

Access to Services and Export Performance

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Abstract

Although there is much anecdotal evidence as well as econometric analysis at the industry level of the importance of access to services for exports and participation in global value chains, generally very limited evidence of the connection between access to services and exports at the firm level. In this paper we use a newly constructed dataset that connects service development at the city level for 230 cities in China to export performance at the firm, destination, and product level based on customs data. The analysis shows that correcting for many firm level and regional controls and using a substantive panel structure over years, that the access to local services substantially improves export performance. By using policy experiments that stimulate service provision at the local level we are able to create an instrument to show the causality of the relationship between access to services and export performance.

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1 Introduction

With the increasing importance of services in developed economies in particular, the importance of trade in services has also grown (Gervais and Jensen (2019), WTO (2019)). First, this is visible in global trade statistics, where the trade in services across national borders is increasing considerably faster than trade in manufactured goods. Much of the participation in the global economy, however, takes place through participation in value chains, and if we look at the role of services in the export of goods as added value-added domestically, the increased importance of services in international trade is even more significant (Miroudot and Shepherd, 2016). Also, it is increasingly difficult to disentangle trade in manufacturing and services because services are embodied in so many goods resulting in the servicification of manufacturing trade (Cernat and Kutlina-Dimitrova, 2014). To add another dimension, services can also be important in enabling global value chains themselves, not so much as a direct input into industrial production, but through transport, communication, and financial services also to optimize trade between the different parts of the value chain (Hoekman and Shepherd, 2017). Thus, both the direct increase in trade in services and the role that services play in enabling trade in goods is an important part of the globalization that has seen even stronger growth over the last 20 years. This growth is mainly concentrated in the increasing participation of emerging markets and developing countries in the global economy (Findlay and Roelfsema, forthcoming, chapter book).

In the empirical analysis of the importance of services in the increasing globalization of the economy, one aspect has so far remained underexposed: the role that access to services plays in export strategies of companies. This in itself is remarkable, because a large part of modern trade theory concentrates on strategies of companies that become internationally active. The basic framework resulting from the Melitz (2003) model indicates that productive firms can bear the fixed costs of internationalization as well as the higher marginal costs of international operations compared to domestic operations. In reality, many of these fixed costs for setting up and deepening international activities are related to the use of services provided by third parties who have market knowledge of foreign markets or supervise internationalization processes (Albornoz et al., 2012; Arkolakis, 2010; Das et al., 2007). In addition, in most major cities in emerging markets there are foreign service providers who, with advice and guidance, can support international value chains or find distribution channels in other countries. And finally, internationalization and diversification of export markets often goes together with a considerably more complex financial structures, for which companies need to work closely with their existing bank contacts and perhaps also enter into new ones abroad that have local branches. All this leads to the assumption that there should be a link between the local access to professional services and export performance and strategy.

In this paper, we take up the issue by studying the export performance of Chinese firms between

2005 and 2015 for which we use the CSMAR database on company characteristics and combine this (as several others have done in recent papers) with the very detailed Chinese import and export transactions database collected by the Chinese General Administration of Customs. In addition, we have built a dataset where we use the City Statistical Yearbook to map those years with service intensity at the city level measured by the employment share of service industries. Using this panel database and correcting for fixed effects at the firm, industry and year levels we study the connection between local service intensities of where the firm is headquartered and export performance measured by the volume of exports at the product, destination, and firm-level.

The analysis shows several interesting findings of how access to services affects export performance. An overall finding is that access to services seems to matter for exports when we control for several firm characteristics, as well as taking up a substantial set of fixed effects. If we consider the full sample, access to services increases the volume of exports at the level of individual goods and that of firms. The large sample size allows us to work with subsamples split based on firm age, firm size as well as export diversification. This analysis shows that access to services has a more significant effect for larger firms but also younger firms. We also focus on measures of the intensive margin of exports (higher volumes of sales for products) and the extensive margin (in terms of product range and destination range). The results indicate that access to services matters more for the intensive margin and less for the extensive margin of exports. In line with other experimental literature, discussed in more detail below, these findings connect to the hypothesis that access to services matters more for initial steps of exports than for extending exports to multiple countries. However, it also supports the hypothesis that services are essential for deepening existing market penetration, especially for firms that have concentrated on several core products and markets.

The analysis in this paper is much supported by two recent contributions - who study an entirely different content question than we do - that use the same data we do concerning the dependent variables and measures of service intensities of industries and firms. Ding et al. (2018) study how export performance is related to political connections and by doing so provide a great tutorial on how the firm-level export data can be used to study various elements of firm internationalisation, including the measures of the intensive and extensive margins used in our paper. We will introduce these export variables more briefly than they do, so the reader is well advised when studying Chinese export dynamics to consult their very thoughtful analysis. The second important input in this paper is the recent industry classification of service intensity provided in Liu et al. (2018). If we combine this with the city dataset constructed for Zhang and Roelfsema (2020), we have a very powerful database to confront the question how access to local services is related to export performance.

Most closely related to our analysis is a small set of papers in economics that analyse services inputs at the firm level to study the effects of exporting behaviour. Much of this literature is

inspired by the observation that exporting firms benefit from local exporting experience of other firms. In that case, it is a small step to define experience slightly different as not only associated with other exporters but also with the service industry that supports it. In a series of papers, Berlingieri (2014); Berlingieri and Marcolin (2018) analyse this connection for French firms and find that higher imports of services and outsourcing of services are associated with more robust export performance. Measurement of services as an export input of the firm is difficult because whether for example marketing costs are associated with exporting or the consumption of IT services are used in exporting lacks a direct link in the production function of the firm. The focus of this paper concerning the dependent variable of export performance is quite similar. Still, we add another piece of circumstantial evidence with respect to services inputs to this puzzle. Whereas the connection between services inputs and the use of those services for exports is difficult to establish, in our paper the relationship between access to services in service-intensive locations and export performance is also not that direct.

Further analysis connects to the domain of studying trade in services at the industry level. As summarised already in Francois and Hoekman (2010) and more recently in WTO (2019), there is a substantial literature that deals with cross-border trade in services. However, over years a substantial literature has emerged that uses input-output tables to study the input of services into manufacturing at the industry level, see for example a Miroudot and Shepherd (2016) for a prime example of this literature and a survey of "connected papers. The use of input-output tables to study trade outcomes is restricted to estimations at the industry level whereas much of the empirical economics of international trade literature moves towards the analysis of firm level data. However, so far there is limited progress of connecting the input-output literature to a more fine-grained analysis at the firm level of inputs and outputs. Our analysis of considering service intensive firms in certain intensive regions also has a bit of an assumption that the location of firms and the need for services is a good proxy for firm level input-output relations. But just as in the input-output literature on international trade, the exact relationship remains a bit of an assumption.

Lastly, the analysis is associated with the rapid progress in the understanding of how entrepreneurial ecosystems, of which access to services for entrepreneurial firms is a key component, shapes firm dynamics. In early practitioners contribution, Isenberg (2010) argues that local service provision as part of an entrepreneurial ecosystem is key to scale up activities, of which internationalisation is only included implicitly. In the seminal academic contribution, Stam (2015) argues that policies that support local service provision are key to the emergence of effective entrepreneurial ecosystems. Zhang and Roelfsema (2020) apply these theories to the Chinese context to show that city level entrepreneurial ecosystems have substantial effect on scale up activities, but they do not consider international activities affirms. Hence, this paper contributes to this literature by creating a link between local service provision as part of entrepreneurial ecosystems and the

internationalisation of firms.

The paper commences as follows. In the next section we introduced a dataset and elaborate on the empirical model so as to discuss the opportunities and restrictions of the data. Section 3 represents the main results, where we start with the baseline regressions and after that present the subsamples for more fine-grained analysis of the way in which services affect export performance. The last section draws conclusions in which we pay attention to a summary of the contribution of the paper to the current state of the literature, as well as what the paper can teach for policy practice.

2 Data and empirical strategy

2.1 Data

We combine three data sources to examine the effects of local producer services development on firm export performance. The first data source is the China Stock Market & Accounting Research (CSMAR) database, which contains detailed accounting and financial statements information for all Chinese listed firms. The second source is the Chinese custom data collected by the Chinese General Administration of Customs. The custom data cover the universe of Chinese imports and exports transactions. The data record detailed import or export values, quantity, quantity units, products, source or destination countries, and some firm information (e.g., names, ownership types, and contact information) for each trade transaction. The third source is China City Statistical Yearbook, from which we obtain information on employment in various sectors at the city level. We first merge the CSMAR data and custom data by manually matching company names and further merge this firm-level data with city-level data by matching city names. Our matched sample covers 243,450 export records of 12,758 firm-year observations in around 230 Chinese cities from 2005 to 2015.

2.2 Empirical specifications

To systematically investigate the effects of local producer services development on firm exports, we estimate the following specification:

$$\log exports_{ijckt} = \alpha + \beta \times PS_{ct} + \delta X_{it} + \varphi_i + \gamma_{jkt} + \varepsilon_{ijckt} \quad (1)$$

where $\log exports_{ijckt}$ represents firm i 's log export value of product j to destination country k in city c and year t . PS_{ct} is a measure of city-level producer services development. Following the insight from the literature of structural transformation, we measure local producer services devel-

opment as the employment share of producer services sectors in total employment at the city level over years. Producer services sectors consist of transportation, storage and postal services, communication, computer and IT services, wholesale and retailing services, financial services, and rental and business services. X_{it} is a set of firm-level control variables including total factor productivity (TFP), log number of employees, log total assets, state-owned enterprise (SOE) status, return on assets (ROA), leverage, firm tax burden, political connectedness, and domestic-sales-to-total-sales ratio. We include firm fixed effects φ_i and product-destination-year fixed effects γ_{jkt} to control for unobserved firm heterogeneity and country-sector level demand shifts.

In addition to the above specification, we also consider the following model specification to examine whether access to services is more important for firms with high services input intensity:

$$\log exports_{ict} = \alpha + \beta_1 \times PS_{ct} + \beta_2 \times PS_{ct} \times SII_s + \beta_3 \times SII_s + \delta X_{it} + \varphi_i + \gamma_t + \varepsilon_{ict} \quad (2)$$

where $\log exports_{ict}$ is firm i 's log export value (aggregated across products and destinations) in city c and year t . SII_s is a measure of services input intensity at the manufacturing sector level developed by Liu et al. (2018). Here we instead control for firm fixed effects φ_i and year fixed effects γ_t .

To explore the heterogeneous effects of producer services on firm exports, we employ subsample regressions in later analysis.

3 Estimation results

We asked several questions to the data, on which the answers are present in separate subsections. We start off with analysing the full sample to derive the baseline results. These results are obtained for the firm level, the destination level, as well as the product level. Second, we look at heterogeneous effects for firm age, firm size, and firm export diversification over country destinations. Third, we zoom in on the difference between extensive and intensive margins to see whether the baseline results are driven by rising export volume or an increase in product destinations. Fourth, we deal with the endogeneity issue in which export orientation of a majority of firms in the region may cause an increase in service orientation at the city level.

3.1 Baseline results

Table 3 presents the baseline results in three columns. In column (1), the dependent variable is exports at the level of product to a specific destination coming from a specific firm and city. We control for firm and destination-products-year fixed effects in a fixed effects estimation. Basically,

in columns (2) and (3) we collapse the dataset of column (1) by summing over export destinations (column 2) and products-destinations (column 3). The variable of interest is the producer services in the region and we control for some additional firm characteristics that might influence export performance. In column 3, we may observe that an interaction effect between producer services and the service intensity of a manufacturing industry is added. In contrast to the estimations at the product level, if we sum over industries to arrive at the firm level, we assume that the access to services is important for firms for which services as an input are important. This distinction is important in China, because export orientation in manufactured goods may not necessarily call for more service inputs but could by contrast be influenced by the presence of many other manufactured goods producers in for example export processing zones. To interpret the results easily, the coefficients could be interpreted as semi-elasticities.

As can be observed in table 3, the coefficient for access to producer services at the regional level is directly significant in columns (1) and (2). Hence, as a baseline conclusion controlling for many firm characteristics the presence of service providers has a positive effect on exports at the products as well as at the product-destination level. In column (3), the interaction effect between producer services and the service intensity is highly significant so that we can state that for firms in the service intensive sectors the presence of those services has a positive effect on exports aggregated over export destination and product range. From the control variables estimates, some interesting observations can be made. Total factor productivity is significant at the most fine-grained product level but is not significant if we aggregate over destinations, which would support an hypothesis that especially highly productive firms are able to diversify exports over multiple countries. The same conclusion holds true for state owned firms, even if we control for numbers of employees and total assets. This may connect to the observation that for China good connections support export performance. Also, firms that export seem to specialise in internationalisation as the domestic sales rate is negative across all estimations. Lastly, if we sum over export destinations it seems that the number of export destinations is positively correlated with export performance. This provides evidence that diversification of exports over destinations is an important driver in contrast to market focus that deepens penetration in a specific market. All these observations go for splitting out firm size, from age and the destinations versus deepening issues (extensive versus intensive margins).

3.2 Firm heterogeneity

Given the size of our sample the cleanest way to look for differences in firm characteristics is to create subsamples. We may expect the value of access to services to differ whether firms are young or old, small or large, as well as diversified over export destinations or not. Although there is not a precise hypothesis what to expect with respect to firm heterogeneity, the estimations

Table 1: Baseline results

	(1) Product-Des.	(2) Product	(3) Firm
Producer services	1.014*** (0.311)	0.752** (0.370)	-1.284 (1.177)
Producer services \times SII			3.649** (1.560)
SII			8.514*** (0.485)
TFP	0.260*** (0.061)	0.040 (0.070)	-0.007 (0.149)
log of no. of employees	0.074** (0.030)	0.145*** (0.036)	-0.088 (0.105)
log of total assets	0.004 (0.037)	-0.194*** (0.043)	-0.005 (0.090)
State	0.129*** (0.041)	0.009 (0.058)	1.522*** (0.244)
ROA	0.251 (0.285)	0.285 (0.324)	0.205 (0.802)
Leverage	0.443*** (0.103)	0.076 (0.129)	0.299 (0.401)
Tax burden	-0.477 (0.865)	-1.352 (0.934)	-0.149*** (0.041)
Political connections	-0.020 (0.025)	-0.012 (0.033)	0.114 (0.130)
Domestic sales rate	-1.078*** (0.083)	-0.468*** (0.093)	-3.594*** (0.519)
No. of destinations		2.738*** (0.010)	4.524*** (0.134)
Firm F.E.	Yes	Yes	Yes
Product-Des.-Year F.E.	Yes		
Product-Year F.E.		Yes	
Year F.E.			Yes
Observations	243,450	92,293	12,758
R-squared	0.661	0.744	0.941

Note: A constant is included in all regressions. Column (1) controls for firm and destination-product-year fixed effects, Column (2) controls for firm and product-year fixed effects, and Column (3) controls for firm and year fixed effects. Robust standard errors are reported in parentheses and are clustered at the destination-product-year level in Column (1), the product-year level in Column (2), and the city level in Column (3). ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.

themselves are interesting to observe what actually drives the baseline results. But some background thoughts may play a role. For example, older firms may have more established relations in the local environment and may therefore have stronger ties to service providers which arise over time. For large firms production of services in-house might be easier than for smaller firms who rely more on

Table 2: Firm Heterogeneity

	Product-Des.		Firm	
	(1)	(2)	(3)	(4)
Panel A (Firm age)	Young	Old	Young	Old
Producer services	-0.195 (1.599)	1.025*** (0.365)	-5.217 (3.207)	-0.569 (1.245)
Producer services \times SII			5.703 (6.193)	4.359 (2.719)
Observations	23,053	175,067	3081	9484
R-squared	0.700	0.676	0.939	0.950
Panel B (Firm size)	Small	Large	Small	Large
Producer services	-0.147 (0.441)	3.265*** (0.679)	-1.948 (1.831)	-0.972 (1.895)
Producer services \times SII			4.481* (2.457)	2.553 (2.988)
Observations	139,792	56,187	8263	4289
R-squared	0.642	0.738	0.948	0.944
Panel C (Destinations)	Few	Many	Few	Many
Producer services	-0.304 (0.418)	5.753*** (1.138)	-0.552 (1.192)	-0.751 (0.662)
Producer services \times SII			2.247 (1.684)	0.550 (0.914)
Observations	137,351	52,498	8187	4310
R-squared	0.647	0.724	0.906	0.939
Control variables	Yes	Yes	Yes	Yes
Firm F.E.	Yes	Yes	Yes	Yes
Product-Destination-Year F.E.	Yes	Yes		
Year F.E.			Yes	Yes

Note: Columns (1) and (2) follow the specification in Column (1) of Table 3; Columns (3) and (4) follow the specification in Column (3) of Table 3. Young firms are those with firm age less than or equal to 10 years and old firms are those with firm age larger than 10 years. Small firms are those at the middle and bottom tertiles of the total assets and large firms are those at the upper tertile. In Panel C, firms are grouped according to the number of destinations that a firm export to. Firms with few number of destinations are those at the middle and bottom tertiles of the number of destinations and firm with many number of destinations are those at the upper tertile. Robust standard errors are reported in parentheses and are clustered at the destination-product-year level in Columns (1) and (2) and the city level for Columns (3) and (4). ***, ** and * indicate statistical significance at the 1%, 5% and 10% levels, respectively.

the entrepreneurial ecosystem. Also, it may well be that exporting initially requires a high level of service inputs but that scaling the number of destination countries does not significantly change the relation between access to services and export performance. Let us see whether there is some evidence for such back of the envelope hypotheses.

As can be observed, table 2 is divided in three panels A, B, and C. The first two columns are the

most fine-grained estimation where dependent variable is at the product-destination level. Columns (3) and (4) are aggregated over destinations and product range, so that they again analyse firm level exports over time. From panel A the overall conclusion is that if we look at the fine-grained product-destination level producer services are positively associated with higher levels of exports for older firms only. However, if we look at the aggregated level for firms, the interaction term is not significant, despite the right sign and close to significance for all the firms. This provides some (weak) evidence that all the firms profit more from access to services in their export performance. In panel B some interesting effects show up. If we focus at the product-destination level first, we observe that producer services are significantly positive for larger firms and insignificant for smaller firms. This implies that market penetration (more sales in a given market for a specific product) should be supported by access to services which works out for large firms only. By sharp contrast if we concentrate in columns three and four on the firm level, it is especially small firms that benefit from services. A tentative conclusion is that specialised services that increase market penetration abroad for specific goods benefit larger firms who may have the resources to invest in them whereas when it comes to overall market entry and market penetration at the market level (in contrast to the level of specific goods penetration) access to services benefits especially smaller firms. The results in panel C can be used to voice the endogeneity problem that may arise due to selection. We can see that when it comes to higher levels of exports at the product-destination level, firms that export to many destinations gain more from access to services at the local level. However, this result does not extend to export at the firm level. The endogeneity may arise when firms that have high levels of exports in multiple destinations located in areas where the provision of services is high. We will return in more detail in subsection 4 below.

3.3 Extensive and Intensive Margins

Traditionally there is a difference between the extensive and intensive margin of trade. At the country level, the intensive margin is whether in existing products countries are exporting more, for example due to trade liberalisation. The extensive margin means that more firms are exporting. When we consider our dataset, the large majority (actually nearly all) of the firms included in the data are exporters, something to be expected in a Chinese manufacturing industry. We can still talk about the effects of access to services for the intensive margin of trade, but when we talk about the extensive marginal of trade we mean diversification of products at the firm level (so in the dataset we consider multi-product firms) or a wider range of export destinations. Hence, the extensive margin can be over destinations and over products. By differentiating across extensive and intensive margins, and types of extensive margins over the product range and destination range, we hope to be able to say more about the underlying mechanisms of how services contribute to

export performance.

Table 3 provides an analysis for both the extensive margins (the column on the left) and the intensive margins (the column on the right). We have four panels, where the panel A and B are on the product level and the panels C and D are on the firm level. When we start at the product level, we may observe that from panel A the conclusion emerges that access to services has a positive correlation with the intensive margin of trade, as the export value for each destination is increasing but not the number of destinations itself. To some degree this is in line with the findings in panel B, which shows that higher access to services reduces the number of products per destination, so that firms from services intensive region seem to focus more in the product range. Combining those two findings, qualitatively one may say that access to services makes firms focus more on deeper penetration in and more limited number of products.

4 Conclusions

Using a large dataset for Chinese firms and where they are located, in this concluding section we returned from a journey of investigating the connection between services intensity of locations, service intensities of firms, and export performance. With respect to the dependent variable export performance we have made distinctions between intensive and extensive margins of trade, different levels of analysis for goods, destinations, and firms. By using subsamples, we have distinguished between old and young firms, large and small firms, and have control for many firm characteristics that are commonly associated with extra performance. Overall, we have established a link between access to services at the local level and firm export performance.

With respect to the interpretation of the results, we would like to draw the attention in this conclusion to two limitations. For many countries in the emerging world and China is no exception, one has to be critical about the quality of data. Although Chinese authorities are often applauded for their rigour in providing statistics, especially the aggregated city-level data for many cities in China, we should allow for a margin of error. Such errors may be magnified in this study because we connect very detailed information even at the product level with explanatory variables that are at a much higher level of aggregation. Although we take account by clustering carefully, such differences in aggregate levels of the data is a concern for the validity of the results. A second limitation is reverse causality due to selection effects, as firms that need services will probably locate in areas where the services are abundantly provided. Given the slow moving of a time of service intensities at the city level, it is difficult to use dynamic panel techniques to create internal instruments to take account of such reverse causality effects.

The main theoretical contribution of this paper is that it provides another piece of the puzzle that

Table 3: Extensive and Intensive Margins

Panel A	(log) number of destinations by Product-Year	(log) average export value across destinations by Product-Year
Producer services	0.045 (0.118)	0.835** (0.417)
Control variables	Yes	Yes
Firm F.E.	Yes	Yes
Product-Year F.E.	Yes	Yes
Observations	92,293	92,293
R-squared	0.397	0.561
Panel B	(log) number of products by Destination-Year	(log) average export value across products by Destination-Year
Producer services	-0.393*** (0.077)	0.025 (0.271)
Control variables	Yes	Yes
Firm F.E.	Yes	Yes
Destination-Year F.E.	Yes	Yes
Observations	154,103	154,103
R-squared	0.461	0.322
Panel C	(log) number of destinations by Firm-Year	(log) average export value across destinations by Firm-Year
Producer services	-0.259 (0.371)	-2.167 (1.795)
Producer services \times SII	-0.080 (0.621)	3.416* (1.821)
Control variables	Yes	Yes
Firm F.E.	Yes	Yes
Year F.E.	Yes	Yes
Observations	12,758	12,758
R-squared	0.874	0.884
Panel D	(log) number of products by Firm-Year	(log) average export value across products by Firm-Year
Producer services	-0.187 (0.260)	-1.119 (1.160)
Producer services \times SII	1.082** (0.544)	2.439 (1.621)
Control variables	Yes	Yes
Firm F.E.	Yes	Yes
Year F.E.	Yes	Yes
Observations	12,758	12,758
R-squared	0.890	0.929

Note: A constant is included in all regressions. Panel A controls for firm and product-year fixed effects, Panel B controls for firm and destination-year fixed effects, and Panel C and Panel D control for firm and year fixed effects. Robust standard errors are reported in parentheses and are clustered at the product-year level in Panel A, the destination-year level in Panel B and the city level in Panel C and Panel D. ***, ** and * indicate statistical significance at the 1, 5 and 10 percent levels, respectively.

connects services to export performance. There are already a few pieces that we have discussed in the introduction, which consists of firm-level input of services loosely related with export performance for French firms. There is also some evidence that at the industry level input-output tables linking service industries to manufacturing industries show a connection between service intensities in manufacturers and higher participation in global value chains. Much of these contributions in the theoretical literature have many restrictions in the empirical modelling to draw conclusive answers on the relation between services in exporting and participation in global value chains. So probably the way forward, and therefore the main contribution of this paper, is that we have to build the back of circumstantial evidence which all in itself are somewhat limited contributions but together provide a substantive case that services matter for internationalisation of firms.

The analysis also has some important policy implications, especially in the context of China. Many policymakers are well aware that after initial stages of exporting manufacturing goods, moving up in value chains as well as creating sustainable competitive advantages and deeper penetration export markets require the transformation to a setting in which services play a more prominent role. Traditionally, in emerging markets, services are associated with logistics and infrastructure that supports trade. By focusing on the importance of access to professional services, our paper changes somewhat the policy focus towards intangible value propositions that improve the offering and reduce information gaps in exporting decisions as being of prime importance for moving to the next stage of economic development. The buildup of the service economy next to being a manufacturing powerhouse is an essential shift in policy objectives in China, which may also include substantial market access for foreign service providers. This last point also calls for a multilateral effort to put services trade that supports manufacturing exports as being a prime objective for the coming years.

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