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8th GES GLOBAL ECONOMIC SUMMIT

Services: Enabler of Growth for Trade and Industry

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SUMMIT HANDBOOK

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8th GES GLOBAL ECONOMIC SUMMIT

Services: Enabler of Growth for Trade and Industry

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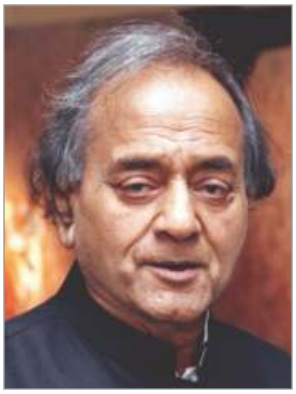


Preface

Services industry is a critical pivot on which the juggernaut of the world economy rotates. Agriculture and manufacturing activities will come to a grinding halt without the supporting services of transportation, finance, retail and wholesale trade. A strong services industry is essential for the success of Government of India's flagship programmes such as Make in India, Digital India, Skill India, Startup India, Standup India and so on. World's most industrialized countries such as USA, UK, France and Switzerland have a vibrant services sector that contributes more than 70% to their GDP. Services sector is also a major driver of skilled and unskilled employment and exports for most countries.

The service sector has produced the world's most valuable companies such as Microsoft, Google, Facebook, Alibaba and Amazon. Together, these companies are disrupting business models in a wide range of industries with their innovative service offerings. The importance of the services sector to economic development is underrated and its discussion is largely limited to academic literature. Even at the policymaking level, many countries do not have a dedicated policy for services sector as a whole, on the lines of agriculture policy and industrial policy. Given the peculiarities of different services industry, governments have formulated specific policies on education, telecom, healthcare etc. The emergence of information and communication technologies has given rise to new set of policy concerns. Thus, countries are formulating regulatory policies on e-commerce, data privacy and cyber security to protect the interest of various stakeholders. At the global level, World Trade Organisation is working on trade facilitation in services industry to promote cross-border trade in the services sector. The importance of service sector has prompted governments to redesign their trade agreements to include services such as e-commerce, easing barriers to movement of professionals, students and tourists.

At a time when the business model and policy paradigm are undergoing significant change with the evolution of the service industry, MVIRDC World Trade Center Mumbai and All India Association of Industries (AIAI) have themed the 8th edition of their flagship event Global Economic Summit on this critical industry. The Summit, to be held from March 6-8, 2019, on the theme 'Services: Enabler of Growth for Trade and Industry', will stimulate multidimensional discussion on how services industry will enhance productivity in agriculture and manufacturing sectors. As the world economy is embarking on an incredible journey of digital transformation, the Summit will highlight emerging trends in areas such as smart cities, robotics, artificial intelligence and other technologies associated with fourth industrial revolution. Industry 4.0 technologies are redefining business models in traditional services such as transportation, wholesale and retail trade, education and healthcare. Business leaders and policymakers will also exchange best practices on smart cities, which will revolutionalize public services such as traffic management, policing, waste management, among others. As Government of India aims to make the country a digitally empowered society, the Summit will explore emerging business opportunities in services such as information technology, cyber security, cloud computing, data analytics, among others. Industry leaders will discuss how micro, small and medium enterprises (MSMEs) can enhance their market reach by making use of services provided by e-commerce and digital marketing companies.

This handbook combines a meticulous analysis of the services industry with diverse views from business leaders and research scholars on emerging trends defining this industry. The book features articles from officials representing multilateral institutions, trade & industry, think tanks and academic institutions. The articles in this handbook brings a wide range of perspectives on the changing face of the services industry in the context of smart city projects, digital factories, artificial intelligence, machine learning, among others. I am confident that this handbook will offer insightful perspectives on the emerging trends shaping the future of services industry and their impact on agriculture and manufacturing sectors.

Kamal Morarka
Chairman
MVIRDC World Trade Center Mumbai

Introductory Remarks

Services constitute more than two-third of the global GDP and about half of global exports measured in value-added terms. They are integral to agricultural and manufacturing activities, right from financing and insuring the project to marketing and delivery of goods. The share of services in India's GDP is about 55 per cent.

In a world of increased automation and faster connectivity, services enhance the scope of delivering higher growth through intellectual services such as R&D and training, which aid MSMEs in scaling up their business. These services enhance exchange of ideas, know-how and standards and help MSMEs gain greater access to international markets. Without adopting the latest technologies, improving infrastructure, developing a skilled workforce and allowing alternative modes of finance and insurance, developing economies cannot match their elite counterparts.

Essentially, services economize costs and time taken to produce and deliver goods in a highly competitive globalised world where time and cost overruns can hurt MSMEs dearly and even oust them from the market. They enable backward and forward linkages with several countries so that MSMEs in the domestic country can concentrate on their core competencies and be a part of Global Value Chains through value addition. Developing countries face resource constraints such as lack of adequate and timely credit, poor infrastructure facilities, inhibiting labour laws and non-availability of quality raw material that restrict MSMEs from scaling up and becoming internationally competitive. Government reforms and a vibrant services sector can play a catalytic role in bringing efficiencies that can place these countries on an upward growth trajectory.

Services also have the potential of transcending nations without physical movement of goods and people. Considering the intangible nature of services, trade in services improves foreign exchange, and attracts foreign investments and contracts with minimum physical interference and presence in a foreign country which emboldens MSMEs to venture into newer markets. Trade in services as a percentage of India's GDP is about 12 per cent. The same for major economies such as Germany, USA and China is about 17, 7 and 6 per cent respectively. The domestic value added share in gross exports of the services industry in India accounts for about 88 per cent suggesting that there is substantial scope for increasing foreign value addition. There is a huge potential for India to enhance its trade in services with other nations.

Considering the importance of the services sector to Indian economy, MVIRDC World Trade Center Mumbai and All India Association of Industries (AIAI) are organizing the 8th edition of their flagship event, the Global Economic Summit on the theme 'Services: Enabler of Growth for Trade and Industry' at World Trade Center Mumbai from March 6th – 8th 2019. The objective of the Summit is to exchange experiences in spheres such as digital innovation and automation building MSME competitiveness, improving farm productivity through IT applications, smart urban infrastructure, FDI in the services sector, etc in order to highlight potential opportunities for value-addition in the agriculture, manufacturing and services sectors.

This Handbook deals with articles and opinions from experts in enhancing the global services footprint to meet the challenges of creating an inclusive society. We are grateful to experts for contributing their valuable perspectives and enriching the content of this Handbook.

We are confident that the book will be a useful reference for policy makers, diplomatic corps, think tanks, academic institutions, chambers of commerce, MSMEs, corporate houses and industry at large.

Vijay G. Kalantri
President, All India Association of Industries (AIAI)
Vice Chairman, MVIRDC World Trade Center Mumbai
Director, World Trade Centers Association Board, New York

Services: An Untapped Source of Competitiveness

While headlines are dominated by the ubiquitous coverage of electoral promises aimed at the resurgence of trade barriers, the global economy appears to be undergoing a deeper, structural shift towards a more services-driven economic arrangement.

In order to cohesively analyse these developments, one could begin with exploring the **2 'T's of services: Technology and Tradability.** Rapid rates of disruptive innovation coupled with the exchange of services beyond borders are the underlying foundations upon which developments in global commerce will be based.

The first 'T': Technology

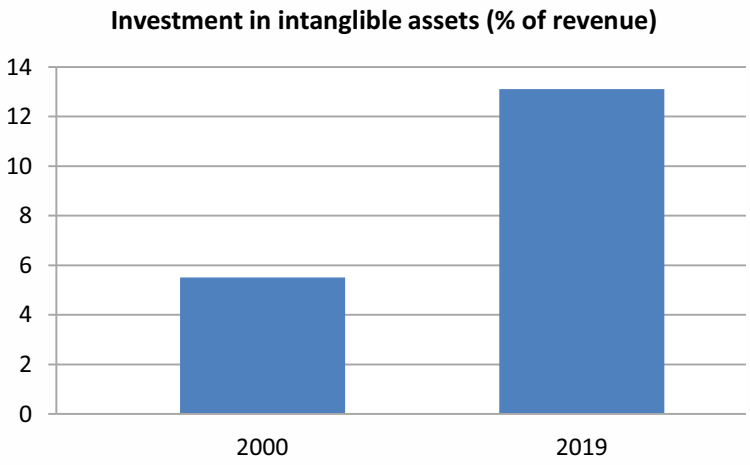
Digitization is a rather powerful trend. It draws its power from its effect on productivity and firm growth particularly in the services sector. The footprints of services such as fintech, ITeS, data analytics, e-commerce etc are testament to the rapid rates of innovation in the services sector. Consequently, services such as finance, retail, transport, communication, healthcare and education have undergone transformation in not only business models but also market structure. Further, the accessibility of these services, the number of jobs they create and the impact of their enterprise on the larger economy have increased substantially.

The data in figure 1.1 shows the results of a recent research report by the McKinsey Global Institute titled *'Globalization in Transition: The Future of Trade and Value Chains'.* Their research shows that on aggregate, across value chains, investments in intangible assets (such as branding, IP, R&D) more than doubled since the turn of the century. This can be interpreted as an indicator of technology-based innovation in the services sector that is feeding into productivity of other sectors such as manufacturing and agriculture.

Thus, technology has intensified the 'servification' of value chains; the extent to which services are consumed as inputs for production. This in turn, has also impacted the growth of the services sector in terms of wages, employment and share of national economic activity.

It is therefore vital to analyse the depth of innovation in services and its impact on companies operating in manufacturing and agriculture who use these services as inputs in their value chains.

Fig 1.1



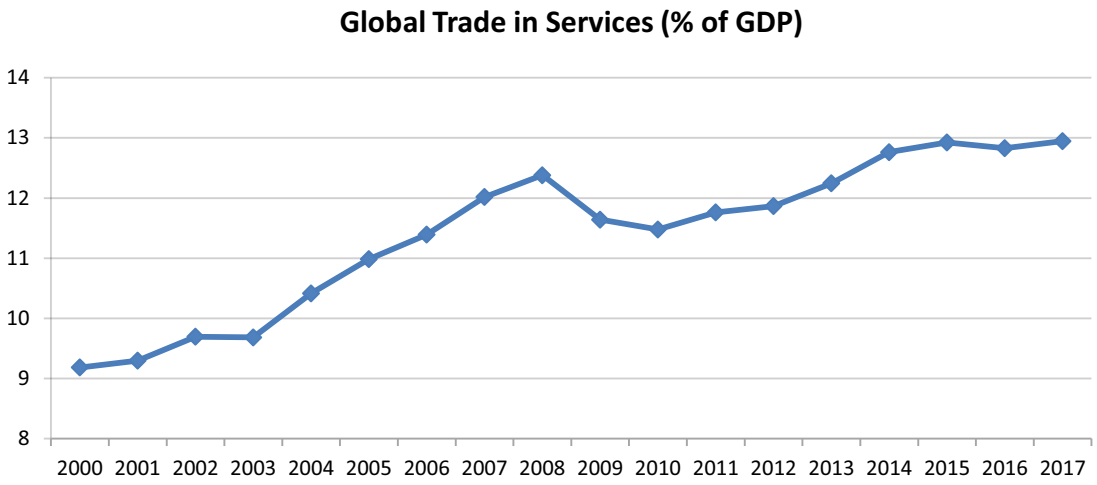
Source: McKinsey Global Institute

The 2nd T: Tradability

While technology and innovation are boosting the domestic productivity of services sectors, there is a parallel process underway that is expanding their global reach. The trade-intensity (share of output that is traded across borders) of services is growing nearly 60 percent faster than goods. This means that while lesser goods are traded beyond borders (global trade has been slowing down), more services are being exported and imported.

Growth in the international consumption and provision of services has critical implications for both companies who provide such services and governments who aim to

Fig 1.2



Source: World Bank

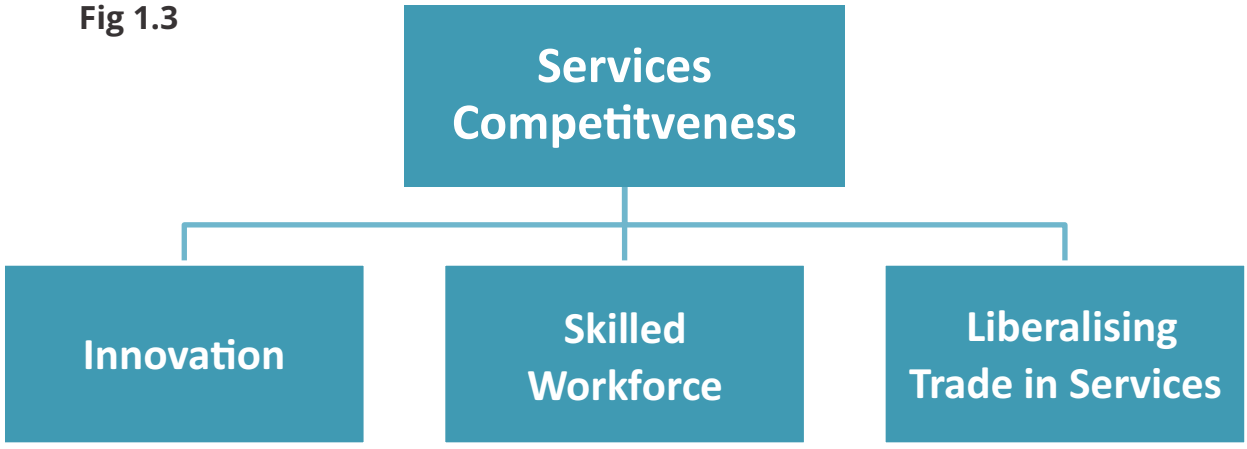
increase the standard of living for their population. Therefore, domestic services sectors will determine to a large extent, the competitiveness of companies and economies. An emerging market such as India with a robust consumer market, an identity as a net exporter of services and favourable demographic profile stands to benefit from such realignment of global trade if the provision of skills (service sector employment and productivity is driven by the availability of skilled workers) and the tradability of its services is supported by policy interventions.

Competitiveness Re-imagined

As services get more specialised, technology-driven and tradable, the contours of competitiveness will change. Factors that traditionally drove competitiveness of a country as a location for investment and growth (low cost inputs for instance) may not necessarily dictate the competitiveness of companies and countries in the future. To remain competitive in the digital economy, innovation, skills and liberalising trade in services will affect the levels of productivity, incomes and growth of economies. Therefore, if emerging markets and their companies are to converge with developed markets, strategy must be revisited, keeping in mind the vitality of the services sector.

(The article has been contributed by MVIRDC World Trade Center Mumbai Research Team)

Fig 1.3



Importance of Fintech for Financial Inclusion

The Indian economy is endowed with a huge population with many trapped at low levels of income and development. Serving the financial needs of all the sections of the society has been a challenge due to the heterogeneity of land and diverse needs of the people.

Development so far has been more pronounced in the urban areas, with commercial banks mostly catering to the urban and affluent populace, thereby leaving a vast majority of the people out of the formal sector net. The banking channels have so far not been able to reach and uplift a major section of the society belonging to the MSME sector and poor farmers.

Need for institutional credit is at the forefront for any person wanting to undertake an economic activity or a livelihood project. While the Western, Southern and Northern regions in India have collectively access to about 83 per cent of the total credit issued by the Scheduled Commercial Banks (SCBs), the Central, Eastern and North Eastern states collectively account for only 17 per cent of the same, with the North Eastern region accounting for only one per cent.

Commercial banks have not been able to tap the potential of these regions owing to the huge investment required in the brick and mortar structure and the low incentive of generating profits from the same. This void can now be filled by fintech companies which through their digital and customized solutions can reach the vast majority of the population and deliver credit at very low costs, compliance and collateral.

With increased mobile penetration, individuals and firms leave a huge digital footprint of their transactions such as payments, remittances and choices. These enable fintech firms to make informed decisions about the credit worthiness of these firms and offer credit within a short span of time. Improving Tele Density[1] can aid in financial penetration in the less served areas.

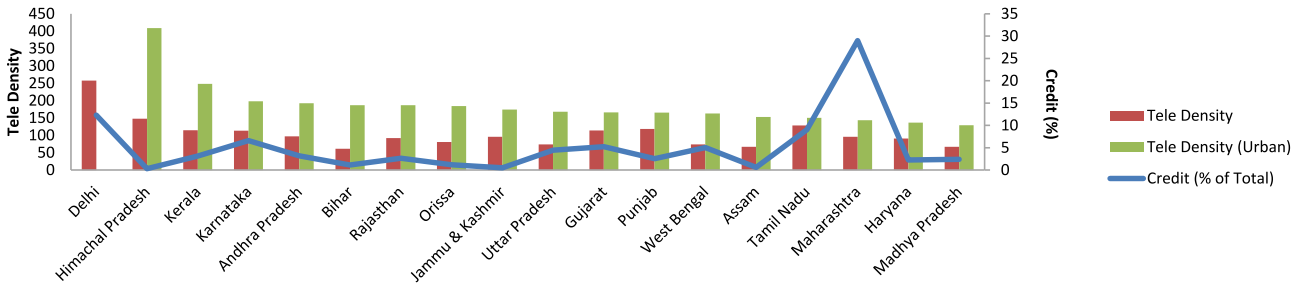
Fintech Growth Potential in Major States in India

Figures 1 & 2 show state-wise Urban and Rural Tele Density of major states in India and the Percentage of Total Credit issued by SCBs to these states in FY17.

An analysis of the selected states suggests that states such as Himachal Pradesh, Kerala, Andhra Pradesh, Bihar, Rajasthan and Orissa, each received less than five per cent of the total credit issued by the SCBs in India in FY17; however, they have an Urban Tele Density of greater than 180, suggesting that with increasing mobile penetration and smart phone usage, there is a huge opportunity for fintech firms to enter the untapped credit space.

Similarly, states such as Jammu & Kashmir, Uttar Pradesh, Punjab, Assam, Haryana and Madhya Pradesh which also had very low credit penetration from the SCBs in FY17 can have increased credit access from fintechs by improving their Urban Tele Density, which stood at below 180 in FY17, and smart phone usage.

Fig. 1: State-wise Urban Tele Density and Percentage of Total Credit by SCBs (FY17)



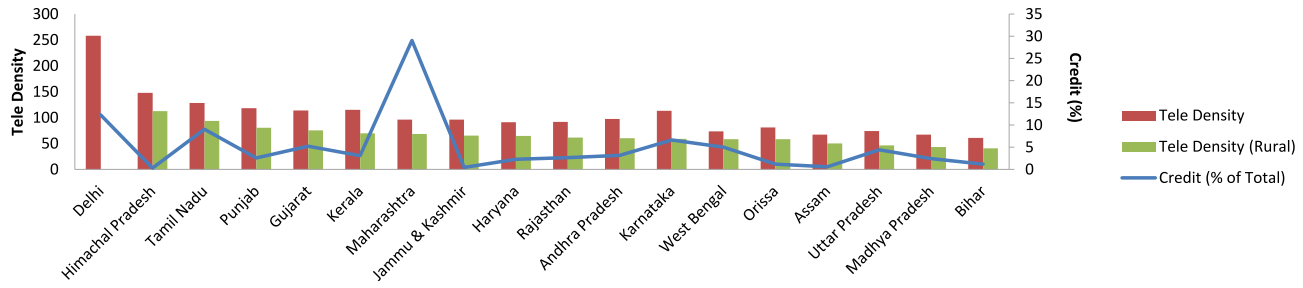
Source: CEIC Database, MVIRDC WTC Mumbai In-house Analysis

[1]Tele Density is the number of telephone connections for every hundred individuals living within an area

At the same time, increasing the pace of mobile penetration in rural areas (Rural Tele Density being below 100 in most states) can improve the standard of living of the rural folk by enhancing their digital footprint and addressing their financial needs through advanced fintech technologies.

manufacturing of cement and cement products, drugs and pharmaceuticals, rubber and rubber products, paper products and printing, among others in FY18. These manufacturing industries received about one per cent each of the total outstanding credit. Industries such as fertilizers, electronic engineering, beverages,

Fig. 2: State-wise Rural Tele Density and Percentage of Total Credit by SCBs (FY17)



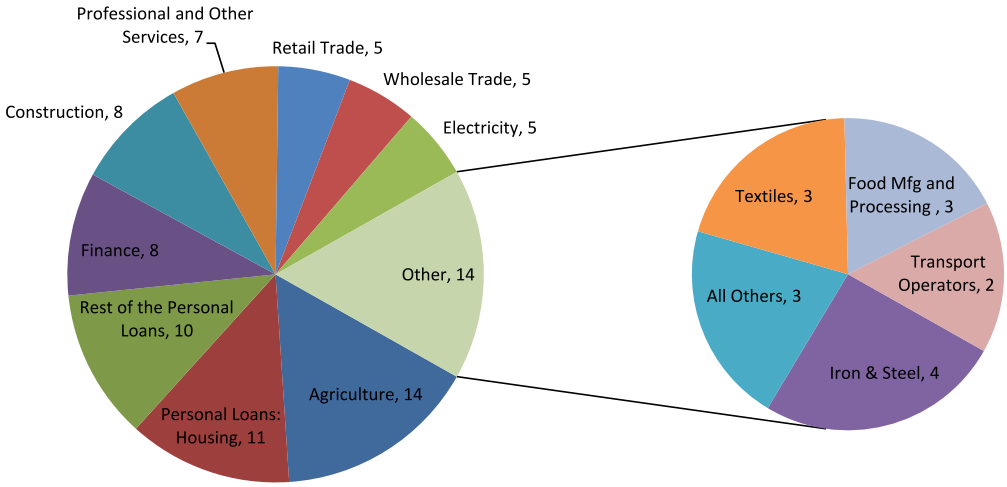
Source: CEIC Database, MVIRDC WTC Mumbai In-house Analysis

Sectoral Analysis of Credit Outstanding of Scheduled Commercial Banks (SCBs) in India

A further sectoral analysis of the credit outstanding of SCBs in India (Figures 3, 4 & 5) points out that individual services such as wholesale and retail trade, construction, finance and professional services had a higher share of the credit outstanding than most manufacturing industries like vehicles, vehicle parts and transport equipment, light engineering, electrical engineering, and leather and leather products received less than one per cent of the total. While many MSMEs belong to these industries, not requiring huge investments, they can be easily catered to by fintech companies.

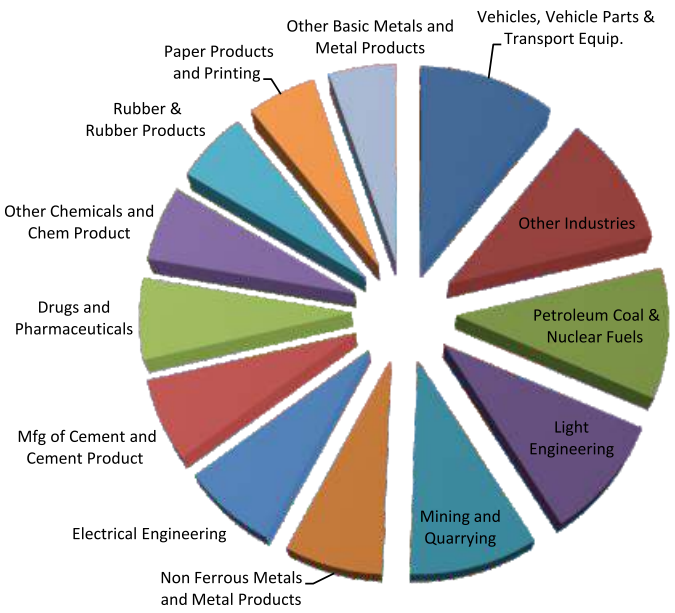
Even in the agricultural sector, which accounted for about 14 per cent of the credit outstanding of SCBs in FY18, fintech companies can play a pivotal role in delivering crop loans and improving the productivity of the sector.

Fig. 3: Percentage of Credit Outstanding of SCBs to Sectors (>1, FY18)



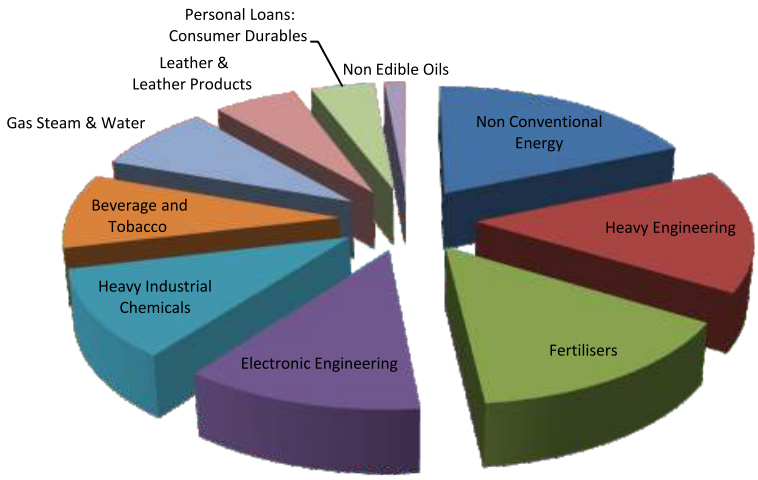
Source: CEIC Database, MVIRDC WTC Mumbai In-house Analysis

Fig. 4: Credit Outstanding of SCBs to Sectors (=1%, FY18)



Source: CEIC Database, MVIRDC WTC Mumbai In-house Analysis

Fig. 5: Credit Outstanding of SCBs to Sectors (<1%, FY18)



Source: CEIC Database, MVIRDC WTC Mumbai In-house Analysis

Conclusion

Factors such as availability of cheap smart phones, affordable high-speed data plans, convenience of transacting through the digital mode and a tech-savvy young population enhance the possibilities of the evolution of a dynamic fintech sector in future.

Further, taxation reforms such as the introduction of Goods and Services Tax, push for digital payments and programmes such as 'Make in India' and 'Skill India' that aim for economic inclusion of even the lower rungs of the society, among others, will pave way for the development of a vibrant fintech sector.

While growth in fintech in advanced nations such as the USA and Japan can stagnate over the next few years as internet penetration in these economies has already saturated, growth in fintech can translate into higher growth for India.

With more than 60 million MSMEs in the country and countless enterprises in the unorganized sector, fintech companies can play an important role in promoting inclusive development.

(The article has been contributed by MVIRDC World Trade Center Mumbai Research Team)

Fostering a Competitive and Dynamic Service Industry in Asia

Dr. Donghyun Park
Principal Economist
Asian Development Bank, Philippines

Services play a critical role in developing Asia's growth. The sector is already large, accounting for over half of the region's GDP. Services contribute substantially to economic growth across Asia, as well as employment. Structural changes in the region's economies will further expand the role of services.

Developing Asia is following the same path travelled in the past by the advanced economies, with agriculture's dominance giving way to industry, and then industry being supplanted by services. Rising incomes and rapid urbanization are boosting demand for services domestically. As the manufacturing sector sees wages rise and labor intensity fall, Asia will look even more to services to create jobs for the millions who join the workforce every year.

A vibrant service sector has broad benefits for the economy. First, it has positive spillovers to other sectors. A vibrant business service sector, such as information and communication technology (ICT), industrial design, and marketing, may facilitate investment and the development of new products.

The cross-benefits work both ways, as a dynamic industry sector creates demand for more business services. This synergy between services and industry can raise the productivity of the economy as a whole.

Second, job creation is central to inclusive growth, and services tend to be labor-intensive. The sector's share of total employment in the region is large—employing more than one third of Asia's workers —and growing. Empirical evidence also suggests that service sector growth helps reduce poverty. More directly, services such as health care and education enable individuals to be more productive and enhance their quality of life.

Third, the extended slowdown in the major industrial countries is weighing heavily on merchandise exports from the region. Developing the service sector can diversify the production base, which will enhance the resilience of the economy and boost its growth momentum.

Fourth, technological progress has enabled the rise of cross-border trade in services. For example, the advent of ICT has catalyzed the global exchange of outsourced business processes.

India and the Philippines have established themselves as world leaders in the export of such services. Asia accounts for a large share of this trade already, but greater openness can support a more competitive and productive service sector.

Yet, labor productivity in developing Asia's service sector lags far behind that of advanced economies. For most economies in the region, labor productivity is less than 20% of the figure in advanced economies. It languishes at around 10% in the PRC and India. In the worst cases, it may take up to 30 years to reach 20%.

Low productivity partly reflects the dominant role of traditional service industries. These services—such as wholesale and retail trade, real estate, transport, personal services, and public administration—still account for the bulk of the sector's output.

In contrast, modern services such as ICT, finance, and

professional business services occupy less than 10% of Asia's service economy, well below the 20%–25% share in advanced economies. Enabling the shift to modern services and modernizing traditional services are essential to close the productivity gap with advanced economies.

Modern services enjoy higher productivity, have greater potential for synergies with other sectors, and are more amenable to cross-border trade. They also strengthen the link between services and inclusive growth by generating high-quality, high-wage jobs. There are also considerable productivity gains to be reaped from updating practices within traditional services.

Regulatory, infrastructure, and human capital bottlenecks are holding back service sector productivity. Infrastructure for services, such as ICT, still lags advanced economies.

The highly skilled workers that are required for modern services, such as scientists and bankers, are in short supply. And above all, excessive regulation that protects incumbent firms and other vested interests keeps markets less competitive and thus undercuts prospects for improved productivity and efficiency.

There are a number of policy priorities for Asia to improve the efficiency of its services sector. Regulatory reform is needed to foster a more competitive service sector. The burden of heavy regulation is the single tightest bottleneck constraining the sector. A slew of regulations and restrictions currently protect incumbent firms and thus stifle competition and innovation in services markets.

In India, for instance, a staggering 13 official bodies regulate higher education. The PRC, India, Indonesia, Malaysia, the Philippines, and Thailand maintain higher trade barriers than do other countries with similar incomes. International experience shows that regulatory reform can catalyze competition and deliver significant economic benefits. It must be a top priority for policy makers.

Investment in infrastructure for services needs to be ramped up. ICT infrastructure, for example, has large positive spillover effects for the whole economy. Examples of the benefits of such investments are India's and the Philippines' world-class services industries in ICT and outsourced business processes. While Asia has invested in ICT infrastructure at a furious pace, it still lags advanced economies.

Education reform is vital to easing the shortage of highly skilled workers. While education attainment has risen rapidly in Asia overall, the region still suffers acute shortages of some skills. Modern high-productivity services require highly skilled workers.

The shortage is especially evident in professional groups: accountants, business managers, engineers, lawyers, medical doctors, scientists, and software specialists.

The key guiding principle for policy makers is to create a more competitive environment for services. Dismantling the wide range of regulatory barriers that protect vested interests from domestic and foreign competitors holds the key to unleashing competition. Such barriers include domestic restrictions and foreign trade barriers, both of which create and preserve monopolies and oligopolies in domestic services markets.

Easing constraints on infrastructure for services, and training workers in the skills demanded by modern services, will provide the means to move beyond traditional low-productivity services. Fostering a more competitive and dynamic service industry can boost overall productivity and support developing Asia's future growth.

About the Author

Dr. Donghyun Park joined ADB in April 2007. Prior to joining ADB, he was a tenured Associate Professor of Economics at Nanyang Technological University in Singapore. Dr. Park has a Ph.D. in economics from UCLA, and his main research fields are international finance, international trade, and development economics. His research, which has been published extensively in journals and books, revolves around policy-oriented topics relevant for Asia's long-term development, including middle-income trap, service sector development, and financial sector development. Dr. Park plays a leading role in the production of Asian Development Outlook, ADB's biannual flagship publication on macroeconomic issues, and leads the team that produces Asia Bond Monitor, ADB's quarterly flagship report on emerging Asian bond markets.

At Your Service: A New Pathway for Development?

Dr. Prakash Loungani
Assistant Director
IMF's Independent Evaluation Office

Prejudice against the service sector runs deep: in The Wealth of Nations Adam Smith questioned the social value provided by "churchmen, lawyers, physicians, men of letters of all kinds, players, buffoons, musicians, opera-singers, opera-dancers, etc." In the 1960s, William Baumol fostered the view that services are a sector resistant to improvements in productivity. Provision of services–such as restaurant meals, haircuts, and medical checkups–required face-to-face transactions, which did not lend themselves easily to standardization and trade, the source of growth in productivity and hence income. Also in the 1960s, Kaldor put forth an argument for the supremacy of the industrial sector for the promotion of broad economic growth. The success of many countries, such as Korea and China, through exports of goods seemed to cement the importance of manufacturing as a pathway to prosperity.

Times are changing. Recent evidence has begun to challenge the tenet that industrialization is the prime engine of growth. Recent evidence highlights that business services seem to allow productivity growth by the same mechanisms that have traditionally made manufacturing the key driver of growth, a point made by the noted Indian economist Ejaz Ghani. Hence, even countries like China are now seeking new sources of growth to be service-led. The structure of economic production is continuously evolving, with trade in services playing a greater role. The share of services exports in total exports has doubled from 17 percent in 1970 to over 32 percent by 2014.

Are the drivers of growth and development shifting away from manufacturing into services? It may be too early to tell, but there are new investment opportunities in a variety of tradable service activities. More recently, there is also a growing sentiment in policy and media that the pace of globalization, driven primarily by exports in goods, may have started to decelerate after two decades of uninterrupted progress. Could trade in services support a future wave of globalization, trade and growth? These questions have sparked an interest in understanding the implications for trade in services on productivity, jobs and growth, but very little is known about global services trade.

My colleagues Chris Papageorgiou, Saurabh Mishra, Ke Wang and I have constructed a new data set on global trade in services for 192 countries, more detailed than any earlier efforts. The data is broken down into one and two-digit disaggregation, providing as many as 27 services export sectors. The data is based on the IMF's Balance of Payments Statistics.Using this rich dataset, it is shown that trading services are gaining momentum in world trade and are becoming an increasingly important component of global production. Our analysis documents global trends in trading services and provides stylized facts documenting how countries differ on various dimensions of exporting services. The paper makes the case that trading services are not only catching up with exports of goods in many countries, but they could help continue the strong globalization process started by export of goods.

About the Author

Mr. Loungani is Assistant Director at the IMF's Independent Evaluation Office. He has 30 years of experience at the IMF and in the Federal Reserve System and academia. He is also adjunct Professor of Management at Vanderbilt University. He is the author of well-rated academic articles in macroeconomics and international economics and the book Confronting Inequality: How Societies Can Choose Inclusive Growth (Columbia University Press, 2019) . His previous jobs at the IMF include: chair of the Jobs & Growth group set up by IMF management; chief of the Development Macroeconomics division; Senior Personnel and Budget Manager for the Research Department; and advisor to the IMF's Communications Director. Mr. Loungani holds a Ph.D. in economics from the University of Rochester.

International Trade in Services - Opportunities and Challenges

Dr. Robert B. Koopman
Chief Economist and Director
Economic Research and Statistics Division
World Trade Organization

International Trade in services has been growing rapidly over the last few decades fuelled by enabling technology, particularly digital technology and the internet, as well as continued liberalization and integration.

At the same time services share of most large developed and emerging economies continues to grow, particularly as productivity in manufacturing soars, requiring fewer and fewer workers, and more highly skilled workers.

Many service industries have defining characteristics that make them potentially tradeable. In economics terms any industry or sector for which the production of the good or service can be geographically concentrated while serving geographically widely dispersed demand is potentially tradeable across borders.

This is because the inherent trade costs associated with moving the good or service over a great distance is likely small compared to its cost of production.

Thus the cost savings from economies of scale, internal or external, or agglomeration affects from co-location can more easily overcome the costs of distance. Of course, other trade related costs must also be overcome, such as regulatory and trade barriers, language barriers, and specific market aspects such as trust that relate to tacit knowledge requirements.

In addition, the role of services in contributing to the productivity and competitiveness of manufacturing is increasing. The servicification of manufacturing activities and the transformative impact of digitalization on services have been fundamentally altering the global economy.

Over the past two decades, services have been the fastest growing segment of output, employment and, significantly, trade, and there are reasons to believe that the growth of services trade may accelerate, driven by powerful forces such as digital technologies, GVCs, demographics and economic development.

In the World Trade Organizations World Trade Report 2018 we provided a glimpse of the changes at play in the services sector. The Report found that digital technologies increase the services component of trade.

Digital technologies are also changing the composition of trade in services and goods, and redefining intellectual property rights in trade.

They are blurring the distinction between goods and services and are increasing the importance of data flows and intellectual property.

For example, a 3D printed object is also a "3D traded object" – a good that is produced on the basis of a design

protected by intellectual property that is transmitted by electronic means as a service.

The WTO predicts that the share of services trade will grow from 21 per cent to 25 per cent by 2030. This is a story of digital technologies leveraging the internet to generate, store and process data. Technologies such as artificial intelligence, the internet of things, 3D printing, and blockchain.

These technologies have the potential to deeply transform the world economy, the way people live, work, and trade. Technologies such as the Internet of Things (IoT) enables companies to track products along the supply chain and helps to prevent equipment failures.

Artificial intelligence is used to guide robots in warehouses and optimize the packing of products. It allows companies to dive into our preferences and behaviour to offer us tailored products.

3D printing could bring manufacturing closer to consumers, even inside our homes. And Blockchain could enhance the transparency of supply chains, accelerate the digitalization of trade processes and automate contractual transactions.

The Report helps to illustrate some of the big changes that are already happening and shows the impact of technological advances on trade costs and trade patterns.

The WTO predicts that trade could grow yearly by 1.8 to 2 percentage points more until 2030 as a result of the falling trade costs. This amounts to a cumulated growth of 31 to 34 percentage points over 15 years.

The decline in trade costs can be especially beneficial for MSMEs and for firms from developing countries, if appropriate complementary policies are put in place and challenges related to technology diffusion and regulation are addressed.

Our estimations foresee that, in such case, developing countries' share in global trade could grow from 46 per cent in 2015 to 57 per cent by 2030.

Overall, digital technologies and the new services trade they will enable have the potential to generate considerable benefits. They can unlock many opportunities for individuals, entrepreneurs and businesses around the world.

But they also give rise to a number of challenges and concerns, including about market concentration, loss of privacy and security threats, productivity and the digital divide.

These important questions deserve close attention. How will the technological future evolve, can it be trusted to market forces? What can be done to make this new digital revolution a truly inclusive one?

It is likely that governments will have to consider how they want to respond to these challenges. But international cooperation also has an important role to play in helping them ensure that digital trade continues to be an engine of inclusive economic development.

The WTO framework, and in particular the GATS, is relevant for digital trade. WTO members have already taken certain steps to promote digital trade within the existing framework.

Discussions continue on how WTO members may want to respond to the digitalization of the economy and ensure that everybody can participate and benefit from it.

About the Author

Dr. Robert B. Koopman is the Chief Economist and Director of the Economic Research and Statistics Division at the World Trade Organization and a Professor at the Graduate Institute in Geneva. As Chief Economist at the WTO, Bob provides the Secretariat and Member Countries with analysis and information that promotes a deeper understanding of trade and trade policy's role in economic growth and development.

At the Institute, Bob teaches courses on international trade and conducts research on trade policy and on the various mechanisms and sources of adjustment to economic development and trade policy. Bob also serves as the WTO representative to the G20 Trade and Investment Working Group. He has also previously served as the Chief Economist and Director at the Office of Economics in the United States International Trade Commission.

Trade liberalization in Services in Support to Sustainable Development

Summary of findings from ESCAP study for the Asia-Pacific region[1]

Ms. Mia Mikic (PhD)
Director, Trade, Investment and Innovation Division,
UN Economic and Social Commission for Asia and the Pacific, Thailand

Evidence abound about the rising role of services and services trade in national economies and their connectivity with international markets. ESCAP's publication on Services and Global Value Chains: The Asia-Pacific Reality (2017) shows that services have now become more important for countries irrespective of their level of income per capita or trade dependency. They contribute to a much larger share of GDP, employment and trade across the board. All types of services are now used as inputs in manufacturing as well as other services making them a significant component of the overall production as well as trade costs. In contrast to traditional thinking, they are the key driver of productivity or its reflection, competitiveness.

A country without an efficient services supply will undermine its development potential. It is understood that technological progress drives supply, diversity, and quality of services as well as access to the services markets and consumption. In the upcoming era of 4th industrial revolution, with all its technological disruptions, it is expected that the automation will affect many types of jobs currently performed by humans.

Services are likely to be harshly hit. For example, professional services (e.g., accountancy, law, health care) as well as transport, construction and similar services are identified as likely most affected, both in terms of number of jobs and ages. Nevertheless, empirical evidence currently still points to the growth of services exports contributing to somewhat faster job growth. Furthermore, these technological changes may take time, so it is important for countries possibly facing adverse impacts to put in place policies to mitigate such effects.

[1] Available in fool text from https://www.unescap.org/publications/services-and-global-value-chains-asia-pacific-reality-studies-trade-investment-and

In hedging sustainable development on services, that is on the role that services trade plays, it is crucially important to understand that 4th industrial revolution and this digital era imposes the need for trade policy to not only be coherent in terms of intersectoral reach (that is, linking goods, services, investments, intellectual property, and more) but also to be linked closely with other policies crucial for sustainable development (e.g. technology development, education, social protection, etc.).

In the situation of the stalled multilateral negotiations on improving the General Agreement on Trade in Services, many countries have turned to negotiating bilateral and regional trade agreements covering certain aspects of services liberalization, but not all of them provided much improvement over their MFN commitments, because many at the same time also undertook autonomous services reforms (creating deep "water in GATS commitments").



This of course makes job of trade policymakers and trade negotiators harder but not impossible. A good coordination at the level higher than a single ministry turns out to be very helpful in most countries.

ESCAP (2017) discusses the policy aspects at length, clustered into these three areas: 1. Keeping markets open for services trade growth; 2. Reducing costs and increasing competitiveness; and 3. Keeping it all together: Coherent policymaking.

Let me extract few main points from each of these clusters. With respect to keeping markets open, there are two key areas of action. One is to stop the increase in protectionism that has been creeping into the multilateral trading environment since the global financial crisis of 2008-2009. Another one is to look at alternatives to direct liberalization through facilitation of services trade.

Even a small tariff may have a sizable impact on competitiveness of producers within the supply chain, and thus dampen the demand for traditional and other services used in GVC-linked production and trade. Unfortunately, instead of the removal of less transparent forms of protectionism (non-tariff barriers), there are new instruments such as domestic taxation that may have an adverse impact on GVCs and thus on services.

While preferential trade liberalization has proliferated, resulting in many formal trade agreements (177 in force for Asia-Pacific region countries), the level of liberalization in services and market opening that is meaningful for the developing countries is not large, and should be enhanced through better negotiations and implementation of available deals.

Very importantly, services facilitation (seen as the simplification, modernization and harmonization of services supply processes with a view to reducing transaction costs, thus really directly linked with the next point) should also be part of negotiating mandates of FTAs. With respect to actions to take to reduce costs and increase competitiveness, one of the drivers of the services trade success story is the fact that services as intermediate inputs into manufacturing and other services can reduce costs (especially for smaller market players, that is SMEs). Again, technological advances are a very important factor in pushing services costs down. Aside from technology, the focus should be on policies and regulatory frameworks, starting with those in domestic economies. Often, the most impactful cost-reducing measure is the removal and streamlining of burdensome regulations, including those preventing more efficient competitive behaviour. Improving regulation transparency is often the first and easiest step towards reducing regulatory costs.

In additionally, regulatory co-operation and harmonization, including through trade agreements, play an important role (OECD, 2017). Regulatory cooperation is needed to reduce compliance costs in different jurisdictions and to ensure ease of doing business across borders.

In this regard, governments can consider a mechanism or platform for sharing experiences regarding services regulation and reform as well as for identifying best practices that can be applied across borders. Mutual recognition agreements in the area of standards for products and services(including qualifications for professionals) come to mind as possible areas where current frictions exist, and which can be moved with relative ease.

Traditionally, cost reduction and increased competitiveness have been expected from spillovers and technological diffusion from foreign to domestic providers of services. Policies necessary to achieving this result may first of all include, for example, removal of explicit discrimination against foreign providers of services so that they can enter the domestic market. Furthermore, public investment in upgrading and improving domestic absorptive capacities, such as investment in education and training, ICT readiness and networks, are all high on the list of desirable policies. In addition, greater domestic and international labour mobility will enable domestic firms as well as individuals to take advantage of service export opportunities.

Finally, how to keep it all together, how to deliver policy coherence? The importance of services requires a comprehensive approach to policy formulation. While liberalizing trade in goods is a starting point for seeking new trade opportunities, the value chain of industrial goods requires efficient services.

Improvements in the performance of the service sectors, including by liberalization of services trade, would thereby enhance the competitiveness of manufacturing firms and facilitate their participation in global production networks. In contrast, restricted service trade and rigid regulation, often found among some of the fastest-growing economies in the region, could translate into a negative effect on exports of goods.

However, as imported services become an increasingly essential element of internationalized production, governments will come under more pressure to create a balance between assisting domestic service providers and promoting the competitiveness of manufacturing exports in GVCs. There is also a risk that too much reliance on imported intermediate services andgoods may lead to limited development spillovers from GVCs to the rest ofthe economy.

Lastly, a regional initiative is needed for prioritizing cooperation in regulatory reforms. International and regional organizations such as ESCAP can play a role in supporting governments in the region by launching a regional initiative for all-of-services best practice regulation. Regulatory reforms should cover all modes of delivery. ESCAP can act as a regional platform for bringing services regulators together with trade officials, both sector-by-sector and at the whole service level, to: (a) identify the barriers to liberalization in services; (b) share regulatory experiences; (c) raise awareness of regulatory incoherence; (d) consider options for improving regional practice; and (e) benchmark the progress of regional integration in services.

About the Author

Ms. Mia Mikic coordinates the Asia-Pacific Research and Training Network on Trade (ARTNeT), an open network of research and academic institutions and think-tanks in the Asia-Pacific region. Previously, she was Professor of International Economics at the University of Zagreb, and Senior Lecturer at the University of Auckland. She is the author of International Trade (Macmillan, 1998), co-author of Trade Statistics in Policymaking – A handbook of commonly used trade indices and indicators (United Nations, 2009), journal and technical papers, and has edited or co-edited several volumes, most recently with Bruno Jetin, ASEAN Economic Community- A model for Asia-wide regional integration? (Palgrave, 2016).

She led a development of the Asia-Pacific Trade and Investment Agreements Database of ESCAP which monitors performance of the trade agreements for the regional economies. She oversees preparation of Asia-Pacific Trade and Investment Report, a flagship publication of ESCAP in the area of trade and investment. Her current work focuses on the impacts of preferential and multilateral trade liberalization, services trade liberalization, non-tariff protection, Aid for Trade and evidence-based policymaking in trade. She has masters in International Business from the St. Mary's College of California and a doctorate in Economics from the University of Zagreb. E-mail: mikic@un.org

Integrating into Global Value Chains: Why do Services Matter?

Dr. Witada Anukoonwattaka
Economic Affairs Officer, Trade Policy and
Analysis Section, Trade and Investment Division, UNESCAP

In the 1990s, when East Asian economies were the show case of successful integration into global value chains, the rapid increase of manufacturing exports was given credit for being a major driver.

The importance of the services sector was overlooked. Part of the reason was because services represented only a marginal share in total exports.

Today, the view on services has changed significantly. Manufacturing firms have increasingly realized their dependence on services both regarding inputs and outputs. Globally, services contribute about one-third of manufacturing exports.

The significant share of services contribution to manufacturing exports is a result of the fact that most of high value-added activities in manufacturing GVCs are service activities, not manufacturing activities.

Substantial value addition occurs at either an early part (such as R&D, design and engineering services) or a final part of the value chain (such as distribution services, wholesale and retail services).

In addition, geographical dispersion of value chains means that the efficiency of services, which relate to the link between different functions from different locations such as ICT services and transportation services, will be highly critical to the just-in-time supply chain management and competitiveness of manufacturing GVCs.

In addition, there are GVCs for the production of services. The rapid development of offshoring of the business services sector has shown that services can create a GVC in their own right.

The offshore services mainly include information technology services, knowledge process services and business process services. Similarly, global operation has already occurred in health services, legal services, financial services and tourism services.

With the revolution of digital and telecommunication technologies, more and more services will operate through GVCs.

Asia-Pacific perspectives

For most developing countries in Asia and the Pacific, the economic development has been driven extensively by the rapid expansion of manufacturing exports. The most important driver of the impressive manufacturing export growth was the integration of developing economies into manufacturing GVCs.

Calculations using WTO-OECD Trade in Value added

data reveals that service inputs account for 31.2 per cent of total manufacturing export value. Services' contribution to manufactured goods production is higher for industries related to GVCs.

In the Asia-Pacific region, the contribution of services is highest at 36.6 per cent of the value of exports of computers and electronics, followed by chemical products, and motor vehicles.

In contrast, mining and quarrying sector which are not part of GVCs tend to have small service content. Such differences clearly indicate the greater need for services if a country aims to integrate into GVCs. Based on its contribution to exports of the Asia-Pacific region, distribution, logistics, R&D, finance and insurance are important services for GVCs of manufacturing and services in the region.

For manufacturing exports, distribution services, including wholesale and retail, contributed 12.4 per cent of the total inputs used. Based on the experience from advanced economies', GVC participation, R&D and other business services, and finance and insurance are highly essential for upgrading GVC participation to higher value-added stages of GVCs.

Notably, the key services for GVC participation tend to be import intensive. The import content in the exports of logistics and R&D services in Asia and the Pacific were about 19 per cent and 15 per cent, respectively. The high import content of these services implies that efficient access to imports of these services is a key factor in the further enhancement of the region's participation in GVCs.

Towards strengthening a country's position in GVCs

When production in GVCs relies on the international sourcing of services or imports of intermediate services, efficient access to essential intermediate services provided by the most competitive service providers is key to promoting participation by Asia-Pacific economies both in manufacturing GVCs and in service GVCs.

Heightening service trade restrictions and rigid regulation will have an undesirable impact on users of services, including firms engaging in GVCs. In the long term, such highly restricted trade in services could adversely affect export competitiveness of manufacturing industries and service industries themselves.

However, as imported services become an increasingly essential element of internationalized production, governments will come under more pressure to create a balance between assisting domestic service providers and promoting the competitiveness of manufacturing exports in GVCs.

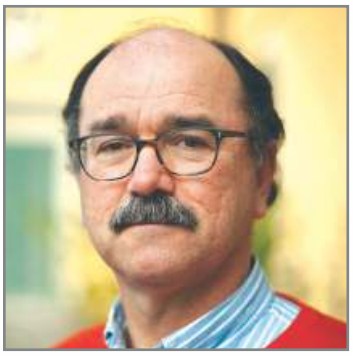
There is also a risk that too much reliance on imported intermediate services and goods may lead to limited development spillovers from GVCs to the rest of the economy. Therefore, it is therefore important to have a comprehensive set of policies in place in order to encourage spillovers and technological diffusion from foreign to domestic providers.

About the Author

Dr. Witada Anukoonwattaka holds a PhD in Economics from the University of Melbourne, Australia. She is Economic Affairs Officer, in United Nations ESCAP. She serves as a core researcher and leading several research projects, in particular for the Trade Policy and Facilitation Section of the Trade and Investment Division. Before joining ESCAP, she was a lecturer of the Faculty of Economics at Thammasat University, Thailand, and also worked in the advisory team of Thailand's minister of industry, foreign affairs, and commissioner of Thailand's National Telecommunications Commission. Her research areas cover economic impacts of trade and investment policies as well as contemporary trade issues of Asia-Pacific countries including global value chains, regional integration, trade in services, and the relationships between trade, technology, and sustainable development.

E-mail: anukoonwattaka@un.org.

Harnessing Benefits from Services Trade for India's MSMEs



Dr. Anirudh Shingal
Indian Council for Research on International Economic Relations, New Delhi and European University Institute, Florence

Dr. Bernard Hoekman
European University Institute, Florence and CEPR, London

1. Introduction

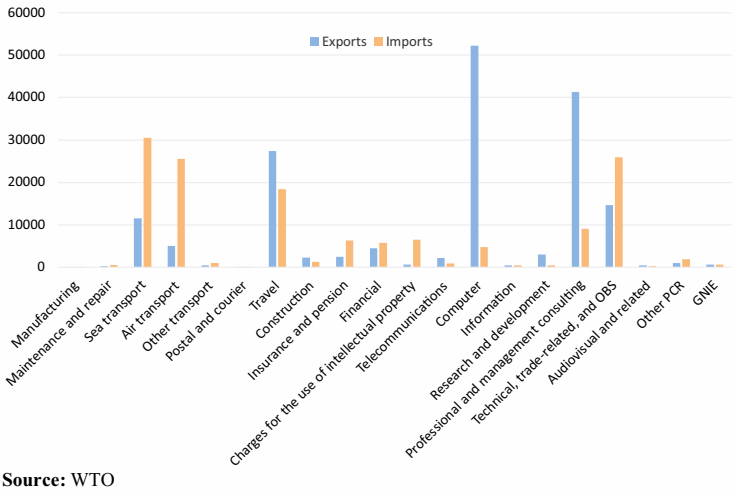
The services sector accounts for close to 60% of India's GDP and its importance as a source of jobs has been growing over time, rising from 20 percent of total employment in 1995 to an estimated 30 percent at present. Services account for more than a third of India's total gross trade and for more than 50% of total trade when measured in value added terms: in 2015, services contributed 51.7% of the total value of India's exports according to OECD-WTO Trade in Value Added data. India has one of the highest growth rates for services exports and imports over the last two decades. It is one of the top 20 services traders in the world.

Services are heterogeneous. They include low/semi-skilled sectors such as travel, tourism, construction, distribution, hotels and restaurants and more sophisticated and skill-intensive sectors like finance, health, education, ICT, and professional services such as legal,
accountancy, engineering, and management consultancy. Many of these services are inputs into almost everything that the MSME sector produces, both for domestic and foreign consumption. Thus, the growth of the services sector provides immense opportunities to the MSME sector for expansion.

2. Opportunities from services trade

India's gross services exports are dominated by computer, management consulting, travel, transport and other business services (OBS).[3] Services imports are concentrated in transport, OBS and travel services (Figure 1).

Figure 1: India's trade in services by main categories (2017, USD mln)



Source: WTO

[3] OBS is a broad category that includes merchanting, trade-related, operational leasing, legal, accounting and auditing, advertising, architecture and engineering, agricultural mining, maintenance of offices abroad, environmental services and refund and rebates.

Table 1: India's Revealed Comparative Advantage in Services

Sectors	2014	2015	2016	2017
Manufacturing services on physical inputs owned by others	0.06	0.06	0.04	0.03
Maintenance and repair services n.i.e.	0.08	0.06	0.05	0.07
Sea transport	0.99	0.87	0.98	1.02
Air transport	0.56	0.39	0.43	0.39
Other modes of transport	0.05	0.04	0.05	0.06
Postal and courier services	0.03	0.04	0.04	0.04
Travel	0.51	0.55	0.56	0.60
Construction	0.48	0.48	0.71	0.65
Insurance and pension services	0.55	0.51	0.51	0.56
Financial services	0.41	0.38	0.35	0.27
Charges for the use of intellectual property n.i.e.	0.06	0.04	0.05	0.05
Telecommunications services	0.59	0.58	0.62	0.54
Computer services	5.84	5.62	5.11	4.46
Information services	0.31	0.24	0.36	0.40
Research and development services	0.29	0.30	0.41	0.54
Professional and management consulting services	3.10	3.33	3.18	2.98
Technical, trade-related, and other business services	0.69	0.66	0.76	0.71
Personal, cultural, and recreational services	0.83	0.84	0.87	0.83
Government goods and services n.i.e.	0.25	0.24	0.25	0.25

Source: WTO; own calculations

India's global competitiveness in different services can be assessed by looking at indices of Revealed Comparative Advantage (RCA).[4] As shown in Table 1, this indicator suggests that India has a clear comparative advantage in the export of computer and management consulting services. Both sectors have been largely driven by private enterprise operating in relatively competitive markets. They are also among the more liberalized sectors in the Indian economy in terms of market access to foreign investment. The performance of India's computer services in particular augurs well for the country's MSMEs that provide the bulk of the electrical machinery, parts and components needed by the IT sector.

3. Services-sector trade and regulatory barriers for MSMEs

Policy is a major determinant of the costs that service suppliers incur to contest foreign markets. In some cases, policy simply prohibits foreign sourcing; in others policy measures greatly reduce the scope for trade to occur – e.g., through the application of economic needs tests or quotas applying to foreign services suppliers. According to the OECD, in 2018 India had a services trade restrictiveness index (STRI) of 0.488 compared to an average value of 0.235 for OECD economies. India is a lot more restrictive in terms of its services trade policy.

India's two major markets for her services exports, the EU and the US, have STRI values of 0.216 and 0.238, respectively. High trade restrictions come at a cost for MSMEs, reducing access to low-cost services and thus the ability of Indian firms to compete. Research has found that a more open trade and investment policy stance could boost productivity performance of Indian firms in the agricultural and manufacturing sectors, especially if accompanied by improvements in economic governance and associated regulation.[5]

In addition to services trade restrictions, regulatory compliance costs constrain MSMEs from benefiting from the growth of the services sector. Irrespective of a government's trade policy stance and regulatory requirements, there will always be procedural and administrative requirements that must be satisfied. As is true for procedures that apply to goods crossing borders, there will be costs for services providers in complying with regulatory policies.

[4] The RCA index for a given services sector in country A is calculated by taking the share of the sector's exports in country A's total exports of services, and dividing this by the ratio of the rest of the world's exports in this sector to the total services exports of the rest of the world. An RCA index exceeding unity indicates a comparative advantage in the sector, while a value less than one indicates a comparative disadvantage.

[5] See for example M. Fiorini and B. Hoekman, "Trade Agreements, Regulatory Institutions and Services Liberalization," Global Policy, 2018. At: https://doi.org/10.1111/1758-5899.12583.

These costs go beyond fees and charges for documents or certification and conformity assessment and the associated time costs. Inadequate information, lack of predictability and more generally uncertainty regarding applicable measures and whether services provision will be authorized, all will increase costs as well.

4. What can MSMEs do?

The MSME sector needs to organize itself better to inform itself and the government of the regulatory and compliance issues that it faces both in the Indian market and in its major export destinations abroad. Such information could pertain to (i) rules relating to taxes, fees, and other charges on services supply or suppliers; (ii) suggestions on ways to enhance access to information on applicable regulation, including through electronic means, and more generally to increase the transparency of the application of services trade-related policies; and (iii) suggestions for domestic review-type mechanisms to provide opportunities for suppliers to raise issues related to the administration of measures and the pursuit of regulatory cooperation by the authorities.

Some of these issues are part of the Trade Facilitation in Services proposal that was submitted by India to the WTO's GATS Working Group on Domestic Regulation in 2016. The MSME sector would do well to engage more actively with the government to ensure that its suggestions on services regulation and compliance issues are implemented bilaterally with India's major trading partners as well as multilaterally.

Possible global rules of the game for policies pertaining to e-commerce and cross-border data flows are currently being discussed at the WTO by a group of 76 countries including China. In parallel, there is a joint initiative on MSMEs that establishes a work program to identify how to better address MSME trade concerns and needs.

Given the critical importance of internet presence for the MSME sector, Japan has proposed that such a body look into the 'opportunities, challenges, and barriers' that MSMEs face while wanting to participate in e-commerce. India has chosen not to be a part of either initiative at the WTO, thus excluding India's MSMEs from being able to influence the work program and potential new rules on e-commerce-related policies that may be agreed by participating countries.

About the Author

Dr. Anirudh Shingal is a Senior Fellow at the Indian Council for Research on International Economic Relations (ICRIER), New Delhi. Dr. Shingal is also the Programme Associate of the Global Governance Programme at the European University Institute (EUI), Florence. A PhD in Economics from the University of Sussex, Dr. Shingal has more than 15 years of experience in the empirical analysis of trade and development issues.
E: anirudh.shingal@eui.eu

Dr. Bernard Hoekman is Professor and Director, Global Economics at the Robert Schuman Centre for Advanced Studies, European University Institute in Florence, Italy where he also serves as the Dean for International Relations. He is a CEPR Research Fellow, where he co-directs the Trade Policy Research Network; a senior associate of the Economic Research Forum for the Arab countries, Iran and Turkey; and a member of the World Economic Forum Global Future Council on International Trade and Investment.
E: bernard.hoekman@eui.eu

How the UK Turned its Back on Services

Prof. L. Alan Winters
Professor of Economics Director,
UK Trade Policy Observatory

The UK is a service economy: about 80% of GDP is generated by service sectors and 40% of total UK exports are cross-border services – by a long way, the highest proportion for any major economy. And this ignores services exports delivered via foreign presence – so-called Mode 3 – which is also large for the UK. Financial services are well represented in these data but they are far from the only area of strength in the UK services offering – think legal services, education and cultural exports.

At the same time, as it tries to work out what Brexit entails, we hear almost nothing about services. British politics and media are currently (February 2019) locked in an intense debate about the future trading relationship between the UK and the EU. This hinges around whether the border in Ireland between Northern Ireland and the Republic will permit frictionless trade in goods and it is spiced with concerns about how parts of the car industry might gradually leave the UK in the absence of a 'deal' – a negotiated trade agreement between the UK and the EU.

It is true that both the UK and the EU wish to negotiate a deep agreement to govern their mutual trade post-Brexit, but when one considers the published outlines of such a deal, one realises that even this will give services trade short-shrift – Winters (2019). In fact, no trade agreement has achieved much actual liberalisation of services trade beyond binding applied policies more firmly – Morita-Jaeger and Winters (2018) – so it would be unrealistic to expect a UK-EU trade agreement to get close to the replicating the trading conditions within the European Single Market.

Moreover, it is not as if UK-EU services trade will unaffected by Brexit. In the UK debate about Brexit, there have been claims that the UK never gained much better access to EU services markets than it would obtain under EU rules for services trade with third countries. These claims were never very credible and they have recently been decisively disproved by path-breaking work from the OECD. Benz and Gonzales (2019) extend the OECD's Services Trade Restrictiveness Index (STRI) to cover the regulatory regimes that govern services trade between 25 European Economic Area countries (the larger members of the European Union, Iceland and Norway). The STRI is the definitive source for measuring restrictions on services trade. It is based on publicly available information from legal databases and government gazettes. OECD researchers

- assemble a catalogue of legal information in the STRI regulatory database,
- use a codified algorithm, built on the basis of expert knowledge, to score measures as restrictive (=1) or not (=0),
- average the individual measure scores to create indicators in five areas (Restrictions on foreign entry, Restrictions on the movement of people, Other discriminatory measures, Barriers to competition and Regulatory transparency) and, finally,
- weight the areas together with weights that vary somewhat from sector to sector[1].

The method and weights are identical for the MFN and the intra-EEA calculations and in both cases the resulting indexes of trade policy could, in principle, range from zero (totally unrestricted) to unity (totally restricted).

To give a flavour of the difference between the UK trading with EU members on third country (MFN) terms and as a member of the Single Market, consider, for

example, computer services, where the mean restrictiveness index for trade between the EEA countries is 0.04 and for their third-country trade, it is 0.22. For air transport, the comparison is 0.15 and 0.42 and for legal services 0.08 and 0.37. In fact, differences such as these are found in every sector.

Second, the differences in restrictiveness between sectors are much smaller for within-EEA trade than for EEA countries' third-country imports. Differences in protection between sectors are important economically because they distort the pattern of production away from the sectors in which an economy is most naturally competitive.

Third, the European Single Market has not only reduced barriers to services trade within the EEA, but it has also harmonised regulations across member states. This is hugely important because the costs and barriers to services trade arise at least as much because regulations differ between exporter and importer as they do from restrictive regulations per se. Thus for all pairwise comparisons between EEA countries, OECD has recorded whether, measure by measure, they have similar regulations, scoring 0, or dissimilar ones, scoring 1. The average over all comparisons and sectors is 0.06 for intra-EEA trade compared with 0.22 if these countries had traded according to their third country policies.

It is worth asking how the UK, the champion of free trade and the liberalisation of services trade in particular, has so consciously neglected its principal area of comparative advantage.

First, in popular – and therefore in political – minds, the shine was beginning to come off services anyway. Crafts (2019) has argued cogently that we should see Brexit as a consequence of the financial crisis of 2008-09, which was laid at the door of the dominant services sector – finance. Following the 'big-bang', which liberalised financial services in the mid-1980s, UK governments had given the financial services sector little supervision and great latitude to make money. While the crisis did not originate in the UK, UK banks were at its centre and the way it spread so deeply to the UK can certainly be laid at the door of the UK banking sector. Moreover, many people found it deeply offensive that at the same time as the government imposed a vicious fiscal squeeze on public services (so-called austerity) the banks were bailed out and very few bankers suffered at all[2]. Suffering the effects of austerity is one of the strongest correlates with voting for Brexit in the UK referendum of June 2016.

The shine has further been tarnished by the unacceptable behaviour of the tech giants – service industries – which was certainly becoming evident during 2017 as the UK government formulated its Brexit strategy. And also by the growing geographical divide between London (and the South-East) and the rest of the UK, which was largely driven by the former's heavy focus on service industries. Indeed, the Cameron government of 2010-16 had already started to talk about re-balancing the economy towards the regions and manufacturing industry. Thus the services sector was weak politically at the start of the Brexit process, and for a variety of reasons, including its relatively recent rise, it was much less well organised than manufacturing, agriculture or fishing. The financial sector did try to argue its corner, but realising that it was not making headway just withdrew and focussed on preparing for the deepest of Brexits, which they appear to have done reasonably successfully including moving critical business and assets outside the UK.

Relatedly, the Brexit debate has not been notable for its sophistication or its willingness to analyse issues carefully rather than rely on point-scoring. One current cabinet minister declared during the referendum that 'I think we have heard enough from experts' and he has neither retracted this view nor, I regret to say, been disproved by changes in popular opinion or the popular press. It is much easier to explain international trade in terms of goods rather than abstract services which often seem merely to exist in the ether. Thus faced with twenty seconds to make a point, politicians have fallen back on goods – especially sensitive ones like cars and food – rather than try to explain that universities, say, are threatened by Brexit are larger employers and exporters than the car industry. In fact, one can sympathise: services trade is subtle and depends on so many factors that it is difficult to explain. Moreover, the complexity of services trade and the absence of detailed

[1] For details see Geloso Grosso et al. (2015).

[2] Very few commentators saw the bail outs as an attempt (successful) to protect depositors rather than bankers, although the fact that so many of the latter survived so well did not help to elucidate their true nature.

data on trade and trade barriers made it doubly difficult to counter the concrete alarms that manufacturing industry threw up. However, an economically literate government would at least have tried.

Third, the pro-Brexit campaign in the referendum deliberately avoided spelling out what Brexit entailed and thus evaded all talk about trade-offs – any attempt by the other side to raise them was termed 'Operation Fear'. Thus Theresa May became Prime Minister in July 2016 with no plan and no analysis at all. Despite this, she suddenly enunciated four 'red-lines' that greatly endeared her to the 'hard-Brexit' wing of her party: leaving the customs union, leaving the Single Market, freedom from the European Court of Justice and not paying 'vast sums' to the European Union. At the same time the EU made clear that it would not allow the UK to 'cherry-pick' the bits of each element that it liked and discard the rest - you were either in or out of the customs union or the Single Market. The UKTPO was among the first to point out that these positions left little option other than seeking a UK-EU Free Trade Agreement (Gasiorek et al, 2016) and that this could well bode ill for services (Borchert, 2016).

In fact, the situation was even more constrained than suggested in the previous paragraph. Many people argued that the most critical factor behind Brexit was a wish to curtail (control) immigration from EU member states, and immigration was Theresa May's bete noire in policy terms. As Home Secretary under David Cameron she had been asked and failed to cut migration into the UK despite ever more stringent policy positions. For her, Brexit had to include controlling migration.

As the UK government tried to formulate an offer to the EU, it (plausibly) felt that it could not ask for frictionless trade in goods (which would involve de facto customs union membership and the Single Market in goods), continuing de facto membership of the Single market in services and yet seek to end the freedom of movement for EU citizens to enter the UK. So something had to give. Over 2017 the issue of maintaining a perfectly open border between Northern Ireland and the Republic and concerns that UK ports would complete cease up if UK-EU trade were subject to border formalities elevated frictionless trade in goods to pole position and Mrs May was not going to give up on immigration. So the UK Government just decided to give up Single Market type trade in services.

It was that simple. There was no conscious debate (one of Theresa May's several blind-spots is a reluctance to debate – with anyone, anywhere); no serious analysis of the costs and benefits of different options, little effective lobbying and, for understandable reasons, absolutely no effort by the EU side to put services back in the frame. Given the lack of analytical understanding of services trade it is difficult to be sure, but my fear is that we will come to view this neglect of the UK's key sectors as a mistake of historic proportions.

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About the Author

Prof. L. Alan Winters is the Director of the UK Trade Policy Observatory in the University of Sussex, a leading contributor to the debate on Brexit. From 2008 to 2011, he was Chief Economist at the British government's Department for International Development (DFID), and from 2004 to 2007, he served as Director of the Development Research Group of the World Bank. Prof. Winters is a leading specialist on the empirical and policy analysis of international trade, especially in developing countries. He has published more than two hundred and forty articles and chapters and thirty books in areas such as regional trading arrangements, non-tariff barriers, European integration, transition economies' trade, international labour migration, agricultural protection, trade and poverty, and the world trading system.

Industry 4.0 and the transformation of services

Dr. Ganesh Natarajan
Founder and Chairman, 5F World

The sweep of artificial intelligence and machine learning and its impact on predictive and prescriptive analytics has been amply described in thinker and academic Noel Harari in his new book Homedeus.

Harari warns that our lives can become so planned and controlled by intelligent digital assistants that in a few years, even the people we meet will be guided through our AI linking up to other people's AIs and taking prescriptive action.

While this may be the scary side of letting digital take over our physical reality, there is no doubt that every activity known to man will feel the impact of new customer thinking, processes, analytics and technologies in the emerging future.

In our country, the extensive automation of manufacturing and business processes that created Industry 3.0 has now yielded to Industry 4.0 with the sweep of digital transformation creating a focus on the end-to-end digitization of all physical assets and integration into digital eco-systems with value chain partners.

In fact, this is the way one consulting firm PWC has defined Industry 4.0 in its 2016 Global Industry 4.0 survey.

McKinsey & Co has defined Industry 4.0 as "the next phase of digitization of the manufacturing sector" and calls out four disruptions which enable 4.0 – data volumes, computational power and connectivity, emerging analytics and business intelligence capabilities, human-machine interaction advances like touch interfaces and augmented reality systems and the improvements in transferring digital instructions to the physical world, such as advanced robotics and 3-D Printing.

In the services domain, traditional repetitive processes in financial services and healthcare are already being impacted by blockchain models and robotic process automation while traditional IT services areas like computer application development, testing and support are being completely eliminated by automat- ion and artificial intelligence.

Add to this, the opportunities in mixed reality (augmented and virtual) and the incredible advances in analytics and one can see that every services function, from logistics to healthcare to

hospitality will be transformed beyond recognition in the very near future.

After early and not so successful experiments with e-Learning and MOOCs, digital learning platforms like Skills Alpha are also enabling assistive AI to help youth plan their careers, access the right skills to enable their professional journey and then be mentored and become part of peer communities to continue their professional advancement.

A Huffington Post blog suggests that with our vast pools of technically trained manpower, Industry 4.0 is the defining opportunity for India to take its place as a global leader in manufacturing.

With services being the larger percentage of GDP in the country today, a fact that is unlikely to change in the short and medium term, it is imperative that job seekers as well as working professionals embrace the new changes and prepare themselves for this new world

For businesses, the pull of the marketplace imperative and the digital transformation push are creating new value disciplines to adopt.

Product and Service offerings are substantially enhanced by the addition of new intelligent data provision to the customer and completely new end to end digitised products and services with transformed commercial models is the order of the day with the time to market for new product introduction shrunk to all time low levels.

In the arena of operational excellence, vertical integration of all order fulfilment processes and extension beyond company walls to all value chain partners through digital interfaces has made supply and demand matching, operations and process planning, production inventory and quality control and asset and labor utilization to be optimised.

And customer satisfaction is being maximized by design thinking and charting new customer journeys on an ongoing basis, substantially improving sales service and aftersales customer management.

India with its vast pool of communicative and trained manpower and the market leadership it has already built in IT services, can clearly take the lead. The time for services transformation is now!

About the Author

Dr. Ganesh Natarajan is Executive Chairman and Founder of 5F World, a platform for Digital Start-ups, Skills and Social Ventures in the country. He is also Chairman of Global Talent Track and Skills Alpha and a co-founder of two Indo-US Joint Ventures – Kalzoom Advisors and the Center for AI and Advanced Analytics.

Ganesh has received the Distinguished Alumnus Award of IIT Bombay and NITIE and has been recognized by EY and the Asia Pacific HR Forum for excellence in entrepreneurship and people-centric leadership. He has two successful CEO tenures over twenty-five years at APTECH and Zensar Technologies.

Harvard Business School has written and teaches two case studies on Dr. Ganesh Natarajan and Zensar's success through Vision Communities.

The Digital Enterprise is Already a Reality!

Mr. Ashish Bhat
Executive Vice President and Head, Digital Factory, Siemens India

Manufacturing industry in India has gone through various phases of development over the period of time and promises to be one of the high growth sectors in the coming years. The Make in India initiative aims to boost the contribution of the manufacturing sector from 15% to 25% of GDP, in the near future. In order to support this growth, India will need an ecosystem comprising tier 1, tier 2, as well as tier 3 suppliers, with a high level of efficiency, flexibility, and quality focus. The next decade of manufacturing will focus on cognitive solutions that infuse intelligence into all processes—from a factory's floor to the finished product. We have to adopt and adapt new technologies in our manufacturing right through our supply chains. Digitalization will play a big role in this entire transition to make sure we create world-class products.

Digitalization promises lower costs, improved production quality, flexibility and efficiency, shorter response time to customer requests and market demands, and also opens up new and innovative business opportunities.

The integration and interplay of product lifecycle management (PLM), factory automation and digitalization which forms the basis of Industry 4.0 will be the key to the sustainable progress of the manufacturing sector, equated as the future of manufacturing (FOM).
Industry 4.0 will result in new ways of creating value and novel business models. It will transform the design, manufacturing, operation and service of products and production systems. Connectivity and interaction among parts, machines, and humans will make production systems as much as 30 percent faster and 25 percent more efficient and elevate customization to new levels. Digitalization will majorly impact and redefine the 'productivity' criteria and measure owing to digital real-time supply chain, digital product definition and digitally crafted and run production lines.

Digital Enterprise Suite is Siemens' unique offering for digital transformation. The Digital Enterprise Software Suite provides an integrated portfolio of Industrial Software and Automation solutions for the discrete industry. This allows product manufacturers, machine and line builders to integrate and digitalize their entire value chain – including their suppliers. It is already a reality, and companies are pursuing its benefits and opportunities through digital transformation, which requires seamless integration of big data along the entire manufacturing value chain.

As the world is moving towards industry 4.0, India will also have to move with it if 'Make in India' has to succeed. This will mean that we have to adopt and adapt new technologies in our manufacturing right through our supply chains. Digitalization must be a top management priority on two levels: On the one hand, companies need to align what they offer to reflect Industry 4.0 and add digital solutions and services to their portfolio. On the other hand, they must undergo transformation and gear their internal processes to meet the requirements for digitalization. In India, while some of the large businesses have been quick to transition into this digital world, majority of the Small and Medium Enterprises (SME) in the manufacturing sector are yet to put these digital technologies to work.

SMEs are the backbone of industrial development. The contribution of small scale Industry has been

remarkable in the industrial development of the country. It has a share of 40% in the industrial production. 35% of the total manufactured exports of the country are directly accounted for by this sector. In terms of employment generated, this sector is next only to agriculture employing approximately 36 million people.

Despite SMEs occupying majority share of the industry, they currently face multiple issues that are hindering their growth. The most critical issue for SMEs is continuous quality improvement, scope and scale. Some of the major factors responsible for this are extensive manual interventions in processes, interrupted flow of data and lack of skilled manpower. There will be a sustainable development of the manufacturing only when the SME sector participates in with upgraded technology and skills.

Through Digitalization, SMEs can enhance efficiency to fight scale, reduce cost of production, minimise manufacturing defects, and shorten production time. With this, they can not only meet international quality standards but also strengthen their position as competent suppliers for the global market.

There are already some examples especially in the automotive sector of Indian enterprises who have used modern technology to improve their competitiveness. Since the last 4 decades the advancement of the automobile industry has facilitated the growth of a sizeable ecosystem of SMEs. Catering to the automotive industry, their standards lifted and their quality went up. Furthermore, they invested into their manufacturing processes and now the same SME's are supplying to multiple automotive companies.

Apart from partnering our customers in their journey towards Digitalization, Siemens India also inaugurated its showcase digitalized Low-voltage Switchgear factory at Kalwa in 2017. The upgraded factory using Siemens' own Digital Enterprise technology is the most advanced switchgear manufacturing facility in India and is in sync with Government's 'Make in India' and 'Digital India' initiatives. It is a unique story which Siemens is showcasing to India. Here, all the data is transformed in a digital format. This is a completely digital workshop that starts at the level of product R&D all the way through manufacturing simulation and then building the manufacturing facility from the optimized and simulated product and plant data. This is what makes it unique. The globally-benchmarked factory is capable of producing more than 180 variants in one line at the rate of one product every nine seconds. Products at the plant communicate with machines and all processes are optimized for IT control, resulting in a minimal failure rate. The production methods deployed at the plant are expected to be a standard for small and medium-sized manufacturing units in India, achieving a visionary model for the future of manufacturing: end-to-end digitalization where the real and virtual worlds merge in "Digital Factory".

We are now taking our experience of digital transformation to the Indian enterprises especially the SME segment through a unique road show called the "Ingenuity Tour" - a multicity tour through the Industrial corridors of India. The Ingenuity Tour will demonstrate a comprehensive array of innovative products, solutions and services covering Electrification, Automation and Digitalization, as well as Customised Financing Solutions for the manufacturing segment. Our focus is on helping our customers generate performance improvements across the entire value chain, from design to production and operations to maintenance and become more agile, efficient, reliable and future-proof.

Indian manufacturers have the unique opportunity to blend the availability of advanced manufacturing technologies with low cost of labour to create extraordinary competitive advantage. The need of the hour is for SMEs to take the lead in adopting new technologies and make it an integral part of their business strategies. Those that are successful in understanding the power of digitalization and harnessing it across their businesses will lead this new wave of growth.

About the Author

Mr. Ashish Bhat heads the Digital Factory Division of Siemens India comprising the business units of Factory Automation, Motion Control, Control Products and Industry Services. Prior to this, he was the head of Process Industries & Drives and Digital Factory divisions in Thailand. With an industry experience of over 30 years, his expertise spans Strategic planning, Governance and Portfolio management of Industry sector with specialised expertise in the Industrial Automation portfolio, market development and channel development.

Technological Innovation – Policy Challenges and Perspectives at the National and Global Level

Dr. Robert D. Atkinson
President, Information Technology and Innovation Foundation (ITIF)*

Technological innovation and technology policy is a vast topic, covering many technologies, industries and policy tools. However, perhaps the most important focus for technology policy over the next decade will be to help countries prepare for the next wave of digital innovation.

Countries can welcome it, prepare for it, and ride it to new heights of innovation and prosperity, or they can ignore the changing tide and miss the wave, only to be left behind treading water.

Economies are complex production systems with myriad industries. What and how these production systems produce is grounded in technology. So, as technologies change, production systems change.

Today, the most important and widely shared technologies are digital information technologies that have evolved from the mainframe and mini-computing systems of the 1960s and 70s.

They include an array of personal computing devices, back-office servers, IT-embedded machines, and cloud-based services that are connected or dynamically provisioned to users over private networks or the Internet.

But the world is now beginning to transform into a new kind of digital system, one that will not only build on existing devices and systems, but will also increasingly incorporate emerging technologies such as sensors, robotics, and artificial intelligence as they improve in price and performance.

This next digital economy will be significantly more connected (with many more things, and many more types of things networked, including in more advanced wireless and wireline networks), more automated (as devices and systems enable more work to be done by machines), and smarter (as algorithms play increasingly important roles in sensing—and making sense of—all this).

This pervasive connectivity, combined with machine-driven automation and intelligence, will signal a new era for the global economy. While transformative, this next economy will not be the so-called "Fourth Industrial Revolution"—a term some have embraced to trumpet an epochal transformation akin to the rise of steam power and electricity (only even more consequential).

Rather, these technologies represent more of an evolution of our current digital system; albeit one that will bring significant advances, particularly in applying digital technologies to the physical world (as opposed to principally information) and using software systems to generate intelligence.

Although this evolution could bring widespread economic and societal benefits, obstacles and challenges must be overcome to realize its full potential—and therein will lie an important role for government. Getting this right is critical for two main reasons.

* This article is based on an ITIF report "The Task Ahead of Us: Transforming the Global Economy With Connectivity, Automation, and Intelligence", (https://itif.org/publications/2019/01/07/task-ahead-us-transforming-global-economy-connectivity-automation-and)

First, countries' competitive advantage in the global economy will increasingly be based on the extent to which they are home both to the industries that are developing these new technologies and to the industries that are adopting them, particularly in globally traded sectors (e.g., agriculture, business services, and manufacturing).

Second, nations that lead in adoption of these technologies—in all sectors, traded and non-traded—will experience greater increases in living standards and quality of life. But success in both development and adoption of these new digital technologies is not assured; in fact, many forces today work against it.

One aspect of this next innovation wave is that large economies, especially those of the United States and China—and potentially India—have significant advantages in next-wave digital development and adoption. This is partly because economies of scale, enabled by large integrated markets are key to digital innovation.

For example, having access to large data sets is useful for artificial intelligence. Large markets also enable companies in industries where there are high fixed costs in developing a technology (such as R&D) to gain sustainable advantages over competitors with access only to smaller markets.

However, successful nations will be the ones with the most competitive companies, the most skilled workers and entrepreneurs, and the best policy systems. Having one or even two of these components will not be enough.

The role of government in supporting this next innovation wave is straightforward: Make next-wave digital evolution a central policy goal. Governments that choose to do so will benefit from more competitive digital technology-producing industries and a more transformed and prosperous digitally enabled economy.

To do that, governments need to enact policies that support digital transformation, and resist policies that limit it. While there are both broad and specific policy areas involved, and each issue area is complex, they all fundamentally boil down to a simple question: Will the policy spur digital transformation or limit it in favor of another goal?

There is a large set of policy areas where the benefits are largely unequivocal. All governments should move forward expeditiously in these areas, such as in supporting digital skills; freeing more radio spectrum; supporting broadband rollout to high-cost areas; funding R&D; supporting voluntary, global, and industry-led digital standards; prosecuting cybercrime; enacting trade policies that prohibit data localization and support foreign direct investment; expanding and deepening e-government and open-data policies; and crafting industry transformation policies (e.g., smart transportation, smart grid, smart health care, fintech, etc.).

While some of these policy areas might involve trade-offs with incumbent economic interests (e.g., the taxi industry does not like competition from ride-sharing apps), they involve few trade-offs with competing social priorities (e.g., privacy).

Perhaps the most straightforward step nations can take is to ensure their agencies and institutions of government are up to date, sophisticated, and deep users of existing and emerging digital technologies. Yet governments in most nations are falling further behind private-sector leaders.

Where there are trade-offs with social issues (such as

privacy, fairness, etc.), governments should favour next-wave digital implementation by designing policies that spur installation in ways that minimize trade-offs.

Many policies affecting digital technologies can either help or hinder transformation, depending on policy design. For example, by limiting access to data and raising compliance costs, overly stringent privacy policies, such as the EU's General Data Protection Regulation, come at the cost of faster digital transformation.

Finally, governments should eschew protectionist policies that limit digital transformation. Some policies, such as discriminatory taxes on digital services or companies (e.g., data taxes, broadband taxes); unneeded regulations (e.g., regulating "over-the-top" Internet services to achieve supposed parity with broadband providers; instituting restrictions on cross-border data flows); limiting foreign market access, especially by firms with innnovative digital business models; and technology bans (e.g., on autonomous weapons, ride-sharing applications, autonomous delivery robots, self-checkout systems, facial recognition systems, and algorithmic decision-making) will severely limit a nation's next-wave digital progress.

All too often these policies are pushed for by either anti-technology civil society groups or incumbent businesses and interests that want the government to protect them from consumer-enhancing competition.

Policymakers need to support not just technological innovation, but also institutional innovation. IT and business in general are evolving together, which requires new management practices and new business models. This is true in government and nonprofit sectors as well.

As digital technology evolves, societies need to embrace not just the technologies, but also institutional innovation to enable new governance models. For example, 3D printing technology will likely lead to entire houses being printed, but unless local zoning and building codes are reformed, innovation will be limited.

Policymakers need to avoid favoring politically influential incumbents. Existing firms and new firms, big and small, domestic and foreign, all can be digital innovators.

Wherever possible, policymakers should enable innovators to enter markets (e.g., establish regulatory sand boxes - a framework set up by a regulator to allow small-scale testing of innovations by firms in a controlled environment under regulators' supervision.)

At the end of the day, nations' success in embracing next-wave digital technologies will depend on a combination of awareness and strategic action. Each nation needs to ask itself where it stands on both fronts.

Do policymakers truly understand the technologies and competitive strengths, weaknesses, opportunities, and threats they present? Such an assessment requires an honest, non-ideological evaluation, and a rejection of myths and self-reinforcing ideas that sound good but are in fact false.

Groupthink should not trump thoughtful, objective analysis, painstaking though it may be. In taking strategic action, are nations focused on learning from global best practices in the wide range of policy areas affecting next-wave digital technologies, and then ensuring they adapt those lessons to fit the realities of their own nations? Getting this right will have a significant, positive impact on the living standards and quality of life of future generations.

About the Author

Dr. Robert D. Atkinson is one of the country's foremost thinkers on innovation economics. With an extensive background in technology policy, he has conducted groundbreaking research projects on technology and innovation, is a valued adviser to state and national policy makers, and a popular speaker on innovation policy nationally and internationally. A sought-after speaker and valued adviser to policymakers around the world, Atkinson's most recent book, Big is Beautiful: Debunking the Mythology of Small Business, released March 2018.

Before founding ITIF, Atkinson was Vice President of the Progressive Policy Institute and Director of PPI's Technology & New Economy Project. He received his Masters in Urban and Regional Planning from the University of Oregon and was named a distinguished alumnus in 2014. He received his Ph.D. in City and Regional Planning from the University of North Carolina at Chapel Hill in 1989.

Artificial Intelligence (AI), Globalization of Services and Structural Transformation

Dr. Saurabh Mishra, Phd
Manager, AI Index Program
Stanford University

Globalization of Services and Economic Transformation

Recent technological innovations are altering the structure of economic production. In his book "The Wealth of Nations", Adam Smith questioned the social value provided by "churchmen, lawyers, physicians, men of letters of all kinds, players, buffoons, musicians, opera-singers, opera-dancers, etc." Moreover, William Baumol fostered the view that services is a sector resistant to improvements in productivity. He noted that the provision of services, such as: restaurant meals, haircuts, and medical checkups, required face-to-face transactions which did not lend themselves easily to standardization and trade i.e. the sources of growth in productivity and income. As a result, to this day, economists and policymakers propagate manufacturing over services. These biases in economic thinking remains, rooted in the long-held traditions, are yet to account for how the data revolution and capabilities in Artificial Intelligence (AI) are altering the structure of economic production. These evolutions are putting services at the center of economic production and world commerce.

In Silicon Valley, there is a truism that "70 percent of hardware is software", an early recognition of the link between sales of computers and software services. Interestingly, the lifecycle and adoption of AI in enterprise systems relies on an ecosystem of varied services that are distinct from software services. Increasingly AI-services are the glue that binds many manufacturing supply chains and are critical to their reliable operations. The future wealth of nations could very well depend on an underpinning of AI-services components, from research and development at the inception of the product to automated distribution and repair at completion. Thereby, the national strategies for AI and questions supporting what an inclusive AI-ecosystem entails will remain critical to the future growth patterns of cities and nations.

AI services led Trade and Growth

Using communication networks, services can be transported almost instantly over long distances. The range of service activities that can be digitized and globalized is expanding, from the processing of insurance claims and tax payments to the transcription of medical records to the provision of education via online courses. AI is such a critical component that is altering the value chain of such service-based ecosystems. For example, the growing technical performance of AI in domains such as: image recognition, is fueling the value added across several sectors; such as: reducing the time for medical diagnosis with high accuracy, or defense and economic intelligence decisions using real-time satellite imagery.

Hence, AI services are disrupting the nature of both modern and traditional services. Modern services are defined as: financial, telecommunications, computer and information, charges for IP and business services like R&D services that have more direct knowledge spillovers from AI-service components. In addition, AI services are also creating value added for traditional services such as travel, transportation, construction, personal, cultural and recreation, and government services. For example, the use of AI-based optimization using natural language processing (NLP) for travel booking, and the search and matching related AI-services for taxi rides are blurring the lines between traditional and modern services. The importance of

modern services to the economy is highlighted in figure (1) which shows the components of world exports - modern services, total services, manufacturing and hi-technology manufacturing exports, where the year 2000 is indexed to 100. The chart shows that modern service exports have grown five-folds since the year 2000, whereas hi-technology manufacturing exports are decelerating. Ultimately, this figure highlights that modern services offer a more complete picture of trade globalization.

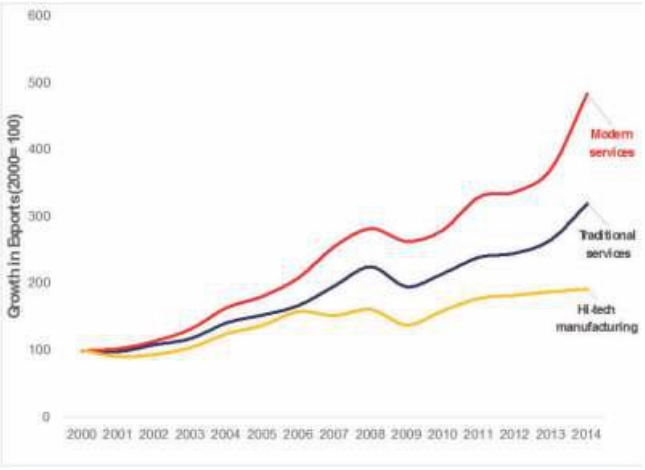

Figure- 1 Modern Service Exports are one of the fastest growing sectors of the global economy
Source: Mishra, Tewari, and Toosi, 2018.

Notes: For left panel, the numbers indicate the decadal growth rate of service exports for the world. The right panel shows subset of service and manufacturing exports. Modern services include Research and Development, Business, Computer and Information, Financial intermediation services.

Complex AI-services are the most connected node in global production networks

Figure- 2 shows the progression network for the universal matrix of world trade i.e. both the detailed exports of goods and services; with the blue nodes representing goods-only sectors, and the yellow nodes representing services. The network is spatially organized using a standard layout to make it possible to visualize potential clusters. From this figure, it can be noticed that services are not segregated, in the sense that they do not constitute a cluster on their own; on the contrary, they are fully integrated with the industrial sector, indicating that they share a high number of capabilities. This is true, in particular, for the highly complex services; such as: research and development, and intellectual property, which are highly connected with sophisticated industrial sectors; namely: Aircraft and Spacecraft, and Pharmaceuticals. Moreover, there is no net flux of information going from a sector to the other; instead, all these sectors benefit from the presence of the other sectors in the same country at the same time. Furthermore, the centrality of the complex services; such as: finance, research and development, business consulting, and intellectual property, provides new insights with respect to the goods-only approach. Complex services can help countries gain competitiveness in: (a) other services such as air-transport, sea-transport, and business services, and (b) advanced manufacturing components in the world trade network: such as: pharmaceuticals, photographic, cinematic goods, and electrical machinery. In other words, the centrality of complex services reinforces the idea that ignoring services specialization will misinform about the production's structure and potential diversification opportunities for country strategies.

Figure - 2

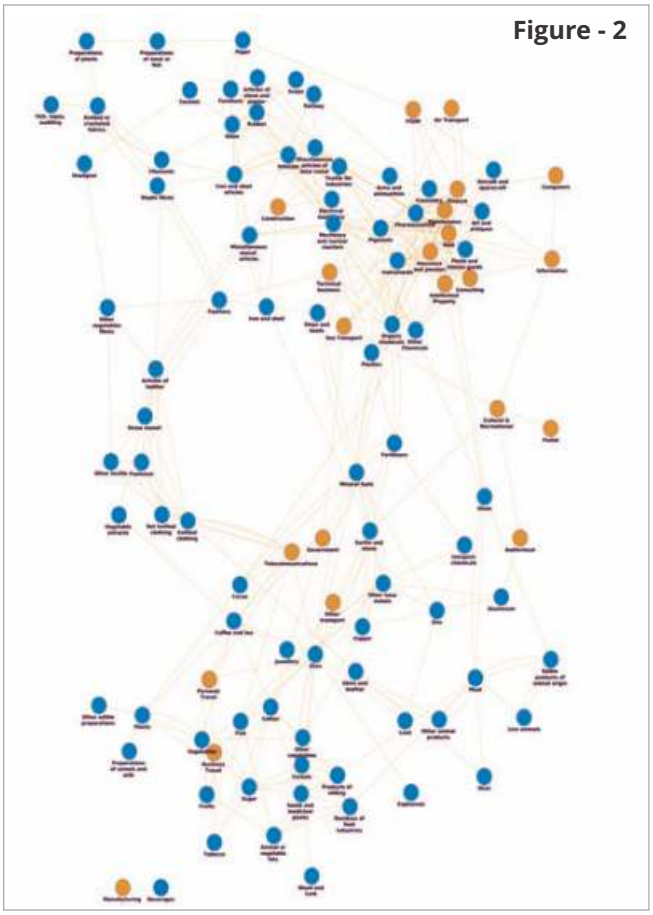

Figure. 2 The Universal Progression Network. Each node represents a sector (goods in blue, services in yellow), while the links represent a statistically significant correlation with a time delay of 3 years. The chart shows that services are the most connected node in global production networks and exporting complex services can help get into manufacturing and modern services. Source: Zaccaria et al. 2018.

AI and Levels of Autonomy

There is remarkable amount of interest in the degree of automation and how it relates to AI-services. The reality is that, for the medium-run, the majority of AI-services will be there to aid human-decisions, rather than fully autonomous systems. Hence, The Society of Automation Engineers (SAE) issued an international standard that defines six levels of driving automation (SAE J3016) which can be useful in classifying the levels of automation in domains other than self-driving cars. The definitions of these levels are outlined below:

Level 0 (Manual Process)

The absence of any automation.

Level 1 (Attended Process)

Users are aware of the initiation and completion of the performance of each automated task. The user may undo a task in the event of incorrect execution. However, users are responsible for the correct sequencing of tasks.

Level 2 (Attended Multiple Processes)

Users are aware of the initiation and completion of a composite of tasks; yet they are not responsible for the correct sequencing of tasks. An example will be the booking of a hotel, car and flight.

Level 3 (Unattended Process)

Users are only notified in exceptional situations and are required to do the work in such situations. An example of this is the systems that continuously monitor security of a network.

Level 4 (Intelligent Process)

Users are responsible for defining the end goals of automation; however, all aspects of the process execution, as well as the handling of in-flight exceptional conditions, are managed by the automation.

Level 5 (Fully Automated Process)

This is a final and future state where human involvement is no longer required in the processes. This of course may not be the final level because it does not assume that the process is capable of optimizing itself to make improvements.

Level 6 (Self Optimizing Process)

This is an automation that requires no human involvement and is also capable of improving itself over time. This level goes beyond the SAE requirements but may be required in certain high-performance competitive environments; such as: Robocar races and automated high-frequency stock trading.

Resource Reallocation and AI for human decision-making

The availability of large-scale data and AI-services are adding more noise and complexity that may trigger unintended societal events, indecisiveness, and potential failure to adapt to long-term risks. The complexities in domain knowledge, computational limits, knowledge fusion, and interdependencies among domains pose a challenge to design a flexible

framework for AI-adoption across sectors. Nevertheless, AI is rapidly transforming business operations and how executives take decisions. Although, many executives are concerned about how to best adopt these technologies to aid their decision-making, organizational culture, transparency, and trust are major concerns of the executives regarding these technologies, these new technologies also provide new opportunities to improve risk management and project-related executive decision-making.

It is anticipated that executives will have a broad view of new information that did not exist before and the economic theory suggests that AI will substantially raise the value of human judgment. It is also expected that human judgment will increasingly specialize in weighing the costs and benefits of different decisions, and then combine this judgement with machine-generated predictions to make decisions. Hence, cheaper predictions will generate more demand for decision-making to exercise human judgment related to mass movements in finance, economics, political, or technological changes. These mass movements denote large shifts in domain-specific trends, i.e., short or long-term directional change in market, population, or price movements. Consequently, CEOs and their boards will need to monitor these aspects very closely and promote the use of practical applications and validation to enhance the decision-making process.

In conclusion, the growth in the AI industry is a closely-tied structural transformation. Thereby, proliferation of AI will transform economies to ones based on high-value added complex service activities. The pace and structure of this transformation will have significant implications on the future of work, value creation, pattern of economic growth, and how we think about economic systems, market design, and potential negative externalities; such as: ethical implications. Hence, a critical question in this regard is what are the characteristics of an enabling environment that can facilitate inter-and-intra sectoral reallocation, and knowledge and technology spillovers while, at the same time, making this transformation inclusive and cognitively less-biased.

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About the Author

Dr. Saurabh Mishra is the Manager for the AI Index Program at the Human-Centered AI Initiative (HAI), Stanford University. His research and work are at the intersection of AI, economics, and decision-making. He is leading pioneering projects for reliable forecasting of international capital markets and risk management to aid executive decision-making in the private and public sector. His current research interests are on cognitive and psychology aspects of how executives interact with forecast information to make better decisions and reach sustainable outcomes.

For ten years, he served as an economist at the World Bank Group, International Monetary Fund (IMF), and International Finance Corporation (IFC) where he worked on versatile operations, projects, and research around the world. He pioneered research on trade in services, export competitiveness, economic diversification, structural transformation and drivers of global economic growth. He continues to consult for diverse international institutions including International Finance Corporation (IFC), Organization for Economic Co-operation and Development (OECD), World Trade Organization (WTO), and advises startups and companies.

Saurabh received BA in Economics, MS in Applied Economics and Finance from the University of California Santa Cruz, and PhD in Reliability Engineering from the University of Maryland College Park where he was associated with the Center for Technology and Systems Management (CTSM).

Greenfield Smart Cities: New Engines of Economic Growth

Mr. Alkesh Kumar Sharma
CEO & MD – DMICDC

Urbanization has been an important feature in the process of human development in the history. This trend is often associated with a sweeping population migrating from the countryside to the cities (McKinsey Global Institute, 2011). India's urban population grew from the 290 million reported in 2001 census to an estimated 340 million in 2008, and as MGI projects it could soar further to 590 million by 2030.

India will have 68 cities with population of more than 1 million by 2030[1]. Government of India has announced the development of Industrial Corridor Projects so as to address the urbanisation challenge and majorly give a strong boost to the country's manufacturing/industrial potential.

The first Industrial Corridor, Delhi Mumbai Industrial Corridor (DMIC) Project has been initiated on the backbone of the 1504 Km long Western Dedicated Freight Corridor (WDFC) in the 6 north-western states of the country.

The DMIC cities/nodes are envisaged to be world class destinations with efficient infrastructure offering opportunities for setting up manufacturing units which will help in increasing the industrial output of the country and create jobs (10 million Plus) besides providing an environment for 'Live, Work and Play'.

Planned as smart, sustainable communities, the DMIC cities will act as the role model for future cities in India. Holistic planning has been adopted in the DMIC cities addressing the statutory norms/mechanisms essential for city development as well as sustainability principles for developing inclusive and self-reliant communities.

The tenets of sustainable development in the DMIC cities lay emphasis on quality of infrastructure services such as *water supply, sanitation, renewable energy, housing for all, solid waste management, sustainable public transportation etc.*

Benchmarked with the best practices in various cities for different infrastructure sectors as Urban planning and design, potable water and waste water system, storm water management, transportation system planning, etc., these cities have been set up at par with the highest global standards.

The detailed landuse planning of the DMIC cities has been prepared by the Best in class consultants/Master Planners chosen through competitive process from across the globe. The implementation and phasing of the cities is not only focussed on developing the core infrastructure but also addresses the distribution of Social amenities like schools, health care centres, community centres, old age homes with the provision of mandatory Open Spaces and Parks and the housing for Economically Weaker Section (EWS).

In today's world, where everything operates in silos, it is very important to create healthy environs where social interaction is encouraged and people feel free to express themselves. It is utmost necessary that unique/creative public places/open plazas are created in the cities which enables citizens from every stage to participate and enjoy. The cities aim at -

[1] India's Urban awakening: Building inclusive cities, sustaining economic growth by McKinsey Global Institute, April 2010

- People centric development which is liveable, workable and walkable
- Creation of a public space which responds to a human scale and climate considerations;
- Creating buildings which are interactive through function, scale and location

"Walking is our most basic form of movement. It is easy, healthy, and sustainable and costs nothing to walk instead of taking the car. It offers the opportunity to use our senses, to go on a voyage of discovery and to meet other people. Walking is urban life." – Vision Copenhagen

In the DMIC cities, parks and open spaces have been provisioned based on hierarchy and catchment of 5min and 10min walking distance. The community amenities have been clustered with the Parks and Open Spaces so that they serve either a neighbourhood or a community based on the hierarchy of Open Spaces and are reachable within walking distance.

This will promote walking and cycling within the cities and improve the health of the citizens. Smart Planning in the DMIC cities, will result in reduced reliance on private vehicles for local trips due to availability of community amenities and conveniences within walking distance of one's place of residence.

A Special Purpose Vehicle (SPV) has been set up in each DMIC node/city to ensure effective integrated planning, coordination and implementation of various components essential to the development of these cities. The formation of a single SPV has helped to overcome the challenges of inter-departmental cooperation and coordination challenges.

- **The Indian Green Building Council (IGBC) has awarded the prestigious IGBC Green City 'Platinum' Rating to Dholera Special Investment Region (SIR), Gujarat. Dholera City, with a total footprint of over 920 sq. km. and developable area of 422 sq. km., India's largest upcoming Greenfield Smart City.**

- **Auric Hall building (Admin Building) in Shendra Industrial Area in Aurangabad, Maharashtra received Times Network National Award in two categories i.e. Best Architecture and Best Office Building.**

In the four smart industrial cities of Dholera (Gujarat), AURIC (Maharashtra), Integrated Industrial Townships at Greater Noida (U.P) and Vikram Udyogpuri (M.P) under implementation, the land allotment policies have been finalised and allotment of land parcels to industries has begun. Fifty-Seven (57) plots have already been allotted to industries and this is expected to bring an investment of about Rs. 8200 crores. In Dholera, the development of world's largest solar park with a capacity of 5000 MW has been proposed and the tendering activities for phases has been initiated.

The cities are planned and developed to be Smart & Sustainable. The focus is on recycling and reuse, use of intelligent technology to optimize use of resources such as power and water and strongly promote renewable energy. In addition to the physical master planning, digital master planning has already been completed in these cities to make them Smart & Sustainable.

In addition to creation new Greenfield Industrial Smart Cities, the programme envisages development of infrastructure linkages like power, assured water supply, high capacity transportation and logistics facilities as well as softer interventions like improvement in quality of life, skill development programme for employment of the local populace and creation of liveable cities.

Multi-Modal Logistic Hubs are being developed at strategic locations along the freight corridors to boost the logistics facilities. Similarly, two Mass Rapid Transit System (MRTS) Projects and two Greenfield Airports are being developed simultaneously to ensure seamless connectivity of these cities with the regional hinterland.

About the Author

Mr. Alkesh Kumar Sharma is presently working as Chief Executive Officer & Managing Director of the Delhi Mumbai Industrial Corridor Development Corporation Limited. He is also Member Secretary and CEO of National Industrial Corridor Development and Implementation Trust. Before joining this, Mr. Sharma was working as Joint Secretary, Ministry of Road Transport and Highways, Government of India for three years, where he handled matters relating to land acquisition, forest and environment clearances, review and monitoring of National Highways Projects, coordination with Railways, Defence and other agencies and all matter related to toll and toll policy on the national highways. He was also Chairman of the Indian Highways Management Company Ltd.

Smart Cities – Where do we go from here, Practical Considerations for Implementation and Success

Ms. Sui Jin Kon
Director - Global Alliances, WTC Harbin

- Whilst there is a utopian fantasy of cities that pulsate with the populations that inhabit them, the varying considerations implementing solutions that will see this vision come to fruition are many.
- Tempering our zeal for technology and the arms race to be the smartest city in the shortest time may in fact prove to be the balm of wisdom that is needed to navigate the challenges of going from zero to hero.
- It is to be noted that whilst legacy issues with respect to technology adoption exist in already established metropolises, this is in no way reflective of the situation in fast developing economies like India.
- The opportunities to establish next generation networks that ready to support and implement smart city solutions off-the-bat is an unprecedented opportunity to leapfrog the change management process that many other established metropolises will have to embark on. Further, these will serve as testbeds for smart city solutions and enable new industries to blossom.
- From the political will and ability of city bureaucrats, to availability of resources and knowledge, to the willingness and ability of city dwellers to adapt to these changes, cities would be well advised to plan, educate and socialize their various stakeholders to these concepts and ideas before embarking on ambitious but ill-planned programmes in a bid to be the next 'smart' city.
- Let us be clear, cities exist because of and for the people that live, work and play in them. People are what make cities great, and we must prioritize their considerations above all else.
- When we look to providing solutions for the population, let us first consider what will be foremost in the minds of the users, and what these solutions can do to make cities more resilient and more innovative. Essentially, what is the business case for these solutions, and do they make sense for the people who pay for them.
- What opportunities lie in the provision of the current slate of solutions for Smart Cities and is there a possibility for innovation in this area such that these solutions can and will be customized for their region, and is there an active role that government and private enterprise can play in this, to also encourage the growth of businesses in this sector.

- I highlight several major macro-considerations for implementation below:
- Regulatory/Legislation

  - Political Willpower in the current administration have long term vision to see through the implementation of these solutions for the good of the inhabitants of the city, no matter the political backlash becomes critical due to the long implementation cycles of such solutions
  - How to write legislation that will enable technology to enhance the lives of citizens without becoming overly intrusive and subject to the exploitation of service and technology providers, we must be careful to not, in our zeal to create efficiencies, lose the essence of being human and the human interactions that make cities the great places that they are.
  - Are there opt-in or opt-out options that will enable the public to feel more control over their lives , i.e. can I choose to live off the 'smart' grid but still keep my standard of living as it is currently.

- Has the legislation been strength tested for hacks and breaches of personal data, i.e. has legislation been suitably written such that granularity of the data stored in provider databases provides only enough for service and technology providers to carry out their work but not enough for this data to be drilled down to such a personal level that threats to individual security; whether personal, financial or otherwise would be obliterated.
- Has the legislation been written in consultation with the general public, such that when time comes for implementation, it would meet with minimal resistance from various stakeholders, and avoid negative PR.

- Financing
  - Are there proper financing plans that will enable cities and their inhabitants to roll out these smart city programmes without having to overhaul their tax structure to make these initially (un)welcome changes to the quality of the lives of their inhabitants.
  - What business models are available or that can be created in order to deploy and maintain the technology to required for these smart cities such that they will run efficiently at point of inception, to maintenance to upgrades need to be considered by policy makers before embarking on public calls for such projects.
  - Can small and medium sized businesses also benefit from smart cities initiatives, can policy markets, whilst improving the efficiencies of their habitat, also encourage the growth of heretofore unknown industries and therefore create a positively reinforcing ecosystem that increases the breadth of the local economy and in so doing increase its resilience.

- Programme Management
  - There is a requirement for seamless integration between the various systems that make up the entire solution for each city. Hence the overarching programme management structure must, whilst being robust enough to manage the rollout of the programme over the time-space continuum, also remain flexible to changes in technology, demographics and economic structure to ensure that the Smart City programme can achieve the dual purposes of remaining relevant to the users of these technologies and maintain adoption rates that will reinforce the business case of the Smart City in the first place.
  - Risk Management – concentration risk of a single technology or technology provider would expose the metropolis to hacking, technology failure, and the crippling of the city. The movies come to life, where the evil lies not in an external threat, but from internal inadequacies, be they in cyber security policing, power generation, software maintenance, etc

- Smart cities are the future, that is something that we can all agree on. And there is no doubt that this is a journey that will befull of its challenges and rewards. In our bid to usher the future in today, there is a need to constantly remind ourselves that it is humans that make cities great, and whatever we do, the human element and their related concerns must remain central to our planning and decision-making processes.
- As planners and implementation professionals, we are tasked with making the living environment of our co-city-dwellers more comfortable, and we are thus responsible for ensuring that we are good stewards of the resources that have been placed at our disposal, to build our shared utopia.

About the Author

Ms. Sui Jin Kon's global career spans six continents and over a period of nearly 20 years, she has amassed a wealth of business expansion experience in a diverse array of industries including infrastructure to Ag-Bio-Sciences.

Her passion for developing innovative solutions for today's business and societal challenges has propelled her to the forefront of the business, frequently leading her teams to the cutting edge of technology in their practice areas.

Today, Ms Kon is active in maintaining her global network of resources that informs her insight into the various genres of investment opportunities ranging from real estate deals to innovations in the fields of agriculture and healthcare.

The Role of TReDS in Easing the Working Capital Requirements of MSMEs

Mr. Kalyan Basu
MD & CEO, A.Treds Ltd.

2019 promises to be an exciting year from many perspectives, of course, the most exciting would be watching how the political scenario plays out in the first half of the year and it is already building up to be a nail biting thriller!

We as a nation are also looking forward to become the 5th largest economy in the world in terms of nominal GDP, getting past United Kingdom. In terms of smart phone users we will cross the 350 million user milestone this year.

Out of the top ten large economies of the world, though slightly down, our growth rate is still the highest at over7%.

It is also great to see that we as a nation are now looking at the MSMEs more closely and recognising the potential and importance of this segment in terms of achieving inclusive growth.

Going by statistics, more than 95% of the business enterprises in India fall under this category. In terms of contribution to GDP, exports and manufacturing, MSMEs' contribution is overwhelming.

In terms of employment generation, this sector provides employment to more than 110 million people, that is good, but what is better, is that it has the potential to employ much more.

To improve our world ranking in terms of per capita income and progress on the inclusive growth agenda, we need to ensure that we resolve the bottlenecks restricting the growth of MSMEs.

The present government has come out with a number of schemes for the MSMEs, which will help this segment in the days to come.

One of the major recognised problem which is restricting the growth of this segment in India as well as the world across is availability of finance at the right time, right amount and on reasonable terms and conditions.

Problem statements

It is a known fact that out of the 63 million plus MSMEs in the country only about 10% have access to formal credit from Banks and NBFCs. Some of the estimates show a credit demand and supply gap of Rs. 19 lac crores for the MSME segment.

We all are aware of the financing gap in the segment and it is encouraging that the system is recognising the problem and trying various ways and means to address it.

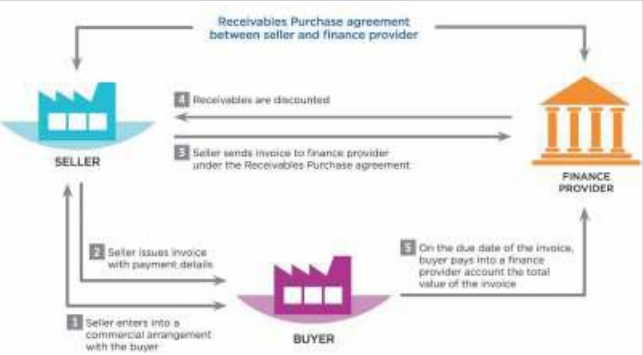
Considering the fact that 90% of the formal MSME funding today is from Banks and NBFCs we need to

identify and address the pain points this two segments are facing in proving finance to the MSMEs.

We also encourage the Micro Finance companies, the new Fintech companies to enter this space to increase the coverage and improve on the credit delivery processes.

Worldwide, factoring is an excellent way of financing working capital needs of the MSMEs. In India, unfortunately, factoring of receivables as a business model could not make much progress mainly due to lack of regulatory framework. But the things have now changed with introduction of Factoring Relations Act, Payment Settlement and Systems Act, IT Act, GST, Etc.

The Factoring companies have earlier suffered due to non-standardised processes and insufficient regulations. Factor Chain International (FCI) reported a volume of EUR 2598 Billion in 2017 registering a growth of 9% over the 2016 numbers.



Source: Global Supply Chain Forum

While China tops the list by registering factoring volume of EUR 405 billion, UK occupies second place at EUR 324 billion. The Factoring business for 2017 in India stands only at EUR 4.2 billion, while some of the other Asian economies such as Taiwan, Korea and Singapore do 10 times more factoring volume than us.

Considering that the GDP of these countries are much smaller than ours, the scope in increasing this business is humongous.

Given that the existing lending models and credit appraisal processes will take some time to align with the unmet demand, resolving the existing bottlenecks, these institutions can look at factoring as an alternate channel of funding the MSMEs and thus supporting them in better cash flow management.

Trade Receivable Discounting System (TReDS)

TReDS was introduced by RBI based on the report of the Raghuram Rajan Committee on Financial Sector Reforms in 2008. The final guidelines were preceded by a report prepared by RBI appointed working group in November 2009. The final Guidelines on TReDS was issued by RBI on 3rd December 2014.

TReDS is a payment system and operates under the Payment & Settlement Systems Act, 2007. The three participants on the TReDS exchanges are Large Corporate Buyers / PSUs / Govt.Depts., MSME Sellers and Banks and NBFC Factors.

TReDS exchange offers factoring and reverse factoring options through a transparent and electronic bidding mechanism for discounting of receivables by the MSME sellers. The MSME sellers on the platform have a unique opportunity of getting a host of Financiers on platter who are willing to provide discounting rate for factoring the receivables of the MSMEs through a bidding process.

The sellers need not enter into bilateral agreements with the Financiers, they only have to execute a one-time documentation with the TReDS platform, the discounting is without recourse to the MSME sellers and topping it, the same requires no collateral to be provided to the Financier.

TReDS thus provides the best possible rate to the MSMEs as financiers provide rates depending on the credit risk of the large corporate buyer and not that of the MSMEs.

This ability to choose the discounting rate provided by a host of Banks and NBFC Factors registered with the platform makes the platform attractive not only to the MSMEs but also to their corporate buyers.

The platform allows the MSMEs to receive their payments on time while allowing corporate buyers to extend the credit period up to 180 days thus aligning it

to their cash flow and enjoy a better discounting rate in the case of reverse factoring.

This enables buyers and their MSME suppliers to manage their working capital cycles more efficiently thus saving costs substantially.

For the banks,I believe this is a superior model of booking PSL(Priority Sector Lending) as exposure on TReDS qualify as PSL. Booking exposure on TReDS is much more cost effective, as TReDS platform does the KYC of the sellers and the financiers need not do any further KYC, which is a huge cost saving.

Similarly, the financiers are taking a risk on the large corporate buyer and hence credit risk comes down substantially, moreover they need not have large team for credit appraisal, documentation, KYC and security creation.

For the MSMEs, it is a huge cost saving not only in terms of better discounting rate, but they save cost as they are not required to pursue late payments with corporates and jeopardising business relations with the buyer.

In the past one and a half years of operations, Invoicemart (the leading TReDS platforms) discounted invoices worth more than INR 1,800 crores.

The figure of INR 1800 crores may be small keeping in mind the huge unmet demand for credit by the MSME sector, which is estimated to be around INR 19 lakh crores, but it is a revolutionary step which allows MSMEs to secure credit at significantly favourable terms as compared to the traditional channel to access working capital finance.

Road Ahead

Thus, TReDS is one channel which I believe must be explored by all financiers as a new channel for MSME financing. **The Government of India has now made it mandatory for all CPSEs (Central Public Sector Enterprises) and all companies having turnover of Rs. 500 crores and more to compulsorily register with TReDS platforms.**

Thus, we foresee TReDS as a game changer in the near future for increasing factoring as a way of working capital financing option in India.

TReDS is an end to end digitized platform for receivable factoring and must be adopted by all business units and financiers as a preferred mode of working capital finance. It is highly efficient in terms cost savings for all stake holders, the sellers, buyers and the financiers.

At present, TReDS Model is buyer-led, meaning the process of acceptance of invoices on the TReDS Platform by the buyer is mandatory, of course, this makes the model more credible and trust worthy, but at the same time it makes it exclusive for sellers which have relationship with buyers, which are registered with the platform.

I would like to highlight that across the world factoring is supported by credit insurance which at present is not available in India to the financiers.

My appeal to the policy makers and Insurance Regulator would be to have a relook at the present position and whether we can at least allow credit insurance in favour of the financiers for MSME participants on the TReDS Platforms.

TReDS will then become a real enabler for the MSMEs as a source of working capital finance and can be accessed by the MSMEs independently without dependence on the Buyer making a meaningful impact in reducing the credit funding gap and make inclusive growth possible.

About the Author

Mr. Kalyan Basu is the MD & CEO, A.Treds Ltd. (a joint venture of Axis Bank Ltd. And mjunction services ltd.), the holding company of the digital invoice discounting platform Invoicemart. He comes with over 3 decades of experience across banking sector. During his 14 plus years with Axis Bank he has been Head of Trade Advance and Forex for New Delhi Main Branch and also headed Corporate Banking Operations. He was a part of Large Corporate Credit (North) for more than five years and SME Head for North for more than 4 years. Before moving to head A. TREDS LTD he was Head of Supply Chain Finance for Axis Bank.

Advanced Weather Services Impacting Agriculture and Manufacturing Sectors - A Case Study

Mr. Himanshu Goyal
India Business Leader for The Weather Company

As one of the world's largest private weather enterprises, The Weather Company, an IBM Business, helpscompanies and consumersmake more informed decisions by providing personalized, actionable weather insights.Organizations across industries rely on services and solutions from The Weather Company to help them better prepare and respond to weather's impact on business.

Named by ForecastWatch as the world's most accurate forecaster[1], The Weather Company combines weather data from major centers around the world with information collected from thousands of personal weather stations and an enterprise-class Internet of Things (IoT) platform to create forecasts for 2.2 billion locations. These forecasts are supported by advanced machine learning algorithms and monitored by a team of more than 160 meteorologists to help improve accuracy and create better insights.

Serving the agriculturevalue chain

As the global population grows beyond the capacity of current food production, growers must find new ways to increase harvests with the same amount of arable land. Weather can be one of the most limiting factors to the agriculture industry, affecting not only how crops grow, but also the logistics around planting, harvesting and transportation.

Watson Decision Platform for Agriculture helps address these challenges by combining AI, IoT data and predictive analytics with industry knowledge and decades of research to help growers and other industry stakeholders increase profitability, support sustainability and improve crop yields.

The solution is designed to help drive benefits such as:

Crop yield forecasting – Analysis of historical and near-real-time weather data can help pinpoint the ideal acreage for a particular crop.

Improved irrigation strategies – Growers and producers can leverage data from weather sensors to help

[1]Three Region Accuracy Overview: 2010 through June 2016, December,2016: https://www.forecastwatch.com/wp-content/uploads/Three_Region_Overview_2010_201606.pdf

ensure crops receive the right mix of sun and water. For example, identifying that a particular field has not received adequate rainfall can cue growers to turn on irrigation systems.

Predictive modeling in the field - Hyperlocal weather insights combined with predictive models can help growers make more informed decisions on critical crop stages, the timing of field operations, pest and disease pressure, equipment deployment, soil needs and nutrient requirements.

Helping to avoid downtime in manufacturing

Global manufacturers must consider the impacts of severe weather on their bottom line. By understanding how conditions such as changes in temperature, winter storms and flooding may impact business performance, companies can take more proactive measures to better predict demand fluctuations, improve internal efficiencies and plan for "what if" scenarios.

For example, supply chains may represent about 60 percent of a manufacturer's costs and can be seriously impacted by weather. Applying advanced analytics to weather data can help you identify and respond to potential disruptions to your supply chain and optimize performance.

Severe weather can also lead to equipment failure, power outages and absence of key personnel for manufacturing plants across industries, potentially causing hours of unexpected downtime. The ability to harness weather data and insights can help manufacturers:

- Predict potential disruptions in operations due to weather events and take action to avoidcostly equipment failures.
- Reduce risks and mitigate accident-related costs due to weather.
- Prevent unnecessary shutdowns.
- Enhance safety for field workers and equipment.

For more information on how The Weather Company can help you make better weather-based decisions, please visit business.weather.com or contact Himanshu Goyal at himgoyal@in.ibm.com

About the Author
Mr. Himanshu Goyal is an entrepreneurial leader who has a track record of building and leading high impact, high performance organizations to lead in new markets and deliver growth.

He has been a Co-Founder of two Start-ups, delivered and led four product launches and managed one acquisition. He has performed multiple roles for more than a decade at IBM. His previous experience includes working in organizations such as Wipro, Digite and Adobe.

The Weather Company, an IBM Business, is the world's largest private weather enterprise, helping people make informed decisions – to take action – in the face of weather.

The company offers the most accurate, personalized and actionable weather data and insights to millions of consumers and thousands of businesses via Weather's API, its business solutions division, and its own digital products from The Weather Channel (weather.com) and Weather Underground (wunderground.com).

Linkedin: https://www.linkedin.com/in/himgoyal/
Twitter: @himgoyal

Why Networks Matter

Mr. Scott Ferguson
Chief Executive Officer
World Trade Centers Association, New York

When I assumed the role of Chief Executive Officer (CEO) of the World Trade Centers Association (WTCA) I came into the job with a pre-existing understanding of the organization.

I had led efforts at Trade Centre Limited in Halifax, Nova Scotia, Canada, a company which operated World Trade Center Halifax, as well as the city's convention center. I had attended WTCA events, met with colleagues in the network, and understood the inherent value of the brand and belonging to the association.

What I did not quite understand was the level of activity undertaken by our members. To say I was impressed is an understatement.

As was detailed in our inaugural **"WTCA Trade and Investment Report",** our members are an incredibly diverse set of businesses and individuals that cross geographies, cultures, and sectors. Each reflects the unique needs and industries in their local business communities and is intricately woven into the fabric of those local economic ecosystems.

For example, where World Trade Center (WTC) St. Louis may focus on programming that helps attract the foreign talent needed to fill the needs of local businesses, and WTC Santiago might offer a robust selection of training programs to grow the skills needed in that city, WTC Mumbai has a heavy concentration on research and international trade promotion.

And while these business models might differ, what connects them is our network, itself an ecosystem of expertise, business intelligence, and connections that go deep into the grass-roots levels of the more than 300 cities where our members are located.

This is incredibly powerful when considering the cross-border trade and investment implications.

Think about this eye-opening statistic from our trade and investment report: small-to-medium-size enterprises (SMEs) make up 50-60-percent of value add in the member countries of the Organization for Economic Cooperation and Development (OECD).

These local SMEs are also responsible for 70 percent of the jobs in these nations. However, only 10 percent of these businesses are engaged internationally. While most of the business news we receive focuses on large global corporations and conglomerates, the real sleeping giant is right under our noses—it is the local

companies that thrive in the cities where our members are located.

And while large multinationals have their own teams of experts in global trade and investment, these local companies may not house these competencies. Enter the local WTC.

Members like Mumbai who offer a suite of services, educational resources, and facilities provide a huge service to these communities of SMEs as they can assist in helping them unleash their potential and "go global," whether that means finding a distributor in the next country over, or a supplier halfway around the globe.

By working with their local WTC these companies gain access to a qualified, trusted source of intelligence and services in our member cities the world over.

And as anyone who has done business internationally will tell you, that kind of trust and confidence in your foreign partners is central to getting business done.

The prevailing narrative of our time is about the economic uncertainty that surrounds us all. We read about the retrenchment of national governments, many of which are closing doors rather than opening them.

We hear about how national policy in countries around the world are creating an environment that is not friendly to trade, or at least makes it more difficult. All of this may be true. But when we looked deep into our Membership and explored the ways in which they are working in tandem with local governments, chambers of commerce, private businesses, and each other, we saw a different kind of picture emerging.

As the policies and governments of the countries our members call home seesaw back and forth, from administration to administration, our network is a constant.

For half a century we have been making global trade connections for the local business communities of our members' cities. And as the institutions we used to rely on continue through a period of flux and change, we remain steady. In short, there is a need for our network now more than ever.

At WTCA, we remain very optimistic about the future. We see opportunity in our day-to-day interactions with our members, and moreover, we see the opportunities individual WTCs create themselves.

So, while we remain cognizant of the changes around us, and the challenges we face, we know that we can navigate them together and seize on the chance we have to make a positive impact. That is why our network matters.

About the Author

Mr. Scott Ferguson is a senior executive with a concentration in building sustainable business models. Mr. Ferguson brings more than 30 years of experience in international business and the WTC Network to the role of Chief Executive Officer. Most recently, he was President and CEO of Trade Centre Limited, an Atlantic Canadian organization that operates "World Trade Center Halifax" in Halifax, Nova Scotia.

During his tenure at WTC Halifax, Scott received international and national recognition for his ability to innovate and foster organizational growth, most notably with the development of the largest convention center in Eastern Canada, the Halifax Convention Centre.

WTCA and Cross-Border Trade and Investment Services in Asia Pacific Region

Mr. Scott Wang
Vice President, Asia Pacific
World Trade Centers Association

Asia Pacific region has been a driving force for global trade and investment in the past few decades. In 2017 the region regained double digit growth rate in merchandise trade and remained as the largest trading bloc in the world.

At the same time services trade recovered and achieved robust growth led by China and India. In the investment front, the region remains as the largest resource and destination of FDI by 39% of inflow and 36% of outflow.

As one of the largest integrated networks of premium business facility and trade/investment services in the world, the World Trade Centers Association (WTCA) is committed to sustainable growth of cross-border trade and investment in Asia Pacific region and around the globe.

Founded in 1970, the WTCA is a nonprofit, non-political association dedicated to the establishment and effective operation of World Trade Centers (WTCs) as

Just when the global and regional economy set to finally emerge from the dark cloud of 2008 financial crisis, new headwind started to blow in escalating trade disputes and protectionism. As a result we observed tempered growth starting in the second half of 2018 which could well be extended into coming years.

However, the long-term growth prospect of the region remains strong due to its size of population, moderate per capita income and strong comparative competitiveness.

instruments for the promotion of international trade and investment.

Currently, there are more than 300 World Trade Centers in nearly 100 countries around the world. Served by each of these World Trade Centers is a growing list of an estimated hundreds of thousands of businesses all in pursuit of new customers, sources of supply and opportunities for investment.

Asia Pacific is the largest and fastest-growing regional

bloc for WTCA where the network covers more than 90 major cities and trade hubs.

Backed by an international ecosystem of global connections, iconic properties, and integrated trade services under the umbrella of a prestigious brand, a World Trade Center-branded operation provides companies and organizations with access to a diverse array of international trade/investment services and facilities, enabling them to increase their international business.

WTCs create a critical mass of international business expertise that attracts leading companies and stimulates economic growth in their community. WTCs cooperate with local business communities and enhances their offerings by differentiating and offering programs not available elsewhere.

In this setting, WTCs and other trade organizations complement each other, and the WTCA is a resource to these potential partners as the only organization of its kind that is apolitical and transcends borders.

While each WTC is unique in terms of its size, location, organization, facilities and services which is tailored to the specific needs, objectives, opportunities and obstacles of its own region, successful World Trade Centers across the globe provides trade-related services offered to the tenants and the business community at large, as well as branded physical facility with tenants.

The trade services include an array of trade information, trade education, trade missions, trade shows/exhibitions, market research, business services, networking events and B2B matchmaking.

The branded facility offers an internationally-recognized address suited for any company seeking to enhance their profile and trade globally. WTCs provide flexible, modern office accommodations, including co-working and hot-desk space, as well as conference, meeting and exhibition facilities.

For nearly half a century, WTCA has been the world's trusted brand facilitating international trade and investment through global connectivity and local access.

As our network is expanding throughout the Asia Pacific region at a rapid pace, the WTCA envisions an acceleration of our contribution to the share of cross-border trade and investment services and the economic prosperity in the region.

About the Author

Mr. Scott Wang draws from his twenty years of expertise in businesses relations and trade in the U.S., China and other Asian countries to lead WTCA's efforts in developing business relations in Asia Pacific region.

Prior to his appointment to WTCA, Mr. Wang served as Vice President of the World Trade Center San Diego. During his tenure, he organized 19 trade missions to Asia with participation of companies and senior State and local government/business leaders, and provided thousands of small and medium-sized companies with assistance in information, communications and connections for doing business in Asia.

Promoting bilateral partnership through Tuscany – India Association

Ms. Viktoria Lopatina
Founder and Managing Director
Kat.El International Trade Consulting and
President, Tuscany-India Foundation

Italy and India have always been two countries with a long history of cordial and close relationships and above all of an intense exchange of cultural and commercial relations. In 2018 the two countries celebrated 70 years of diplomatic ties.

In 2017, bilateral trade reached 8.7 billion euros (+ 16.1% compared to last year), with Italian exports of 3.5 billion euros (+ 9.2%) compared to the same period of 2016) and imports from India valued at about 5.1 billion euros (an increase of 21.4% compared to 2016). India represents a market with significant potential, perhaps unique, at a global level, for the breadth of the margins of integration it offers, even in the presence of important complexities.

The Government led by Prime Minister Modi has put in place important reforms and economic development programs aimed at modernizing the country and favouring a growing attraction of foreign direct investment, ease of doing business as well as visa liberalisation for business visitors..

Tuscany is a region of international fame for fashion, for the fine arts, for the made in Italy, for tourism, manufacturing products, industry and agriculture and the quality of life. There are 3 important universities, 5 institutions of higher education; 17 institutes of the National Research Council (CNR), 500 foreign multinationals; 10 technology clusters: fashion industry, furniture and interior design, marble, life sciences, new materials, construction of yachts, railways, technology, green economy, advanced production, cultural heritage.
Overall, Tuscany can become an important destination for Indians from all points of view. This is demonstrated by the growing number of tourists, some marriages held in our region, interest in the real estate sector and in production activities, the recent acquisition of the Piombino steel mill. Recently, Florence has become second Italian city due to the attractiveness of investments. India can and must become an ideal partner for the Tuscan companies who intend to expand into emerging markets. Given the above and due to the new political and commercial era between Italy and India, the desire of both countries to increase institutional, cultural, business relations, collaboration in the sphere of research and the exchange of best practices in various fields, the members of the Association have defined a will to promote institutional, cultural and commercial relations between the city of Florence, the Tuscany Region and the Republic of India.

The Tuscany-India Association intends to involve the main subjects, representatives of the city of Florence and of the Tuscany Region to become a permanent reference point for the Indian market, developing strategies and to promote the territory in the cultural and economic fields on the Indian context, as well as promoting India in Tuscany and assisting Indian companies that would like to operate in Tuscany. We hope that the Tuscany - India Association will soon become a useful and supportive vehicle for the promotion and growth of institutional, cultural and business relations between Tuscany and India.

Productivity in services

The competitiveness of a country in modern global economy is largely based on the efficiency and productivity in the service sector and that issue of the competitiveness of a country is very important today. Competitiveness has become a main objective of many countries. One of the tools to win the competition is to focus on innovation, invest in research, creativity, staff and young people and Italy has many resources to

become a competitive country. Productivity also influences pricing as a tool of competitiveness. Productivity along with quality may produce the optimal results.

The service sector has changed substantially in recent years. An important influence derives from the wide-spread use of computers and, principally from the network communications, developing unprecedented productivity. Globalization in the service world has also played an important role, partly due to information and communication technologies. This has led to a sharp increase in the demand for services, reorganizing the industry and services themselves, accelerating the trend towards competition and the internationalization of the sector. Thanks to this, the services have therefore increasingly assumed an infrastructure function of the global economy.

Italy's competitiveness consists, in fact, in innovation and, above all, in innovation also in the services sector. According to ISTAT's (National Institute of Statistics) report on 2017, we can notice that employment growth is driven by the services sector; recently it increased in Italy, reaching 74%. Between 2008 and 2017, employment in the service sector has grown 5.3% in Italy. This shows us how the tertiary sector for our economy has become important. Services are gaining importance in the national economy, always destined to grow.

The future of the Italian economy depends on the realization of an increase in productivity, understood as the value produced per hour worked and per euro invested and could increase it, relying on a different use of knowledge. The distance between productivity and services has been greatly reduced. An investment in industrial innovation passes only partly to traditional material assets and requires a shift towards intangible intelligence.

Speaking of productivity, attention must be paid to services, or better, precisely, to intangible production. Industry and services have become complementary in production processes. Given the small size of the largest number of Italian companies, most services must be developed and provided in the form of outsourcing. ICTs have also put the turbulence to the knowledge economy, making the immaterial transferable and reproducible and allowing its multiplication in real time in re-use, thus industrializing the service.

However we have to consider some fundamental points to favour specialization and quality of services. The first is the attention to the human resource. We need to invest in improving the knowledge, skills, attitudes and behaviour of our staff. Well-trained staff, with good IT and linguistic skills and innovative skills, are the key factor for the development of modern services. This is the main factor for making a company or a country competitive as disciplined and process driven approach produces better results.

Service sector can achieve productivity improvements if it becomes more technology-oriented. The new era of digitization and of Industry 4.0 can make services more innovative and consequently more competitive and have a great impact on efficiency and productivity. In fact, Industry 4.0 represents a significant change not only on the technological level but also, as we can notice, on the organization of work and the skills required to drive the same process of change in the most effective way. Innovate the company through digitalisation means, not only acquire new technologies, but especially to activate a process of change that affects entire company; means jointly achieve objectives of flexibility, speed, productivity, quality, greater competitiveness of products. Digital technologies support the integration of the entire value chain from product design, production management, and after-sales service delivery. Quality 'After Sales Service' becomes an important tool and 'Unique Selling Products' for many products and justifies higher pricing. An integrated feedback system ensures a continual improvement in products and services.

The new context of Industry 4.0 will bring great benefits in terms of efficiency and productivity in services, however, on condition to invest a lot in skilling.

About the Author

Ms. Viktoria Lopatina, Founder and Managing Director, Kat.El International Trade Consulting and President, Tuscany-India Foundation. Ms. Lopatina holds two University degrees in Law: In Moscow, Russia and in Florence, Italy. She is specialized in International Commercial Law. Viktoria has always been involved in international trade, promoting relations between Italian and foreign companies. For several years, she worked with countries such as Russia, Azerbaijan, the Baltic countries and others. Recently, she has focused on the Indian market, devoting much time to the study of the market and the culture of doing business in India.

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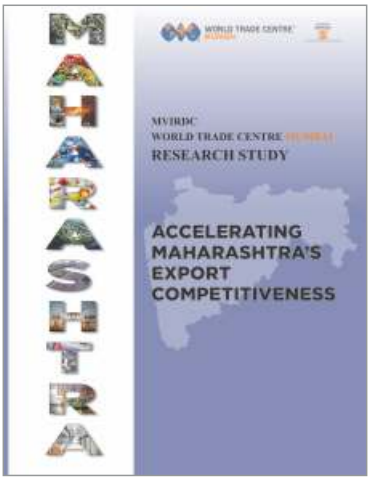
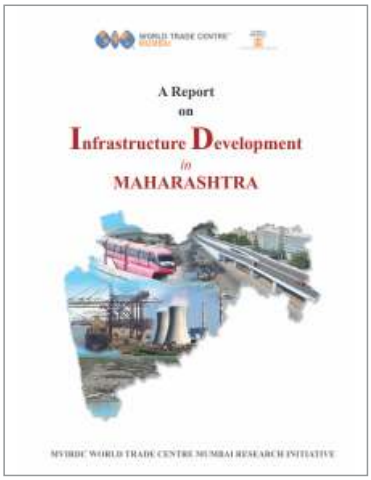
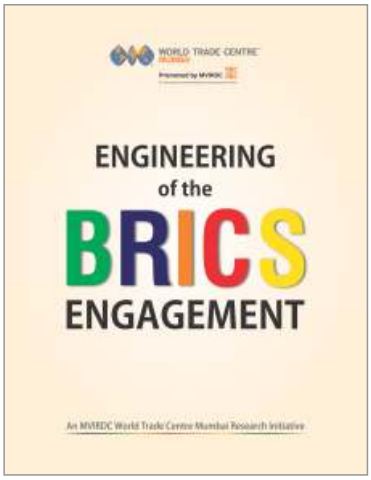
Research Publications







MVIRDC World Trade Center Mumbai

31st Floor, Centre 1, World Trade Center, Cuffe Parade, Mumbai - 400 005

t: 91 22 6638 7272 | **e**: wtc@wtcmumbai.org | **w:** www.wtcmumbai.org

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