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Characteristics features of Vietnam's international economic integration in the context of industrial revolution 4.0

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Abstract

This article provides the basic characteristics of international economic integration in the current context with the impact of the Industrial Revolution 4.0, affirming the general trend of most countries is international integration and stating the promoting role of the industrial revolution. The article also mentions some of the characteristics of the industrial revolution 4.0 and the results it has brought to the present. Moreover, it points out the differences in the trend of capturing the achievements of the Industrial Revolution 4.0 of developed and developing countries and its application to the process of international economic integration. From that, we deduce the relationship between economic integration and Industrial Revolution 4.0. The study also provides some good examples of businesses and countries being in the process of integrating into the world economy and quickly adapting to the Industrial Revolution 4.0. Finally, the paper present some recommendations to take advantage of useful features while avoiding the adverse effects of both industrial revolution and international integration in the development process of a country and business.

Keywords: Industrial revolution 4.0, economic integration, enterprises, countries

1. Introduction

The Industrial Revolution 4.0 is in the onset and will affect all sectors of the economy and society, at the same time completely changing the current production and management system. Industry 4.0 is based on digital technology and integrates all the smart technologies to optimize processes and production methods such as 3D printing technology, biotechnology, new material technology, automation technology ^[1]. Currently, the world is at an early stage of Industry 4.0, with the basic content of creating new structures and operations for production based on high-tech applications, the Internet of things and artificial intelligence. The biggest feature of industry 4.0 is the connection between the subjects and the economic cycle thanks to the development of information technology and Internet infrastructure, culminating in the network of all things connected. This connectivity is creating a new trend often referred to as a shared economic concept. Accordingly, direct resource sharing models between individuals are realized through the foundation of information technology and the Internet, aiming to optimize the resources of the whole society. Since then, countries and businesses around the world can easily cooperate and apply technological achievements to the economic development based on flexible production base with a combination of diverse processes from design, production, testing under the support of technology. Before the fourth industrial revolution began, Vietnam had many achievements in the field of economic and social development that helped to increase income and reduce poverty, but now Vietnam is facing an important crossroads. Kenichi Ohno from Japan's National Policy Research Institute said: "Vietnam is facing a middle income trap with a series of worrisome signs." Vietnam will have to rely more on increasing labor productivity through technological innovation and significantly improving domestic innovation capacity ^[2]. In front of that intersection, the fourth industrial revolution appeared and has been creating development turning points for individuals, businesses and countries around the world. According to Tran Dinh Thien, Director of Vietnam Economics Institute, Industry 4.0 will help businesses increase productivity, flexibility and efficiency, shorten the time to bring products to market, thereby increasing competitiveness of the business. At the same time, consumers will benefit from the consumption of higher quality products,

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more competitive prices and especially personalized products and services ^[3]. Besides, the process of international economic integration takes place more and more deeply. Economic cooperation between countries appears when production forces and division of labor have developed to a certain level. Initially, it appeared only in form of bilateral trade, after that it expanded, developed in the form of business links ^[4]. International integration transcends conventional international cooperation, which requires high sharing and discipline of participants (Pham Quoc Tru, 2011). In this day, production and information technology forces have been developing at an unprecedented speed. The situation has just demanded and created the ability to reorganize the market in the global scope. Countries are more and more interdependent. They need complementar economic and trade relations as well as investment and other relationships such as culture and environment. These are the actual bases for reaching the final destination of the process of globalization towards a unified global economy with no national borders. Thereby, we see the necessity and importance of international economic integration for each country, each enterprise in the present and future time, especially in the context of industrial revolution 4.0. Therefore, the aim of this paper is to identify some basic features of the process of international economic integration under the impact of the industrial revolution 4.0.

2. Theoretical framework

There are many ways to approach the concept of international integration, namely the following three approaches. The first approach, belonging to the federalist school, assumes that integration is a final product rather than a process. That product is the formation of a federal state like the United States or Switzerland. In order to assess cohesion, those who follow this school are primarily concerned with the legal and institutional aspects. The second approach sees integration as the linkage of countries through the development of exchanges such as trade, investment, information, tourism, migration and culture. Since then, the community of security comes into being (Karl W. Deutsch, 1957). According to Deutsch, there are two types of security community: the united type that is in the United States, and the type that is diverse as Western Europe. Thus, this second approach considers integration as both a process and a final product. The third approach considers integration as a phenomenon that countries expand and deepen their cooperative relations on the basis of intentional international division of labor, based on the advantages of each country and the pursued goals (Pham Quoc Tru, 2011). In terms of economic integration, according to the simplest and popular concept in the world, it is the economies that link together. In this way, economic integration has been going on for thousands of years and global economic integration has taken place two thousand years ago when the Roman Empire invaded the world and expanded its communication network, promoting goods circulation and imposing their currencies in their entire vastly occupied territory. Economic integration, understood more closely, is an institutional connection between economies ^[5]. More specifically, economic integration is the active process of simultaneously carrying out two things. On the one hand, it is to link the economy and each national market to the regional and world markets through efforts to

implement openness and promote liberalization of the national economy. On the other hand, it is to join and contribute to construct regional and global economic institutions (Béla Balassa, 1960).

Economic integration has five levels of advancement: (1) preferential trade area / agreement, (2) free trade area / agreement, (3) customs union, (4) common market, (5) monetary economic union. Preferential Trade Agreement (PTA): Member states grant each other trade preferences on the basis of tariff reductions, but there are still restrictions on the scope (the number of items included in the cut tariff reduction) and the level of reduction. The PTA Agreement of ASEAN (1977), the Vietnam-US Trade Agreement (2001), the GATT Agreement (1947 and 1994) is concrete examples of the economic linkage model at the lowest stage. Free Trade Area (FTA): Members must implement the reduction and elimination of tariff barriers and quantitative restrictions (which may include the reduction and removal of some goods). It means non-tariff barriers in intra-regional trade, but still maintains independent tariff policies for non-bloc countries. Examples are: European Free Trade Area (EFTA), North American Free Trade Area (NAFTA), ASEAN Free Trade Area (AFTA). In recent years, most of the new FTAs have a much wider scope of regulation. In addition to the goods sector, these agreements also have liberalization provisions for many other areas such as services, investment, intellectual property, government procurement, etc. Examples are: FTA between ASEAN and Australia-Australia (2009), Trans-Pacific Partnership Agreement (TPP-negotiating). Tariff Union (Custom Union): Members in addition to reducing and eliminating tariffs in intra-regional trade also agree to implement a common tariff policy for countries outside the bloc. Examples are ANDEAN Group and Russian-Belarusian-Cadavan Customs Union. Common Market (Single Market): In addition to the elimination of tariffs and non-tariff barriers in intra-regional trade and having a common tariff policy for non-bloc members, members must also abolish restrictions on the flow of other production elements (capital, labor) to form a common production base for the whole sector. For example, the European Union has undergone a single market construction phase (European Common Market) before becoming an economic alliance. Economic-Monetary Union: The economic integration model at the highest stage based on a single and common market plus the implementation of general economic and monetary policies (one common currency, common central bank), for example, Eurozone currently. A country can simultaneously participate in many integration processes with different nature, scope and form. However, basically undergoing integration steps from low to high, acceleration can only take place in certain specific conditions (for example, the European Economic Community has simultaneously build free trade area and customs union in the 60s and 70s). Economic integration is a very important foundation for the sustainable existence of integration in other areas, especially political integration and, in general, it is prioritized by countries to be like leverage for cooperation and development in the context of globalization.

International economic integration is the linkage of each nation's economy into regional and global economic cooperation organizations, in which the relationship between member countries has the imposition to follow the general rules of the block ^[6]. Currently, when the economies

of the countries in the world have increasingly mutually dependent relations, the connection and integration among these countries is absolutely indispensable. The process has become increasingly strong under the impact of globalization, regionalization, internationalization and the international division of labor taking place more and more deeply. In a new era, no country can survive without the connection with the outside world and no country can develop its economy without cooperation with other countries. The most obvious manifestation of international economic integration is the formation of free trade areas, economic alliances such as EU and ASEAN, trade agreements signed between countries accompanied by the expansion of foreign investment carried out by multi and transnational companies. For developing countries, the process of international integration offers a tremendous opportunity in promoting economic, scientific and technological development thanks to the exchange, cooperation and the help from the world's major economies. However, it is also a great challenge to compete to survive, not to be left behind. As for developed countries, international integration not only strengthens their position in the world but also the expansion of international cooperation will enlist the support of many countries to enhance their position in global stage. To achieve that goal, developed countries should not only build mutual and multilateral relationships but should also practically help the other developing nations in technology transfer, scientific research, implementation of preferential policies and trade agreements.

The concept of the 4th Industrial Revolution was introduced by Klaus Schwab, the German Chairman of the World Economic Forum Davos in 2016. The concept Industry 4.0 or smart factory was first launched at Hannover Industrial Fair in the Federal Republic of Germany in 2011. These industrial networks will bring a whole new change on almost all fields of socio-economic life that are not limited to the areas of previous industrial revolutions [7]. At the conference "ASEAN 4.0: Entrepreneurship Spirit in the Industrial Revolution 4.0", Mr. Dato 'Mohd Zamruni Khali, Malaysian Ambassador to Vietnam, has identified artificial intelligence as a challenge for workers. This leads to a profound impact on the ongoing international economic integration process [8]. It not only affects the level of development between countries but also includes the widening gap between the rich and the poor. Myanmar state adviser Aung San Suu Kyi mentioned a very important point in the speech at the ASEAN WEF Conference, that Industrial Revolution 4.0 is not useful in the context of rising rich people and growing poverty and unemployed. Industrial Revolution 4.0 must be linked to the goal of sustainable development to change the world in a better way. The main challenge lies in the distribution of wealth in society [9]. To expand the cooperative relationship, there cannot be too big difference between nations in terms of development level or it will lead to dependence and stagnation. Therefore, many countries must quickly grasp the trend of Industrial Revolution 4.0 to create a premise for cooperation and development. Currently Industrial Revolution 4.0 is taking place in developed countries like the US, Europe and Asia. Vietnam is currently in the second and third revolutions. And now the transition to Industrial Revolution 4.0 will be a great opportunity for socio-economic development in all aspects. Besides new

opportunities, Industrial Revolution 4.0 also poses many challenges for Vietnam, including security challenges [10]. Therefore, the study of the impact of the Industrial Revolution 4.0 and the characteristics of international economic integration will help country and businesses to have more concrete view to build own strategy appropriate and correct to take advantage of their own in the development process.

3. Research Methodology

World economic integration is an issue of a macro and international stature, so to study its basic characteristics requires a lot of time and resources. For simplicity, this article is mainly based on secondary data sources on economic integration to provide assumptions about the general characteristics of many economies in the integration process. These data are collected through various channels such as newspapers, Internet, journals. The reference to the methods used to study issues related to the topic is also an effective solution to choose a research method that is more suitable for the article. Besides, qualitative research method is the best approach to explore, describe and explain based on interviewing and surveying experience, awareness, motivation, intended behavior and attitude. They can direct us to build hypotheses and explain appropriately to give answers to the questions: How, Why or What. In addition, the article also provides some typical examples of international economic integration in some countries or businesses that relate to the impact of Industrial Revolution 4.0 to determine their similarities and differences from which to draw interesting conclusions.

4. Research Results

First of all the article outlines some of the characteristics of the Industrial Revolution 4.0 to help readers become more aware of its specific impact on socio-economic life. The Industrial Revolution 4.0 has a strong impact on many areas, with the emergence of robots with artificial intelligence that bring about many applications in society. Thanks to AI (Artificial Intelligence), the intelligent robot works more smartly, has the ability to memorize and learn infinitely. The advantage of working 24 hours without pay, taxes, insurance of the robot is also threatening the use of workers who real but not robots. During the 4.0 Industrial Revolution, the factors that countries like Vietnam have considered dominant and advantageous such as the young, abundant labor force will no longer be strong, even seriously threatened. In the future, people may lose their jobs, because of the areas where robot easily can replace people.

In the field of trade, services, entertainment, robots have also been present in job positions that are supposed to be irreplaceable to people such as hotel reception, offices, restaurants, call centers. When visitors arrive, the robot can automatically identify, remember to greet, remember their interests, answer customer needs by voice completely like humans.

In the field of transport, the unmanned vehicle generation will grow thanks to much higher safety because there is no drunkenness, red lights and reckless overtaking. In August 2016, an American man who was using Tesla's self-driving car had symptoms of chest pain. He promptly contacted his wife to call the hospital to tell the doctor to wait for him to arrive and ordered the car to move to the hospital. Doctors

have given emergency help, saving this man's life.

In the field of textile and garment, traditional production technologies will gradually be replaced by 3D printing technology for some garment products made of adhesive materials. In addition, the application of robots and programmed devices in many stages of production will offer opportunities to create high labor productivity, good product quality and reasonable price compared to production by traditional technology. Thereby, the workforce in the textile and garment industry will have the opportunity to receive a higher income but will also face the challenge of capacity building to access new technology relevant to the Industrial Revolution 4.0.

In the field of healthcare, the IBM Watson machine nicknamed the "Doctor knows all" can browse millions of medical records at the same time to provide doctors with evidence-based treatment options within seconds thanks to the ability to synthesize huge data and powerful processing speed. This knowledgeable doctor also allows people to look up information about their health situation. Doctors only need to enter patient data to be analyzed, compared with the huge data warehouse available and give suggestions for precise treatment. Earlier this year, several hospitals in Ho Chi Minh City and Hanoi performed surgeries with the help of robots. With four arms, smart camera head, 540 degree wide angle of operation, 3D images, robots can operate in difficult positions, assisting doctors to perform surgeries with minimal invasion and maximal accuracy.

Under the strong impact of the Industrial Revolution 4.0 with the specific effects mentioned above, how will the ongoing international economic integration process bring about opportunities and challenges is an interesting question. Currently, the majority of countries have affirmed that international integration is a major indispensable trend of the world and at the same time pointing out that there is now other way of development for all countries in the era of globalization and international integration. This inevitable choice is also determined by the many benefits that international integration creates for all. Below, there is presented a list the main benefits of international integration that countries can take advantage of:

- Firstly, the integration process helps to expand the market to promote trade and other international economic relations, thereby promoting socio-economic growth and development.
- Secondly, integration also motivates economic restructuring, improves the business and investment environment, thereby improving the efficiency and competitiveness of the economy, products and businesses. At the same time, it increases the ability to attract investments into the economy.
- Thirdly, integration helps improve the professional level of national human resources and advancement in science and technology, thanks to the cooperation in education and training and scientific research and the acquisition of new technologies through direct investment, technology transfer from advanced countries.
- Fourthly, integration increases opportunities for domestic businesses to access international markets, credit sources and international partners.
- Fifthly, integration creates opportunities for individuals to enjoy products and services of various types, designs

and quality at competitive prices; to have access to and interact more with the outside world, thereby having the opportunity to develop and find jobs both inside and outside the country.

- Sixthly, integration creates favorable conditions for policy makers to better grasp the situation and development trend of the world, from which they can implement development policies suitable for the country to move on the global value chain instead of being marginalized.
- Seventhly, integration helps supplement the values and progress of the culture and civilization of the world, enriches the national culture and promotes social progress.
- Eighthly, integration creates motivation and conditions for comprehensive reform towards building an open, more democratic society, and a rule of law state.
- Ninthly, integration creates conditions for each country to find itself an appropriate position in the international order, to help strengthen its international reputation and position, as well as the ability to maintain security, peace and stability for the purpose of sustainable development.
- Tenthly, integration helps maintain regional and international peace and stability for countries to focus on development. At the same time, it opens the possibility of coordinating countries' efforts and resources to address common regional and world's concerns.

However, integration not only brings benefits, on the contrary, it also puts countries in front of many disadvantages and challenges, especially

- Firstly, integration makes competition intensify, causing many businesses and economic sectors to face difficulties and even bankruptcy, thereby causing many socio-economic consequences.
- Secondly, integration increases the dependence of the national economy on the external market and, therefore, makes the economy vulnerable to fluctuations in the international market.
- Thirdly, integration does not distribute equally benefits and risks to different countries and groups in society, so there is a risk of widening the rich-poor gap.
- Fourthly, in the integration process, developing countries face the risk of adverse natural economic restructuring, due to the tendency to focus on industries that use a lot of resources, labor-intensive, but low value added. Therefore, they can easily become industrial and low-tech landfills depleted of natural resources and destroy the environment.
- Fifthly, integration can create some challenges for State power (traditionally about independence and sovereignty) and complex for maintaining security and stability in developing countries.
- Sixthly, integration may increase the risk of losing traditional national identity and culture being eroded by the invasion of foreign culture.
- Seven, integration can put countries at increased risk of international terrorism, smuggling, transnational crimes, epidemics and illegal immigration.

5. Discussion

This paper aims to understand and identify the basic

characteristics of the international economic integration process of countries and businesses in the context of the Industrial Revolution 4.0 so that they can propose some ideas to make use of them. These characteristics serve as an opportunity to help the economy grow and overcome challenges in the present era. For developed countries, the economy only changes formally under the impact of the Industrial Revolution 4.0, particularly from an industrial production economy to a knowledge economy, mainly used high technology in the field. As for developing countries, economic integration has brought about opportunities to expand the market, resources, technology. In addition, it also enlists the support of developed countries not only in production, international trade but also other areas of socio-economic life, such as the formation of key economic sectors, access to investment capital sources such as FDI, ODA and FII (Foreign Indirect Investment) to improve the conditions of infrastructure, socio-economic performance, training to create a high quality human resource to meet the requirements of the nation and enterprises. Each step of the development forward will shorten the gap with other countries. However, everything has its downside, developing countries face many challenges such as the difficulty of accessing and applying new technologies, the legal policy structure of some countries still faces many shortcomings, the quality of the labor force is not enough to meet the demand, the increasing foreign investment easily leads to competition and the loss of the domestic market. In other areas, economic integration also brings many problems such as social evils, increasing social crimes and their internationalization. At the same time, it is easy to lead to dependence on major countries, affecting the political and territorial risks and will possibly lead to backwardness compared to the general development level of the world. Industrial Revolution 4.0, on the one hand, has direct impact on social and human life, such as increased life expectancy, physical strength, mental strength and manifold increased intellectual capacity. By being more indirect, but stronger, faster and more profound, it impacts people and society through technology, manufacturing, telecommunications, communication. Through the direct products of the Industrial Revolution 4.0, new science and technology go into production and human life. Science only becomes the real driving force of production and social development, when it adopts the Industrial Revolution 4.0 achievements to promote rapid production, connect and profit people and society. Currently, new products and new technologies have been created and quickly put into production, human life and society, creating big revolutionary changes in all possible areas.

6. Conclusions and recommendations

The Industrial Revolution 4.0 that is happening at an exponentially rapid rate is changing the global context and has an increasing impact on Vietnam, both in positive and negative sense. As a consumer, all people benefit because goods and services will be diverse, abundant and more affordable. However, in the medium term, many workers will be affected, especially less skilled workers, so the impact of automation is accelerating in developed countries. If Vietnam makes good use of opportunities and overcomes challenges, it will be able to narrow the development gap with more advanced countries, and soon realize its goal of becoming an industrialized country in the right direction. In

the opposite case, the development gap with the preceding countries will continue to increase. Therefore, Vietnam needs to implement a dual agenda: (i) continue to address the remaining economic, social and environmental issues from the previous hot growth period, (ii) Quickly take advantage of opportunities and overcome new challenges that appear in relation to the Industrial Revolution 4.0 that is accelerating globally. As results, we suggest the following recommendations:

- Firstly, the challenges associated with the Industrial Revolution 4.0 need to be taken as a mandatory content of context analysis to adjust the parameters of central development plans in a long-term, especially the large infrastructure investment programs related to Internet, information and communication infrastructure.
- Secondly, there should be increased awareness of policy-making agencies as well as the business sector (especially in the energy industry, natural resource exploitation and manufacturing industries and the banking sector due to these sectors are potentially impacted by the Industrial Revolution 4.0 to help regulate business and investment plans to avoid false investments, thereby helping to prevent bad debts arising in the future.
- Thirdly, there should be fundamental changes in managing exchange rates in a more flexible and marketable manner, avoiding the high valuation of the Vietnamese currency to help improve the competitiveness of enterprises in the manufacturing industry being under great adjustment pressure when Vietnam's cheap labor advantage in these sectors is strongly reduced and robots and automation are becoming mainstream in the coming time.
- Fourthly, in the context of limited financial capacity due to high public debt, it is necessary to consider property taxation to have more budgets for social security, especially for labor support that may lose their jobs in sectors affected by the Industrial Revolution 4.0.
- Fifth, improve technology absorption capacity and encourage innovation: to promote the establishment of industry-linked clusters; to prioritize public investment in infrastructure development in association with improving connectivity (expanding coverage, speeding up access and lowering prices for Internet use); to develop a long-term capital market, and promote the development of venture capital funds associated with technological and creative development;
- Sixth, implement appropriate industrial policies to strengthen closer links between domestic and FDI sectors, especially with measures to support startups and some businesses operating effectively in the fields of technology application and development, especially medium technology and supporting industries associated with global value chains; promote an effective cooperation between the State, the business sector and universities of technology to promote the development of selected industries, especially information technology.
- Seventh, implementing strong reforms of education and training system in the direction of:
 - Strong support for science and technology (STEM) sectors by effective institutions and policies;
 - Promote and raise awareness of young people, students to study STEM disciplines;

- Nurturing STEM skills from a young age, starting from kindergarten with appropriate teaching methods such as robots clubs;
- Follow experience of advanced countries in bringing programming into the curriculum from the lower grades;
- Encourage the spirit of lifelong learning, continuous learning on the basis of taking advantage of new Internet-based learning technologies;
- A radical change in how English is taught in schools with specific monitoring indicators;
- Implement mechanism to encourage businesses and education institutions to work together to narrow the skills gap of new graduates, thereby helping them shorten the time to find suitable jobs and businesses to shorten time and reduce recruitment costs.

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