Does Covid-19 have a more significant influence on the employments in the developing countries compare with the developed countries?

DH 100 Theory and Methods | Student: Jiayi Zhou (Joy) | June 30, 2021

Course Title: Digital Humanities 100
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Project Descriptions:

Since the start of the Covid-19, there were debates that concentrated on how the health conditions of the developing countries are less influenced by the pandemic compare with the developed world, leading to their lower mortality rates. According to the report produced by International Labour Organization, such reversed health conditions are the results of demographic (younger population), geographic(large rural area), and technological(disconnectivty) factors.

While the developing countries seem to do better, would this pattern persist with the economic activities? **To find out the answer, this project would focus on the employment aspect by evaluating the percentage loss of weekly working hours in each country.**

Jupyter Notebook Link:
s://drive.google.com/file/d/1o1mLpyFI60bpnAccT9GVB_75UtvZgk8U/view?usp=sha

Dataset:

The main dataset used in this project is titled “Impact of Covid-19 on Employment- ILOSTAT,” which was found on Kaggle. I have added an additional dummy variable called “Developing Country” based on the country categorization published by the United Nation. The criteria of being included in the list of developed country is very strict in this project. All of the transitioning countries suggested by the United Nation are categorized as developing countries.

Link: https://www.kaggle.com/vineethakkinapalli/impact-of-covid19-on-employment-ilostat

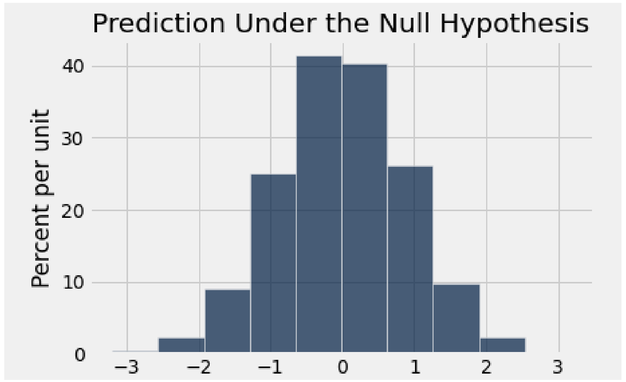
Workflow:

- Randomization Inference

The primary goal of this test is to investigate whether the percentage of working hours lost in the developed countries come from the same underlying distribution with the developing countries. Our test-statistic would be the difference between the mean of percentage working hour loss in the developing countries and developed country. The null hypothesis would be these averages have no difference; while the alternative hypothesis would be the percentage working hour loss is higher in the developing countries. Positive test statistic favors the alternative hypothesis. The result of this test is shown by the graph on the top right (Prediction Under the Null Hypothesis).

- OLS simple regression analysis

This analysis intend to investigate the relationship between developing countries and the average weekly working hours before the pandemic. The independent variable is the dummy variable "Developing Country" that either equals to 1 or 0. The dependent variable is the average weekly working hours. The coefficient of "Developing Country" captures the difference between the average pre-covid weekly working hours between the developing and developed countries. The p-value of this coefficient would indicate whether it is statistically significant.



Difference between the percentage of working hour loss in the developing and developed countries

Discussion and Result Interpretations:

The blue histogram on the top displays the difference between the percentage of working hour loss in the developing and developed countries under null hypothesis. This hypothesis test has shuffled the dummy variable for country categorization, and repeated 5000 trials. The observed statistics is 1.85. Although the shuffling process has introduced randomness, the p-value was around 1.7% and was never greater than 2%. If we take 5% as the significance level, this hypothesis testing would reject the null hypothesis and conclude a statistically significant difference between the percentage of working hour loss in the developing and the developed countries.

The chart which displays the OLS results have a coefficient of 8.2324, which indicate that the employees in the developing countries work 8.23 more hours per week compare with those in the developed countries before the pandemic. The p-value associated with this coefficient is 0. It is absolutely small and we could conclude that the difference between the average weekly working hours in the developed and developing countries are statistically significant. That is to say, when developing countries havse lost a larger percentage of working hours due to Covid-19, they are already working more before the pandemic. This imply a larger fall on the living standards and resources in the developing countries.

OLS Regression Results

Dep. Variable:	y	R-squared:	0.272
Model:	OLS	Adj. R-squared:	0.268
Method:	Least Squares	F-statistic:	69.94
Date:	Mon, 21 Jun 2021	Prob (F-statistic):	1.38e-14
Time:	04:08:51	Log-Likelihood:	-582.87
No. Observations:	189	AIC:	1170.
Df Residuals:	187	BIC:	1176.
Df Model:	1		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
const	40.4414	0.886	45.663	0.000	38.694	42.189
x1	8.2324	0.984	8.363	0.000	6.291	10.174

Omnibus:	2.350	Durbin-Watson:	1.797
Prob(Omnibus):	0.309	Jarque-Bera (JB):	2.009
Skew:	0.153	Prob(JB):	0.366
Kurtosis:	3.402	Cond. No.	4.38

Conclusions & The Story

Based on the analysis presented in the story, the developing countries tend to lose larger percentage of working hours due to covid-19. This effect is further emplified by the fact that the developing countries have higher average of weekly working hours beford the pandemic. The developing countries, with their fragile economies that focus on manufacturing, construction, services, and minning, have higher average working hours before the pandemic because these job pay less. The employees may need longer working hours in order to support their basic living. Furthermore, the legal system for labor protection in the developing countries are poorly regulation, and exploitations may exist. After the pandemic, the economies in the developing countries are heavily influenced not only because their jobs are low-skilled and replaceble, but also because the global economies they rely on is significantly impacted by the healthy crisis.

Works Cited & Acknowledgements:

This project has referenced the employment studies in the report titled “Covid-19: Tracking the Jobs Crisis in the Least Developed Countries” produced by International Labour Organization. It also referenced codes and statistical knowledge from UC Berkeley Data 8 course demo, taught by Professor Ramesh Sridharan and Swupnil Sahai in Spring 2020.

- Links to the image used:
https://voxdev.org/topic/infrastructure-urbanisation/spacial-structure-cities-developing-countries
https://www.information-age.com/advanced-smart-cities-world-123470745/