Globalization, diversification and COVID-19

Our economic and financial systems are not built to deal with correlation. That was a problem for the 2008-09 financial crisis, but it's even more of a problem with COVID-19. How might we plan better this time around?

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It's been a little more than 10 years since the financial crisis, and the world is suffering

another severe crisis. While very different, there are some common aspects to these crises. In this brief article, we shall focus on the common aspects and crucial differences from the perspective of global networks.

The financial and economic crisis of 2008-09 originated in the United States, then the world's largest economy (measured in terms of purchasing power parity), and repercussions were felt around the globe. Similarly, the present crisis originated in what is currently the largest economy (again, in PPP terms), China, and it has spread to every corner of the world. The former crisis originated in the financial sector and was diffused throughout the broader economy, while the present one is primarily a health crisis with profound economic implications. What, then, is the common aspect? In one word: correlation.

A key aspect of the financial crisis was the mispricing of mortgage-backed securities (henceforth MBS) which led to massive originations of mortgages and contributed to the sharp increase in house prices prior to the crash. What went wrong? Essentially, a misunderstanding that geographic diversification of the mortgages pooled into MBS would protect their senior tranches from default. The idea was that a default on a mortgage in Ohio would not impact the likelihood of a default on a mortgage in California. In formal language, the defaults in California are independent of those in Ohio. However, this argument overlooked a common risk factor to all U.S. mortgages: national house prices. If house prices declined in a correlated fashion nationwide, then this would lead to correlated default probabilities -- i.e., the case in which a default in Ohio makes a default in California more likely. As we know, house prices *did* decline nationwide, mortgages defaulted nationwide, and this triggered the financial crisis.

Similarly, today we are witnessing correlation, albeit of a different kind. In 2019 we would have estimated the probability of national lockdown in Spain due to a respiratory disease as extremely low. However, this changed in January. The probability of a national lockdown in Spain increased sharply, conditional on the lockdown in China. As the disease was already widespread in China by then, it was almost certain that it would spread around the world. On average, Chinese nationals make more than 12 million trips outside of China every month, and it only takes one infected traveler for COVID-19 to take root beyond the Chinese borders.

On spillover effects

While both crises are examples of the international diffusion of a country-specific shock, there are important differences. Global connections take many forms and can be represented by many networks. For our case, consider the trade network among countries, the network of

ownership of financial assets by financial institutions, and the travel network. In 2009 the initial shock was to U.S. house prices and, by extension, to MBS. All countries whose financial institutions were directly exposed to the U.S. housing sector or MBS were subject to the initial shock. However, this set of countries was smaller than those subject to the secondary shock which impacted the trade network. So, the crisis spilled over from U.S. financial institutions to the real economy, from there to U.S. trading partners, and finally to the whole world via reduced demand for foreign (and domestic) goods and services. Thus the initial shock was severe only for a small number of countries, albeit economically important ones. What prevented an even worse crisis 10 years ago was the lack of global connectivity in the asset-ownership network. In particular, Chinese financial institutions were not exposed to MBS. Thus China was not subject to the initial shock and then only suffered reduced external demand, which could be offset by aggressive monetary and fiscal measures to stimulate internal demand. In 2009, world real GDP (including China) contracted by more than 1%, while Chinese real GDP grew by more than 9%. Thus, while the U.S. was subject to a negative shock, China partially offset this via its stimulus measures which, in turn, had a positive impact on the global trade network.

This time around, the situation is worse, unfortunately. The initial shock impacted human beings directly and the virus is transmitted via human interaction. China is very integrated in the international travel network, having the most outbound travel departures of any country in the world. This means that every country is subjected to the initial shock, unless, of course, extreme measures were taken to change the travel network and close borders as early as January. The correlation of the initial shocks across countries implies that no country will be able to balance or offset the initial shock's negative consequences nor those of the resulting national lockdowns. By now it is clear that 2020 will be far worse than 2009 as measured by the GDP growth rate.

So what can we learn? Our economic and financial systems are not built to deal with correlation. Beyond the macro argument above, we also suffered massive correlation at the level of specific markets, for example the market for N95 masks. Absent a strongly correlated shock, global market demand is the aggregate of individual demands from across the world, which are indeed independent. This implies that market demand moves slowly, preventing shortages. However, in this case, we had demand for N95 masks explode everywhere, way beyond production capacity at 2019 prices. Demand surged in all countries... And supply? One feature of globalization is specialization and the concentration of production in certain countries, in many cases China. The production of face masks, for example, is concentrated in China: it has an estimated 50% to 90% of world production. In a deterministic world, even

90% would be fine: China is the most efficient producer of masks, hence it should produce them. But the world is not deterministic, so any country-specific shock to China could disrupt the global mask market. Thus, diversifying a substantial portion of mask production across several countries, in order to absorb potential country-specific shocks, would seem prudent. However, in the case of a correlated shock, as we are currently suffering, diversification alone is not sufficient because all countries would be subject to the same shock.

Theoretically, the combination of having the production of an essential good concentrated in one country together with having a global surge in demand for that essential good seems far from optimal for the following reason: Trade is regulated by national governments that are responsible for, and held accountable by, their own constituents, not the world population. In an emergency, every country tends to prioritize local over foreign demand, disrupting the price mechanism and resulting in dramatic shortages in the world market. This time, the concentration of mask production did not turn into a severe issue simply because China expanded capacity very quickly. According to the Chinese government, the daily output of N95 masks increased from 130,000 in early February to over 5 million by the end of April. Nevertheless, in the current climate of increasing geopolitical tension, one can argue in favor of diversifying production beyond China both from a firm and a macroeconomic perspective. Based on recent experiences, countries might even be tempted to move production of some essential goods back within their own borders. At least, national emergency plans should include the conversion of existing plants to produce essential goods if needed.