Youth Unemployment and Crime in France

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ABSTRACT

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In this paper we examine the influence of unemployment on property crimes and on violent crimes in France for the period 1990 to 2000. This analysis is the first extensive study for this country. We construct a regional-level data set (for the 95 départements of metropolitan France) with measures of crimes as reported to the Ministry of Interior. To assess social conditions prevailing in the département in that year, we construct measures of the unemployment rate as well as other social, economic and demographic variables using multiple waves of the French Labor Survey. We estimate a classic Becker type model in which unemployment is a measure of how potential criminals fare in the legitimate job market. First, our estimates show that in the cross-section dimension, crime and unemployment are positively associated. Second, we find that increases in youth unemployment induce increases in crime. Using the predicted industrial structure to instrument unemployment, we show that this effect is causal for burglaries, thefts, and drug offences. To combat crime, it appears thus that all strategies designed to combat youth unemployment should be examined.

JEL Classification: J19, K42, J64, J65

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1. Introduction

In this paper we examine the influence of unemployment on property crimes as well as on violent crimes in France for the recent period (1990 to 2000). During this period, the unemployment rate first increased, then decreased. More precisely, between 1990 and 1997, labor market opportunities fell dramatically (the unemployment rate rose from 8.9 to 12.5 percent). After 1997 the French economy started to recover. The crime pattern for the same period is completely different from that observed for unemployment. Indeed, during the 1990s, property crime rates first increased from 1990 to 1993, and then declined slowly. During the same period, violent crime rates kept increasing. These divergent trends led former Prime Minister Lionel Jospin to confess – while running for the presidency, in March 2002 – *« J'ai péché un peu par naïveté. Je me suis dit (…) : si l'on fait reculer le chômage, on va faire reculer l'insécurité » (I was naive. I said to myself (…) : if we make unemployment decrease, we will make insecurity decrease).* This paper is the first extensive study of this controversial issue in France. Using a variety of data sets, we examine the effects of changes in unemployment on crime. In particular, we compare the effects of changes in unemployment rates of older workers with those of younger workers. In addition, we examine the impact of unemployment benefits on crime.

Most empirical research on the economics of crime aims at testing the Becker hypothesis that the propensity to commit crime depends on the comparison of the expected costs and benefits of legal and illegal activities (Becker, 1968, Ehrlich, 1996). Some researchers have focused on the costs side and evaluated the deterrent effects of apprehension and penalization (Ehrlich, 1973; Levitt, 1997; Imai and Krishna, 2004). Others have examined the relation between labor market and crime, concentrating on measures of the potential benefits of legal opportunities (see the literature reviews by Freeman, 1983, 1984, 1996, 1999). Among them, some have assessed the effect of wages on crime rates. Using aggregate data, Gould, Weinberg and Mustard (2002) for the US, and Machin and Meghir (2004) for the UK show that decreases in unskilled workers wages lead to increases in crime. Grogger (1998) estimates a structural model using individual-level data, and suggests that falling wages may be an important determinant of rising youth crime. Some have tried to relate income inequality and crime (Kelly, 2000; Fajnzylber, Lederman and Loayza, 2002); these authors tend to show that more inequality is associated to higher crime rates.

On the contrary, the literature examining the links between crime and unemployment fails to reach any consensus. Most studies assume that unemployment is a measure of how potential criminals fare in the legitimate job market. From the theoretical point of view this hypothesis seems, at first glance, reasonable. Indeed, according to Becker's economic theory of crime, unemployed people are deprived of legal income resources (except for unemployment benefits), and, thus, are more likely to derive some income from illegal activities. But empirical findings based on aggregate data suggest that this relationship is not particularly strong. According to Chiricos' review (1987), most studies of this type find a positive relationship between unemployment and crime, but this effect is not always significant, and some even find a negative association. For example, using panel data for Germany, Entorf and Spengler (2000) confirm the ambiguous result for total unemployment, even if they suggest that youth unemployment is associated with a higher probability of committing crimes. Studies based on individual-level data (such as Witte and Tauchen, 1994, who use data from a cohort sample of young men) provide more convincing evidence that crime is linked to unemployment. Thornberry and Christenson (1984) investigate the causal structure between unemployment and crime. According to their results, unemployment has significant instantaneous effects on crime and crime has significant but lagged effects on unemployment. Cantor and Land (1985) try to identify two distinct (and potentially counterbalancing) mechanisms, criminal opportunity and criminal motivation, through which unemployment may affect crime rates in the aggregate.

In this article, we estimate a classic Becker-type model and suggest some arguments explaining why most studies were not able to find a strong relation between crime and unemployment. To accomplish this task, we add several elements to the existing literature.

First, this paper is the first econometric analysis for France of this precise question (see however Roché, 2001, for an extensive descriptive study of young criminals). We use both aggregate and individual-level data sets. We construct a unique Département-level data set (there are 95 départements in France, approximately an American county) measuring crimes as reported to the Interior Ministry for the years 1990-2000. 17 crime categories are available: this allows us to separate property crimes (which are more likely to fit the Becker's model of the rational offender) and violent crimes, and to study precisely the temporal and geographic correlations between these categories.

Second, we are able to measure extremely precisely the social environment prevailing in départements.We construct a wealth of social, economic and demographic variables at the department level. In particular, we use multiple waves of the French Labor Survey and, more interestingly, various administrative data sets such as national Censuses, administrative and fiscal sources. Then, these measures are matched to our crime statistics. For instance, we believe that our very precise measures of urbanization (such as city size or population density), of social interaction (such as the part of people living in single-parent families), or of département income structure are relevant controls in order to study criminal behavior: for the United States, Glaeser and Scheinkman (1996), and Glaeser and Sacerdote (1999) found that social interactions mattered in their analysis of criminal behavior.

Third, as the effect of unemployment is often ambiguous, we divide the unemployed into various categories that should have different propensities to commit crime. We directly measure youth unemployment as well as unemployment of older workers. We also measure the fraction of unemployed who do not receive unemployment benefits and unemployment duration. Of course, because today's crime may well generate tomorrow's unemployment – if companies move away from crime-prone zones – unemployment is likely to be endogenous in our crime regressions. Therefore, we use the predicted rather than the observed industrial structure to instrument unemployment, an apparently consensual strategy (see Blanchard and Katz, 1992) if such a thing was ever possible for any set of instruments. And, indeed, our results suggest that increases in youth unemployment may well **cause** increases in crime, because education or work does not pay enough, in particular for the unskilled or low-educated youth.[1]

The paper is organized as follows. Section 2 describes the general trends in crime rates and unemployment in France. Section 3 presents a simple choice model of crime activity wth two types (age groups) of individuals: potential offenders vs. potential victims. In Section 4, we introduce the data, the basic model, and estimation methods. Results are reported and discussed in Section 5. Section 6 concludes.

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[1] In a recent paper, Bowles and Jayadev (2005) put emphasis on the labor disciplining effect of unemployment, but they recognize that the consequences of unemployment extend well beyond this disciplining effect, especially because the unemployment rate influences directly social phenomena such as property crime.

2. Trends in Crime Rates and Unemployment

The aggregate crime data used in this study are collected annually at the département level by the local Police and Gendarmerie authorities. There are 95 départements in France. Each has approximately the same size but different populations. They roughly correspond to an American county. For historical reasons, the body in charge of ensuring security differs between urban areas, which are "police zones", and rural areas, which are "gendarmerie zones". Policemen' status is civilian but gendarmerie is a military corps. Both gendarmes and policemen have to record the number of reported crimes in their respective zones. Then, the Ministry of Interior collects the data in each zone for each département and publishes the total number of offences at the département level. So these data cover all the French population. We restrict attention to the so-called "départements de France métropolitaine", excluding overseas territories, but including Corsica. Data are available for the years 1990-2000. Using département-level population data obtained from the French statistical institute (INSEE), we calculated crime rates, measured as offences per 100,000 people.

For a crime to be included in these administrative data, it must be first reported to the police or the gendarmerie, who must then file an official report of the event. Offences are reported for property crimes (armed or violent robberies, burglaries, car or motorbike thefts, thefts of objects from cars, shoplifting, pick-pocketing, receiving stolen goods), for violent crimes (homicides, voluntary wounds, blackmails, threats, sex offences, family offences) and some other crimes (drug offences, damage to vehicle, illegal weapon ownership, violence against police). In the case of violent crimes, one crime is counted for each victim, while for property crimes one crime is reported for each event regardless of the number of victims (except for pick-pocketing and shoplifting for which one crime is recorded for each victim). For the types of crimes we study, the classification remained unchanged since 1990.

Table 1 shows the levels and the geographical variability of crimes rates for each available type of offence in 1990 and 2000. Property crimes are the most numerous and vary a lot across départments (especially pick-pocketing and violent robberies). On the contrary violent crimes such as sex offences or family offences show little spatial variability.

Figures 1, 2 and 3 depict the trends in these crimes rates for the period 1990-2000. The differences between these trends justify our choice to break up crime into precise categories instead of studying one aggregate index. Property crimes such as car thefts, thefts of objects from cars, shoplifting or burglaries first increased from 1990 to 1993, and then declined slowly, in contrast to what is often written in the French press. For example, burglaries declined by 8% between 1990 and 2000. Only armed or violent robberies increased dramatically (by 74%) during the same period. They follow the same pattern as violent crimes: except for homicides, all types of violent crimes (including damages to vehicles, illegal weapon ownership and violence against police) increased during the last decade. Blackmails and threats tripled and the rate of voluntary wounds doubled. Even if they account for little in the total reported crimes, these violent crimes are the most likely to influence the feeling of insecurity, as discussed in the media.

Little has been said about the spatial correlations of crimes rates. Table A.1 in Appendix A examines these correlations for 2000. All categories of crime are highly correlated. Départements where property crime rates are high also have very high violent crime rates. This suggests that our crime categories have some common determinants, as shown in section 4. Most correlations between growth rates for the period 1990-2000 are positive but some are not significant or even negative (Table A.2); a pattern potentially due to substitution between crimes (see Koskela and Virén, 1997, for an occupational choice model of crime switching, and some empirical evidence).

These data are the most frequently cited measures of the extent of crime in France. They are also the most frequently criticized by the media as being contaminated by multiple biases. Indeed, their capacity to reflect real trends in crime rates depends on the reporting behavior of victims and the recording behavior of policemen and gendarmes.

Indeed, not all crimes are reported to the police and, unfortunately, administrative data only take into account reported crimes. Victimization surveys provide a better measure of the "true" number of crimes (reported or not to the police). Indeed, some studies show that different sources may exhibit different trends: for the US, Bogess and Bound (1993) found that administrative data from the Uniform Crime Report (UCR) suggested a mild increase in crime during the 1980s, while the National Crime Survey depicted lower criminal activity over this period. Therefore, we also use such a survey, conducted by the French Statistical

Institute (INSEE). We use this survey for the years 1996 to 2002. Roughly 6,000 households and 11,000 individuals are interviewed every year. For each household, we have information on burglaries and car thefts. For each individual, the survey records information on thefts, personal attacks, as well as the feeling of insecurity. This survey also gives information on reporting of each incident to the police or the gendarmerie, and, if not reported, the reason for non-reporting the event.

By construction, crime rates measured with victimization surveys are significantly higher than their counterpart in administrative data. Over the period 1996-2002, 3.0 percent of French households were victims of a burglary; 13.5 percent had their car or something in their car stolen. During the years 1997-2002, 8.5 percent of individuals (more than 15 years old) were wounded, insulted or threatened whereas 4.8 percent were affected by pick pocketing.

The reporting rate (Figure 4) depends on the type of crime. Less serious crimes have a lower probability of being reported to the police than more serious crimes. According to the survey, the types of events most likely to be reported to the police are burglaries and vehicle thefts. In 2002, 80 percent of burglary victimizations and 64 percent of car thefts (or thefts of objects in car) were brought to the attention of the police. Indeed these events affect the most valuable possessions of the victims who are required to report it to obtain compensation from their insurance company. By contrast, in 2002, 53 percent of personal larcenies, and 29 percent of voluntary wounds, insults, and threats were reported to the police.

Administrative data are easier to use if reporting rates do not change over time. According to Figure 4, these rates remained stable over the period 1996-2002. And the trends in victimization rates (Figures 5 et 6) seem to fit the trends in administrative crime rates, even though the categories in the two data sources are not exactly similar. According to the victimization surveys, burglaries and car thefts declined by 30 percent between 1996 and 2002, while larcenies increased by 40 percent.

Finally, Figure 7 reports changes in the unemployment rates by age categories during the 1990s. A noticeable fact is the high youth unemployment rate in France, compared to similar countries. During the years 1994-1997 it hits a peak (virtually 30 percent of the 15-24 years old labor force was unemployed). After 1998 it declined (20 percent in 2002). Unemployment rates for other age categories follow the same general trend but are considerably lower.

Trends in crime rates and in unemployment rates obviously differ. This apparent discrepancy led Prime Minister Jospin to confess his naivety. But, this should not stop us from analyzing our data.

3. A Simple Choice Model of Crime Activity

In most papers, the effect of unemployment on crime is often seen as ambiguous. With a simple choice model of crime activity, involving two populations with different propensities to commit crime, we propose a theoretical explanation for this ambiguity. As empirically most "economic" crimes (such as thefts) are committed by young people, whereas homicides or sexual offences are more likely to be committed by older delinquents (figure 8), this will lead us to study separately the effect of youth unemployment.

Let us consider a population composed of two groups of persons, potential offenders (for example, young persons) and potential victims (for example, adult persons). Persons in these two groups are indexed by 0 and 1, respectively. The model is static. For a type-j individual, a licit activity corresponds to the occupation of a regular job which is associated with a wage equal to w_j ($j = 0, 1$). A type-j individual is unemployed with positive probability p_j ($j = 0, 1$). When a type-j person is unemployed, she receives an unemployment insurance benefit whose amount is a fixed fraction α_j of her wage. An illicit activity consists in an assault on a type-1 individual who may be either unemployed with probability p_1 or employed at wage w_1 with probability ($1-p_1$). This assault yieds a fraction β of the victim's wage, and the probability of an assault success (which corresponds to the probability not to get arrested and to be put in jail) is equal to q. The disutility associated with a failure (i.e. a capture followed by a penal sanction) is equal to C. An income level R, which may be obtained either legally or illegally by a type-0 individual, provides her with an (indirect) utility $U(R) = \ln R$, the logarithmic specification implying here that the relative risk-aversion of this person is constant. Correspondingly, we assume that the logarithm of the regular market wage of a potential offender has a normal distribution with mean μ_0 and variance σ_0. In other terms, $\ln w_0 = \mu_0 + \varepsilon_0$, where the random term ε_0 has a normal distribution $N(0, \sigma_0)$.

The expected utility associated with a licit activity for a type-0 individual is :

$$E_0 = p_0\, U(\alpha_0\, w_0) + (1 - p_0)\, U(w_0) = \ln w_0 + p_0 \ln \alpha_0 = \mu_0 + \varepsilon_0 + p_0 \ln \alpha_0 .$$

For the same person, the expected utility associated with an illicit activity is :

$$E_1 = - qC + (1\text{-}q)\, [p_1\, U(\beta\, \alpha_1\, w_1) + (1 - p_1)\, U(\beta\, w_1)] = - qC + (1\text{-}q)\, [\ln \beta + \ln w_1 + p_1 \ln \alpha_1].$$

A type-0 individual chooses an illicit activity if $E_1 > E_0$. The probability of this event is :

$$\Pr[E_1 > E_0] = P_I = \Pr \{\varepsilon_0 < (1\text{-}q)\, [\ln \beta + \ln w_1 + p_1 \ln \alpha_1] - \mu_0 - p_0 \ln \alpha_0 - qC \}$$

$$= \Phi\left(\frac{(1 - q)\,[\ln \beta + \ln w_1 + p_1 \ln \alpha_1] - \mu_0 - p_0 \ln \alpha_0 - qC}{\sigma_0} \right)$$

With this last formula, it is easy to check that :

a) $\quad \dfrac{\partial P_I}{\partial p_0} = -\dfrac{\ln \alpha_0}{\sigma_0}\, \varphi\left(\dfrac{(1 - q)\,[\ln \beta + \ln w_1 + p_1 \ln \alpha_1] - \mu_0 - p_0 \ln \alpha_0 - qC}{\sigma_0} \right) > 0,$

b) $\quad \dfrac{\partial P_I}{\partial \mu_0} = -\dfrac{1}{\sigma_0}\, \varphi\left(\dfrac{(1 - q)\,[\ln \beta + \ln w_1 + p_1 \ln \alpha_1] - \mu_0 - p_0 \ln \alpha_0 - qC}{\sigma_0} \right) < 0,$

c) $\quad \dfrac{\partial P_I}{\partial p_1} = \dfrac{(1 - q)\ln \alpha_1}{\sigma_0}\, \varphi\left(\dfrac{(1 - q)\,[\ln \beta + \ln w_1 + p_1 \ln \alpha_1] - \mu_0 - p_0 \ln \alpha_0 - qC}{\sigma_0} \right) < 0,$

d) $\quad \dfrac{\partial P_I}{\partial w_1} = \dfrac{(1 - q)}{w_1 \sigma_0}\, \varphi\left(\dfrac{(1 - q)\,[\ln \beta + \ln w_1 + p_1 \ln \alpha_1] - \mu_0 - p_0 \ln \alpha_0 - qC}{\sigma_0} \right) > 0.$

In other terms, the probability for a type-0 individual (say, a young person) to choose an illicit activity is, other things being equal, increasing with the youth unemployment rate and with the wage level of type-1 individuals (say, adults). It decreases with the mean wage level offered to young workers and with the unemployment rate of adult workers.

4. Data Set

In this study we construct a regional-level data set (for the 95 départements of metropolitan France) with measures of crimes as reported to the Ministry of Interior. We then match this data set with various socio-economic indicators. These indicators were constructed at the département level (to be matched to our panel).

First, to assess social conditions prevailing in the département that year, we constructed social, economic and demographic variables using multiple waves of the French Labor Force data. In March of every year the French Statistical Institute (INSEE) conducts a Labor Force Survey (Enquête sur l'Emploi), interviewing roughly 130,000 people who are asked a set of standard questions that are repeated every year. In particular, we know for each individual his or her département of residence. We use the Labor Force Survey for the years 1990 to 2000; most variables of interest are available every year. So for each département and year, we construct averages of the following variables: fraction of foreigners coming from North Africa, fraction of other foreigners, an age structure vector (fraction of 15-24 years old, of 25 to 49, above 50), a family vector (fractions of men living alone, of people living in single-parent families), an education vector (fractions of high school graduates, of unskilled people) and a city structure vector (the share of persons leaving in rural areas, in cities with less than 20,000 inhabitants, in cities between 20,000 and 200,000 inhabitants, in cities with more than 200,000 inhabitants, in Paris and suburbs). In addition, we use the industry structure at the department-level from 1986 to 2000 to construct predicted employment shares that will be used as instrumental variables (described below).

As unemployment is the core issue of our paper, we chose to measure it with very precise administrative data instead of using the Labor Force Survey. The French Public Employment Service provided us with département-level data sets with the number of unemployed by age categories, the share of unemployed above 25 years old not receiving unemployment benefits, and the number of those unemployed since more than one year. To focus even more closely on the young, we also compute shares of students and employed among the 15 to 24 years old from the French Labor Force Survey. We also use other administrative data sets available at the département-level. The number of policemen was obtained from INSEE, while the number of gendarmes was obtained from the Ministry of Defence.

5. Empirical Findings

5.1 OLS analysis

Most of our results at the regional level of the département are based on variants of the following equation:

$$\ln\left(CR_{it}\right) = X_{it}\beta + \gamma U_{it} + \alpha_i + \delta_t + \varepsilon_{it} \qquad \textbf{(1)}$$

where CR denotes the crime rate in département i at date t, where X denotes observed characteristics of the population, of the urban structure, U denotes the unemployment rate. Most of the time, we include time indicators and département fixed-effects. Finally, the last term of (1) is a statistical residual.

Table 2 presents the results for the basic specification. Each row shows results for a different crime. The first three columns present respectively the estimate for the unemployment coefficient, the standard error of this coefficient, and the R-square of the regression <u>without</u> time and département indicators. The last three columns present the estimate for the unemployment coefficient, the standard error of this coefficient, and the R-square of the regression <u>with</u> time and département indicators. All regressions include socio-demographic controls: fraction of foreigners coming from North Africa, of other foreigners, fraction of people aged 15 to 24, 25 to 49, of men living alone, of individuals in single-parent families, of individuals without any diploma, of high school graduates, of those living in rural areas, of those living in cities between 20,000 and 200,000 inhabitants, of those living in cities with more than 200,000 inhabitants, and finally those leaving in Paris and its suburbs. Département populations are used as weights.

First, considering the R-square column for the first set of regressions, two facts emerge. As predicted by the Becker's rational model of crime, property crime is better explained than violent crime or family crime (see Kelly, 2000 for a similar observation). Second, all R-squares are very large, even without the département or time indicators. A simple comparison

with wage regressions, where R-squares are lower than 0.3 in the cross-section and, therefore, observed characteristics appear to be less important than unobserved ones in wage analysis, shows that observable characteristics of the regions matter for crime. Third, in the cross-section, unemployment is positively associated to crime. A deeper statistical examination of these results (not reported, but available from the authors) in association with the impact of other variables on crime demonstrates that these cross-section results are **entirely** governed by the opposition between rural and urban départements. Fourth, and in contrast to the third point, unemployment is, in general, negatively associated to crime in the panel dimension. This is most often true for property or, more generally, economic crimes (burglaries, most thefts, or drug offences). Fifth, violent crimes (homicides, threats, violence against police forces) appear to be positively associated to unemployment. Hence, **if** they are the driving force of the insecurity feeling, Jospin was not totally wrong after all.

The following Tables are mere variations on this theme. Table 3 has the same structure as Table 2 but contrasts unemployment by age categories. Focusing on the estimates with region fixed effects, we see that youth unemployment has a positive impact on most crimes whereas unemployment for the two other age categories have a negative impact on most crimes. This set of results is much more in agreement with the popular view of crime, but also with a simple choice model of crime activity (see Appendix B). Indeed, those categories of crime for which the coefficient on youth unemployment is negative or not significantly different from zero – car thefts, homicides, pick-pocketing, shoplifting, blackmail, rapes, family offences – are clearly not youth-specific in contrast to, say, drug offences, motorbikes thefts, or burglaries.

Table 4 goes a step further and tries to identify the effects of unemployment benefits on crime. The structure of the Table is the following. Each row presents the results of two regressions. First, to the unemployment structure by age, we add the fraction of workers above 25 who are unemployed and do not receive unemployment benefits (specification (1)). Second, to the unemployment structure by age, we add the fraction of workers above 25 who are long-term unemployed (specification (2)). For this second regression, we only report the coefficient on the long-term unemployed variable since all other coefficients are virtually identical to those reported for specification (1). Results show that, indeed, not receiving UI benefits appear to be positively associated to almost all economic crimes. These results stand

in stark contrast to those of specification (2) since there is no association between crime and long-term unemployment.

Some institutional details are in order. First, most young workers are not eligible to unemployment benefits. Second, a non-negligible fraction of workers above 25 are not eligible to unemployment benefits, for instance because they did not work enough hours in the preceding year or because they were previously self-employed. Third, a large fraction of long-term unemployed receive UI benefits. In conclusion, the positive coefficients on youth unemployment and on non-reception of benefits for workers above 25 are the two faces of the same coin. Reception of benefits appears to decrease the incentives to commit economic crimes, conditional of course on unemployment.

Tables 5 and 6 test the robustness of these results by including a measure of the median wage and a measure of inequality (Q3/Q1 of the wage distribution) in the département (Table 5) and the number of policemen and of gendarmes (same role as police, mostly in rural areas, the gendarmes belong to the army in contrast to the police who is part of the Ministry of Interior). In addition to confirming the robustness of our previous results, estimates presented in Table 5 show that there is no relation between wages and economic crime (even though there are some evidence that sex offences tend to happen in poorer areas). Furthermore, there is no relation between wage inequality and economic crime.[2]

Results shown in Table 6 are once again similar to those presented in the previous Tables. The presence of police is negatively associated to robberies, burglaries, and thefts. By contrast, the effect of gendarmes is less clear-cut; a potential reflection of the rural nature of their tasks[3].

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[2] In unreported results, inspired by Gould et al. (2002), we estimated similar regressions with the fraction of low-wage workers (among the young and the unskilled) as explanatory variables. None of these variables proved significantly different from zero.

[3] We were able to check some of these results at the city-level and the individual level. The French Ministry of Defence provided us with an aggregate crime rate (restricted to burglaries, robberies, larcenies, and thefts) at the city-level (covering 90 percent of the 36,000 French cities, belonging mostly to rural and semi-urban areas, where gendarmes are in charge of security). We matched this data set with various socio-economic indicators. Most of these results have the same flavor as those shown previously for the département-level analysis, in the cross-section dimension. In particular, when looking at the unemployment variables, youth unemployment seems to have a negative impact on crime. These results in fact contrast small rural communes with larger semi-urban cities. We also performed a similar analysis -with similar results- at the individual level, using our victimization survey matched with various socio-economic indicators.

5.2 Correlations across crimes

A potential issue in our strategy is the following. We have examined crimes separately, one by one. Obviously, some crimes are related. For instance, in a violent burglary, wounds can also be inflicted to the victims. In addition, reporting strategies may vary. For instance, in quiet areas, shoplifting will be systematically reported to the police and registered whereas in more troubled places either shoplifting will not be systematically reported because it is too frequent, or even when the victim tries to report it to the authorities, the police might not have time to register the act. A first strategy to examine these problems is presented now. We compute the correlations between our various measures of crime across regions. This correlation Table, as well as those that follow, are given in the Appendix A. Results of Tables A.1 and A.2 show that economic crimes are very highly correlated across the French departments. Just note though that shoplifting is much less correlated to the rest of economic crimes. Furthermore, family offences seem also to behave differently, a result that is not surprising given that factors that affect this type of crime are obviously not governed by Becker's model of rational crime. An examination of Table A.3 that presents correlations across growth rates for these same crimes confirms that economic crimes are very different from the rest. A relatively large fraction of these correlations are positive and significant in stark contrast with correlations between growth rates of other types of crimes. To understand the nature of the links between these various crimes, we decomposed each crime as described in equation (1). Then, we recuperate and estimate of α_i for each crime. First, we correlate these fixed effects across regions. Results are given in Table A.4. Most correlations are huge (and positive). Once again, shoplifting, family offences and sex offences stand in sharp contrast. Hence, the same unobserved fixed components explain the various crimes. The next stage is to understand the nature of these fixed components. Do they mostly pertain to observable characteristics of the département or to unobservables ? To examine this question, we first estimate the following equation:

$$\hat{\alpha}_i = x_i \delta + \upsilon_i$$

where the fixed effect for each crime is regressed on the same set of time-invariant variables (basically, the average of our variables from equation (1)). We do not report the R-square of these regressions but they are very large, between 0.6 and 0.9. Hence, observed factors explain a large fraction of the fixed effects. Then, we take the estimated υ_i's and correlate them across crimes. The results are given in Table A.5. Once again, correlations are virtually

all significant, positive, and very large. Structural factors, some being associated to oppositions such as rural versus urban environments, explain the level of crime, irrespective of its type and nature.

5.3 A causal approach

Up to this point, we adopted a descriptive viewpoint. But, we obviously need to use a more causal approach. The basic problem is the following. Unemployment can be endogenous in a crime regression. Gould et al. (2002) presents the reason very clearly. If crime in a region induces firms to stop investing or even to start relocating their activities in less crime-prone regions, then unemployment and crime will be positively correlated because crime causes unemployment and not the reverse. The strategy that is usually applied, instrumental variables techniques, will also be applied in the following paragraphs.

Our set of instruments is directly inspired by Gould et al. (2002).[4] In their paper, these authors used the predicted industrial structure to instrument unemployment since those predictions, made at the beginning of the period, were obviously based on purely economic reasons with no room for crime considerations. Following them, we use as instrumental variables the components of the (predicted) change in demographic group *g*'s share of employment between date *0* and date *t* (*t = 1, …,T*) in département *d.* We consider three demographic groups *(g = 1, 2, 3)* based on age (15-24, 25-49 and more than 50 years old). The change in demographic group *g*'s share of employment between date *0* and date *t* in département *d* can be decomposed as follows:

$$f_{g|dt} - f_{g|d0} = \sum_i f_{g|d0i}\left(f_{i|dt} - f_{i|d0}\right) + \sum_i f_{i|dt}\left(f_{g|dti} - f_{g|d0i}\right) \tag{2}$$

where:

- $f_{g|dti}$ (respectively, $f_{g|d0i}$) denotes the demographic group *g*'s share of the employment in industry *i* at time *t* (respectively, at time *0*) in département *d*,
- $f_{g|dt}$ (respectively, $f_{g|d0}$) denotes the demographic group *g*'s share of the employment at time *t* (respectively, at time *0*) in département *d*,

---

[4] See also Blanchard and Katz (1992).

- $f_{i/dt}$ (respectively, $f_{i/d0}$) denotes industry i's share of the employment at time t (respectively, at time 0) in département d.

The first term on the r.h.s. of equation (2), called $GROW_g$, represents the effects of industry growth rates, while the second term, called $TECH_g$, reflects changes in each group's share of employment within industries. Following Gould et al. (2002), in estimating each term, we replace the département-specific employment shares $f_{g/dti}$ and $f_{g/d0i}$ with national employment shares $f_{g/ti}$ and $f_{g/0i}$. We also replace the actual end of period shares $f_{i/dt}$ with estimates $\hat{f}_{i|dt}$ defined as:

$$\hat{f}_{i|dt} = f_{i|do} \frac{f_{i|t}}{f_{i|0}}$$

Our set of instruments includes the predicted effects of industry growth rates $GROW_g$ and their squares, for $g = 1, 2$ (it is easy to verify that $\Sigma_g \, GROW_g = 0$, which implies that one element in the vector of instruments $GROW_g$ has to be excluded from the list of regressors in the instrumental regression). Values of theses 4 instruments are obtained from the French annual Labor Force Surveys collected by INSEE (Paris) between 1989 ($t = 0$) and 2000 ($t = T$).

Results of these instrumenting regressions for two sets of instruments are presented in Tables 7A and 7B. All our measures of unemployment are well correlated to the instruments (see the F-statistics). Gould et al. (2002) justify their instruments, in particular the within-industry growth rates of employment shares in the 4 demographic groups, by appealing to biased technical change. However, unreported results (available from the authors) show that the within industry growth rates (the *TECH* variables) do not seem to have a good predictive power, in contrast to the between-industry growth rates (the *GROW* variables). This is reminiscent of previous results on France showing that biased technical change appears less biased in France than in the United States (see Goux and Maurin, 2000 and Card, Kramarz, and Lemieux, 1999). To summarize, our first-stage results are quite satisfactory for our main variables of interest, the unemployment rates, when using predicted industry growth, by demographic or education group (with slightly larger F-statistics for instruments based on age).

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Tables 8A to 8B presents the IV results for our two sets of instruments. These Tables have the same format as those previously discussed. Sargan's tests of the validity of the instruments are reported in the last two columns. Most test statistics support their (statistical) quality, in particular the instruments are deemed satisfactory in all crimes but four: motorbike thefts, homicides for both instruments, voluntary wounds, violence against police, blackmails, and illegal weapon ownership for one of the two. Hence, for only two crimes our IV estimates are not statistically reliable. These IV results confirm previous estimates. Youth unemployment has a clear (positive) effect on most economic crimes: robberies, burglaries, car thefts, thefts from cars, pick-pocketing, drug offences, damage to vehicles. The effects are often extremely large and significant. In addition, in unreported results (available again from the authors), it is only youth unemployment that positively affects crime; the fraction of students or the fraction of employed among the 15-24 years old has a statistically insignificant effect on crime (most often with negative signs, as expected). Therefore, the culprit is indeed youth unemployment which causes economic crimes. Finally, results in Table 8B (less so in Table 8A) show that the fraction of unemployed workers among the 25 to 49 years old has a strong negative, most often statistically significant, impact on crime (this variable is also instrumented, see Tables 7A and 7B). If criminals are mostly found among the young, their targets appear to be the employed individuals. Hence, an increase in unemployment among the targets may cause a decrease in opportunities of profitable crime.

To summarize these last results, youth unemployment has a positive and robust causal effect on most property crimes – robberies, burglaries, car thefts,… – and on drug offences when other types of violent crimes, such as rapes or homicides, appear to be unrelated to labor market conditions, in agreement with the Becker model of crime.

6. Conclusion

Our results demonstrate that most of the variation in criminality is between regions. They also show that the main reason for this is the opposition between mostly rural regions and mostly urban départements. Are such results a sound basis for a public policy trying to reduce crime ? One possibility is to follow Alphonse Allais who suggested 100 years ago to relocate cities in the countryside ("mettre les villes à la campagne"). Fortunately, there is also

variation within departments. In particular, our IV results suggest potential public policies against crime. Fighting youth unemployment should indeed help decreasing property crimes and drug offences. However, some other economic or violent crimes appear to be unrelated to labor market conditions as measured by unemployment. We have also reported evidence that it is indeed unemployment among the young, and not the young per se, that causes crime. To attract the young away from crime, there are multiple potential routes. Education is an obvious one. More specifically, education has to pay, either directly or indirectly. For the direct component, two ideas can be mentioned. First, apprentices receive – by law – miserable pay when doing their apprenticeship, which may explain that they are often used as cheap labor by firms without being effectively trained (see Fougère and Schwerdt, 2002). Second, experiments in Israel show that large bonuses targeted to the poor that are paid when the child succeeds at school seem to work (see for instance Angrist and Lavy, 2001). The indirect route is obviously longer investments in schooling with deferred compensations large enough to make the investment valuable. This is not an easy route in France where returns to a university education have decreased in the last 10 years (see Kramarz, Lemieux, Margolis, 2002).

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Figures

Figure 1: Property Crimes Rates 1990-2000 (reference 1990 = 100)
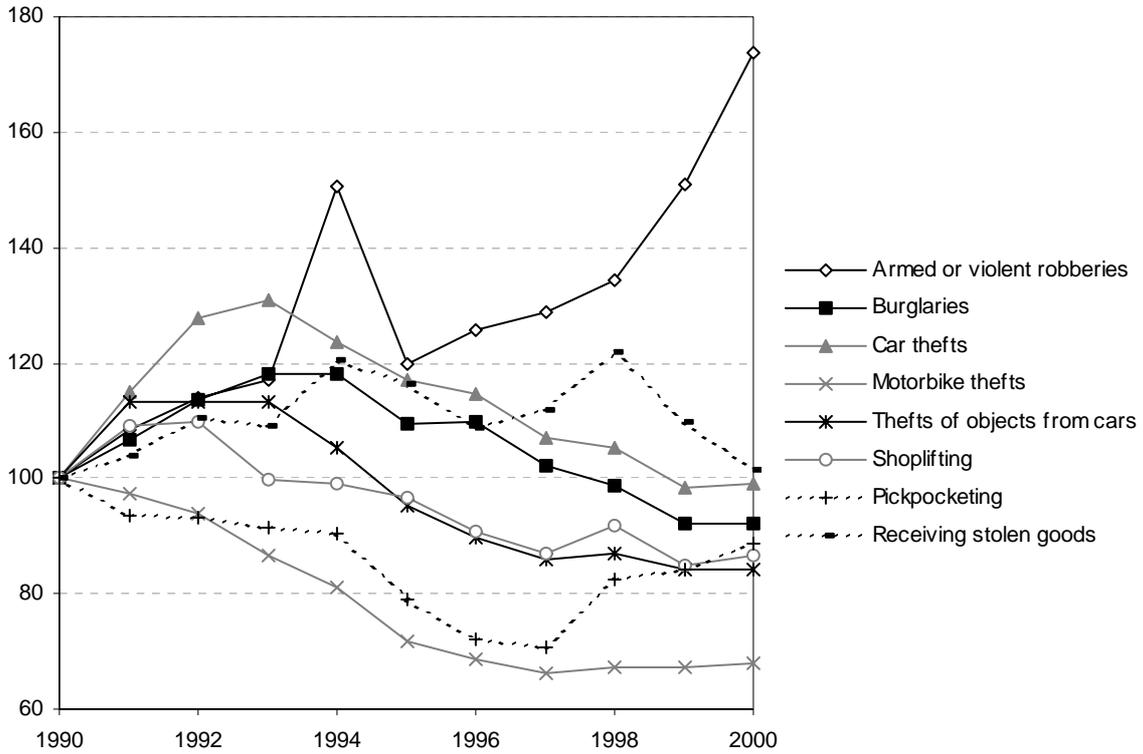
Source: Ministry of Interior

Figure 2: Violent Crimes Rates 1990-2000 (reference 1990 = 100)

Source: Ministry of Interior

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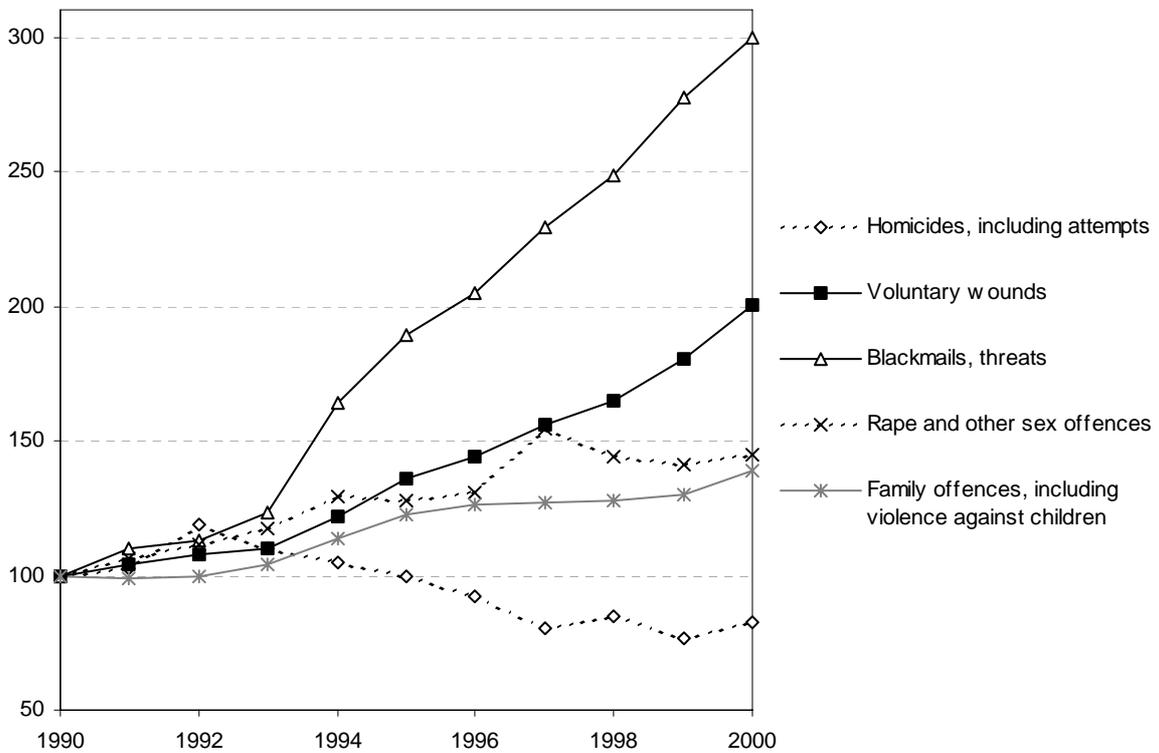
Figure 3: Other Crimes Rates 1990-2000
(reference 1990 = 100)
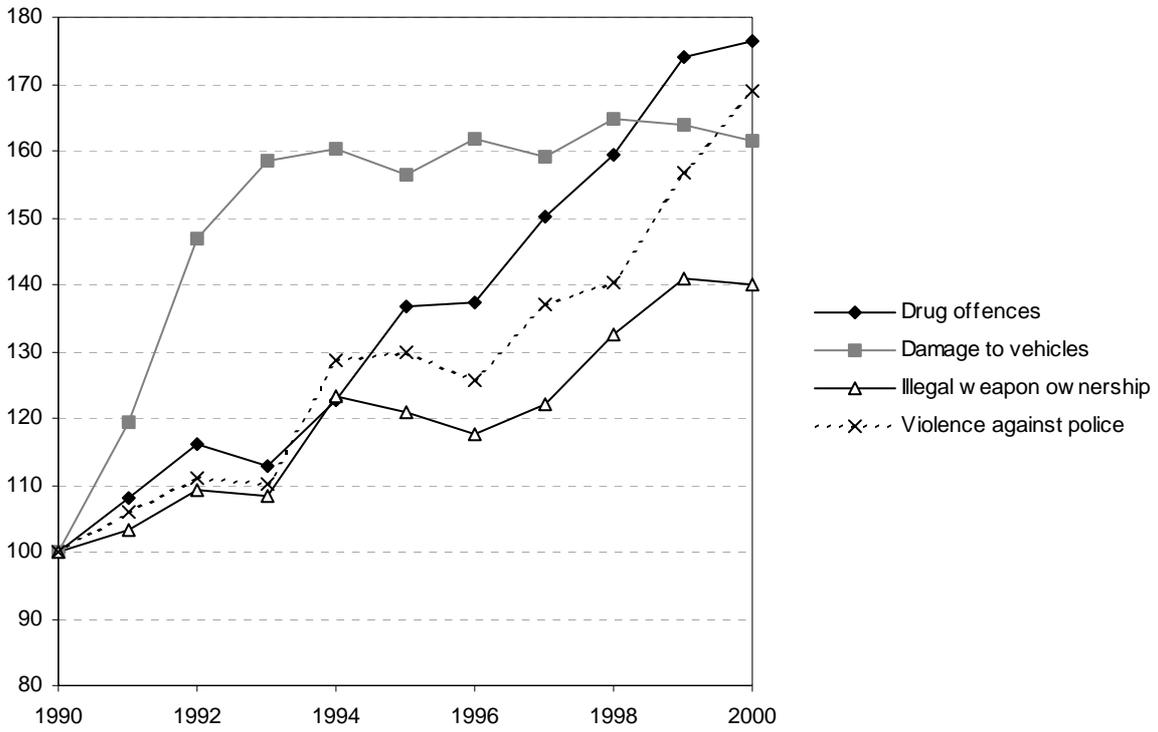
Source: Ministry of Interior

Figure 4: Reporting Rate 1996-2002
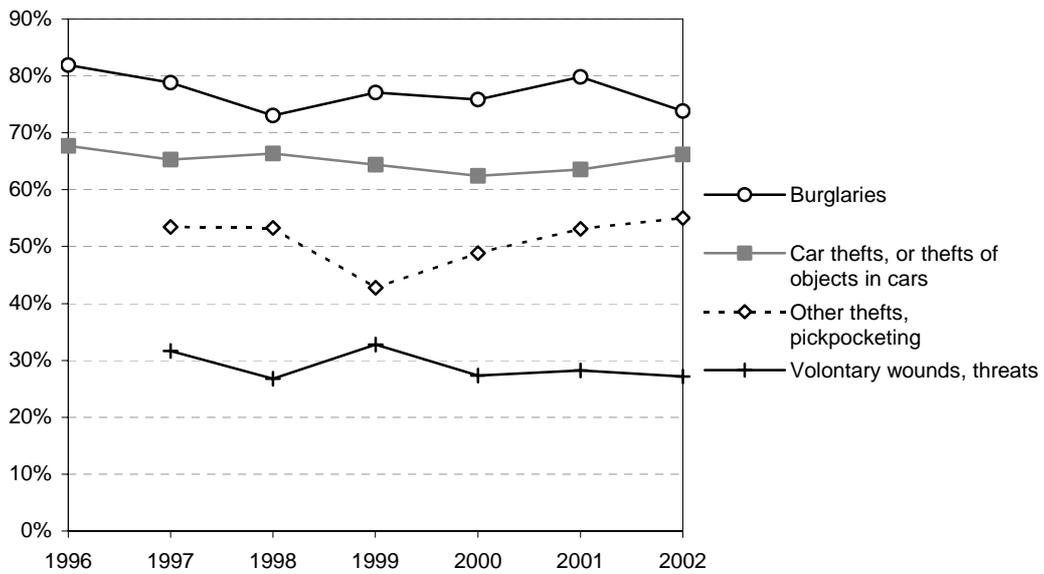
Source: victimization surveys, INSEE, 1997-2002

Figure 5: Victimization Rate 1996-2002
(household level; reference 1996 = 100)
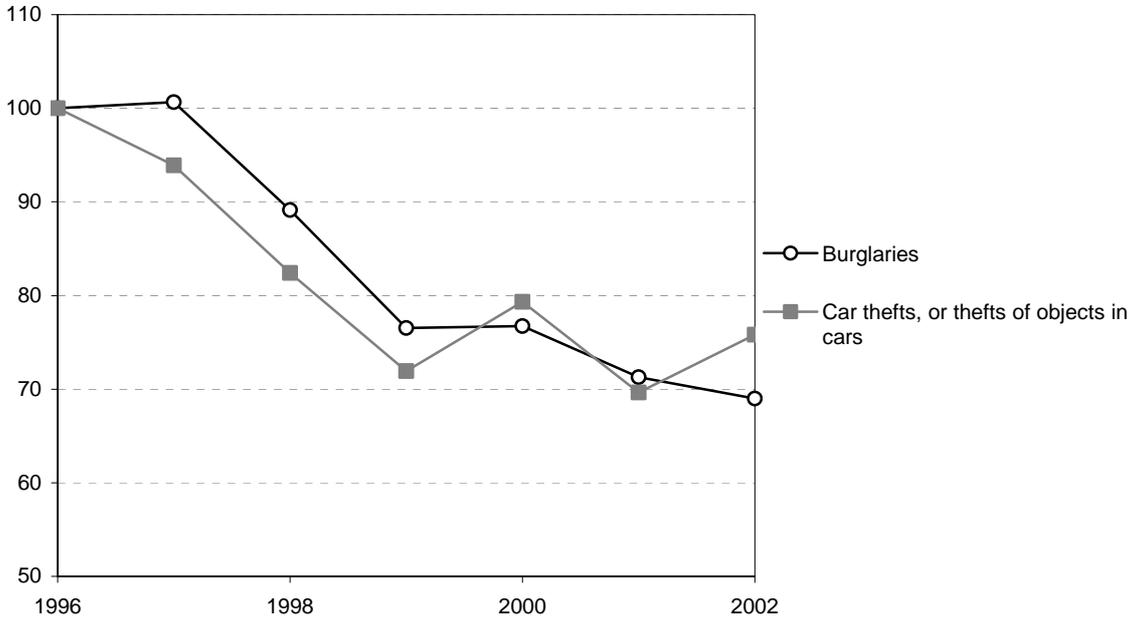
Source: victimization surveys, INSEE, 1996-2002

Figure 6: Victimization Rate 1997-2002
(individual level, reference 1997 = 100)
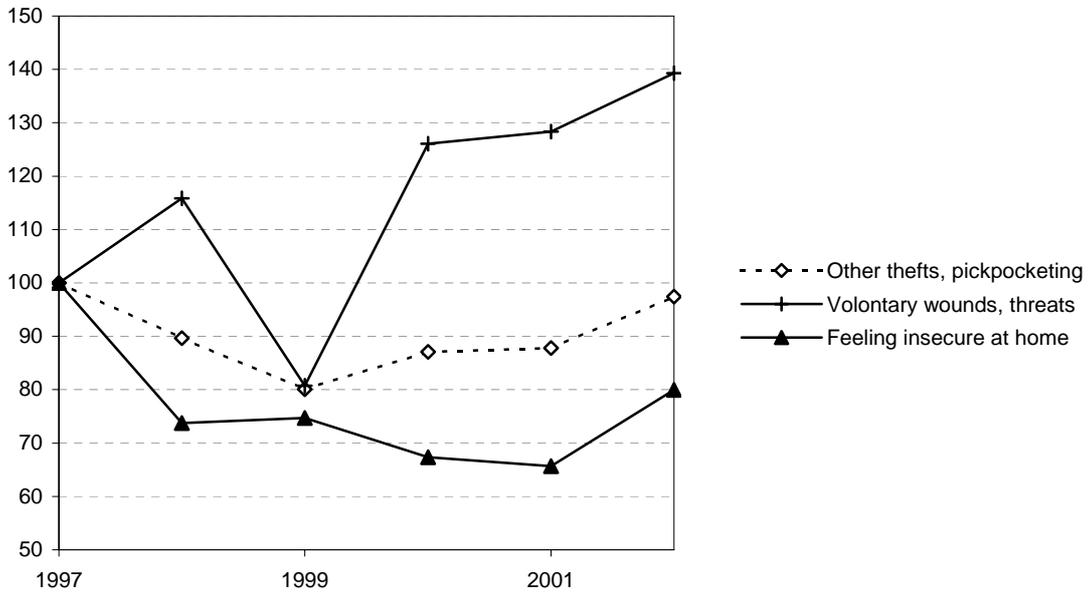
Source: victimization surveys, INSEE, 1997-2002

Figure 7: Unemployment Rates (by Age Categories) 1990-2002
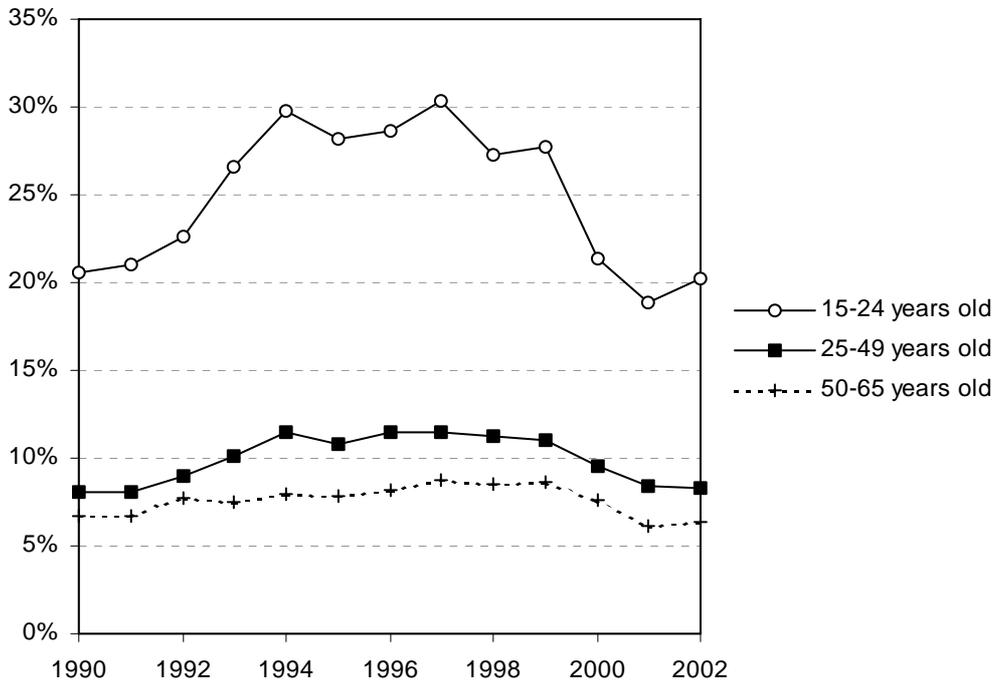
Source: Labor Force Surveys (Enquête Emploi), INSEE, 1990-2002.

Figure 8: Shares of Convicted Delinquents (by Age Categories), 2000
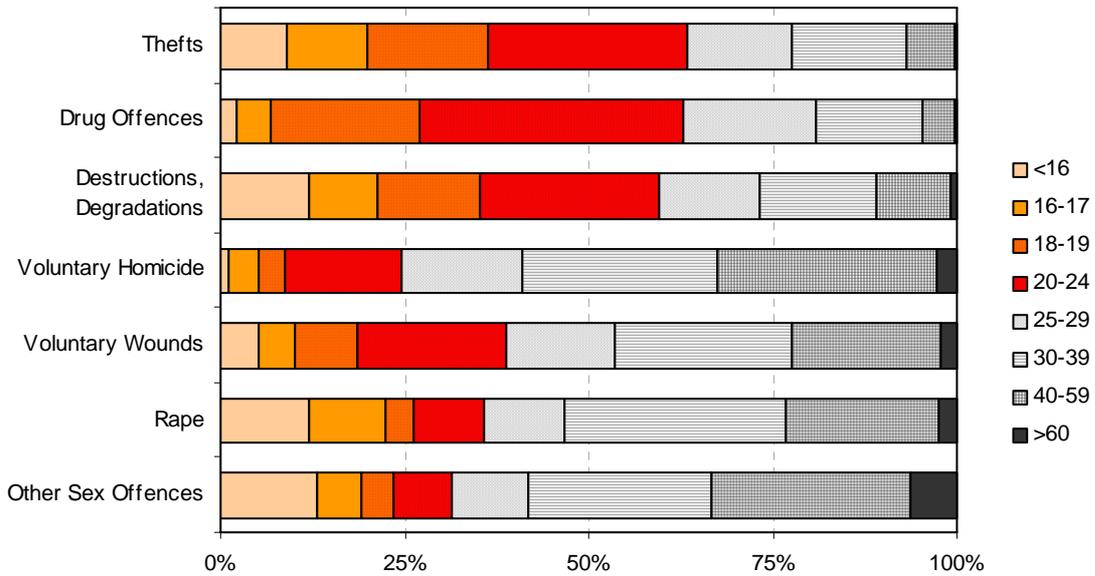
Source: Ministry of Justice

Tables

Table 1: Development of Selected Offences in France (1990-2000)

Crime Rate	1990			2000		
	Mean	Std-error	Coeff. of Variation	Mean	Std-error	Coeff. of Variation
Property Crimes						
Armed or violent robberies	107.5	100.4	0.93	186.8	193,0	1.03
Burglaries	712.5	384.9	0.54	656.5	232.6	0.35
Car thefts	519.9	343.7	0.66	515.1	290.0	0.56
Motorbike thefts	246.6	132.2	0.54	167.5	76.3	0.46
Thefts of objects from cars	1355.1	658.5	0.49	1140.7	450.1	0.39
Shoplifting	112.9	58.5	0.52	97.7	37.7	0.39
Pickpocketing	193.6	334.6	1.73	171.4	270.3	1.58
Receiving stolen goods	54.5	27.1	0.50	55.3	26.8	0.48
Violent Crimes						
Homicides, including attempts	4.5	2.4	0.54	3.7	2.0	0.54
Voluntary wounds	90.3	55.3	0.61	181.2	65.2	0.36
Blackmails, threats	55.2	16.4	0.30	82.7	35.1	0.42
Rape and other sex offences	39.3	16.8	0.43	57.0	12.5	0.22
Family offences, incl. violence against children	52.0	14.6	0.28	72.0	18.6	0.26
Other Crimes						
Drug offences	99.9	76.7	0.77	176.2	64.1	0.36
Damage to vehicles	296.8	164.0	0.55	479.0	212.4	0.44
Illegal weapon ownership	26.6	14.8	0.55	37.3	24.1	0.65
Violence against police	39.4	12.7	0.32	66.6	33.8	0.51

Source: Ministry of Interior.
Crimes rates are offences per 100,000 people.
The département population means were used as weights (there are 95 départements in France)

Table 2: OLS Effects of Unemployment on Crime

	No time or département fixed effects			Département and year fixed effects		
	Fraction of unemployed		Adjusted R2	Fraction of unemployed		Adjusted R2
Armed or violent robberies	12.22	(0.89)	0.83	-0.78	(1.22)	0.95
Burglaries	7.41	(0.60)	0.69	-1.76	(0.66)	0.94
Car thefts	14.80	(1.01)	0.69	-1.54	(0.94)	0.95
Motorbike thefts	3.56	(0.75)	0.50	-1.32	(0.73)	0.92
Thefts of objects from cars	6.42	(0.69)	0.65	-2.76	(0.86)	0.91
Shoplifting	-0.85	(0.93)	0.34	-0.52	(1.45)	0.73
Pickpocketing	7.79	(1.41)	0.75	-0.03	(1.40)	0.96
Receiving stolen goods	6.91	(0.84)	0.52	-2.37	(1.64)	0.70
Homicides, including attempts	4.25	(1.03)	0.42	2.90	(1.98)	0.64
Voluntary wounds	4.17	(0.80)	0.52	0.30	(0.95)	0.64
Blackmails, threats	3.70	(0.87)	0.36	2.92	(1.32)	0.75
Rape and other sex offences	5.66	(0.66)	0.32	-0.65	(1.09)	0.69
Family offences, including violence against children	3.56	(0.59)	0.44	-0.37	(0.73)	0.86
Drug offences	2.64	(1.12)	0.39	-3.48	(1.68)	0.77
Damage to vehicles	10.00	(0.88)	0.65	-2.76	(1.36)	0.86
Illegal weapon ownership	3.09	(0.93)	0.54	5.41	(1.54)	0.79
Violence against police	1.99	(0.67)	0.57	2.49	(0.95)	0.86

Each row presents the results of two regressions. The only reported coefficient is that of the unemployment variable. The first regression does not include time and département effects. The standard errors are between parentheses. Each observation is a département-year. 1,045 observations. The dependent variable is the logarithm of offenses rates (offenses per 100,000 people). Each regression also includes socio-demographic controls (fraction of foreigners coming from North Africa, of other foreigners, fraction of 15-24, of 25-49, of men living alone, of people in single-parent families, of unskilled people, of high school graduates, of those living in rural areas, of those living in cities between 20,000 and 200,000, in cities above 200,000, in Paris and suburbs). Département population is used as weight.
Sources: Ministry of Interior, ANPE, and INSEE (Labor Force Survey, 1990-2000).

Table 3: OLS effects of Unemployment (by Age Categories) on Crime

	No time or département fixed effects							Département and year fixed effects						
	Fraction of unemployed among 15-24 years old		Fraction of unemployed among 25-49 years old		Fraction of unemployed among more than 50 years		Adjusted R2	Fraction of unemployed among 15-24 years old		Fraction of unemployed among 25-49 years old		Fraction of unemployed among more than 50 years		Adjusted R2
Armed or violent robberies	-3.54	(1.02)	8.63	(1.12)	15.59	(3.76)	0.84	4.13	(1.11)	-5.27	(1.46)	2.16	(4.57)	0.95
Burglaries	-5.02	(0.66)	7.76	(0.73)	9.61	(2.45)	0.72	2.63	(0.59)	-1.88	(0.78)	-8.59	(2.46)	0.94
Car thefts	-7.68	(1.11)	13.59	(1.22)	19.76	(4.10)	0.69	1.05	(0.85)	0.41	(1.12)	-11.63	(3.53)	0.95
Motorbike thefts	-4.32	(0.83)	2.00	(0.91)	29.01	(3.07)	0.56	3.33	(0.65)	-1.83	(0.86)	-11.45	(2.69)	0.92
Thefts of objects from cars	-4.70	(0.77)	6.34	(0.85)	14.87	(2.87)	0.68	2.50	(0.78)	-2.96	(1.03)	-5.68	(3.23)	0.91
Shoplifting	4.98	(1.08)	-5.89	(1.19)	6.44	(4.01)	0.35	-0.55	(1.33)	0.91	(1.75)	-3.45	(5.51)	0.73
Pickpocketing	-8.49	(1.56)	5.57	(1.71)	50.94	(5.76)	0.78	1.15	(1.29)	-0.40	(1.69)	-3.72	(5.32)	0.96
Receiving stolen goods	-5.57	(0.97)	8.20	(1.06)	6.81	(3.58)	0.55	4.94	(1.49)	-7.38	(1.96)	5.13	(6.16)	0.70
Homicides, including attempts	-7.57	(1.16)	5.86	(1.27)	25.18	(4.28)	0.48	-1.76	(1.81)	1.61	(2.39)	7.86	(7.50)	0.64
Voluntary wounds	1.47	(0.94)	0.97	(1.03)	2.35	(3.48)	0.51	1.78	(0.86)	-2.57	(1.14)	3.52	(3.58)	0.89
Blackmails, threats	-2.13	(1.02)	5.24	(1.12)	-7.80	(3.76)	0.37	1.21	(1.21)	0.79	(1.60)	-2.55	(5.02)	0.75
Rape and other sex offences	1.87	(0.76)	3.71	(0.84)	-13.08	(2.83)	0.34	-1.39	(0.98)	4.74	(1.29)	-18.62	(4.07)	0.70
Family offences, incl. violence against children	-0.60	(0.69)	3.44	(0.76)	-3.60	(2.55)	0.45	-0.77	(0.67)	1.37	(0.88)	-4.00	(2.76)	0.86
Drug offences	-0.82	(1.30)	5.63	(1.43)	-22.73	(4.80)	0.41	6.64	(1.52)	-5.01	(2.00)	-17.08	(6.27)	0.78
Damage to vehicles	-1.04	(1.03)	7.72	(1.13)	-4.59	(3.82)	0.66	1.05	(1.25)	-1.48	(1.64)	-7.54	(5.16)	0.86
Illegal weapon ownership	-3.02	(1.09)	3.44	(1.19)	8.45	(4.02)	0.55	0.86	(1.41)	-1.53	(1.86)	17.68	(5.84)	0.79
Violence against police	-0.58	(0.78)	-0.21	(0.86)	13.60	(2.89)	0.58	-3.27	(0.85)	0.69	(1.12)	17.80	(3.53)	0.86

The standard errors are between parentheses. Each observation is a département-year. Observations are for the 95 French départements and for the years 1990-2000 (1,045 obs.). Dependent variables are the logarithms of offenses rates (offenses 100,000 people). Each regression also includes socio-demographic controls (fraction of foreigners coming from North Africa, of other foreigners, fraction of 15-24, of 25-49, of men living alone, of people in single-parent families, of unskilled people, of0 high school graduates, of those living in rural areas, of those living in cities between 20,000 and 200,000, in cities above 200,000, in Paris and suburbs). Département population is used as weight. Sources: Ministry of Interior, ANPE, and INSEE (Labor Force Survey, 1990-2000).

Table 4: OLS effects of Unemployment and Unemployment Benefits on Crime

	Specification (1)								Specification (2)	
	Fraction of unemployed among 15-24 years old		Fraction of unemployed among 25-49 years old		Fraction of unemp. among more than 50 years old		Fraction among unemployed above 25 not receiving UI		Fraction among unemp. above 25 with duration >1 yr	
Armed or violent robberies	4.05	(1.11)	-5.16	(1.46)	2.16	(4.57)	0.14	(0.11)	0.07	(0.10)
Burglaries	2.55	(0.59)	-1.77	(0.78)	-8.59	(2.45)	0.14	(0.06)	-0.14	(0.05)
Car thefts	0.99	(0.85)	0.49	(1.12)	-11.63	(3.53)	0.10	(0.08)	-0.15	(0.08)
Motorbike thefts	3.31	(0.65)	-1.81	(0.86)	-11.45	(2.69)	0.03	(0.06)	-0.12	(0.06)
Thefts of objects from cars	2.41	(0.78)	-2.83	(1.03)	-5.68	(3.23)	0.16	(0.08)	-0.20	(0.07)
Shoplifting	-0.45	(1.33)	0.77	(1.76)	-3.46	(5.51)	-0.17	(0.13)	0.11	(0.12)
Pickpocketing	1.05	(1.29)	-0.25	(1.69)	-3.71	(5.31)	0.18	(0.12)	-0.02	(0.11)
Receiving stolen goods	5.03	(1.49)	-7.50	(1.97)	5.12	(6.16)	-0.16	(0.14)	0.18	(0.13)
Homicides, including attempts	-2.02	(1.81)	1.99	(2.38)	7.88	(7.48)	0.47	(0.17)	0.30	(0.16)
Voluntary wounds	1.81	(0.87)	-2.62	(1.14)	3.51	(3.58)	-0.06	(0.08)	0.10	(0.08)
Blackmails, threats	1.35	(1.21)	0.59	(1.60)	-2.56	(5.01)	-0.25	(0.12)	0.10	(0.11)
Rape and other sex offences	-1.48	(0.98)	4.87	(1.30)	-18.61	(4.06)	0.16	(0.09)	-0.13	(0.09)
Family offences, incl. violence against children	-0.76	(0.67)	1.36	(0.88)	-4.00	(2.76)	-0.01	(0.06)	-0.04	(0.06)
Drug offences	6.71	(1.52)	-5.12	(2.00)	-17.09	(6.27)	-0.13	(0.15)	-0.21	(0.13)
Damage to vehicles	1.03	(1.25)	-1.44	(1.65)	-7.54	(5.16)	0.05	(0.12)	0.03	(0.11)
Illegal weapon ownership	0.87	(1.41)	-1.53	(1.86)	17.68	(5.84)	-0.01	(0.14)	-0.04	(0.13)
Violence against police	-3.22	(0.86)	0.63	(1.13)	17.80	(3.53)	-0.08	(0.08)	0.20	(0.08)

The standard errors are between parentheses. Each observation is a département-year. Observations are for the 95 French départements and for the years 1990-2000 (1,045 obs.). Dependent variables are the logarithms of offenses rates (offenses 100,000 people). Each regression also includes year and département fixed effects, socio-demographic controls (fraction of foreigners coming from North Africa, of other foreigners, fraction of 15-24, of 25-49, of men living alone, of people in single-parent families, of unskilled people, of high school graduates, of those living in rural areas, of those living in cities between 20,000 and 200,000, in cities above 200,000, in Paris and suburbs). Département population is used as weight. Specification (1) includes the first four variables for each regression. Specification (2) is the same as (1) but replaces the fraction among unemployed above 25 not receiving UI with the fraction of those with unemployment duration greater than 1 year. Sources: Ministry of Interior, ANPE, and INSEE (Labor Force Survey, 1990-2000).

	Fraction of unemployed among 15-24 years old		Fraction of unemployed among 25-49 years old		Fraction of unemp. among more than 50 years old		Fraction among unemployed above 25 not receiving UI		Median Wage		Ratio of third and first quartiles of the wage distr.		Adjusted R2
Armed or violent robberies	4.18	(1.11)	-5.17	(1.47)	1.63	(4.58)	0.15	(0.11)	0.36	(0.26)	-0.18	(0.23)	0.95
Burglaries	2.61	(0.60)	-1.85	(0.79)	-8.71	(2.46)	0.14	(0.06)	0.08	(0.14)	-0.14	(0.12)	0.94
Car thefts	1.05	(0.86)	0.23	(1.13)	-11.38	(3.53)	0.10	(0.08)	-0.19	(0.20)	-0.29	(0.18)	0.95
Motorbike thefts	3.45	(0.65)	-1.87	(0.86)	-11.95	(2.70)	0.04	(0.06)	0.34	(0.15)	-0.23	(0.14)	0.92
Thefts of objects from cars	2.44	(0.78)	-2.82	(1.04)	-5.85	(3.24)	0.16	(0.08)	0.12	(0.18)	-0.03	(0.16)	0.91
Shoplifting	-0.48	(1.33)	0.17	(1.76)	-2.11	(5.49)	-0.20	(0.13)	-0.97	(0.31)	-0.43	(0.28)	0.73
Pickpocketing	1.11	(1.29)	-0.30	(1.71)	-3.86	(5.34)	0.19	(0.12)	0.10	(0.30)	-0.11	(0.27)	0.96
Receiving stolen goods	5.06	(1.50)	-7.43	(1.98)	4.83	(6.19)	-0.15	(0.14)	0.21	(0.35)	0.02	(0.31)	0.70
Homicides, including attempts	-2.03	(1.82)	2.04	(2.40)	7.84	(7.51)	0.47	(0.17)	0.03	(0.43)	0.06	(0.38)	0.64
Voluntary wounds	1.59	(0.87)	-2.55	(1.14)	4.43	(3.57)	-0.07	(0.08)	-0.62	(0.20)	0.34	(0.18)	0.89
Blackmails, threats	1.23	(1.22)	0.65	(1.61)	-2.12	(5.03)	-0.25	(0.12)	-0.29	(0.29)	0.21	(0.25)	0.75
Rape and other sex offences	-1.66	(0.99)	4.88	(1.30)	-17.78	(4.07)	0.15	(0.09)	-0.56	(0.23)	0.24	(0.20)	0.70
Family offences, including violence against children	-0.74	(0.67)	1.30	(0.89)	-3.95	(2.77)	-0.01	(0.06)	-0.04	(0.16)	-0.06	(0.14)	0.86
Drug offences	6.70	(1.53)	-5.20	(2.01)	-16.88	(6.30)	-0.14	(0.15)	-0.15	(0.36)	-0.05	(0.32)	0.78
Damage to vehicles	1.19	(1.25)	-1.42	(1.66)	-8.34	(5.17)	0.06	(0.12)	0.55	(0.29)	-0.19	(0.26)	0.86
Illegal weapon ownership	0.85	(1.42)	-1.88	(1.87)	18.47	(5.85)	-0.02	(0.14)	-0.57	(0.33)	-0.25	(0.29)	0.79
Violence against police	-3.30	(0.85)	0.36	(1.13)	18.70	(3.53)	-0.09	(0.08)	-0.64	(0.20)	-0.12	(0.18)	0.86

The standard errors are between parentheses. Each observation is a département-year. Observations are for the 95 French départements and for the years 1990-2000 (1,045 obs.). Dependent variables are the logarithms of offenses rates (offenses 100,000 people). Each regression also includes year and département fixed effects, socio-demographic controls (fraction of foreigners coming from North Africa, of other foreigners, fraction of 15-24, of 25-49, of men living alone, of people in single-parent families, of unskilled people, of high school graduates, of those living in rural areas, of those living in cities between 20,000 and 200,000, in cities above 200,000, in Paris and suburbs). Département population is used as weight. Sources: Ministry of Interior, ANPE, and INSEE (Labor Force Survey, 1990-2000).

Table 6: OLS effects of Unemployment and Unemployment Benefits on Crime, Controlling for Deterrence

	Fraction of unemployed among 15-24 years old		Fraction of unemployed among 25-49 years old		Fraction of unemployed among more than 50 years		Fraction among unemployed above 25 not receiving UI		Total Police Employment (in logs)		Total Gendarmes Employment (in logs)		Adjusted R2
Armed or violent robberies	4.68	(1.12)	-5.78	(1.46)	2.35	(4.62)	0.12	(0.11)	-0.14	(0.08)	-0.64	(0.21)	0.95
Burglaries	2.17	(0.60)	-1.71	(0.78)	-6.87	(2.47)	0.15	(0.06)	-0.12	(0.05)	0.41	(0.11)	0.94
Car thefts	0.80	(0.86)	0.15	(1.12)	-8.64	(3.55)	0.10	(0.08)	-0.30	(0.07)	0.23	(0.16)	0.95
Motorbike thefts	3.33	(0.66)	-2.17	(0.86)	-9.51	(2.72)	0.03	(0.06)	-0.22	(0.05)	0.00	(0.12)	0.93
Thefts of objects from cars	2.68	(0.79)	-3.11	(1.03)	-5.57	(3.28)	0.15	(0.08)	-0.06	(0.06)	-0.28	(0.15)	0.91
Shoplifting	0.76	(1.34)	0.13	(1.74)	-6.38	(5.53)	-0.20	(0.13)	0.09	(0.10)	-1.28	(0.25)	0.74
Pickpocketing	0.75	(1.31)	0.06	(1.71)	-3.87	(5.41)	0.19	(0.12)	0.08	(0.10)	0.30	(0.24)	0.96
Receiving stolen goods	5.12	(1.52)	-7.59	(1.98)	5.17	(6.28)	-0.16	(0.14)	-0.02	(0.12)	-0.09	(0.28)	0.70
Homicides, including attempts	-0.85	(1.83)	1.57	(2.38)	3.91	(7.56)	0.44	(0.17)	0.22	(0.14)	-1.25	(0.34)	0.65
Voluntary wounds	1.83	(0.88)	-2.55	(1.15)	3.03	(3.65)	-0.06	(0.08)	0.05	(0.07)	-0.02	(0.16)	0.89
Blackmails, threats	1.86	(1.23)	0.22	(1.61)	-3.18	(5.09)	-0.26	(0.12)	-0.03	(0.09)	-0.53	(0.23)	0.75
Rape and other sex offences	-1.14	(1.00)	4.79	(1.30)	-20.01	(4.13)	0.15	(0.09)	0.09	(0.08)	-0.37	(0.18)	0.70
Family offences, including violence against children	-0.90	(0.68)	1.34	(0.88)	-3.09	(2.81)	-0.01	(0.06)	-0.07	(0.05)	0.16	(0.13)	0.86
Drug offences	5.43	(1.52)	-3.99	(1.98)	-16.61	(6.29)	-0.10	(0.14)	0.19	(0.12)	1.33	(0.28)	0.78
Damage to vehicles	0.84	(1.27)	-1.50	(1.66)	-6.18	(5.26)	0.05	(0.12)	-0.12	(0.10)	0.21	(0.24)	0.86
Illegal weapon ownership	2.39	(1.41)	-2.11	(1.84)	12.69	(5.83)	-0.04	(0.13)	0.26	(0.11)	-1.63	(0.26)	0.80
Violence against police	-2.42	(0.85)	0.53	(1.11)	13.96	(3.52)	-0.09	(0.08)	0.27	(0.06)	-0.87	(0.16)	0.87

The standard errors are between parentheses. Each observation is a département-year. Observations are for the 95 French départements and for the years 1990-2000 (1,045 obs.). Dependent variables are the logarithms of offenses rates (offenses 100,000 people). Each regression also includes year and département fixed effects, socio-demographic controls (fraction of foreigners coming from North Africa, of other foreigners, fraction of 15-24, of 25-49, of men living alone, of people in single-parent families, of unskilled people, of high school graduates, of those living in rural areas, of those living in cities between 20,000 and 200,000, in cities above 200,000, in Paris and suburbs). Département population is used as weight. Sources: Ministry of Interior, ANPE, and INSEE (Labor Force Survey, 1990-2000).

Table 7-A
Instrumenting Regressions
(Instruments: predicted employment growth, by age and département)

	Fraction of unemployed among 15-24 years old		Fraction of unemployed among 25-49 years old	
$GROW_{15-24}$	-1.94	(1.26)	2.53	(1.06)
$GROW_{25-49}$	0.23	(0.17)	-0.40	(0.14)
$(GROW_{15-24})^2$	-189.73	(65.68)	-205.63	(55.38)
$(GROW_{25-49})^2$	4.47	(1.63)	3.94	(1.37)
Adjusted R2	0.94		0.95	
F and p-value	17.29	<0.0001	13.52	<0.0001

The standard errors are between parentheses. Each observation is a département-year. Observations are for the 95 French départements and for the years 1990-2000 (1,045 obs.). We construct the predicted employment growth rates in industries and within-industry growth of different demographic groups as described in sub-section 4.3. Each regression also includes socio-demographic controls (fraction of foreigners coming from North Africa, of other foreigners, fraction of 15-24, of 25-49, of men living alone, of people in single-parent families, of unskilled people, of high school graduates, of those living in rural areas, of those living in cities between 20,000 and 200,000, in cities above 200,000, in Paris and suburbs), and time and département effects . Département population is used as weight. Sources: Ministry of Interior, ANPE, INSEE (Labor Force Survey, 1980-2000).

Table 7-B
Instrumenting Regressions
(Instruments: predicted employment growth, by education, sex and département)

	Fraction of unemployed among 15-24 years old		Fraction of unemployed among 25-49 years old	
$GROW_{\text{low-education males}}$	-0.18	(0.13)	-0.22	(0.11)
$GROW_{\text{low-education females}}$	0.15	(0.23)	-0.03	(0.19)
$(GROW_{\text{low-education males}})^2$	1.45	(0.53)	-1.71	(0.44)
$(GROW_{\text{low-education females}})^2$	-6.00	(1.23)	1.99	(1.02)
Adjusted R2	0.94		0.95	
F and p-value	9.27	<0.0001	15.02	<0.0001

The standard errors are between parentheses. Each observation is a département-year. Observations are for the 95 French départements and for the years 1990-2000 (1,045 obs.). We construct the predicted employment growth rates in industries and within-industry growth of different demographic groups as described in sub-section 4.3. Each regression also includes socio-demographic controls (fraction of foreigners coming from North Africa, of other foreigners, fraction of 15-24, of 25-49, of men living alone, of people in single-parent families, of unskilled people, of high school graduates, of those living in rural areas, of those living in cities between 20,000 and 200,000, in cities above 200,000, in Paris and suburbs), and time and département effects . Département population is used as weight. Sources: Ministry of Interior, ANPE, INSEE (Labor Force Survey, 1980-2000).

Table 8-A: IV Effects of Unemployment on Crime
(Instruments: predicted employment growth, by age and département)

	Fraction of unemployed among 15-24 years old		Fraction of unemployed among 25-49 years old		Sargan Statistics	p-value
Armed or violent robberies	19.71	(6.60)	-19.63	(8.85)	5.75	0.056
Burglaries	16.22	(4.85)	1.94	(6.51)	0.63	0.731
Car thefts	22.60	(6.74)	1.84	(9.04)	3.66	0.161
Motorbike thefts	21.76	(4.98)	-19.77	(6.68)	12.02	0.002
Thefts of objects from cars	16.26	(5.64)	3.57	(7.57)	2.72	0.257
Shoplifting	-0.66	(7.11)	5.83	(9.54)	5.02	0.081
Pickpocketing	20.29	(7.65)	-15.47	(10.26)	0.10	0.949
Receiving stolen goods	8.65	(8.01)	-5.61	(10.74)	0.52	0.770
Homicides, including attempts	-9.62	(9.94)	17.42	(13.33)	8.15	0.017
Voluntary wounds	1.82	(6.34)	24.01	(8.51)	8.57	0.014
Blackmails, threats	14.69	(7.06)	-16.03	(9.47)	4.91	0.086
Rape and other sex offences	6.12	(5.48)	1.12	(7.35)	5.54	0.063
Family offences, incl. violence against children	2.55	(3.99)	-11.09	(5.35)	0.42	0.811
Drug offences	75.65	(14.83)	-41.77	(19.89)	4.60	0.100
Damage to vehicles	6.60	(6.90)	1.70	(9.26)	4.60	0.100
Illegal weapon ownership	16.05	(7.90)	-4.95	(10.59)	2.51	0.285
Violence against police	-25.90	(6.25)	20.44	(8.39)	10.76	0.005

The standard errors are between parentheses. Each observation is a département-year. Observations are for the 95 French départements and for the years 1990-2000 (1,045 obs.). Dependent variables are the logarithms of offenses rates (offenses per 100,000 inhabitants). Instrumented variables are fraction of unemployed among 15-24, or 25-49. Each regression also includes socio-demographic controls (fraction of foreigners coming from North Africa, of other foreigners, fraction of 15-24, of 25-49, of unemployed among the 50 and above, of men living alone, of people in single-parent families, of unskilled people, of high school graduates, of those living in rural areas, of those living in cities between 20,000 and 200,000, in cities above 200,000, in Paris and suburbs), and time and département effects . Département population is used as weight. Sources: Ministry of Interior, ANPE, INSEE (Labor Force Survey, 1990-2000). Instruments: predicted employment growth, by age and département, based on initial industry structure and aggregate industry growth (see Blanchard and Katz, 1992).

Table 8-B: IV Effects of Unemployment on Crime
(Instruments: predicted employment growth, by education, sex and département)

	Fraction of unemployed among 15-24 years old		Fraction of unemployed among 25-49 years old		Sargan Statistics	p-value
Armed or violent robberies	16.72	(5.54)	-4.92	(5.26)	1.36	0.507
Burglaries	35.04	(5.75)	-19.28	(5.47)	2.40	0.301
Car thefts	35.32	(6.65)	-14.30	(6.32)	0.21	0.901
Motorbike thefts	18.72	(3.90)	-13.73	(3.71)	13.90	0.001
Thefts of objects from cars	33.35	(6.08)	-13.68	(5.78)	2.30	0.317
Shoplifting	3.77	(6.08)	-5.22	(5.78)	2.30	0.317
Pickpocketing	27.74	(7.07)	-19.72	(6.72)	2.61	0.271
Receiving stolen goods	18.58	(7.10)	-12.66	(6.74)	1.88	0.390
Homicides, including attempts	3.86	(8.34)	6.28	(7.93)	22.36	0.000
Voluntary wounds	7.27	(4.32)	6.94	(4.11)	0.31	0.855
Blackmails, threats	-19.19	(6.45)	23.68	(6.13)	6.17	0.046
Rape and other sex offences	2.44	(4.54)	1.27	(4.31)	1.78	0.411
Family offences, incl. violence against children	-10.51	(3.40)	4.23	(3.23)	4.08	0.130
Drug offences	73.48	(12.27)	-48.73	(11.66)	3.34	0.188
Damage to vehicles	20.67	(6.48)	-20.03	(6.16)	1.36	0.507
Illegal weapon ownership	-14.06	(7.08)	25.25	(6.73)	12.85	0.002
Violence against police	-38.53	(7.10)	41.81	(6.75)	1.36	0.507

The standard errors are between parentheses. Each observation is a département-year. Observations are for the 95 French départements and for the years 1990-2000 (1,045 obs.). Dependent variables are the logarithms of offenses rates (offenses 100,000 people). Instrumented variables are fraction of unemployed among 15-24, or 25-49. Each regression also includes socio-demographic controls (fraction of foreigners coming from North Africa, of other foreigners, fraction of 15-24, of 25-49, of unemployed among the 50 and above, of men living alone, of people in single-parent families, of unskilled people, of high school graduates, of those living in rural areas, of those living in cities between 20,000 and 200,000, in cities above 200,000, in Paris and suburbs), and time and département effects . Département population is used as weight. Sources: Ministry of Interior, ANPE, INSEE (Labor Force Survey, 1990-2000). Instruments: predicted employment growth, by education, sex and département, based on initial industry structure and aggregate industry growth (see Blanchard and Katz, 1992).

Appendix A: Additional Empirical Results

Table A.1: Geographic cross-correlations among crimes rates (2000)

	Property Crimes								Violent Crimes					Other Crimes			
	Armed or violent robberies	Burglaries	Car thefts	Motorbike thefts	Thefts of objects from cars	Shoplifting	Pickpocketing	Receiving stolen goods	Homicides, including attempts	Voluntary wounds	Blackmails, threats	Rape and other sex offences	Family offenses	Drug offenses	Damage to vehicles	Illegal weapon ownership	Violence against police
Armed or violent robberies	1	0.74**	0.36**	0.54**	0.58**	0.51**	0.90**	0.79**	0.48**	0.63**	0.60**	0.61**	-0.2	0.36**	0.72**	0.70**	0.84**
Burglaries	0.74**	1	0.66**	0.75**	0.80**	0.30**	0.78**	0.70**	0.31**	0.36**	0.51**	0.45**	0.07	0.17	0.40**	0.39**	0.54**
Car thefts	0.36**	0.66**	1	0.44**	0.82**	0.05	0.28**	0.56**	0.47**	0.37**	0.49**	0.18	0.40**	0.15**	0.36**	0.38**	0.37**
Motorbike thefts	0.54**	0.75**	0.44**	1	0.70**	0.14	0.55**	0.51**	0.22*	0.21*	0.39**	0.29**	0.15	0.08	0.35**	0.24*	0.30**
Thefts of objects from cars	0.58**	0.80**	0.82**	0.70**	1	0.26*	0.44**	0.71**	0.51**	0.53**	0.61**	0.32**	0.33**	0.33**	0.48**	0.54**	0.54**
Shoplifting	0.51**	0.30**	0.05	0.14	0.26*	1	0.38**	0.44**	0.21*	0.55**	0.47**	0.45**	0.06	0.48**	0.50**	0.62**	0.66**
Pickpocketing	0.90**	0.78**	0.28**	0.55**	0.44**	0.38**	1	0.64**	0.29**	0.34**	0.45**	0.51**	-0.23*	0.17	0.49**	0.42**	0.64**
Receiving stolen goods	0.79**	0.70**	0.56**	0.51**	0.71**	0.44**	0.64**	1	0.60**	0.63**	0.63**	0.54**	0.14	0.48**	0.73**	0.79**	0.75**
Homicides, including attempts	0.48**	0.31**	0.47**	0.22*	0.51**	0.21*	0.29**	0.60**	1	0.59**	0.48**	0.16	0.19	0.32**	0.54**	0.67**	0.58**
Voluntary wounds	0.63**	0.36**	0.37**	0.21*	0.53**	0.55**	0.34**	0.63**	0.59**	1	0.76**	0.52**	0.21*	0.52**	0.72**	0.82**	0.78**
Blackmails, threats	0.60**	0.51**	0.49**	0.39**	0.61**	0.47**	0.45**	0.63**	0.48**	0.76**	1	0.51**	0.35**	0.52**	0.62**	0.71**	0.70**
Rape and other sex offences	0.61**	0.45**	0.18	0.29**	0.32**	0.45**	0.51**	0.54**	0.16	0.52**	0.51**	1	0	0.54**	0.68**	0.50**	0.60**
Family offences	-0.2	0.07	0.40**	0.15	0.33**	0.06	-0.23	0.14	0.19	0.21*	0.35**	0	1	0.20*	0.04	0.13	0.02
Drug offences	0.36**	0.17	0.15	0.08	0.33**	0.48**	0.17	0.48**	0.32**	0.52**	0.52**	0.54**	0.20*	1	0.57**	0.63**	0.55**
Damage to vehicles	0.72**	0.40**	0.36**	0.35**	0.48**	0.50**	0.49**	0.73**	0.54**	0.72**	0.62**	0.68**	0.04	0.57**	1	0.80**	0.74**
Illegal weapon ownership	0.70**	0.39**	0.38**	0.24*	0.54**	0.62**	0.42**	0.79**	0.67**	0.82**	0.71**	0.50**	0.13	0.63**	0.80**	1	0.85**
Violence against police	0.84**	0.54**	0.37**	0.30**	0.54**	0.66**	0.64**	0.75**	0.58**	0.78**	0.70**	0.60**	0.02	0.55**	0.74**	0.85**	1

Source: Ministry of Interior

Crimes rates are offenses per 100,000 people. The département population means were used as weights (there are 95 départements in France)

** = significant at the 1% level

* = significant at the 5% level

Table A.2: Geographic and temporal cross-correlations among crimes rates (1990-2000)

	Property Crimes								Violent Crimes					Other Crimes			
	Armed or violent robberies	Burglaries	Car thefts	Motorbike thefts	Thefts of objects from cars	Shoplifting	Pickpocketing	Receiving stolen goods	Homicides, including attempts	Voluntary wounds	Blackmails, threats	Rape and other sex offences	Family offenses	Drug offenses	Damage to vehicles	Illegal weapon ownership	Violence against police
Armed or violent robberies	1	0.84**	0.80**	0.60**	0.81**	0.41**	0.85**	0.69**	0.57**	0.68**	0.43**	0.47**	0.05	0.55**	0.81**	0.68**	0.67**
Burglaries	0.84**	1	0.86**	0.72**	0.88**	0.35**	0.86**	0.69**	0.62**	0.47**	0.26**	0.33**	-0.04	0.41**	0.68**	0.58**	0.50**
Car thefts	0.80**	0.86**	1	0.66**	0.87**	0.22**	0.73**	0.65**	0.64**	0.44**	0.28**	0.25**	0.16**	0.34**	0.65**	0.55**	0.42**
Motorbike thefts	0.60**	0.72**	0.66**	1	0.76**	0.25**	0.61**	0.50**	0.50**	0.21**	0.05	0.07*	0.02	0.13**	0.45**	0.29**	0.20**
Thefts of objects from cars	0.81**	0.88**	0.87**	0.76**	1	0.34**	0.81**	0.68**	0.66**	0.42**	0.24**	0.22**	0.09**	0.39**	0.64**	0.59**	0.45**
Shoplifting	0.41**	0.35**	0.22**	0.25**	0.34**	1	0.41**	0.30**	0.17**	0.34**	0.11**	0.36**	-0.02	0.30**	0.40**	0.34**	0.39**
Pickpocketing	0.85**	0.86**	0.73**	0.61**	0.81**	0.41**	1	0.66**	0.58**	0.49**	0.27**	0.31**	-	0.48**	0.64**	0.64**	0.57**
Receiving stolen goods	0.69**	0.69**	0.65**	0.50**	0.68**	0.30**	0.66**	1	0.56**	0.52**	0.38**	0.30**	0.15**	0.49**	0.58**	0.66**	0.59**
Homicides, including attempts	0.57**	0.62**	0.64**	0.50**	0.66**	0.17**	0.58**	0.56**	1	0.37**	0.26**	0.14**	0.04	0.25**	0.47**	0.57**	0.49**
Voluntary wounds	0.68**	0.47**	0.44**	0.21**	0.42**	0.34**	0.49**	0.52**	0.37**	1	0.69**	0.61**	0.28**	0.65**	0.67**	0.63**	0.77**
Blackmails, threats	0.43**	0.26**	0.28**	0.05	0.24**	0.11**	0.27**	0.38**	0.26**	0.69**	1	0.45**	0.49**	0.54**	0.41**	0.56**	0.62**
Rape and other sex offences	0.47**	0.33**	0.25**	0.07*	0.22**	0.36**	0.31**	0.30**	0.14**	0.61**	0.45**	1	0.16**	0.49**	0.53**	0.36**	0.52**
Family offences	0.05	-0.04	0.16**	0.02	0.09**	-0.02	-0.11**	0.15**	0.04	0.28**	0.49**	0.16**	1	0.25**	0.11**	0.18**	0.13**
Drug offences	0.55**	0.41**	0.34**	0.13**	0.39**	0.30**	0.48**	0.49**	0.25**	0.65**	0.54**	0.49**	0.25**	1	0.53**	0.61**	0.58**
Damage to vehicles	0.81**	0.68**	0.65**	0.45**	0.64**	0.40**	0.64**	0.58**	0.47**	0.67**	0.41**	0.53**	0.11**	0.53**	1	0.58**	0.63**
Illegal weapon ownership	0.68**	0.58**	0.55**	0.29**	0.59**	0.34**	0.64**	0.66**	0.57**	0.63**	0.56**	0.36**	0.18**	0.61**	0.58**	1	0.76**
Violence against police	0.67**	0.50**	0.42**	0.20**	0.45**	0.39**	0.57**	0.59**	0.49**	0.77**	0.62**	0.52**	0.13**	0.58**	0.63**	0.76**	1

Source: Ministry of Interior. 1,045 observations.

Crimes rates are offenses per 100,000 people. The département population means were used as weights (there are 95 départements in France)

** = significant at the 1% level

* = significant at the 5% level

Table A.3: Geographic cross-correlations among growth rates of crime rates (1990-2000)

	Property Crimes								Violent Crimes					Other Crimes			
	Armed or violent robberies	Burglaries	Car thefts	Motorbike thefts	Thefts of objects from cars	Shoplifting	Pickpocketing	Receiving stolen goods	Homicides, including attempts	Voluntary wounds	Blackmails, threats	Rape and other sex offences	Family offenses	Drug offenses	Damage to vehicles	Illegal weapon ownership	Violence against police
Armed or violent robberies	1	0.17	0.26*	0.19*	0.40**	0.08	0.19	0.20*	0.2	0.21*	0.08	-0.08	0.03	-0.07	0.22*	0.32**	0.15
Burglaries	0.17	1	0.60**	0.52**	0.68**	0.03	0.37**	0	0.17	0.01	-0.31**	0.1	-0.17	0.23*	0.42**	-0.28**	-0.53**
Car thefts	0.26*	0.60**	1	0.26*	0.68**	0.17	0.37**	0.15	0.12	0.19	-0.21*	0.05	-0.1	0.17	0.24*	0.02	-0.26*
Motorbike thefts	0.19	0.52**	0.26*	1	0.35**	-0.18	0.14	-0.05	0.03	-0.17	-0.20*	-0.1	-0.12	0.01	0.19	-0.29**	-0.31**
Thefts of objects from cars	0.40**	0.68**	0.68**	0.35**	1	0.17	0.39**	0.09	0.30**	0.16	-0.16	0.13	-0.15	0.26	0.33	0.04	-0.23*
Shoplifting	0.08	0.03	0.17	-0.18	0.17	1	0.06	0.25*	0.13	0.12	0.06	0.04	0.16	0.1	-0.11	0.30**	0.25
Pickpocketing	0.19	0.37**	0.37**	0.14	0.39**	0.06	1	0.12	0.12	0.04	-0.15	0.06	0.05	0.17	0.11	0.02	-0.13
Receiving stolen goods	0.20*	0	0.15	-0.05	0.09	0.25*	0.12	1	0.03	0.08	0.09	-0.04	0.2	0.03	-0.02	0.19	0.19
Homicides, including attempts	0.2	0.17	0.12	0.03	0.30**	0.13	0.12	0.03	1	0.04	-0.05	0.17	-0.02	0	0.02	0.2	0.09
Voluntary wounds	0.21*	0.01	0.19	-0.17	0.16	0.12	0.04	0.08	0.04	1	0.25*	0.13	0.27*	0.10*	0.1	0.24*	0.16
Blackmails, threats	0.08	-0.31**	-0.21*	-0.20*	-0.16	0.06	-0.15	0.09	-0.05	0.25*	1	-0.08	0.2	-0.21**	-0.01	0.50**	0.54**
Rape and other sex offences	-0.08	0.1	0.05	-0.1	0.13	0.04	0.06	-0.04	0.17	0.13	-0.08	1	0.09	0.34	0.01	0.07	0
Family offences	0.03	-0.17	-0.1	-0.12	-0.15	0.16	0.05	0.2	-0.02	0.27**	0.2	0.09	1	-0.04	-0.14	0.02	0.26**
Drug offences	-0.07	0.23*	0.17	0.01	0.26**	0.1	0.17	0.03	0	0.1	-0.21*	0.34**	-0.04	1	0.01	-0.07	-0.26**
Damage to vehicles	0.22*	0.42**	0.24*	0.19	0.33**	-0.11	0.11	-0.02	0.02	0.1	-0.01	0.01	-0.14	0.01	1	-0.1	-0.23*
Illegal weapon ownership	0.32**	-0.28**	0.02	-0.29**	0.04	0.30**	0.02	0.19	0.2	0.24*	0.50**	0.07	0.02	-0.07	-0.1	1	0.58**
Violence against police	0.15	-0.53**	-0.26*	-0.31**	-0.23*	0.25*	-0.13	0.19	0.09	0.16	0.54**	0	0.26**	-0.26**	-0.23**	0.58**	1

Source: Ministry of Interior. 1045 observations.

Crimes rates are offenses per 100,000 people. The département population means were used as weights (there are 95 départements in France)

** = significant at the 1% level

* = significant at the 5% level

Table A.4: Geographic cross-correlations among fixed effects

	Property Crimes								Violent Crimes					Other Crimes			
	Armed or violent robberies	Burglaries	Car thefts	Motorbike thefts	Thefts of objects from cars	Shoplifting	Pickpocketing	Receiving stolen goods	Homicides, including attempts	Voluntary wounds	Blackmails, threats	Rape and other sex offences	Family offenses	Drug offenses	Damage to vehicles	Illegal weapon ownership	Violence against police
Armed or violent robberies	1	0.93**	0.89**	0.88**	0.88**	-0.36**	0.91**	0.85**	0.54**	0.38**	-0.41**	0.04	-	0.22*	0.20*	-0.03	0.1
Burglaries	0.93**	1	0.90**	0.90**	0.91**	-0.32**	0.92**	0.88*	0.58**	0.31**	-0.32**	0.05	-	0.26**	0.27**	0.04	0.11
Car thefts	0.89**	0.90**	1	0.80**	0.89**	-0.37**	0.80**	0.83**	0.70**	0.38**	-0.27**	0.02	-	0.19	0.29**	0.04	0.09
Motorbike thefts	0.88**	0.90**	0.80**	1	0.85**	-0.37**	0.81**	0.83**	0.51**	0.31**	-0.32**	-0.04	-	0.18	0.23*	-0.09	0
Thefts of objects from cars	0.88**	0.91**	0.89**	0.85**	1	-0.17	0.85**	0.89**	0.70**	0.39**	-0.13	0.02	-	0.27**	0.45**	0.26*	0.29**
Shoplifting	-0.36**	-0.32**	-0.37**	-0.37**	-0.17	1	-0.32**	-0.24*	-0.05	0.23*	0.67**	0.50**	0.72**	0.26*	0.56**	0.65**	0.59**
Pickpocketing	0.91**	0.92**	0.80**	0.81**	0.85**	-0.32**	1	0.82**	0.49**	0.26*	-0.39**	-0.04	-	0.26*	0.14	0.03	0.11
Receiving stolen goods	0.85**	0.88**	0.83**	0.83**	0.89**	-0.24*	0.82**	1	0.72**	0.45**	-0.12	0.03	-	0.40**	0.36**	0.23*	0.28**
Homicides, including attempts	0.54**	0.58**	0.70**	0.51**	0.70**	-0.05	0.49**	0.72**	1	0.58**	0.30**	0.09	0.1	0.36**	0.54**	0.48**	0.45**
Voluntary wounds	0.38**	0.31**	0.38**	0.31**	0.39**	0.23*	0.26*	0.45**	0.58**	1	0.39**	0.50**	0.18	0.49**	0.44**	0.40**	0.57**
Blackmails, threats	-0.41**	-0.32**	-0.27**	-0.32**	-0.13	0.67**	-0.39**	-0.12	0.30**	0.39**	1	0.26**	0.85**	0.37**	0.52**	0.72**	0.60**
Rape and other sex offences	0.04	0.05	0.02	-0.04	0.02	0.50**	-0.04	0.03	0.09*	0.50**	0.26**	1	0.30**	0.40**	0.44**	0.25*	0.40**
Family offences	-0.57**	-0.51**	-0.39**	-0.49**	-0.27**	0.72**	-0.61**	-0.33**	0.1	0.18	0.85**	0.30**	1	0.2	0.53**	0.62**	0.44**
Drug offences	0.22*	0.26*	0.19	0.18	0.27**	0.26*	0.26*	0.40**	0.36**	0.49**	0.37**	0.40**	0.2	1	0.36**	0.46**	0.32**
Damage to vehicles	0.20*	0.27**	0.29**	0.23*	0.45**	0.56**	0.14	0.36**	0.54**	0.44**	0.52**	0.44**	0.53**	0.36**	1	0.66**	0.61**
Illegal weapon ownership	-0.03	0.04	0.04	-0.09	0.26*	0.65**	0.03	0.23*	0.48**	0.40**	0.72**	0.25*	0.62**	0.46**	0.66**	1	0.78**
Violence against police	0.1	0.11	0.09	0	0.29**	0.59**	0.11	0.28*	0.45**	0.57**	0.60**	0.40**	0.44**	0.32**	0.61**	0.78**	1

Source: Ministry of Interior

Crimes rates are offenses per 100,000 people. The département population means were used as weights (there are 95 départements in France)

** = significant at the 1% level

* = significant at the 5% level

Département fixed effects were obtained as follows. We regressed logarithms of offences rates (offences 100,000 people) on year and département fixed effects, socio-demographic controls (fraction of foreigners coming from North Africa, of other foreigners, fraction of 15-24, of 25-49, of unemployed among 15-24 yrs old, of unemployed among 25-49 yrs old, of unemployed among more than 50 yrs old, of unemployed not receiving UI among unemployed above 25, of men living alone, of people in single-parent families, of unskilled people, of high school graduates, of those living in rural areas, of those living in cities between 20,000 and 200,000, in cities above 200,000, in Paris and suburbs.

Table A.5: Geographic cross-correlations among residuals (after regressions of fixed effects on means)

	Property Crimes								Violent Crimes					Other Crimes			
	robberies	Burglaries	Car thefts	thefts	objects from	Shoplifting	ng	stolen goods	including	wounds	threats	other sex	offenses	Drug offenses	vehicles	weapon	against
Armed or violent robberies	1	0.70**	0.57**	0.48**	0.58**	0.32**	0.48**	0.39**	0.36**	0.41**	0.40**	0.41**	0.13	0.09	0.50**	0.33**	0.29**
Burglaries	0.70**	1	0.70**	0.43**	0.72**	0.20*	0.61**	0.43**	0.41**	0.32**	0.22*	0.45**	0.11	0.09	0.39**	0.29**	0.24*
Car thefts	0.57**	0.70**	1	0.26**	0.63**	-0.14	0.33**	0.26**	0.48**	0.16	0.09	0.12	0.07	-0.05	0.27**	0.16	0.08
Motorbike thefts	0.48**	0.43**	0.26**	1	0.53**	0.21*	0.18	0.19	0.13	0.29**	0.19	0.29**	0.13	0.02	0.31**	0.03	-0.07
Thefts of objects from cars	0.58**	0.72**	0.63**	0.53**	1	0.05	0.48**	0.47**	0.50**	0.34**	0.36	0.41**	0.34**	0.28**	0.42**	0.41**	0.22*
Shoplifting	0.32**	0.20*	-0.14	0.21*	0.05	1	0.24*	0.23*	0.1	0.44**	0.34**	0.51**	0.11	0.18	0.35**	0.22*	0.41**
Pickpocketing	0.48**	0.61**	0.33**	0.18	0.48**	0.24*	1	0.43**	0.28**	0.21*	0.25**	0.22*	0.04	0.21*	0.30**	0.34**	0.23*
Receiving stolen goods	0.39**	0.43**	0.26**	0.19	0.47**	0.23*	0.43**	1	0.47**	0.37**	0.44*	0.43**	0.30**	0.32**	0.30**	0.60**	0.55**
Homicides, including attempts	0.36**	0.41**	0.48**	0.13	0.50**	0.1	0.28**	0.47**	1	0.52**	0.52**	0.41**	0.43**	0.24*	0.41**	0.52**	0.49**
Voluntary wounds	0.41**	0.32**	0.16	0.29**	0.34**	0.44**	0.21*	0.37**	0.52**	1	0.67**	0.69**	0.42**	0.35**	0.44**	0.43**	0.63**
Blackmails, threats	0.40**	0.22*	0.09	0.19	0.36**	0.34**	0.25*	0.44**	0.52**	0.67**	1**	0.56**	0.61**	0.45**	0.33**	0.61**	0.70**
Rape and other sex offences	0.41**	0.45**	0.12	0.29**	0.41**	0.51**	0.22*	0.43**	0.41**	0.69**	0.56	1	0.37**	0.34**	0.48**	0.30**	0.56**
Family offenses	0.13	0.11	0.07	0.13	0.34**	0.11	0.04	0.30**	0.43**	0.42**	0.61**	0.37**	1	0.38**	0.16	0.50**	0.42**
Drug offences	0.09	0.09	-0.05	0.02	0.28**	0.18	0.21*	0.32**	0.24*	0.35**	0.45**	0.34**	0.38**	1	0.17	0.42**	0.34**
Damage to vehicles	0.50**	0.39**	0.27**	0.31**	0.42**	0.35**	0.30**	0.30**	0.41**	0.44**	0.33**	0.48**	0.16	0.17	1	0.26*	0.37**
Illegal weapon ownership	0.33**	0.29**	0.16	0.03	0.41**	0.22*	0.34**	0.60**	0.52**	0.43**	0.61**	0.30**	0.50**	0.42**	0.26*	1	0.65**
Violence against police	0.29**	0.24*	0.08	-0.07	0.22*	0.41**	0.23*	0.55**	0.49**	0.63**	0.70**	0.56**	0.42**	0.34**	0.37**	0.65**	1

Source: Ministry of Interior

Crimes rates are offenses per 100,000 people. The département population means were used as weights (there are 95 départements in France)

** = significant at the 1% level

* = significant at the 5% level

Residuals were obtained as follows. We first regressed logarithms of offences rates (offences 100,000 people) on year and département fixed effects, socio-demographic controls (fraction of foreigners coming from North Africa, of other foreigners, fraction of 15-24, of 25-49, of unemployed among 15-24 yrs old, of unemployed among 25-49 yrs old, of unemployed among more than 50 yrs old, of unemployed not receiving UI among unemployed above 25, of men living alone, of people in single-parent families, of unskilled people, of high school graduates, of those living in rural areas, of those living in cities between 20,000 and 200,000, in cities above 200,000, in Paris and suburbs. We then regressed département fixed effects on the averages