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Crime and European Labour Market Policy

by

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Abstract

In this paper we investigate the effects of labour market policy on several types of criminal offences for fifteen European countries. The main results are the following: Firstly, the results change markedly if we control for unobserved heterogeneity. In the context of criminal offences the estimates seem to be reliable only if we apply fixed effects instead of simple pool specifications. Secondly, the effects of labour market policy vary considerably with respect to the different types of criminal offences and cannot be subdivided into unambiguous effects on property crimes and violent crimes, respectively. Thirdly, the proxy variables for labour market policy we consider have different importance with respect to their effect on criminal offences. Benefit replacement rate, benefit duration, and average years of schooling seem to be important, whereas active labour market policy appears not to be linked to crime. The combination of a shorter benefit duration and higher replacement rate, like in the Nordic countries, seems to be a "crime reducing" combination.

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JEL classification: J64, H31, K42, J22

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1. Introduction

Since Becker's (1968) seminal work on the unemployment-crime relationship numerous contributions on that theme have been published. It has become increasingly clear that unemployment and crime relate to each other. In recent years a series of studies has investigated the link between unemployment and labour market institutions.[1] Some of theses institutions could have an indirect effect on crime via the unemployment rate as well as a direct effect. Examples are benefit duration, benefit replacement rate, and active labour market policy. The change in global trade and production technology has an extensive influence on the long-run perspective of less skilled people on the labour market. Furthermore, it is well known that the criminal activity is higher for the less skilled (Freeman (1995)). Hence, the increase of the average skill level of an economy is an important duty of the long-run labour market policy. In the broader sense we can combine these variables as indicators of labour market policy. It has often been argued that an increase in benefit duration and benefit replacement rate increase unemployment. For active labour market policy the results are ambiguous, however, some more recent studies find unemployment reducing effects in the long run.[2] Even if this is true they could reduce criminal offences via the direct effect. It is therefore important to analyse this link, which has not been studied so far.

The aim of this paper is to analyse the direct effects of labour market institutions and the average skill level on crime for fifteen European countries. There are two reasons why an extensive labour market policy could reduce crime. Firstly, if labour market policy reduces unemployment, it reduces crime via the unemployment-crime relationship. Secondly, active labour market policy could prevent individuals from criminal offences. Thirdly, a higher replacement rate and longer benefit durations respectively could reduce crime. In this case the unemployed benefit is a substitute for illegal income from crime. Fourthly, if we understand labour market policy in the broader sense and consider schooling as a long term labour market policy, an increase of the skill level in the economy could reduce the liability to criminal activities. Additionally to different proxy variables for labour market policy thought has been given to other variables that have an impact on crime, like income, share of foreigners, share of long term unemployed, the employment population ratio and the unemployment rate. Demographic aspects are also taken into account.

The main results are the following: Firstly, the results change markedly if we control for unobserved heterogeneity. In the context of criminal offences the estimates seem to be reliable only, if we apply fixed effects instead of simple pool specifications. Secondly, the effects of labour market policy vary considerably with respect to the different types of criminal offences and cannot be subdivided into unambiguous effects on property crimes and violent crimes, respectively. Thirdly,

[1] See, for example, Belot and van Ours (2000), Blanchard and Wolfers (2000) and Nickell et al. (2002, 2005).

[2] See, for example, Lechner et al. (2005).

the proxy variables for labour market policy we consider have different importance with respect to their effect on criminal offences. Benefit replacement rate has in most of the cases a negative effect on the different criminal offences. The effect of benefit duration is mixed. In some cases it increases (e.g. robbery and drug offences) and in other cases it decreases (e.g. intentional homicide and theft) criminal activity. The combination of a shorter benefit duration and higher replacement rate, like in the Nordic countries, seems to be a "crime reducing" combination. Active labour market policy has no significant effects over-all, but in some cases it seems to reduce the addiction to crime. Finally, average years of schooling have a negative effect on intentional homicide and theft, but a positive effect on robbery and drug offences.

The paper is organized as follows. In section 2 we use a simple theoretical model to motivate the econometric approach. Section 3 describes the data and section 4 the econometric models. Section 5 reports the estimation results and section 6 concludes.

2. Theoretical Framework

In this section we provide some theoretical consideration to motivate the econometric model in section 4. As Grogger (1998) points out, most of the persons who spend time for committing crime also work on the labour market. Therefore, each individual not only choose between income (I) and leisure (L) but also between hours for committing crime (H_C) and hours for legal work (H_M). The utility function (U) increases with decreasing rates in both income and leisure, as usual:[3]

$$\max U(I, L) \tag{1}$$

Income consists of labour income (wH_M), returns to crime $(r(H_C))$, and non-labour income (G). The returns to crime are concave, that is, the more crimes the individual commits, the less remunerative is each additional crime.[4]

$$I = wH_M + r(H_C) + G \tag{2}$$

Leisure is defined as time available (T) minus hours spend for legal work and committing crime:

$$L = T - H_M - H_C \tag{3}$$

[3] The following model is based on the work of Gronau (1977) and Grogger (1998). Because a formal discussion of the model is already made by these sources, we do not repeat this here.

[4] Recall that if the returns to crime were linear, the optimally conditions imply a corner solution. See, for example, Ehrlich (1973) for a formal discussion.

The individual will choose to commit crime (and reduce working time and/or leisure), if crime pays higher wages. The gap between $r(H_C)$ and wH_M increases with the probability (p) of being apprehended. In this case the individual has to be in for a punishment (S).

$$(1-p)r(H_C) - pS > wH_M \tag{4}$$

Equation (4) shows that the chance of being caught affects the decision to commit crime. Moreover, crime will be reduced if the punishment increases and/or the opportunities of legal work increase.

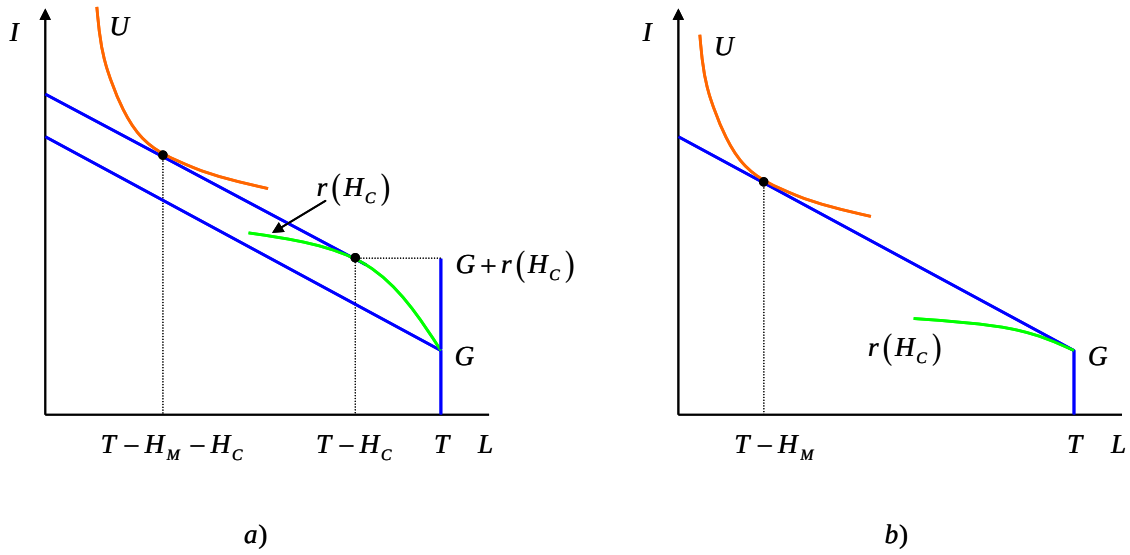

Figure 1: Returns to Crime

In figure 1 we can see two simple solutions. In case a) the individual commits crime as long as the marginal returns to crime are equal to the market wage, provided that the punishment is very low. In case b) the individual does not commit crime as long as $S > 0$, because the marginal returns to crime of the first hour do not exceed the market wage. A decrease in the market wage would increase H_C in both cases.

In this simple framework an increase in active labour market policy could reduce criminal offences because individuals have less time for criminal activities, it helps to improve legal income opportunities (thus increase risk of crime), and helps to realise that crime is bad. The hours for committing crime could be reduced to zero, at best. On the other hand it probably increases criminal offences, due to low income opportunities and a decrease in risk of crime (no severe punishment).

If the individual becomes unemployed it receives benefit replacement rate (B). In case a) of the following figure 2 the individual receives B and commits crime. As long as it receives the replacement rate it reaches the utility U_2 (X). It can reach the same utility level, if the individual

pass on the replacement rate and chooses legal work as well as commits crime (Y); and if the individual decides to work legally only, it reaches U_1 (Z). If the individual will be apprehended the punishment could also result in lower legal income, e.g. due to a criminal conviction, in contrast to a constant replacement rate. Furthermore, an increase in the benefit replacement rate could increase the reservation wage, too. In this case there is more time to commit crime and this could increase the number of criminal offences likewise. We could argue in a similar manner, if the benefit duration increases. Therefore, higher benefit replacement rates and longer benefit durations could lead to an increase in committing crime.

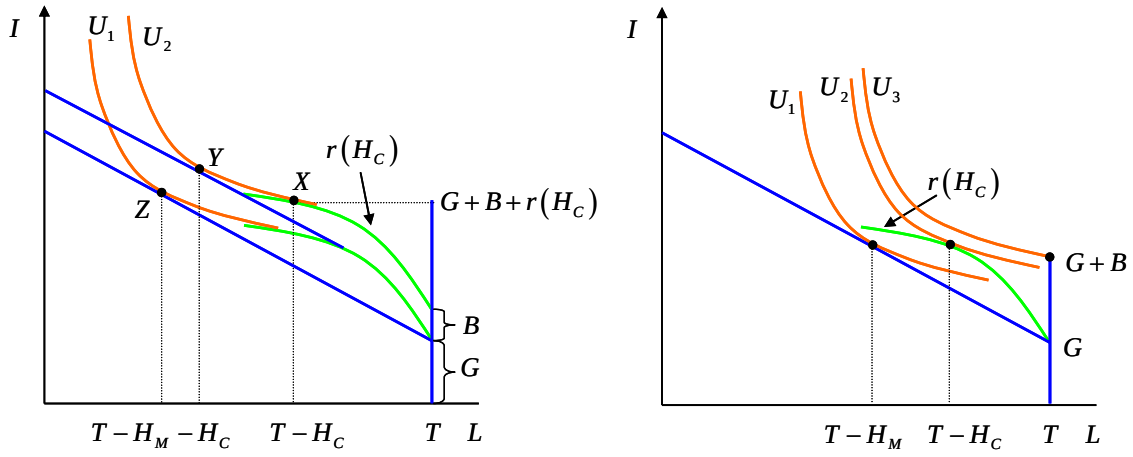

Figure 2: Benefit and Returns to Crime

On the other hand, higher benefit replacement rates and longer benefit durations could lead to a decrease in committing crime, if the individual reaches a higher utility level, as in case 2b). In this case the standard of living or life satisfaction and not the utility maximisation drive the decision to commit crime. From this it follows, that a decrease in the benefit replacement rate and/or benefit duration could lead to an increase in criminal activity.

If the individuals have different skill levels, they receive different wages from legal work. In Figure 3a) the high skilled wage w_h exceeds the marginal returns to crime, whereas the low skilled wage w_l exceeds the marginal returns to crime only after a few hours of committing crime.[5] Therefore, it may be expected that the decision to commit crime decreases with the skill level and labour income respectively.

If the punishment leads to a reduction of labour income, S is higher for the high skilled. This reduces the net returns to crime (R) with an increasing skill level (θ), if we take S into account:

[5] Most studies of criminal income come to the conclusion that the share of legal income is lower for the low skilled. See Freeman (1999) for a discussion of that point.

$$R\left(H_C, S(\theta)\right) = \left((1-p)r\left(H_C\right) - pS(\theta)\right) \tag{5}$$

For the individual income it follows:

$$I = wH_M + R\left(H_C, S(\theta)\right) + G \tag{6}$$

The consequences are diagrammed in figure 3b). The low skilled could increase his utility level (U_l), if he commits crime.[6] The high skilled does not commit crime if he takes the consequences for his labour income into account. From this it follows that an increase in the average years of schooling could reduce criminal offences because with an increase in the skill level the criminal energy decreases and higher income increases the risks of crime.[7] The opposite effect is possible if the high skilled commit a more intelligent kind of crime.

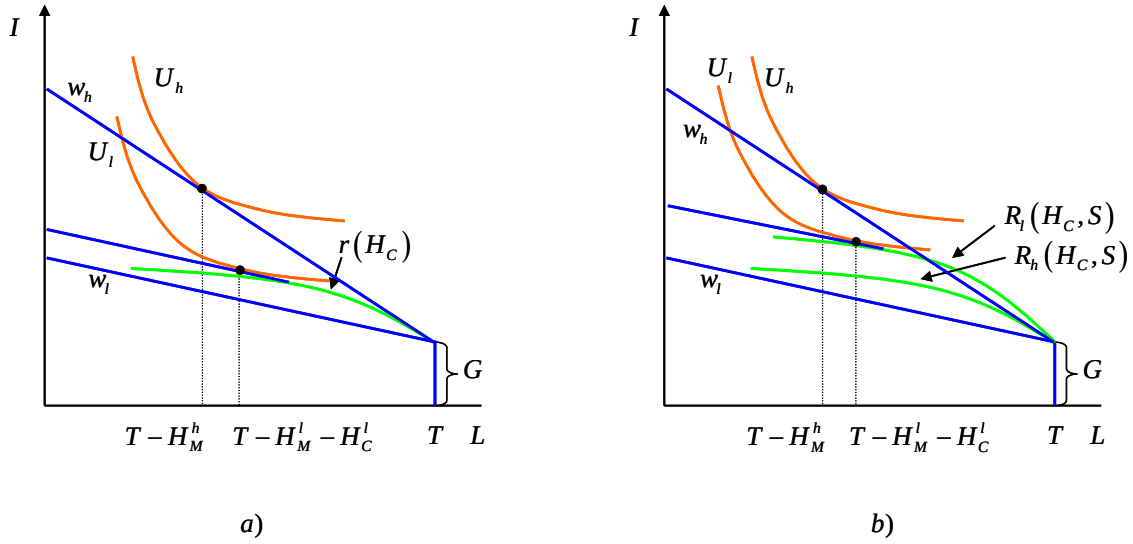

Figure 3: Skills and Returns to Crime

In the econometric part of this paper we don't estimate this model, since we are not dealing with micro data. As it is the aim of this paper to analyse a set of European countries, we can only fall back on the macro level. However, the theoretical implications discussed above will help to understand the estimates discussed in section 5.

3. The Data

The countries considered are: Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and United Kingdom. The criminal offences considered are intentional homicide, assault, rape, robbery, theft, and drug offences. All data are taken from the European sourcebook of crime and criminal justice statistics

[6] Gould et al. (1998) find a strong relation between crime and the legal wage paid.

[7] Freeman (1995) finds a significant negative impact of schooling on the share of income from illegal sources.

(1999, 2003) and correspond to offences known to the police. The data are provided in offences per 100,000 of population.[8]

The explanatory variables are benefit duration, benefit replacement rate, active labour market policy, average years of schooling, real compensation per hour worked, share of foreigners, employment population ratio, unemployment rate, and the share of long term unemployed. The data for benefit duration and replacement rate are taken from Nickell and Nunciata (2002) and Baker et al. (2003). Average years of schooling and the real compensation per hour worked are taken from Osberg and Sharpe (2003). The data for share of foreigners, employment population ratio, and the unemployment rate are taken from the OECD online database. The data for the share of long term unemployed are taken from various issues of the employment outlook (OECD) and the data for active labour market policy are taken from Baker et al. (2002).

The additional variables are more or less common determinants of criminal offences and their effects based on the following theoretical considerations:[9]

- *Compensation per hour worked*: An increase in the legal income increases life satisfaction and/or the risk of crime; but if, in the latter case, the returns to crime increase, as well, the opposite effect is also possible.[10]
- *Share of foreigners*: An increase of the share of foreigners could reduce criminal offences due to the risk of losing the residence permit and the tendency to foreigner ghettos (less official offences). It could increase criminal offences if the foreigners have another moral concept or greater economic incentive.
- *Employment population ratio*: An increase in the employment population ratio could reduce criminal offences if the probability of legal income increases, but increase them, if the returns to crime increase due to an increase in the share of employed to unemployed. Another explanation for a positive effect is the lifestyle theory (Cohen and Felson (1979)). In this case the criminal offences are explained by means of opportunities, which are higher for employed than for unemployed.
- *Unemployment rate*: An increase in the unemployment rate could increase criminal offences because it decreases the living standard and increases frustration, respectively. Criminal of-

[8] To keep the estimated parameters of the linear models about the same size, assault, robbery, and drug trafficking are additionally divided by 100 and theft and drug offences are divided by 1000. In the log-linear model this concerns only the constant.

[9] Entorf and Spengler (2002) provide an extensive discussion of the above mentioned and other explanatory variables.

[10] See, for example, Freeman (1999) for a more detailed discussion of this point.

fences could decrease if the share of unemployed woman (who control criminal men) increase and the returns to crime decrease due to a decrease in the share of employed to unemployed.[11]

- *Share of long-term unemployment*: The arguments for this variable are the same as fur the unemployment rate. Additionally, this variable could increase the over-all effect of the unemployed, if the long-term unemployed have a higher criminal twist.

To account for demographic aspects the share of long term unemployed, the employment population ratio, and the unemployment rate is separated into different age cohorts and sex. The following table comprises all variables used and their abbreviations.

Table 1: Variables and abbreviations

Variables	Abbreviations
benefit duration	bd
benefit replacement rate	brr
active labour market policy	alp
average years of schooling	ays
compensation per hour worked in 1995 US dollars	chw
share of foreigners	sof
employment population ratio	ep
standardised unemployment rate	u
share of unemployed 1 year and more	slu
ep, 15-19 years	ep1519
ep, 15-19 years, man	ep1519m
ep, 15-19 years, woman	ep1519w
ep, 15-24 years	ep1524
ep, 15-24 years, man	ep1524m
ep, 15-24 years, woman	ep1524w
ep, 25-64 years	ep2564
ep, 25-64 years, man	ep2564m
ep, 25-64 years, woman	ep2564w
ep, total, man	eptom
ep, total, woman	eptow
u, 15-19, both sex	u1519
u, 15-19, man	u1519m
u, 15-19, woman	u1519w
u, 15-24, both sex	u1524
u, 15-24, man	u1524m
u, 15-24, woman	u1524w
u, 15-64, both sex	u1564
u, 25-64, both sex	u2564
u, 25-64, man	u2564m
u, 25-64, woman	u2564w
slu, 15-24 years, both sex	slu1524
slu, 25-54 years, both sex	slu2554
slu, 25-54 years, man	slu2554m
slu, 25-54 years, woman	slu2554w

[11] Cantor and Land (1985) argue that there are two effects. If unemployment increases due to economic slowdown, the employment/population ratio decreases. The newly unemployed now watch their property, implying less scope for burgle. If unemployment is negative (positive) related to criminal offences, the watching (unemployment) effect dominates. Weatherburn (2002) points out, that these two effects are a potential reason, why the over-all effect may be non-significant.

4. The Econometric Model

The crime statistics only report data for the period 1990 to 2000. Thus, only panel estimates are possible. An unbalanced panel is used due to the fact that not all variables are available for the whole time period. If *C* is the offence and *X* a vector of explanatory variables, the usual panel model is:

$$C_{it} = \alpha + \alpha_i + \alpha_t + \sum_j \beta_j X_{jit} + \varepsilon_{it} \qquad (7)$$

The subscript *i* (*j*) stand for the different countries (explanatory variables). The parameters α_i and α_t are the fixed and time effects, respectively. Random effects don't seem to be appropriate in case of cross-country macro data, which is confirmed by the application of the Hausman test. Furthermore, time effects dropped out of the equation, since they don't improve the estimates. All estimates are based on unbalanced panels in order to increase the sample size. In consequence of the unbalanced panel we cannot use a GLS estimator to control for heteroscedasticity and autocorrelation. Therefore, White-robust covariances are used to get reliable estimates of the standard deviations. To improve the estimates additionally, all variables whose parameters have a p-value higher than 0.3 (approximately t-statistic = 1) are dropped out of the equation, due to there insufficient explanatory power.[12] However, if we control for different demographic aspects, the respective parameters will always be shown.

In contrast to micro data, several macro studies find no statistically significant causal relation between crime and unemployment in either direction for aggregated data.[13] Furthermore, it seems implausible that labour market policy and crime have a bivariate causal relation. On this account we use OLS instead of an IV estimator.

For each of the offences we estimate 16 equations. The first one does not contain demographic control variables, whereas the following ones control for demographic aspects of the employment population ratio, the unemployment rate, and the share of long term unemployed.[14] Additionally, each equation is estimated with and without fixed effects, in order to demonstrate that some parameters change dramatically. Finally, a linear and a log-linear specification will be estimated.[15]

In principle we have two specifications and each equation contains a set of explanatory variables (k) equal to or less than the available set of regressors (J):

[12] See Entorf and Spengler (2002) for a similar procedure.

[13] See, for example, Raphael and Winter-Ebmer (2001) and Entorf and Spengler (2002) for a more detailed discussion.

[14] Due to the problem of multicollinearity within the three demographic control groups, only the variables with the best fit of each group will be considered.

[15] These two specifications are used most frequently in the literature on the relation of unemployment and crime.

$$C_{it} = \alpha + \alpha_i + \sum_{j}^{k} \beta_j X_{jit} + \varepsilon_{it} \qquad \text{with } k \leq J \tag{8}$$

$$C_{it} = \alpha + \sum_{j}^{k} \beta_j X_{jit} + \varepsilon_{it} \qquad \text{with } k \leq J \tag{9}$$

Given that only eleven years of data are available, tests for orders of integration are inappropriate.

5. Results

While theoretical models come to the conclusion that higher unemployment leads to an increase in criminal offence, the empirical results are contradictory.[16] On reason lies in the heterogeneity of crime. While the relationship is clear between unemployment and theft, it is less clear between unemployment and assault. Another reason is the variable unemployment herself. If aggregate data are used it seems to be important that unemployment is differentiated with respect to age, sex, and the spell of unemployment. By the same token we differentiate the employment population ratio with respect to age and sex. The effects of the other variables change with respect to the sign across the different kinds of crime. On this account we discuss each criminal offence separately.

The results for total intentional homicide are presented in Table 2. With respect to the log-linear specification benefit duration has a negative but non-significant effect or no effect if we control for fixed effects. Without fixed effects the respective parameter is positive and significant. The estimates for benefit replacement rate are similar with respect to the consideration of fixed effects, but the significance level is higher for the negative effects and lower for the positive ones. The results for benefit duration in the linear specification are similar with respect to the sign, but in this case the consideration of unobserved heterogeneity leads to significant negative effects. The benefit replacement rate does not seem to have a significant effect in the linear specification, if we consider unobserved heterogeneity. Due to the fact that fixed effects improve the equations noticeably, we have to conclude that a wilful neglect of unobserved heterogeneity results in a wrong interpretation of the impact of labour market institutions on intentional homicide.

[TABLE 2 ABOUR HERE]

Active labour market policy doesn't have a significant effect in the log-linear specification, but it does in the linear model. In the latter case we get significant negative effects, if we neglect fixed effects. If we consider unobserved heterogeneity, active labour market policy has no significant effect on intentional homicide. The results for average years of schooling are comparatively ro-

[16] See Chiricos (1987) for a review of 63 unemployment-crime studies and Entorf and Spenger (2002) for a discussion of more recent studies.

bust with respect to the neglect and consideration of fixed effects. All estimated parameters are significantly negative and agree with the theoretical considerations in section 2.

Regarding compensation per hour worked all estimated parameters without controlling for fixed effects are significantly negative. Interestingly, we receive no significant effect if we consider unobserved heterogeneity. With respect to the share of foreigners each specification results in a positive effect. Merely, the log-linear fixed effects specifications have a lower level of significance.

The employment population ratio has no significant effect in most of the pool estimates. If we control for unobserved heterogeneity the estimated parameters are mostly positive. The relevance of fixed effects will be abundantly clear if we focus on the employment population ratio of men between 25 and 64 years. In this case fixed effects change the sign and the significance of the parameter.

With respect to the relation between intentional homicide and unemployment we receive for the linear as well as for the log-linear specification two different results. Roughly speaking, if we consider unobserved heterogeneity the sign of the respective parameter will change from positive to negative in most cases. The cohort between 25 and 64 years illustrates this observation. In the log-linear specification the results are more distinct if we consider men only in this age cohort. The share of long term unemployed has a positive significant effect if we choose the pool specification. With respect to the fixed effects model the effects are positive in the log-linear specification, but non-significant in the linear model. If we control for the age cohort 25 to 54 years of women, the parameter will be negative especially in the linear specification.

The results for completed intentional homicide (excluding attempts) are presented in Table 3. The effect of benefit duration on completed intentional homicide is positive in the log linear equations. In the linear model the parameter will be negative, if we use fixed effects. However, the evidence is week. With respect to benefit replacement rate the estimates are negative in the log-linear specification. Again, in case of the linear model the results change, if we consider unobserved heterogeneity. In this specification the effect of the replacement rate is omitted due to low significance.

[TABLE 3 ABOUR HERE]

The results of the pooled estimates show a significant negative effect of an increase in the active labour market policy on completed intentional homicide. However, the results are not significant if we apply panel estimates. Average years of schooling have the expected negative effect and the results are comparatively robust across the different specifications.

An increase in the compensation per hour worked reduces completed intentional homicide in all pooled specifications. However, the effect turns out to be non-significant if we control for unob-

served heterogeneity. The share of foreigners significantly increases intentional homicide if we use the homogenous specification, whereas it does not if we use the log-linear fixed effects model.

With respect to the employment population ratio we obtain different results. All fixed effects estimates yield significant positive effects on completed intentional homicide. However, the results are significant negative in the pooled log-linear specification and non-significant in the pooled linear specification. This will be confirmed if we control for the age cohort 25 to 64 years of men.

Unemployment increases intentional homicide significantly if we apply fixed effects. The neglect of unobserved heterogeneity leads to different results. In the log-linear model the results are mixed whereas in the linear one they are not significant. If we control for the age cohort 15 to 64 years and 25 to 64 years of men the estimated effect is positive for any kind of specification. The share of long term unemployed has a positive effect on completed intentional homicide, if the pooled model will be applied. In the other case the estimated parameters are not significant. These results don't change if we control for the age cohort 25 to 54 years and 25 to 54 years of men.

Table 4 presents the estimates for assault. An increase in benefit duration has a positive influence on assault if the pool specification is applied. For the linear fixed effects model this is also true. With respect to benefit replacement rate most of the pooled estimates are significant negative. Again, for the linear fixed effects model this is true.

[TABLE 4 ABOUR HERE]

The results for active labour market policy are not clear cut. With respect to the model with a common constant for all countries the estimated effects are positive in the log-linear specification, but mixed and mostly non-significant in the linear one. If we consider unobserved heterogeneity, the evidence in the log-linear model is weakly positive, but weakly negative in the linear model. The results for average years of schooling are unambiguous for the linear model. All pooled (fixed effects) specifications give rise to significant negative (positive) effects. The results of the log-linear model are not as clear cut.

The compensation per hour worked does not have a significant effect, if unobserved heterogeneity is considered. Otherwise the estimated parameters are significant negative. The picture for the share of foreigners is nearly the same, but in this case the pooled estimates yield significant positive effects.

With respect to the employment population ratio the log-linear model does not seem to be appropriate. Whereas the linear pooled model yields significant positive effects, the fixed effects specification lead to weak negative results. The results change if we estimate the effects with the age cohort 25 to 64 years for men only. In this case any specification yields significant negative effects.

The results for the fixed effects estimates for the relation between unemployment and assault are significant negative, as expected. The panel specification leads to mixed results. Interestingly, the estimated effects are negative if we control for men with the age cohort 25 to 64 years in the employment population ratio, but positive if we control for men with the age cohort 25 to 54 years in the share of long term unemployed. Finally, the estimates for the share of long term unemployed are ambiguous. The results are positive if we choose the log-linear specification; however, the sign of the respective parameter depends on the consideration of heterogeneity for the linear model. Theses results don't change much if we control for the age cohort 25 to 54 years of men.

The results for robbery are presented in Table 5. One important finding is that all linear specifications yield poor estimates. Benefit duration seems to have a positive effect on robbery, but the estimates do not yield significant results with respect to benefit duration if we apply the log-linear fixed effects specification. The benefit replacement rate has a statistically weak negative effect if we use the fixed effects model.

[TABLE 5 ABOUR HERE]

The effect of active labour market policy is negative, but weak in the statistical sense. The log-linear pool specification of average years of schooling yield to significant negative effects. However, if unobserved heterogeneity is considered, the respective parameter is significant positive.

The effect of compensation per hour worked on robbery is significant negative in the pooled specifications. The fixed effects estimates give rise to non-significant parameters with a slight tendency to a positive effect. In the log-linear pooled specification an increase in the share of foreigners increases robbery. However, in the fixed effects specifications the respective parameter is negative but non-significant.

In the log-linear specification pooled estimates yield positive effects of the employment population ratio on robbery and to negative but non-significant effects (with one exception), if unobserved heterogeneity is considered. If we control for the age cohort 25 to 64 years of men, an increase in the employment population ratio reduces robbery.

Roughly speaking, an increase in the unemployment rate decreases robbery. This finding is independent of the specification. Interestingly, the estimated effect is positive, if we control for young women. The share of long term unemployed has a weak positive effect on robbery, if the pooled specification is chosen. However, if we control for unobserved heterogeneity, no statistically significant effect is estimated. The significance of the effect increases in the pooled model, if we control for the age cohort 25 to 54 years of men.

Table 6 presents the estimates for rape. We have to be very careful with respect to the interpretation of these estimates, particularly with regard to the unknown dark figure. The linear specifica-

tions for rape have no explanatory power. In the following we discuss only the results of the log-linear models. An increase of the benefit duration has a positive effect in the pooled specification, but no significant effect in the fixed effects models, if we control for specific cohorts of men. For the benefit replacement rate the results of the pooled models are positive likewise, but in most of the fixed effects specifications non-significant.

[TABLE 6 ABOUR HERE]

The pooled estimates for active labour market police yield positive effects, whereas the control for unobserved heterogeneity leads to a significant negative effect in only one case. Unlike the pooled estimates the fixed effects models yield the results that rape increases with the average skill level, as measured by average years of schooling.

An increase in the compensation per hour worked decreases significantly (non-significantly) rape, if we use the pooled (fixed effects) specification. The evidence that an increase in the share of foreigners increases rape is not reliable, due to the fact that unobserved heterogeneity is not considered.

The effect of the employment population ratio is positive in general but negative if we control for the age cohort 25 to 64 years of men in the pooled specification. However, it is not significant, if we control for unobserved heterogeneity. Unemployment seems to have a positive effect if we apply the pooled specification, but the effect is not significant in the fixed effects specification. The results for the share of long term unemployed are nearly the same as for the unemployment rate. The only difference is that the considered age cohort of men has no significant effect on rape.

The results for total theft are presented in Table 7. Benefit duration has a positive effect on theft in the pooled specification and a negative effect in the fixed effects models. Benefit replacement rate has a positive but mostly non-significant effect if we apply the log-linear pooled specification and no clear effect if we control for unobserved heterogeneity. With respect to the linear specification the fixed effects model yield to positive effects and the pooled specification lead to negative effects more often than not.

[TABLE 7 ABOUR HERE]

The effect of active labour market policy on theft is positive in the pooled specification but non significant, if we apply the fixed effects model. Theft decreases, if average years of schooling increases. This finding is robust across the different specifications.

The compensation per hour worked has a negative effect on theft in the pooled specification. If we control for unobserved heterogeneity this effect is statistically weak in the log-linear model and

non-significant in the linear specification. The share of foreigners has a positive but mostly non-significant effect in the pooled estimates and no effect in the fixed effects model.

Theft increases, if the employment population ratio increases. This effect is robust across the different specifications and increases, if we control for the age cohort 25 to 64 years of men. With respect to the unemployment rate most of the fixed effects estimates yield significant positive effects on theft. The significance decreases, if we apply the pooled specification. The results do not change, if we control for the age cohort 25 to 64 of men and both gender respectively. An increase in the share of long term unemployed increase theft only in the pooled specification. If we consider unobserved heterogeneity, we find no significant effect. If we control for the age cohort 25 to 54, the significance of the fixed effects estimates increases, but is still to low for a reliable conclusion.

Table 8 presents the estimates for burglary theft. The effect of benefit duration seems to be positive but not significant, if we apply the fixed effects model. With respect to benefit replacement rate the pooled estimates yield to positive effects. However, the fixed effects model leads to negative but non-significant results.

[TABLE 8 ABOUR HERE]

Active labour market policy reduces burglary theft if we apply the pooled specification. The significance of this effect is reduced markedly, if we control for unobserved heterogeneity. The results for average years of schooling are akin to active labour market policy. In contrast to the latter the fixed effects estimates for average years of schooling yield to positive as well as negative effects.

An increase in the compensation per hour worked reduces burglary theft in the pooled specification, but leads to statistically weak and unclear results if we apply the fixed effects model. The share of foreigners has only a positive effect on burglary theft if we use the pooled model. In the other case the effect is not significant, but appears to be negative.

The employment population ratio has an increasing effect on burglary theft in the pooled specification, but no significant effect in the fixed effects model. If we control for the age cohort 25 to 64 of men the estimates are negative. However, the significance is higher in the log-linear and fixed effects specifications.

The effect of the unemployment rate is predominantly negative in the pooled specification. If we consider unobserved heterogeneity the results are not clear cut. If we control for the age cohort 25 to 64 of men the estimated effect is negative (positive) in the pooled (fixed effects) specification. If we consider the younger age cohort 15 to 24 years of men, the significance reduces somewhat. The results for the share of long term unemployed are consistently significant. However, the fixed

effects model yields negative effects, whereas the pooled specification leads to positive effects. If we control for the age cohort 25 to 54 of mean, the estimated parameters increase in most of the cases.

The results for total drug offences are presented in Table 9. The effect of benefit duration on total drug offences is not clear cut if we apply the pooled specification. However, the effect is positive if we control for unobserved heterogeneity. If the benefit replacement rate increases the total drug offences decreases. This effect has a lower significance in the fixed effects model.

[TABLE 9 ABOUR HERE]

The effect of active labour market policy is non-significant in most of the cases, but the over-all effect appears to be negative. In the pooled specification the effect of average years of schooling is mixed, whereas the fixed effects specification yields significant positive effects.

With respect to the compensation per hour worked the effect on total drug offences is negative in most of the cases if we apply a pooled specification. However, there seems to be no statistically significant effect if we consider unobserved heterogeneity. If the share of foreigners increases, the total drug offences decrease, if we apply the fixed effects model. In the alternative specification the effect is not clear cut.

The effect of the employment population ratio is positive in the pooled specification and non-significant in the fixed effects variant. However, if we control for young man and women the estimated effects are negative in both specifications. The same is true, if we control for the age cohort 25 to 64 of men.

With respect to the unemployment rate the results are mixed in both specifications. If we control for the age cohort 15 to 25 the estimated effect is positive and significant. Furthermore, the significance decreases if we control for man only. The estimates for the share of long term unemployed are not reliable. The linear specification seems to yield positive (negative) effects, if we apply the pooled (fixed effects) specification.

Table 10 presents the estimates for drug trafficking. Benefit duration decreases drug trafficking, if the pooled specification is applied, but increases this criminal offence, if we control for unobserved heterogeneity. Benefit replacement rate has the same effect as benefit duration if we use the model with a common constant. However, the respective parameter of the fixed effects estimates is in most of the cases not significant with a tendency to a negative effect.

[TABLE 10 ABOUR HERE]

Active labour market policy also decrease drug trafficking if we apply the pooled specification. With respect to the fixed effects estimates we find positive effects in the log-linear model and no

clear cut results in the linear specification. The results for average years of schooling are similar to that of active labour market policy. Again, in the linear fixed effects specification the estimated parameters are negative but not significant.

In the pooled as well as in the linear fixed effects specification the compensation per hour worked increases drug trafficking. The share of foreigners has a positive effect on drug trafficking if we apply the homogenous specification. However, the fixed effects estimates yield to non-significant results over-all.

The employment population ratio increases the considered criminal offence in the estimates with a pooled specification. The results are ambiguous, if we consider unobserved heterogeneity. If we control for the age cohort 15 to 24 years the estimated effect is negative (positive), if we apply the pooled (fixed effects) specification.

The unemployment rate has a negative effect on drug trafficking especially in the linear specification. However, if we control for the age cohort 15 to 24 of men, the estimated effect is positive and significant (non-significant) in the pooled (fixed effects) specification. The share of long term unemployed does not have a significant effect on drug trafficking over-all.

6. Summary and Conclusions

The results of the previous section highlight that the consideration of unobserved heterogeneity is required to get reliable estimates. In most of the cases the sign of the estimated parameters changes in comparison to the simple pooled specification. With respect to the sign the linear and the log-linear model lead to different effects in some cases.[17] The control for different age cohorts and gender helps to understand some estimates that appear to be surprising at the first glance. The finding that the gender variation in crime is greater than the age variation corresponds with the conclusions of Freeman (1999). The cross-crime variation of the effects of most of the explanatory variables is in line with many other studies.

The main conclusions for the control variables based on fixed effects estimates are the following: The effect of the unemployment rate is positive for homicide and theft. In case of assault, robbery, and drug offences the effect is negative.[18] In this case the increased share of unemployed woman helps to prevent potential criminal men from committing offences. Additionally, women rarely commit these types of crime. In contrast to Levitt (1997, 1998) we cannot subdivide into positive effects on property crimes and a negative relation between unemployment and violent crimes.[19]

[17] Carmichael and Ward (2001) have made the same experience with certain criminal offences when they change the functional form.

[18] Other studies also find a negative link between unemployment and certain types of violent crime. See, for example, Raphael and Winter-Ebmer (2001) for a discussion of this finding.

[19] However, Levitt uses solely the two aggregates violent and property crimes.

The effects of the employment population ratio largely agree with the results for the unemployment rate, particularly with regard to the ratio of men. This is an indication against the lifestyle theory, because the sign of the estimated parameter is the same in most of the criminal offences for the employment population ratio and the unemployment rate. If we control for gender in the employment population ratio the effect of men on crime is mostly negative and the effect of women positive. This corresponds to the theory of Kapuscinski et al. (1998) whereby female employment reduces levels of guardianship.

The effects of compensation per hour worked are statistically non-significant in most of the cases, if we apply the fixed effects model.[20] The relation between the share of foreigners and the different types of criminal offences is significant only for homicide and drug offences.[21] Surprisingly, the estimated effect is negative in the latter case. The share of long term unemployed has significant effects on homicide, assault, theft, and in part on drug offences. In this case the effect is negative for property crimes and positive (if significant) for violent crimes.

The main results for the labour market policy variables are the following, if we take fixed effects results only into account: For both total and completed intentional homicide we can sum up that an increase in benefit duration and benefit replacement rate decrease the offences in most of the cases. Active labour market policy does not seem to have an effect, whereas an increase in the average skill level reduces intentional homicide.

With respect to assault and robbery benefit duration seems to have a positive effect whereas the benefit replacement rate seems to have a negative effect. One interpretation of these findings is that the spell of unemployment increases the likelihood of these criminal offences. If the search intensity for a new job decreases due to an increase of the benefit duration, the attractiveness of these criminal offences increases. If, on the other side, the benefit replacement rate increases, the need for illegal activities decreases.

If active labour market policy has an effect on assault and robbery, it appears to be negative. This effect is to be expected because it increases the (economic) perspectives of the (former) unemployed. Regarding average years of schooling the estimated effect is positive.

With respect to rape we have to interpret the results very careful. For benefit duration, benefit replacement rate, and active labour market policy the results are hardly significant. As well as for assault and robbery the effect of average years of schooling is positive.

[20] The effects of compensation per hour worked on property crime are negative but non-significant in case of theft and drug offences. Levitt (1996) also find a negative but non-significant relation between income and property crime, whereas Field (1999), Pyle and Deadman (1994) and Deadman and Pyle (1997) find a negative significant relationship.

[21] Entorf and Spengler (2000) point out that there are several reasons why foreigners are more often suspected than natives. This could lead to a positive bias in the estimates for homicide.

The effect of benefit duration in the fixed effects models is significantly negative for total theft, but not significant for burglary theft. In the same specification the effect of benefit replacement rate is negative but not significant for burglary theft and positive but seldom significant for total theft. Active labour market policy does not have a significant effect on total and burglary theft. However, it seems to be negative in the latter case. The over-all effect of average years of schooling on total and burglary theft is negative.

Benefit duration has a positive effect on total drug offences and drug trafficking whereas the effect of benefit replacement rate appears to be negative, if we apply the fixed effects model. The interpretation is the same as for assault and robbery. An increase of the spell of unemployment increases the liability to criminal offences, whereas a higher benefit replacement rate reduces this disposition. Active labour market policy has a positive effect in the log-linear specification and a statistically weak negative effect in the linear specification, if unobserved heterogeneity is considered. The over-all effect of average years of schooling on total drug offences and drug trafficking is positive. However, with respect to the latter the effect is negative but non-significant in the linear case.

The results cannot be subdivided into unambiguous effects on property crimes and violent crimes, respectively. Both benefit duration and average years of schooling have positive as well as negative effects on property and violent crimes. However, they have in common positive effects on assault, robbery, and drug offences as well as negative effects on intentional homicide and theft. For the former group the returns to crime seem to be higher than the punishment, and for the latter group the opposite may be the case. With respect to the sign of the estimated parameters it is conspicuous that the effects of the unemployment rate and the employment population ratio are mirror-inverted to that of benefit duration and average years of schooling. Firstly, this underlines the existence of opposite indirect effects of benefit duration and unemployment. Secondly, this is an indication of moral decline with increasing age, because average years of schooling is an indicator of the skill level of the young whereas the employment population ratio is an indicator of an average of 15 to 64 years. Furthermore, this effect is more distinct, if we control for men in the employment population ratio.

Compendious, active labour market policy does not have a significant effect. The other institutions do have significant effects and especially the benefit replacement rate has the expected negative effect on criminal offences in most cases. The combination of a short benefit duration and a high replacement rate, like in the Nordic countries, seems to be a “crime reducing” combination. The results for average years of schooling are mixed, hence, we have to research more closely the relationship between education and criminal offences. With respect to robbery, for example, it

may be that the high skilled have other objectives. Perhaps they favour the crown jewels instead of the coin collection of the neighbour.

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Appendix A

The following tables contain the estimates for each considered offence. All estimates based on unbalanced panels. Fixed effects are identified with a ✓ in the tables. Time effects are not considered in the estimates because they don't improve the results. The estimation method is unweighted GLS. The t-statistics in parenthesis based on White-robust covariances. To get more reliable estimates all parameters with a p-value higher than 0.3 (approximately t-statistic = 1) are dropped out of the equation.

Table 2: Intentional Homicide: Total (IHT)

	LOG(IHT)								IHT							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
bd	0.898		0.846	-0.327	0.682		0.475	-0.364	9.743	-10.057	10.748	-15.026	11.376	-14.300	4.083	-10.406
	(4.065)		(4.447)	(-1.245)	(3.546)		(2.231)	(-1.556)	(3.604)	(-2.445)	(4.646)	(-2.511)	(3.644)	(-2.239)	(1.480)	(-2.124)
brr	1.214	-0.809	1.667	-0.799	0.839	-0.787	1.209	-2.168			7.652		5.125	9.880	17.116	-16.035
	(1.811)	(-1.319)	(3.103)	(-1.201)	(1.397)	(-1.552)	(2.786)	(-5.347)			(1.201)		(0.983)	(1.485)	(3.528)	(-1.077)
alp			-0.115						-2.112		-3.104	1.821	-1.818		-7.603	
			(-1.326)						(-2.344)		(-4.072)	(1.253)	(-2.784)		(-5.182)	
ays	-0.275	-0.314	-0.437	-0.334	-0.221	-0.279	-0.305	-0.298	-3.653	-8.108	-4.274	-7.491	-3.060	-9.956	-5.747	-6.019
	(-3.702)	(-4.507)	(-5.927)	(-3.659)	(-3.057)	(-4.283)	(-3.669)	(-4.223)	(-4.261)	(-5.899)	(-6.008)	(-3.680)	(-3.005)	(-4.062)	(-5.100)	(-3.363)
log(chw)	-8.276		-8.486	0.830	-7.702		-7.834		-85.588		-91.969	19.282	-97.834	16.604	-92.393	
	(-6.203)		(-7.797)	(1.100)	(-6.192)		(-10.167)		(-5.659)		(-5.137)	(1.769)	(-4.856)	(1.146)	(-6.729)	
sof	0.090	0.054	0.134	0.047	0.067	0.068	0.153	0.089	0.987	2.375	1.186	2.498	1.134	2.146	2.988	1.935
	(2.791)	(1.966)	(5.832)	(1.387)	(3.090)	(2.548)	(4.156)	(1.807)	(2.560)	(2.756)	(3.507)	(2.385)	(2.426)	(2.872)	(5.490)	(2.354)
ep	-0.030	0.020				0.021		0.030		0.533			-0.221	0.367	0.310	
	(-1.972)	(1.637)				(2.625)		(1.935)		(4.147)			(-1.390)	(1.936)	(1.895)	
u	-0.074	0.038	-0.172	0.059			-0.052	0.064	-0.689	0.975	-1.053	2.171				1.062
	(-2.855)	(2.147)	(-3.826)	(2.197)			(-1.868)	(3.575)	(-2.268)	(6.704)	(-1.807)	(5.358)				(2.910)
slu	0.034	0.004	0.032	0.006	0.039	0.003			0.343		0.354		0.390			
	(2.761)	(2.051)	(2.764)	(1.901)	(3.528)	(1.154)			(3.724)		(2.708)		(2.798)			
ep2564m			-0.112	0.044							-0.309	1.788				
			(-3.677)	(1.645)							(-0.958)	(4.364)				
u2564m/ u2564					-0.041	0.044							-1.357	0.907		
					(-2.272)	(3.128)							(-3.680)	(3.742)		
slu2554w							0.042	-0.004							0.352	-0.212
							(5.097)	(-1.051)							(3.679)	(-2.043)
$\bar{R}^2$	0.633	0.971	0.652	0.971	0.626	0.972	0.676	0.971	0.607	0.891	0.600	0.903	0.621	0.888	0.684	0.890
Fix. Effects		✓		✓		✓		✓		✓		✓		✓		✓
Obs.	81	81	81	81	81	81	69	69	81	81	81	81	81	81	69	69
Countries	11	11	11	11	11	11	10	10	11	11	11	11	11	11	10	10
Period	91-99	91-99	91-99	91-99	91-99	91-99	91-99	91-99	91-99	91-99	91-99	91-99	91-99	91-99	91-99	91-99

Numbers in parenthesis are serial correlation and time-varying variances robust t-statistics.

Table 3: Intentional Homicide: Completed (IHC)

	LOG(IHC)								IHC							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
bd	0.564	0.694	0.527	0.758	0.531	0.771	0.508	0.795	2.103	-1.065	2.120	-1.784	1.948	-1.214	1.491	-1.366
	(5.606)	(3.643)	(5.301)	(2.865)	(4.909)	(2.446)	(6.228)	(2.248)	(6.343)	(-1.056)	(6.229)	(-1.366)	(5.808)	(-1.120)	(4.813)	(-0.808)
brr	-0.317	-1.233		-1.062	-0.362	-0.896	-0.717	-1.443	-2.163		-2.014		-2.383		-2.543	
	(-1.095)	(-2.626)		(-2.351)	(-1.180)	(-2.200)	(-2.260)	(-3.932)	(-2.731)		(-2.753)		(-3.397)		(-2.264)	
alp	-0.451		-0.567		-0.482		-0.416		-1.415	0.306	-1.484		-1.501		-1.579	
	(-5.342)		(-8.180)		(-5.913)		(-5.303)		(-5.498)	(1.575)	(-6.162)		(-6.553)		(-5.146)	
ays	-0.091	-0.344	-0.188	-0.210	-0.080	-0.345		-0.372	-0.594	-2.096	-0.607	-1.453	-0.599	-1.883	-0.661	-2.220
	(-1.560)	(-4.427)	(-2.617)	(-2.497)	(-1.445)	(-3.887)		(-3.844)	(-3.607)	(-4.835)	(-3.513)	(-3.967)	(-3.955)	(-5.323)	(-3.600)	(-6.513)
log(chw)	-4.399		-4.314		-3.821		-3.566		-14.789		-14.667	3.076	-12.941		-13.344	
	(-11.558)		(-10.724)		(-7.704)		(-12.198)		(-6.903)		(-6.930)	(1.474)	(-5.109)		(-6.967)	
sof	0.044		0.066		0.036				0.156	0.555	0.163	0.325	0.124	0.549	0.244	0.487
	(2.843)		(3.470)		(2.169)				(2.577)	(2.405)	(2.532)	(1.684)	(1.688)	(2.472)	(3.157)	(1.970)
ep	-0.026	0.033			-0.016	0.036	-0.030	0.053		0.250			0.035	0.202	0.050	0.266
	(-5.334)	(2.922)			(-2.677)	(4.482)	(-4.744)	(4.167)		(3.774)			(1.110)	(3.478)	(1.516)	(3.233)
u		0.044	-0.046	0.064			0.020	0.063		0.236		0.430			0.071	0.273
		(3.108)	(-3.508)	(3.327)			(1.543)	(3.562)		(4.247)		(4.314)			(1.692)	(5.623)
slu	0.012		0.013	0.005	0.013	0.005			0.047		0.044	0.019	0.051			
	(3.604)		(3.658)	(1.217)	(3.457)	(1.426)			(5.653)		(3.746)	(0.964)	(3.494)			
ep2564m			-0.069	0.063							-0.015	0.480				
			(-4.886)	(2.911)							(-0.573)	(3.988)				
u1564m/ u2564m					0.023	0.035							0.075	0.207		
					(2.239)	(3.232)							(2.467)	(3.833)		
slu2554/ slu2554m							0.010	0.003							0.051	-0.007
							(2.744)	(0.961)							(3.390)	(-0.315)
$\bar{R}^2$	0.804	0.927	0.813	0.929	0.806	0.930	0.779	0.929	0.789	0.897	0.787	0.906	0.787	0.897	0.797	0.896
Fix. Effects		✓		✓		✓		✓		✓		✓		✓		✓
Obs.	84	100	84	99	84	99	86	87	84	84	84	84	84	84	73	73
Countries	11	11	11	11	11	11	10	10	11	11	11	11	11	11	10	10
Period	91-99	90-99	91-99	90-99	91-99	90-99	90-99	90-99	91-99	91-99	91-99	91-99	91-99	91-99	91-99	91-99

Numbers in parenthesis are serial correlation and time-varying variances robust t-statistics.

Table 4: Assault (AS)

	LOG(AS)								AS							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
bd	1.356		1.637	0.431	1.349	0.399	0.490	0.972	3.702	8.630	6.547	9.662	3.532	10.034		8.888
	(15.486)		(8.154)	(1.278)	(14.817)	(1.436)	(2.759)	(2.146)	(4.223)	(1.999)	(6.783)	(1.960)	(3.513)	(2.251)		(1.730)
brr	-1.507		0.525	0.283	-1.479			1.884	-16.168	-10.379	-5.735	-6.950	-17.523	-10.330	-11.319	-11.133
	(-3.854)		(1.698)	(1.070)	(-3.861)			(2.855)	(-4.333)	(-2.046)	(-5.651)	(-2.045)	(-4.139)	(-2.384)	(-2.854)	(-2.464)
alp	0.706	0.174	0.240		0.683	0.176	-0.125		0.603	-0.750	-1.103	-1.380	0.534	-1.127	-2.152	
	(7.197)	(2.312)	(1.910)		(7.711)	(1.654)	(-1.438)		(1.287)	(-1.543)	(-1.290)	(-2.409)	(1.076)	(-1.386)	(-2.521)	
ays		0.294	-0.480	0.224		0.369	-0.245		-1.223	3.378	-2.984	2.129	-0.716	3.352	-2.140	4.265
		(3.041)	(-6.331)	(1.166)		(1.939)	(-5.375)		(-5.856)	(6.557)	(-6.794)	(5.736)	(-3.203)	(7.502)	(-5.148)	(4.239)
log(chw)	-7.351		-9.571	-1.166	-7.105	-1.122	-7.932	-1.763	-27.685		-42.938		-22.592		-29.459	
	(-7.712)		(-13.750)	(-1.203)	(-6.780)	(-1.074)	(-12.842)	(-1.772)	(-6.927)		(-9.222)		(-4.018)		(-6.583)	
sof	0.107		0.281		0.106		0.384	0.104	0.288		1.078		0.190		1.289	
	(5.420)		(10.435)		(5.359)		(11.191)	(2.246)	(1.926)		(14.214)		(0.983)		(6.476)	
ep						0.014	0.061		0.333	-0.106			0.505		0.579	-0.227
						(1.570)	(2.832)		(2.904)	(-3.532)			(2.578)		(5.126)	(-1.681)
u		-0.033	-0.351	-0.096			0.089	-0.022		-0.200	-1.381	-0.560			0.290	-0.253
		(-2.441)	(-4.393)	(-5.441)			(7.222)	(-1.521)		(-3.859)	(-2.625)	(-3.373)			(2.398)	(-3.224)
slu	0.026	0.017		0.009	0.025	0.017			0.154			-0.063	0.194	-0.040		
	(3.224)	(3.183)		(2.330)	(2.898)	(2.651)			(3.835)			(-1.973)	(3.703)	(-1.955)		
ep2564m			-0.313	-0.089							-0.953	-0.637				
			(-5.801)	(-5.154)							(-3.454)	(-3.246)				
u2564m/ u1524m					0.013	-0.015							0.150	0.033		
					(0.943)	(-1.060)							(1.968)	(0.925)		
slu2554m							0.033	0.013							0.194	-0.038
							(2.724)	(2.100)							(6.017)	(-1.080)
$\bar{R}^2$	0.583	0.963	0.677	0.964	0.578	0.960	0.749	0.949	0.562	0.905	0.588	0.911	0.566	0.906	0.688	0.903
Fix. Effects		✓		✓		✓		✓		✓		✓		✓		✓
Obs.	88	110	88	104	88	103	76	76	88	104	88	103	88	103	76	90
Countries	11	11	11	11	11	11	10	10	11	11	11	11	11	11	10	10
Period	91-99	90-99	91-99	90-99	91-99	90-99	91-99	91-99	91-99	90-99	91-99	90-99	91-99	90-99	91-99	90-99

Numbers in parenthesis are serial correlation and time-varying variances robust t-statistics.

Table 5: Robbery (RO)

	LOG(RO)								RO							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
bd	0.970		1.235	0.577	0.534	0.553	0.462		3.685	19.250	2.752	19.455	5.084	17.885		
	(7.597)		(4.273)	(1.336)	(1.829)	(1.277)	(1.777)		(2.873)	(2.266)	(3.055)	(2.798)	(3.969)	(2.334)		
brr	-1.099	-1.327		-0.721		-2.295		-3.809		-23.653		-23.217		-28.696		-58.755
	(-1.045)	(-1.802)		(-0.969)		(-1.463)		(-1.636)		(-1.459)		(-1.268)		(-1.957)		(-1.215)
alp		-0.252	-0.287	-0.362	-0.708	-0.272	-0.526	-0.223	-1.931		-2.535				-3.065	
		(-1.735)	(-1.517)	(-4.071)	(-2.955)	(-1.671)	(-1.900)	(-1.644)	(-1.307)		(-1.589)				(-1.663)	
ays	-0.259	0.438	-0.501		-0.397	0.753	-0.430	0.899		11.516		7.667		10.357		13.095
	(-4.080)	(1.986)	(-2.826)		(-2.374)	(6.025)	(-2.642)	(2.219)		(2.109)		(1.717)		(2.138)		(2.035)
log(chw)	-5.857	4.001	-7.318	3.673	-5.329		-5.887	4.703	-21.460		-19.241		-16.961		-11.109	86.686
	(-3.535)	(1.652)	(-6.875)	(2.201)	(-6.442)		(-6.786)	(1.273)	(-2.433)		(-2.400)		(-2.303)		(-1.609)	(1.186)
sof	0.081	-0.261	0.185	-0.254	0.268		0.269	-0.424		-4.339		-3.962		-2.917		-9.830
	(3.266)	(-1.015)	(4.357)	(-1.399)	(3.923)		(4.132)	(-1.031)		(-1.139)		(-1.274)		(-1.031)		(-1.171)
ep	0.031	-0.053			0.096	0.062	0.064	-0.107		-0.935					0.355	-2.535
	(2.202)	(-1.015)			(2.210)	(2.249)	(4.284)	(-1.141)		(-1.123)					(1.974)	(-1.316)
u	-0.108	-0.076	-0.297	-0.176			-0.048	-0.079	-0.684	-0.963	-0.972	-1.857			-0.342	-1.386
	(-2.494)	(-2.601)	(-3.564)	(-7.797)			(-1.295)	(-2.359)	(-1.484)	(-2.222)	(-1.654)	(-4.704)			(-1.036)	(-2.073)
slu	0.054		0.032		0.056				0.201		0.164		0.284			
	(2.572)		(1.827)		(2.240)				(1.650)		(1.489)		(2.321)			
ep2564m			-0.153	-0.163							-0.282	-1.867				
			(-2.467)	(-4.429)							(-1.674)	(-3.143)				
u1519w/ u2564w					0.019	0.031							-1.063	-0.017		
					(2.721)	(1.578)							(-2.532)	(-0.038)		
slu2554m							0.058	-0.012							0.279	-0.218
							(3.051)	(-0.912)							(1.743)	(-1.008)
$\bar{R}^2$	0.349	0.723	0.381	0.731	0.411	0.730	0.492	0.713	0.040	0.059	0.031	0.066	0.064	0.064	0.061	0.043
Fix. Effects		✓		✓		✓		✓		✓		✓		✓		✓
Obs.	87	87	87	87	78	92	75	75	103	87	102	87	103	87	92	75
Countries	11	11	11	11	10	10	10	10	11	11	11	11	11	11	10	10
Period	91-99	91-99	91-99	91-99	91-99	90-99	91-99	91-99	90-99	91-99	90-99	91-99	90-99	91-99	90-00	91-99

Numbers in parenthesis are serial correlation and time-varying variances robust t-statistics.

Table 6: Rape (RA)

	LOG(RA)								RA							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
bd	0.689	-0.597	1.197		0.673		0.240		7.765				7.464			*
	(8.419)	(-2.679)	(6.727)		(8.470)		(1.245)		(4.174)				(4.241)			
brr			1.587	0.904			2.909								163.137	*
			(3.331)	(2.029)			(2.692)								(1.237)	
alp	0.147				0.126		-0.885	0.130	-2.998		-5.063		-4.689		-56.340	*
	(3.034)				(2.157)		(-3.541)	(0.988)	(-1.652)		(-1.624)		(-1.921)		(-1.278)	
ays		0.459	-0.272	0.381		0.618	-0.435	0.751	-2.703				-4.056		-19.840	*
		(2.741)	(-3.003)	(1.238)		(4.245)	(-3.300)	(3.504)	(-1.155)				(-1.746)		(-1.293)	
log(chw)	-2.234		-5.863	-2.627	-1.854	-1.618	-5.550	-3.788	-75.589		-67.786		-51.321		-166.997	*
	(-5.246)		(-5.234)	(-1.265)	(-4.020)	(-1.004)	(-3.655)	(-1.378)	(-1.552)		(-1.897)		(-1.079)		(-2.159)	
sof			0.135				0.385	0.173							11.205	*
			(4.953)				(6.059)	(1.052)							(1.712)	
ep	0.039				0.040		0.071			-4.537			0.861			*
	(7.416)				(11.774)		(2.674)			(-0.999)			(1.841)			
u	0.025		-0.211	-0.129			0.077		-2.117	-6.050		-6.779				*
	(1.338)		(-2.920)	(-1.132)			(2.420)		(-0.992)	(-1.241)		(-1.380)				
slu	0.009				0.009					1.799		1.526		2.090		
	(2.923)				(2.806)					(1.197)		(1.077)		(1.171)		
ep2564m/ eptom			-0.143	-0.148							0.260	-5.840				
			(-3.929)	(-1.120)							(0.926)	(-1.212)				
u2564m/ u1564m					0.047	0.017							-0.109	-1.579		
					(2.431)	(1.161)							(-0.073)	(-2.037)		
slu2554m							0.010	0.006							-0.946	*
							(0.978)	(0.638)							(-0.846)	
$\bar{R}^2$	0.227	0.693	0.285	0.707	0.235	0.707	0.538	0.640	-0.036	0.016	-0.017	0.018	-0.048	0.015	-0.030	*
Fix. Effects		✓		✓		✓		✓		✓		✓		✓		✓
Obs.	104	105	88	104	103	113	76	80	104	105	109	149	103	149	76	80
Countries	11	11	11	11	11	11	10	10	11	11	11	15	11	15	10	10
Period	90-99	90-99	91-99	90-99	90-99	90-00	91-99	90-00	90-99	90-99	90-00	90-00	90-99	90-00	91-99	90-00

Numbers in parenthesis are serial correlation and time-varying variances robust t-statistics.

Table 7: Theft: Total (TT)

	LOG(TT)								TT							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
bd	0.298	-0.358	0.376		0.190	-0.358	0.243	-0.336	2.101	-4.052	2.790	-4.433	1.961	-5.585	1.531	-4.128
	(2.265)	(-2.188)	(4.148)		(3.510)	(-2.339)	(1.978)	(-1.862)	(1.721)	(-3.473)	(3.288)	(-4.693)	(1.417)	(-2.499)	(1.408)	(-2.740)
brr		0.177	0.104	-0.698		0.427	0.733		-1.643	5.978	-3.985	4.079	-1.822	9.938	3.343	3.532
		(1.001)	(0.874)	(-2.212)		(2.449)	(3.973)		(-1.546)	(4.379)	(-2.636)	(1.438)	(-1.534)	(3.071)	(2.432)	(1.567)
alp	0.265		0.324		0.188				1.405		2.405	0.834	1.348		-0.523	
	(6.973)		(9.737)		(4.370)				(7.266)		(7.178)	(1.746)	(6.177)		(-1.630)	
ays	-0.075	-0.273	-0.039	-0.268	-0.052	-0.232	-0.192	-0.268	-0.995	-3.476		-1.052	-1.015	-3.696	-1.774	-3.644
	(-2.066)	(-3.068)	(-1.493)	(-2.572)	(-2.619)	(-2.838)	(-3.979)	(-2.973)	(-3.013)	(-4.142)		(-1.407)	(-3.336)	(-3.627)	(-3.831)	(-5.678)
log(chw)	-2.215	-0.519	-2.325		-1.623	-0.668	-2.631	-0.772	-16.970		-19.349		-15.814		-19.897	
	(-3.036)	(-1.461)	(-4.007)		(-3.613)	(-1.807)	(-5.298)	(-1.875)	(-2.724)		(-4.875)		(-2.082)		(-3.627)	
sof	0.019		0.016				0.121		0.194				0.174	0.384	0.864	
	(1.282)		(2.445)				(6.020)		(1.423)				(1.060)	(1.068)	(3.771)	
ep	0.048	0.040			0.052	0.025	0.043	0.052	0.298	0.322			0.327	0.368	0.286	0.396
	(6.786)	(5.734)			(7.684)	(4.155)	(4.078)	(7.457)	(4.487)	(5.617)			(3.601)	(3.124)	(3.717)	(8.174)
u		0.072	0.034	0.121			0.024	0.087		0.548	0.519	1.152			0.206	0.744
		(4.336)	(1.771)	(5.786)			(2.232)	(5.279)		(5.958)	(2.862)	(5.636)			(3.051)	(4.358)
slu	0.018	-0.004	0.010		0.017	-0.005			0.120		0.115		0.121			
	(3.251)	(-1.193)	(1.997)		(3.817)	(-1.361)			(2.979)		(3.731)		(2.970)			
ep2564m			0.052	0.084							0.743	0.996				
			(3.349)	(5.765)							(4.249)	(5.415)				
u2564m/ u2564					0.019	0.055							0.070	0.645		
					(2.018)	(3.873)							(0.534)	(4.674)		
slu2554m/ slu2554							0.010	-0.007							0.068	-0.057
							(2.678)	(-1.582)							(2.098)	(-1.150)
$\bar{R}^2$	0.510	0.712	0.513	0.742	0.512	0.702	0.576	0.712	0.381	0.606	0.475	0.644	0.374	0.534	0.420	0.602
Fix. Effects		✓		✓		✓		✓		✓		✓		✓		✓
Obs.	87	104	87	103	102	103	75	89	87	104	102	102	87	87	75	89
Countries	11	11	11	11	11	11	10	10	11	11	11	11	11	11	10	10
Period	91-99	90-99	91-99	90-99	90-99	90-99	91-00	90-99	91-99	90-99	90-99	90-99	91-99	91-99	91-00	90-99

Numbers in parenthesis are serial correlation and time-varying variances robust t-statistics.

Table 8: Theft: Burglary Total (TBT)

	LOG(TBT)								TBT							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
bd	1.633		1.890		1.512		1.319		2.829	1.636	3.407	1.626	2.234	1.814	2.200	3.838
	(7.377)		(9.002)		(7.192)		(11.686)		(7.263)	(1.092)	(8.544)	(1.251)	(5.306)	(1.214)	(8.166)	(1.779)
brr	2.205		3.024	0.661	1.936		3.349	-1.164	1.308	-0.865	3.024				2.600	-6.037
	(4.760)		(7.379)	(1.279)	(3.960)		(7.660)	(-1.898)	(1.141)	(-1.739)	(3.604)				(2.197)	(-1.872)
alp	-0.168		-0.296	-0.049	-0.153		-0.680		-0.567	-0.196	-0.807	-0.280	-0.522	-0.383	-1.252	
	(-2.775)		(-7.416)	(-0.961)	(-2.498)		(-5.156)		(-3.605)	(-1.660)	(-4.047)	(-2.134)	(-1.951)	(-2.136)	(-4.344)	
ays	-0.279	-0.085	-0.420	-0.178	-0.260	-0.054	-0.526	0.155	-0.690		-0.941		-0.723		-1.074	1.461
	(-10.232)	(-2.646)	(-5.555)	(-4.199)	(-10.078)	(-1.721)	(-14.047)	(2.176)	(-9.144)		(-5.288)		(-5.319)		(-9.999)	(2.097)
log(chw)	-5.788		-6.897		-5.588		-5.851		-12.238	2.417	-14.780		-9.668	1.957	-11.952	
	(-7.155)		(-9.822)		(-5.869)		(-9.770)		(-8.257)	(1.867)	(-11.384)		(-7.938)	(1.452)	(-8.897)	
sof	0.054		0.117		0.044		0.254	-0.050	0.086		0.212		0.038		0.407	-0.347
	(2.045)		(3.650)		(1.647)		(6.823)	(-1.080)	(1.797)		(4.959)		(1.130)		(7.271)	(-1.408)
ep	0.025	0.010			0.040		0.065		0.070				0.122		0.137	-0.137
	(1.468)	(1.022)			(1.872)		(3.997)		(2.161)				(3.545)		(4.372)	(-1.488)
u	-0.068	0.033	-0.170	-0.029				0.031	-0.176	0.043	-0.372	-0.038			-0.087	
	(-2.802)	(4.806)	(-2.808)	(-2.995)				(2.673)	(-2.739)	(2.814)	(-2.516)	(-0.951)			(-1.373)	
slu	0.021	-0.009	0.010	-0.014	0.023	-0.011			0.059	-0.028	0.034	-0.031	0.056	-0.031		
	(4.505)	(-4.255)	(2.528)	(-4.531)	(4.286)	(-8.044)			(5.199)	(-4.670)	(2.824)	(-3.747)	(4.414)	(-5.030)		
ep2564m			-0.073	-0.063							-0.122	-0.094				
			(-1.848)	(-5.170)							(-1.520)	(-1.909)				
u2564m/ u1524m					-0.046	0.028							-0.041	0.038		
					(-2.265)	(5.095)							(-1.857)	(3.637)		
slu2554m							0.024	-0.012							0.065	-0.053
							(4.929)	(-6.171)							(9.934)	(-2.862)
$\bar{R}^2$	0.613	0.962	0.621	0.967	0.602	0.963	0.793	0.972	0.578	0.903	0.577	0.909	0.563	0.906	0.694	0.912
Fix. Effects		✓		✓		✓		✓		✓		✓		✓		✓
Obs.	85	111	85	100	85	110	73	73	85	101	85	120	85	100	73	73
Countries	11	11	11	11	11	11	10	10	11	11	11	15	11	11	10	10
Period	91-99	90-00	91-99	90-99	91-99	90-00	91-00	90-99	91-99	90-99	91-99	90-99	91-99	90-99	91-00	90-99

Numbers in parenthesis are serial correlation and time-varying variances robust t-statistics.

Table 9: Drug Offences: Total (DOT)

	LOG(DOT)								DOT							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
bd	-1.021	4.244	0.464	2.088	-0.748	4.074	-2.040	3.207	1.329	11.783	2.628	8.834		9.705		14.587
	(-4.270)	(2.286)	(3.495)	(1.625)	(-2.702)	(2.207)	(-6.207)	(2.753)	(2.289)	(2.463)	(3.780)	(1.990)		(2.418)		(2.158)
brr	-5.952	-3.722	-3.422		-5.834	-2.323	-4.194	-9.136	-7.591	-14.434	-2.375	-5.564	-10.362	-11.104	-7.630	-21.382
	(-4.957)	(-1.790)	(-6.560)		(-4.265)	(-1.324)	(-7.407)	(-1.906)	(-3.127)	(-1.984)	(-1.895)	(-1.562)	(-3.201)	(-2.803)	(-2.868)	(-1.870)
alp		0.380	-0.454	0.359			-1.217	0.387	-0.767		-1.519	-1.913	-0.683	-1.623	-1.164	
		(1.195)	(-1.333)	(1.233)			(-2.405)	(1.525)	(-1.901)		(-2.391)	(-2.513)	(-1.753)	(-1.421)	(-2.269)	
ays	0.145	2.630		1.781	0.426	2.343	-0.237	2.817	-0.442	4.519	-1.211	1.926		3.800	-0.315	7.207
	(2.159)	(4.238)		(5.337)	(6.938)	(4.519)	(-2.098)	(4.694)	(-1.842)	(12.327)	(-2.949)	(3.559)		(9.157)	(-1.434)	(3.211)
log(chw)	2.526	-6.693	-5.966		1.711	-4.745			-3.586		-16.060				-2.416	
	(7.685)	(-1.761)	(-2.322)		(5.060)	(-1.165)			(-1.383)		(-3.253)				(-1.178)	
sof		-0.614	0.161	-0.956		-0.725	0.307	-1.307		-0.689	0.354		-0.161			-1.247
		(-2.806)	(12.362)	(-4.058)		(-5.326)	(8.902)	(-6.839)		(-2.560)	(4.426)		(-2.929)			(-1.862)
ep	0.147	0.080			0.135		0.200		0.156	-0.235			0.389		0.227	-0.631
	(10.214)	(1.507)			(7.989)		(7.819)		(2.794)	(-2.367)			(2.877)		(3.380)	(-1.666)
u	0.175	0.088	-0.178	-0.162			0.229	0.109		-0.430	-0.764	-0.937				-0.529
	(7.969)	(2.147)	(-1.489)	(-2.739)			(4.576)	(1.682)		(-6.417)	(-2.787)	(-7.300)				(-6.061)
slu			-0.022						0.027			-0.098	0.089	-0.073		
			(-2.236)						(1.094)			(-1.886)	(2.563)	(-2.365)		
ep1524/ ep2564m			-0.054	-0.104							-0.395	-0.984				
			(-2.140)	(-3.334)							(-3.135)	(-6.609)				
u1524/ u1524m					0.075	0.018							0.109	0.040		
					(9.462)	(1.880)							(2.055)	(0.679)		
slu2554m							0.003	-0.011							0.055	-0.087
							(0.352)	(-0.446)							(2.214)	(-0.870)
$\bar{R}^2$	0.386	0.726	0.403	0.744	0.388	0.729	0.511	0.736	0.290	0.545	0.349	0.548	0.346	0.498	0.331	0.557
Fix. Effects		✓		✓		✓		✓		✓		✓		✓		✓
Obs.	104	87	87	87	103	87	75	75	103	87	87	102	101	102	88	75
Countries	11	11	11	11	11	11	10	10	11	11	11	11	14	11	10	10
Period	90-99	91-99	91-99	91-99	90-99	91-99	91-99	91-99	90-99	91-99	91-99	90-99	91-99	90-99	90-00	91-99

Numbers in parenthesis are serial correlation and time-varying variances robust t-statistics.

Table 10: Drug Offences: Drug Trafficking (DODT)

	LOG(DODT)								DODT							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
bd	-4.438	1.862	-2.491	2.598	-3.807	2.770	-4.534	2.978	-2.408	3.607	-1.478	6.508	-2.020	2.849	-2.803	3.000
	(-8.596)	(2.253)	(-5.631)	(2.346)	(-6.849)	(2.275)	(-6.400)	(2.273)	(-7.506)	(1.638)	(-2.895)	(1.603)	(-4.777)	(1.917)	(-10.381)	(3.861)
brr	-5.407		-2.754	-2.369	-4.078		-5.330	5.882	-4.523		-3.289	-14.447	-3.683		-6.233	
	(-4.591)		(-2.796)	(-2.134)	(-3.455)		(-4.005)	(1.717)	(-5.275)		(-4.410)	(-1.382)	(-3.813)		(-8.727)	
alp	-0.832	0.772	-1.009	0.814	-1.030		-0.717	1.234	-0.553	-1.260	-0.617		-0.678	-1.234		0.692
	(-4.051)	(4.154)	(-4.684)	(3.211)	(-8.019)		(-2.604)	(2.656)	(-3.388)	(-1.175)	(-3.719)		(-5.125)	(-0.980)		(2.123)
ays	-0.899	0.527	-0.772	0.717	-0.710	-0.797	-1.075	0.688	-0.249	-3.686	-0.169		-0.124	-3.886	-0.358	
	(-8.356)	(2.007)	(-6.406)	(4.877)	(-8.829)	(-1.226)	(-7.410)	(1.560)	(-3.052)	(-1.477)	(-1.652)		(-1.825)	(-1.281)	(-3.385)	
log(chw)	8.645				8.126	3.137	6.779		8.420	17.348	3.782	8.645	8.207	19.515	7.535	2.789
	(5.299)				(4.694)	(1.037)	(5.190)		(7.589)	(1.761)	(2.703)	(2.547)	(6.980)	(1.443)	(3.368)	(3.089)
sof	-0.212	-0.151	-0.033	-0.198	-0.192			-0.469	-0.230		-0.134		-0.223		-0.257	
	(-5.412)	(-1.150)	(-1.861)	(-1.786)	(-5.454)			(-4.116)	(-8.451)		(-4.762)		(-8.950)		(-2.537)	
ep	0.120	0.039			0.130	0.107	0.212	-0.128	0.083	0.144			0.098	0.175	0.108	-0.097
	(4.621)	(1.089)			(5.730)	(2.674)	(4.674)	(-2.147)	(1.999)	(1.230)			(2.645)	(1.516)	(3.064)	(-2.092)
u			-0.234				-0.115	-0.135		-0.183	-0.153				-0.090	-0.198
			(-2.344)				(-1.707)	(-2.149)		(-2.543)	(-2.747)				(-1.703)	(-3.478)
slu		-0.013	-0.027						-0.029		-0.046	0.078	-0.026			
		(-1.028)	(-1.848)						(-1.577)		(-4.920)	(1.112)	(-1.431)			
ep1524			-0.054	0.041							-0.026	0.302				
			(-4.818)	(8.040)							(-2.087)	(1.851)				
u1524m					0.062	0.009							0.043	-0.060		
					(1.985)	(0.327)							(2.220)	(-1.159)		
slu1524/ slu2554m							0.052	0.000							0.003	0.012
							(3.788)	(-0.024)							(0.249)	(0.724)
$\bar{R}^2$	0.715	0.965	0.731	0.965	0.729	0.927	0.753	0.967	0.655	0.578	0.653	0.599	0.665	0.573	0.694	0.872
Fix. Effects		✓		✓		✓		✓		✓		✓		✓		✓
Obs.	58	58	58	58	58	70	54	43	58	71	58	70	58	70	43	54
Countries	9	9	9	9	9	9	8	8	9	9	9	9	9	9	8	8
Period	91-99	91-99	91-99	91-99	91-99	90-99	90-99	90-99	91-99	90-99	91-99	90-99	91-99	90-99	91-99	90-99

Numbers in parenthesis are serial correlation and time-varying variances robust t-statistics.