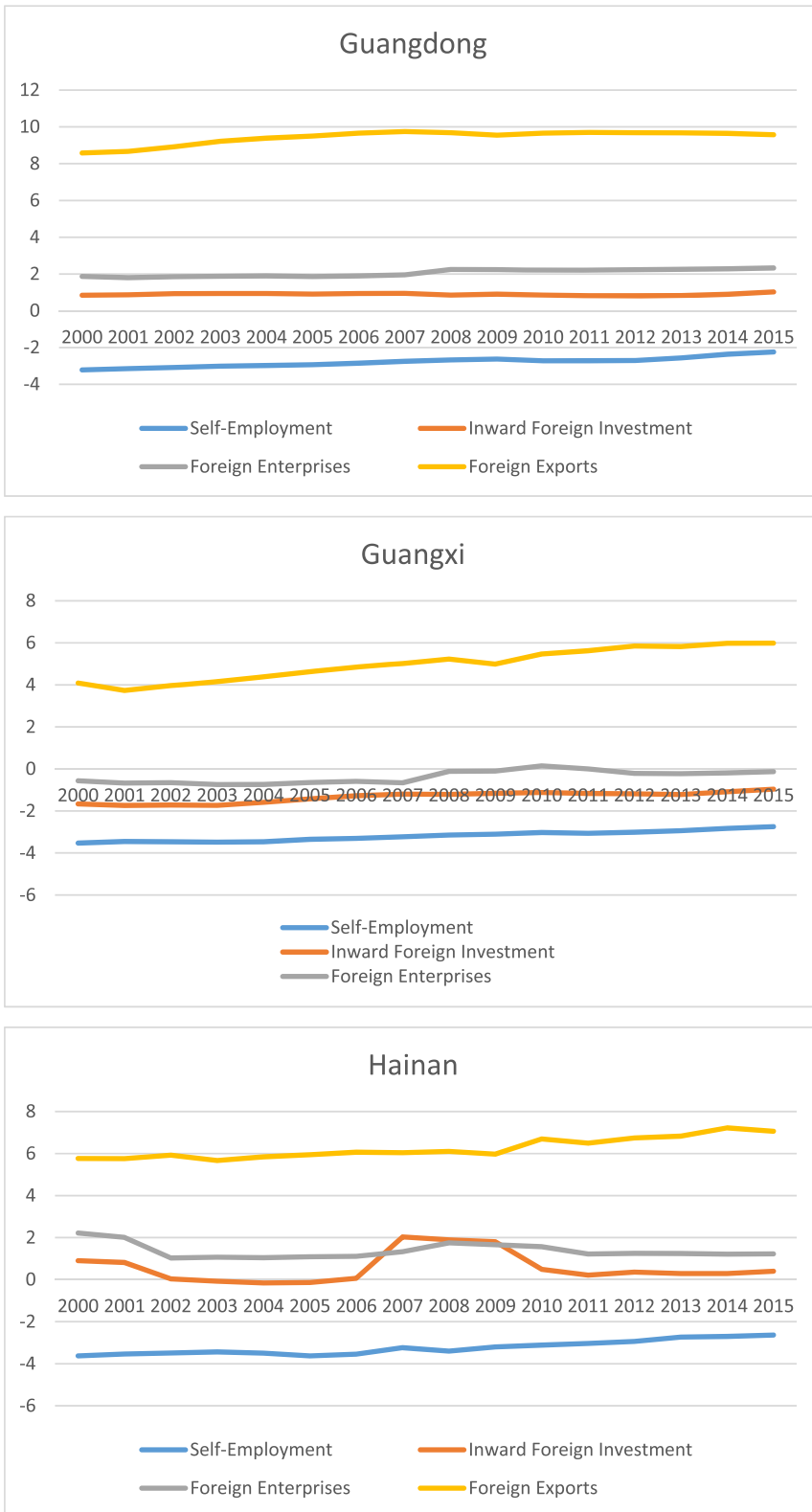
FIGURE A1   (Continued)
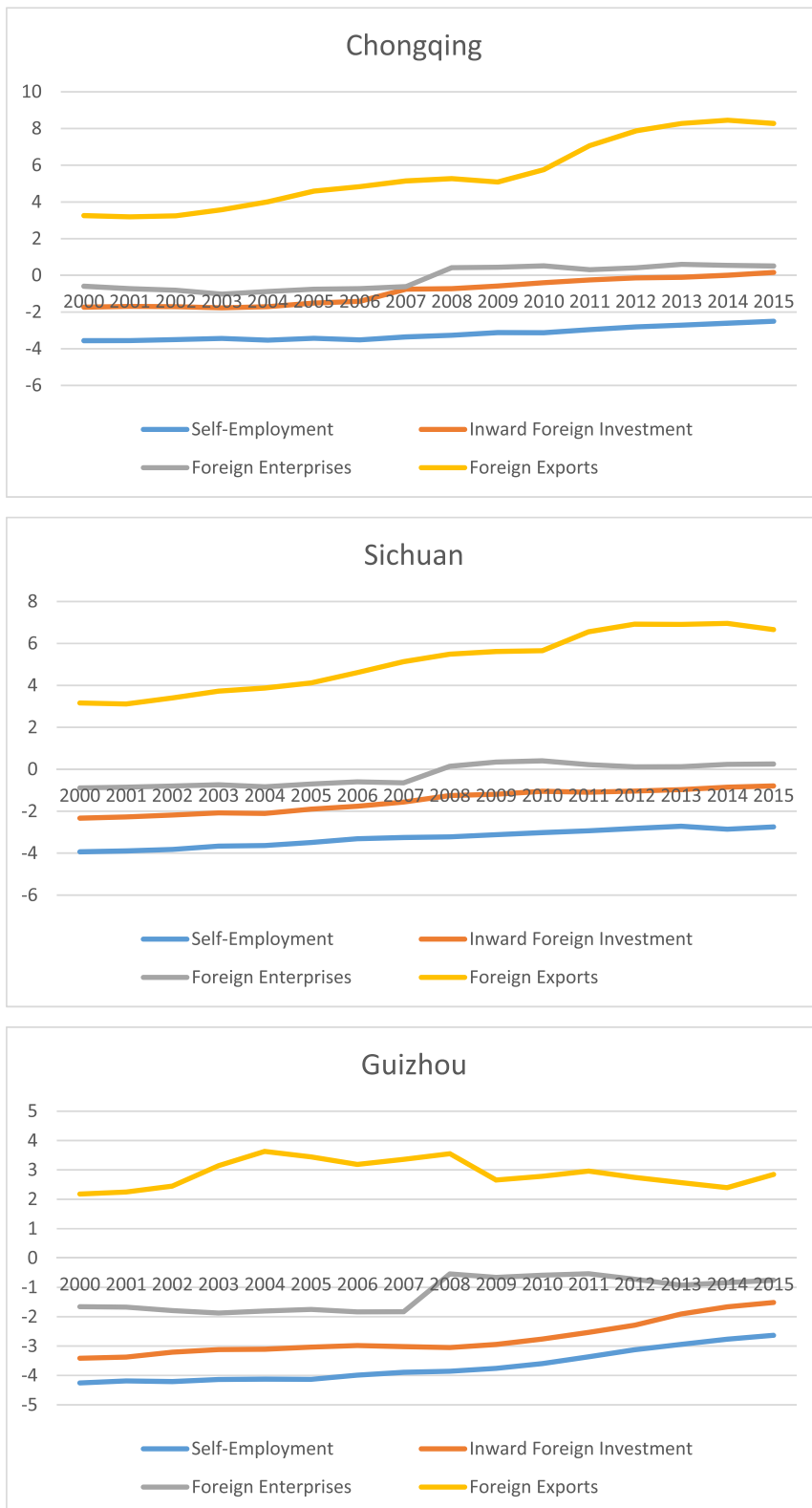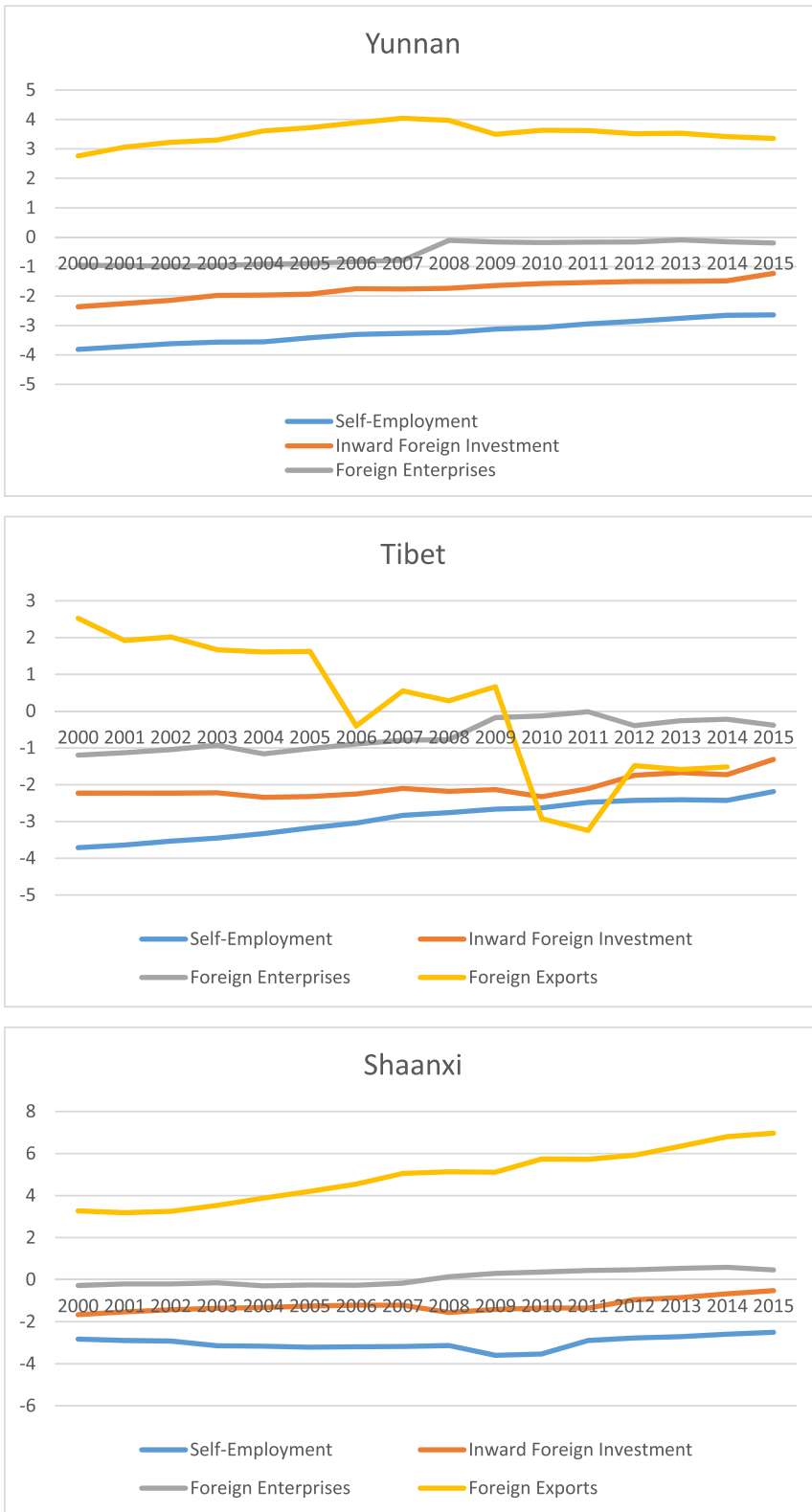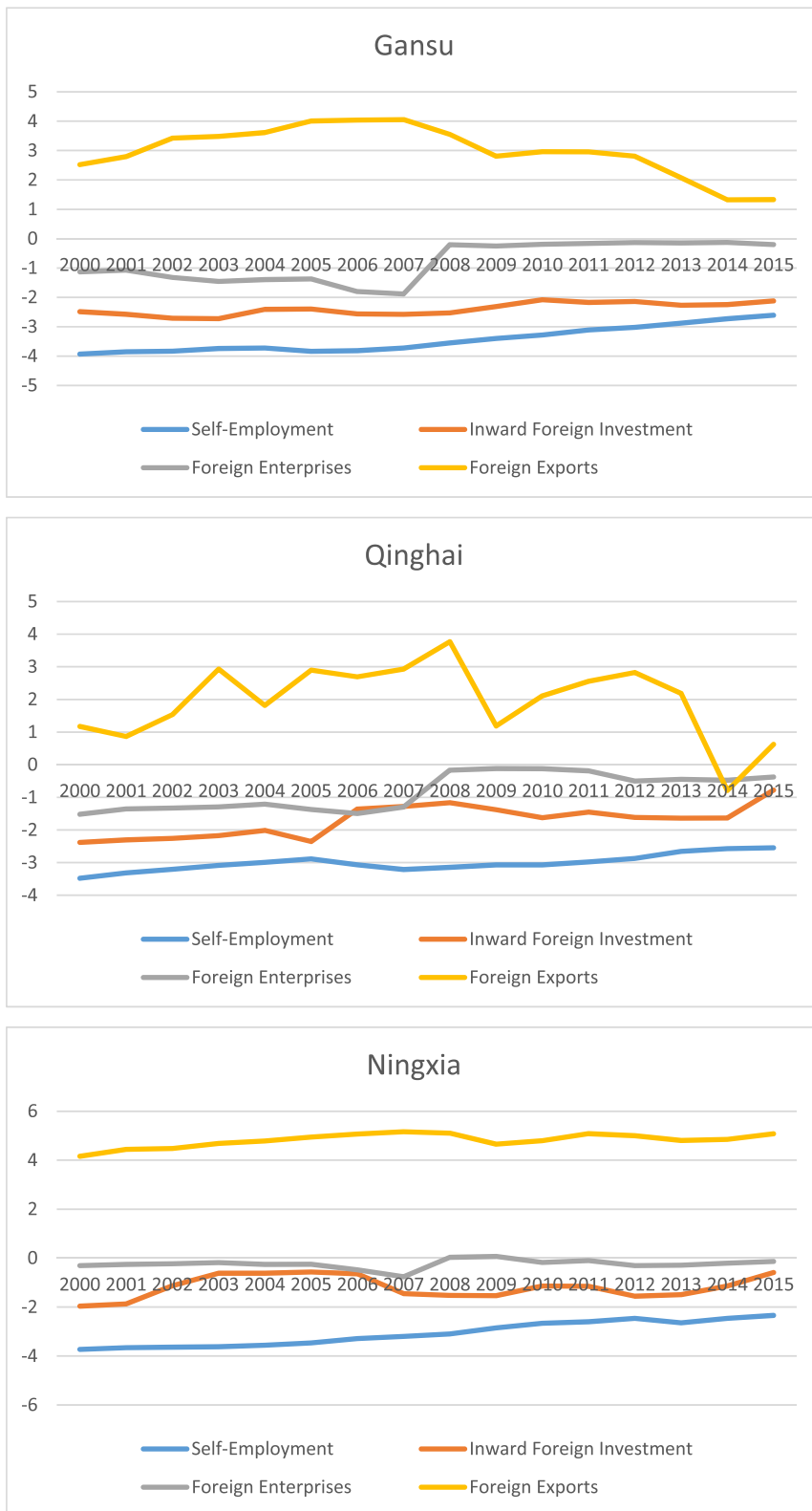
FIGURE A1   (Continued)

FIGURE A1   (Continued)

FIGURE A1   (Continued)

FIGURE A1 (Continued)

FIGURE A1 (Continued)

TABLE A1 Definitions of variables.

Variable	Definition
Self-employment	Number of self-employed individuals divided by the province population
	Self-employed individuals include employers, own account workers, members of producers' cooperatives and contributing family workers
Inward foreign investment	Total inward foreign investment divided by the province population (in constant Chinese Yuan)
Foreign enterprises	Number of foreign enterprises divided by the province population
Foreign exports	Value of exports by foreign owned enterprises divided by the province population (in constant Chinese Yuan)
Average wage	Average wage of people in urban units
Community services	Number of community service facilities
Exports by origin	Exports by origin (in constant Chinese Yuan)
Health care institutions	Number of health care institutions
Patents granted	Number of patents granted
College qualifications	Percentage of people holding college or higher qualifications
Length of good quality road	Total length of good quality roads (km)
State owned enterprises liabilities	State owned enterprises total liabilities (in constant Chinese Yuan)

TABLE A2 Summary statistics.

	Mean	Median	Standard deviation	Minimum	Maximum	Kurtosis	Skewness
Self-employment	−3.113	−3.127	0.458	−4.253	−1.808	−0.375	−0.012
Inward foreign investment	−0.777	−1.109	1.303	−3.414	2.531	−0.595	0.504
Foreign enterprises	0.283	−0.015	1.208	−1.883	3.434	−0.586	0.482
Foreign exports	5.668	5.379	2.434	−3.244	10.517	0.036	−0.153
Average wage	9.956	10.008	0.534	8.842	11.339	−0.674	−0.072
Community services	−0.014	0.029	0.988	−3.433	2.394	0.439	−0.400
Exports by origin	7.352	7.001	1.468	4.665	10.857	−0.658	0.546
Health care institutions	1.365	1.272	0.663	−0.631	3.178	−0.512	0.169
Patents granted	0.348	0.213	1.367	−3.641	3.768	−0.450	0.356
College qualifications	1.940	1.959	0.642	−1.337	3.746	1.824	−0.311
Length of good quality road	−1.010	−0.837	1.105	−5.140	0.733	1.199	−1.091
State owned enterprise liabilities	−0.406	−0.473	0.773	−2.705	1.490	0.004	0.043
Balance of payments Taiwan * Inverse of distance	3.704	3.562	0.878	1.467	5.870	−0.453	0.419

Note: All variables are in the form of natural logarithm.

TABLE A3 The impact of different measures of foreign direct investment (FDI) on self-employment in Eastern provinces.

	Model 1		Model 2		Model 3	
	1st stage	2nd stage	1st stage	2nd stage	1st stage	2nd stage
Inward foreign investment		−0.3184				
		(0.218)				
Foreign enterprises				0.2165		
				(0.175)		
Foreign exports						2.0817
						(0.424)
Balance of payments Taiwan * Inverse of distance	0.1321**		−0.1944***		−0.0202	
	(0.027)		(0.000)		(0.370)	
Average wage	−0.4670	−0.5501**	0.8238**	−0.5798**	0.6821***	−1.8214
	(0.356)	(0.046)	(0.026)	(0.022)	(0.001)	(0.277)
Community services	−0.0620	−0.0183	0.0235	−0.0036	0.0193	−0.0386
	(0.128)	(0.501)	(0.426)	(0.865)	(0.213)	(0.513)
Exports by origin	0.4695***	0.2086*	−0.0167	0.0628	1.0000***	−2.0225
	(0.001)	(0.087)	(0.867)	(0.379)	(0.000)	(0.444)
Health care institutions	0.0138	−0.0098	−0.0239	−0.0090	−0.0049	−0.0040
	(0.747)	(0.698)	(0.445)	(0.694)	(0.764)	(0.922)
Patents granted	0.1199	−0.0007	0.0361	−0.0467	−0.0638*	0.0940
	(0.220)	(0.992)	(0.610)	(0.352)	(0.087)	(0.643)

(Continues)

TABLE A3 (Continued)

	Model 1		Model 2		Model 3	
	1st stage	2nd stage	1st stage	2nd stage	1st stage	2nd stage
College qualifications	0.0265	0.0360	0.0778	0.0107	−0.0144	0.0576
	(0.805)	(0.572)	(0.322)	(0.848)	(0.725)	(0.595)
Length of good quality road	−0.1475	−0.0429	0.0987	−0.0173	0.1240**	−0.2540
	(0.260)	(0.592)	(0.299)	(0.800)	(0.014)	(0.439)
State owned enterprises liabilities	−0.0409	0.1051	0.1585	0.0839	−0.0250	0.1702
	(0.799)	(0.264)	(0.175)	(0.350)	(0.682)	(0.262)
N	154	154	154	154	154	154
Groups	11	11	11	11	11	11
Anderson under-identification test		5.176**		19.182***		0.861
		(0.023)		(0.000)		(0.353)

Note: All variables are on the first differences of logged data. The values in brackets are *p* values. *, ** and *** indicate 10%, 5% and 1% significance levels respectively. The Eastern region includes Beijing, Fujian, Guangdong, Hainan, Hebei, Jiangsu, Liaoning, Shandong, Shanghai, Tianjin, and Zhejiang.

TABLE A4 The impact of different measures of foreign direct investment (FDI) on self-employment in Central provinces.

	Model 1		Model 2		Model 3	
	1st stage	2nd stage	1st stage	2nd stage	1st stage	2nd stage
Inward foreign investment		−83.5344				
		(0.983)				
Foreign enterprises				0.2423**		
				(0.017)		
Foreign exports						0.8308
						(0.140)
Balance of payments Taiwan * Inverse of distance	0.0011		−0.3959***		−0.1155*	
	(0.983)		(0.000)		(0.100)	
Average wage	0.8597*	71.1330	0.5237	−0.8122***	−0.1900	−0.5274
	(0.053)	(0.983)	(0.317)	(0.008)	(0.733)	(0.348)
Community services	−0.0632	−5.2346	0.0622	0.0291	−0.0036	0.0472
	(0.193)	(0.983)	(0.280)	(0.403)	(0.953)	(0.409)
Exports by origin	0.1355	11.2125	−0.2922***	−0.0379	0.6869***	−0.6794
	(0.104)	(0.983)	(0.004)	(0.512)	(0.000)	(0.113)
Health care institutions	0.0543	4.5845	−0.0149	0.0557*	−0.0377	0.0834
	(0.231)	(0.983)	(0.781)	(0.090)	(0.508)	(0.158)
Patents granted	−0.0072	−0.5113	−0.2547**	0.1546**	−0.0500	0.1344
	(0.931)	(0.986)	(0.012)	(0.021)	(0.638)	(0.196)
College qualifications	0.0748	6.2725	−0.0744	0.0459	−0.0391	0.0603
	(0.415)	(0.983)	(0.494)	(0.502)	(0.736)	(0.599)

TABLE A4 (Continued)

	Model 1		Model 2		Model 3	
	1st stage	2nd stage	1st stage	2nd stage	1st stage	2nd stage
Length of good quality road	−0.0384	−3.2113	0.2531**	0.0615	0.0652	−0.0544
	(0.687)	(0.983)	(0.027)	(0.378)	(0.588)	(0.629)
State owned enterprises liabilities	0.0297	2.6472	0.3354	0.0885	0.3236	−0.0991
	(0.892)	(0.981)	(0.198)	(0.602)	(0.242)	(0.776)
N	126	126	126	126	126	126
Groups	9	9	9	9	9	9
Anderson under-identification test		0.000		30.166***		2.913*
		(0.983)		(0.000)		(0.088)

Note: All variables are on the first differences of logged data. The values in brackets are *p* values. *, ** and *** indicate 10%, 5% and 1% significance levels respectively. The Central region includes Anhui, Heilongjiang, Henan, Hubei, Hunan, Inner Mongolia, Jiangxi, Jilin, and Shanxi.

TABLE A5 The impact of different measures of foreign direct investment (FDI) on self-employment in Western provinces.

	Model 1		Model 2		Model 3	
	1st stage	2nd stage	1st stage	2nd stage	1st stage	2nd stage
Inward foreign investment		−0.2574				
		(0.621)				
Foreign enterprises				0.0451		
				(0.584)		
Foreign exports						0.0627
						(0.609)
Balance of payments Taiwan * Inverse of distance	0.0623		−0.3558***		−0.2558	
	(0.241)		(0.000)		(0.130)	
Average wage	0.1748	−0.0865	0.3195	−0.1459	1.1096	−0.2010
	(0.596)	(0.732)	(0.498)	(0.399)	(0.290)	(0.284)
Community services	0.0276	0.0378*	0.1148***	0.0255	0.0688	0.0264
	(0.339)	(0.096)	(0.006)	(0.168)	(0.452)	(0.166)
Exports by origin	0.1911***	0.0745	−0.1125	0.0304	0.6462***	−0.0152
	(0.001)	(0.452)	(0.178)	(0.339)	(0.001)	(0.869)
Health care institutions	0.0565*	0.0215	0.0822*	0.0032	0.1498	−0.0025
	(0.090)	(0.582)	(0.085)	(0.859)	(0.157)	(0.918)
Patents granted	−0.0022	0.0485	−0.0628	0.0519	0.1887	0.0372
	(0.971)	(0.177)	(0.456)	(0.121)	(0.314)	(0.350)
College qualifications	−0.1199*	−0.0025	−0.0886	0.0324	−0.2596	0.0446
	(0.066)	(0.973)	(0.340)	(0.375)	(0.208)	(0.369)
Length of good quality road	−0.1537	−0.0213	0.3888*	0.0007	−0.6381	0.0582
	(0.335)	(0.863)	(0.089)	(0.994)	(0.208)	(0.641)

(Continues)

T A B L E   A 5   (Continued)

	Model 1		Model 2		Model 3	
	1st stage	**2nd stage**	**1st stage**	**2nd stage**	**1st stage**	**2nd stage**
State owned enterprises liabilities	0.0977	0.1312	0.0176	0.1052	−1.5678***	0.2042
	(0.482)	(0.178)	(0.929)	(0.170)	(0.000)	(0.322)
N	153	153	153	153	153	153
Groups	11	11	11	11	11	11
Anderson under-identification test		1.467		20.499***		2.442
		(0.226)		(0.000)		(0.1181)

Note: All variables are on the first differences of logged data. The values in brackets are *p* values. *, ** and *** indicate 10%, 5% and 1% significance levels respectively. The Western region includes Chongqing, Gansu, Guizhou, Ningxia, Qinghai, Shaanxi, Sichuan, Xinjiang, Yunnan, Guangxi and Tibet.

T A B L E   A 6   Long-run and short-run causality based on cointegration and vector error correction model.

	Cointegration	**Long-run causality**	**Short-run causality**
Inward foreign investment and self-employment	Yes	Self-employment → Inward foreign investment	Inward foreign Investment → self-employment
Foreign enterprises and self-employment	No		
Foreign exports and self-employment	Yes	Self-employment → Foreign exports	

Note: The tests are significant at 10% level.