

Firm Strategies and the Economic Governance of Global Industries

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Abstract: *Difference between developed and developing countries are very remarkable, technologically, socially and economically. Automation and Digitalization in production and service sector is affecting the global value chain, where the developed countries are taking advantage more than that of developing countries because of their affordability of the modern technology in automation and digitalization. Increasing the existing gap between developed and developing countries. Artificial Intelligence and Robotic technology has a potential in productivity as an enhancer. But when it will take place as a factor of production, will drive a new growth formula for the world. To get the extra advantages of automation and digitalization, the leading firms are creating a value chain for their own is, individual firm with multiple suppliers.*

Introduction

21st Century is the revolutionary century for the industrial revolution which we called the age of 4th industrial revolution. Global Value Chain has become the economy's backbone and central nervous system. The fragmentation of global value chain is fueled by technological, economical and social changes of the world.

Lower production costs earn the higher profit in business. The global industrial leaders are moving through the world for the sophistication of their production system to reduce the production cost, which is the major factor for the production of goods to stay competitive among the competitors.

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To reduce production cost developed nations are using the technologies together at the different stages of production and services like, Artificial Intelligence, Ultra intelligence, Next Generation Robotics, 3D Printing, Biotechnologies, Genetic Engineering Technologies, Nanotechnologies, Computer and Internet Technologies to transform manufacturing and production system to boost up the production speed and lessen the production cost.

In future, the use of sophisticated technology in production sector will help the industrialists to diversify the raw materials according to the requirement of the production process which is another system to reduce production cost and to stay risk free in competitive market.

Ability to capture and store energy will be another advantage for the developed countries in future, and the availability of low-cost energy would be a compound upon the advances in technology and diversified raw materials.

In the future distribution system the use of technology will impact upon the cost of goods and their services to reach at the user, the technologies are RFID, Drones, Driverless Trucks, Automated Warehouse etc., all in these sectors need very few human skilled labors.

The world consumer behavior has changed. The information about the products are very available and purchase of the products from anywhere of the world is very easy. The companies are directly involved with the global marketing are well informed about the customers demand, and they know very well about, how to do it.

So, a “New Paradigm Model” is very easy to apply for the industrially developed countries upon the developing countries, which will be a way of new thinking about consumption. Moreover in business, the idea is the same, a new way of looking at things.

World industrial leaders are looking for their profit maximization in industrial production and service sectors and emphasizing upon new modern technologies, low cost energy, diversified raw materials and consumption trends towards their goods for their expected business goal.

Development of Automation and Digitalization

Rapid development of automation and digitalization are creating changes in the nature of production and services over the world, which is a factor of 4th industrial revolution.

Automation is that, from where any country cannot hide them from this environment. Because in the present decade, it is an important part of global business. Almost all the countries of the world are connected with the internet for the transaction of their business and commerce. The automation in home, institution and in business centers by different types of devices are increasing over the world. For the security purposes many organizations of the world are connecting with the internet. Now, it is a growing trend of the world that, most of the cars of the world is connecting with the internet system for the security and advanced driving information.

For automation the world is rapidly depending upon computer and internet system. Which require a central computer system for data and information is called cloud computing. Cloud computing is going to be a big deal for the developed countries, because of its low cost service, any time any place access and capacity of load sharing.

The growing trend of automation and internet of things is rising the question of internet security and employment. Moreover, the cloud computing is rising the question about the dependency upon the service provider and can limit the local innovation of the developing countries in computer sector.

In manufacturing, production and service sectors the industrialists are looking for the modern technologies to reduce the cost of their goods to stay competitive in the market and to maximize their profit. To stay risk free in the market, developed countries are using Artificial Intelligence and Robotic technology to increase their productivity, reducing the cost of goods and to maximize their profit.

The installation of robotics and artificial intelligence technology in production sector is much expensive. It is affordable for the developed countries but not for the developing countries. Accenture (a research organization) analyzed 12 developed economies that together generate more than 50 percent of the world's economic output, and found that artificial intelligence has the potential to double their annual economic growth rate by 2035.

Almost every aspect of our daily life has become digitalized. Artificial Intelligence can utilize data to assist in many tasks what the world have never seen before. The world economy is entering in a new era in which artificial intelligence has the potential to overcome the physical limitations of capital and labor and open up new sources of value and growth. Artificial Intelligence has become another productivity enhancer. But when it will be a new factor of production will transform our thinking about growth.

The AI Growth Model:

This model adapts the traditional growth model by including AI as factor of production.

Traditional Growth Model : Capital + Labor + TFP = Growth

Adapted growth Model : Capital + Labor + TFP + AI = Growth.

AI as new factor of production it will drive the growth at least three important ways. First, it will create new virtual workforce. Second, it will enhance the skill and ability of the existing workforce. Third, it will drive the innovation.

In a study at the University of Johannesburg, they saw that, artificial intelligence has been applied successfully to fill the gap that exist in information required to make informed decision. It is found to them, that the use of artificial intelligence machine changes the degrees in which the theory of bounded rationality, efficient market hypothesis and prospect theories are applicable.

With the over accelerating development of technology, the world is moving towards consumer economy to knowledge-based economy, which will transform the tangible assets into intangible assets and our world economic system will operate a new growth formula.

The growth formula is as follows:

$$IA > MI - \text{therefore} - IC + AI = W$$

Which translate into Intangible Asset (IA) is greater than Money Supply (MI) – therefore – Intellectual Capital (IC) plus Artificial Intelligence (AI) equals to Wealth.

Executive office of the president of the USA declared on December 20, 2016 about the Artificial Intelligence, Automation and the Economy that, AI and related fields have opened up new market and new opportunities for progress in critical areas such as health, education, energy, economic inclusion, social welfare and environment which will continue to create wealth. But the Americans have to take aggressive policy action to take full advantage of the AI driven automation, and to ensure their continued leadership in the creation and use of Artificial Intelligence.

Increasing trend of profit maximization and the automation and digitalization of manufacturing

And production sector is widening the technological inequality between developed and developing countries, because the technological impact of third

industrial revolution has not yet reach in many developing countries of the world. At the phase of 4th industrial revolution technologically the developed countries will be stay at higher position than 3rd industrial revolution period, in comparison with the developing countries.

At the period of 4th industrial revolution the developing countries will be the low and mid type technology consumer for their production system. The low and mid type technology of production is mainly dependant upon different type of energy and there will be a huge possibility of that, the developing countries will be the highest energy consuming area in future. Acquiring energy and the availability of energy will be a major factor of production in the developing countries will inspire the developed countries more to enter in the global energy politics in future, which can influence the more in global arms race, where another type of value chain is running within the block chain of the power countries.

Automation and digitalization in production sector is a technological transformation, require more skilled labor. To adopt in the new technological production environment, the present skill set of the world should be developed. Accordingly for the decentralization of production technology, the industries will be established in the urban area and to meet the labor demand the rural and agricultural labor will migrate to the urban area and in agriculture based industries.

Use of different type of energy and the over population in urban areas for industrial urbanization in developing countries will create environmental pollution in future. Where the developed countries are suggesting the developing countries to established the environment related project which are also high tech automated and expensive to established.

Thus the developed countries are trying to shifting the value chain towards automated and digitized and want to give some priority to the developing countries to produce the intermediate goods for their consumption by creating another value chain with the developing countries, which will be the barrier for the developing countries to enter in the developed markers with their final products. Because, the final products will be manufactured and distributed by the developed countries by using automated and digitized technology which will ensure product quality, maximum production per hour, less wastage.

Automation and Dizitalization in Service Sector

The increasing importance of fragmentation of production involves services. The fragmentation of production depends on a part is production value chain and other

is on trade. Demand on ICT in business service sector is increasing globally. Where there need minimum investment and have the scope of maximum employment within short period of time. So, that many developing countries are trying to take the advantages of service value chain, by developing their present skill set of manpower and providing them globally.

The increasing demand of digitalization in service sector for rapid transportation, distribution and services are causing the needs of skill development of workforces both in developing and developed countries according to the quality of goods and services. So, electronic infrastructure and human capital are the most important factor for the service value chain. According to the development of training and research capabilities, the developed countries are involving much in high tech production service sectors and the developing countries are involving mainly in the areas where there required lower wage services.

GVC Is Changing the Global Political Economy

International political economy is an interaction in international relations of the pursuit of wealth and the pursuit of power. Political globalization is a must for the developed countries for economic globalization. So, there has been a rise in the influence and power of international and regional institutions such as W.B, IMF, BRIC, EU, OECD, UN, WTO, and ASEAN. These international and super national actors are increasingly shaping domestic politics.

The better and cheaper price for product and services and its availability, easier access to capital and commodities, increased competition are the advantages of economic globalization where firms can diversify their investment markets and can contribute to economic growth.

Governments of different nations, and their relation with each other is the key factor for political globalization. Developing countries want to work with their developed international friend countries to gain influence internationally. And the developed countries want their market of goods and finances to take advantage of economic globalization.

In developed countries Artificial Intelligence and robotics has become viable both in commercial and military sectors. Which lead the political globalization to pursuit wealth and power which will affect the strategic direction of the leading firms. The firms of developed countries are decentralizing their production unit in many developing countries for the cheaper intermediate product by transferring technology in exchange with low cost labor and land and in some sector the final

products too, because of the rising trend of labor cost in developed countries. The developing countries are going to be the highest energy consuming countries in future. For the decentralized industries and their low-cost production, low cost energy, energy availability and secure of energy is a must for the developed countries where military involvement are much. And now the developed countries are using Artificial intelligence and Robotic technology to increase their military strength. They are also transferring military technology in developing countries for their low-cost military production within their block chain. So, some of the leading firms of the developed and developing countries are changing their strategy.

Higher Value and Higher Performance

Artificial Intelligence, Advanced Robotics, Internet of Things, Wearable and 3D printing technologies are transforming the global production system and creating new wave of competition among the competitors. These technologies are breaking the geographic barrier in decision making for the firm that, where and how the production and marketing for consumption will take place to maximize the profit.

Automation and digitalization touch every steps of global value chain. Their convergence rises a new set of strategic choices related to value. Which deal with, how value is created within firms and redistributed among the society, countries and global value chain.

Proximity of the consumers is the key value driver. Very few companies of the world already take their policies to take the advantages of digitalization in production and competition. But firm at the different stages of the world should redefine their strategies to capture higher value and performance for profit and growth and to stay relevant with the global value chain.

Moving up the Value Chain

If we have to challenge the notion of moving up the value chain, both the developed and developing countries should upgrade their production system and value creation. Global market opportunity for the third world is very limited. Again, the production system digitalization is improving the capacity of developed countries to gain approximately double growth for them. So, only moving up the value chain as the principal way to upgrading is not the truly globalization policy.

Automation and digitalization technology should be truly global. More effort is needed to ensure all countries, developed and developing, and a wide range of

world culture should be included in collaborative research and technology transfer. Here is also requiring a continuous dialogue between Government, Firms, Politicians and Military Leaders for the policy of adoption of technologies in the society and in the world in a cooperative and coordinating manner. Firms of the develop and developing countries should work jointly to find the liberalized solution about the requirement of new skilled labor, scopes for unskilled labor, global business model, innovation and growth, environment which are created by automation and digitalization of production and services.

Governance Mechanism to Integrate Connectivity

In the period of 4th industrial revolution technological changes has a significant role in global value chain. The production system is changing rapidly. The global firms are decentralizing their production in the different areas of the world for ensuring the lower production cost and intermediate production as an input for their final production. Production system integration and connectivity of production made a new world order in global economy.

At the changing global production and business environment, governance mechanism of the firms should reengineer. From the developing part, production system integration, new innovation, incremental research and development, development of present skill set and knowledge acquisition and from the developed part, investment, technology transfer, production and market data sharing will make a sustainable relation between investors, producers and buyers.

Governments of the different countries of the world should ensure the global market and resources for free access for all the industry players of the world and restrict the development of mass destructive technology like Autonomous, Nuclear, Chemical and Biological Weapons, which influencing the global arms race and affecting global economy.

EMNE Altering the Global Value Chain

EMNE is altering the dynamics of global value chain. The internationalization of EMNEs is mainly depends upon to acquire new advantages around the world to reduce the production cost of goods and services, where lower wage labor force and energy sources are available and have good local and regional market, the firms from developed countries choose these areas of developing countries named hot location.

Because in the developed countries, living standard are high and the labor wages are rising remarkably to maintain their higher living expenses. And the people movement is rising against the environmental pollution.

The developed countries are transforming their production system towards digitalized advanced technology dependent industry and they are shifting their market in higher income areas of the world. Because these high-tech industrial products have a very limited market in the lower income countries like aero, space and ocean based industrial products.

The developed countries are decentralizing their industries to the developing countries for a market within the lower income people and lower cost production as an input for their high tech industrial final products. On the other hand, they are shifting their market in the higher income areas for their high-tech industrial products.

EMNE is Affecting the Participant of GVC

The increased internationalization of EMNEs is affecting the chain participants in many ways. The developed countries are decentralizing their production unit in the developing countries are the industries are dependant upon new intermediate type of technology and lower labor wage and different type of energy consuming. Creating unemployment for increasing skilled industrial workforces demand, pure agricultural workers are shifting in urban areas for new unskilled industrial jobs, urban population density is increasing. For consuming the deferent types of energy, environment of the developing countries are going polluted and increasing health hazards. Governments of the developing countries are under political pressure.

Firms of the developing countries are facing the shorter product life cycle in competition with the rapid innovation and integration in the production system of the developed countries for the same products, which is affecting local production and shortening the local and global market.

Increasing military involvement in energy resources is rising the question of military expenditure and war fear in the both developed and developing countries. Large multinational firms are losing the market and free access in energy without participating in the military powers block chain.

A very popular and recent concept in the world is WPM world product mandate is an organizational response to market and product diversity where MNE delegate for a single product worldwide to particular national subsidiary. WPM is

an innovative project through from formulation to implementation. WPM comprises suitable entrepreneurs but where there are not suitable entrepreneurs WPM would not be succeed like artificial intelligence and robotics in the third world countries for production and it's decentralization, because of it's affordability.

Development Implications for Economic, Sectoral and Firms

GVC lead by the investment decision within the firms located in the different areas of the world. Under the changing nature of global value chain the participants mainly the developing countries should follow some development implication for economic upgrading to attract the FDI and to increase the export volume. Development of political stability, Regulatory reform for inspiring innovation for both in production and service sector, Flexibility on tariff and other business restriction, Institutional development for human resource development, Technical skill development, Initiatives to reduce transportation cost within the regional and global market, Follow the preferential trade agreement policy for attracting global investment and not the regional investment only. Increase logistic support and initiatives to increase employment opportunities, initiatives to protect environment and infrastructure development.

GVC Facilitating the Local Firms and the Country

Sectoral development mainly service sector is not yet much developed in many developing countries, but here is a variety of causes for sectoral development. Because of the increasing demand of the firms in different stages of production (research, design, innovation.), distribution and post distribution services there required a huge number of people to operate these tasks efficiently. More sophisticated service required more skilled labor. Developing countries should have take initiatives for skilled service sector workforce. If the service sector workforce cannot be affordable in domestic market that can be adopted in external market for participating in the GVC.

SME can play a dynamic role in developing countries, because SME is not participating as a provider of large input in GVC production line. By contributing in micro level innovation SME can produce the goods can fill the local requirement of goods and services, which is a primary input for the developing countries to enhancing the intermediate production of the country and GVC.

Women in the different areas of the world mainly in the third world countries are not participating widely in economic activities, those who are participating are by

vary lower labor wage. Globally initiatives are to be taken to increase the women workforce skill and to employ them in different stages of GVC.

Firms should reform the policy for the wider participation in GVC from the developing countries. Small and medium size firms should integrate their production system to stay relevant with the GVC. They should emphasize upon R&D for new innovation of technologies for goods and services by minimum cost to stay competitive.

Requirements of efficient supply chain management are an increasing demand in GVC. Firms should develop a skilled workforce and policy for an efficient supply chain management. They have to use transportation instrument for lower cost faster distribution system, is the demand for final producers. For the faster distribution the developed countries are using the technologies like RFID, Drones, Automated warehouse, Driverless trucks. Though there required a very few human labor.

Global value chain facilitates the local firms in different ways. If a firm is percipient in global value chain can receive FDI from the final producer countries for intermediate input for their production and the local firms can export these intermediate goods in the world market. For global standard products the local firm needs to integrate the production system where new technologies and innovation ideas can build up the local knowledge. Local firms can build up a supply chain both in internal and external market. For research, design and innovation in production sector a service sector is required with a knowledge-based workforce.

The local country will facilitate from the global value chain, increase of the foreign investment, development of competitive regulatory authority both government and private sector, new employment, increase of human development aids, increase of knowledge-based manpower for tomorrows knowledge-based economy.

The Spillover Effect of GVC

Spillover effects of global value chain on local firms and their global competitiveness are, as the global economy is unilateral so the imbalance redistributes within the participants of global value chain in different level of production, distribution and services for a balance trade. Local firms mainly the intermediate producers and their trading build the efficiency of the firm. In the global market the increasing demand of intermediate goods, local firm's

innovation capacity for higher productivity increase the competitiveness of the firm in global context by trading of its production and services. Lower labor and production cost and market size is not the only factor of business and trade but now it is a major factor of business and trade from which hot locations the product will be manufactured by low cost and can be distributed within a large market by a minimum transportation cost. As for an example, CHINA and INDIA are the country for low cost production by using lower labor wage in exchange with technology transfer and they have a good initial market but a new hot location is Bangladesh from where the goods can be produced by minimum cost and can be distributed within the major part of the region including India.

Managerial Implications to Survive GVC

The managerial implication for different type of integration of the firms should be dynamic to stay competitive in the global competitive market both for the production and service sector. It would not be wise to stay at the last lower end point of the value chain. By integrating the strategy, structure and performance it is possible to deliver better quality product and services within the agreed timeframe. The firm can stay relevant with the value chain.

There is no specific method of changes fit for every firm. It is an approach to adopt with the requirements of competitiveness both internally or externally for a firm. At the changing nature of global value chain, strategically there are a set of factors that are relevant with the global Transformation of value chain. These are, political, economical, technological, social, environmental and legal. Managers are the leaders of changes. They should remember the factors relevant with the strategic change to stay competitive in the global business environment. Managers should emphasize upon the value added to his goods and services for competitiveness, continuous innovation is to gain on productivity.

Managers should follow a shared vision of his strategic change in business decision making to stay relevant with the global value chain. Small and medium size firm managers should made a policy about how they can contribute in domestic market to fill the domestic demand and to contribute as a primary input for intermediate production and services. Large scale firm managers should made the policy about how they could contribute to fill the domestic demand and to contribute as an intermediate input for final production by exporting their production and services.

Firm's performance depends upon its competitiveness. The innovation designed to increase the quality of goods and services, productivity and cost leadership are

the key factor for a firm competitiveness both in local and global market. So the managers should follow the market by different type of information network to guide its innovation requirements.

Survival of GVC

World product mandate and the global industries can be the survival and the prosperous for a truly global value chain. For which a global production circuit is needed. Production decentralization under local licensing, for cost benefit and for a planned surplus production can maximize the profit for global industries and local industries can build up their capacity to increase productivity to contribute in GDP and global economy. Individual firms and their own global value chain cannot be a solution for a sustainable global value chain.

GVC and the Firm Relationship

There are two type of shifts affecting firm's relationship in the world. These are, individual firm and multiple suppliers, other is multiple firms and multiple suppliers. When an individual firm is in production either in a centralized or decentralized location, they supply their goods according to their supply chain and policy which is not the free access for all the suppliers, the supply chain is not truly global in this form and the production is not affecting global productivity and economy. Because the demand is restricted for the individual firm and the supply is for their own. Here the development of production and distribution can earn profit for an individual firm who have the capacity much, will be the winner.

On the other type of firm relationship is Production is not centralized, it is decentralized regionally or globally according to the size of required benefit of the country and the firm, then the production is supplied by different firm according to the market size and destination and the demand of the goods and services. This type of relationship between the firms can made a relationship between demand and supply and between developing and developed countries where a truly global value chain can take place for sustainable global growth for each country can achieve the global requirement of flat world.

These two types of global value chain in quite different in nature for capital accumulation and distribution for global growth.

Conclusion

Technological gap between developing and developed industrial countries of the world is very remarkable. In the 21st century at the age of 4th industrial revolution, rapid development of automation and digitalization in production and service sector making more economic and social gap between developed and developing countries. Artificial intelligence and robotic technology is playing a vital role in automation and digitalization in the developed countries as productivity enhancer. But when it will be the factor of production, productivity will increase more with minimum cost can increase the existing gap between developing and developed countries socially, economically.

To get the opportunities of automation and digitalization, lead firms are creating a value chain which is, individual firm and multiple suppliers is opposing the economic globalization is based on multiple firms and multiple suppliers. These two types of global value chain in quite different in nature for capital accumulation and distribution for global growth. Interdependency between these two types of global value chain by interchanging the similarities can contribute to a flattening of the differences.

Technical Summary

The world economy is entering in a new era, Where Artificial Intelligence and Robotic technologies have the potentiality as a productivity enhancer, but as a factor of production artificial intelligence can drive the global growth. It will widen the existing gap between developing and developed countries. To get the extra advantages of these technologies, leading firms are creating their own GVC. That is, individual firm and multiple suppliers, contradicting the global participation in GVC, which is multiple firm and multiple suppliers.

Governance mechanism of firms and governments should reshape to build up interdependency between these two types of GVC by finding the methods of interchanging the similarities according to the size of required benefit for the firms and for the countries participating in GVC.

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