AN ECONOMETRIC ANALYSIS OF THE EFFECTS OF THE INCOME PER CAPITA AND EDUCATION TO THE NUMBERS OF CRIME IN AZERBAIJAN

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ABSTRACT

This analysis illustrates effects of the Income per Capita and Education to the Numbers of Crime in Azerbaijan. The study adopted a quantitative research and data mentioned for the Republic of Azerbaijan between 2005 and 2017 by The State Committee of the Republic of Azerbaijan. The variables used in this study were "Income per Capita" in Euro (dependent variable), "Education level" which I considered higher education as a standard (dependent variable) and "Numbers of Crime" (independent variable). The data was analyzed with using R programming language and Ordinary Least Squares. The main objective of this study is the examine the Effects of the Income per Capita and Education to the Crime Numbers in Azerbaijan. Specially, the study will also investigate the doctor students from higher institutions in Azerbaijan. In the model, I have used the Breusch-Pagan test for heteroskedasticity and The Durbin-Watson test for autocorrelation, after the result I have tried fixed heteroskedasticity and autocorrelation with The Newey-West. Our result allows us to draw a conclusion regarding the effects: there is a negative effect with an inappropriate circumstance.

Keywords: NoC = Numbers of Crime, IPC = Income per Capita, EL = Number of students from higher educational institutions.

INTRODUCTION

Randi and Lance (2012) noticed that focusing on growing international evidence that suggest that policies designed to increase educational attainment and improvement on education can significantly reduce crime rates. Benjamin and Jonathan (2013) noticed that the economic factors such as income per capita could be correlated to criminal activity, and the effects of crime on the economy. The present study examines effects of the income per capita and education to the numbers of crime in Azerbaijan. According to the international trend, levels of income per capita

and education level directly influence to criminal behavior of population. Generally, countries are trying to regulate this problem with investing money to their education for increasing its level and taking income level into consideration for diminishing the number of recorded crimes. In this paper I analyzed same circumstance for Azerbaijan. The Republic of Azerbaijan is in developing countries' list, in developing counties the psychology of population is absolutely different than developed countries, due to this reason I took standards of life from income aspect into account for this case. The data covers the number of students in higher educational institutions, income per person and crime's numbers in Azerbaijan from 2005 to 2017.

https://economics.handels.gu.se/digitalAssets/1439/1439011_49-55_research_lochner.pdf

https://mail.google.com/mail/u/0/#sent?projector=1

PROBLEM SOLUTION

The data used for this study was gotten from websites https://www.stat.gov.az/ (crime numbers, students from higher education and income per capita between 2005 and 2017) and https://www.cbar.az/home?language=en (exchange rates, that we applied to convert our income per capita in Euro). The data consist of 3 variables which are:

1) NoC = Numbers of Crime (except governmental issues, for example corruption)

2) IPC = Income per Capita

3) EL = Number of students from higher educational institutions

Year	IPC	EL	NoC
2005	808.27	129948	18049.00
2006	1063.10	129141	19045.00
2007	1429.10	130430	18667.00
2008	1951.97	136587	21692.00
2009	2258.25	139194	22830.00
2010	2677.56	140241	23010.00
2011	3047.63	143146	24263.00
2012	3726.18	145584	21897.00
2013	3851.98	151274	22381.00
2014	3993.30	158212	24607.00

2015	3823.89	161234	26916.00
2016	2648.63	163779	26611.00
2017	2580.19	167677	26113.00

METODOLOGY

OUR MODEL: **OLS**

NoC = β0 + β1 * IPC + β2 * EL + e

Heteroskedasticity: The Breusch-Pagan was used to check for heteroskedasticity for this model and the result shows that P>0.05 with BP test value of 4.5958 which implies that we do not reject the Null hypothesis therefore conclude that there is heteroscedasticity in our model.

data: lmMod

BP = 4.5958, df = 2, p-value = 0.1005

Autocorrelation: The Durbin-Watson statistic was used to check for the presence of autocorrelation in the residuals. The result shows that p<0.05 with which implies that there is evidence of autocorrelation in the model.

data: lmMod

DW = 1.2207, p-value = 0.009445

Estimation of model and result interpretation

Estimation gives us:

NoC = -4606 + 0.32 * IPC + 0.18 * EL

Therefore the 1-point increase in IPC increases NoC by 0.32 points and 1-point increase in EL increases NoC by 0.18 points. Standard errors for our case are equal to 488.1 and 39.3 for IPC and EL respectively, also from estimation we get that $R^2 = 0.8376$, which, means that PIC and EL are responsible for 84% of variation of NoC in case of Azerbaijan.

Newey-West: According our results, there are heteroskedasticity and autocorrelation, for that reason I approached to Newey-West for resolving this problem.

Standard error with and without robust standard errors:

S.E. (Newey West) for IPC: 5.0920e-01=0.5

S.E. (without Newey West) for IPC: 4.881e-01=0.4

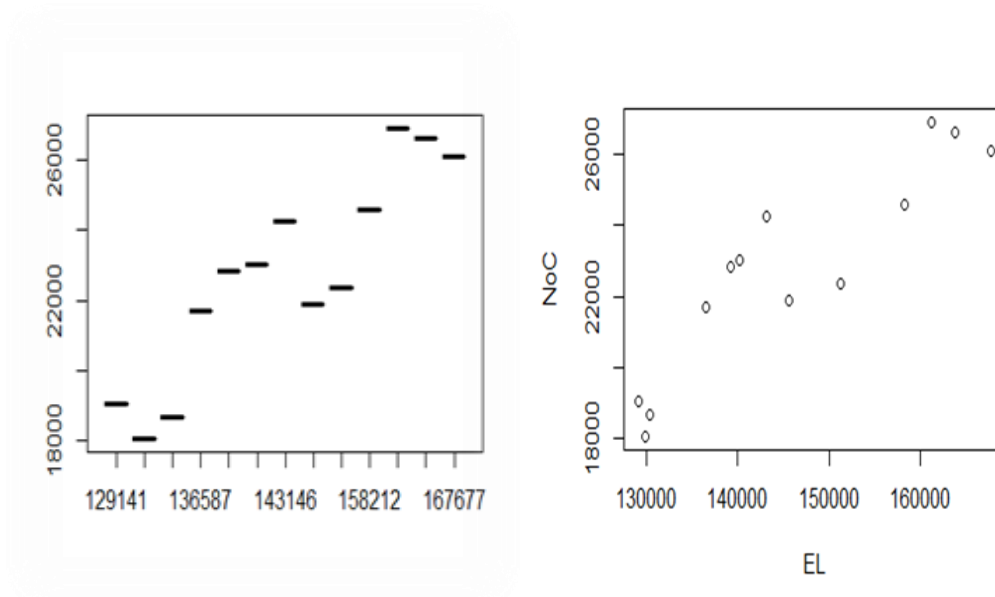**S.E. (Newey West) for EL: 2.7145e-02=0.02**

S.E. (without Newey West) for EL: 3.929e-02=0.03

T-value for EL: 6.7043 ------ significant for case.

T-value for PIC: 0.6277 ------- isn't significant for case.

We can assume that overall circumstance for IPC is significant for this case, but it is not significant for EL

R-Programming Language: Graphs

Figure 1 and Figure 2: EL ~ NoC

(Boxplot and Plot) respectively

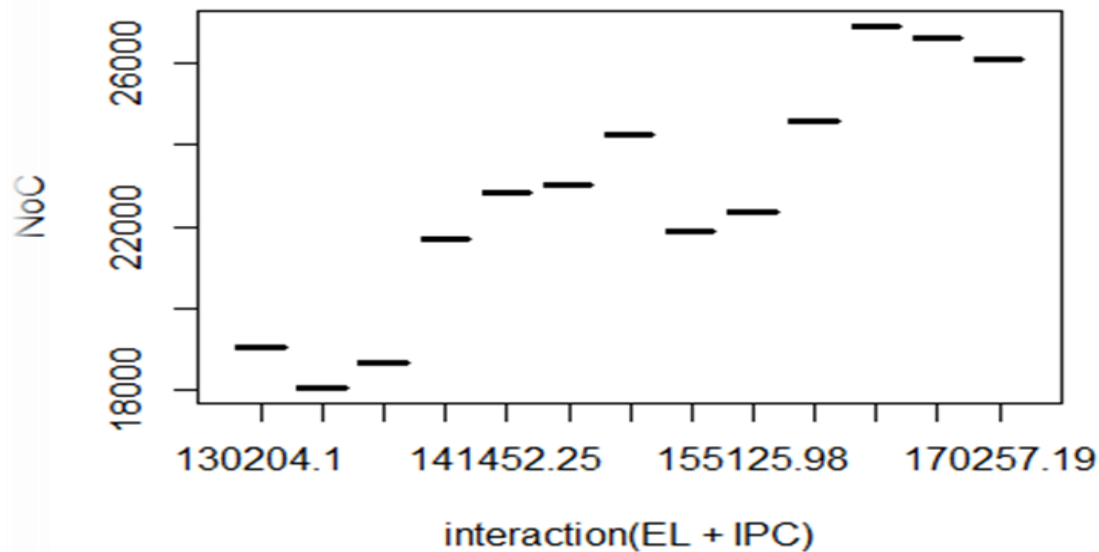❖ We can realize that boxplot is more meaningful and in detail than plot.

Figure 3: NoC ~ Interaction (EL+IPC)

CONCULUSION

In this analysis I mentioned effects of the Income per Capita and Number of students from higher educational institutions to the Numbers of Crime in Azerbaijan between 2005 and 2017. Nowadays, there is a circular issue in developing countries' economy, which are corruption and monopoly. I would like to indicate that effect of this issue is on significant level, which we have to take it into consideration. When it comes to my model, for this circumstance I have used the Breusch-Pagan test for heteroskedasticity and The Durbin-Watson test for autocorrelation, after the result I have tried fixed heteroskedasticity and autocorrelation with The Newey-West. Our result allows us to draw several conclusions regarding the effects: 1) there is a negative effect with an inappropriate circumstance, 2) government must regulate it and needs to take every detail into account according to this case. United Nations Human Rights mentions as a key concepts on economic, social rights according to the violation. So, failure to ensure a minimum wage sufficient for a decent living (rights at work), Failure to provide for a reasonable limitation of working hours in the public and private sector (rights at work), Failure to ensure maternity leave for working mothers (protection of and assistance to the family), Failure to prevent employers from discriminating in recruitment (based on sex, disability, race, political opinion, social origin, HIV status, etc.) (The right to work).

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