Criminal Offense, Educational Level and Economic Growth—Quantile Regression Model Based on Chinese Provincial Panel Data from 1991 to 2012

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Abstract. According to the model of economic growth of criminal elements, quantile regression was employed to study the impact of criminal offenses and educational levels on China's economic growth from 1991 to 2012 in China. The research shows that human capital plays a significant role in promoting economic growth, especially in developed areas; the regional economic growth was affected by changes in the rate of criminal arrest, the effectiveness of criminal policies in different regions is diverse, and the impact on economic growth is various. A criminal policy that suits human capital can provide a stable social circumstance for economic development and spur sustainable economic development.

Induction

In recent years, with the rapid economic development in China, the education has been continuously improved and the national quality has been greatly improved. Yet as the economic growth rate of criminal offenses is also on the rise, the stability of the social order is seriously threatened. According to the data of the Procuratorial Yearbook of China over the years, the criminal crime rate in China has risen significantly over the short span of 20 years from 1991 to 2012. National Bureau of Statistics data show that the average age of education in China increased by nearly 50%. However, there are some regional differences in the distribution of education in our country. The gap between the average years of education in Beijing and Tibet is more than five years. Therefore, we suspect that the increase in the rate of criminal offenses may be due to the unbalanced development of education that leads to the generally low income levels of people in lower education levels and the need to participate in criminal offenses in order to seek the rapid growth of wealth.

In foreign, most scholars believe that crime is not conducive to economic growth, and demonstrate this point of view on the empirical level. Cardenas (2007) found a significant negative correlation between crime and average capital output growth, and Arslan Ahmad et al. (2014) concluded that long-term crime has a negative impact on economic growth. In recent years, domestic scholars mainly focus on the empirical analysis of the relationship between criminal offenses and economic growth. For example, Xie Mindi et al. (2006) found that the improvement of economic development is conducive to curbing crime. Chen Yi-li (2007) found that there is a significant negative correlation between economic growth and property crime. On the relationship between human capital and economic growth has been the study concluded that human capital is an important factor in the economic growth of a country. The quality of human capital is related to its level of education and technical accomplishment. The higher the level of education or technical accomplishment, the more it contributes to technological progress and economic growth. Thus, human capital and economic growth are inherently related.

Most researchers will focus their research on criminal criminality and economic growth or on human capital and economic growth. Few scholars will combine the two to study the regional economic growth in China. The article chooses the inter-provincial panel data from 1991 to 2012 in China to study the impact of criminal levels and education levels on China's regional economic growth. The article uses a quantile regression method to estimate the model, with the purpose of distinguishing how different the criminal policy and human capital differences will affect regional economic growth in different locations of conditional distribution.
In this paper, based on the traditional Cobb-Douglas production function (C-D function):

\[ Y_t = A_t K_t^\alpha L_t^\beta . \]  

(1)
to improve take the human capital factor as an endogenous variable, and learn from Li Xiaoning’s (2005) method that takes the criminal criminality as exogenous variables, the criminal offense is introduced into the model as an exogenous explanatory variable.

\[ Y = AK^\phi L^\theta Edu^\sigma Crime^\omega . \]  

(2)

In formula (2), \( Y \) represents total output. A, K and L represent the representatives of technical efficiency, capital investment and labor input respectively, \( Edu \) stands for human capital, Crime as criminal offense, \( \phi, \sigma, \omega \) represent human capital, output elasticity of criminal crime. Among them, this paper uses the per capita GDP of each province and region, the stock of physical capital, and the total number of employed persons at the end of the year are served to measure \( Y, K \) and \( L \) respectively. The study used the average years of schooling in each province and province and the Edu and Crime rates for each 100,000 arrests. Take logarithm on both sides of the model to get the corresponding regression model. Since total output is also affected by other economic variables, this article sets other factors as control variables.

The sample data used in this paper includes the data of 29 provinces and regions from 1991 to 2012. Among them, the data of Tibet have more missing in more years and are therefore not included. The data of Chongqing are incorporated into Sichuan. The relevant data come from the reports of two high-profile work reports over the years, China Statistical Yearbook, China Labor Statistical Yearbook, China Industrial Economy Yearbook, China Economic Census.

The gross output is calculated using the per capita real GDP of each province and region, using the same price in 1978 and GDP exponential deflator. This paper uses the change of criminal rate in each province and province to measure the effect of criminal policy, and takes the average years of education as the proxy variable to measure human capital. And learn from Li Xiumin (2007) the method of calculating to get the average years of schooling in all regions. The stock of physical capital is obtained according to the calculation methods and published data of Zhang Jun et al. (2004). The capital stock of provinces and autonomous regions in 1978 are taken as the base period, labor input variables \( L \) by the end of each province to measure the number of employed.

**Empirical Results**

**Correlation between Criminal Offenses, Human Capital and Per Capita Output**

We use scatter charts to show the correlation between them. In Figure 1, the logarithm of the Inarrest shows a significant positive correlation with the logarithm of Iny, indicating that the more frequent the criminal activities in the more economically developed areas, the higher the rate of criminal arrests, the more obvious the effect of criminal policies. In Figure 2, there is a significant positive correlation between human capital and per capita output, indicating that the more advanced the economy is, the higher the level of human capital development and vice versa.

![Figure 1. Scatter plot of logarithm of criminal arrest rate and logarithm of output per capital.](image)
The Influence of Criminal Offense, Educational Level Differences on Economic Growth

For a complete analysis of the data, we selected the quantiles (0.1, 0.25, 0.5, 0.75, 0.9), estimated and analyzed the model (2) and compared it to the least-squares regression (OLS), since our primary focus is on criminal offenses and the relationship between educational level and economic growth, so other control variables are not all displayed. The estimated result is shown below.

Table 1. Impacts of differences in criminal policy and education levels on economic growth.

<table>
<thead>
<tr>
<th>variable</th>
<th>OLS</th>
<th>quantile</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>q=0.1</td>
</tr>
<tr>
<td>lnk</td>
<td>0.478***</td>
<td>(0.0203)</td>
</tr>
<tr>
<td>Inlabor</td>
<td>-0.451***</td>
<td>(0.0208)</td>
</tr>
<tr>
<td>Inarrests</td>
<td>0.0905***</td>
<td>(0.0359)</td>
</tr>
<tr>
<td>lnedu</td>
<td>1.586***</td>
<td>(0.127)</td>
</tr>
<tr>
<td>_cons</td>
<td>3.665***</td>
<td>(0.313)</td>
</tr>
<tr>
<td>N</td>
<td>638</td>
<td>638</td>
</tr>
<tr>
<td>Pseudo R²</td>
<td>0.9267</td>
<td>0.7448</td>
</tr>
</tbody>
</table>

Note: (1) The values in parentheses are standard deviation; (2) *** means significant level at 1% level, ** means significant level at 5% level, * indicates significant level at 10%; (3) R² quantile regression Pseudo R².

(1) The impact of changes in criminal policy on economic growth. The Inarrests was significantly positive only at 0.75 and 0.9 and not significant at the other quantiles. This shows that the effect of criminal policy can promote economic growth, but only in areas with high levels of economic development more effective criminal policies, while in the more economically backward areas criminal policy did not produce the desired effect. This may be due to the relatively low standard of living of people in economically backward areas, thus inducing low-income groups to seek new paths of wealth growth through criminal activities.

(2) The role of human capital for economic growth. The regression coefficient of human capital at each quantile is significantly positive, which indicates that human capital has a significant role in promoting economic growth. From the regression results, it can be seen that the output elasticity of the average years of education in all quantiles is greater than 1, and the output elasticity increases with the increase of the sub-sites. This shows that the higher the average years of education in the economically developed areas, the more obvious the promotion of economic growth.

Conclusion

The empirical analysis shows that the changes of human capital and criminal policy can exert a influence the economic growth, and the change of criminal policy can cause the human capital to
raise the output level of economic growth, which indicates to some extent that the development of social economy needs a stable policy environmental support. The main conclusions are as follows.

First, Human capital has a significant role in promoting economic growth. The regions with more developed economy have higher level of human capital, faster economic growth and vices versa.

Second, Criminal policy has a certain impetus to economic growth. Only when the criminal policy has the expected deterrent effect in the economically developed areas, effectively reduces the incidence of criminal offenses and has a certain promotion effect on the economic growth. However, it has no obvious effect on economic growth in those areas where the economy is relatively backward.

Thirdly, the dynamic matching of criminal policy and human capital has a certain impetus effect on economic growth. In the area where human capital is at a high level, the effect of criminal policy is more obvious and the promotion effect on economic growth is greater and vices versa.

Accordingly, we propose the following policy recommendations: Relying solely on legal policies can’t fundamentally curb the criminal offenses. The government must pay more attention to education and improve the quality of the people so that people will have a profound understanding of the dangers of criminal activities, reduce the criminal rate and strive to build a harmonious society so as to promote sustained and rapid economic development.

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References