

Covid-19 And The Globalization Challenges

كوفيد 19- وتحديات العولمة

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Abstract:

The increased production specialization between nations makes the supply chain at the international level more complicated and interconnected. This issue raises the dependency of the production process in terms of both manufacturing, logistics and delivery. In this context, the smoothly and harmonic movement of the supply chain according to the advantages brought by each nation under the globalization flagship is more than a necessity. Nevertheless, the outbreak of the COVID 19 poses challenges issues related to the efficiency of the international supply chain as strategy of the nations' interconnection and a way to boost simultaneously their economic and social welfare. In this paper, we present a mathematical model in which we demonstrate that COVID-19 spread has negative spillovers on the aggregate investment, labor productivity and global supply chain. The model proves that the spread magnitude of COVID-19 exercises harmful effects on the investment capacity of the facilities and the propensity of the labor productivity.

Keywords: COVID-19, Globalization, Investment, Labor Productivity, International Supply Chain.

JEL Classification Codes : I 150, F 600, F21, F42, F44

ملخص:

إن زيادة التخصص في الإنتاج بين الدول يجعل سلسلة التوريد على المستوى الدولي أكثر تعقيداً وترابطاً خصوصاً من حيث التصنيع واللوجستيات والتسليم. في هذا السياق، فإن تنظيم سلاسل التوريد وفقاً للمزايا التي توفرها كل دولة تحت ريادة العولمة هي أكثر من ضرورة. ومع ذلك، فإن ظهور COVID 19 يطرح تحديات تتعلق بكفاءة سلسلة التوريد الدولية كاستراتيجية للترابط بين الدول ووسيلة لتعزيز رفاهيتها الاقتصادية والاجتماعية في وقت واحد. في هذه الورقة، نقدم نموذجاً رياضياً نوضح فيه أن انتشار COVID-19 له تداعيات سلبية على الاستثمار الكلي وإنتاجية العمالة وسلسلة التوريد العالمية. يثبت النموذج أن انتشار COVID-19 له آثار ضارة على القدرة الاستثمارية للمنشآت وميل إنتاجية العمالة على المستوى الدولي.

كلمات مفتاحية: كوفيد 19 ، العولمة ، الاستثمار ، إنتاجية العمالة ، سلسلة التوريد الدولية

تصنيفات JEL : I150 ، F600 ، F21 ، F42 ، F44

INTRODUCTION:

The COVID 19 had changed the international business landscape both in demand and supply sides. This fact is due to the restrictions applied by the governments on the movements of people and products across nations. As a consequence, each nation confronts serious challenging issues in logistics, manufacturing and delivery processes and tries according to this to mould its supply chain in convenience with the pandemic outbreak situation. Unlike the historic pandemics that swept the world like H1N1 (1918), H2N2 (1957), H3N2 (1968), H1N1 (2009), COVID 19 is totally different as it had devastating impacts on the economic and social sides alike (Abhijit , Rudi, & Pijus , 2021, pp. 4-5). Indeed, the supply chain was the subject of the impact of the financial crisis of 2008-2009 but less hard than the COVID 19 impacts as this pandemic affects harshly both the demand the supply sides (Goel, Saunoris , & Goel , 2021, pp. 307-308-309). In this context, most manufacturing firms face hardships in items productions and big fluctuations in production, logistics and delivery. As an example and after the outbreak of the pandemic, the demand of the facemasks had increased dramatically; the fact that led to emptying the facemask stocks and a strong thrash between firms to increase production in order to fulfill the exponential demands (Stevano, Tobias, Yannis , & Elisa , 2021, pp. 8-9-10). The impacts of COVID 19 on the supply chain are twice: operational impacts and disruptions ones. The former means the disturbances and troubles in daily operations of logistics, delivery and demands while the second impacts denote the major interruptions and disruptions caused by stringent low demand, frequent high fluctuations in prices and troubles in procurements. In this paper, we try to analyze the impact of the COVID-19 pandemic on the ongoing process of the global supply chains in terms of both stability and disruption by asking the following question:

- The Research Issue:

How does the COVID-19 pandemic affect the process of the global supply chain? Under this question, two basic hypotheses are envisaged according to the trend of the supply chain

- The Hypotheses:

- COVID-19 led to an increasing trend of the global supply chain stabilization
- COVID-19 led to an increasing trend of the global supply chain disruption

To come up with the above question, we examine a mathematical model of the pandemic in which we try to highlight the trend of the supply chain according to three basic considerations: The economic agent preference consideration, the production consideration, the investment, and the uncertainty consideration. These three considerations are reshaped both micro-economically and macro-economically by the spillovers of COVID-19.

1- COVID 19 and the New Shape of Globalization:

COVID 19 had resulted in deep changes in relationships between countries and brought clear premises of post- Corona world characteristics. This fact is shaped by the repercussions of the epidemic and the exacerbation of the difference factors as well as the disparity of both the countries and the organizations' positions (Marisa, 2020, pp. 1709-1710-1711). In this regard, some tend to envision a disjoint and a disturbed globalization as a new wave of protectionism to get the necessary balance of the global power in terms of the structural and

the institutional roles of the global powers ((Elaine & Avril , 2020, pp. 7-8-9-10) (Jianfa , 2021, pp. 7-8-9). In this context, The Corona epidemic is considered the most serious real crisis of the twenty-first century. The question arises about the possible change in the distribution of global powers because of this crisis. In light of this fact, the impact of the epidemic is comparable to that of any of the two world wars, but it is clear that a global crisis of this magnitude leads to a serious geopolitical shocks (Susan, 2020, pp. 154-155). America will maintain its position as a superpower at the top of the world order, while much evidence reveals that China as an emerging dominating superpower. There is no doubt that this competition which defines the features of hegemony in the twenty-first century, began long before the outbreak of the epidemic (Zhaohui & Zhiqiang , 2021, pp. 70-71-72). However, the outbreak of the epidemic, along with the US elections and their results may deepen and accelerate the clash. It is interesting to note that most of President Trump's policies led to a split in American society, but his aggressive stance towards China was an exception, with broad support from partisans. However, the Trump administration's repeated efforts to abdicate the role of global leadership raise questions about what the United States wants (Ionut , 2021, pp. 6-7-8). Under the president, the United States is mired in short-term thinking of Leading Without Responsibility (LWR). Meanwhile, China is establishing itself as an alternative reference for a global leadership and investment, and is working diligently to follow a long-term strategy to exploit the geopolitical void left by America's internal retreat ((Huiyao & Lu , 2020, pp. 225-226). The pandemic has exposed an overall impression of the US image as a declining superpower, soon to be replaced by a skilled, strategic and economically dynamic China. Currently, the virus is writing the ancient story of the rise and fall of superpowers (Justin , 2020, pp. 329-330). With the Corona epidemic, a tug of war is taking place between two competing stories about the ongoing battle, the dominance of one of the two scenarios will have it, despite the urgency of dealing with the epidemic / world governance (Paramjit , 2020, pp. 641-642). The first scenario is straightforward: the global health crisis showed the need for pluralism, and the bankruptcy of each country's way of working on its own (increasing patriotism and isolationism). It also adopts the second scenario: Globalization and opening borders weaken countries to viruses and other threats, in contrast. Current efforts to control supply channels and medical care devices require each country to take care of its own affairs. The first is that, in order to overcome common threats, countries should work together; the epidemic is a proof of the necessity while proponents of the second view believe that every country will be safe when it is self-reliant (Moon, Soo Yeon, & Samuel, 2021, pp. 289-290-291). At first glance, the coronavirus appears to support the need for coordinated global action as long as the virus does not stop at these borders. There is no doubt that there is a strong reason not to be reacting exclusively to countries, the expansion of cooperation for testing, discovery and production of treatment, immunization and regulation, from the point of view of public health travel, will help a safe exit from the crisis (Jongeun , 2021, pp. 17-18). The epidemic may also raise the call for joint efforts to end bloodshed not only to protect the local population from the dangers of epidemic and fighting. However, there are also reasons whether from economic guidance or from helping the hardest-hit countries globally that require cooperation, or from the global economic recession per se (Takuma , 2020, pp. 53-54-55). In addition to this, the epidemic may strengthen the opposite argument. Crises lead to entrenchment and perhaps acceleration of the

rise of populism and the opposition of advocates to “dismiss the prevailing trends” before it ((Manuela & Paolo, 2019, pp. 1152-1153). The Corona epidemic increases globalization and the international system produced by World War II. The Intensification of the opposition exacerbates the problem of inequality between countries and within each country. The picture of the future might look like this: in the coming months and years, pressing domestic needs will make global solidarity an impossible luxury. As the country declines economically, the government's efforts will focus on meeting the needs of its citizens or it will be difficult for political leaders to justify the provision of development aid diplomatic initiatives. Dissatisfaction at home will turn into anger and disappointment in the world order. It also appears that what remains of the allegations of US killings have harmed the global leadership, and had it continued to manage the pandemic crisis, it would have been unable to protect itself or others. Undoubtedly, China has shown signs of failure, but it may also find itself, without leadership, prompting it to fill a void, with generosity in dealing with the epidemic and economic decline. Will a better and stronger world order ever emerge? One may begin to envision that the coming years will be better than the previous ones. In 1945, the system that arose was needed to create a new, more sustainable system to deal with the growing interest in equality, and which would allow nations to make their voices heard. The Corona epidemic has exposed the cost of confronting a global crisis in a global system that will be flawed. The worst result is that we face the next crisis without any system at all ((Caro , 2021, pp. 120-121-122). The Corona epidemic has put globalization to a severe test. With critical supply chains disrupted, medical supplies hoarded, and countries rushing to restrict travel, the crisis has required a fundamental reassessment of the intertwining of the global economy ((Jeffrey , 2021, pp. 771-772) (Caron, 2021, pp. 245-246-247). Globalization has not only allowed the rapid spread of infectious disease, but it has also reinforced the interdependence between companies and countries, which has exposed them to unexpected shocks. Now companies and countries have realized how weak they are. But the lesson from the pandemic is not that globalization is “failed” but rather that it is “fragile,” despite its benefits, perhaps even because of it (Fabio , 2021, pp. 227-228). The ultimate advantage of globalization is that it helps manufacturers build resilient supply chains by creating a thriving global market by substituting one supplier or one product with another when needed. Business has benefited from the globalization of the division of labor, and specialization has led to increased efficiency, which in turn has led to growth. However, globalization has also created a complex system of overlap (Have & Bert , 2021, pp. 153-154).

From a global network, national economies have become part of the procurements. However, the Corona epidemic exposed the fragility of the globalization system for some marginal sectors or whose production is distributed between; while other sectors have come close to the brink of bankruptcy due to a deficit (Yifan & Xuechen , 2021, pp. 91-92-93). Indeed, a number of countries have bypassed the crisis. One of the two input suppliers in one country can meet the crisis. In the past, the inventory and the final goods did the job. In the midst of the Corona crisis, the disintegration of the supply chain resulted in a drop in global production of laptop computers by 50% in the last quarter of 2020, and smartphones regressed by 12% in the last quarter of 2020 ((Bhaskar , Susmita, Raktim , & Dhurbaranjana, 2020, pp. 118-119). The crisis will have the most severe impact on the products needed to address the crisis, such

as medical inputs for the manufacture of test devices, masks, and others. The supply crisis will worsen and the normal international exchange of these products and their components will be interrupted. While the administration of US President Trump used the conditions of the epidemic to retreat from the integration that characterized globalization, China is working to exploit the crisis to show its willingness to lead. After suffering greatly during the first months of the virus' emergence, China began to recover at a time when the epidemic spread quickly and violently in most countries of the world. This put the Chinese industry in front of a problem because of the low demand for its products from countries that are still suffering from the crisis (Walter , 2021, pp. 123-124).

The Corona epidemic is an excuse for those who already prefer domestic production over global trade. The outbreak of the epidemic encouraged protectionists and de-globalization. Known concern about industrial job losses, increasing inequality, or the desire in some circles to punish China (the peg) through distributive tariffs, this view has fueled protest against global supply chains (Rajesh & Kliem , 2021, pp. 6-7-8). According to the high volume of production made economies less self-sufficient, and therefore less resilient. The solution becomes, in the future, restoring existing business activities inward, reducing outside activity completely, but skeptical about it, and reducing dependence on trade in general. This perception is not new. Trade. They may say that the epidemic crisis has revealed the vulnerability of supply chains to export restrictions and external shocks. Many countries, including members of the European Union, initially imposed restrictions on exports of personal protection devices, such as facemasks, depriving importing countries of their needs of these tools. The second argument focuses on a specific feature of contemporary commerce: the super-specialization of production and distribution chains that extend across multiple countries (Caro , 2021, pp. 126-127). However, proponents of globalization consider these challenges as evidence that global coordination and cooperation are more beneficial than ever before. Having multiple sources spread across countries increases flexibility, and ensures that one source in the chain replaces one if problems can be avoided, another if one does (Manu (Manuela & Paolo, 2019, pp. 1147-1148). Opponents raise a totally counter-coordination view if the ventilator supply chain were local. In fact, when all countries experience a shock, local supply chains are only stronger under one unexpected scenario. Crisis management and increasing resilience does not lie in the trade-off between “global” and “local”, and diversification - whether or not - is the title of the basic principle in risk management (Fabio , 2021, pp. 249-250-251). Distributing production globally does not only raise efficiency from the critics' point of view - by giving up an obsession - but also represents a good risk management. This spends efficiency and profit in the short term. A degree of 'inefficiency' may for a time confirm its necessity to save or operate hospitals in the future. Acceptance of an increase in surplus, such as a number of expatriates, could have avoided bottlenecks during the current crisis. The pandemic crisis offers lessons, but it has not bolstered important global supply arguments, the mask manufacturer or strong chains against traders or the international supply chains ((Elaine & Avril , 2020, pp. 9-10).

2- COVID 19 and the Globalization Crashes:

The Corona epidemic crisis revealed flaws in the structure and mechanisms of globalization, especially in its economic axis. Opinion parties are attracted between the

possibility of bridging the rift and maintaining globalization (the first scenario) and between nations, in the wall of the global system, the expansion of evil here in front of another globalization (the second scenario). There are four open challenges, the solution of which depends on further disintegration or repair of the rift in the global system (Bernadette & Runya , 2021, pp. 311-312-313).

The role and shape of the state: Since the beginning of the outbreak of the Corona epidemic, expectations have shifted towards the shape of society and the state that this unprecedented crisis will result in. Under the impact of the shock drag people wait for the reduction and exclusion of risk and many see the advantage of state (government) intervention to achieve this, whether by stimulating demand (pumping resources through the budget, and other sources), protecting workers, expanding health care programs, and so on. The Corona crisis is being reversed. Some see that one has the effect of restoring the national state's strength and influence as a major actor in internal and external interactions. From this point of view, the mechanism does not have a role, but rather it should have a role in the field of neoliberal theory. The state is considered a guardian according to economic and production. The gaps in the health systems in the developed world show the extent to which they are related to the adoption of the concept and policies of the neoliberal state, which seeks to limit its functions to the narrowest limits and abandon 2020, even protection, care, comprehensive health insurance, and so on (Muhammad). There is not much difference with the government,” as he sees that one of them relates to the so-called “re-selection,” from these conclusions from the impact of the epidemic, as the crisis showed the need to modernize the state’s governmental and bureaucratic institutions, and that there are problems that are resolved through the market forces ((Jianfa , 2021, pp. 8-9).

The second of these challenges lies in the institutions and leadership of the international system. There is no doubt that the economic system, in the aftermath of the Cold War, benefited a few countries at the expense of many. Likewise, the world, with the United Nations becoming like a relic, favors the victors in a war that ended long ago, denies the effective participant to young states that have gained their independence, and reflects an outdated balance of power within the establishment of this international organization. In parallel, in 2008, especially since the global financial crisis, dissatisfaction has led to an increase in populism, national chauvinism, and authoritarianism across the continents ((Marisa, 2020, pp. 1747-1748-1749).

With the outbreak of the Corona epidemic, it became clear to them that the international organizations that struggled all over the world. The failure of the five members to face its permanent repercussions in the UN Security Council has lost some of its relevance and usefulness in convening a virtual summit to coordinate efforts to confront the virus. Neither the Group of Twenty nor the Group of Seven were able to take any decision on the return of global economic activity. Perhaps the strangest thing was the position of the World Health Organization and its slow, hesitant and perhaps biased response, while it is the organization that is entrusted with the leadership of the international community in such crises. Rejecting it is not correct for the lack of its resources and news, and for the weakness and impotence of international institutions. The main reason for this problem lies in the failure of the major global powers and the failure of the major world powers, especially the loyalty of this

problem. The failure of global cooperation in addressing the investment in support of the multi-framework system efficiently, united to the virus does not mean throwing the institutions of the international system into the sandbox of history!! Or write it off as a key player in the face of the current crisis. And if America and China do not rush to take the leading role, he advises Like the European Union, others necessarily provide frameworks for some, B and the countries of democratic Asia, to bear the burden of renewing and developing the bodies of the international system. The spread of the epidemic has been linked to fueling patriotism and xenophobia to the international institutions, which confirms the world's need now more efficiently than at any other time, and protectionism ((Luis, Martinez, Sedas, Orcutt, & Bhopal, 2020, pp. 1-2).

As for the third of these challenges is evident in supply chains. International trade and investment are now moving through networks that divide production into steps and stages that take place in different countries. Firms exchange inputs and products across borders through highly complex supply chains. These chains expanded 80% of some industries, and by 2017, to the extent that it became about two-thirds of the global trade volume in manufacturing, through them. As a result of the spread of the Corona epidemic, international merchandise trade is expected to deteriorate within %. The worst is that the epidemic has paralyzed manufacturing networks, 32-13 percent of the total industry in the world and supply chains - especially in China, which is producing after the damage and economic imbalances caused by the Corona epidemic. The leaders of foreign business owners have begun to re-evaluate the extent to which their companies depend on one company, and to examine how to mitigate and reduce strategic vulnerabilities. There have been mounting calls from political leaders in rich countries for a radical transformation of production structures and trade policies. It goes without saying that international trade has brought many benefits to the global economy, especially for developed countries. But in light of the current difficult reality, M sees some, such as, that the slicing of global value chains and placing restrictions on the movement of trade and investment The narrow nationalism, with its implications, whose implementation leads to a return to the worst forms of protection, are negative thoughts on global well-being, peace, and peace. Developed countries may have some right to be concerned after they are decided. The spread of the epidemic made it very dependent, perhaps only on China or another country. However, the solution will not be by disassembling the chains and blocking ((Alam , Sayem , Syed , & Wayeyenberge, 2021, pp. 2-3-4).

As for the fourth and final challenge, it lies in the greater suffering of the developing countries. It spreads from a country not to borders between countries nor could it be possible to contain the economic effects of the emerging virus from the outset, but it was a global concern that the Corona epidemic was a global problem that required a solution. It was clear the global position determined by self-interest. The impact of the epidemic is unfolding in developing and emerging countries. There are obvious reasons to believe that its suffering from the epidemic will be more severe than that of developed countries. After all, people in low-income countries are forced to live close together, a large proportion of the population suffers from health problems that reduce their resistance to disease, and health problems in these countries are less prepared. As well as to deal with such emergency crises from their counterparts in the developed countries, which in turn were unable to work efficiently.

3- The Model:

The model comprises two countries with periods and two kinds of goods. We assume that the producer exploits the full endowment to start the production process and uses the factors of production to create a stable production capacity over the periods. Consider that the first period (t_1) is the period before the pandemic and the second period (t_2) is the period after. The following preference model represents the utility of the economic agent during this period:

- The Preference Model:

$U_t = Y_1 + \frac{P_2 + W(L)}{1 + \rho}$ Where U_t is the Utility Function, Y_1 is the goods consumption at the first period (the consumed goods generated by the first period production), $W(L)$ is the labor function exploited during the period $t_1 \rightarrow t_2$ and it is considered as the disutility of labor at the second period, L represents labor in which $L' \leq 0$, $L'' \leq 0$. The Utility preference of the goods' consumption at the second period (after the pandemic) is given by:

$P_2 = \left[\sum_{i=1}^d (P_{2,i})^\alpha \right]^{1/\alpha}$, $0 < \alpha < 1$, which means that the utility function has a decreasing trend as a consequence of the COVID-19 disruptive reflects.

- The Production Model:

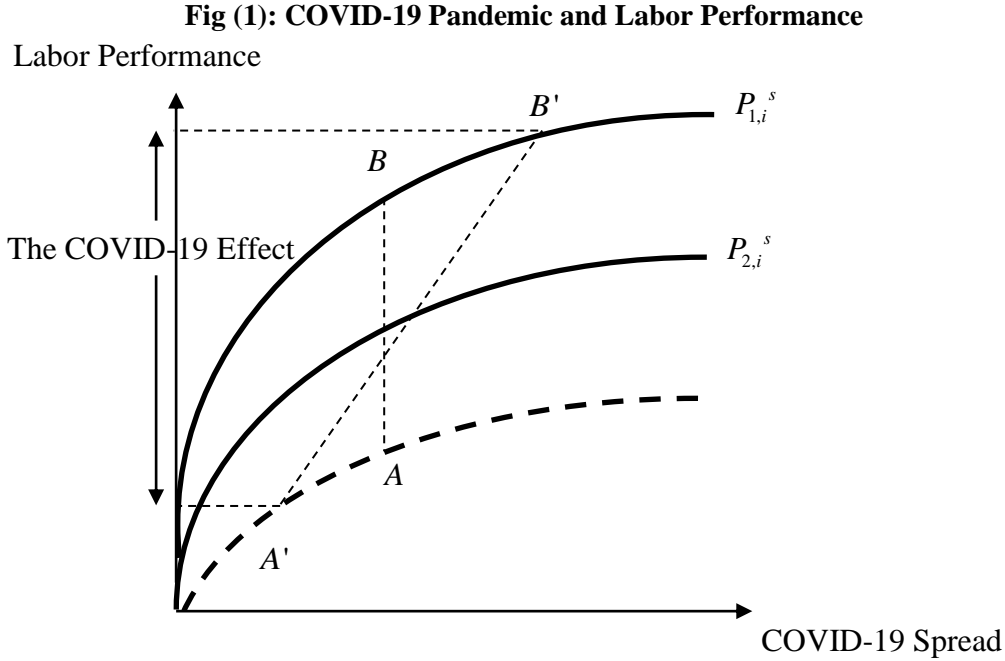
The production models of the different productions facilities before and after the pandemic undertake the Cobb-Douglas model conditions as follow:

$P_{2,i}^s = \frac{1}{a}(L)^\gamma$, $P_{2,i}^{s*} = \frac{1}{a^*}(L^*)^\gamma$, $0 < \gamma < 1$ and S , S^* denote the home and the foreign facility respectively. The function utility at the second period is decreasing because the decrease in the labor performance during the period of study (before and after the pandemic). This is due to the negative spillovers of COVID-19 on the production facility performance. This fact generates a failure in work supply chain at the short period; it is exacerbated by the magnitude of the pandemic at both the scale, and the scope levels.

- The Investment and the Uncertainty Model:

In order to diversify their exposure to country-specific shocks, producers may decide to operate as multinationals producing in various countries. Returns to scale can exist as long as several plants share some fixed inputs—and hence the capacity cost of two plants is less than twice that of one plant. Even if producers are risk-neutral, the diversification process will function as long as a variable input is employed in the near run and the correlation between shocks affecting two countries is less than unity. This idea is shown in the following figure, which depicts a multinational's production function using labor as a variable input. Assume that there are two alternative natural states, h and l, which are linked to high and low performance, respectively. $P_{1,i}^s$ and $P_{2,i}^s$ are the related production functions. In the absence of a variable input, the production process collapses into points A and B in the short run. Assume that the correlation between productivity shocks in the two countries is negative and that the chance of each shock occurring is one-half. A multinational that invests in both nations will produce twice. In this tense situation, the multinational increases predicted output

per facility by diversifying worldwide. Diversification, on the other hand, stabilizes output at the expense of increasing the producer's productive potential.



The investment is both locations and product specific, enabling for the manufacture of the differentiated product i at the designated location. An entrepreneur can invest in one of the two countries for K . Alternative entrepreneurs can diversify their producing capacity by investing at home and abroad at a cost of $K(1+q)$, for q diversified producer operates as a multinational corporation with production capacity in both countries. Entrepreneurs are risk averse, and there is no barrier to entrance. The uncertainty relates to future labor productivity and COVID-19 disruptions in each economy. All agents know the symmetric joint distribution of shocks in period 1. Prior to the resolution of the uncertainty, investment is made in period 1. The characteristics of a non-diversified equilibrium, where all producers are specialized in one area, include:

$$E[\pi^{nd}] = K(1+q)$$

$$E[\pi^{nd}] < K(1+q)(1+\eta)$$

Where E is the expectations operator relating to the projected amount of second-period earnings in the first period. The free entry, meaning the break-even condition, is affected by the degree of COVID-19 pandemic spread, which indicates that the marginal producer has no incentive to diversify globally and increase the level of global supply chain. Integrating the two requirements, one can assume that the non-diversified equilibrium between the spread degree of COVID-19 and the performance level of the global supply chain is stable if and only if:

$$\frac{E[\pi^d] - E[\pi^{nd}]}{E[\pi^{nd}]} < \eta$$

This condition implies that the (percentage) benefit from diversification under the growing spread size of COVID-19 falls short of the percentage rise in costs, implying that the crowding effect between the diversification process and the spread magnitude of COVID-19 is guaranteed. Using the same approach, the diversified equilibrium is defined as:

$$E[\pi^d] = K(1+q)(1+\eta)$$

$$E[\pi^{nd}] < K(1+q) \text{ or}$$

$$\frac{E[\pi^d] - E[\pi^{nd}]}{E[\pi^{nd}]} > \eta$$

4- The Equilibrium between the COVID-19 Spread Magnitude and the Global Supply Chain Stability:

Focusing on the simplest stochastic scenario yields more insight: two states of nature with a negative correlation between domestic and international COVID-19 shocks. A study of the extreme instances, when all shocks are either real or nominal, simplifies the explanation. These two extreme situations are examined:

- COVID-19 and Investment Performance Shock:

Assuming that nexus COVID-19-Investment shocks causes volatility, consider the following:

$$\left(\frac{1}{a}, \frac{1}{a^*}\right) = \begin{cases} (1+l, 1-l) \\ or \\ (1-l, 1+l) \end{cases} / 0 < l < 1, l : \text{The marginal productivity of labor.}$$

In the non-diversified regime under the spread of COVID-19, aggregate investment and aggregate employment are represented by:

$$AI_{|Covid,R,N} = \left[\frac{(1/2)(1-\alpha\gamma)(2l)^\gamma}{1+\rho} \right]^{\alpha/[\alpha(1+\gamma)-1]} \cdot \left[\frac{(1+l)^{\alpha/(1-\alpha\gamma)} + (1-l)^{\alpha/(1-\alpha\gamma)}}{K} \right]^{(1-\alpha\gamma)/[\alpha(1+\gamma)-1]} /$$

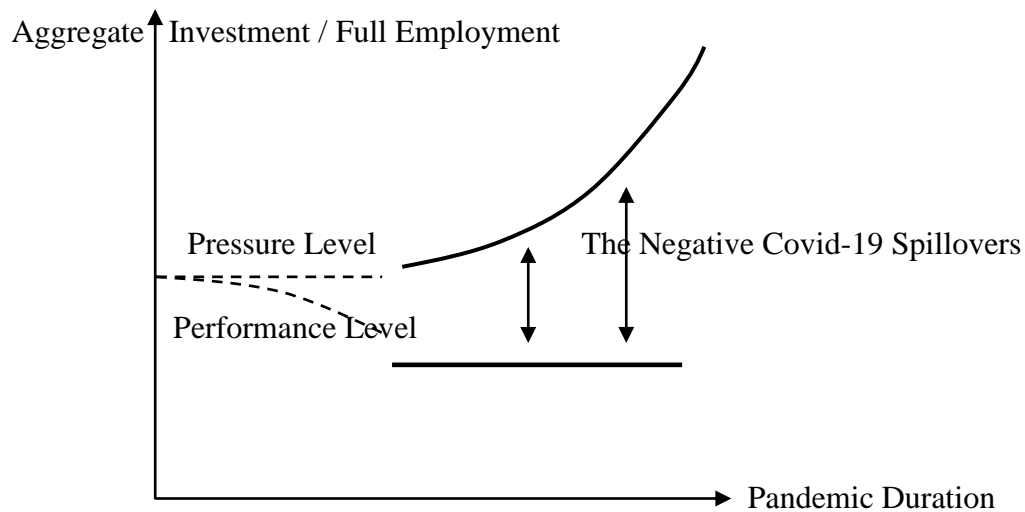
$AI_{|Covid,R,N}$ is the Aggregate Investment under the COVID-19 spread, Real Shocks and Non-diversified production facilities. The above equilibrium equation indicates clearly that COVID-19 exercises a negative impact on the marginal labor productivity, which affects in its turn the propensity to diversify the production facility and reduces the capacity to absorb negative spillovers of COVID-19 on the supply chains.

On the other, the equilibrium position of the full employment is given by:

$$L_{2|Covid,R,N}^P = 2l \left(\frac{1}{a}\right)^{\alpha[1-\alpha\gamma]} \cdot \left[(1-l)^{\alpha/[1-\alpha\gamma]} + (1+l)^{\alpha/[1-\alpha\gamma]} \right]^{-1}$$

This employment equilibrium position indicates that the spread of COVID-19 diminishes the propensity of the labor productivity, the fact that leads to decrease the investment performance and its capacity to absorb the negative spillovers of COVID-19. The process of COVID-19 negative pressure is highlighted in the following exhibit:

Fig (2): COVID-19 Pandemic Negative Pressure



Source: Adapted by the researchers

The above figure demonstrates clearly that the level of the pandemic spread has negative pressure on the productivity and the labor efficiency. This situation is exacerbated by the lack to absorb these spillovers as a counteract strategy in an attempt to create a level of flexibility able to reduce the impacts of the negative COVID-19 spillovers.

Conclusion:

The COVID 19 pandemic is a challenging issue that posed the world in a strong fatality to understand the global driving forces differently. This is because of the hard sweeping effects of this pandemic on the economic and societal tissue of the countries and the cooperation as well as the competition between them. This study demonstrates clearly that the COVID-19 affects negatively the investment process performance and the labor productivity. This fact results in reducing the capacity of the facilities and the global supply chain to absorb the increasing level of the disruptions caused by the pandemic. As A result, COVID 19 makes changes at micro and macro levels of the countries and what matters now is to find the suitable international strategy to increase the cooperation in an attempt to get out of this fatal void.

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