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CHANGE IN INTERNATIONAL TRADE: GLOBALIZATION AND FRAGMENTATION OF PRODUCTION

Abstract

The last two decades we have witnessed a rapid growth in global trade. Technology and new players, in particular emerging countries, have changed the pattern of international trade. Production processes are more and more fragmented across firms and countries, and commerce is increasingly characterized by trade in tasks. Thanks to global value chains, production has turned truly international.Today, companies divide their operations across the world, from the design of the product and manufacturing of components to assembly and marketing, creating international production chains. More and more products are "Made in the World" rather than "Made in the UK" or "Made in France".The volume of trade in intermediate goods (components and subparts of unfinished products) has risen sharply in recent decades, and the off shoring of goods and even services has accelerated - this is referred to as production fragmentation, or vertical specialization of production. The off shoring of these stages gives extra strength to truly global production chains.

The purpose of this study is to generate a theoretical framework for better understanding about the global value chains and fragmentation of production especially "Made in the World" notion.

Keywords: Global supply chain, product fragmentation, trade in intermediate products, trade in value added

ULUSLARARSI TİCARETTE DEĞİŞİM: KÜRESELLEŞME VE ÜRETİMİN PARÇALARA AYRILMASI

Özet

Son yirmi yılda küresel ticarette hızlı bir büyümeye tanık olduk. Teknoloji ve özellikle yeni gelişen ülkelerde yeni oyuncular uluslararası ticaretin kalıplarını değiştirdiler. Üretim süreçleri işletmeler ve ülkeler arasında gittikça daha fazla parçalara ayrıldı ve ticaret artan şekilde "sorumluluklar ticareti" olarak nitelendirilmeye başlandı.Bugün, şirketler işlemlerini, ürünün tasarımından parçaların üretimine, montajından pazarlanmasına kadar, uluslararası üretim zinciri oluşturacak şekilde, tüm dünyaya bölmüşlerdir. Gittikçe daha fazla ürün, İngiliz malı, Fransız malı olmaktan çok "Dünya Malı"dır.Ara mallar ticaret hacmi (parçalar ve tamamlanmamış ürünün alt parçaları son yıllarda hızla arttı ve ülke dışı mal ve hizmet üretimi hızlandı. Bu, üretimin parçalara ayrılması ya da üretimde dikey uzmanlaşma olarak tanımlanmaktadır. Bu aşamada ülke dışı üretim küresel üretim zincirlerini ayrıca güçlendirmektedir.
Bu çalışmanın amacı; küresel üretim zincirleri ve "Dünya Üretimi" fikri içerisinde üretimin parçalara ayrılması olgusunun daha iyi anlaşılabilmesi için teorik çerçeve oluşturmaktır.

Anahtar Kelimeler: Küresel arz zinciri, üretimin parçalara ayrılması, aramallar ticareti, katma değer ticareti.

1. Introduction. Globalization is changing business models and increasing international fragmentation of production. Companies increasingly divide their operations across the world, from the design of the product and manufacturing of components to assembly and marketing, so creating international production chains. More and more products are "**made in the world**" rather than in any particular country. In this process, the nature of **comparative advantages** is altered, with new trade opportunities being created for emerging countries.

In recent decades the world's production structure has become increasingly fragmented, i.e. production in one geographic location has been split into different tasks and spread across the globe. Affiliates and independent subcontractors process and refine products, turning them into finished consumer products in long complicated supply chains. This has led to trade with input goods (components, raw materials, semi-finished goods, etc.) and input services (business services) becoming increasingly important (Isakson, 2011).

Fragmentation of production across countries and vertical integration of multinationals have increased the importance of intra-firm trade. Multinationals may relocate parts of their production processes to countries with a relative comparative advantage. Multinationals is shipping raw or intermediate goods to an affiliate abroad for assembly. The country assembling the final product may then export it to a third country.

With multinational corporations fragmenting international production, sales of goods between firms or multinational companies has increased. This is reflected in an increase of trade in intermediate goods. Outsourcing is often used to describe this phenomenon, shifting production either to another domestic company or a foreign firm abroad (offshore-outsourcing),

(Krugman and Obstfeld, 2005, p.20).

Knowledge of the world's fragmented production and the need for input goods and services is necessary in order to formulate a modern trade policy. The policy should allow for companies to find, according to their own prerequisites, the production structure that best suits them. Having a large or small proportion of imports within production or exports is not an end in itself, what is important is that companies can develop their competitiveness (Isakson, 2011).

Modern trade is about goods, services and tasks. Revolutionary progress in communication and information technology and have led to a fragmentation of the production process and the accession of the global chain as one of the major platforms for integrating developing countries into the Multilateral Trading System. We are witnessing the phenomenon of global production (Rugwabiza, 2011).

Today, manufacturing processes are broken down into separate parts and spread across different countries before the finished product is assembled for export into one of those countries. Therefore, attributing the full value of the product to the country from which it is exported to its final consumer destination can give an exaggerated idea of the importance of trade within that country (Rugwabiza, 2011).

This geographical fragmentation of the value chain is called 'Made in the World'. There are many examples of this notion of 'Made in the World' — from the iPods which are assembled in factories all around the world to the plains whose components are manufactured all over the globe. The Airbus Consortium, for example, is jointly owned by companies from four countries — France, Germany, Britain, Spain. The wings are from the UK, the fuselage and tail from Germany, the doors from Spain, and the cockpit and assembly in France. This is more than 1,500 suppliers in 27 countries (WTO, 2011).

On a smaller scale, let's look at the Barbie doll. The design and moulds are completed in the US, the oil refined into ethylene in Chinese Taipei, the hair manufactured in Japan, the clothing made in China, and the assembly in Indonesia and Malaysia. And what about what we commonly term an 'American' car. Thirty per cent of the value is to Korea for assembly, 17.5% to Japan for components, 7.5% to Germany for design, 4% to Chinese Taipei and Singapore for minor parts, 2.5% to the UK for marketing services and 1.5% to Ireland and Barbados for data processing. For an 'American' car, 37% of the production value is generated in the US (WTO, 2011).

International trade today is inseparable from global production networks and in this new context of trade in tasks and Made in the World, is requiring the development of a new measurement of trade flows based on value added (Rugwabiza, 2011).

With the international fragmentation of production, national boundaries and distances are collapsing. Reductions in transport costs, the information technology revolution, and more open economies have made it easier to distribute production across a range of countries. Global manufacturing has brought a new dimension to the relationship between trade, investment, industrial production and development (Jara, 2011).

International trade today has become inseparable from global production networks, and it is important for policy makers, as well as analysts and opinion makers, to fully understand the implications of such economic interdependence among countries participating in the multilateral trading system (Jara, 2011).

2. The New Trade Theory: Trade in Tasks and Fragmentation of Production

The geographical fragmentation of production has created a new trade reality. Often referred to as global value chains or vertical specialization, this fragmentation deepens the interdependency of trade relations and has many implications for how we understand trade policy (WTO, 2011/a, pp.4). Increased vertical integration and the rise of "Global manufacturing" led to significant changes in trade patterns.

Trade in tasks and the fragmentation of production along global supply chains has challenged the validity of the traditional Ricardian models, based on the exchange of final goods, each country specializing in a certain type of products. Contrary to the Ricardian model, countries that are similar in factor endowment and technology have developed a significant part of their trade in the same products, and trade intermediate goods between their industries. The new trade theory looks at explaining divergence from this traditional model (Escaith, Lindenberg and Miroudot, 2010, p.2).

In recent decades, it has become increasingly common to produce goods in a number of geographically dispersed stages linked by international trade. Such international supply chains have been described variously by economists as production fragmentation, processing trade, vertical specialization, slicing up the value chain etc. The implications of this global change in the organization of industry is that it takes many more export and import transactions to provide a single unit for final demand of complex goods like computers and automobiles than previously. The widespread adoption of this method of production and trade has a number of implications for how the world economy works today. These include reallocating the value added by trade among different countries depending on where they fit in the supply chain and, possibly, making international trade flows more sensitive to the business cycle, as demonstrated in the recent Great Recession and Great Trade Collapse of 2008- 09 (Ferrantino, 2012, p.1).

3. Globalization of the Industrial Production Chains

The term "globalisation" has been widely used to describe the increasing internationalisation of financial markets and of markets for goods and services. Globalisation refers above all to a dynamic and multidimensional process of economic integration whereby national resources become more and more internationally mobile while national economies become increasingly interdependent (OECD, 2005, p.11).

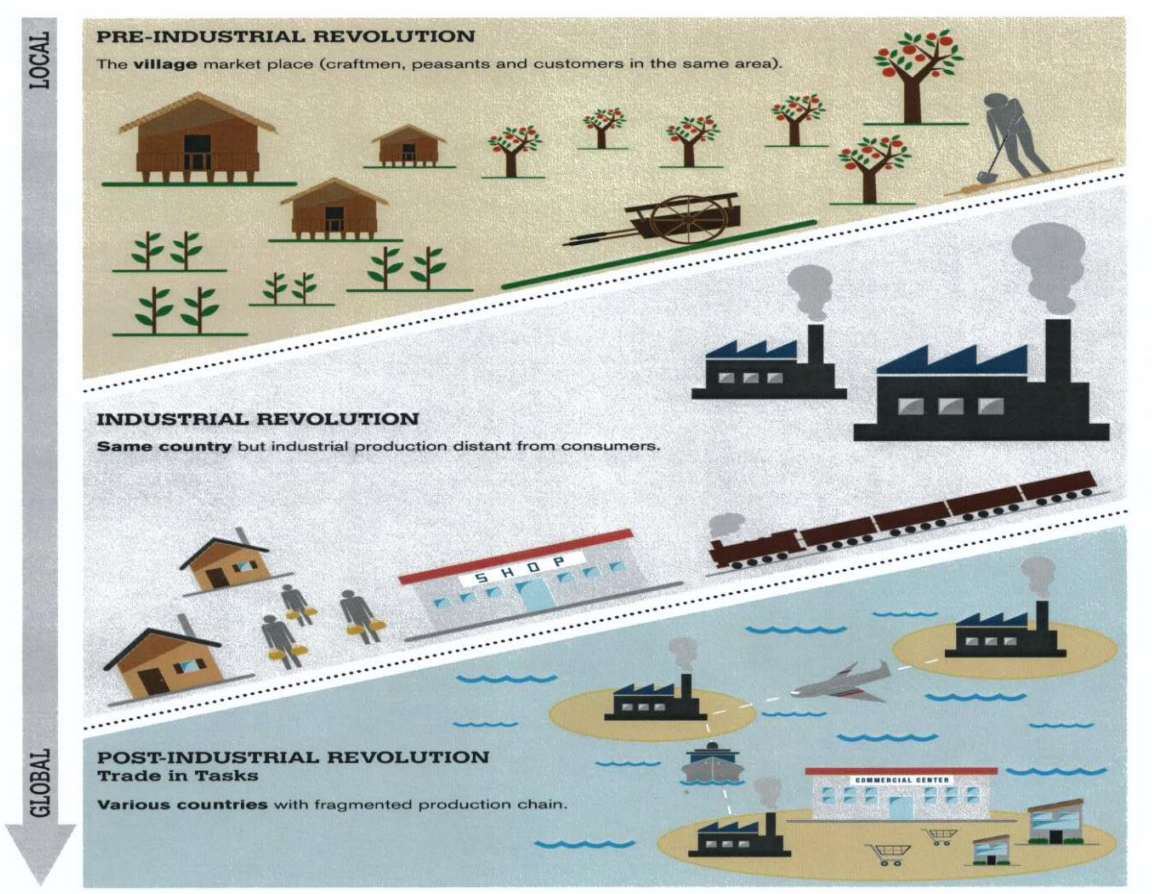
Globalization has gone through several phases; as a matter of fact, the history of mankind is often closely related to the evolution of trade. In former times, when transportation was difficult, international trade was limited to the most expensive items. With the industrial revolution in the 19th century, mass production and improved transportation made international trade much easier, and most goods became tradable. More recently, a new phenomenon, "global manufacturing", is again boosting the volume and diversity of products being exchanged. But it is also changing the very nature of international trade. Global manufacturing is characterized by the geographical fragmentation of productive processes and the offshoring of industrial tasks (WTO, 2011, p.4).

In past decades, increased vertical integration of multinational enterprises and the expansion of processing zones, mostly in developing economies, led to significant changes in trade patterns. One of the most noticeable features of this evolution is the increasing trade in intermediate goods in the manufacturing sector. Intermediate inputs are intensively exchanged

within international production chains and imported in processing zones for the production of goods to be exported (Maurer and Degain, 2010, p.22).

The old division of labor between nations has been radically changed by the recent wave of globalization. We are no longer in an economy where countries trade final goods. Today's tendency is for countries to specialize in "tasks", rather than in "products". Global value chains, or international supply chains, are core to this development: The parts and components that make up a final product are manufactured in different countries around the globe, many of which are developing countries (Jara, 2011).

Figure 1
From local to global production and markets



Source: WTO Secretariat.

4. From Trade in Goods to Global Value Chains

The old division of labor between nations has been radically changed by the recent wave of globalization. Global value chains, or international supply chains, are core to this development and traditional boundaries and distances are collapsing (Lamy, 2011).

One of earliest exponents of value chain analysis was Michael Porter. In these chains, core activities are organized as separate but coordinated phases. Each phase or task is organized to create and optimize a specific aspect of the global chain (value driver). Thanks to their international nature, global value chains are able to benefit from the respective comparative

advantages of various countries. Firms slice their demand and supply chains into parts, varying the final products and their price according to consumers' tastes and socio-economic characteristics. At the same time, they standardize the production of parts as much as possible, so that work can be distributed with maximum efficiency among the different suppliers (Porter, 1985).

The starting point for understanding the changing nature of international trade and industrial organization is contained in the notion of a value-added chain, as developed by international business scholars who have focused on the strategies of both firms and countries in the global economy. In its most basic form, a value-added chain is 'the process by which technology is combined with material and labor inputs, and then processed inputs are assembled, marketed, and distributed. A single firm may consist of only one link in this process, or it may be extensively vertically integrated (Gereffi, Humphrey and Sturgeon, 2005, p.79).

The rising integration of world markets through trade has brought with it a disintegration of multinational firms, since companies are finding it advantageous to 'outsource' an increasing share of their noncore manufacturing and service activities both domestically and abroad. This has led to a growing proportion of international trade occurring in components and other intermediate goods (Gereffi, Humphrey and Sturgeon, 2005, p.80).

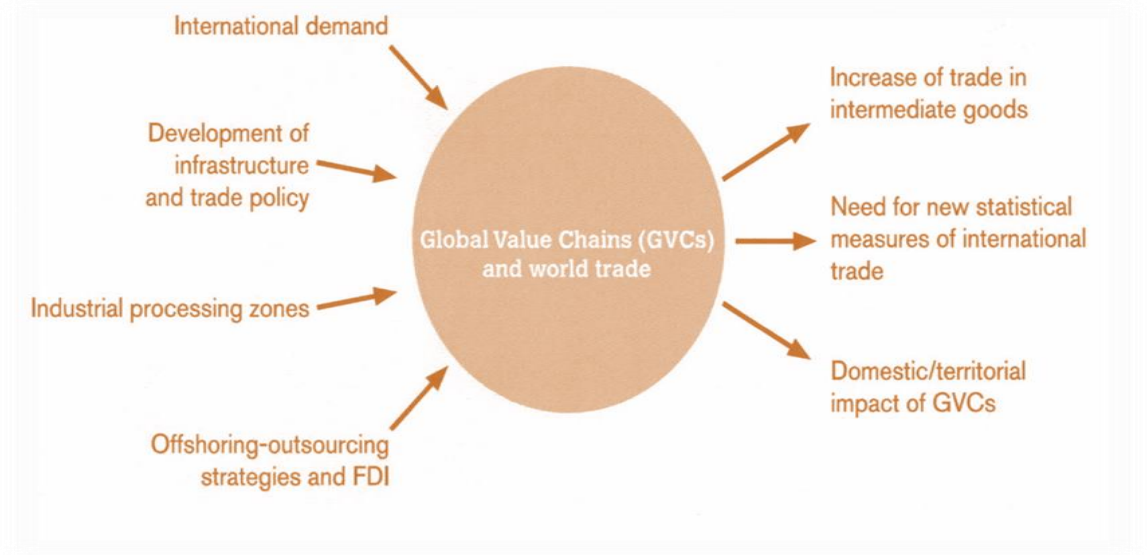
The rise of global value chains and increasing fragmentation of production process has dramatically increased the role of intermediate goods in merchandise trade. The electronics industry, one of the world's most important goods-producing sectors, is a very representative example of this process.

The rise of international transactions in intermediate goods is a direct consequence of the expansion of global supply chains. The WTO estimated the share of intermediate goods in non-fuel merchandise trade at around 40 per cent in 2008, with wide differences for individual countries (WTO, 2009, p.2).

The increasing fragmentation of value chains has led to an increase of trade flows in intermediate goods, especially in the manufacturing sector. In 2009, trade in intermediate goods was the most dynamic sector of international trade, representing more than 50 per cent of non-fuel world merchandise trade. This trade in parts, components and accessories encourages the specialization of different economies, leading to a "trade in tasks" that adds value along the production chain. Specialization is no longer based on the overall balance of comparative advantage of countries in producing a final good, but on the comparative advantage of "tasks" that these countries complete at a specific step along the global value chain (WTO, 2011/a, p.4).

Nowadays, many products are building up for supply chain that crosses several national borders. Items like electronic and transportation equipments are the result of this network factors that different countries involve the production, delivery and sale to final customer.

Figure 2: Global Value Chains



5. The Importance of Measuring Trade in Value Added

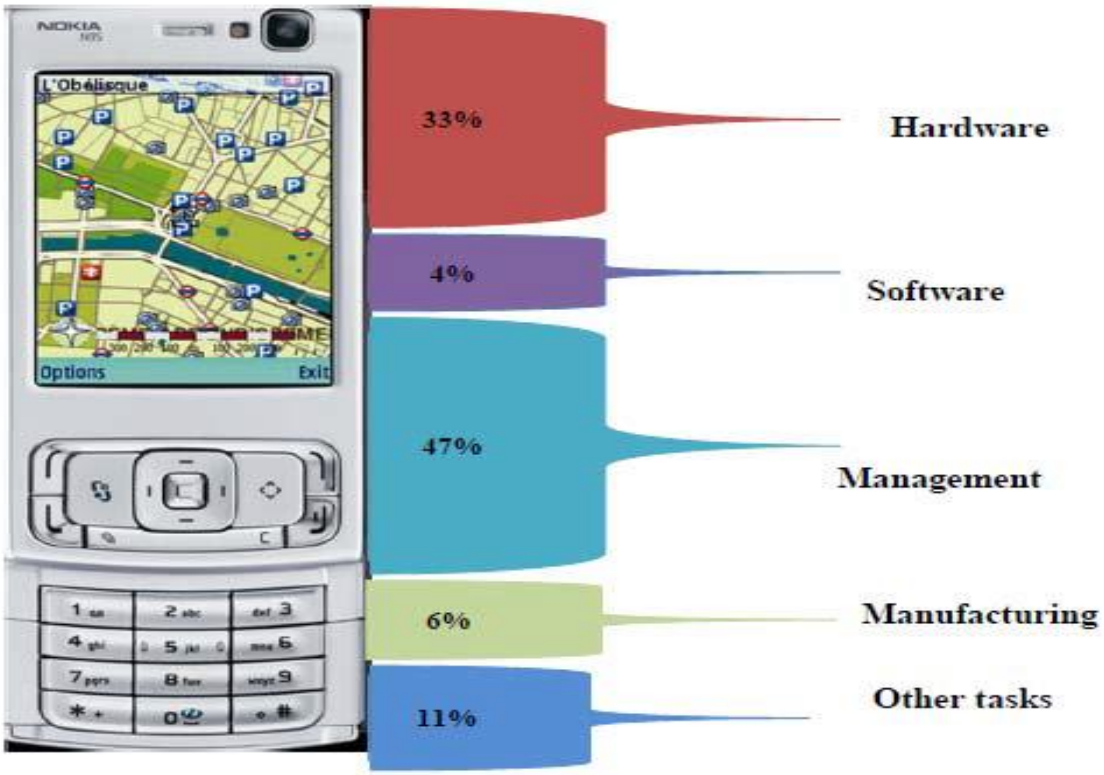
To understand fully the importance of measuring trade in value added, one needs to look at intermediate consumption and in particular at imported intermediate goods. Intermediate goods are those which are used to produce other goods. Trade in intermediate goods is particularly developed in the context of production fragmentation and vertical specialization, i.e. the division of labor at international level (WTO, 2010, p.7).

Today, a fundamental chance has been taking place in the structure of international trade. This change is referred to in various ways: Vertical specialization, production sharing, trade in tasks, or supply chain trade, to cite a few. What these all indicate is that much of trade these days comprises components or intermediate goods and services that pass from economy to economy before becoming part of a final traded product.

Offshore-Outsourcing and Foreign Direct Investment (FDI) led to an increase in Trade in Intermediate Goods" (i.e. parts, components and accessories) which encouraged the specialization of different economies. As a result, economies have been "Trading Tasks" (as opposed to "Final Goods") which "add value" along the production line.

The term outsourcing is used to designate the use of goods and services produced outside the enterprise. Outsourcing can occur within the country where the enterprise is located (domestic outsourcing) or abroad (outsourcing abroad) (OECD, 2007, p.15).

Figure 3: Allocation of tasks: The example of the NOKIA N95



Hardware and management tasks comprise 80% of total value added. More than half comes from the EU for management, hardware and software tasks; while North America and Asia account for 17% and 18% of total value.

Source:
Jyrki Ali-Yrkkö, Petri Rouvinen, Timo Seppälä & Pekka Ylä-Anttila (2011)

Table 1: The iPhone example.

Country	Components	Manufacturers	Costs
Chinese Taipei	Touch screen, camera	Largan Precision, Wintek	$ 20.75
Germany	Baseband, power management, transceiver	Dialog, Infineon	$ 16.08
Korea	Applications processor, display, DRAM memory	LG, Samsung	$ 80.05
United States	Audio codec, connectivity, GPS, memory, touchscreen controller	Broadcom, Cirrus Logic, Intel, Skyworks, Texas Instruments, TriQuint	$ 22.88
Other	Other	Misc.	$ 47.75
		Total	**$ 187.51**

Source: WTO.

6. Weaknesses in Current Statistical Methods and Developing Statistics

The nature of trade has changed, but our trade data have not. Merchandise trade is measured at "gross value", so the total value of an import is assigned to a single country of origin when it crosses the border. Around the world, many researchers, statisticians and business people work on complementary ways to measure trade to reflect the global nature of industrial production, and to better assess the impact of trade opening on jobs (Lamy, 2011).

Intermediate goods, such as parts and components, cross borders several times and each country participating in this global supply chain adds a bit of value. Many goods are assembled in China, but their commercial value comes from the numerous countries that precede its assembly (Lamy, 2011).

A better understanding of global manufacturing, and the impact it has on measuring trade patterns is require use of correct data about international transactions. In fact, developing adequate statistics to understand correctly the nature of today's world production and trade is essential for proper policy making. The question of “who produces what for whom” and “where the value added is accruing” are perhaps as important as the traditional concept of country of origin.

Yet, answering these questions with our current statistical tools is not easy. The concept of country of origin for manufactured goods has gradually become more challenging as the various operations, from the design of the product to the manufacture of the components; assembly and marketing have spread across the world. Cross-border trade in intermediate goods is recorded multiple times; distorting bilateral trade balances which country does.

Similarly, by focusing on gross values of exports and imports, traditional trade statistics also gives us a distorted picture of trade imbalances between countries. The picture would be different if we took account of how much domestic valued added is embedded in these flows.

Current trade statistics hide the truth about the internationalization of production processes. While such internationalization is nothing new, it has been the focus of particular attention over the last ten years due to an increase in outsourcing and offshoring, a reduction in transport and communication costs, and improved trade logistics. Final consumption has changed due to a broadening of the range of goods and services. Since most goods produced nowadays are "Made in the World", a new statistical framework for measuring trade in value added would help us to understand fully the nature of trade relations at world level. There is currently no exhaustive, solid statistical framework for measuring the international fragmentation of production (WTO, 2010, p.16).

The boundary between goods and services is blurred and current trade recording systems struggle with the adequate reporting of globalization phenomena such as goods for processing or intra-firm trade. Traditional trade statistics record trade across borders on a gross basis, thus double or multiple-count vertical trade or flows in intermediates. Trade in value added allocates the value added to each step of the supply chain across countries (Maurer, 2011).

7.Conclusion

In recent decades, it has become increasingly common to produce goods in a number of geographically dispersed stages linked by international trade. Such international supply chains have been described by economists as fragmentation of production. The geographical fragmentation of production has created a new trade reality. This fragmentation deepens the interdependency of trade relations and increased vertical integration and the rise of "global manufacturing" led to significant changes in trade patterns.

The fragmentation of production along global supply chains has challenged the validity of the traditional Ricardian models. Contrary to the Ricardian model, countries that are similar in factor endowment and technology have developed a significant part of their trade in the same products, and trade intermediate goods between their industries.

In today's planet trade looks very different from when the first rules governing world new trade theory looks at explaining divergence from this traditional trade. The old division of labor between nations has been radically changed by the recent wave of globalization. Today's tendency is for countries to specialize in "tasks", rather than in "products". Global value chains, or international supply chains, are core to this development.

The starting point for understanding the changing nature of international trade and industrial organization is contained in the notion of a value-added chain. The value-added chain is, a single firm may consist of only one link in this process, or it may be extensively vertically integrated.

The rise of global value chains and increasing fragmentation of production process has dramatically increased the role of intermediate goods in merchandise trade over the last decade. Many products are building up for supply chain that crosses several national borders. Much of trade these days comprises components or intermediate goods and services that pass from economy to economy before becoming part of a final traded product.

Knowledge of the world's fragmented production and the need for input goods and services is necessary in order to formulate a modern trade policy. International trade today is inseparable from global production networks and in this new context of trade in tasks and "Made in the World" is requiring the development of a new measurement of trade flows based

on value added.

The nature of trade has changed, but our trade data have not. A better understanding of global manufacturing, and the impact it has on measuring trade patterns is require use of correct data about international transactions. In fact, developing adequate statistics to understand correctly the nature of today's world production and trade is essential for proper policy making.

Current trade statistics hide the truth about the internationalization of production processes. Traditional trade statistics record trade across borders on a gross basis, thus double or multiple-count vertical trade or flows in intermediates. Trade in value added allocates the value added to each step of the supply chain across countries.

Most goods produced nowadays are "Made in the World", a new statistical framework for measuring trade in value added would help us to understand fully the nature of trade relations at world level. There is currently no exhaustive, solid statistical framework for measuring the international fragmentation of production.

In conclusion, improved measurement and knowledge of actual trade flows will help better understand the interdependencies of today's national economies, supporting the design of better policies and better trade regulation worldwide.

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