

Crime and Labor Market: A panel data analysis

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Abstract

This study empirically investigates the causal relationship between crime and labor market. Panel regression analysis with time period 2012- 2014 along with pool OLS method has been used for this purpose. The countries under study are divided into three categories: high, moderate and low crime index. The variables used in this study are also of three kinds: socio economic, demographic and deterrence variables. The results indicate that in high crime index countries (UDCs) unemployment & urbanization have significant positive impact on crime index whereas inflation, GDP growth rate, prison population rate and participation of youth 18-24 years in education and training are insignificant. In moderate crime index countries (UDCs) GDP growth rate & urbanization have significant negative impact on crime index. Whereas inflation, unemployment, prison population rate and participation of youth 18-24 years in education and training are insignificant. In low crime index countries, the same socioeconomic and demographic factors as are noticed in high crime index countries i.e. unemployment and urbanization in addition to prison population rate are found to be responsible for labor market crimes. In order to control labor market crimes, the study recommends the improvement in GDP growth rate, discouraging the trend of urbanization, enhancement in education and training programs so that unemployment level be controlled and hence labor market can be saved from crimes.

Keywords: Crime, Labor, high and low crime index countries, Unemployment, Urbanization.

Introduction

Crime is a social issue which levies considerable economic costs on a society. Studies have revealed that crime inclines to be linked with easy-going economic development at mutually the national level (Mehlum et al., 2000) and local level, such as metropolitan and city areas (Leichenko, 2001). Conventionally, it is believed that poor economic conditions lead to unemployment, low growth rate, inflation, urbanization, and lack of education facilities for adults and high prison population rates which in turn fosters crime in an economy (Gillani et al., 2009). In relation to the previous works, it was found that unemployment had positive impact on crime. The value of unemployment crime coefficient was found to be 9.3 (Maddah, 2013). Using data from one single country, many studies confirm that unemployment increases crime but its relation with crime in international perspective, has not been studied broadly (Altindag, 2012). As for as GDP growth rate is concerned, GDP growth rate was found to have 2% negative impact on homicide crimes only (Fajnzyber, 2002) with the view that increased economic activities caused less homicide crimes in the economy. In order to analyze its impact on overall crime, it is included in the present crime study. Education and urbanization were found to have sometime positive and sometimes negative effect on crime therefore needs to be tested again in this study. The bidirectional relation of inflation

has been tested with respect to a single country. It was observed that inflation is positively related to crime (Gillani et al., 2009). But the present study is going to test it in international outlook.

In 2007, National bureau of economic research (NBER) witnessed a global economic slump which was lasted up to 2009. The impact of this economic and monetary crisis which was initiated in 2007, was worse. It was opened as a critical crisis of the banking system, and then started quickly affecting the real economy, causing a considerable decline in business investment, aggregate demand and production. The economies of European Union (EU) were extremely affected. In 2009, GDP of these countries dropped by 4.1% and industrial output by 20% (UNODC report on crime, 2012). Economic indicators showed a critical situation. Different business magazines reported this critical economic situation, alarming for an increase in crime rate. But an opposite situation was observed when crime rate in this era instead of increasing either remained same or even started decreasing. Crime situation in different countries between 2007 and 2011 were observes as:

Table 1: Crime situation in different countries between 2007 and 2011

Country	Crime Rate 2007	Crime Rate 2008	Crime Rate 2009	Crime Rate 2010	Crime Rate 2011	Overall change (2007-2011)
Belgium	9351/100,000	9291/100,000	9377/100,000	9319/100,000	9469/100,000	1%
France	5808/100,000	5725/100,000	5646/100,000	5506/100,000	5462/100,000	-6%
Georgia	1377/100,000	1019/100,000	820/100,000	783/100,000	722/100,000	-48%
Germany	7635/100,000	7436/100,000	7383/100,000	7235/100,000	7328/100,000	-4%
Greece	3790/100,000	3746/100,000	3436/100,000	2954/100,000	1716/100,000	-55%
Italy	4960/100,000	4545/100,000	4380/100,000	4344/100,000		
Norway	6693/100,000	6421/100,000	6553/100,000	6278/100,000	5999/100,000	-10%

The above table shows that during the crisis of 2007, the crime rate in France instead of rising dropped by 6%, in Georgia this decline was observed as 48%, Germany's crime rate was deteriorated by 4%, the most astonishingly Greece which showed a huge decline by 55% during this disaster.

So it became important to study whether any relationship exists between labor market and crimes. Despite of a massive literature on crime, empirical studies have not proved a significant relationship between crime and labor market conditions in international perspective.

This primary stimulating and significant theoretic and experimental work fashioned extensive consideration in studying crimes amongst economists especially, and researchers in other fields of social sciences more largely. Hundreds of papers investigate how labor markets affect crime, and numerous others determine the correlation in different ways, sometimes by controlling for the variables related to labor market for searching the answers of some other questions linked to crime. Some behavioral theories also illuminate the relationships between economic conditions and crime. Motivation theory argues that the individuals are inclined to commit crimes during depression because incomes are decreased. Crime rates tend to increase during the period of economic slump on the basis of the fact that there exists positive relation between adverse economic conditions and crimes (Lauridsen et al., 2014). Numerous appraisals have been published till now in this huge vibrant field (Mustard, 2010). A significant and outstanding theme of the existent appraisals is that the experimental work illustrates that the labor markets have slight consistent impact on crimes. Piehl (1998) declared that there was unexpectedly petite proof to support the idea

that economic situations drive crimes. According to Piehl (1998), though various people, politicians, policy makers, and researchers assume that economic conditions have impact on crimes, but the proof of this link has shown vague. In this way, there remains a large gap between theory and empirical evidence on this topic. Moreover, the need still arises to compare the elements of crimes across the labor markets of different countries in order to know what are the factors, which are unanimously agreed upon to cause crime in labor markets. The present study is going to be conducted for the solution of this stimulating puzzle. Actually it is an attempt to investigate the empirical relationship between labor markets and crimes in international outlook. The following study aims at analyzing the determinants of crimes, their intensity and the importance of different factors from the policy point of view. The study covers not only the local labor market but also evaluates it in international perspective. The present study will contribute to the existing literature through modeling the relationship between crimes & its determinants in labor market and it also aims at comparing results for the three categories of countries with high, moderate & low crime Index. The study also suggests some measures for the labor markets to reduce crimes.

Methodology

The crime and labor market model for the present study is specified as;

$$Cit = \beta_0 + \beta_{1t}(unp) + \beta_{2t}(GDP) + \beta_{3t}(inf) + \beta_{4t}(edu) + \beta_{5t}(urb) + \beta_{6t}(pri) + \epsilon_{it}$$

Where C symbolizes crime index (Patalinhug, 2011) working as explained variable in this study. The other variables present on the right side of the equation are functioning as explanatory variables. These explanatory variables are the combination of socioeconomic, demographic and deterrence variables. ϵ Stands for error term of the model and indices i and t represent number of cross section and time period respectively. The model is using total 6 explanatory variables out of which 2 are socioeconomic and other 3 are demographic variables and the last one is a deterrence variable as shown by their abbreviations in the equation. The economic variables used in the model are unemployment rate abbreviated by UNP, Gross Domestic Production growth rate as by GDP (Altindag, 2011). The demographic variables are inflation rate denoted by INF (Gillani et al., 2009), participation rate of youth with age 18-24 in education and training represented by EDU, urbanization rate represented by URB (Buonanno, 2006). Deterrence variable is prison population rate per 100,000 inhabitants (Wolpin, 1978). Data on different socioeconomic, demographic and deterrence variables is obtained for the time period 2012-2014 from World Development indicators (WDI), United Nations Economic commission for Euro (UNECE), Principal global indicator (PGI), index mundi and EUROSTAT. Deterrence variable data is sourced from International Centre for prison studies (ICPS) while data on crime index is accessed from NUMBEO. Pool OLS methodology has been used to calculate empirical results. Crime is a concept that is not captured by one single measure rather it is connected with the measurement of different individual outlined criminal offenses for example fraud, larceny, burglary, murder, rape and theft etc. This study is also using crime data from NUMBEO, a population based criminal offence survey, which defines crime index as:

“It is an estimation of overall level of crimes in a given country. “It considers burglary, motor vehicle theft, property crimes, violent crimes, drug related crimes, physical injury, hate crimes etc.

The value of these offences ranges between 0 and 100. The countries with value ranging between 0 and 20 are considered to be very low crime index countries, value between 20 and 40 means low crime index countries, crime level between 40 and 60 denotes moderate crime index value, between 60 and 80 means high crime index countries and above 80 indicates very high crime index countries .For the purpose of analysis, three crime categories on the basis of 2015 data, have

been selected i.e. high, moderate and low crime index countries. 2015 data ranks total 22 nations as high crime index countries, 52 nations as moderate crime index homelands and 27 nations as low crime index countries. From each categories, a sample of 5 countries have been selected. Those countries are selected for which data is available up to 2014. In this way total 15 countries out of 5 continents of the world have been considered for analysis.

Table 2: Countries with high crime index

High Crime Index Countries		
Serial No.	Country Name	Crime Index value
1	South Africa	78.44
2	Pakistan	61.16
3	Brazil	68.95
4	Malaysia	69.97
5	Venezuela	84.07

Table 3: Countries with moderate crime index

Moderate crime index countries		
Serial No.	Country Name	Crime Index value
1	United Kingdom	42.01
2	Italy	47.50
3	France	49.71
4	Belgium	42.04
5	Greece	41.35

Table 4: Countries with low crime index

Low Crime Index Countries		
Serial No.	Country name	Crime Index Value
1	Canada	37.46
2	Germany	28.49
3	Norway	31.19
4	Turkey	36.40
5	Georgia	22.01

Results and Discussion

For the purpose of identifying significant variables, when the p value of different variables was compared with alpha value, it was observed that GDP growth rate has (p value=0.5859 >0.01, 0.05) showing that GDP growth rate is insignificant at 1% and 5% significance level. Unemployment has (p value=0.0064 < 0.01) behaving that unemployment is a significant variable. Urbanization has p value=0.0499 < 0.05 pointing out that urbanization is also significant in its impact on crime. Inflation has (p value =0.4732 > 0.01, 0.05 or even 0.10) specifying that inflation is insignificant at 1%, 5% or 10%.

Table 5: Results for High Crime Index Countries

Variable	Coefficient	Std.Error	t-Statistics	Prob.
Constant	38.30834	50.50946	0.758439	0.4699
GDP Growth Rate	0.754943	1.330156	0.567560	0.5859
Unemployment	1.260523	0.344568	3.658271	0.0064
Urbanization	0.447470	0.193984	2.306743	0.0499
Inflation	0.191161	0.253969	0.752694	0.4732
Education of young 18-24 Years	-0.047655	1.041905	-0.045738	0.9646
Prison pop. Rate	-0.069485	0.055031	-1.262653	0.2423

Adult education and training has (p value=0.9646 > 0.01, 0.05 or even 0.10) confirming that adult education and training is an insignificant variable. Prison population has (p value=0.2423>0.01, 0.05 or even 0.10) indicating that prison population rate is insignificant at all levels 1%, 5% and even at 10% level. Overall In high crime index countries (UDCs) unemployment & urbanization have significant positive impact on crime index. This positive and significant relationship between crime and urbanization is justified by Buonanno (2006). Unemployment exerts significant positive impact on crimes. This relationship is verified by the Lauridsen et al. (2014). Whereas inflation, GDP growth rate, prison population rate and participation of youth 18-24 years in education and training are insignificant.

Table 6: Results for Moderate Crime Index Countries

Variable	Coefficient	Std.Error	t-Statistics	Prob.
Constant	43.85274	19.75396	2.219947	0.0572
GDP Growth Rate	-1.750411	0.829786	-2.109472	0.0679
Unemployment	-0.259704	0.352564	-0.736617	0.4824
Inflation	0.018242	1.150107	0.015861	0.9877
Urbanization	-0.182859	0.092822	-1.969992	0.0843
Education of young 18-24 Years	0.307029	0.211516	1.451564	0.1847
Prison pop. Rate	0.033349	0.051607	0.646221	0.5362

In moderate crime index countries, when the p value of different variables was compared with alpha value, it was observed that GDP growth rate has (p value=0.0679 >0.01, 0.05 but < 0.10) showing that GDP growth rate is insignificant at 1% and 5% significance level but becomes significant at 10%.Unemployment has (p value=0.4824> 0.01) behaving that unemployment is an insignificant variable. Inflation has (p value =0.9877> 0.01, 0.05 or even 0.10) specifying that inflation is insignificant at 1%, 5% or 10%. Urbanization has (p value=0.0843<0.10) pointing out that urbanization is also significant in its impact on crime. Adult education and training and training has (p value=0.9646 > 0.01, 0.05 or even 0.10) confirming that adult education and training and training is an insignificant variable. Prison population has (p value=0.4362>0.01, 0.05 or even 0.10) indicating that prison population rate is insignificant at all levels 1%, 5% and even at 10% level. Overall In moderate crime index countries, GDP growth rate & urbanization have significant negative impact on crime index. The significant negative relationship between GDP growth rate and crime is justified by Goulas & Zervoyianni (2013), according to which high growth rate in other words increased business activities in the economy leads to lower crime. The urbanization

negatively impacts crimes. According to Cullen & Levitt (1996) when de-urbanization happens i.e. urban population reduces then crime in city areas start rising because people become less secure. Whereas inflation, unemployment, prison population rate and participation of youth 18-24 years in education and training are insignificant.

Table 7: Results for Low Crime Index Countries

Variable	Coefficient	Std.Error	t-Statistics	Prob.
Constant	-193.9253	59.48415	-3.260117	0.0115
GDP Growth Rate	0.804783	1.194856	0.673539	0.5196
Unemployment	2.977846	1.026680	2.900463	0.0199
Inflation	1.363700	0.909220	1.499857	0.1720
Urbanization	2.031417	0.430008	4.724135	0.0015
Education of young 18-24 Years	0.646252	0.393337	1.642997	0.1390
Prison pop.Rate	0.090421	0.037677	2.399897	0.0432

In low crime index countries, for the identification of significant variables, when the p value of different variables was compared with alpha value, it was observed that GDP growth rate has (p value=0.5196 >0.01) showing that GDP growth rate is insignificant at 1%, .Unemployment has (p value=0.0199 < 0.05) behaving that unemployment is a significant variable at 5% level. Inflation has (p value =0.1720 > 0.01) specifying that inflation is insignificant at 1% level. Urbanization has (p value=0.0015 <0.10) pointing out that urbanization is significant in its impact on crime. Adult education and training has (p value=0.1390 > 0.01, 0.05 or even 0.10) confirming that adult education and training is an insignificant variable. Prison population has (p value=0.0432 < 0.05) indicating that prison population rate is significant at 5% level. Overall In low crime index countries (UDCs) unemployment and urbanization and prison population rate have significant impact on crime index whereas GDP growth rate, inflation, and participation of youth 18-24 years in education and training are insignificant. The positive relation between prison population rate and crime is verified by Dhondt (2012).

The results support the motivation theory, according to which worse economic conditions exert positive impact on crimes i.e. economic stress leads to criminality. And the improvement in labor market prospects help to reduce crime.

Recommendations

The study recommends following factors which must be addressed by the policy makers of these countries and it also expects the relevant governments to resolve these issues for a peaceful and prosperous world. As it is evident that crimes are influenced by labor markets, so the macroeconomic policies suggested are

- Governments should introduce labor market reforms.
- Governments should start different programs regarding the provision of education and job training skills to the individuals.
- Governments should start different loan schemes for the education of youth.
- It should also initiate training programs to increase the professional abilities of youth people to save them from going towards crime market.
- Moreover the governments should also strengthen the judicial structure of the countries.

- Government should increase the deployment of police and other law enforcement agencies.

Conclusion

Results are important not only for the economic development of these countries rather for the crime prevention too. The study evaluates the reasons of crime in high, moderate and low crime index countries. It also provides detailed knowledge about the question whether crimes in a country are committed due to economic problems or due to law and order situation. The results are different for different categories.

The reaction of the labor markets with high and moderate crime index value are similar i.e. when these economies are facing the problem of inflation then crimes are committed on economic grounds. Law and order situation does not create issue. Whereas in low crime index countries, the situation is different. Here economic problems coupled with law and order situation both are responsible for crimes. The results seem to be quite confusing that high crime index countries that are usually underdeveloped, has no law and order issue. But the reality is that the imperfect and incorrect data about deterrence variables in these countries misleads the results. However overall scene confirms the facts invented by motivation theory that crimes in all the three categories are committed due to economic problems.

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