**The World Covid-19 Atlas: Predictability and the Economic Impacts**

**Prof Dr. Tolga Omay**

Atılım University

Ankara

Welcome dear participants. I am an econometrics professor at Atilim University, Department of Economics. My fields of study Non-linear econometrics and applications to the economy. In this sense, I develop various nonlinear unit root, cointegration, nonlinear and panel estimators and prediction models. In this study, I will explain the predictions of Corona virus on the World map by using a nonlinear forecast model which is proposed with my colliques.

**Abstract**

In this presentation, I will talk about the results of the new forecasting model which we developed for outbreak model namely Corona virus (Covid-19) and the early signals of the economic crises in the process of the Corona virus. As it is known, Corona virus spread and early predictions of this spread are important for health, economy and other strategic sectors to produce early policies to recover the negative effects of this pandemy.

**Slayt 1**

Now in this slayt we have shown the epidemic models, The methodology that we employ allows us to estimate both the peak number of total infected people and its timing at an early stage to overcome this pandemic with relatively less harm.

In this model, we are using a logistic smooth transition (LST) function in which the state variable is time. This logistic smooth transition trend (LSTT) is a well-behaved function. The function is characterized by a transition speed parameter gamma () and threshold variable (). These nonlinear parameters shape the structure of the logistic function. In an epidemic the number of infected people first increases at an increasing rate and then increases at a decreasing rate, reaches a maximum and then starts to decrease slowly over time.

This methodology allows us to estimate when and where the number of people infected will arrive at a peak, which is not possible with the traditional methods. Moreover, we have given the exact day of convergence to peak infected person by using the transition speed parameter or the slope of the logistic function. Therefore, we visualize the parameters’ all over the world to summarize the countries behaviours in the outbreak period.

**Slayt 2**

As can be seen from the map, the speed of transition increase as the blue tones, that is, the number of days when the epidemic started to accelerate, and the number of days increases as the red spectra is used.

Although it is thought in the first place that getting a blue color (ending the epidemic in the early period) is a good situation, it is seen from the World map that the outbreak in Africa and the Middle East has just begun or measures are being taken recently due to the high transition rate parameter in the proposed model. Looking at the map, Egypt, Saudi Arabia and Iran appear in dark red. What this situation shows us is that the epidemic of the countries that have taken measures in Africa and the Middle East will be long. In this sense, WHO must prepare an emergency action plan for these regions. The regions in orange and yellow tones show the developed and developing countries. In this sense, it seems that they will reach the peak day between 50-70 days from the first day of the average **outbreak**. In addition, it is seen that developed countries such as Sweden, which support herd immunity, and Afghanistan and some Turkic Republics that have not completed their technological and institutional evolution, will undergo a problematic epidemic in the Asian region. It is anticipated that WHO and the countries of the region will plan emergency action in these regions, otherwise the spread of the poor management of the epidemic in the second wave style cannot be prevented.

**Slayt 3**

As mentioned previous slayt, the prediction of the threshold model with the proposed model also shows which country started the process earlier. As can be seen from the world map, China and South Korea are seen in the dark red color as the earliest countries to start the process.

**Slayt 4**

Now we see the potential peak day estimate in this slayt. The blue spectrum indicates that the peak number of cases will be high, while red indicates that the numbers will be low. As can be seen in the yellow and above countries, the developed and developing population density is high in the Northern hemisphere. Besides, in a remarkable example, the southern hemisphere country is Brazil. While the outbreak will not be expected to spread due to temperature in the Southern hemisphere compared to the Northern hemisphere, serious numbers of cases have already been reached in Brazil. This slayt prepared with the data of May 2020, hence, the model prediction has shown the prevailing conditions several months ago about the Brazil.

**Slayt 5**

And this slayt or world map is showing the variance of the proposed model. The high variance is estimated from the early begginers and small variance obtained from late begginers of the epidemic process.

**Slayt 6**

Now As seen in this caricature, the wave of economic crisis will come behind the first wave. If the second wave of epidemics comes, the economic crisis wave will grow even more. This cartoon is summarized the process very well.

Now we can start to talk about the economic impacts of this corona virus. Before the corona virus pandemic begins, the leading indicators of the economy will be addressed an oncoming demand-oriented economic crisis. In the second round of the presentation this demand oriented economic crises will be discussed. Along with the start of the corona virus and measures taken all around the world, it will be discussed how the demand-oriented crisis turned into a supply-side crisis with the measures such as stay at home, lock-down and so on. Factors that deepen the effects of the supply-side economic crisis will be discussed, as well. More over the changes in some financial variables in the Corona virus period will be visualized with the help of the World map. So these maps shows the source of crises and consequences of the crises.

One of the important actions taken now by all countries around the world to fight the pandemic is social distancing. Social distancing directly affects the labour market and thereby has a profound effect on the supply side of the markets. According to Bloomberg, unfortunately the recent month witnessed historic declines as the global economy slowed. These negative supply side effects are causing the supply chains to collapse. To prevent these severe economic effects from turning into a great depression, countries are trying to lift pandemic related restrictions in a controlled way.

**Slayt 8**

There are some early indicators of the demand side economic crises. I want to give these indicators without making detailed comment. Term structure of interest rate is one of the leading indicators. When the Term structure of interest rate is inverted this is the signal of the demand side economic crises. The shaded areas correctly predicts the recession using inverted yield curve methodology. In this figure we are seeing that delayed Crises of 2020 due to Covid-19 at the end of the figure.

**Slayt 9**

In the similar vein Gold Dolar negative correlation is also indicating the demand side economic crises.

**Slayt 10**

Now we can visualize the financial sources of the economic crises with this first slayt. World dept stock before starting the Covid—19 epidemics. As it can be seen the developed countries have more dept stock than the rest of the world. High amount of dept stock leads to more deeping of the economic crises. In this sense the developed countries have serious problem recovering the effects of the economic problems.

**Slayt 11**

In this slayt the Red colour shows the negative difference or a decline in real exchange rate and blue colours indicate the positive difference or increase in the real exchange rate of that country. Russia, Brazil and Mexico are the countries which are facing the highest decline in their exchange rates. So the emerging markets or developing markets have also high debt stocks and these dept stocks are based on dollar. Therefore, their debt stock is also increasing with this negative effect of pandemic. The other interesting observation In Europe, England, Norway, Sweden which are not the partner of the European monetary union facing the highest decline in their real exchange rates.

**Slayt 12**

Following the conclusion of the previous slayts or world map In this world map we are seeing the default risk of the countries. The red ones are the low risk countries and the blue are the high default risk countries in the corona virus period. While the risk perception of developed countries is low, the risk perception of developing countries has increased. Therefore, we can conclude that the dept stock figures are not considering in the calculation of the risk perception but the interaction with the real exchange rate decline is important in Default risk computation. The countries with high dept stock and high decrease in their real exchange rate are seen to be the risky countries. This country group is developing or emerging countries.

**Slayt 13**

Lastly we can also see the negative effects in stock markets of the countries. The stock prices of almost all countries have decreased. Countries whose stock indexes did not fall are China, the former eastern bloc European countries and the countries with shallow financial markets. Following the previous world dept real exchange rate decline and risk perception maps this map is also give the clue about the loosers of the pandemics in economic sense.

These figures are still changing day by day but the figures which we obtained in may 11 still prevails.

These figures are the indication of Deeping of the supply side economic crises day by day.

**Slayt 14**

Lastly I will show some maps from Turkey

This slayt shows the distribution of the cases of corona virus among the Turkey cities. As it expected the concentration of the infected person are located in big cities which have the most important impact on their economies. Therefore, the lock down measures directly leads to supply side economic crises.

**Slayt 15**

As we have indicated the debt stock of the countries in the world map. It is also important to know the accumulation of the reserve money dollar in that country to not to be fragile in the case of payback periods. Turkey have around 230 billion dollar debt stock which is mostly belonging to private sector. Therefore, it is important to show their conditions to payback situation. Thi,s is summuraized with Dollar Deposits distribution by Turkeys cities. Therefore, the strength of the Turkish companies seem to be good which are located in Istanbul, central Anatolia and some other industrial cities.

**Slayt 16**

Lastly you can also read my detailed comments to Turkey from this newspaper. Thank you for listening my presantation.