**Paper Session:**

**Measures to master challenges of the 21st century**

**Chair**
Mariya Brussevich *(International Monetary Fund, USA)*

**Presentations**

1. **Title:** Automation and human capital investment.  
   Authors: Sidharth Rony *(Royal Holloway University of London, UK)* & Arnaud Chevalier *(Royal Holloway University of London, UK)*

2. **Title:** Who will bear the brunt of lockdown policies? Evidence from tele-workability measures across countries.  
   Authors: Mariya Brussevich *(International Monetary Fund, USA)*, Era Dabla-Norris *(International Monetary Fund, USA)* & Salma Khalid *(International Monetary Fund, USA)*

3. **Title:** Using cognitive skills of ordinary citizens to predict preparedness for pandemic: Lessons from PIAAC  
   Authors: Chong Ho Yu *(Azusa Pacific University, USA)*, David Zizhong Xiao *(University of Maryland, USA)* & Jolia Awadallah *(Alliant International School of Psychology, USA)*
1. Automation and human capital investment.

Authors
Sidharth Rony *(Royal Holloway University of London, UK)* & Arnaud Chevalier *(Royal Holloway University of London, UK)*

Presenter
Sidharth Rony *(Royal Holloway University of London, UK)*

Abstract
Automation has an ambiguous impact on labour market by creating demand for some skills and destroying some others. Over the years, multiple measures of automation have been developed to analyse its overall impact on labour market, but the effect automation has on training decision remains an empirical question. In this study, we look at the risk of automation from the perspective of a worker and identifies its relationship with workers' decision to invest in their human capital. We classify the risk of automation based on tasks and technology and identify the variation in workers' decision. All occupation can be divided into tasks which can be automated and cannot be automated. When the tasks done by the worker is used to estimate the automation risk, it is termed as individual level automation measure. When occupation of the worker is used to estimate automation risk, it is termed as occupation level automation. As a second classification, we use exposure to technology of tasks. Different types of technology have different impacts on the same task and hence the occupation. Robots automate manual tasks. Software automates routine information processing. AI automates routine information processing, identifying patterns in the information and makes predictions. The paper also highlights the importance of country of residence in workers' decision in human capital investment. Using five measures of automation and workers' information from PIAAC survey for 12 countries, with different penetration of technology, we investigate the relationship between specific automation measures and training decisions. We use the Technological Readiness from World Economic Forum as measure for rate of adoption of technology in different countries. We find that the effect of automation on training is sensitive to the measure of automation used. When measured by individual or occupational level automation, automation reduces the incidence of training. However, while relying on technology based measured of automation, workers affected by older technologies (Robot, Software) receive less training with automation, while workers affected by newer technologies (AI) receive more training with automation. We find the trends to remain same for workers of different age groups and skill levels.
2. Who will bear the brunt of lockdown policies? Evidence from tele-workability measures across countries.

Authors
Mariya Brussevich (International Monetary Fund, USA), Era Dabla-Norris (International Monetary Fund, USA), & Salma Khalid (International Monetary Fund, USA)

Presenter
Mariya Brussevich (International Monetary Fund, USA)

Abstract
Lockdowns imposed around the world to contain the spread of the COVID-19 pandemic are having a differential impact on economic activity and jobs owing to differences in the ability to work remotely. Using PIAAC data, this paper constructs a new index of the feasibility to work from home to investigate what types of jobs are most at risk for 35 advanced and emerging market economies. Cross-country heterogeneity in the ability to work remotely reflects differential access to and use of technology, sectoral mix, and occupational selection. Workers least likely to work remotely also tend to be young, without a college education, working for non-standard contracts, employed in smaller firms, and those at the bottom of the earnings distribution, suggesting that the pandemic could exacerbate inequality. We estimate that over 97.3 million workers, equivalent to about 15 percent of the workforce, are at high risk of layoffs and furlough from lockdowns across the countries in our sample. Policies should account for demographic and distributional considerations both during the crisis and in its aftermath.
3. Using cognitive skills of ordinary citizens to predict preparedness for pandemic: Lessons from PIAAC.

**Authors**
Chong Ho Yu *(Azusa Pacific University, USA)*, David Zizhong Xiao *(University of Maryland, USA)*, & Jolia Awadallah *(Alliant International School of Psychology, USA)*

**Presenter**
Chong Ho Yu *(Azusa Pacific University, USA)*

**Abstract**
2019 Global Health Security Index (GHSI) rated the US as the most prepared country for pandemic out of 195 countries (score=83.5 out of 100) due to its high-quality laboratories and scientists, strategic national stockpile, and emergency distribution and communication plans. Other developed countries are also ranked high on the list. Since the outbreak of COVID19, it has been obvious that GHSI failed to predict sky-rocketing confirmed cases and deaths by high-ranking countries, such as the US and the UK. It is the conjecture of the research team that in addition to the availability of cutting-edge technologies and expertise provided by elites, the capability of discernment among ordinary citizens also plays a crucial role in containing a pandemic. By merging the pandemic data compiled by Worldometer and the PIAAC data collected by OECD, the research team is intended to find out whether the intellectual quality of ordinary citizens, including basic literacy, basic numeracy, problem-solving skills, engagement in knowledge acquisition (e.g., attending workshops and seminars, use complex mathematical equations or read scholarly publications for work), open-mindedness/motivation for ongoing learning (e.g., read a lot daily, enjoy finding/learning new things daily), communication with others (e.g., sharing information with coworkers, participating in discussions on the internet) etc. could be utilized to build a better predictive model for anti-pandemic performance. It was argued that people whose employment requires complicated skills and people who enjoy learning new things are more likely to be complicit with COVID-19 guidelines than people whose employment requires lower education, research, and training levels. Although the data sourced from multiple countries with large samples, only summarized data by country were utilized (n = 36). In addition to traditional OLS regression modeling, generalized regression analysis and Bayesian regression analysis were employed for triangulation. The merit of generalized regression modeling is its capability of avoiding overfit and collinearity, especially when the number of predictors exceeds the number of observations. Bayesianism treats probability as the degree of belief informed by the evidence, rather than relying on p values. In this case, the Bayesian approach is useful for modeling small-sample data.