Property crime and macroeconomic variables in Malaysia: Some empirical evidence from a vector error-correction model

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3 February 2008

PROPERTY CRIME AND MACROECONOMIC VARIABLES IN MALAYSIA: SOME EMPIRICAL EVIDENCE FROM A VECTOR ERROR-CORRECTION MODEL

by

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Abstract

In this study we investigated the long-run relationship between property crime and three macro-financial economic variables in Malaysia for the period 1973 to 2003. In order to avoid what the econometrician term as 'spurious regression problem' we estimate the model using the vector-error correction (VECM) framework. The results tend to suggest that there are long-run relationship between property crime and the three macroeconomic variables in Malaysia. Our VECM results, however, suggest that there is no long-run and short-run causal effect of the three macro-variables on the property crime. Nevertheless, our variance decomposition results indicate that property crime in Malaysia is affect by economic growth measure by real income per capita. But, given the short sample nature of this study, our results should be viewed with cautious.

I. INTRODUCTION

Crime is a public menace. Crime will result in the loss of property, lives and misery. In the United States, Freeman (1996) estimates the total cost due to crime in 1995 is about 2 percent of GDP and another 2 percent of GDP is allotted to crime control activities. Recognizing the importance of deterring crime, Freeman (1996) notes that the state of California spent more on prisons than on higher education whereby the budget allocated to spending on prisons rose from 2 percent in 1980 to 9.9 percent in 1995 compared to spending on higher education which shrunk from 12.6 percent in 1980 to 9.5 percent in 1995.

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Malaysia is no exception to crime offenders. Recently, the phenomenon of crime wave has received an increasing attention and the criminal activity has been given wide coverage in the newspaper and media. Murder, robbery, assault, rape, burglary and theft are common criminal offences in Malaysia. It seems that since the financial crisis, crime has increased significantly in Malaysia. Without doubt, there is a deep sense of social alarm that has called for urgent measures from the government to reduce the levels of criminality. Despite this alarming event, Malaysia's criminal activity has received little attention and remains largely neglected by the economics of crime literature originally proposed by Becker (1968) and Ehrlich (1973). Thus, the purpose of the present study is to fill this gap in the literature by providing some empirical evidence on the link between the crime rate in a developing economy, Malaysia and the economic activity measured by economic growth, financial wealth and monetary policy. We intend to determine whether there exist a long-run relationship between the crime rate and these macro-financial economic variables in Malaysia.

The present study is important in two aspects. First, this paper provides a first attempt in the study of the economics of crime in Malaysia. Thus, the starting point in our study is to explore the relationship between crime and those economic activities. In majority of the study conducted on crime in other countries, economic activity has been identified as strongly influencing crime. Economic activity has been proxy by a variety of measures that include the rate of unemployment, the level of aggregate consumption, the level of national income, inflation, population, interest rate and others. Due to short span of availability of data, we will conduct the analysis using three macro-financial economic variables, namely: real income per capita, wealth and interest rate.

II. A REVIEW OF RELATED LITERATURE

The starting point of the analysis on the economics of crime is the seminal paper by Becker (1968). In his theoretical paper, Becker (1968) assumes that criminals are rational and utility maximizing individuals and therefore, contended that an individual will decide whether to engage in crime by comparing the benefits and costs of committing crime. The rational individuals will compare the expected costs of being caught and punished to the expected rewards of criminal behaviour before deciding whether to commit crimes. In his paper, Becker (1968) emphasizes on how changes in the probability and severity of punishment can alter the individual's decisions to commit crime. Later, Ehrlich (1973) extend Becker's crime model by including the role of opportunity cost between illegal and legal work. If legal income opportunities become scarce relative to potential gains from crime, the Becker-Ehrlich model predicts that crime will become more frequent. In other words, when opportunity cost in illegal activity is low, individual will turn into criminal as the payoffs is greater.

Economic adversity as a result of recession would encourage criminal activity. According to the economic models of crime such as Becker (1968), when a nation's economy becomes stronger, improvements in legitimate labour market opportunities make crime relatively less attractive. A study using panel data by Fajnzylber *et al*. (2002) on 15 industrialized, 11 Latin American and the Caribbean, 4 Eastern Europe, 3 Middle East, and 12 Asian countries, found that an increase in GDP per capita is associated with a significant fall in the robbery rate. This result support the view that economic conditions related to the economic cycles, such as employment opportunities and salaries in legal activities, have a strong impact on the incidence of crime. Other studies support that improving economic conditions will result in a fall in the level of criminal activity include Pyle and Deadman (1994), Deadman and Pyle (1997), Hale (1998) and Masih and Masih (1996).

The level and growth of economic activity in a society create attractive opportunities for employment and investment and as a result increase their wealth, but the increase in the size of individual’s wealth will portray potential loot from crime will also rises. According to Ehrlich (1973), greater wealth means a higher level of transferable assets in the community and, thus, more lucrative targets for potential criminals. Therefore, a positive coefficient between wealth and crime would support the interpretation of wealth measures as indicators of illegal income opportunities. Study by Scorcu and Cellini (1998) support the positive relationship between financial wealth and crime in Italy, however, the relationship is weak as a result of the dominant impact of unemployment and consumption expenditure. Another important economic variables related to economic condition is the interest rate. Jones and Kutan (2004) point out that monetary policy through interest has a positive effect on criminal activity. According to Jones and Kutan, higher interest rates have socially and statistically significant positive effects on the rate of theft and knife robberies in the US.

III. SOME STYLISED FACTS ON CRIME RATES IN MALAYSIA

Table 1 illustrates the crime statistics by twelve categories of crime in Malaysia for the period 1973-2003. In the table we sub-classify the period into 1973-82, 1983-92, and 1993-2003. In columns 2-4, we present the average number of cases, and in columns 5-7 is the average growth rates in crime cases, and the last three columns represent the average share of criminal activities in total crime. Total crime include both violent and property crimes. While murder, attempted murder, armed robbery, robbery, rape and assault constitute violent crime, property crime consisted of daylight burglary, night burglary, lorry-van theft, car theft, motorcycle theft and larceny.

As indicated in Table 1, the average number of all crime cases has been on an increasing trend. For the past three decades, the quantum of crime cases has shown an upward trend for all crime categories except for a brief dropped in number of cases for attempted murder for the period of 1983-92, and armed robbery in the period 1992-2003. In all three periods, property crime represented more than 80 percent of all crime recorded (see columns 8-10). The main contributor to property crime is larceny and followed by motorcycle theft and night burglary. Although the share of larceny and night burglary to total crime is on a decreasing trend, the share of motorcycle thefts is increasing. The share of motorcycle thefts has increased from 8 percent in 1973-82, to 15 percent in 1983-92 and 24 percent in 1993-2003 periods. As for other crime category, the share to total crime has been sustained.

In Table 1, from columns 5-7, we observed that the average percentage growth rate of all crime categories for the period 1983-92 suggests that the growth in the number of cases is slowing down compared to the previous period. Except for murder and lorry-van theft, all category of crime has been slower despite their higher quantum in 1982-93 compared to 1973-82 periods. However, for the period 1992-2003, we experienced higher growth rates in all crime categories except for murder and armed robbery, which show an average growth of 3.2 percent and –1.9 percent respectively.

III. METHODOLOGY

Since our task is to determine the long-run relationship and the causal direction between the four non-stationary variables in question, we estimate a vector error-correction model (VECM). For the following four-variable vector error-correction models (VECM)

$$\Delta y_t = a_0 + \sum_{i=1}^{k} \alpha_i \Delta y_{t-i} + \sum_{j=1}^{k} \alpha_j \Delta x_{t-j} + \sum_{\ell=1}^{k} \alpha_\ell \Delta h_{t-\ell} + \sum_{s=1}^{k} \alpha_s \Delta z_{t-s} + \gamma_1 ecm_{t-1} + \varepsilon_{1t} \tag{1}$$

$$\Delta x_t = b_0 + \sum_{i=1}^{k} \beta_i \Delta y_{t-i} + \sum_{j=1}^{k} \beta_j \Delta x_{t-j} + \sum_{\ell=1}^{k} \beta_\ell \Delta h_{t-\ell} + \sum_{s=1}^{k} \beta_s \Delta z_{t-s} + \gamma_2 ecm_{t-1} + \varepsilon_{2t} \tag{2}$$

$$\Delta h_t = c_0 + \sum_{i=1}^{k} \varphi_i \Delta y_{t-i} + \sum_{j=1}^{k} \varphi_j \Delta x_{t-j} + \sum_{\ell=1}^{k} \varphi_\ell \Delta h_{t-\ell} + \sum_{s=1}^{k} \varphi_s \Delta z_{t-s} + \gamma_3 ecm_{t-1} + \varepsilon_{3t} \tag{3}$$

$$\Delta z_t = d_0 + \sum_{i=1}^{k} \delta_i \Delta y_{t-i} + \sum_{j=1}^{k} \delta_j \Delta x_{t-j} + \sum_{\ell=1}^{k} \delta_\ell \Delta h_{t-\ell} + \sum_{s=1}^{k} \delta_s \Delta z_{t-s} + \gamma_4 ecm_{t-1} + \varepsilon_{4t} \tag{4}$$

where ecm_{t-1} is the lagged residual from the cointegration between y_t (say, crime rate) and x_t (real income) h_t (financial wealth) and z_t (lending rate) in level. Granger (1988) points out that based on equation (1), the null hypothesis that x_t, h_t and z_t does not Granger cause y_t is rejected not only if the coefficients on the x_{t-j}, $h_{t-\ell}$ and z_{t-s} are jointly significantly different from zero, but also if the coefficient on ecm_{t-1} is significant. The VECM also provides for the finding that x_{t-j}, $h_{t-\ell}$ and z_{t-s} Granger cause y_t, if ecm_{t-1} is significant even though the coefficients on x_{t-j}, $h_{t-\ell}$ and z_{t-s} are not jointly significantly different from zero. Furthermore, the importance of α's, β's, φ's and δ's represent the short-run causal impact, while γ's gives the long-run impact. In determining whether y_t Granger cause x_t, the same principle applies with respect to equation (2). Above all, the significance of the error-correction term indicates cointegration, and the negative value for γ's suggest that the model is stable and any deviation from equilibrium will be corrected in the long-run.

However, before we estimate a VECM, we test for cointegration between the variables under investigation that is we check whether there is long-run relationship between them. To determine the long-run relationship between crime and the macro-financial economic variables mentioned above, namely; real GDP per capita, financial wealth and lending rate, we employ the Johansen (1988) and Johansen and Juselius (1990) multivariate maximum likelihood estimation procedure. Detailed exposition on the Johansen-Juselius technique has been provided in Dickey *et al*. (1991), Cuthbertson *et al*. (1992) and Charemza and Deadman (1992). However, a brief discussion on the Johansen-Juselius technique is provided below. We begin with by defining a *k*-lag vector autoregressive (VAR) representation

$$X_t = \alpha + \Pi_1 X_{t-1} + \Pi_2 X_{t-2} + \ldots + \Pi_k X_{t-k} + \nu_t \quad (t=1, 2,\ldots,T) \tag{5}$$

where X_t is a $px1$ vector of non-stationary $I(1)$ variables, α is a $px1$ vector of constant terms, $\Pi_1, \Pi_2 \ldots \Pi_k$ are pxq coefficient matrices and ν_t is a $px1$ vector of white Gaussian noises with mean zero and finite variance. Equation (5) can be reparameterised as

$$\Delta X_t = \alpha + \Gamma_1 \Delta X_{t-1} + \Gamma_2 \Delta X_{t-2} + \ldots + \Gamma_{k-1} \Delta X_{t-k+1} + \Pi_k X_{t-k} + \nu_t \tag{6}$$

where $\Gamma_i = -I + \Pi_1 + \Pi_2 + \ldots + \Pi_i \qquad (i=1, 2,\ldots k-1)$

and Π is defined as

$$\Pi = -I + \Pi_1 + \Pi_2 + \ldots + \Pi_k. \tag{7}$$

Johansen (1988) shows that the coefficient matrix Π_k contains the essential information about the cointegrating or equilibrium relationship between the variables in the data set. Specifically, the rank of the matrix Π_k indicates the number of cointegrating relationships existing between the variables in X_t. In this study, for a two case variables, X_t = (crime rate and unemployment) and so $p=2$. Therefore, then the hypothesis of cointegration between crime rate and unemployment is equivalent to the hypothesis that the rank of $\Pi_k = 1$. In other words, the rank r must be at most equal to $p-1$, so that $r \leq p-1$, and there are $p-r$ common stochastic trends. If the $r=0$, then there are no cointegrating vectors and there are p stochastic trends.

The Johansen-Juselius procedure begins with the following least square estimating regressions

$$\Delta X_t = \alpha_1 + \sum_{i=1}^{p-1} \Gamma_i \Delta X_{t-i} + \omega_{1t} \tag{8}$$

$$X_{t-p} = \alpha_2 + \sum_{i=1}^{p-1} \Gamma_i \Delta X_{t-i} + \omega_{2t} \tag{9}$$

Define the product moment matrices of the residuals as $S_{ij} = T^{-1} \sum_{t=1}^{T} \varpi_{it} \varpi_{jt}$ (for $i,j=1,2$), Johansen (1988) shows that the likelihood ratio test statistic for the hypothesis of at most r equilibrium relationships is given by

$$-2lnQ_r = -T \sum_{i=r+1}^{p} ln(1-\lambda_i) \tag{10}$$

where $\lambda_1 > \lambda_2 > \ldots \lambda_p$ are the eigenvalues that solve the following equation

$$/\lambda S_{22}\text{-}S_{21}S_{11}{}'S_{12}/=0. \tag{11}$$

The eigenvalue are also called the squared canonical correlations of ω_{2t} with respect to ω_{1t}. The limiting distribution of the $-2lnQ_r$ statistic is given in terms of a $p\text{-}r$ dimensional Brownian motion process, and the quantiles of the distribution are tabulated in Johansen and Juselius (1990) for $p\text{-}r=1,...,5$ and in Osterwald-Lenum (1992) for $p\text{-}r=1,...10$.

Equation (10) is usually referred to as the trace test statistic which is rewritten as follows

$$L_{trace} = -T\sum_{i=r+1}^{p} \ ln(1\text{-}\lambda_i) \tag{12}$$

where $\lambda_{r+1},...\lambda_p$ are the $p\text{-}r$ smallest squared canonical correlation or eigenvalue. The null hypothesis is at most r cointegrating vectors. The other test for cointegration is the maximal eigenvalue test based on the following statistic

$$L_{max} = -T.ln(1\text{-}\lambda_{r+1}) \tag{13}$$

where λ_{r+1} is the $(r+t)^{th}$ largest squared canonical correlation or eigenvalue. The null hypothesis is r cointegrating vectors, against the alternative of $r+1$ cointegrating vectors. Comparing the two tests, Johansen and Juselius (1990) indicate that the trace test may lack power relative to the maximal eigenvalue test which will produce clearer results.

Sources of Data

Data on crime and their subcategories for the period 1973 to 2003 are collected from the Royal Police of Malaysia (PDRM). The total crime activities are classified into 12 categories: murder, attempted murder, armed robbery, robbery, rape and assault (these comprise the violent crime); daylight burglary, night burglary, lorry-van theft, car theft, motorcycle theft and larceny (comprises the property crime).

For the macro-financial economic variables, we used real GDP per capita and real GNP per capita to proxy for economic growth. Financial wealth is proxy by the monetization ratio computed as the ratio of money supply M2 and GDP. To proxy for monetary policy, we used the bank lending rate. All data series were collected from various issues of the International Financial Statistics published by the International Monetary Fund.

IV. THE EMPIRICAL RESULTS

Before testing for cointegration by using the Johansen-Juselius procedure and subsequently estimate a VECM, we test for the order of integration of all categories of crime variables and the macro-financial economic variables. Table 2 show the results of the unit root test for the test of the order of integration of the economic time series under investigation. Clearly the augmented Dickey-Fuller test (Dickey and Fuller, 1976) statistics indicate that property crime rate and the three macro-financial economic series in Malaysia are difference stationary, in other words, they are I(1) in levels.

Having noted that all series are of the same order of integration, we run the cointegration test following the procedure provide by Johansen and Juselius (1990). These results are tabulated in Table 3. The null hypothesis of no cointegration cannot be rejected in both all cases (real GDP and real GNP) using the lambda-max statistics at the one percent significance level. The cointegrating regressions result suggest that for the long-run equation, real income per capita indicate negative relationship with property crime in Malaysia. On the other hand, the long-run relationship between financial wealth and monetary policy and criminal activity in Malaysia is positively related.

In our analysis, we further explore the long-run relationships between the four variables employing the vector-error correction model. According to the 'Granger Representation Theorem' not only does cointegration imply the existence of an error-correction model but also the converse applies, that is, the existence of an error-correction model implies cointegration of the variables. Furthermore, the VECM framework is found to be more robust than the Johansen-Juselius multivariate cointegration procedures in small sample.

The results of estimating equations (1) through (4) are presented in Table 4. In our study, we attempt to determine whether property crime and the macro-financial economic variables in Malaysia are related and when these variables are related or exhibit long-run relationship, we would expect the estimated parameters of the error-correction terms in equations (1) through (4) are significant and show negative sign. Generally, the results in Table 4 indicate that property crime and the macro-financial economic variables are cointegrated. In all cases, at least two error-correction terms are statistically significant at the 5 percent level in the four variable VAR systems. In other words, all these macro-financial variables are bound together by the long-run relationship.

From the VECM results in Table 4, we can infer that the short-run and long-run casual effect between the variables. The significance of the error-correction term with negative sign signifies that property crime Granger cause real income per capita and lending rate in the long-run in Malaysia, however, in the short-run, all four variables are not related. Thus, one important outcome from this result is that property crime is exogenous both in the short-run as well as in the long-run. In other words, criminal activity related to property losses in Malaysia is not fully explained by the macro-financial variables incorporated, thus, other potential socio-economic variables need further research.

Nevertheless, on the contrary, our variance decomposition results shown in Table 5 support the impact of economic growth on property crime. A substantial portion of the variance of property crime rate is explained by their own innovations (or shock) in the short-run (say, at five-year horizon). However, gradually in the long-run (say, 10-year to 20-year horizon), shocks in other variables, in particular real income explain about 30% to 40% of the shock in the property crime rate.

V. CONCLUSION

This study considered a macro-financial economic variables model for the property crime in Malaysia. In this study we utilized the vector-error-correction model framework to account for the stationarity of the economic time series being investigated in order to avoid what the econometrician term as 'spurious regression problem.' The study covers annual data for the period 1973 to 2003, and the three macro-financial economic variables employed are real income per capita (we used both real GDP per capita and real GNP per capita), financial wealth (ratio of M2 to GDP) and the lending rate to proxy for monetary policy.

The results tend to suggest that property crime and the three macro-financial economic variables are cointegrated. The presence of cointegration between these variables tends to suggest that these macro-financial economic variables are bound together by common trends or long-run relationships. According to Masih and Masih (1996), although these cointegrated variables will have short-run or transitory deviations (or departures) from their long-run common trends, eventually forces will be set in motion which will drive them together again. In other words, the evidence of cointegration tends to suggest that although, in the short-run, one or two determinants may not be related to crime in a temporal causal relationship, in the long-run it is the dynamic interaction of all these variables with which each category of crime is ultimately 'causally' related.

Our vector-error-correction model and the variance decomposition results suggest that the property crime rate in Malaysia cannot be explained properly by the macro-financial economic variables. In general, this study indicates that criminal activity related to property losses in Malaysia cannot be fully explained by real income per capita, financial wealth and monetary policy. But probably, other economics and non-economic factors omitted from this study could appropriately explain better the criminal (related to property crime) behaviour in Malaysia. Nevertheless, given the short sample nature of this study, our results should be viewed with cautious.

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Table 2: Results of ADF unit root test

Economic variables	Level (Intercept and Trend)	First difference (Intercept and Trend)
Property Crime (property)	-2.06 [0.54]	-4.02 [0.01]*
Real GDP per capita (rgdp)	-2.60 [0.28]	-5.05 [0.00]*
Real GNP per capita (rgnp)	-2.63 [0.26]	-4.99 [0.00]*
Financial wealth (fw)	-3.31 [0.08]	-6.08 [0.00]*
Lending rate (i)	-1.96 [0.59]	-5.37 [0.00]*

Notes: All unit root estimations were done using Eviews5.1. Eviews5.1 automatically select lag based on SIC as default and were used throughout the analysis. The square brackets, [.].contain the *p-values*. Asterisk (*) denotes significance at 5% level. Critical values for unit root test are referred to MacKinnon (1996).

Table 3: Results of Johansen-Juselius multivariate cointegration test

Property Crime	**Null hypothesis**	**Trace-statistics**	**λMax-statistics**	**C.V. at 1% level Trace/λMax**
(a). log(property) = 53.269 – 12.371 log(rgdp) + 18.638 log(fw) + 5.0311 log(i)				
	$r = 0$ [≥ 1]	60.55*	28.98	54.46/32.24
	$r \leq 1$ [≥ 2]	31.56	23.25	35.65/25.52
	$r \leq 2$ [≥ 3]	8.31	8.30	20.04/18.63
	$r \leq 3$ [$= 4$]	0.00	0.00	6.65/6.65
(b). log(property) = 22.415 – 3.5837 log(rgnp) + 4.5315 log(fw) + 0.0070 log(i)				
	$r = 0$ [≥ 1]	62.76*	28.07	54.46/32.24
	$r \leq 1$ [≥ 2]	34.69	26.05	35.65/25.52
	$r \leq 2$ [≥ 3]	8.63	8.56	20.04/18.63
	$r \leq 3$ [$= 4$]	0.07	0.07	6.65/6.65

Notes: Asterisk (*) denotes statistically significant from zero at the 1% level.

Table 4: Temporal causality results based on vector-error correction model (VECM)

Property crime	**Financial economic variables:**				
	$\Delta property$	$\Delta rgdp$	Δfw	Δi	ecm_{t-1}
(a). With rgdp	*F-statistics (Significance levels)*				*t-statistics*
$\Delta property$	-	0.45	0.47	0.11	-0.09
$\Delta rgdp$	0.85	-	0.84	0.87	-3.07*
Δfw	0.65	0.60	-	0.31	-0.03
Δi	0.20	0.53	0.31	-	-2.37*
(b). With rgnp	$\Delta property$	$\Delta rgnp$	Δfw	Δi	ecm_{t-1}
$\Delta property$	-	0.43	0.44	0.12	-0.04
$\Delta rgnp$	0.77	-	0.84	0.49	-3.59*
Δfw	0.73	0.68	-	0.28	0.47
Δi	0.21	0.36	0.47	-	-2.18*

Notes: The VAR was based on a 1-year lag structure and a constant. Asterisk (*) indicates significance at the 5% level.

Table 5: Results of variance decomposition

	Percentage of forecast variance explained by innovations in:			
	$\Delta property$	$\Delta rgdp$	Δfw	Δi
1	100.00	0.00	0.00	0.00
2	96.20	1.55	0.05	2.18
3	92.50	5.26	0.03	2.18
4	87.25	10.94	0.05	1.74
5	80.55	17.66	0.08	1.39
10	65.07	33.92	0.10	0.90
20	58.56	40.76	0.10	0.57
	$\Delta property$	$\Delta rgnp$	Δfw	Δi
1	100.00	0.00	0.00	0.00
2	96.90	1.11	0.07	1.90
3	94.23	4.01	0.05	1.66
4	89.68	8.96	0.05	1.29
5	83.75	14.94	0.07	1.21
10	68.45	29.76	0.06	1.71
20	62.16	36.06	0.06	1.70

Notes: Figures in the first column refer to horizons (i.e. number of years).

Table 1: Descriptive statistics on criminal activities in Malaysia, 1973-2003

Crime category	Average number of cases			Average growth rates in crime cases in percentage			Average share of criminal activities to total crime		
	1973-82	1983-92	1993-2003	1974-82	1983-92	1993-2003	1973-82	1983-92	1993-2003
Crime:	62638	77262	127550	6.4	1.2	8.2	100	100	100
Violent:	6023	10102	17065	10.1	4.1	8.1	9.49	13.10	13.45
Murder	240	348	514	4.0	7.2	3.2	0.39	0.46	0.42
Attempted murder	64	45	55	4.5	4.2	12.2	0.10	0.06	0.05
Armed robbery	503	817	687	12.6	3.8	-1.9	0.81	1.05	0.61
Robbery	3220	5758	10179	14.6	4.0	10.5	5.01	7.42	7.81
Rape	324	607	1258	8.2	5.5	6.9	0.52	0.80	1.03
Assault	1673	2526	4372	6.4	4.3	5.8	2.66	3.31	3.53
Property:	56616	67160	110485	6.1	0.8	8.2	90.51	86.90	86.55
Daylight Burglary	3634	4445	7062	8.6	3.2	4.9	5.69	5.79	5.76
Night Burglary	12395	16711	20331	10.8	0.5	3.7	19.57	21.58	16.83
Lorry-van theft	167	576	2781	16.4	16.6	18.2	0.26	0.77	2.04
Car theft	1168	2918	5243	15.5	6.1	11.4	1.83	3.77	3.95
Motorcycle theft	5342	11635	32696	15.2	4.4	15.4	8.37	14.99	24.49
Larceny	33911	30876	42372	2.9	-0.7	6.0	54.78	40.00	33.49

Notes: Authors' calculation.