

Benz, S., A. Khanna and H. Nordås (2017-01-20), "Services and Performance of the Indian Economy: Analysis and Policy Options", *OECD Trade Policy Papers*, No. 196, OECD Publishing, Paris.
<http://dx.doi.org/10.1787/9259fd54-en>



OECD Trade Policy Papers No. 196

Services and Performance of the Indian Economy

ANALYSIS AND POLICY OPTIONS

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Anupam Khanna,
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Abstract

SERVICES AND PERFORMANCE OF THE INDIAN ECONOMY: ANALYSIS AND POLICY OPTIONS

Sebastian Benz, Anupam Khanna, and Hildegunn Kyvik Nordås

This paper highlights India's unique services export led growth path. Observing that Indian business services have helped manufacturers all over the world to become more efficient and productive, it raises the question how Indian business services can do the same for local manufacturers and thus support the Make in India initiative. The paper also explores the potential for broadening the export base in services. The services sector that appears to have the largest prospect for unleashing the potential of both manufacturing and knowledge intensive business services is the telecommunications sector, particularly broadband internet services. In addition reforms in the distribution sector that enable multi-channel wholesale and retailing could facilitate the development of marketing channels for SME manufacturers both across the vast Indian market and abroad. Reforms in the logistics sector would further improve the competitiveness of local manufacturers producing time-sensitive goods including inputs to global value chains. Finally, competitiveness in knowledge-intensive services is obtained through knowledge sharing across borders. A prerequisite for broadening the export base in these sectors is openness to foreign professionals. The set of proposed recommendations emerging from this analysis underlines the importance of streamlining sector-level regulatory frameworks in all sectors to encourage foreign entry and competition, and the role that cross-cutting improvements in the trade and business environment would play to render services providers as well as down-stream manufacturers more competitive.

Keywords: Trade policy, services trade restrictions, competitiveness, services, trade in manufacturing, India.

JEL Codes: F13, F14, F15, F60, L80, O53.

Acknowledgements

The paper has benefitted from comments from workshop participants at the Centre for Policy Research in New Delhi, and from discussion at the OECD Working Party of the Trade Committee, which has agreed to make the study more widely available through declassification on its responsibility. The authors are very grateful to Sahil Ravgotra for research assistance, Ken Ash, Carmel Cahill, John Drummond, Isabelle Joumard, H.A.C Prasad, Dorothée Rouzet and Sebastián Sáez for useful comments and inputs. The study was conducted with funding by the United Kingdom.

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Executive Summary

India's services export led growth since the 1990s is unprecedented. India exhibits a comparative advantage and has run a trade surplus in services since the early 2000s. Its export-oriented services sector is dominated by ICT, where India is among the world's leading exporters. ICT is an important source of employment for skilled workers, but cannot absorb the millions of unskilled workers that enter the labour force every year. Therefore, India is looking to develop its industrial base and attract export-oriented manufacturing investment. This report goes beyond a mere description of India's services trade, towards a holistic analysis of key services sectors and their importance for growth and job creation in India.

The Make in India initiative seeks to develop the industrial base, create jobs and diversify exports. Competitive services markets are essential for meeting the objectives of this initiative. First, India is well placed to seize the opportunities that digitisation and globalisation of the professional services bring. Second, services are crucial inputs to product development, supply chain management, production process support, distribution and marketing of manufactured products. With better internal connectivity of transport, logistics and telecommunications, state-of-the-art Indian business services providers may help local manufacturers improve their products and productivity in the same manner as they have done for countless clients around the world before. By the same token, a more developed Indian industrial base constitutes a new and fast-growing source of demand for sophisticated business services such as engineering, design and R&D. At the same time more open services markets allow local industries to access foreign business services and distribution channels.

India tends to have more restrictive regulation than most other countries covered by the OECD Services Trade Restrictiveness Indices (STRI). A detailed exploration of the services trade policy framework reveals that the general regulatory framework imposes a number of burdensome administrative procedures and time consuming licensing and permit requirements. Foreign investment is permitted in most sectors, but foreign companies cannot have direct ownership in Indian firms. Natural persons who seek to provide services on a temporary basis must obtain a work and residence permit which is subject to economic needs tests. These economy-wide regulations establish a floor on the value of the STRI before sector-specific measures are added.

The STRI scores are particularly high in the services sectors most important for supporting the objectives of the Make in India initiative. Communications services, professional services, financial services and distribution provide important inputs and supply chain support for manufacturers. India has a relatively liberal trade and foreign investment policy in road transport and engineering services but for the other sectors a number of sector-specific limitations and conditions on foreign investment are imposed, which explains elevated scores on the STRI indices. In the case of regulated professions the requirements for obtaining a license are difficult to meet for people with a foreign degree and practice, particularly in legal services and auditing where it is nigh impossible for a foreign supplier to satisfy the conditions.

Services trade barriers hamper services exports at least as much as services imports. A first estimate of the costs of trade restricting regulations facing businesses, calculated as a tax equivalent on the sector's output, range from about 15% for courier services to about 60% in auditing and accounting. In the protected domestic market such costs can be recuperated from consumers and downstream business customers. In more competitive export markets this may not be possible, which is one of the reasons why trade restrictions have an anti-export bias. Model simulations suggest that if India brought its services trade policy stance more in line with

the average for the 44 countries covered by the STRI database, services exports could over time increase by between 15% and 200% depending on the sector, with the largest predicted effect in telecommunications and commercial banking. Being the backbone of the digital economy, telecommunications are essential for trade in all services that can be digitised, and the simulated reforms in the telecommunications sector could over time boost total services exports by 85% and potentially double the exports of business services, compared to a status quo scenario.

Indian manufactured products are ubiquitous globally, but thinly spread mainly at the low-end price range. India's manufacturing exports are highly diversified geographically and in terms of the number of products being exported. However, at the same time the total export volume is relatively small, indicating that exports are thinly spread across markets. Furthermore, the unit prices Indian exporters obtain are significantly lower than the average for the same product and market for all exporters. The policy challenge of meeting the Make in India objectives is therefore not so much diversification of manufactured exports, but rather of scaling up existing export links and moving beyond niches and bridgeheads. For this, delivery reliability is essential. Modern manufacturing markets require the right volume at the right time with close to zero faults, which in turn relies on a strong chain of supporting services.

Connectivity is a key to scaling up manufacturing production and exports. Broadband internet connections have become a necessity for managing supply chains and to access knowledge in modern manufacturing. Globally, a 10% increase in broadband connections from the mean is associated with about 4% higher manufacturing export volumes at about 1% higher unit prices. Broadband connections are particularly important for exports to developed markets such as Germany, Korea and the United States. Entering high-end markets in the apparel, electrical machinery and pharmaceutical industries also relies on access to the Internet. These are all sectors where India has already established pockets of excellence in well-connected clusters of industrial activities. In labour-intensive and price sensitive lower end markets, physical connectivity is crucial. Finally, a 10% better logistics performance would reduce the cost of exporting by about 2%.

Modern retailers connect manufacturers of consumer goods to export markets. Retailers increasingly enter contractual relationships with manufacturers and help them tailor products to consumer tastes and comply with product standards set by the retailers themselves and by governments. In a more open policy regime, modern retailers could connect local manufacturers, including SMEs, both to the vast and fast-growing Indian market and beyond. Caps on foreign ownership and restrictions on combining bricks and mortar and e-retailing may help "mom and pop stores" stay in business for longer, but at the same time they prevent retailers from offering SMEs a channel for marketing their produce beyond the local village.

Simultaneous policy reforms in the communications and distribution sectors could unleash India's export potential in manufactured goods and higher-end professional services. To scale up export linkages, better physical and virtual connectivity inside India's vast market as well as to external markets is needed. Reforms in the transport sectors, particularly railways, ports and maritime transport could significantly reduce the cost of sourcing inputs and reaching customers both inside India and beyond. Removing remaining restrictions on foreign entry and better pro-competitive regulation in fixed line broadband telecommunications would enable manufacturers to better integrate in global value chains and to expand exports in higher-end market segments. The telecommunications regulator has recently initiated a consultation process to improve pro-competitive regulation. This is a timely and important step to modernise regulation. Finally, lifting some of the restrictions in commercial banking, particularly measures such as directed credit schemes could improve access to credit for innovative firms both in manufacturing and services.

1. Introduction

India has pursued a services-led development path and has become one of the major global exporters of business services, notably in the ICT sector. Today India is the fastest growing large economy in the world and possibly one of the economies with the greatest potential for sustained growth and development in the medium term. Indeed, the sheer size of the economy and its young and increasingly skilled labour force suggest that it could also become a driver of global growth.

India's reliance on services as the engine of growth during the transition from a low to a middle income country is unprecedented. Whether this is a benefit or a disadvantage going forward is subject to debate. On the one hand there is concern that India may lose momentum if it misses out on industrialisation. Manufacturing is also seen as the most reliable source of job creation for low and medium skilled workers. Recent economic policies such as the Make in India initiative have therefore focussed on strengthening manufacturing. On the other hand services are essential for the competitiveness of manufacturing as product differentiation, speed to market and responsiveness to changing consumer preferences gain prominence even for low-end manufactured products.

Indian business services exporters have helped improve clients' competitiveness around the world. This study asks under which circumstances they, and other key services providers, could do the same for local clients. It starts by describing shifts in industrial structure over the past decades, documenting the prominent role of services since the mid-1990s. India's strength in global services markets is highly concentrated in ICT and other business services. These use telecommunications networks intensively. India's mobile telecommunications sector is highly competitive and in major cities also fixed line internet connections are available for businesses. Nevertheless, the fixed internet coverage is poor for most of the country. Improving this is one of the key factors that would help India build on its strengths and expand the benefits to new sectors and regions of the country.

The virtual connectivity that telecommunications provide is a necessary but not sufficient condition for India to build on its existing strengths. Better physical connectivity is also required to move parts, components and final products along the value chain in a timely and efficient manner. Investments in infrastructure are of course needed to support growth and development. Such investments take time and considerable resources, but progress can still be made in the short to medium term by better utilization of existing infrastructure. This study focuses on services related trade, investment and competition policies that could support India's objectives of sustainable and inclusive growth and job creation. It shows that open and well-regulated services markets not only improve physical connectivity in the short run, but could potentially also raise the return to infrastructure investment in the long run.

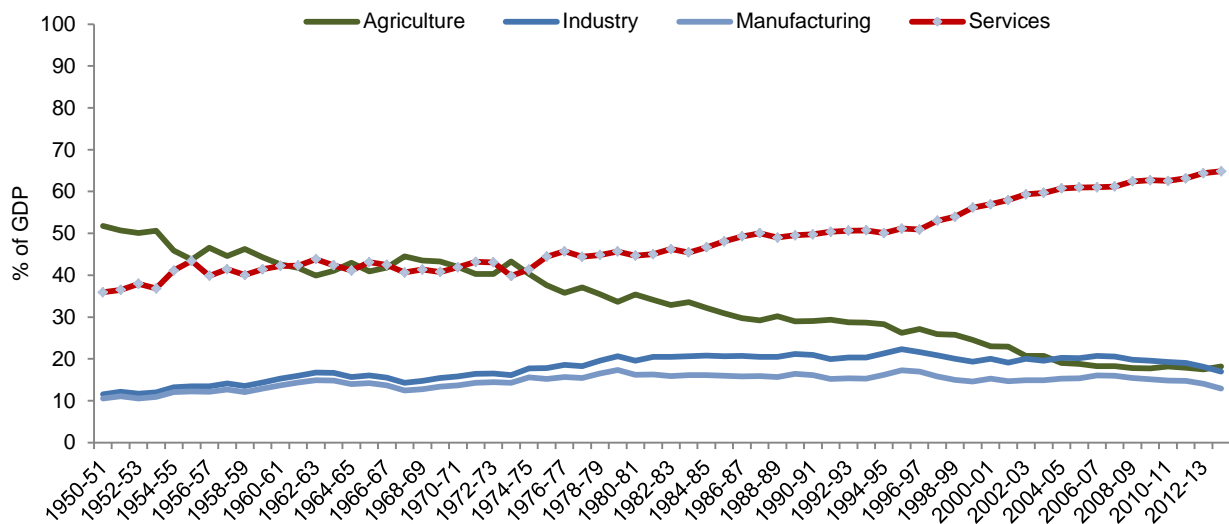
India has a strong comparative advantage in ICT-related services. Business process outsourcing and business process management have been the most important services sectors in the past and still account for the bulk of India's IT-enabled services exports. However, with better telecommunications connectivity, design and engineering could potentially become a new source of services exports. Furthermore, local demand for such services from the manufacturing sector could provide the scale that a diversified and competitive engineering sector needs.

The rest of the study is organised as follows: The next section sets the stage by describing the role of services in the Indian economy going back several decades. Section three presents patterns of services trade and investment while section four focuses on the role of services in trade in value added. Section five provides an in depth comparative analysis of India's service trade policy relative to nine other large countries. The analysis focuses on the services that play the most important role in supporting manufacturing production, marketing and trade, i.e. communication, distribution, finance and business services. The policy analysis is followed by impact analysis of services sector reforms for services trade and domestic competition in services in section six and downstream manufacturing sectors in section seven. Section eight offers concluding remarks and draws some tentative policy conclusions.

2. The role of services in India's economy

Services have played a more important role in India's economic development than in any other major economy. The literature describes economic development as a shift from an agrarian economy dominated by subsistence farming to an industrialised economy with a rising share of services in GDP. This is a virtuous cycle starting with rising productivity in farming, which releases labour to urban manufacturing and services. The services sector begins to gain ground as a share of GDP first during the early phase of industrialisation, where traditional services such as transport, distribution and public administration support and drive urbanisation and complement the rise of manufacturing. A second wave of services growth tends to follow when the economy reaches a per capita income level around USD 2000, when demand for modern services such as finance, business services and telecommunications start rising faster than GDP (Eichengreen and Gupta, 2011; 2013a).

Figure 1. GDP by major sector



Source: Central Statistics Office (CSO). Note that services include construction, while utilities are recorded under industry.

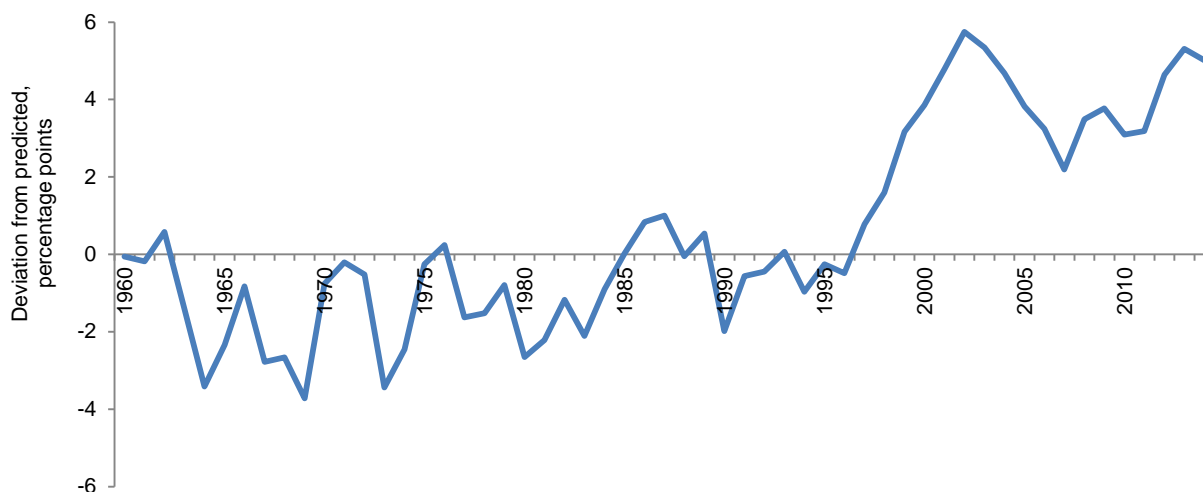
Figure 1 shows the structural changes in the Indian economy from 1950 to the present. After a brief spurt during the mid-1950s, the services share of GDP was pretty much constant at around 43% for more than two decades. In the 1980s the services share started to increase at an accelerating pace, reaching 64.4% in 2013-14.¹

At any point in time, the services share of GDP tends to be higher the richer is the country. The services share of GDP also tends to increase over time for any level of GDP per capita. For instance a country with a real GDP per capita of USD 2000 in 1980 tended to have a lower services share of GDP than a country with the same real GDP per capita in 2014. Estimates of the relationship between the services share of GDP, GDP per capita and a time trend suggest that India's services sector underperformed for most of the period from 1960 to the mid-1990s, as

1. Construction is defined as a services sector in this study. In the literature it is sometimes classified under the industry sectors, which is one of the reasons why the services share of GDP may differ across data sources. The construction sector accounts for roughly 9% of value added in India.

illustrated in Figure 2.² The rising share of service in GDP since the 1980s thus started with a catch-up towards the international norm, while remaining above its predicted level ever since.

Figure 2. Deviation from predicted services share of GDP in India



Note: Predicted services share of GDP has been estimated using the methodology of Eichengreen and Gupta (2013).

The structural changes as far as the services sector is concerned fit into the stylized facts described by Eichengreen and Gupta (2011; 2013a; 2013b), with two caveats. First, the rising share of traditional services came much later than expected, possibly due to protection of small and medium sized enterprises (SMEs) in the retail sector and the dominance of the state in the transport sectors. Second, the expansion of modern services has been faster and started at an earlier level of per capita income than the international norm.

While the services share of GDP has grown rapidly since the 1980s, the services share of total employment has risen at a slower pace and the share of services in total employment was only about a quarter in 2010, up from 20% in 1983 (see Table 1). Growth of services employment was facilitated by a reduction in the employment share of the primary sector, while employment in manufacturing increased at similar rates as employment in services. The fact that 25% of all employees in India account for 65% of GDP means that on average labour productivity is much higher in the services sectors than in the rest of the economy and also was growing faster in the last three decades. While much of this increase in labour productivity may be due to the growing importance of sectors with high labour productivity, such as computer services. In fact the fastest labour productivity growth during the past three decades was recorded in the telecommunications sector, increasing more than 14-fold, followed by manufacturing of electrical and optical equipment, which is one of the manufacturing sectors that uses telecommunications services most intensively.³

Employment in services increased by around 10% between 1983 and 2000, followed by an additional increase of 10% during the period 2000 to 2010. Starting from a low level in 2000, financial intermediation and real estate, renting and business activities, grew much faster than other services sectors, reflecting an emerging transition towards modern services.

2. The regression equation predicting the services share of GDP reads as follows: $\frac{S}{GDP} = a_0 + a_1 \ln GDP + a_2 \ln GDPcapita + a_3 \ln GDPcapita^2 + a_4 \ln GDPcapita^3 + a_5 \ln GDPcapita^4 + dum_{70-89} + dum_{90-04} + dum_{05-14} + \gamma_i$. The last four terms are period dummies and country fixed effects.
3. Labour productivity data are calculated by authors from the World KLEMS database.

Modern services, particularly the ICT sector have largely depended on international demand for its growth. For example, about a third of computer and related services produced in India is exported, while as much as 80% of R&D and other business activities are exported.⁴ There is therefore ample scope for continued growth in these sectors supported both by growth in demand from the local manufacturing sector and exports of digitised professional services.

Table 1. Employment distribution in India

Sector	1983	1987-88	1993-94	1999-00	2004-05	2009-10
Primary/Agriculture	64.6	62.4	62.0	61.7	58.5	53.2
Secondary/Manufacturing	14.6	15.7	15.2	15.9	18.1	21.5
Tertiary/Services	20.4	21.2	22.0	22.4	23.4	25.3
Wholesale and retail trade; repair of motor vehicles, motorcycles & personal & household goods	7.2	7.8	8.1	8.7	9.0	9.5
Hotels and restaurants	-	-	-	1.1	1.3	1.3
Transport, storage and communications	2.9	3.0	3.1	3.5	3.8	4.3
Financial intermediation	-	-	-	0.5	0.6	0.8
Real estate, renting and business activities	-	-	-	0.6	0.9	1.3
Public administration and defence; compulsory social security	-	-	-	2.5	1.8	2.1
Education	-	-	-	2.0	2.4	2.6
Health and social work	-	-	-	0.6	0.8	0.8

Source: National Sample Survey Organization, Surveys on Employment, Various Rounds.

3. Services trade and investment in India

Patterns of services trade and foreign investment

India's trade in services has grown rapidly in the last two decades. As is shown in Figure 3, services exports skyrocketed from less than USD 3 billion in 1991 to USD 150 billion in 2013. Imports grew at a similar pace to a volume of USD 125 billion. This pattern can be explained by India's transition to a service oriented economy, liberalisation of the economy and the establishment of ITC infrastructure in major cities. During this period services trade in India grew much faster than the global volume, allowing the country to more than quadruple its share in world services trade from 0.7% to 3%. Since the early 2000s India has remained a net exporter of services while it had a negative trade balance in services during the 1980s and 1990s.

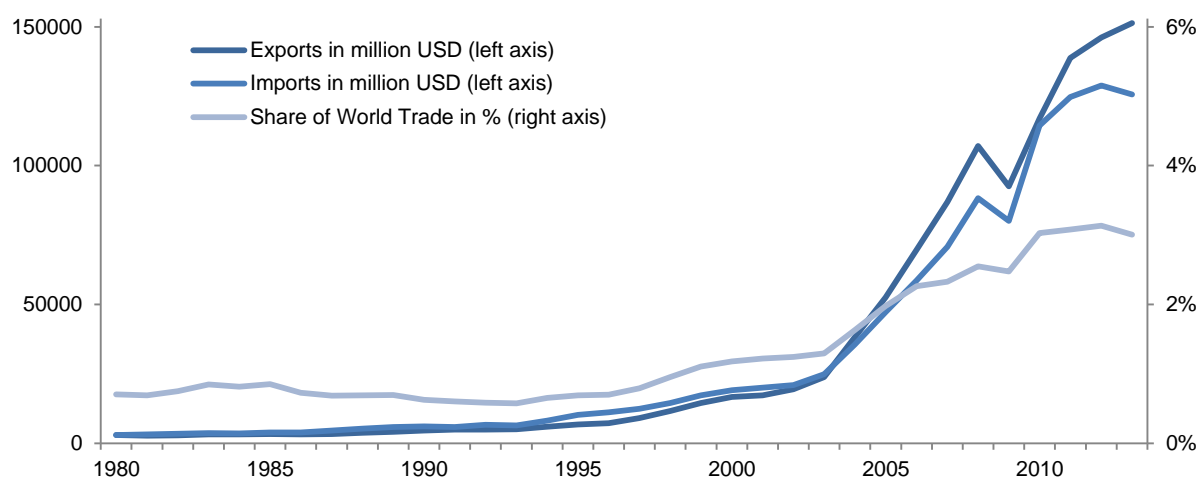
The composition of services trade by sector is presented in Table 2. The export side is dominated by computer services and other business services which combined account for about two thirds of India's services exports. The contribution of these two services categories to total services trade has remained relatively stable during the last decade, Travel and transport services are other important export categories, but while transport and travel account for about half of world services exports, they account for less than a quarter of India's services exports, underscoring its strength in modern services.

4. The export shares are calculated from the Indian input-output table for 2011 from OECD.stat.

On the import side, transport services figure most prominently, followed by other business services and travel services. Also financial services and insurance services account for a significant share of services trade. Moreover, financial services are one of the few sectors that managed to notably increase its contribution to total exports of services. Charges for the use of intellectual property are important as a share of imports, while their contribution to exports is negligible. A growing contribution of charges for the use of intellectual property to total services imports might be due to a rising importance of the manufacturing sector, which often relies on foreign technology that is licensed or transferred within affiliated companies. Computer services only represent a minor share of imports, indicating the high degree of competitiveness of this sector in India.

India has held a strong position in the global ICT services market for a long time. Already in 2005, the country accounted for more than 8% of world exports in this sector. Most recent data reveals that roughly 12% of world exports of ITC services originate from India. Bearing in mind that India's share of world GDP was only 2.6% in 2014, the country clearly punches above its weight in global services markets and in particular in ITC services. It is, however, worth noticing that India's share of world services exports peaked around 2011 in all services sectors except construction. A possible loss of momentum will be related to policy developments in Sections 5 and 6.

Figure 3. Services trade in India, 1980-2013



Source: UNCTAD Stats

Table 2. Services trade by sector, in %

		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Transport	X	12.53	12.46	11.80	12.07	12.09	11.34	12.78	12.03	11.38	11.92
	M	44.28	43.00	44.56	49.22	44.40	40.56	46.33	46.64	45.26	46.13
Travel	X	14.36	12.43	12.40	11.16	11.99	12.38	12.78	12.35	12.38	12.61
	M	13.12	11.70	11.71	10.95	11.59	9.14	10.96	9.52	9.16	11.43
Construction	X	0.66	0.89	0.87	0.79	0.87	0.45	0.61	0.63	0.82	1.03
	M	1.28	1.36	1.04	0.80	1.34	0.87	0.91	0.84	1.10	0.89
Insurance and pension services	X	1.80	1.60	1.74	1.47	1.63	1.52	1.87	1.55	1.44	1.46
	M	4.94	4.57	4.54	4.94	5.00	4.36	4.95	4.95	4.70	4.66
Financial services	X	2.19	3.39	3.90	4.05	3.89	4.98	4.51	3.68	4.29	3.61
	M	1.84	3.33	4.61	4.04	4.68	5.92	6.63	4.12	4.67	3.22
Charges for the use of intellectual property n.i.e.	X	0.39	0.09	0.19	0.14	0.21	0.11	0.22	0.22	0.30	0.42
	M	1.42	1.45	1.65	1.74	2.31	2.13	2.25	3.08	3.09	3.80
Telecommunication services	X	1.50	1.57	1.36	1.17	1.83	1.29	1.18	1.12	1.47	1.38
	M	0.44	0.52	0.61	0.60	1.21	0.95	1.07	0.74	0.87	0.82
Computer services	X	30.50	30.33	31.21	33.04	34.32	32.80	32.70	32.29	33.99	34.09
	M	2.22	3.07	4.41	3.86	2.01	1.90	1.00	1.62	1.81	2.26
Information services	X	0.31	0.43	0.53	0.78	0.49	0.51	0.13	0.13	0.12	0.15
	M	0.46	0.27	0.70	0.46	0.81	0.31	0.48	0.32	0.29	0.30
Other business services	X	34.90	35.96	35.05	34.30	29.71	29.49	27.83	32.36	31.16	30.27
	M	28.78	29.76	25.33	22.45	21.00	22.22	20.10	23.06	22.14	21.05

Note: Services exports by sector as share of total services exports (in %) and services imports by sector as share of total services imports (in %).

Source: Authors' calculations based on WTO data.

Table 3. India's contribution to world services exports by sector, in %

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Transport	1.12	1.33	1.31	1.40	1.57	1.61	1.96	1.91	1.79	1.91
Travel	1.09	1.15	1.23	1.23	1.27	1.51	1.65	1.61	1.54	1.52
Construction	0.75	1.10	1.07	0.88	0.92	0.61	0.89	0.96	1.25	1.53
Insurance and pension services	1.45	1.41	1.69	1.53	1.50	1.86	2.35	1.95	1.73	1.70
Financial services	0.53	0.89	0.98	1.22	1.15	1.75	1.64	1.42	1.57	1.33
Charges for the use of intellectual property n.i.e.	0.12	0.03	0.08	0.06	0.09	0.05	0.11	0.12	0.15	0.21
Telecommunications, computer, and information services	8.12	9.23	9.79	11.10	10.62	12.03	12.07	11.80	11.86	11.45
Other business services	3.52	4.17	4.23	4.48	3.69	4.31	4.10	4.84	4.46	4.23
Total Services	1.96	2.31	2.41	2.63	2.58	2.99	3.13	3.20	3.08	3.04

Source: Authors' calculations based on WTO data.

The levelling off of services export shares depicted in Table 3 is also reflected in weakening comparative advantage in services as measured by the Balassa index of revealed comparative advantage. Simply put, the index compares the share of a sector in a country's total export to the share of the same sector in global exports. An index value above unity reveals comparative advantage, and the higher the index the stronger is the revealed comparative advantage.⁵ The indices for India's main services sectors are presented in Table 4. They confirm the strong comparative advantage of computer and information services for which the index value in 2014 indicates that the sector is almost four times more important for services exports in India than for services exports around the world. Only two out of eight services sectors demonstrate a revealed comparative advantage in 2014. These are, however, advanced modern services with a large potential for future growth. The shift towards modern services is further underscored by a growing competitiveness in financial services, where the index increased from 0.27 in 2005 to around 0.5 in most recent years.

Table 4. India's revealed comparative advantage in services trade

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Transport	0.57	0.58	0.54	0.53	0.61	0.54	0.63	0.60	0.58	0.63
Travel	0.55	0.50	0.51	0.47	0.49	0.51	0.53	0.50	0.50	0.50
Construction	0.38	0.48	0.44	0.34	0.36	0.20	0.28	0.30	0.40	0.50
Insurance and pension services	0.74	0.61	0.70	0.58	0.58	0.62	0.75	0.61	0.56	0.56
Financial services	0.27	0.38	0.41	0.46	0.45	0.58	0.52	0.44	0.51	0.44
Charges for the use of intellectual property n.i.e.	0.06	0.01	0.03	0.02	0.03	0.02	0.03	0.04	0.05	0.07
Telecommunications, computer, and information services	4.13	4.00	4.06	4.22	4.12	4.02	3.86	3.69	3.85	3.76
Other business services	1.79	1.80	1.75	1.70	1.43	1.44	1.31	1.51	1.45	1.39

Source: Authors' calculations based on WTO data.

Growth of India's services sector is backed by inflows of foreign direct investment (FDI) which have increased from USD 4 billion in 2000 to USD 34 billion in 2014. Bearing in mind the size and growth rate of the Indian economy this is quite modest.⁶ Around 40% are invested in services in recent years while the distribution of FDI inflows across the services sectors differs substantially from year to year. High volatility is a general attribute of FDI inflows, however, and not specific to India.

For example, the other services category, which comprises financial services and the outsourcing business, absorbed around 20% of all FDI inflows into India between 2000 and 2012, whereas in 2014 it only accounted for around 10% of FDI inflows. In contrast, the telecommunications sector experienced large inflows in 2014 while FDI activity in this sector was low during the immediately preceding years. This can be explained by a policy change in 2014, allowing for 100% foreign equity in telecommunication services, including telecommunication infrastructure providers. The trading (wholesale and retail distribution) sector absorbed 10% of FDI inflows in 2014, up from less than 2% in the period from 2000 to 2011. Construction was one of the most important recipients of FDI inflows during the first decade of the 21st century but has lost

5. The index is calculated as $RCA_{ij} = \frac{x_{ij}/X_{it}}{x_{wj}/X_{wt}}$, where x_{ij} stands for exports of services j in country i (India), X_{it} stands for total service exports of country i (India), x_{wj} refers to world exports of services j and X_{wt} are total world exports of services (Balassa, 1965).

6. For comparison FDI inflows to China and Brazil stood at USD 250 billion and USD 65 billion respectively in 2015.

importance since then. The hotel and tourism sector experienced a surge in inflows in 2012 but only very little foreign direct investment in all other years.

Table 5. FDI inflows in services

Sector	2000-2011	2012	2013	2014
Total FDI equity inflows (in billion USD)	229	27	31	34
Percentage				
Total FDI equity inflows	100	100	100	100
Other Services*	19.08	20.78	10.52	10.24
Telecommunications	7.62	0.35	1.37	13.38
Trading	1.82	2.77	3.15	9.96
Computer Software and Hardware	6.55	2.83	2.83	5.45
Construction**	11.62	10.46	5.34	3.53
Hotel & Tourism	1.95	14.88	1.72	2.78
Hospital & Diagnostic centres	0.67	1.74	2.89	1.35
Consultancy Services	1.17	0.68	0.88	1.74
Maritime Transport	0.67	0.29	0.18	0.55
Information & Broadcasting	1.54	2.38	2.57	0.78

Notes: * Financial, banking, insurance, non-financial business, outsourcing, R&D, courier, technology testing and analysis, other; **Combined with infrastructure activities and townships, housing, built-up infrastructure and construction-development projects.

Source: RBI, SIA Newsletters, DIPP.

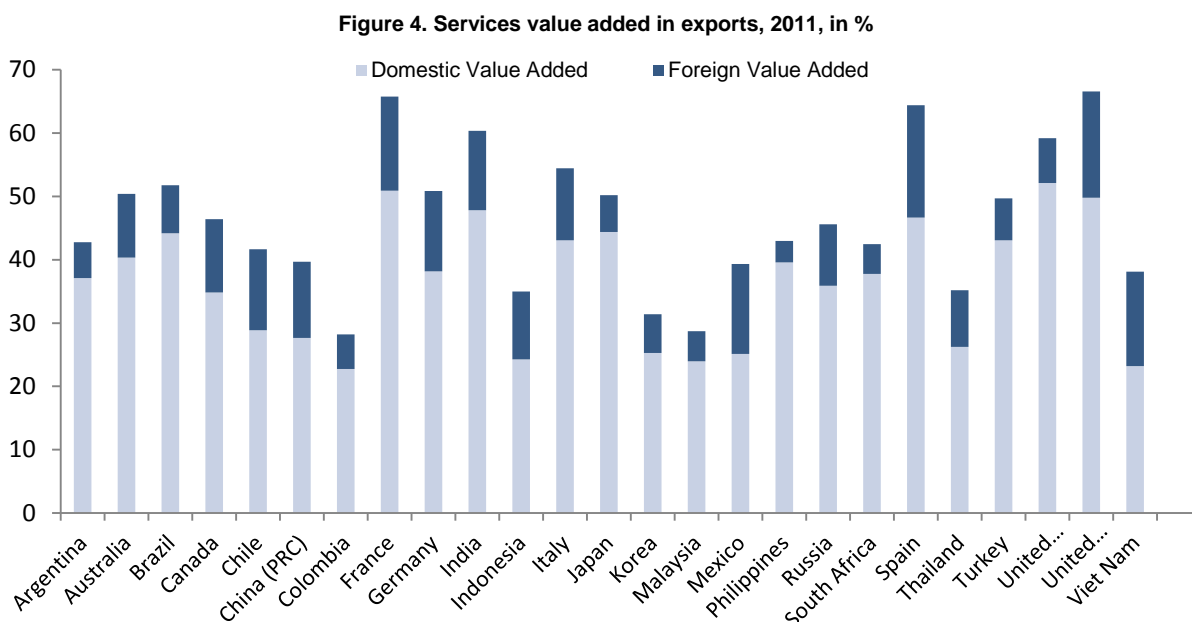
Several studies analyse how inward FDI may strengthen exports in the host country. First, foreign investors bring technology and management skills that improve productivity in the targeted firms (Arnold and Javorcik, 2009). Second, knowledge spillovers to neighbouring firms or to suppliers of intermediate inputs can help spread this beneficial effect through the economy (Javorcik, 2004). In particular, there is evidence that inward FDI fosters exports by leading to an increase of the unit values of export products, indicating higher product quality (Harding and Javorcik, 2012). The evidence on this mechanism for India is scant, but Saleena (2013) concludes that FDI inflows contribute positively to services exports growth.

This section has shown India's trade in services have grown rapidly during the past three decades and that India's contribution to world services exports is higher than its contribution to world GDP. Average growth of exports was slightly higher than that of imports, giving rise to a trade surplus in services. Exports of services are dominated by the ITC and other business services sectors, where India is one of the world's largest exporters. In contrast, imports of services are more evenly distributed across the different services categories.

4. The role of services for trade in goods

International trade within global value chains has been one of the major driving forces behind the spurt in trade relative to GDP over the past two decades. The trade in value added (TiVA) database has shed light on the deepening international division of labour manifested in a rising share of intermediate inputs in international trade flows. One of the most surprising findings from this work is the prominence of services in international trade when the contribution of services to value added is taken into account.

The TiVA data enable us to identify the sources of value added at each stage of production broken down by the country and by the industry where the value adding activity came from. Figure 4 shows the contribution of services value added to total exports, broken down on local and foreign sources in selected countries, latest year available. It is noted that the contribution of services value added in India's exports is among the highest in the sample. In 2011 the share was 57%, up from 48% in 1995. Most of the services value added in India's exports comes from domestic services providers, while foreign services value added accounts for less than 10% of Indian exports.



Source: Authors' calculation based on OECD-TiVA database.

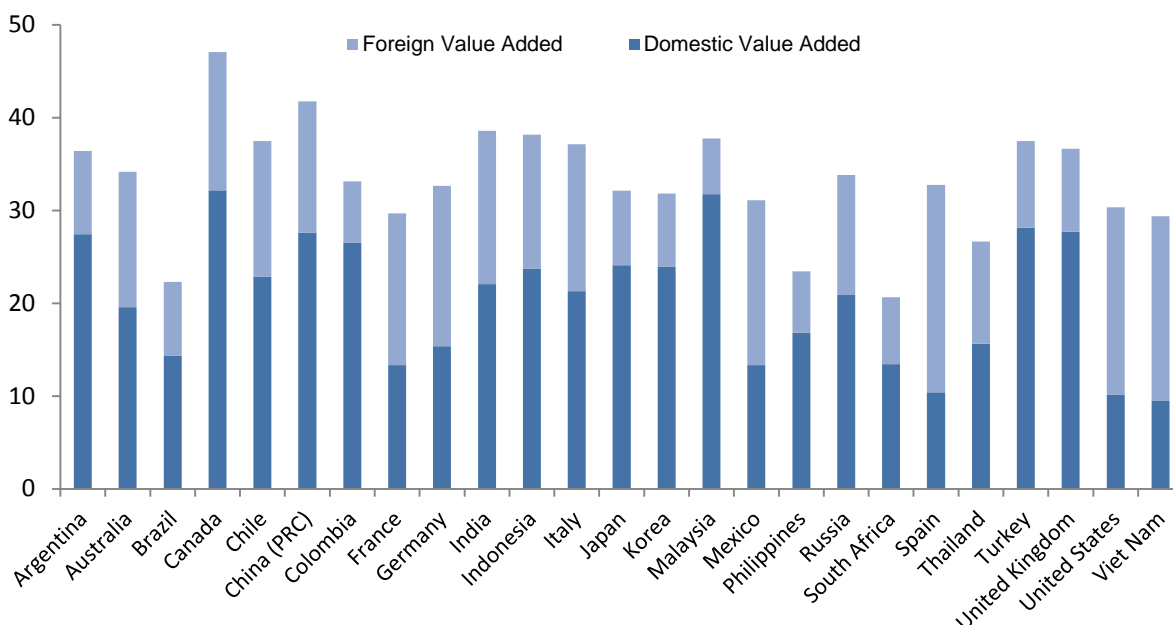
Figure 5 takes a closer look at the services value added in manufacturing exports for the same countries and year. At 33%, the services intensity of Indian manufacturing exports is at a similar level as the other countries in the sample. Also the foreign services share, at around 12% of the value added in manufacturing exports, is around the average. The higher share of services in total value added exports (Figure 4) than in manufacturing exports (Figure 5) reflects direct exports of services, as discussed in the previous section. By the same token the low foreign share in Figure 4 reflects that foreign value added in services exports is very low in India, only 7% in 2011.

The next step in describing the role of services for trade in goods focuses on 16 manufacturing sectors in more detail.⁷ A break-down of services value added on services categories in various manufacturing sectors is presented in Figure 6. The contribution of different types of services into different manufacturing sectors is surprisingly similar. While some sectors rely less on services

7. The share of services value-added in India's exports of agriculture and mining is negligible.

inputs (Coke, refined petroleum products, electricity) than others, the differences seem to be in terms of a scale parameter rather structural differences. In all sectors, wholesale and retail trade is the most important services input, followed by transport and storage and financial intermediation.

Figure 5. Services value added in manufacturing exports, 2011, in %



Source: Authors' calculation based on OECD-TiVA database

The similarity in the importance of different services inputs across manufacturing exports may indicate that services constitute a bundle of not easily substitutable components, while only the importance of this bundle for manufacturing output varies across sectors. It is, however, also a possibility that the constant proportions reflect a statistical artefact that we observe in the TiVA data due to the lack of precise input-output information for the Indian economy. There is for instance evidence that some sectors use financial services more intensively than others (Guerrieri and Meliciani, 2005), and it is unlikely that they are also proportionally more intensive in all other services. Be that as it may, it is clear that services play an important role as inputs in most manufacturing sectors. In particular, the contribution of value added from distribution services, transport services and financial intermediation for exports of manufactured products is notable.

The relative importance of an input does not always correspond to its share of value added. Some inputs, for instance electricity, telecommunications or rental of machinery may account for a small share of value added, but production would not be possible without them. By the same token, manufactured products cannot be exported without the inputs from transport services. If such essential services account for a higher share in a countries' value added exports relative to other countries, there is the possibility that the services inputs are more expensive, less efficient or both. Furthermore, the cost of inefficient and expensive transport, energy or telecommunications may have to be borne by the exporter, rather than the final consumer, when suppliers from several countries compete intensively in export markets.

Figure 6. Services value added in exports by industry, India, 2011, in %

Source: Authors' calculation based on OECD-TiVA database

The input of R&D services, engineering, design and other business services on the other hand typically contributes to improving the quality of the product so that it may obtain a higher price in the export market. A practical way of looking at the role of services in manufacturing and exports of manufactured products is to distinguish between services that affect the cost of production and transactions, and services that mainly affect the quality of the product. The literature distinguishes between cost services and value services (e.g. Arbache et al., 2016). Of course transporting a good to the consumers that value it the most adds value to it, so there is no sharp distinction between cost and value services. Nevertheless, the distinction is useful bearing in mind that in competitive markets exporters must absorb excessive transport cost and costs of other services that do not change the quality of the product, and thereby reducing their margins at best and prevent them for entering markets outside their region at worst.

5. Indian services trade policy in comparative perspective

This section analyses India's services policy stance in a comparative perspective using the Services Trade Restrictiveness Index (STRI) developed by the OECD. The STRI database records and updates the provisions in laws and regulation of relevance to international services trade through cross-border trade, consumption abroad, movement of natural persons and commercial establishment for 22 sectors and 44 countries, but also captures restrictions only indirectly related to international services trade such as competition policy and regulatory transparency (Box 1).

The STRI database records regulations actually in force and does not take into account preferential agreements. India is party to four regional trade agreements that cover services and that are notified to the WTO (with ASEAN, Japan, Malaysia and Singapore). In addition there is an agreement with Korea. These do not seem to provide market access or national treatment beyond regulations currently in force as far as access to the Indian market is concerned.

India's score on the STRI index for 2016 is presented in Figure 7 along with the average among the 44 countries included in the STRI database, and the score in 2014 and 2015. India has a STRI score above average in all sectors. The chart shows a large variation in trade restrictiveness across sectors, and also as far as the relative importance of the five policy areas is concerned.

Some of the regulations recorded in the STRI database apply to all sectors in the economy, while others apply to specific services sectors. The analysis of India's services trade-relevant policy starts with the measures that apply to all sectors, which are referred to as horizontal measures.

Box 1. The STRI

The STRI database contains a standardised set of measures covering 44 countries and 22 sectors. It can be used for obtaining specific information on a regulation in a particular country and sector as well as comparison across countries or sectors. This information forms the basis for the calculation of composite indices, Services Trade Restrictiveness Indices (STRI), that take values from zero (completely open) to one (completely closed), and gives a snapshot of the trade restrictiveness of regulation in a country and sector at given point in time. The policy measures in the STRI regulatory database are organised under five policy areas:

Restrictions on foreign entry include information on foreign equity limitations, requirements that management or board of directors must be nationals or residents, foreign investment screening, restrictions on cross-border mergers and acquisitions, capital controls and a number of sector-specific measures.

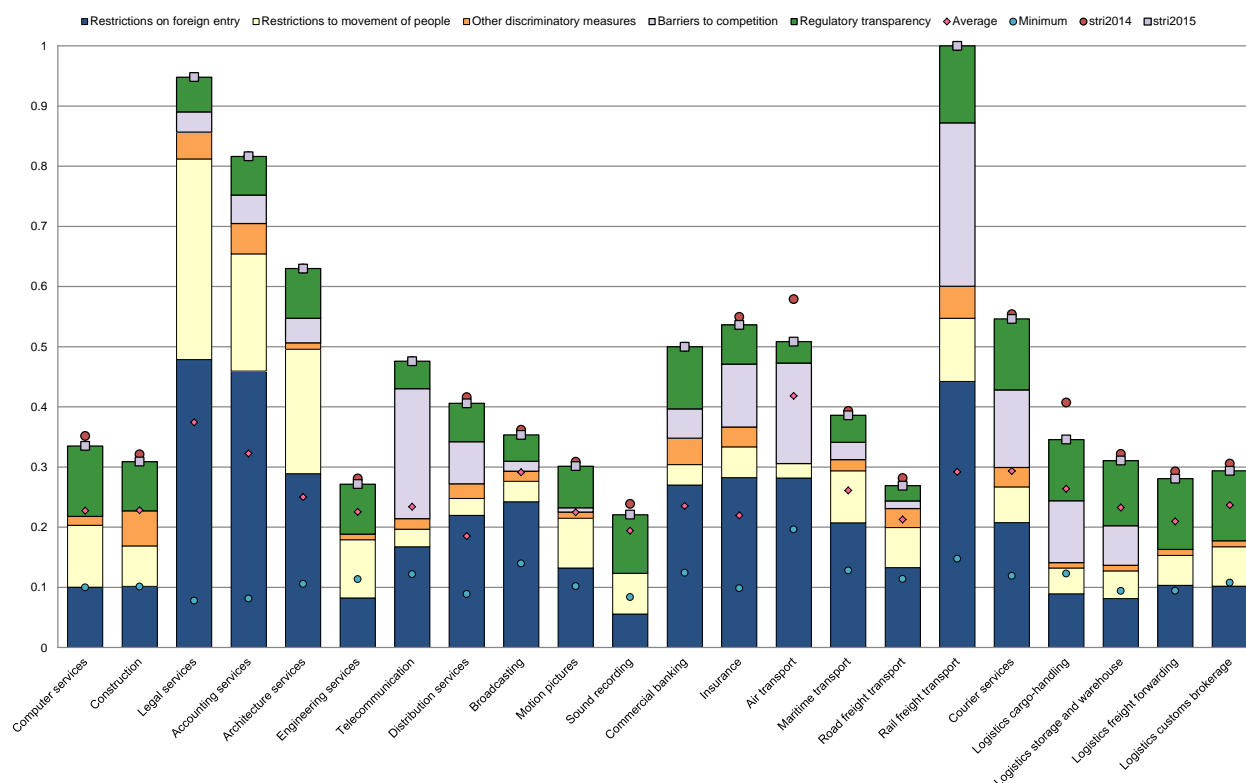
Restrictions on movement of people include information on quotas, economic needs tests and duration of stay for foreign natural persons providing services as intra-corporate transferees, contractual services suppliers or independent service suppliers. These categories are covered by the GATS and have in common that the natural persons are not supposed to seek employment in the host country. This policy area also contains information on recognition of foreign qualifications in regulated professions.

Other discriminatory measures include discrimination of foreign services suppliers as far as taxes, subsidies and public procurement are concerned; and instances where national standards differ from international standards where relevant.

Barriers to competition include information on anti-trust policy, government ownership of major firms and the extent to which government owned enterprises enjoy privileges and are exempted from competition laws and regulations. Sector-specific pro-competitive regulation in network industries also falls under this category.

Regulatory transparency includes information on consultations and publications prior to entering into force of laws and regulations. It also records information on administrative procedures related to establishing a company, obtaining a license or a visa.

Figure 7. STRI score by sector and policy area, India, 2016



Note: The STRI indices take values between zero and one, one being the most restrictive. They are calculated on the basis of the STRI regulatory database which contains information on regulation for the 35 OECD countries, Brazil, China, Colombia, Costa Rica, India, Indonesia, Lithuania, the Russian Federation and South Africa. The STRI database records measures on a Most Favoured Nations basis. Preferential trade agreements are not taken into account. Air transport and road freight cover only commercial establishment (with accompanying movement of people).

Horizontal measures

Foreign investment is governed by the “Consolidated FDI Policy” released annually by the Department of Industrial Policy and Promotion (DIPP), Ministry of Commerce and Industry.⁸ This document contains a positive list of sectors subject to limitations on establishment and operations in the Indian market. Sectors are categorised into two groups: prohibited and permitted sectors. In the permitted sectors investment can take place either through the government route through which prior approval is needed, or the automatic route where no approval is required. In some sectors the automatic route applies up to a certain threshold beyond which approval is needed. Sectors that are not listed in the document are not subject to restrictions on establishment other than those that follow from general provisions and the regulation that applies to the sector in question. With the exception of rail operations, all services sectors covered by the STRI falls under the permitted category.

Foreign investment is subject to horizontal limitations on the manner in which foreign investors may buy and sell shares in Indian companies. First, foreign companies cannot directly own assets or carry out business in India. They must establish a branch office, project office or liaison office to do so. Buying shares from local residents is also subject to pricing guidelines issued by the Security and Exchange Board of India (SEBI). Repatriation of dividends is permitted through authorised foreign exchange dealers only. There are also different procedures depending on the

8. The current version is effective from 7 June 2016.

nature of the investor and the investment. Eligible investors are Foreign Institutional Investors, Foreign Portfolio Investors, Foreign Venture Capital Investor and Non-Resident Indians.

Trade through the **temporary movement of natural persons** is regulated through the Foreigners Act and related regulation.⁹ These establish which documents and permits are needed for the different categories of natural persons and the criteria for obtaining the permits. India applies a relatively liberal regime for business visitors, defined as those coming to India to make sales, establish contacts, participate in meetings, exhibitions, and similar on behalf of a company established abroad. Multi-entry business visas for up to five years validity are available. Each entry can last a maximum of six months. Foreigners who seek to provide a service in India need an employment visa. Such visas are available to highly skilled or qualified professionals if the work they are to perform cannot be undertaken by a qualified Indian citizen. The minimum salary or fee is USD 25 000 per year. Employment visas are issued for one year and can be extended for up to five years.

Foreign services suppliers have access to the **public procurement** market, provided that they register with the appropriate body. India does not yet have national procurement legislation. A public procurement bill (Bill No 58 of 2012) was introduced in 2012, but did not pass the parliament. It was revived in 2015 and at the point of writing it is pending introduction to the parliament. Government procurement procedures are subject to the General Financial Rules of 2005 (GFR) and regulations and procedures at a state level. In addition the Ministry of Finance has developed three manuals for public procurement, for goods, public works and services respectively, which provide detailed guidelines for the tendering process and awarding of contracts. The rules and guidelines do not discriminate against foreign suppliers. It is, however, required that 20% of annual value of goods or services be awarded to micro, small and medium sized enterprises (MSMEs).

Taxes and subsidies are in principle non-discriminatory, although there are some sector-specific deviations from this principle. India has also recently introduced a tax that can be seen as an import tax on certain advertising services. A so-called equalisation levy on on-line advertising was introduced in the 2016/17 budget. From 1 of June 2016 Indian businesses that buy on-line advertising from companies not established in India must deduct 6% of the payment and deposit it to the Indian government. This arrangement applies to business to business transactions exceeding INR 100 000 per year.¹⁰

Most business operations and functions have become digitised. In addition, a host of business services are offered by specialised international services providers that help run integrated and effective operations. Examples are cloud computing, customer services, supply chain management and many more. In recent years, **regulations and limitation on location and transfer of data** have emerged. The regulation typically restricts transfer of personal data with the objective of protecting consumers and their privacy, but many countries define privacy so broadly that the regulations may significantly impair modern cross-border services activities. In India the Information Technology Act of 2000 contains horizontal regulation on data protection and privacy. Under the law, sensitive personal data and information (SPDI) is protected. The law requires that personal data can only be transferred to countries that ensure the same level of privacy protection as India does. More stringent rules apply to financial information and information on health conditions. Given its narrower definition of private information, Indian law is less stringent in limiting data flows than for instance the European Union.

9. The STRI covers regulations affecting intra-corporate transferees, contractual services suppliers and independent service suppliers as defined in the General Agreement of Trade in Services (GATS).

10. See the budget speech (<http://indiabudget.nic.in/ub2016-17/bs/bs.pdf>), paragraph 151. The purpose of this levy is "...to tap tax on income accruing to foreign e-commerce companies from India".

Sector-specific measures

In the following, India's score on the STRI by sector is compared to the ten largest economies in the STRI database. These are Brazil, People's Republic of China (hereafter "China"), Germany, Indonesia, Japan, Mexico, Russian Federation, Turkey and the United States. Size is an important factor when assessing the economic impact of trade barriers. The larger is the economy, the larger and thicker the local market, and the smaller the marginal effect of trade liberalisation (Anderson et al. 2014; Benz, 2016).

The first two sections of this paper showed that India has lagged somewhat behind in the development of traditional services, while taking a leading role in the development of a relatively narrow set of modern services, notably ICT services. Furthermore, the trade in value added analysis shows that distribution services contributes to a large share of value added exports in almost all manufacturing industries, while transport, storage and financial services are also important. Based on these findings the sectors selected for in depth policy analysis are transport and logistics, financial services, distribution services, telecommunications and professional services.

Transport and Logistics

As Figure 7 shows, the regulations affecting foreign participation in logistics and road transport is relatively liberal compared to other sectors in India. In contrast, maritime and air transport services and courier services are relatively restricted, while only a small segment of rail freight services is open to foreign trade and investment. Figure 8 compares India's scores on transport services to the ten largest countries in the STRI database.¹¹ It is noted that in air transport, the level of restrictiveness is relatively high across the board. In general, large countries tend to have a higher STRI in air transport services than smaller countries.¹² A possible explanation is that large countries have larger domestic air transport markets which allow local airlines to operate on an efficient scale, and thus the welfare losses from protecting them may be smaller.

The main contributions to the indices come from the restrictions on foreign entry and the barriers to competition policy areas. Following recent reforms, India is the only country depicted in Figure 8 that does not impose a general foreign equity cap in air transport.¹³ Foreign investment is allowed up to 49% through the automatic route and through the government route above 49%. Foreign airlines, however, can only own up to 49% of invested capital in Indian companies operating scheduled and non-scheduled flights in India. There are a number of additional conditions related to obtaining a scheduled operator permit. To obtain such a permit, the company must be registered and have its principal business in India. The chairman and at least two thirds of the board of directors must be citizens of India, and the substantial ownership and effective control of the company must be vested in Indian nationals. Also Brazil, the Russian Federation, Turkey and the United States require that the majority of board members are citizens. All foreign nationals associated with Indian air transport services must be security cleared. Finally, foreign investment in Air India is not permitted. The main contribution to the score under barriers to competition is government ownership of Air India. Government control of a major airline is also found in China, Indonesia, the Russian Federation and Turkey. The final main contribution to barriers to competition is the slot allocation system which is not based on market principles neither in India nor the other countries depicted in Figure 8.

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11. Cross-border trade in air and road transport is governed by a large number of bilateral agreements which are not yet covered in the STRI database.
 12. A simple regression shows the following correlations between the STRI in air transport and geography: $STRI_{air} = 2.41 - 0.189 \ln(\text{area}) - 0.128 \ln(\text{population}) + 0.012 \ln(\text{area}) \ln(\text{population})$. All coefficients are significant at a 1% level with robust standard errors. The R^2 is 0.452.
 13. In fact only three other countries covered by the STRI database, Australia, Chile and Colombia, have no foreign equity restrictions in air transport.

Also in maritime services are contributions to the STRI concentrated in the restrictions on foreign entry category, but restrictions on the movement of people are also significant. The main sector-specific contributions to India's score are reservation of coastal shipping for Indian flagged and owned vessels and six cargo sharing agreements. The cargo reservations schemes aim at increasing the share of overseas trade carried by Indian vessels and is reiterated in the Twelfth Five Year Plan 2012-17. There is for instance a policy in place for reserving one-third of the petroleum, oil and lubricants and dry bulk cargo in international trade for Indian vessels. The other countries in the sample have similar restrictions on coastal shipping, but cargo sharing agreements are no longer common.

Figure 8. TRI transport services, ten largest countries, 2016

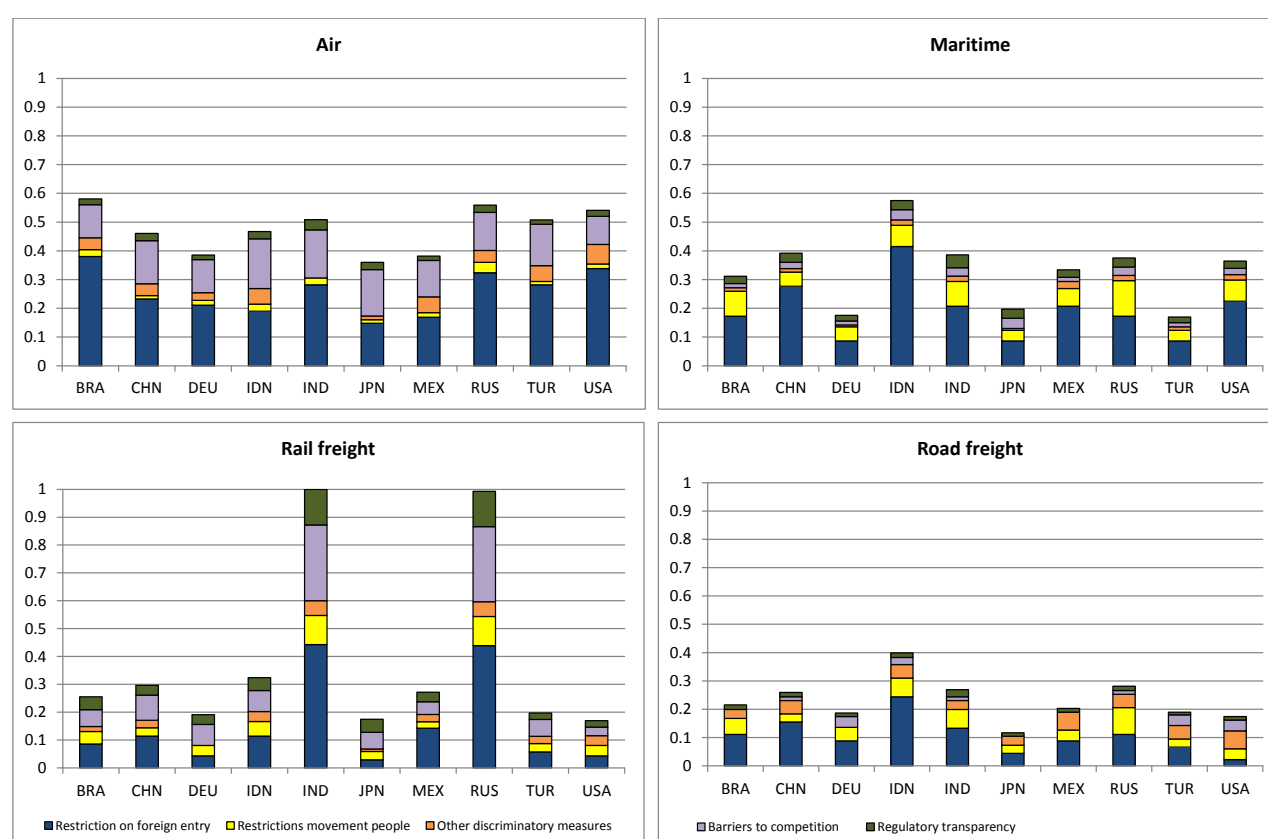
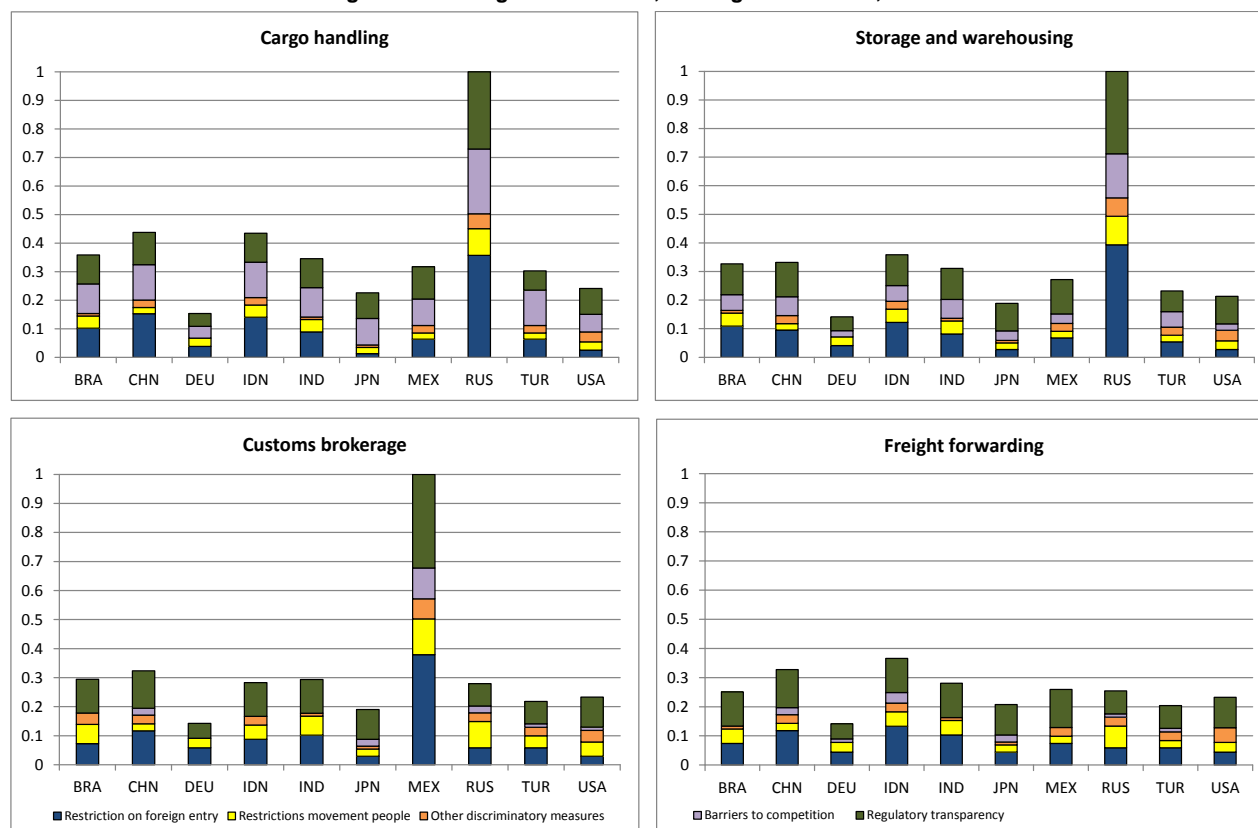


Figure 9. STRI logistics services, ten largest countries, 2016



India's railway sector is subject to quite complex regulations. According to the Consolidated FDI Policy effective from 7 June 2016, railway operations are on the list of prohibited sectors and reserved for Indian Railways, a state-owned enterprise. On the other hand, 100% foreign equity is permitted through the automatic route for construction, operation and maintenance of railway infrastructure. The Ministry of Railways' publications and guidelines (Ministry of Railways, 2014) explain that there are five models through which private, including foreign participation can take place. These are i) Non-Government Private Line Model, ii) Joint Venture Model, iii) Build, Operate and Transfer model, iv) Capacity augmentation with funding provided by customers, v) Capacity augmentation through annuity model. All five models require that the freight operations over the infrastructure are undertaken by Indian Railways, which will pay a user fee to the owner. All five models specify Reserved Services to be provided by Indian Railways. It thus appears that the activities covered by the STRI are reserved for Indian Railways. Transit rights are also very limited rendering the sector closed to foreign trade and investment. Container transport by rail, which accounts for roughly 5% of Indian rail transport has been liberalised recently.¹⁴

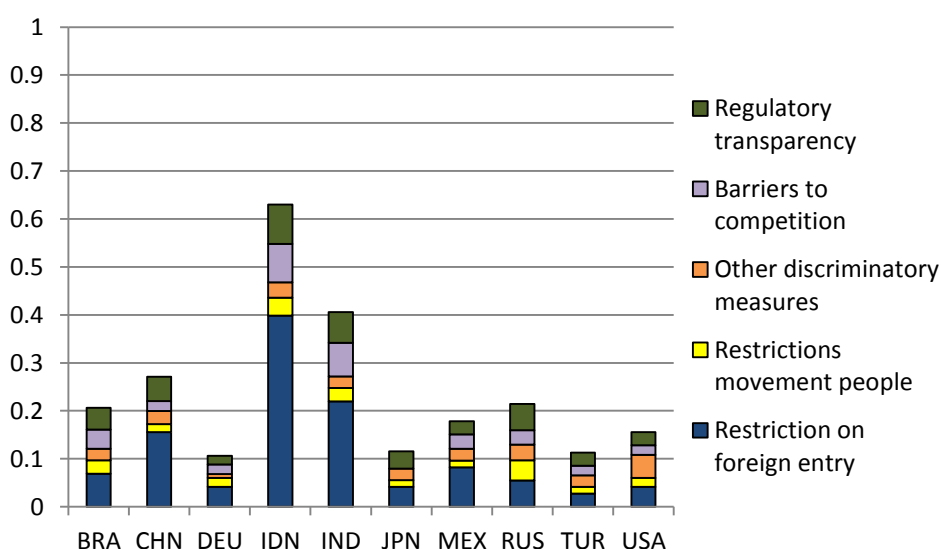
Road transport is fully open to foreign investment and only subject to the general regulatory framework related to foreign investors and movement of natural persons. The same goes for logistics services which are depicted in Figure 9. India is among the most restrictive in customs brokerage and freight forwarding, and in the middle for storage and warehousing and cargo handling. A major state-owned enterprise contributes to the score under barriers to competition in storage and warehousing and cargo handling.

14. Two other countries in the STRI database, Israel and Korea, have a score of one on the STRI for railways.

Distribution services

Distribution services are essential for bringing goods from the producer to the consumer, for job creation and for demand-driven economic growth. In India the sector has been subject to intense policy debate and a host of recent reforms. Nevertheless, as indicated in Figure 10, India has the second highest score and together with Indonesia it is the only country in the sample that maintains a foreign equity cap in this sector. Furthermore, the conditions related to foreign participation in the sector are complex, detailed and may force retailers to employ a different business model than they would have done in the absence of such rules. Thus, retailers have met the opportunities and challenges emerging from e-commerce and the proliferation of platforms on smart-phones by restructuring and combining bricks and mortar and digital commerce in a manner that keeps them in business. Such combinations are not permitted for foreign-owned retailers in India.

Figure 10. STRI distribution services, ten largest countries, 2016



The policy framework distinguishes between cash and carry wholesale trading, e-commerce activities, single-brand product retailing and multi-brand product retailing, for which different access conditions apply. Cash and Carry Wholesale is the most liberal segment with no foreign ownership restrictions throughout India. However, if the retailer has a foreign owner, e-commerce is allowed only for business to business (B2B) transactions, and only for so-called marketplace e-commerce, where the trader does not hold inventory. B2B marketplace e-commerce traders may not source more than 25% of sales from one vendor. FDI is not permitted in inventory-based e-commerce, where a vendor sells on his own account.

Turning to retail distribution there is a distinction between single-brand and multi-brand retailers. FDI up to 49% through the automatic route and up to 100% through the government route is allowed for single-brand retailers. There are several conditions attached, however. For investment under the automatic route, the brand has to be sold in other countries as well, and the branding must be made at the manufacturing stage of the value chain. For FDI exceeding 49% additional conditions apply. These are local sourcing of 30% of the value of goods purchased, preferably from micro, small and medium sized enterprises (MSME). The permit is given for a specific product category. Any addition of new product categories requires a fresh approval. The local content requirement combined with the branding at the manufacturing stage appears to imply that FDI beyond 51% requires upstream investment in manufacturing as well. Nevertheless the government has discretionary power to allow for higher shares of foreign sourcing for high technology products. This flexibility was used in June 2016 with the decision to “relax local sourcing

norms up to three years and a relaxed sourcing regime for another five years for entities undertaking Single Brand Retail Trading of products having ‘state-of-art’ and ‘cutting edge’ technology.” (Prime Minister's Office, Government of India, 2016).

FDI in multi-brand retailing is allowed up to 51% through the government route in states that decide to implement the policy.¹⁵ A minimum investment of USD 100 million is required of which half must be made in back-end infrastructure such as processing, manufacturing, design, quality control and logistics. At least 30% of the value of procurement must be made from Indian MSMEs, and government has first right to procurement of agricultural products. Finally retail sales outlets must be set up only in cities with a population of more than 1 million inhabitants and the retailers are not permitted to engage in e-commerce. Regulations on the retail sector are also found in other countries. Regulation on sales periods and opening hours are not uncommon in OECD countries and both China and Indonesia impose restrictions on the distribution of certain products, the number of sales outlets per firm, restrictions on e-commerce and the permission to offer consumer credit.

Professional services

The STRI covers four professional services (accounting, architecture, engineering, legal services) and the scores on the STRI are depicted in Figure 11. Professional services are typically highly regulated through professional bodies that issue licenses, monitor conduct of professionals and set and uphold professional standards.

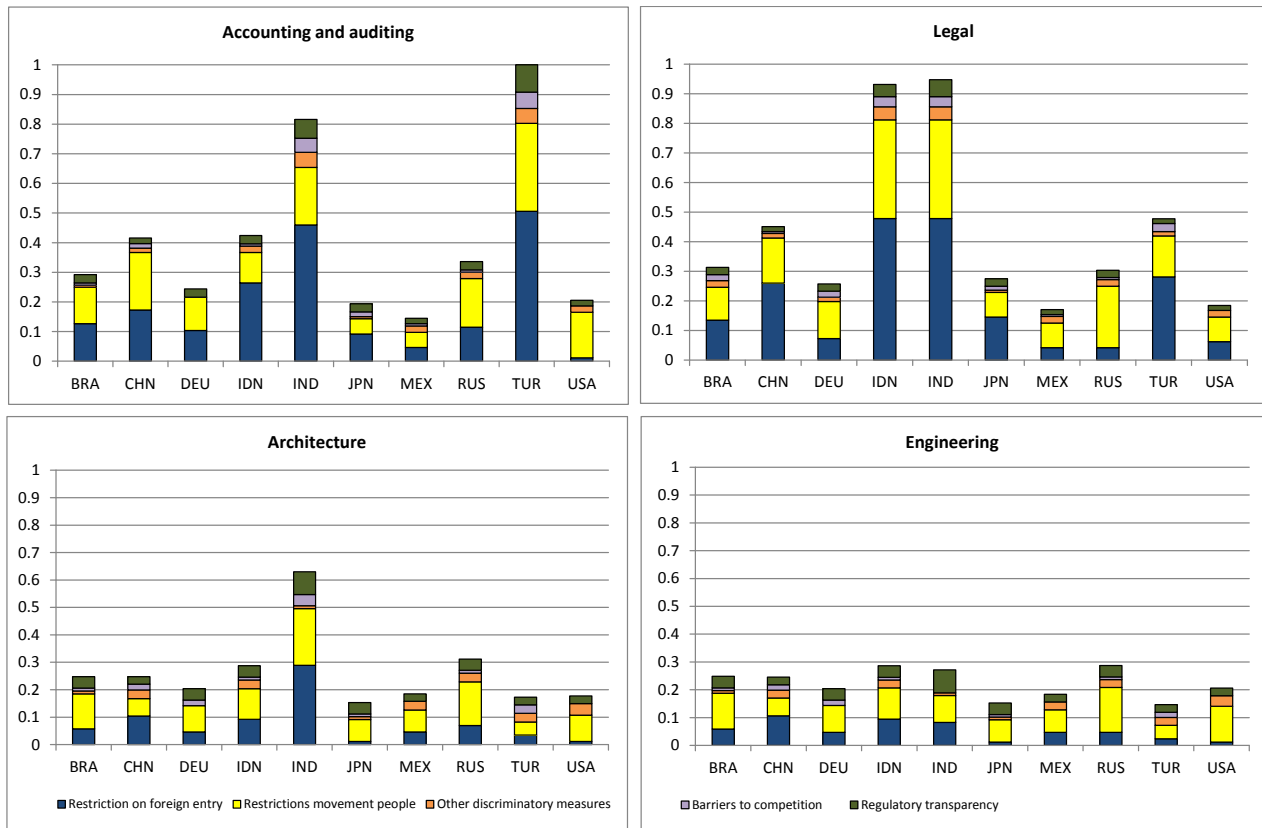
India regulates accounting, auditing, legal services and architecture. Starting with legal services, India reserves both national and international law for licensed Indian lawyers. Furthermore, the license can only be obtained by Indian nationals or citizens. Only licenced lawyers may form and own law firms. Corporations are not permitted in the sector and lawyers may not enter into partnerships or otherwise associate with other professions or foreign lawyers. The only opportunity for foreign legal services providers to do business in India is through business visits to provide legal advice to their clients (fly-in fly-out), which is a small share of the total market for legal services, hence the score of 0.95 on the STRI index. All countries in the STRI database have elements of this type of regulation for domestic law. But what makes India stand out is lack of liberalisation of foreign and international law, which is open to trade in all the other countries depicted in Figure 11.

Auditors and chartered accountants are regulated professions in India. As for legal services, the major restrictions relate to the criteria and procedures to obtain a license. Degrees from Indian higher education institutions or institutions in countries with which India has a mutual recognition agreement are required. In addition, only licenced auditors or chartered accountants may form and own accounting or auditing firms. Foreign auditors or accountants may provide services in India on a short-term basis through limited licensing.

Like legal services auditing is subject to heavy regulation in most countries. In fact, all countries in the STRI database regulate the auditing profession, while accounting is regulated in 25 out of 44 countries. Turning to the sample in Figure 11, only India, Japan and Turkey require that auditing firms must be fully owned by licensed auditors. What makes India and Turkey particularly restrictive is the additional requirement that foreign providers have to completely re-do the university degree, practice and exam locally in order to obtain a license. Brazil, Germany, Indonesia, India, Japan and Turkey require that at least half of the board members must be licenced auditors. The final major restrictions in India are that auditing corporations or commercial associations with other professionals are not permitted. This limitation is also found in Turkey.

15. Hitherto 12 states have chosen to do so (see Consolidated FDI Policy, effective 7 June 2016, pp 40-41).

Figure 11. STRI professional services, ten largest countries, 2016

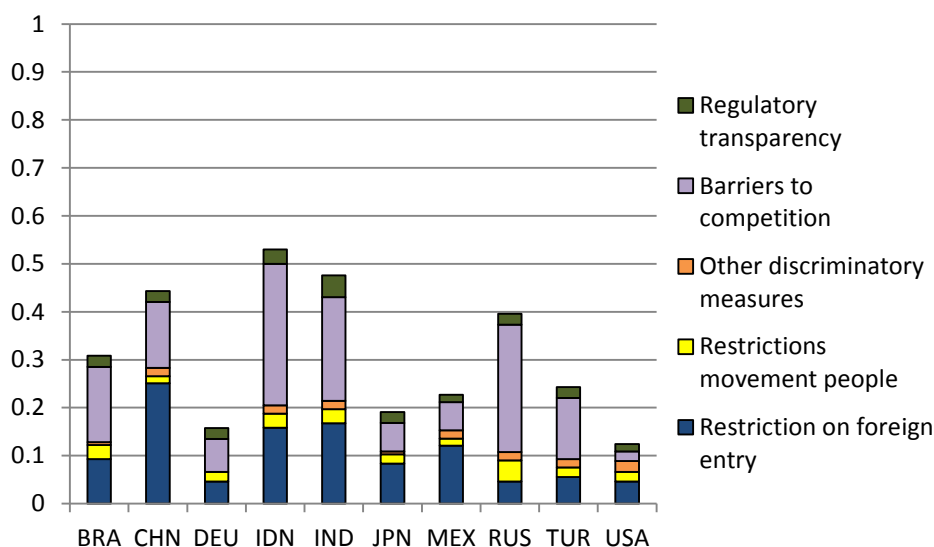


Architects are also a regulated profession in India, but foreign architects have the opportunity to provide services through a limited license system. Finally engineering is not a regulated profession in India, a unique feature among the countries depicted in Figure 11. The sector is thus not subject to sector-specific regulation, at least not at the federal level. Nevertheless, due to the general regulatory environment India's index is still among the highest. Being a skilled-labour intensive sector, restrictions on movement of people carry a high weight in the index for this sector where India's economic needs tests and minimum earnings contribute significantly to the score.

Telecommunications

Telecommunications constitute the backbone of the digital economy in which India has flourished. The sector has been subject to substantive liberalisation over the past years, which is reinforced in the latest Consolidated FDI Policy. Fully owned foreign companies are allowed with up to 49% foreign equity through the automatic route and the government route applies beyond that threshold. As illustrated in Figure 12, India's score is still on the high side and the contribution to the score comes mainly from barriers to competition and the general regulatory framework faced by foreign investors in all sectors. Under barriers to competition, the main contribution to the index comes from lack of best practice pro-competitive regulation in the fixed line segment of the market where the government owns the major supplier. For instance interconnection is regulated through the Telecommunications Interconnection (Reference Interconnect Offer) Regulation from 2002, which mandates interconnection, but largely leaves to the parties to agree on the terms through negotiations. In the fixed line segment the incumbents, two state-owned enterprises, probably have considerable bargaining power. As noted in a recent consultation paper from the regulator, there is a need to review this regulation in the light of the technical and commercial developments that have taken place since 2002, and experience with existing regulation (TRAI, 2016).

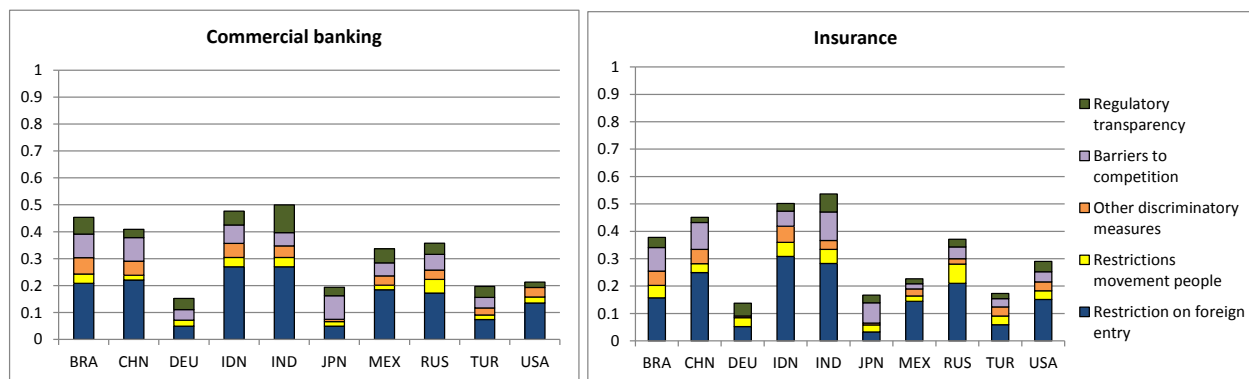
Figure 12. STRI telecommunication services, ten largest countries, 2016



Financial services

Finally, financial services are essential for economic development and growth (Levine, 2005). In particular, financial services are important for the transition from an economy based largely on informal economic activities to activities with access to legal enforcement of contracts and protection of workers' rights, intellectual property and other benefits – in exchange for paying taxes and being subject to the regulatory regime. Figure 13 depicts the STRI for the ten largest countries in the STRI database in commercial banking and insurance.

Figure 13. STRI financial services, ten largest countries, 2016



Out of the 44 countries India has the second highest score in the commercial banking sector and the highest score in insurance. The main restrictions in commercial banking are a foreign equity cap of 74% on private sector banking and 20% in public sector banking. For private banks the automatic route applies to equity investments up to 49% and the government route is required for investments between 49% and 74%. The government route applies to public sector banks. India is the only country in the STRI database that has a foreign equity cap on banks.¹⁶ Nevertheless, wholly owned subsidiaries of foreign banks as well as foreign branches are permitted, which implies that in practice the equity limit applies mainly to acquisition of local banks. Restrictions on

16. Indonesia has a foreign equity cap of 99%.

mergers and acquisitions are also found in Brazil, China and Russian Federation among the countries depicted in Figure 13. The Reserve Bank of India has policies in place to encourage foreign banks to take the subsidiary rather than the branch route, but with limited success. Foreign banks have preferred branches because subsidiaries would not be able to leverage their parents' balance sheets when making big loans, and foreign subsidiaries face limitations on the number of branches they may open.

The majority of the board of directors must be Indian nationals, also for wholly-owned subsidiaries and a third must be Indian nationals resident in India. Commercial presence is required for undertaking the core businesses of a bank, i.e. lending and deposit taking, and the capital control regime affects commercial banks' international activities. The government controls 19 commercial banks, interest rates are regulated, up to 40% of lending must go to priority sectors, and the regulator is not fully independent.

For insurance there is a foreign equity cap of 49% and investment follows the automatic route. Foreign branches are not allowed in this sector. Licenses are subject to economic needs tests and commercial presence is required to do insurance business in the Indian market, although cross-border re-insurance is allowed. Insurance brokers and notaries must have a local license and qualifications from local institutions. Notaries must also be Indian citizens. Life insurance is dominated by a state-owned enterprise and the state also owns a number of significant non-life insurers. Finally, up to 30% of any reinsurance policy must be ceded to a local reinsurer.

Among the other nine countries included in the chart, only Indonesia has an equity cap (of 80%) on reinsurance. China has an equity cap (50%) for life insurance and Russian Federation has a 49% foreign equity cap for life insurance and 51% for non-life insurance. Also China, Russian Federation and the United States have restrictions on cross-border mergers and acquisitions in the insurance sector. All ten countries in the chart require a commercial presence to provide life insurance services in their country.

To summarize this section, India has relatively high scores on the STRI largely because of a general regulatory framework which controls the flow of capital and natural persons. The general framework amounts to a floor for the STRI score in all sectors before sector-specific restrictions are added. The sector-specific requirements are mainly related to licensing, foreign equity caps and prior approval of FDI. It is important to note that very few of the restrictions are unique to India. Indeed most of them are found in some shape or form in OECD countries as well. Thus, rather than being qualitatively different from the OECD countries, it is the accumulated number of trade restricting regulations that explain the somewhat elevated scores on the STRI for India.

6. Impact of services sector reform on trade and on domestic competition

Services exports and imports

Even though the STRI is a relatively new source of information it already has been used in several studies to analyse the relationship of services trade restrictions and cross-border trade in services.¹⁷ By now there exists ample evidence for a statistically robust negative effect of the barriers captured in the STRI on services trade flows and a positive effect on services trade costs. Similar to the existing literature, all results in this section are derived from gravity estimations on sector-level data. The gravity estimation is a standard model in the empirical analysis of trade flows and trade barriers (see Box 2).

This chapter extends existing research by constructing within-country trade flows which are included in the gravity regression in addition to the observed international bilateral trade flows. Technically, these are calculated by subtracting the aggregate value of exports in a sector from the value of production in this sector. To include internal trade flows in a gravity analysis, an otherwise standard gravity equation is augmented by a binary variable indicating international trade, i.e. the variable is zero when the services-producing country is equal to the services-consuming country and one in all other cases.

Box 2. The gravity model

The gravity model, pioneered by Tinbergen (1962), is the most widely used model in the analysis of international trade. Bilateral trade flows are explained by the size of the trading partners and trade costs between them. In that sense, it resembles the gravity forces between two objects, determined by their respective masses and the distance between them. Formally, the relationship can be written as

$$exports_{ij} = \frac{Y_i E_j}{Y^W} \left(\frac{P_i P_j}{T_{ij}} \right)^{\sigma-1}$$

so that exports from country i to country j depend on the output of country i , expenditure of country j , world GDP, the price levels in countries i and j and trade costs between i and j . This theoretical foundation of the gravity model was laid out by Anderson and van Wincoop (2003), based on differentiated products and homothetic preferences. Since then, a very large group of models has been identified which yield a gravity-like pattern for the volume of bilateral trade flows. However, not only the solid theoretical underpinning, but mostly the high explanatory power of the model has contributed to its success.

One shortcoming of the gravity model is the prediction of strictly positive trade flows between all country-pairs. This prediction is clearly refuted by the data. To deal with the existence of zero-trade in our dataset, we use the Poisson pseudo-maximum likelihood technique introduced by Santos Silva and Tenreiro (2006).

In order to obtain consistent estimates it is crucial to control for a country's multilateral resistance to trade. This multilateral resistance represents unobservable country-specific trade costs which determine the price levels in the equation specified above. Since the multilateral resistance is unobservable, a straightforward strategy is the use of country fixed effects to control for this term. These fixed effects capture all variation in trade flows which systematically differs across countries. This raises the problem that the impact of country-specific trade barriers, such as the STRI, cannot be identified anymore. A solution to this problem is described in the main text below.

Due to the missing overlap of time series data on trade flows and STRI scores, all regression coefficients are identified from different levels of bilateral trade between countries with different degrees of services trade restrictions, measured by the STRI score in 2014, not from actual changes of bilateral trade following a change of the STRI. Therefore, all results must be understood as potential for additional trade in services in the long run. There exists some evidence that trade liberalisation takes quite some time before coming into effect, even though most evidence is based on data of trade in goods. For example, Baier and Bergstrand (2007) identify a 10 year "phase-in" period for the effect of free trade agreements on trade flows. Such a time horizon also seems plausible for the required time until a regulatory reform fully translates into additional trade in services.

17. Nordås and Rouzet (2015; 2016) show the negative impact of the STRI on services trade and manufacturing trade, while Nordås (2016) presents evidence that not only the level of the STRI but also the regulatory heterogeneity captured in the STRI has a negative effect on bilateral trade.

More intuitively, any firm has a choice between selling a service domestically and exporting, with the transaction costs of selling locally being lower. If it wishes to export it faces restrictions to services trade which are measured by the importing country's STRI score. The estimation technique exploits information on the difference between local sales and exports to derive the trade costs.

Consequently, the impact of services trade restrictions on trade flows can be identified from the interaction of the STRI score with the border variable in this setup. The coefficient on this interaction identifies whether services trade restrictions — as measured by the STRI — increases the frictions of trading services across borders relative to consumption of domestic services. In other words, there is a negative impact of services trade restrictions on cross-border flows, if more restrictive countries trade less with other countries relative to what they consume domestically than countries with low restriction levels. This allows including country fixed effects which control for all the country-specific variation of trade flows.

The estimation strategy is implemented on data on services trade flows that cover all years from 2010 to 2013 and come from three different sources: The OECD Trade in Services by Partner Country (TISP) data; the WTO-UNCTAD-ITC trade in services database; and the United Nations Service Trade database from UNSD, of which TISP is the preferred data source. When no information on the export volume is available, imports reported by the partner country are used to fill the gaps wherever possible. Information on the production value of services comes from the OECD national accounts data, while gravity control variables come from CEPII.

The same strategy and dataset is used in Benz (2016) in order to calculate the tariff equivalents of services trade restrictions, using import demand elasticities in the range from -1.5 to -5. An import demand elasticity of -1.5 indicates specialised services that cannot easily be substituted for, whereas an import demand elasticity of -5 indicates standardised services for which substitution between services of domestic and foreign suppliers is relatively easier. The ad valorem tariff equivalents correspond to the hypothetical tariffs that would generate the observed pattern of services trade in countries with different levels of services trade restrictions. The results from that study indicate tariff equivalents for services trade differ substantially across sectors. Two sectors, namely courier services and commercial banking are characterised by services trade restrictions that correspond to very high tariff equivalents between 150% and 2000% in the courier services sector and between about 120% and 1250% in the commercial banking sector. In two further sectors, the STRI is equivalent to a tariff of intermediate size. In the telecommunications sector the tariff equivalent is between about 50% and 300% and in the construction services sector between 33% and 160%. In all cases, the upper threshold of the estimate corresponds to the case where the service is relatively specialised while the lower threshold corresponds to the case where the service is more standardised.

In addition to the calculation of average tariff equivalents the approach can be used to show the trade potential of services trade liberalisation in India. Results are available for seven sectors. Five sectors for which information on services trade barriers is summarised in the STRI: Computer services, construction, courier services, telecommunication services, commercial banking. In addition the availability of high-quality telecommunications services is paramount for trade in business services. Hence, the information from the STRI in the telecommunications sector is used to evaluate the trade potential in the business services sector and the overall potential for trade in services in India. The regression coefficients are reported in Table A.1 in the annex.¹⁸

18. This description of the results is based on point estimates of regression coefficients. It should be taken into account that confidence intervals around these point estimates can be relatively large in some cases.

Computer services

India's STRI score in computer services is 0.34 compared to an average of 0.23 as depicted in Figure 7. The regression analysis shows that a reduction of the STRI score leads to a significant increase of cross-border trade in this sector. So what would happen if India was to reduce its trade barriers in the computer services sector to the average level of other STRI countries?

An example of reforms that would bring India's index down to the mean is to eliminate restrictions on movement of people providing computer services in India on a temporary basis (mode 4). Such a reform is associated with an increase in cross-border trade in computer services of about 16% in the medium to long run.

Construction services

India's STRI score in the construction services industry is 0.31, as can be seen in Figure 7, while the average STRI score of all countries is 0.23 and the median country has a score of 0.18. If India reduced its STRI score to the mean, trade in construction services is predicted to increase by about 7%, while a reduction to the median is associated with a close to 20% increase in construction services trade.

Such a liberalisation would require abolishing sector-specific as well as horizontal restrictions. For example, opening the public procurement market to international competition and harmonising national building design standards and construction product standards with international standards would close half the gap to the mean STRI. The remaining gap would be closed by introducing administrative reforms that improve the efficiency and reduce the cost of the regulatory process related to obtaining a construction permit and by extending the initial duration of stay for inter-corporate transferees, contractual services suppliers and independent services suppliers to three years.

Courier services

As can be seen from the representation of the STRI in India by sector in Figure 7, the courier services sector is one of the country's most restrictive services sectors with an STRI score of 0.55, almost twice the mean, which is 0.29. The most restrictive countries in this sector reserve a large share of the market for the designated postal services, while the more liberal countries have introduced competition in the markets for delivery of letters and parcels.

One single regulatory reform – opening the postal services to competition - would bring India's STRI down to the mean. Currently, India Post maintains the exclusive privilege of carrying and delivering letters in India. The abolishment of this monopoly would bring India into line with the sample average. Our estimates suggest that this reform could boost cross-border trade in courier services by around 25%. Liberalisation of cross-border e-commerce could further boost trade in courier services because international shipments necessarily imply either imports or exports of courier services. The restrictions to e-commerce are captured in the STRI for the distribution sector. While these cross-linkages are intuitively evident, econometric identification is difficult and will not be pursued in this study.

Commercial banking

Trade in commercial banking services is relatively restrictive in India, indicated by an STRI score of 0.50, whereas this sector already has been substantially liberalised in many other economies. The mean score of all economies in the STRI database is 0.24. This implies that roughly half of all barriers to trade in commercial banking need to be lifted to bring the regulatory environment into line with the average of countries in the sample.

More than half of India's current STRI score comes from restrictions on foreign entry. As noted above, there exist restrictions on the establishment of foreign branches and limits on the number of branches. Furthermore, the majority of the board members must be Indian nationals, there are quotas or economic needs tests to receive a banking licence and the criteria to obtain a licence are

more stringent for foreign companies. There exist limitations on the cross-border transfer by customers as well as restrictions on internet banking. An important regulation in the area of barriers competition is the directed credit schemes, which require banks to allocate 40% of their net credit to priority sectors and business forms. Amongst others, these include agriculture, education, renewable energy, and small and medium enterprises. Bringing the STRI down to the average would require the lifting of all these restrictions, but the reforms could drive up trade in banking services by around 75%.

Telecommunication services

Figure 7 shows that telecommunication services trade policies are relatively restrictive in India, with a score of 0.48 which is more than twice the mean at 0.23. According to our estimates, a reduction of India's STRI score to the mean could more than double trade in telecommunication services. Such a reduction would require full liberalisation of FDI through the automatic route and stronger pro-competitive ex ante regulation on suppliers with significant market power, particularly in the fixed line and fixed broadband markets. Thus, privatisation of the incumbents, stronger enforcement of interconnection and access regulation by a fully independent regulator would bring the STRI score of India down towards the average.

Trade in telecommunication services is also driven by the dynamics of international trade in general, as well as by the number of business travelers and international tourists. Our results suggest that a pro-competitive regulation in the telecommunications sector facilitates international communication and can have important repercussions in the economy as will be elaborated below.

Business services

The quality of a country's telecommunications network is an important determinant of the general business environment. As shown in Table 10 below, the STRI in the telecommunications sector is significantly correlated with the availability of broadband internet services.¹⁹ Since a fast and reliable internet connection is paramount for many of today's business transactions, in particular transactions across international borders, we use the telecommunications STRI to assess the potential for growth in cross-border business services in India.²⁰

The regressions show that services trade restrictions in the telecommunications sector are indeed significantly correlated with the volume of trade in business services. Reforms that reduce India's telecommunications STRI score to the mean could boost trade in business services by more than 100%. This large effect becomes even more impressive when taking into account that business services account for roughly 25% of total trade in services in India, as shown in Table 2. However, business services are not the only sector of an economy that can benefit from high-quality telecommunications services. Evidence on the importance of telecommunication services for exports of manufactured products is presented below in Section 7.

Total services

Not only do business services rely on the availability of high-speed telecommunications services. Computer services providers use broadband to connect with clients. For providers of transport and travel services, it is crucial to be in contact with counterparts located in different regions or different countries. Audio-visual services can be consumed online through streaming platforms. Brick and mortar structures become less and less relevant for banking and distribution services, while the importance of electronic exchange is increasing.

19. See also Nordås and Rouzet (2015).

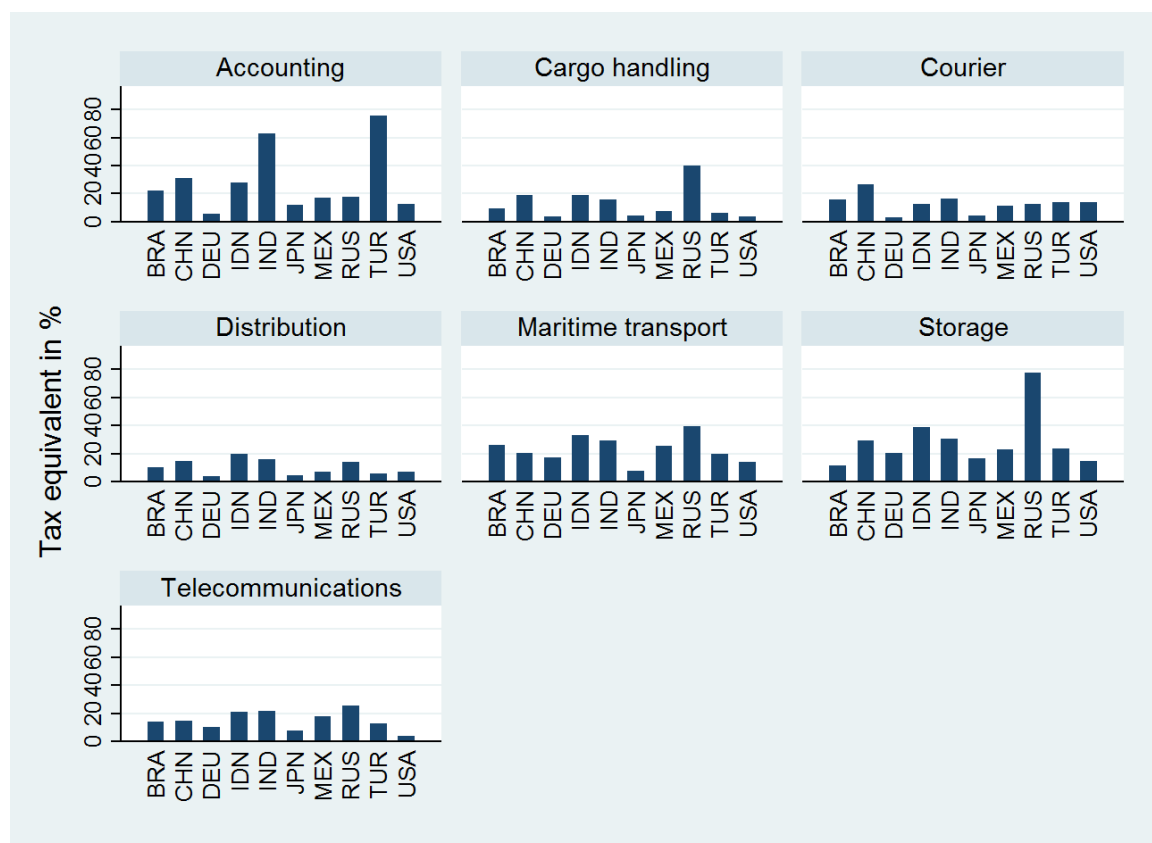
20. According to the EBOPS 2002 classification these business services include: merchanting and other trade-related services; operational leasing services; legal, accounting, management consulting, and public relations; advertising, market research, and public opinion polling; research and development; architectural, engineering, and other technical services; agricultural, mining, and on-site processing services; other business services; and services between related enterprises not included elsewhere.

Due to this pivotal role of virtual connectivity for a high number of services it is not surprising that we identify a significant relationship between total trade in services and a country's STRI in the telecommunications sector. While the magnitude of the effect is slightly smaller than for business services only, the results still emphasise the importance of adequate regulation in this industry. A reduction of India's STRI from the current level of 0.48 to the sample mean is associated with an increase in services trade by 85%.

Domestic competition

Restrictive regulation of services does not only affect imports and exports of services but it can also have an impact on the level of competition in the domestic market. One commonly used indicator of the strength of competition in a market is the price-cost mark-ups that firms obtain. The less competitive pressure, the easier it is for companies to raise the prices that consumers or down-stream industrial customers need to pay. Figure 14 depicts the protection that local firms enjoy from the services trade restrictions covered by the STRI. Since a mark-up is similar to a sales tax from the customer point of view, it is presented as the tax equivalent of the mark-ups that can be attributed to the level of the STRI score (Rouzet and Spinelli, 2016).²¹ As in the previous section, India is compared to the largest countries in the STRI sample.

Figure 14. Estimated tax equivalents of the STRI, selected sectors and countries



Source: Rouzet and Spinelli (2016). The vertical axis depicts percentage points.

21. The study used the Orbis firm-level database to calculate mark-ups by firm, sector and country and estimated the contribution of services trade restrictiveness measured by the STRI to the mark-up.

The variation of tax equivalents across countries and sectors is determined by both the STRI and the estimated mark-up, which is explained by market size and a number of structural factors other than the STRI. Therefore, the ranking of countries in terms of the size of the tax equivalent and the STRIs may differ. In the accounting sector, for instance, the United States has the lowest STRI in the sample, but the smallest tax equivalent is in Germany. On average for these countries the tax equivalent of services trade restrictiveness is the highest in accounting services and storage (one of the logistics subsectors) and the lowest in courier services and distribution.

Bearing in mind statistical uncertainties, the result implies that the trade restrictions that India has in place, for example distribution services cost consumers a sales tax equivalent of about 16%. By the same token, the regulations captured in the STRI database for India on accounting services is equivalent to a tax on businesses who must use local accounting firms of 60%. Finally the tax equivalent of trade restrictions in telecommunications is about 27%. The mobile sector is highly competitive in India and mobile prices are among the lowest in the world.²² Businesses rely on landlines and fixed broadband to a much larger extent than consumers, and this sector is less competitive with a low density and low average speed of data flows, and these are the most likely to bear the cost of regulation or lack thereof.

7. Impact of services reforms on downstream sectors

Services and trade in manufactured goods

The Make in India initiative aims at attracting foreign direct investment to create jobs in export oriented manufacturing. This section describes India's trade performance in five of the priority sectors: Automobile and components; Chemicals; Electrical machinery; Pharmaceuticals and Apparel. The analysis is based on trade data at the 2-digit harmonised system (HS) classification, which breaks chemicals into two categories (organic and non-organic) and apparel into knitted and crocheted and not knitted or crocheted. Thus, seven 2-digit HS industries are included in the analysis.²³ Export performance in these sectors is analysed and related to access to credit, internet and logistics services which are essential services inputs in product development, production, marketing and exports of manufactured products. The analysis is conducted along three dimensions. First, it looks at the pattern of geographical and product diversification of Indian exports. Second, prices obtained in major export markets are described and the determinants of export prices analysed. Finally, a possible relationship between access to services and services trade policy and regulation is explored.

Figure 15 shows exports in the selected sectors over the past decade and also the combined share of these sectors in India's total merchandise exports.²⁴ The fastest growing exports depicted in the chart are clearly motor vehicles, while growth in exports of electrical machinery has levelled off and even reversed in recent years. It is also noted that the share of these sectors in total merchandise exports has fluctuated between 20% and 25% over the decade. India's exports are largely oriented towards United States and the European Union. The exception among the sectors depicted in Figure 15 is inorganic chemicals for which China constitutes the largest export market and also Russian Federation, Iran and Bangladesh feature prominently. Sri Lanka and Bangladesh are important markets for the Indian car industry.

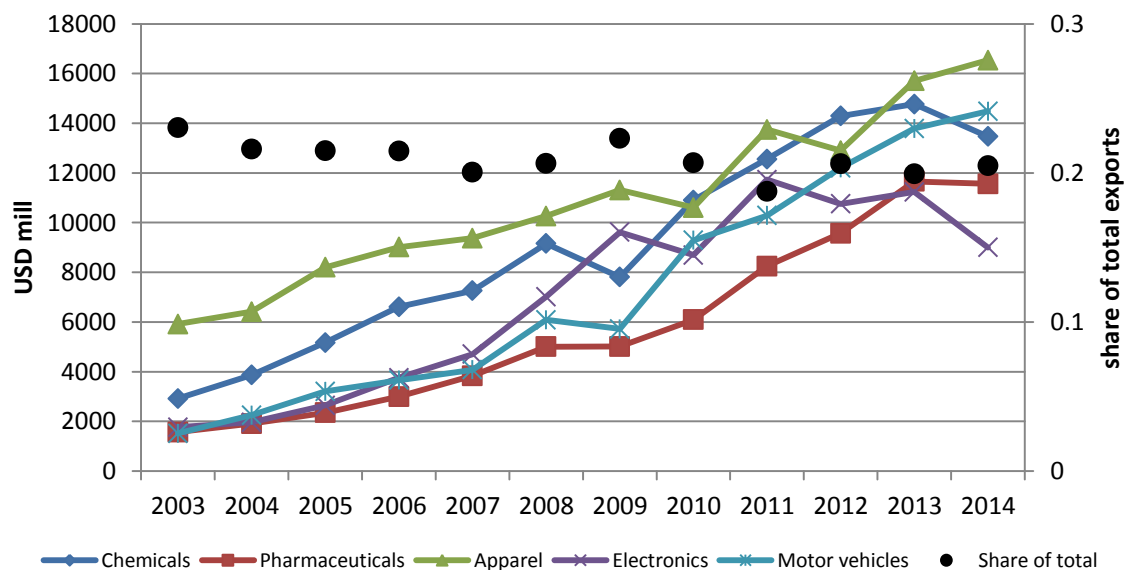
22. Price data from International Telecommunications Union (ITU) show that in India the price of mobile-cellular prepaid one-minute local call (peak, off-net) is the second lowest in the world. The lowest is in Bangladesh.

23. See the OECD Economic Survey of India, 2014 for a more in depth analysis of the manufacturing sector, and Arnold et al. (2014) for a study relating services sector reforms to the performance of manufacturing in India.

24. The by far largest export categories 'mineral fuels, mineral oils and products of their distillation' and 'precious metals, precious stones and jewellery' are not included in the analysis.

Table 6 reports the details on the geographical and product diversification of Indian exports. It shows the number of export markets for each 2-digit category, and then the number of 6-digit products under each category exported to major markets. The geographical distribution ranges from 165 export markets for inorganic chemicals to 201 in pharmaceuticals. Thus, Indian products are available almost universally. It is also interesting to note that India exports a broad range of 6-digit products and that the diversification on product lines is most prominent in the US market. India exports more than 60% of all possible 6-digit products covered by these seven sectors to the United States. For comparison, China exports about 70% of all HS categories to the United States.

Figure 15. Exports, selected industries



Source: COMTRADE

Table 6. India's export diversification, selected countries and sectors 2014

Number of 6-digit categories exported by partner and number of export markets

	Inorganic chemicals HS 28	Organic chemicals HS 29	Pharmaceuticals HS 30	Apparel HS 61	Electrical machinery HS 85	Motor vehicles HS 87
Export markets	165	182	201	186	195	195
Number of 6-digit products exported to selected markets						
United States	104	209	58	86	92	45
United Arab Emirates	106	186	67	86	88	55
Germany	62	187	55	90	80	41
China	46	175	53	58	59	32
South Africa	66	139	29	62	71	44
Memo: 6-digit prod. in HS Chapter	182	333	125	116	119	76

Source: WITS. The countries included are the five largest export markets for the seven categories combined. The European Union is the largest market, and Germany is chosen as the representative EU market.

Having a highly diversified manufacturing export base is a policy objective that many countries strive for. A first glance at the data suggests that India has a dynamic manufacturing sector willing to venture into new markets. However, a closer look reveals that exports are thinly distributed across a large number of products and markets and that the average export volume for each product-destination pair is small.²⁵

It is well documented that entering a new market is a risky business and most new entrants fail after the first couple of years. Access to credit encourages market entry and a well-developed financial market absorbs the risk that each individual investor and exporter faces (Besedes et al, 2014). Furthermore, access to timely, accurate and relevant information helps exporters select the markets that best match their products, thereby reducing risk. A large and dispersed diaspora has been an important source of market information and external demand for great trading nations in the past and even today there is evidence that the diaspora can be important for trade linkages (Gould, 1994; Head and Ries, 1998 and Aleksynska and Peri, 2014). A recent study focussing on the Indian diaspora found that Indian migrants are an important driver of exports from India to their new home country, and more so than for instance the Chinese diaspora (Giovannetti and Lanati, 2015).²⁶

It appears that the main challenge for meeting the Make in India objectives may be strengthening and scaling up existing trade linkages beyond the relatively small niches currently characterising Indian exports. Policies supporting the scaling up of activities may be quite different from those that aim at assisting firms to enter new markets. A standard tool that makes the distinction between barriers to entry and barriers to operations and to scaling up is the gravity model (Box 2). It not only explains the volume of trade between partners that already trade with each other (the intensive margin of trade), but also the likelihood that countries will trade with each other in the first place (the extensive margin of trade).

The role of access to services, particularly services that connect markets both physically and virtually takes centre stage in the analysis. Virtual connectivity is provided by telecommunications operators. Thus, manufacturers rely on access to broadband internet services and secure servers to use process and store the information they need to compete in modern, largely digitised markets. Physical connectivity increasingly relies on logistics which connect different modes of transport and ease the flow of goods and the related processing of required documents. Finally, financial services have already been mentioned as a service that helps spread the risk of entering new markets.

The services indicators selected for further empirical analysis are fixed broadband subscribers per 100 inhabitants and secure services per 1 million people.²⁷ Financial services are represented by bank credit to the private sector as share of GDP. Finally the World Bank overall logistics performance index which takes values between one and five, with five representing best performance is used as a measure of physical connectivity. The summary statistics for these variables for all exporting countries included in our analysis are reported in Table 8. India's performance on the services-related development indicators is about the sample average for logistics and bank credit to the private sector. For the internet indicators, however, India lags far behind the sample average of almost 240 countries and territories.

-
25. Comparing to the countries that come closest to India in market size, which is an important determinant of export volume, the skewness of India's exports is 40.7 compared to 11.2 for Brazil, 32.3 for Canada, and 21.7 for Italy. Roughly speaking, the higher the skewness the more observations are found at the low end of the distribution.
 26. United Arab Emirates is India's second largest trading partner. About 30% of the population in the United Arab Emirates is of Indian origin. According to UN Population Division Migration Statistics, there were 2.8 million Indian migrants in the United Arab Emirates out of a total population of 9.3 million in 2013.
 27. For each of these variables the natural logarithm of the number provided in the WDI database is included in the regressions.

Box 3. Determinants of the extensive and intensive margin of trade

Entering into a new market is associated with a number of activities such as market research, establishing a contract with a distributor, complying with local regulations and establishing after-sales services to mention but a few. Such activities cost money and a firm, unless it is very big, is not able to deploy the necessary resources in all countries in the world. As a result, most firms export to only a few countries. Furthermore firms from a given country in a given industry have a tendency to export to the same countries. In the detailed trade statistics this is reflected in a large number of country pairs that do not trade with each other in certain products.

Zero inflated Poisson is an econometric technique used for count data with excessive zero observations. It builds on the underlying assumption that with a probability p the only possible outcome is zero and with a probability $(1-p)$ a Poisson random variable is observed. In the context of bilateral trade at a very detailed product level, bar re-exports, zero is the only possible outcome for exports if there is no production of the item in question in the country, or if the market price is lower than bilateral trade costs. If there is local production and trade costs are not prohibitive, on the other hand, bilateral exports are a random variable (including zero) depending on the characteristics of the exporting and importing countries and relative trade costs. The result of regressing exports from all countries in the world to ten selected markets at a 6-digit HS level for selected industries is reported in Table 7.

Table 7. Determinants of entry and export values, pooled manufacturing

	Baseline		With services	
	Exports	Inflate	Exports	Inflate
Ln distance	-0.654*** (0.053)	0.276*** (0.005)	-0.628*** (0.063)	0.157*** (0.005)
Ln GDP per capita	0.502*** (0.068)	-0.895*** (0.009)	0.744*** (0.215)	0.245*** (0.016)
Ln population	0.927*** (0.062)	-0.812*** (0.011)	0.932*** (0.087)	-0.381*** (0.011)
Ln Area	-0.283*** (0.064)	0.114*** (0.005)	-0.337*** (0.092)	-0.036*** (0.005)
Credit			-0.325** (0.145)	-0.232*** (0.017)
Logistics			0.486 (1.386)	-8.617*** (0.103)
Broadband			0.418*** (0.073)	-0.503*** (0.014)
Server			-0.307*** (0.102)	0.174*** (0.007)
chi2	4822.251		5446.859	
N	1627020		1080540	

Note: Pooled zero inflated Poisson regressions for the exports of seven HS 2-digit sectors (28, 29, 30, 61, 62, 85, 87) run at 6-digit level for all countries in the world to United Arab Emirates, China, Germany, India, Japan, Korea, Malaysia, South Africa, United Kingdom, and the United States. Robust standard errors clustered on 6-digit products are reported in parentheses. ***, **, * signify statistical significance at 1%, 5% and 10% levels respectively. The probability of zero trade is estimated using logit. The Vuong test strongly supports using zero inflated Poisson rather than simple Poisson.

The columns labelled “Exports” report the contribution of each variable to explaining export flows, while the column labelled “Inflate” report the contribution of each variable to explaining the probability that countries will *not* trade with each other. Thus, a negative coefficient on the services indicators in the inflate columns mean that the services indicators increase the likelihood of entering new markets.

Comparing the baseline and the regressions adding the services performance indices reveals that more than a third of the observations are lost, since, as Table 8 below suggests, information on one or more of the services indicators are missing for many countries. The services indices are also correlated with each other and with GDP per capita. For these reasons, the services performance indices were also entered into the regressions one by one for robustness checks. The result is essentially the same for each index (Annex Table A2).

Table 8. Services variables, summary statistics, 2014

	Obs.	Mean	Standard deviation	Min	Max	India
Logistics performance index	192	3.05	0.53	2.08	4.12	3.08
Bank credit to private sector	116	52.64	33.28	4.84	179	51.5
Fixed broadband density	188	14.34	12.89	0.007	46	1.24
Secure internet servers per 1 million people	238	419.38	837.14	0.157	6490	5.54

Source: WDI. Bank credit to private sector is supplemented with information from Bank of International Settlement when missing in WDI.

These four services indicators are added to the specification of the gravity model that simultaneously features both the extensive and intensive margin of trade. The model is estimated on pooled export data from all the countries in the world to ten selected countries. These are United States, United Arab Emirates, Germany, China and South Africa as reported in Table 6, and in addition the United Kingdom, Japan, Korea, Malaysia and India are included. Export data is at a 6-digit level of detail for the seven 2-digit sectors. Importantly, the trade data records both positive trade flows and the zero values of trade between country pairs that do not trade a specific 6-digit product. Technical details and the regression results are reported in Box 3, while estimations by 2-digit sector and destination are reported in annex tables A2 to A4.

For all services indicators except secure server density the results mean that the better the performance of the services the more diversified are exports. Thus, better services performance is associated with exporting a larger number of HS-6 category products to a larger number of destinations. The relationship between services and the volume of manufactured exports per product-destination is, however, more mixed. Logistics do not have a statistically significant impact on manufacturing export volumes; broadband density is positively associated with export volumes; and secure server density is negatively associated with both export volumes and the number of export markets. The aggregate results thus suggest that access to credit and logistics is important for entering a market, but not necessarily for staying and expanding the volume in existing markets. Access to broadband helps expanding trade both at the extensive and the intensive margin, while a higher density of secure servers is associated with less manufacturing exports. These findings are true on average for all sectors and countries included in the analysis. However, the average conceals some interesting differences both across export markets and across sectors.

While access to credit is negatively associated with export volumes in the aggregate, it is positively associated with exports to India and to exports of apparel.²⁸ A possible explanation could be that a well-developed market for credit is important for succeeding in markets with high risks. The Indian market may be perceived by foreign exporters as relatively risky. The apparel sector where fashions change quickly in unpredictable ways may also be subject to high risk.

A higher score on the logistics performance index is insignificant for export volumes in the aggregate. However, a detailed analysis by country reveals that better scores on logistics are associated with both higher volumes and more diversified exports to the United Arab Emirates, Germany, the United Kingdom, Korea and South Africa. A detailed analysis at the sector level shows that in the apparel and electrical machinery industries, better logistics is associated with more diversified exports and smaller volumes of each 6-digit product to each market.

Better access to broadband is associated with more diversified exports and higher trade volumes in the aggregate. However, broadband appears to be significantly related to export volumes only for exports to the OECD countries and to South Africa. For exports to United Arab Emirates, China, India and Malaysia, a higher broadband density affects the extensive margin only.

28. Access to credit is weakly related to export volumes. The coefficient is negative and statistically significant at a 5% level when controlling for the other services indicators (Table 7) but not statistically significant when introduced in the regression on its own (Table A2).

Turning to a detailed analysis by sector, they mainly follow the aggregate pattern, but for pharmaceuticals, a higher broadband density is associated with exporting a smaller volume to a larger number of countries. This pattern – spreading a given volume on a larger number of 6-digit products to a larger number of export markets – is also found for secure server density in the apparel and electrical machinery industries.

To summarize these findings, the services that help spreading or reducing the risks related to exporting are consistently associated with more diversified exports of manufactured products. In some cases export diversification goes together with higher volumes of each category on average, while in other cases export diversification is associated with lower volumes of each product on average. As noted India's exports are highly diversified with relatively low volumes for each market. This pattern is consistent with the results reported in Box 3, bearing in mind that India's logistics performance index and credit to private sector are both around average for all countries, while it lags quite far behind in broadband and secure server density. To get the full picture of how the trade patterns relate to competitiveness, prices obtained in the export market should also be taken into account. A high rate of diversification in up-market niches is an indicator of industrial sophistication, while a high rate of diversification combined with low export prices could reflect a competitiveness problem and constraints on scaling up production and exports.

Services and prices obtained in export markets for manufacturing

Having established that India's exports in the sectors that feature prominently under the Make in India initiative are highly diversified, but thinly spread both geographically and in terms of product lines, it is interesting to look at unit prices as a next step in the analysis. Figure 16 plots the average unit price for Indian exports that each 6-digit product obtains across all markets, compared to the average unit price obtained by all exporters. The horizontal axis depicts the deviation from average (calculated as $(\text{India's unit price})/(\text{average unit price}) - 1$) and can take values between (but not including) minus one and infinity. Zero represents the case when India's average unit price is the same as the average price obtained by all exporters.

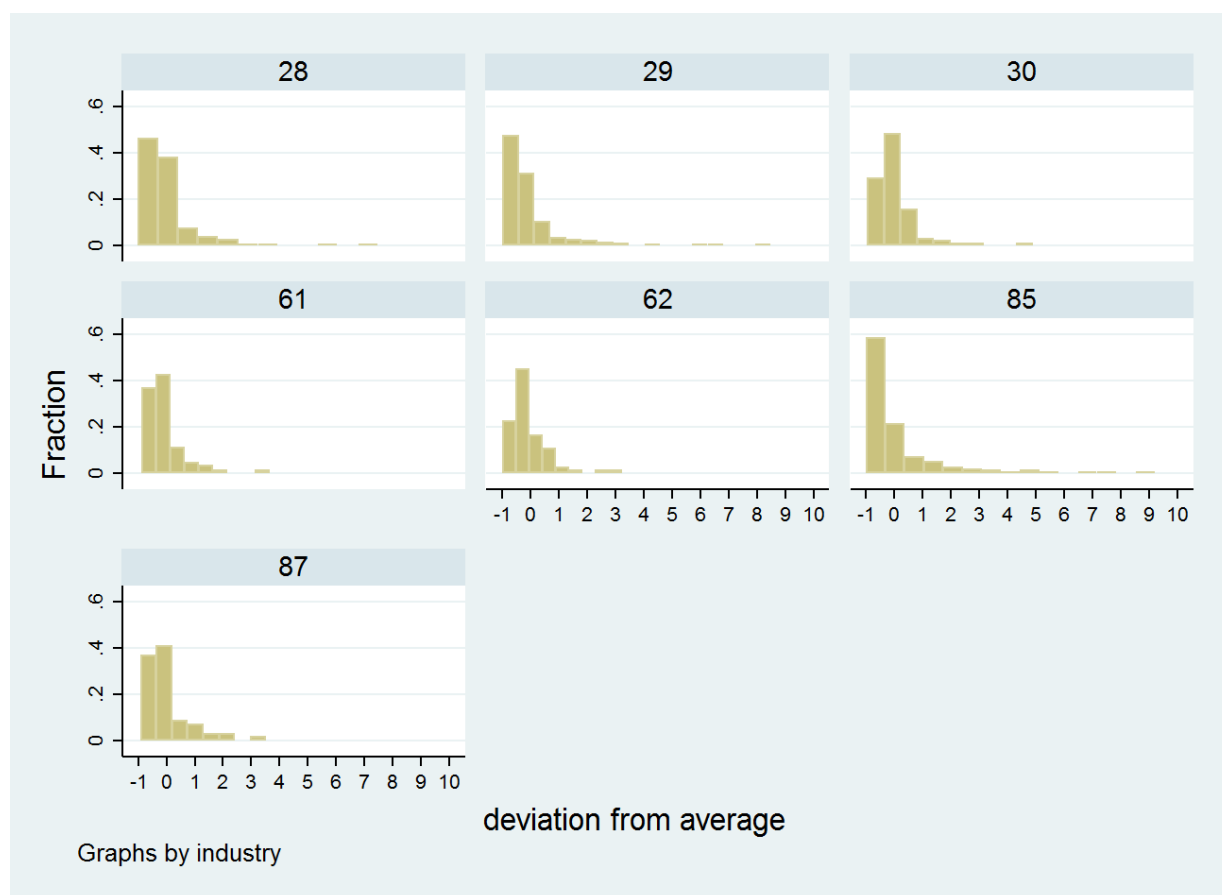
It is noted that for India's exports of chemicals and electrical machinery the largest fraction of the 6-digit product categories obtains a lower price than average in export markets. For the other industries most of India's exported products obtain a price around the average, while unit prices are skewed towards the low end for all sectors. A long tail of relatively high prices is however observed for electrical machinery (85) and chemicals (28 and 29). The only industry where Indian exporters obtain a unit price above the (unweighted) average for all exporters is inorganic chemicals where the unit price is about 5% above average. For the other industries unit prices are between 6% and 15% below the average for all exporters. For comparison, China obtains about the same prices as India for chemicals and pharmaceuticals, but for all other sectors China obtains higher export prices.

Does India obtain lower prices than average in export markets because its exports are highly cost-competitive, or is it because exports mainly target the low-end market – or both? A casual look at Table 6 suggests that it is not because India's exports target markets with low purchasing power. To answer the question more precisely, one first needs to obtain clarity on the determinants of export prices. Of course product characteristics are the most important, but there is significant variation both across suppliers within a market for a narrowly defined product category and across markets for the same supplier and the same product category. A relatively small literature has looked at this question and found that the unit prices obtained in a foreign market are positively correlated with GDP per capita in the exporting country as well as the importing country and with the distance between the two markets (Fontagné et al., 2008; Berthou and Emlinger, 2011). The latter reflects the “shipping the good apples out” effect where countries tend to ship the best quality and up-market products to distant markets since these are the products that can best absorb the extra cost of long-distance shipping.²⁹

29. See Hummels and Skiba (2004). In addition some recent papers distinguish between productivity and cost effectiveness on the one hand and product quality on the other as determinants of export prices. They find

Figure 16. Unit prices obtained by India's exports relative to the average, 2014

Estimated at 6-digit HS 2002 level



Note: The sectors depicted are HS 2002 classification: inorganic chemicals (28) organic chemicals (29) pharmaceuticals (30); apparel, knitted or crocheted (61); apparel not knitted or crocheted (62); electrical machinery (85); and transport equipment (87). The graphs show the fraction of HS 6-digit products that obtains a price that deviate from the average by the amount indicated on the horizontal axis.

Source: estimated by authors from CEPII unit value database.

These variables are all factors to which exporters have no choice but to adjust. But surely there are opportunities for exporters to invest in higher quality and for policy makers to reduce the cost of exporting. The importance of intermediate inputs for the quality of the final product and the price it obtains in the market has mainly been studied for intermediate goods (Bas and Strauss-Kahn, 2015), but there is every reason to believe that raising the quality and cost effectiveness of services inputs would have a similar effect. Evidence on this link can be drawn from a positive relationship between the quality, diversity and cost of services inputs and productivity in manufacturing. For instance, offshoring of ICT-related services to India has been found to raise productivity in US manufacturing (Amiti and Wei, 2009).

that products for which price competition dominates, export prices decline with distance, while products for which quality dominates export prices increase with distance and in the middle are some products for which export prices are not affected by distance. In the aggregate, it appears that a positive relationship applies to both income levels and distance. See Benedetti Fasil and Borota (2013) for a recent contribution and survey.

Table 9. Determinants of unit export prices, pooled manufacturing
Pooled regressions, 2014

	Baseline	With services
Ln distance	0.218*** (0.007)	0.207*** (0.007)
Ln GDP per capita	0.313*** (0.012)	0.150*** (0.019)
Ln population	-0.131*** (0.013)	-0.007 (0.012)
Ln area km ²	0.050*** (0.006)	0.012* (0.006)
Credit		-0.142*** (0.014)
Logistics		-1.999*** (0.130)
Broadband		0.124*** (0.013)
Server		0.203*** (0.009)
R ²	0.265	0.278
N	194060	179938
Industry fixed effects	Yes	Yes
Importer fixed effects	Yes	Yes

Note: OLS regressions of unit price obtained in export markets pooled over seven industries (HS2002 28, 29, 30, 61, 62, 85, 87) and ten countries (China, Germany India, Japan, Korea, Malaysia, South Africa, United Arab Emirates, the United Kingdom and United States), with robust standard errors clustered on 6-digit HS categories. ***, **, * signify statistical significance at a 1%, 5% and 10% level respectively.

Access to credit, logistics services and internet services are likely to affect export prices as well as export volumes and diversification as demonstrated in the previous section. Services may affect prices through lower costs or higher quality or both. We expect that logistics first and foremost reduce costs, while access to broadband services may help improving quality through better access to information and information-intensive business services such as engineering, design, R&D and market intelligence. Access to credit could affect both cost and quality. This is an empirical question which we explore by introducing the four services performance indicators from the previous section into export unit price regressions. We include the same ten export markets and the same seven sectors as in the previous section, broken down to the 6-digit level of detail. We follow previous studies and control for GDP per capita and distance and add exporter population size to capture possible scale effects; and land area of the exporter to capture possible internal distance that could add to the impact of bilateral distance. Table 9 presents the results for a pooled regression using importer and industry fixed effects to control for unobserved industry and export market characteristics. Detailed analysis by export market and sector is reported in annex table A6.³⁰ It is noted that internal distance, approximated by area, has a similar impact on export unit prices as bilateral distance, although the coefficient is much smaller. Population size is negatively associated with unit export prices, suggesting that economies of scale may be significant and improve the price competitiveness of exports.

30. Annex Table A5 reports the result of regressions using the core explanatory variables reported in the literature to make sure that our sample of products exhibit the properties documented in previous studies.

As expected, the first two services indicators are associated with lower export prices, while the internet related services indices are associated with higher export unit prices. These results are consistent with other studies that distinguish between cost and value services (e.g. Arbache et al, 2016), suggesting that high-speed internet services belong to the value services category. The channels through which these could add to quality are many. First, internet services facilitate using information for monitoring markets and differentiating products so that they better match consumer tastes at any point in time (Nordås, 2011). Second, internet services open for new possibilities for bundling goods and services, including after-sales services, establishing customer communities on social media and the like (Lee et al., 2016). Finally, access to broadband internet services and secure servers facilitates computer assisted design and manufacturing (CAD/CAM) which are standard in many industries, as well as 3-D printing which is also gaining a foothold in manufacturing. Thus, reliable and cost-effective broadband allows manufacturers to source state of the art digital engineering and design globally, while secured servers ensures that the designers can protect the intellectual property embodied in the digital designs. The results suggest that a 10% increase in the density of broadband raises export prices by 1.2% and a 10% increase in the server density raises prices by about 2% on average. The logistics performance index is associated with lower export prices. A 10% increase in this index is associated with about 20% lower export prices on average. Also bank credit is associated with lower export prices. Thus, 10% more bank credit relative to GDP is associated with about 1.4% lower export prices.

The impact of services performance on export prices varies somewhat across export markets and sectors (Annex Table A6). The German and Indian markets appear to be the most sensitive to cost-related services, while Korea seems to be the market where export prices are most sensitive to internet-related services. Export prices obtained in the United Arab Emirates, India's second largest export market, are more than average sensitive to all four services indicators. South Africa is the market where prices are the least sensitive to the services performance in the exporting country.

Turning to industries, there are quite interesting differences. First, the results for the two apparel sectors and electronics are consistent with the aggregate pattern and export prices obtained for electronic products are more sensitive to services performance in the exporting country than average. Bank credit and logistics do not seem to matter for prices obtained in export market for pharmaceuticals, but access to internet services is strongly and positively related to prices obtained in export markets. Bearing in mind that pharmaceuticals have a very low weight to value ratio and strongly rely on R&D inputs, the result is not surprising. Export prices obtained for chemicals are strongly related to logistics performance, but not so much the other services. Finally export prices in the motor vehicle industry are the least sensitive to services performance among the sectors included in the analysis.

The results on the impact of services on export prices are particularly interesting for the cases where services are associated with a higher degree of diversification and smaller volumes for each product in each market. We recall from the previous section that this was the case for secure server density in the electronics and apparel industries. The positive association with export prices thus suggests that access to secure services is important for developing high-end niche markets, particularly in India and the United States. A similar combination of effects is found for access to broadband services in the pharmaceutical industry. However, the finding that logistics services are associated with a higher degree of diversification and smaller volumes for inorganic chemicals is not associated with higher prices. In this sector it appears that diversification may be a strategy for spreading risk across many products and markets in a highly cyclical sector.

The findings regarding the relationship between services and manufacturing competitiveness can be summarised as follows:

- Access to credit is important for cost competitiveness and supports manufacturers' entry into new markets. Access to credit is particularly important in the apparel and electrical machinery industries, which tend to be subject to a great deal of uncertainty related to rapidly changing consumer tastes.
- Well performing logistics is very important for cost competitiveness and strongly supports manufacturers' entry into new markets in all sectors; underscoring that reliability with respect to timely delivery has become a universal requirement.
- Access to broadband supports manufacturers' entry into new markets while increasing the total volume of exports, and is thus associated with trade expansion both at the extensive and intensive margin. This effect is particularly strong for exports of apparel, electrical machinery and motor vehicles. For apparel and electrical machinery, better access to broadband also helps shift exports towards the higher end of the market.
- The presence of secure servers is associated with a greater ability to export into high-end niches.

If it is indeed the case that Indian manufacturers face constraints mainly related to scaling up exports in existing markets, it appears that improvements in fixed broadband services should be a priority area of reform.

Key services sector performance and services trade policy

Having documented that trade performance in manufacturing sectors targeted by the Make in India initiative is strongly related to key services sector performance, we now turn to the relationship between services sector performance and services trade policy. For this purpose we use the STRI indices discussed in Section 5. The STRI indexes that capture the policy environment facing credit markets, logistics services suppliers and broadband services suppliers respectively are the index for commercial banking, the four indices for logistics services and the index for telecommunications.

A simple OLS regression relating the STRI for commercial banking, telecommunications and the four logistics sectors respectively, controlling for GDP per capita and GDP is presented in Table 10.³¹ Clearly, services sector performance is strongly related to the scores on the STRI in logistics and telecommunications respectively, although bank credit to the private sector cannot be explained by this simple relationship.³² Therefore banking reforms alone may not contribute significantly to raising domestic credit in the short to medium run. The relationship between the logistics performance index and the STRI in freight forwarding could also not be precisely estimated.

Correlation does not mean causation, and it takes time for policy reforms of take full effect in the economy. With this caveat in mind, we now undertake a simple experiment analysing what could be the impact of reforms that would bring India's STRI closer to the average. Starting with logistics, policy reforms that would bring India's score down to the average could result in an increase in the logistics performance index from 3.08 to about 3.6, which could move India up the ranking from 54th place to 25th; between Malaysia at 3.59 and Finland at 3.62. Such advancement

31. Rich countries tend to have larger and more diversified services sectors, as suggested in Section 2. In the presence of economies of scale the overall size of the economy could also play a role for the performance of services.

32. However, as reported in Nordås and Rouzet, (2015; 2016), credit to the private sector is significantly lower in countries with a high score on the STRI for commercial banking than countries with a low score on the STRI. That analysis classifies countries into three categories of services trade restrictiveness (low, medium and high).

in the logistics performance ranking is in turn associated with cost competitiveness improvement of about 25% on average across products and export markets. Examples of reforms that would bring the index down to the average are raising foreign equity limits to allow majority ownership for cargo handling; introducing pro-competitive reforms such as prohibiting cross-subsidization in cargo handling, storage and warehousing; removing the nationality requirement for obtaining a license as a customs broker and privatising cargo handling at air ports and rail terminals.

As Table 8 shows, India lags behind as far as broadband and secure server penetration is concerned. Reforms that would lower India's score on the STRI in telecommunications to the sample average are associated with an increase of broadband penetration and secure servers penetration by about 50%. This change is in turn associated with 15% higher export prices on average across markets and sectors and the long-run effect on exports value could be an increase of as much as 30%. Reforms that would bring the STRI down to the average could be full liberalisation through the automatic route of FDI in the sector, lifting the nationality requirement for board of directors and the introduction of a fully independent regulator overseeing pro-competitive regulation of suppliers with significant market power.

To summarize this section, it has shown that India's performance in logistics is about average for all countries in the world. Nevertheless, there is ample scope for improvement towards best practice. Reforms to the effect of making the markets for cost services more open to competition both from foreign services providers and for local start-ups would over time help improve India's performance in cost related services sectors which in turn would significantly improve the cost competitiveness of India's manufacturing. We have also shown that India lags behind when it comes to rolling out internet services. Such services are very important for modern manufacturing and competitiveness in markets for differentiated products that obtain a premium in export markets. Reforms in the telecommunications sector that bring the score on the STRI index down to the sample average could over time significantly improve broadband and secure server penetration rates. This could in turn help raise export prices by 15% and export value by 30%.

Table 10. Services performance and services regulation

STRI	Logistics performance index				Credit	Broadband	Server
	LScar	LScus	LSfgt	LSstg	FSbnk	TC	TC
Ln GDP per capita	0.244*** (0.046)	0.280*** (0.043)	0.281*** (0.048)	0.262*** (0.043)	0.438*** (0.081)	0.616*** (0.065)	1.500*** (0.100)
Ln GDP	0.082*** (0.015)	0.070*** (0.016)	0.069*** (0.017)	0.077*** (0.014)	0.117 (0.063)	0.002 (0.026)	-0.150** (0.054)
STRI	-0.907*** (0.162)	-0.493* (0.201)	-0.544 (0.485)	-0.948*** (0.113)	0.243 (0.685)	-1.789*** (0.503)	-2.172** (0.652)
Adjusted R ²	0.732	0.663	0.64	0.746	0.341	0.8	0.857
N	42	42	42	42	84	84	84

Note: The services performance indicators are related to the STRI for the sector in question using OLS. Robust standard errors are reported in parenthesis and ***, **, and * signify statistical significance at a 1%, 5% and 10% level respectively. The STRI indices entered in the regressions are logistics cargo handling (LScar), logistics, customs brokerage (LScus), freight forwarding (LSfgt), logistics storage and warehousing (LSstg), commercial banking (FSbnk) and telecommunications (TC). The row entitled STRI reports the coefficient on the STRI index reported in the column subheading.

8. Conclusions and policy recommendations

This study has emphasised that India's services-led growth over the past couple of decades has been partly a catch-up process of bringing traditional services such as transport and distribution up to speed with what could be expected from India's level of development and partly an unprecedented boom in modern ICT-related services and other business services. Services have stimulated growth in the Indian economy and generated numerous skilled and semi-skilled jobs. Furthermore, offshoring of ICT services to India has improved productivity in countless companies around the world.

Nevertheless, modern services account for only 6% of total employment in India. With a large and growing labour force, jobs for less skilled workers are needed as well. The manufacturing sector is seen as an important source of future employment and growth. Against this backdrop the Make in India initiative aims at developing a competitive manufacturing sector through a number of policy initiatives designed to attract investment and create jobs.

This study finds that services have an important role to play in generating jobs and growth in its own right, but also for supporting the development of the industrial base. In the current industrial environment speed to market and customisation of products even at the low end of the product spectrum are essential for competitiveness. Speed to market and customisation in turn are associated with efficient and effective logistics services and access to fast and high capacity broadband internet connections. Manufacturing also relies on business services some of which India has ample experience in exporting. With a fast growing local manufacturing sector, a virtuous cycle of growing domestic demand for business services and diversification of local business services, including the professional services, could sustain India's growth and broaden its export base both in manufactured goods and business services.

To set in motion such a virtuous cycle, services sector reforms are needed. India scores well above the average on the STRI in most sectors and among the highest of all countries in some sectors. The scores stem partly from a general business environment that imposes significant costs of establishing and conducting business. Among these are restrictions on the movement of people for the purpose of providing services, restrictions on access to land and real estate, rules and regulations related to establishing a branch or subsidiary and relatively burdensome administrative procedures for obtaining the permits and licenses needed to conduct business. Thus, liberalising international trade and FDI alone would not make a sufficient dent in the cost of establishing and conducting business to obtain the objectives of the Make in India initiative.

Retailers play an increasingly important role in connecting manufacturers of consumer goods and consumers at home and abroad. Furthermore, retailers have been among the sectors the most affected by the digital revolution. Successful retailers have created new business models combining bricks and mortar and bytes, giving them flexibility to monitor and respond to shifts in consumer demand. Retailers increasingly enter into contractual relationships with manufacturers and help them produce the products that consumers want and comply with product standards set by the retailers themselves as well as by governments. The production of consumer goods, including apparel, is labour-intensive and demand-driven. Modern retailers could connect local manufacturers, including SMEs, both to the vast Indian market and beyond. However, India's trade policy for the retail sector not only limits market access through caps on foreign ownership, it also imposes certain business models on the retailers that may prevent them from innovating and seizing the opportunities in the digital economy.

Railways have played an important role for the industrialisation of large countries such as the United States, China and Canada in the past. Although container transport on roads have taken much traffic from railways in recent years in most countries, rail freight still has a role to play, particularly in bringing bulky raw materials to the manufacturer and industrial products such as chemicals to the markets. Indian rail freight is completely dominated by a state-owned enterprise with close to monopoly on freight operations. Reforms to attract more investment in capacity have been introduced, but it is important that the reforms also extend to introducing competition in freight

operations. This could significantly improve the cost competitiveness in international markets for industries such as chemicals.

The other transport and logistics sectors also have a relatively high score on the STRI. In air and maritime transport a number of sector-specific regulations contribute to raising costs for manufacturers which engage in external and internal trade. In maritime transport the regulations currently in place are estimated to be equivalent to a tax of about 20%. These are costs borne by the users of the services, including manufacturers. Clearly such high tax equivalents of regulations and trade restrictions are a drag on manufacturers' international competitiveness and their ability to create jobs in the local economy. One policy measure that could be particularly problematic for the competitiveness of manufacturing is cargo reservation schemes. Most countries have rolled back such schemes and India could consider the benefits of lifting this regulation as well. In addition ports play a key role for the seamless flow of goods. Bearing in mind that a chain is as strong as its weakest link, burdensome regulation and barriers to enter cargo handling services in ports could have repercussions along the transport chain and impose considerable costs on manufacturers.

This study has found that India's manufacturing exports are highly diversified across countries and products. Although ubiquitous, Indian exports are thinly spread with relatively small volumes in each market. This does not appear to reflect a focus in high-end niche products as prices obtained in export markets with few exceptions tend to be low. The study has identified access to broadband services and secured servers as an important driver of exports to high-end and less price sensitive markets.

Indian consumers and businesses enjoy a vibrant and competitive market for mobile telecommunications. Mobile telephony may satisfy consumers' demand for connectivity, but for businesses fixed broadband remains crucial for thriving in the digital economy. In this area India lags far behind the global average. India could draw lessons from its own mobile market to motivate pro-competitive regulatory reforms on fixed broadband related activities. The recent initiative by the regulator (TRAI) to review regulations is promising and deserves support. Over time pro-competitive regulatory reforms could significantly improve Indian manufacturers' access to broadband and extending the reach of business services to domestic as well as foreign customers.

The professional services are particularly well positioned to gain from better broadband access. Many of their activities can be digitised and traded over the internet both over vast distances within India and abroad. Thus, better connectivity could give local manufacturing plants access to Indian business services that tend to be clustered in hubs such as Bangalore as well as to foreign business services. As noted Indian business services have contributed to the competitiveness and productivity of firms globally. Better access to internet could allow them to do the same for local firms throughout India.

Nevertheless, face to face interaction with clients is also needed when professionals help clients solve problems related to entering new markets, innovating, restructuring or adjusting to new regulations. In a business environment where clients have multi-country operations and knowledge intensive business services providers form international teams, openness to temporary movement of people is essential. For India liberalisation of mode four at home is equally important as pursuing openness to mode four in the WTO and in trade agreements. Only then will local manufacturers be able to enjoy full access to business services that support their innovation and internationalisation efforts.

To summarise, introducing a business-model neutral and more open trade and investment policy in the distribution sector could stimulate demand for and production of manufactured consumer goods; reforms in the transport sectors, particularly railways, ports and maritime transport would very significantly reduce the cost that manufacturers face in sourcing inputs and reaching customers both inside India and beyond. Removing remaining restrictions on foreign entry and pro-competitive regulation in fixed line broadband telecommunications would enhance incentives to roll out infrastructure which would enable manufacturers to better integrate into global value chains and to expand exports particularly in higher-end market segments. Lifting restrictions on movement of professionals would help Indian engineers and other professionals teaming up

with foreign partners and offer services support for both local and foreign manufacturers. Finally, lifting some of the restrictions in commercial banking, particularly measures such as directed credit schemes could improve access to credit for innovative firms both in manufacturing and services.

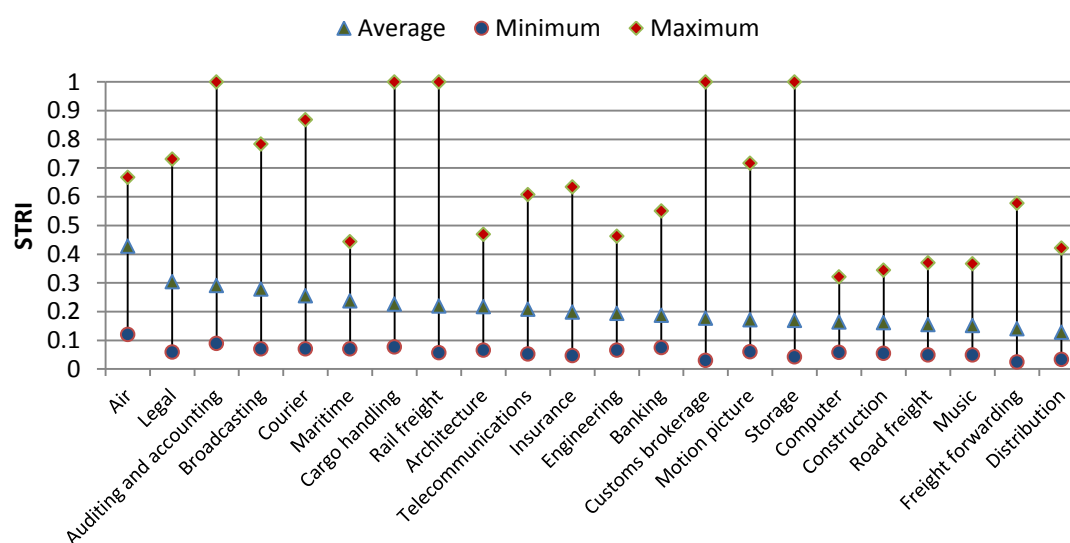
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Technical and Statistical Annex

Figure A.1 STRI by sector 2016



Source: OECD STRI database for 44 countries.

Table A1. Trade effect of STRI reduction

	Computer	Construction	Telecoms	Courier	Commercial banking	Business services	Total services
b * stri	21.51** (10.78)	-27.16** (11.89)	-9.48** (3.81)	-47.95* (26.42)	-63.55*** (12.02)	-8.76** (3.56)	-7.47*** (2.05)
b * stri^2	-45.32* (27.05)	53.83* (30.42)		70.29 (55.76)	122.24*** (27.38)		
b * stri * EU	9.44 (14.11)	18.16 (12.94)	6.68 (4.66)	15.16 (27.32)	10.10 (18.63)	7.21* (4.05)	3.39 (2.14)
b * stri^2 * EU	-40.58 (41.52)	-37.82 (26.40)		-2.44 (60.36)	-12.15 (61.27)		
border	0.22 (1.78)	-12.73*** (4.36)	3.33* (1.81)	-7.47 (5.06)	3.86 (4.83)	0.43 (2.84)	-1.64 (1.01)
STRI heterogeneity	-4.15*** (0.79)	1.16 (1.81)	-4.38*** (1.24)	-8.51** (4.29)	2.39 (1.79)	-0.85 (1.18)	-2.85*** (0.87)
ln distance	-0.79*** (0.12)	-0.79*** (0.17)	-0.76*** (0.18)	-0.16 (0.27)	-1.25*** (0.18)	-0.92*** (0.17)	-0.60*** (0.08)
contiguity	0.38** (0.16)	0.55*** (0.17)	0.21 (0.18)	1.56*** (0.27)	-0.07 (0.28)	0.18 (0.15)	0.49*** (0.12)
common language	0.08 (0.24)	0.28* (0.16)	0.55*** (0.12)	0.62 (0.46)	1.04*** (0.30)	0.33** (0.16)	0.26** (0.12)
time difference	0.08** (0.03)	0.04 (0.04)	-0.10** (0.04)	0.20** (0.08)	0.15*** (0.05)	0.03 (0.06)	0.06* (0.04)
former colony	-0.47*** (0.18)	0.46** (0.18)	-0.48*** (0.13)	-2.85** (1.17)	-0.43** (0.19)	-0.53** (0.24)	-0.07 (0.12)
common legal system	-0.09 (0.16)	0.10 (0.14)	0.10 (0.12)	0.07 (0.23)	-0.07 (0.24)	0.09 (0.13)	0.17** (0.09)
RTA services	-0.07 (0.28)	0.47 (0.37)	-0.46 (0.39)	0.83 (0.61)	-0.33 (0.31)	0.07 (0.41)	0.00 (0.18)
intra EU	-0.21 (1.16)	-2.11 (1.46)	-0.77 (0.95)	-4.31* (2.31)	-1.33 (1.37)	-0.21 (0.90)	-0.01 (0.47)
b * language	-0.51*** (0.13)	-0.34* (0.18)	-0.81*** (0.12)	-0.76** (0.31)	-0.22 (0.27)	-0.18 (0.23)	-0.52*** (0.12)
b * English	0.36*** (0.14)	-0.23 (0.18)	0.66*** (0.10)	0.23 (0.20)	1.42*** (0.16)	0.51*** (0.14)	0.73*** (0.08)
b * internet		3.72*** (0.78)		3.06*** (0.93)	-0.72 (0.97)		
Exp * Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Imp * Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	4597	5039	4439	3887	4598	4191	4143

Note: All results from sector-level PPML regression. Dependent variable is the volume of exports. Independent variable preceded by b * refer to interactions with the border dummy. Standard errors clustered at the importer level. ***, ** and * represent statistical significance at a 1%, 5% and 10% level respectively.

Source: Benz (2016) and own regressions.

Table A2. Determinants of entry and export values, selected sectors and importers

	Credit		Logistics		Broadband		Server	
	Exports	Inflate	Exports	Inflate	Exports	Inflate	Exports	Inflate
Ln distance	-0.662*** (0.055)	0.221*** (0.005)	-0.665*** (0.056)	0.212*** (0.005)	-0.637*** (0.055)	0.254*** (0.005)	-0.638*** (0.056)	0.264*** (0.005)
Ln GDP per capita	0.539*** (0.088)	-0.681*** (0.012)	0.642*** (0.103)	-0.044*** (0.008)	0.132 (0.117)	-0.522*** (0.013)	0.952*** (0.148)	-0.521*** (0.015)
Ln population	0.961*** (0.043)	-0.747*** (0.010)	0.983*** (0.099)	-0.469*** (0.010)	0.926*** (0.070)	-0.781*** (0.011)	0.872*** (0.047)	-0.820*** (0.010)
Ln area	-0.294*** (0.053)	0.077*** (0.004)	-0.308*** (0.079)	0.004 (0.005)	-0.286*** (0.071)	0.110*** (0.005)	-0.297*** (0.069)	0.111*** (0.005)
Service	-0.059 (0.191)	-0.654*** (0.016)	-1.402 (1.403)	-7.867*** (0.088)	0.496*** (0.091)	-0.479*** (0.011)	-0.277** (0.120)	-0.232*** (0.008)
chi2	4948.096		4863.222		5176.408		4902.876	
N	1242000		1428300		1589760		1627020	

Note: Pooled zero inflated Poisson regressions for the exports of seven HS 2-digit sectors (28, 29, 30, 61, 62, 85, 87) run at 6-digit level for all countries in the world to United Arab Emirates, China, Germany, India, Japan, Korea, Malaysia, South Africa, the United Kingdom and the United States. Robust standard errors clustered on 6-digit products are reported in parenthesis. ***, **, and * signify statistical significance at 1%, 5% and 10% levels respectively. The row labelled Service reports the coefficients on the services variable indicated in the column heading. The columns labelled Exports report the results of the full models while the columns labelled Inflate report the probability of zero trade using logit. The Vuong test strongly support using zero inflated Poisson rather than simple Poisson.

Table A3. Services and manufacturing exports, intensive and extensive margin by export market

	United Arab Emirates		China		Germany		United Kingdom		India	
	Exports	Inflate	Exports	Inflate	Exports	Inflate	Exports	Inflate	Exports	Inflate
Bank credit	0.108	-0.794***	-0.487*	-0.753***	-0.195*	-0.985***	-0.104	-0.930***	0.823***	-0.672***
Logistics	2.858*	-10.172***	1.686	-8.045***	1.866**	-6.006***	9.730***	-8.410***	-2.547	-8.523***
Broadband	0.056	-0.481***	0.034	-0.436***	0.859***	-0.705***	0.430***	-0.418***	-0.07	-0.767***
Server	-0.001	-0.349***	0.277	-0.473***	0.057	-0.308***	-0.017	-0.227***	-0.488***	-0.062***

	Japan		Korea		Malaysia		United States		South Africa	
	Exports	Inflate	Exports	Inflate	Exports	Inflate	Exports	Inflate	Exports	Inflate
Bank credit	-0.529***	-1.057***	0.362	-0.880***	-0.85	-0.906***	-0.587***	-0.694***	0.173	-0.624***
Logistics	1.859	-9.192***	8.067**	-8.954***	-0.754	-11.322***	-6.045***	-7.079***	8.125***	-6.422***
Broadband	0.408***	-0.673***	0.613***	-0.527***	0.083	-0.271***	0.686***	-0.487***	0.418**	-0.216***
Server	0.122	-0.141***	-0.261	-0.149***	0.151	-0.039***	-0.540***	-0.246***	-0.041	-0.095***

Note: The table reports the coefficients on the services variable of interest for zero inflated Poisson regressions run on pooled data for bilateral manufacturing exports at 6-diigt HS level for HS sectors 28,29,30, 61, 62, 85 and 87 for 2014. ***, **, and * represent statistical significance at 1%, 5% and 10% levels respectively.

Table A4. Services and manufacturing exports, intensive and extensive margin, by industry

	Inorganic chemicals		Organic chemicals		Pharmaceuticals		Apparel		Electrical machinery		Motor vehicles	
	Exports	Inflate	Exports	Inflate	Exports	Inflate	Exports	Inflate	Exports	Inflate	Exports	Inflate
Bank credit	-0.141	-0.157***	0.043	-0.268***	-0.283	-0.456***	1.491***	-1.266***	0.342	-0.617***	-1.002***	-0.493***
Logistics	-5.092**	-8.707***	3.234**	-9.399***	5.051	-6.772***	-6.703***	-7.547***	-7.783***	-8.701***	1.803	-8.525***
Broadband	0.560***	-0.116***	0.088	-0.108***	-0.645**	-0.191***	0.719***	-0.648***	0.867***	-0.655***	0.361***	-0.447***
Server	-0.317	-0.033*	-0.151*	-0.018	0.011	-0.163***	-1.056***	-0.225***	-0.691***	-0.393***	0.420***	-0.394***

Note: The table reports the coefficients on the services variable of interest for zero inflated Poisson regressions run on pooled data for bilateral manufacturing exports at 6-diigt HS level for the exports to United Arab Emirates, China, Germany, the United Kingdom, India, Japan, Korea, Malaysia, United States and South Africa for 2014. ***, **, and * represent statistical significance at 1%, 5% and 10% levels respectively.

Table A5 reports the results of a standard regression relating unit prices to income and distance in a cross-section for 2014. Ideally one should use panel data to capture the time variation in the data and also to be able to control for unobserved time-varying country-specific factors. Due to time constraints this was not possible for this draft. There are about 4 million observations per year.

Table A5. Determinants of unit export prices, 2014

Ln export unit prices	(1)	(2)
Ln exporter GDP per capita	0.422*** (0.005)	0.422*** (0.004)
Ln importer GDP per capita	0.084*** (0.002)	0.105*** (0.003)
Ln distance	0.144*** (0.003)	0.133*** (0.003)
Ln export value		-0.076*** (0.003)
R ²	0.435	0.444
N	3840515	3840515
2-digit sector fixed effects	Yes	Yes

Note: the regressions are run on 6-digit HS 2002 product categories for all 2-digit sectors from 10 to 97 for all countries using OLS with robust standard errors clustered on 6-digit product categories. ***, ** and * represent statistical significance at a 1%, 5% and 10% level respectively.

The first regression confirms the results reported in the literature. The second regression adds export value, which is negatively associated with the unit price. Ideally, one should control for export volume rather than value, since the unit price is a component of export value. With that caveat in mind, the result suggests that there may be economies of scale in exporting and there could also be a trade-off between quality and quantity of exports.

Table A6. Services performance and export prices

Panel A. Regressions by export market

	ARE	CHN	DEU	IND	JPN	KOR	MYS	USA	ZAF
Bank credit	-0.345*** (0.027)	-0.121*** (0.033)	-0.136*** (0.022)	-0.225*** (0.037)	-0.049* (0.027)	0.026 (0.035)	-0.056* (0.034)	-0.197*** (0.019)	-0.279*** (0.039)
Logistics	-1.511*** (0.207)	-1.264*** (0.242)	-2.246*** (0.177)	-2.703*** (0.297)	-1.126*** (0.250)	-0.626* (0.339)	-0.912** (0.404)	-1.045*** (0.155)	-0.376 (0.254)
Broadband	0.243*** (0.022)	0.280*** (0.027)	0.036* (0.021)	0.393*** (0.042)	0.317*** (0.022)	0.297*** (0.033)	0.053** (0.026)	0.117*** (0.015)	-0.022 (0.029)
Server density	0.243*** (0.015)	0.206*** (0.018)	0.157*** (0.011)	0.196*** (0.023)	0.151*** (0.015)	0.300*** (0.019)	0.098*** (0.019)	0.249*** (0.013)	0.272*** (0.018)

Panel B. Regressions by industry

	28	29	30	61	62	85	87
Bank credit	-0.038 (0.051)	0.150*** (0.037)	-0.06 (0.042)	-0.200*** (0.047)	-0.220*** (0.044)	-0.411*** (0.022)	-0.218*** (0.024)
Logistics	-2.002*** (0.556)	-1.763*** (0.514)	-0.248 (0.387)	-1.373*** (0.226)	-1.600*** (0.229)	-2.109*** (0.204)	-0.371* (0.203)
Broadband	-0.011 (0.054)	0.107 (0.076)	0.200*** (0.054)	0.153*** (0.015)	0.185*** (0.016)	0.161*** (0.022)	0.012 (0.023)
Server density	0.217*** (0.030)	0.048 (0.030)	0.235*** (0.039)	0.175*** (0.017)	0.195*** (0.019)	0.299*** (0.014)	0.127*** (0.019)

Note: The table reports the coefficients for the services indicators when the export price regression is run by country (with industry fixed effects) and by industry (with export market fixed effects). The regressions are OLS with robust standard errors clustered on HS6-digit products. ***, ** and * signify statistical significance at a 1%, 5% and 10% level respectively. In the interest of space we drop the United Kingdom from Panel A. The results are very similar to Germany.