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**Unemployment, Inequality, Poverty and Crime.
Spatial Distribution Patterns of Criminal Acts in Belgium,
2001-2006.**

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S U M M A R Y

Abstract

Previous research has indicated that various deprivation indicators have a positive impact on crime rates at the community level. In this article we investigate the impact of deprivation indicators on crime in Belgian municipalities (n=589) for the period 2001-2006. A spatial regression analysis demonstrates that unemployment figures have a strong and significant impact on crime rates, and this effect is stronger than the effect of income levels. Income inequality has a significant positive impact on property crime rates but a negative impact on violent crime. Crime is heavily concentrated in the urban centres of Belgium, but we also observe some important regional variations. Demographic structure was not related to crime levels, while spatial analysis shows there is a spill over effect to neighbouring communities for property crime, but not for violent crime. We close with some theoretical and policy considerations on the relation between unemployment and crime.

Keywords: geographical distribution, crime rates, Belgium, spatial analysis, unemployment, inequality

Introduction

Investigating spatial distribution patterns of crime is a continuing concern within criminology. Traditionally it has been argued that economic deprivation and inequality are positively correlated to crime rates (Blau and Blau, 1982; Messner, 1982; O'Brien, 1983; Williams, 1984; Sampson, 1985a). A concentration of poverty, a lack of resources, and various indicators for social disorganisation have all been invoked to explain a concentration of crime. Both from a theoretical as from a policy perspective, it is of crucial importance to determine in a more precise and reliable manner what kind of community characteristics have an effect on specific crime rates. The effort to determine what specific indicators of poverty, exclusion or inequality have the strongest impact on crime rates is hampered by the fact that most data thus far have been collected for specific areas in the United States or the United Kingdom. Most of the existing research is concentrated on metropolitan areas, and there are not that many studies available on rural crime (see however Bouffard and Muftic, 2006; Osgood and Chambers, 2000). Although most of the available data suggest that at least some forms of crime are heavily concentrated in urban areas, it is clear that if one wants to achieve a comprehensive understanding of the geographical distribution of all forms of crime, it is crucial to take into account crime data covering an entire territory, and not just one specific urban setting.

In this study we offer new evidence on the relation between deprivation, inequality and crime, based on nationally collected crime figures in Belgium. Since the year 2001, the Belgian federal police collects these data in a uniform manner, which allows us to test the impact of economic indicators on crime rates at the community level. More specifically we want to investigate whether unemployment, inequality or poverty can be regarded as the strongest predictor for crime rates. Our hypothesis in this analysis is that inequality has a stronger effect on crime rates than income levels (Blau and Blau, 1982). We also pay special attention to the effects of unemployment. The experience of unemployment leads to a loss of income and thus to an increased risk of poverty, but simultaneously various studies have demonstrated other negative outcomes, like a weakening of social relations, a feeling of social isolation and the loss of a socially meaningful role in society (Lin, 2008). High unemployment rates also provide incentives to perform all kinds of criminal acts (Arvanites and Defina, 2006). Given all these negative consequences, it can be assumed that unemployment has a strong effect on crime, over and above the effect of poverty and inequality. While previous studies have shown that unemployment is positively associated

with crime in countries with a conservative social security system (and thus restrictive rules on unemployment allocations), there is less evidence available on the effect of unemployment in countries with a more generous social security system. Since Belgium clearly belongs to this latter category (e.g., unemployment benefits are not restricted in time), we can assume that the Belgian data are especially relevant in this regard. If, even in a generous social security system like the Belgian system, unemployment would have a strong effect on crime, this would suggest that the experience of unemployment cannot be reduced to the effects of a substantial loss of income. Investigating the spatial distribution of crime in Belgium therefore allows us to shed new light on the ongoing theoretical discussion about the relation between unemployment and crime.

In this article, we first review the literature on the relation between economic deprivation, inequality and crime, before presenting our data and methods. Subsequently we include a section on data and the appropriate model specification, before turning to the results of the analysis. We close with some observations on the implications of our findings for the study of the spatial distribution of criminal acts.

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Data and methods

In this article we rely on crime data for the entire territory of Belgium for the period 2001-2006. Although the number of unreported or unregistered crime remains a crucial problem in any analysis of crime rates (Tarling and Morris, 2010), we can be confident that these data offer a reliable image of registered crime in Belgium. Although we have to be extremely cautious in comparing crime rates across countries, there is no indication that Belgium would offer an exceptional case, compared to other countries in Western Europe (Newman, 1999)

Since 2001 a uniform crime recording protocol has been used by the Belgian police force, and this has led to a reliable measurement of registered crime in the country. Since we want to determine a more general pattern and in order to cancel out yearly fluctuations we opt for a six-year average (2001-2006) as a dependent variable. Belgium is a relatively small country in Western Europe, with a population of 10,540,000 inhabitants. The country is divided in 589 municipalities, with on average 17,900 inhabitants (median value: 11,500). The municipality, therefore, can be considered not only as a relevant political and administrative

unit, we can also claim that the average scale of a municipality still allows for a feeling of ‘community’ among the inhabitants of that municipality. The general assumption in this line of research is that the geographical unit should be as small as possible (Weisburd, Bernasco and Bruinsma, 2009), and in this specific case, the municipality is the smallest geographical unit for which reliable data are available. Most studies on the spatial distribution of crime focus only on metropolitan or urban areas. Since our data were collected across the entire territory of a country, we have access to data from both rural and urban areas. Rural crime is generally understudied in criminology, but it is safe to assume that crime rates will be dramatically lower in rural areas than in the urban regions of Belgium (Hardyns, 2010; Wells and Weisheit, 2004).

In line with the literature, we will introduce a distinction between violent crime and property crime (Wikström, 1991; Byrne, 1986). Since homicide levels are rather low in Belgium, this form of crime had to be excluded from the analysis. In the Belgian police records, and in accordance with the Belgian criminal code, violent crime refers to the acts of ‘intentional assault and battery’ and ‘destruction and damaging’. Property crime refers to theft from motor vehicles, stealing motor vehicles, ‘vandalism’ (whether aimed at cars or other material goods) and burglary. Although these two crime measurements are correlated, both theoretically and empirically it makes sense to distinguish them in the analysis. It is believed that these different kinds of crimes will have different patterns of geographical concentration (Byrne, 1986; Field, 1990; Kawachi et al., 1999; Wilkinson et al., 1998).

While the police records only contain information on the absolute number of these offences, for our analysis we constructed crime rates for every municipality, which are calculated as:

$$CR_i = [a_i / u_i] * 1000,$$

where CR is the crime rate, t is the year, i the municipality, a is the number of crimes recorded and u is the population of the municipality.

At this moment, data are available for the years 2001 to 2006. Since we have only six observations, we cannot conduct a reliable trend analysis. We use the averaged annual crime rate for every municipality over this period. For every single year the crime rate has been calculated using the population figure for that specific year.

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Methods

The level of analysis is the municipality (n=589). Not only is this level sufficiently small to assume that a municipality still reflects a real community, one should keep in mind that local mayors have some authority on police policy in their municipality. As such, the municipality can be seen as a natural and the smallest possible entity for this form of analysis. This means that our analysis only allows us to reach conclusions at the municipality level, and we cannot make any statement about the individual level. In other words, we are looking at the indicators of contexts in which crime takes place more or less often, and not at the characteristics of criminals. To take account of the spatial nature of the data, spatial regression techniques will be used to analyse the data. This is necessary, since it is possible and even likely that the standard assumption of the independence of observations, or the independence of error terms, needed for ordinary least squares (OLS) regression, are violated (Anselin, 1988). This means that the coefficients or the standard errors can be biased, which renders the parameters of an OLS regression model less reliable.

Two forms of spatial models are commonly used to improve regressions on spatially correlated data. Theoretically, these two forms of spatial interdependence have a different interpretation. If two municipalities are adjacent, the crime rate of the first can be influenced by the crime rate of the other. This means that there is a contagion or dispersion effect of crime, represented best by a spatial lag model. If the error residuals of the municipalities are influenced by one another, this substantively means that the phenomenon under study is not analysed at the correct geographical level, or that there might be an unobserved variable correlated with the spatial structure of the data. Thus would imply a clustering effect (for some unknown or unobserved reason municipalities resemble one another) and this has to be studied by a spatial error model (Anselin, 1988; 1994). A spatial lag model therefore is appropriate if neighbouring municipalities influence one another; the spatial error model documents that municipalities geographically cluster but for an unknown reason.

It is impossible to fully specify a model with both a spatial lag and spatial error component, so a choice between a spatial lag or spatial error model has to be made. A robust Lagrange Multiplier test on the residuals of a nonspatial ordinary least squares regression is used to

determine the best specification of the spatial regression model: spatial lag or spatial error (Anselin et al., 1996).

The first step to be taken therefore is to compute Lagrange multiplier tests on the residuals of a nonspatial ordinary least squares regression model. While in the case of property crime, a spatial lag model was clearly preferred over a spatial error model, for violent crime a spatial error model was more appropriate. This means that property crime in one municipality is influenced by the crime levels of the neighbouring municipalities, where violent crime tends to cluster in zones larger than a municipality.

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Discussion

In the current article, we analysed the geographical distribution of crime rates in Belgium for the period 2001-2006. As far as we know, this is the first time the appropriate spatial regression techniques were used to analyse crime rates over the entire territory of a country. The fact that we can rely on six year averages also implies that the patterns we find can be considered as quite robust. The fact that we obtain a degree of explained variance of up to 73 per cent also indicates that the effects we encountered are not negligible.

First of all, the results indicated that crime rates tend to be concentrated in the urban regions of Belgium, with a strong and consistent effect of population density on crime rates, and this holds both for property as for violent crime. The rate of non-nationals, however, only had a weakly significant impact on property crime and no effect at all on violent crime rates. In Belgium, non-nationals are concentrated in urban areas, which are also characterised by high crime rates. But the multivariate analysis clearly demonstrated that the direct link between the presence of non-nationals and crime rates was either weak or non-existent. Especially high unemployment levels seems to explain away the modest effect of the presence of a non-Belgian population on property crime. A second significant, but underinvestigated correlate of crime rates is touristic activity. Both property crime and violent crime are positively related to the degree of tourism. Since tourism inflates not only the population at risk, but also the opportunities for crime and the number of possible perpetrators, it is not entirely clear if tourism substantively causes higher crime rates, or if this is only an artefact of the

way crime rates are calculated.

The main goal of the current article was to determine what specific aspect of deprivation is most powerful in explaining crime rates. First of all, it has to be acknowledged that all three indicators we used (income level, income inequality and unemployment) were related to crime rates, and therefore we can state that deprivation in general clearly is associated with the occurrence of crime, and this is true both for property crime as for violent crime. Only for income inequality our findings are somewhat mixed. Inequality was strongly associated with property crime, but contrary to expectations we observed a negative relation with violent crime. This allows us to speculate that larger gaps in income, and thus also in available resource and property levels, apparently offered a positive opportunity and incentive structure for property crime. In comparing income levels and unemployment, both for property and violent crime we observed that the effect of unemployment was larger than the effect of income levels. Replacing median income with unemployed in both cases increased the explained variance of the model. In line with the Lin (2008) argument, this points quite strongly to the direction of unemployment as a major ecological correlate of criminal behaviour: in municipalities with high unemployment rates, both property and violent crime occur more often, even controlling for various other community level characteristics. While the Lin study documents a positive impact on property crime, our findings allows us to broaden this claim: unemployment is not just positively associated with property but also with violent crime. The impact of unemployment therefore might even be larger and more pervasive than Lin (2008) already argued and certainly this is a relation that needs to be investigated further in future research.

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With regard to public policy, the main conclusion could be that especially unemployment is strongly related to crime rates. Communities with high levels of income inequality might encounter specific problems, e.g. with regard to property crime. But the effect of unemployment on crime rates occurs across the board, and it is much more powerful than e.g. the presence of non-nationals. We can note, however, that future research should take the role of unemployment more strongly into consideration than was the case thus far. Specific community studies in communities or neighbourhoods with high unemployment figures might be a promising method to elucidate the question whether there is indeed a causal mechanism between unemployment and crime rates.