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CAPACITY BUILDING WORKSHOP
TRADE AND TRADE POLICY ANALYSIS FOR THE POST COVID -19 RECOVERY

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VIRTUAL MEETING, MS TEAMS

Narrative on Self-study 1: Understanding GVCs and Trade in Value Added by Dr. Biswajit Nag

Module-1

Slide-1
Welcome to the lecture on understanding Global value chains and trade in value added. In this lecture we will study the basic ideas behind these two concepts, the rationale behind emergence of global value chain or what we call in short GVC, different definitions, analytic approaches to understand these two concepts, etc. We will also study the importance of measuring trade-in value added in this lecture.

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The lecture is divided into 5 parts. We will start with the understanding of globalization and its relation with GVC. Different types of GVCs will be discussed in this section. In the second part, we will understand the emergence of GVCs and analytical approaches, different typologies. In the third part, our focus will be on mapping GVCs and how to measure GVCs through different methods. In section four, the trade-in value added will be discussed as how the intermediate Goods trade become more important and we can try to understand whether the existing trade statistics is sufficient enough to measure the trade in value added. In the last part we will understand what is the impact of covid-19 on GVC, whether GVCs are still resilient or there is a new dimension of GVCs emerging.

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So, what is GVC? A GVC breaks up the production process across countries, with firms specializing in a specific task and stages of production rather than producing the whole product. This is possible due to the fragmentation of the production process because of new technology and also a significant reduction in the transport cost. This allows economies of scale to happen in the production process. Apart from fragmentation, GVC also leads to increase in technology and knowledge transfer as well as capital. We have observed foreign direct investment moving to different countries to take the advantage of fragmented production structure.

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The production process of the bicycle. As the picture depicts, the bicycle has different parts, and these parts can be produced at different locations. As the picture says, several countries are involved in producing components like frames, blades, wheels, etc. Countries like China, Spain, Vietnam, Singapore, Malaysia are producing different components. And, finally all these components come to a place and get assembled. GVCs help to connect different countries and this new form of international trade is observed in 21st century.

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The concept of vale chain is not new. Michal porter describes as a set of activities that a firm performs to deliver a valuable product or service to the market. Please note that Porter identified not only the products or component but also the services. Services are the main driver of the value chains. There could be different components of the value chains as can be seen in the figure here. These are different components, like in terms of inbound Logistics the firm receives raw materials and, in the operations section, raw materials are converted into finished product and product goes through the distribution channel using the outbound logistic, reaches retail store and then finally it is sold. So, basically supply chain considers three components

but value chain still continues because marketing, sales, after-sales, getting consumer feedback and pushing consumers to buy more products, advertising all those are components of value chain.

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Further, by segregating the supply chain and the value chain, this picture helps us in better understanding. The production and logistics are mostly under the supply chain part, but the value chain starts much before the production process, like R&D, design, product planning are basically the part of value chain. Further, when the product is delivered, then marketing services and after-sales service are also adding value. From the firm's perspective these are the activities which need to be monitored, controlled so that the goods are delivered to customer in right time with optimum cost. And there is also a possibility of improving the quality. This process is not limited to national boundaries, the companies in different countries are involved in this process, so value chains may get spread across the borders.

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Another concept. Production Network, the word value chain explains a sequential activity. A vertical sequence of events leading to the delivery, consumption and maintenance of particular good and services. On the other hand, Network, basically takes into account both vertical and horizontal linkages between different economic actors. In case of value chain, we are taking into account sequential activities but Network is a kind of complex set of activities involving both vertical and horizontal linkages such as consolidation of activities, process improvement, etc. In production network, the network itself generates value, the firms can think of moving to a new network or upgrade network to add value. When this network is beyond the national boundary, it becomes International Production Network (IPN).

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Literature has identified different shapes of Global Production Network, which are mostly due to historical reasons and how the industry developed over the years. This also could be because of technological change or it could be because of firm's attention towards particular activities to be outsourced from particular location which could be national or international. So, a simple way of describing this is by basically using a figurative configuration like spiders or snakes. In case of snakes, the goods move in a sequence from upstream to downstream, with value added at each stage. In case of spiders, just like spider it has multiple limbs coming together to form a body, that is being either the final product itself, or a component. Also, it could be a mix of both, linear or non-linear kind of linkages.

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This picture explains the snakes, spider and the hybrid one which we call sniker.

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Another kind of concept call Net-Chain. Where both network and chain of activities are visible. There is a vertical sequence from suppliers to consumers, but at the same time each stage has horizontal movement also. So here basically the network and chain come together and the concept is popularly known as net-chain activities.

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Let us now concentrate on different kinds of approaches which have been taken up by researchers to understand GVCs.

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One of the earlier theories of global value chain has been focussing on slicing up the production process due to rising transportation and Communication Service. Jones & Kierzkowski, 1990 paper highlights that the slicing of production process can take the advantage of rather reduced transportation and communication services connecting different locations. The work of Feenstra and Hanson, 1996; Campa & Godberg, 1997; Yeats 1998, focus on trade in intermediate goods. Feenstra's work indicates that when you are outsourcing the activities.. which are most labour-intensive activities from the developing countries, how the developing country companies will get benefit. Prof. Richard Baldwin highlighted the unbundling process. Where the first unbundling process was due to reduction in transport cost and second unbundling process was due to reduction of information and communication costs coming out from the rapid development of Information Technology. Apart from that the Grossman and Rosi-Hansberg, 2008 work mentioned how to harness the advantages of higher factor productivity in different locations. From the macro and the trade aspects, we move towards firm level, there are several studies which also highlight different aspects of production Network. One of the seminal works by Gereffi, Humphrey, and Sturgeon (2005), focus on the governance structure of organizing IPNs. These works are trying to understand the relationship between the lead firm and supplier. More recent research works are making an attempt to understand how we can measure the trade in value added. Several studies used multi-country input-output tables developed by different agencies to measure the trade in value added. In the process, double counting is measured and foreign value-added and domestic value added and indirect value added in exports are separated. Also there are studies to understand the relationship at the firm level trying to identify several conditions which are necessary for SMEs to get connected with GVCs. Further, the possibility of success of GVCs depend on the nature of conditions between lead and supplier firms especially if they are located in different countries.

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In this slide, we highlight the linkage between lead firm and the supplier at different levels. To extreme level, one is completely a market driven, where the lead firm is looking for suppliers who can ensure the right price and quantity. Another extreme could be complete hierarchy-based relation, where there is significant control on the supply firm by the lead firm. Apart from that there could be modular, captive or relational based linkages between lead and supplier firms. The success of each model depends on certain conditions. And when we look at the intra-firm trade across the border, these conditions play a very important role. The complexity of transactions, if the lead firms demand complex or less standard products from their suppliers, it is difficult for them to exchange necessary information of product specification with suppliers as the tacit knowledge needs to be exchanged with them which at times quite complicated. So, if there is a less standardised product, then no or less specific knowledge is to be transferred. The lead firm can provide a kind of specimen, by which the supplier firms work out their cost, quality and capabilities, and they offer their price. Therefore, if the complexity of the transaction is relatively less, then the market driven mechanism is much more effective. On the contrary, if there is higher complexity of transaction then hierarchical or captive model become more appropriate. Secondly, the ability to codify transactions is important; whether it's possible

to codify the complex information and whether lead firms can easily exchange that information with suppliers in codified form without any fear of leakage. If it's a hierarchical model, then there is a full control on the supplier, then this fear would be less. If it is a market driven structure, then the fear of leakage would be higher. Lastly, the Capabilities in the supply base is also important. If the suppliers are competent and flexible enough to produce a product as per lead firms' requirement, lead firms require no monitoring and supervision to suppliers' activities. However, if the suppliers are not competent to supply the product specified by lead firms, lead firms require to monitor and supervise suppliers' activities to make them capable to supply that output. So, in the captive and hierarchical structure risk will be relatively less. The success of GVCs in international trade depend on the governance structure.

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The capability of upgrading provides the opportunities to suppliers for the continuous upgrading. It could be a product or process upgrading, also a chain or functional upgrading. As the supplier firms are in the global value chain, they get important information which help them to improve the efficiency of the internal process which could be inventory management, it could be improved efficiency in delivery or the efficiency in any part of their production activities. So, process upgrading is a natural aspect, otherwise the small firms will be out of the global value chains. There will be lot of pressure on them to improve the process. Firms get continuous information from the consumers as well as from the lead firm which can help the smaller firms who are there in the in GVCs, also assist them to introduce new products or improve the old products. Small firms can also help in the innovation process of the big firms, if so, they will become part of the innovation process. Small firms can gain lot of knowledge while being in the value chain which can help them to diversify. For example, a company producing TV picture tube can move to produce computer monitors and then to laptop. So, it is known as chain upgrading. There could be functional upgrading as well in which a firm can upgrade some of the functions like accounting, logistics function and it can outsource these functions from other firms too. These firms can improve the functional upgrading and they can move from one network in an expanding or more complex Network.

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Example of functional upgrading: A firm can move to a higher valued activities for example from managing productions to the moving to designing the new product or moving to branding or marketing the product.

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Another popular concept in GVC literature is the Smile Curve. Through this, we try to understand the extent of value generated at different level. The production activities which is mostly manufacturing and assembly activities generates relatively low value till the logistics part. But higher values are there in service activities before the production process like innovation, designing, production planning, etc. At the same time more values are there after the goods are delivered to the customer which are basically marketing, branding after after-sales services, etc.

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Let us now concentrate on the issues, on how to capture the value-additions and what are the attempts in the literature.

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One of the popular ways of understanding the global value chain is through the firm-level survey. This is basically by tracking the values generated thorough the production activities of a particular firm. Consider the example of Apple's devices like iPod and iPhone. All of us are aware of the fact that these high-tech products are assembled in China and they contribute to a significantly in China's exports. And Apple's export from China has encouraged many other companies to start outsourcing or doing the final assembly in China. But China adds a small value in the entire iPhones and iPods production chain. We have noted that in the value chain other countries are also involved such as Germany, Japan, Republic of Korea, etc. Several studies have found out that if you are able to separate the values at every stage, then we'll be able to correct the problems of double counting due to multiple crossing of components. For example, a WTO report calculated that the US-China trade balance in 2008 would be about 40 per cent lower if estimated trade in value-added terms. Also, in a report from USITC, showed a 50 per cent reduction in the EU15-China trade balance, and the Japan-China trade balance switching from a surplus in gross terms to a deficit in value-added terms.

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So, extending the argument further. The figure is explained.

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The major components are the cost drivers to produce Apple's iPhone and the contribution of different companies located in different countries. The total cost of production is US$178.96. And China's contribution is only US$6.5 which is just 3.6 percent of the total cost. In 2009, China exported around 11.3 million units of the iPhone to USA. As a result of that USA had a trade deficit with China close to US$ 2 Bn, which is 0.8 percent of trade deficit with China. But, if we calculate through the concept of trade in value added, in that case China's contribution is only US$ 6.5 and then we can multiply US$6.5 with 11.3 million units. Then the value comes down to only US$73 mn. So, it is very clear that when the calculation is done on the trade in value-added basis, the value goes down significantly from the calculation done by gross export basis.

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Apart from the survey and firm-based approach, we can measure trade in value added based on value addition component in input-output table. That approach combines the input output tables of various countries and bring trade also in the picture. So this is basically an approach to construct multi-regional input-output table. So, there is a huge or big data set created. Theoretically, the input output table, can track the value-added generated at every stage. So, we can take the advantage of that and in this process, we will be able to identify the double counting. And we will be able to eliminate the double counting. Through this we able to get the real picture of the contribution of each country.

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So, in short, there could be there three approaches. One approach which is based on case study, another approach is just looking at the trade through the intermediate goods of specific sectors. This is mostly using the trade data and third approach is basically through the multi-regional input-output table.

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Let us now understand the trade in value-added more in detail.

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Trade in value added actually is based on an idea of fragmentation of production. What we have noted is now, not the goods rather than in the production process there are several tasks and countries are having comparative advantage on specific tasks. So, what we see is there are super-specialization in making components or intermediate goods. The world has witnessed basically a huge growth of trade in tasks. This is basically due to multiple things both from the demand side as well as from the supply side. There is a significant rise of consumer demand due to globalisation; many countries have witnessed a significant rise in the growth especially in the emerging countries. At the same time, the globalization pushed countries to reduce tariffs and other trade barriers. So, more goods are being traded with lower cost. There is an increase in market size and also it pushes more intermediate goods to cross the border easily. Apart from that, there is a significant rise in technology. Countries have invested in export processing zones, and also there are a lot of FDIs which are going from the developed to developing countries. All these have helped the GVCs to become a reality. Hence, there is a significant requirement of a new kind of statistics. Because of GVCs the countries need a new dimension in the trade policies.

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The current statistics are grossly incompetent in understanding the country of origin and follow the trade-in value added because the data is not supporting that. So, if there is a new measure which can take into account the components trade and link it with the domestic and foreign value added in the exports, then a clearer picture will be evolved, which can help in developing policies, not just for the trade but for development of the sectors, address skill related issues, employment related issues, infrastructure related issues, etc.

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This diagram depicts the total trade in intermediate goods is much higher than the Gross trade in final goods. What we saw in 2000, the distance between the trade in intermediate goods and final goods is much lower but now actually the gap is very high. But, overall, the trade has come down a bit recently due to covid and a global down. But the gap between intermediate goods and final goods is still very high.

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Now, we will see the sectoral performance of different intermediate and final goods in some of the Asia-Pacific countries.

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If we look at the trade of the transport equipment, we can see that the export of the final goods has come down in major exporters of automobile, for example in Japan, we can see the same thing in South Korea. And also, there is a rise of intermediate goods trade. And, similarly, we can see the same scenario for China.

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The situation in electronics is clearer as you can see the trade in intermediate goods as a percentage of gross trade has been very high and, in some cases, for example in South Korea it is almost touched the 80%. But, overall, the major exporters of the electronics actually export intermediate goods around 60%.

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In case of textiles, Japan and South Korea export mostly the textile machines, synthetic fabric of man-made fibre, etc., so in those cases trade in intermediate goods are very high. We can see that China and Vietnam which are exporting the final goods mostly garments and related things like fabric. So, as a result their trade of final goods is much higher for them.

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In case of chemicals goods, we see that the trade in intermediate goods is as high as 90%.

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Now, let us look into the covid related issues.

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Covid-19 has basically ignited a discussion which is always there in the shadow, which is basically the risk of a global production or extended supply chain across the border. Because the lockdown might have influenced the global value chain and as lockdowns are not symmetric, the resilience of the global supply chains are affected. However, there is no evidence that economies would have done better without global value chains. Now, discussion is centred on having production inside the country so there will be a drive towards more protectionism. But it is important to identify that in recent time there is no evidence or rather there is lack of evidence that the trade of intermediate goods are slowing down due to Covid. The performance of the global value chain has started declining from as early as 2011. And in some cases, we have found out that the length of value chains has shortened (independent of Covid) . So, what we guess is that several activities, tasks which were outsourced earlier are now being consolidated and outsourced from one place, so it just looks like one activity. And also because of technological change some of the routine tasks which were being outsourced from developing countries can now be done in the developed countries. The new technology through automation and robotics actually help in the production of same quality of goods with a cheaper cost or maybe cheaper than outsourcing from developing countries.

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So, when we look at the possible impact of covid-19 on GVC, we can divide the impact into four possible parts. One is the direct impact, just because of the health concern, enterprises operating in GVCs cease production. And this direct effect is not limited to GVCs, but rather to areas where the virus has propagated. COVID-19 has had a direct impact on the majority of countries and businesses. Also, through the supply chain disruption there is an indirect impact- when one location's functioning gets hampered by second location (while it gets directly impacted). Because of Covid, there is also significant volatility in demand. As the demand has gone down, input demand has also gown down. So, this is also an impact on the global supply chain. Additionally, in some cases, the firms in the global value chain predicted a further reduction in demand. So, they have reduced or stopped the production of components. We have

observed a world-wide crisis, which is because of sudden stoppage of production. So, demand volatility having an effect on the prediction of future demand. As a result, trade has come down and the investment on the value chain has also come down. So direct impact results into an indirect impact and it is also getting accentuated because the demand has become volatile. Low expectation as a result further reduces investment in production process which are part of GVCs.

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In some cases, the GVCs remained very resilient. Some of the sectors such as IT helped people to connect with each other, organised business through online platform, pushed for e-commerce, etc. Therefore, this sector became very agile in terms product and service development. Food sector has also been quite resilient. Medical supplies and equipments initially faced crisis but later on, these value chains also became very resilient. Therefore, in the pandemic some of sectors remained very active and also did many innovations during this time.

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So, basically, we can see that GVCs may take a different form and boom with a different speed in post-Covid period. GVCs may not be having the same dynamics in the coming days. So, technological readiness is very important because some of the routine jobs which were earlier outsourced are now being automated. Those jobs or those activities will not come back. So, the question is the companies which were earlier in the global value chain, whether they will be able to move up the value chain so to remain in the new forms of value chain. The debate of protectionism currently is centred around the move from ‘just in time’ concept to ‘just in case’ situation. Earlier global value chains were driven by the idea of just in time to save time and cost. Now the reasoning behind protectionism is to reduce the risk and an attempt to maintain a regular Supply. And that’s why many of the countries and companies are having another sourcing strategy in case there is another crisis. But what we will see, is that those would be much more costly because world has moved to a different level due to reduction in the transport costs and fast progress in information technology. The government should support firms to build more resilient global value chains, understanding in which direction it is moving. So, it is important to identify the new bottlenecks. May be new investment is required, new skill may be needed. So, if a country is able to do that then then the value chain will again become resilient. And it will see a different dynamics all together.


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