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Hugues LAGRANGE

Crime and Socio-Economic Context

ABSTRACT

Thinking in France on relations between crime rate trend and evolution of socio-economic context over time is underdeveloped. Recent studies in the United Kingdom suggest that the business cycle influences fluctuations in both property offenses and violent crime. Whereas pre-1970 research in the United States only rarely pointed up a direct link between crime rate and unemployment, post-1970 American studies are dominated by demonstrations of a direct correlation between the two. In this article, analysis of trends in unemployment, prices and wages, marriage among men, and schooling leads to an interpretation of delinquency and crime over the long term in which it is affirmed that an increase in opportunity, such as that attested to by increased consumer prices and wages over time, has a more pronounced role in the strong growth period of the cycle and influences property offenses more than violent crime, and that unemployment among young people without educational degrees is a factor working in favor of both theft and violent crime. This phenomenon was partially masked in periods where it was common to remain in the school system, such as early in the last decade of the twentieth century in France. Lastly, the fact that starting in the early 1980s fewer young people settled in couples and, more generally, the tension in relations between the sexes may also have worked to favor delinquency.

Thinking on relations between trends in rates of all varieties of crime and evolution of socio-economic context is seriously underdeveloped in France. The idea that crime is linked to a crisis in the political and moral order, a loss of orientation and guiding values, often prevails, though it would be difficult to put a date on it. Among the few researchers who have examined the recent past, T. Godefroy and B. Laffargue (1985), following the tradition begun by G. Rusche and O. Kirchheimer (1939), emphasized links between crime rate and variations in prison population, but found no relation between crime rate and economic context. (1) In the absence of empirical studies, we in France have generally settled for dutiful rhetorical allusions to the possible influence of socio-economic motives or reasons. It is also true that many observers believe administrative statistics do not provide reliable information about the extent of criminal acts. Moreover, undertaking to analyze the relations between crime rate and socio-economic context is often interpreted as a way of reducing the problem to "the determinant, ineluctable effect of poverty". This is obviously not what is at issue. Developments in wages, consumer prices,

(1) "On the basis of our examination of these results, we cannot conclude with certainty that unemployment affects reported crime." (Godefroy and Laffargue, 1985, p. 44).

and unemployment also determine the conditions under which social cohesion can be maintained; in other words, our reasons for agreeing to live together in relative peace.

In contrast to the French research situation, English-language literature on crime rate trends is very rich. The very wealth of studies in the United States –T. Chiricos (1987) listed 63 quantitative studies from 1960 to 1986– seems an obstacle to an effective overview. American researchers were led naturally enough to formulate the hypothesis that the conditions for an expansion of crime are defined by socio-economic context, particularly the existence of a potentially delinquent population and the great number of delinquency opportunities. Inspired by rational actor theory, many American studies stress the importance of crime-associated risks, especially degree of certainty of legal sanctions and sentence severity. (2) The literature on this point was not very conclusive (Garland, 1990), and ties between crime and economic context began to be explored in a more general way, though rational actor theories remain central. Two other approaches for interpreting trends are more stimulating in my view than calculating risk associated with criminal acts: L. Cohen and M Felson's in their 1979 study, and research inspired by R. K. Merton. Cohen and Felson inquired into the consequences of prosperity –the relative abundance of "prey"– but also its effects on lifestyle: people go out more often, residences are not as well protected, and this facilitates casual delinquency.

From a broader theoretical perspective, R. K. Merton emphasized motives for getting started on a criminal career and reasons for continuing one –what may be called criminal "supply". While the volume of crime may increase because occasions for illegally appropriating property have, it may also increase due to an increase in the fraction of the population excluded from employment. In the interpretation he proposed in 1938, Merton hypothesized that most delinquents do not have different aims in life than law-abiding citizens. These aims may be expressed as money and recognition, in varying proportions. Delinquents and criminals, however, use different means than most citizens for achieving them. He suggests that from the point of view of the society as a whole rather than at the scale of the individual, the fraction of the population attracted to criminal activity depends on the possibilities people have to live by legal means compared to those deriving from the use of illegal means. This should be understood in the broadest sense: costs are not solely economic and the choice does not concern the rationality of criminal acts evaluated one by one but rather choosing or rejecting this type of activity altogether.

(2) For a whole current of research in the United States, crime volume depends on the risks involved in committing criminal acts – as if occasions for stealing, for example, were uniformly abundant and crime was just one economic activity among others. From this perspective, the volume of property crime is associated with an opportunity cost that non-specialized actors are assumed to assess.

Merton's approach, which implies not only looking at crime rate fluctuations over the short term but using those fluctuations to discover how delinquency is regulated over the long term, has elicited a great number of empirical studies, the results of which are not all concurrent. The literature suggests that relations between crime rate and economic context were different in the last quarter of the twentieth century than in the context immediately following World War II. (3) For the period from 1946 to 1982, D. Cantor and K. Land (1985) found an inverse relation between increased unemployment and crime. While prior to 1970 researchers rarely pointed up a direct connection between crime and unemployment, since that time, research has been dominated by findings of a direct correlation between the two. S. Carlson and R. Michalovsky (1993) theorized this evolution of the correlations by showing that the links between violent crime and unemployment depend on historical period. (4)

Studies by S. Field (1990) have a major place in the United Kingdom. For Field, the business cycle influences fluctuations in both property offenses, which he is most interested in, and violent crime. In the mid-1980s Field analyzed a series of relative variations, validating above all the idea that theft generally increases with a relative decline in real consumption and decreases when consumption rises: increased incentive to engage in criminal activity is therefore the preponderant cause of increased crime.

Pursuing Field's analyses, D. J. Pyle and D. F. Deadman (1994) emphasized the need to take into account long-term delinquency regulation. D. Dickinson (1994) concurrently underlined an aspect that had not before been empirically validated in the United Kingdom: the strength of correlations between juvenile delinquency and unemployment. Dickinson showed the existence of links between opportunistic delinquency (burglary) and low employment among adolescent boys. He underlined that it was in poor regions, those most affected by industrial decline in the 1980s and 90s, that opportunistic crime and drug abuse increased most rapidly.

C. Hale in a recent article (1998) adopts most of Field's conclusions, but also underlines that by reasoning in terms of relative variations, Field failed to take into account long-term influences. (5) Recommending use of error correction models, Hale affirms that trends in theft are tied to consumption, and that while employment does not influence criminal trends, it does explain some

(3) A contrast could also be established with the nineteenth century, when crime spontaneously drew observers' attention to the effects of drinking – and only afterward, along this path, to consumer prices (Zehr, 1976).

(4) The ambivalence of American results on the link between crime and unemployment are related to the fact that the job market in the United States functions quite differently than in most European countries. The literature can produce contradictory impressions. Absence of relation obviously isn't the same thing as pointing up a link. In effect, absence of relation does not allow us to conclude that the variable in question does not affect crime; it may be the result of specification errors or inadequate measuring data.

(5) Hale gives elaborate technical accounts of Pyle and Deadman's analyses, criticizing them for overdifferentiating their time-series and therefore not picking up certain relational tendencies.

short-term fluctuations (deficit of socio-economic integration possibilities in the short term). In the Netherlands, C. Beki, K. Zeelenberg, and K. Van Monfort (1999), using an approach similar to Hale's, interpret consumption fluctuations as a motivating effect: when consumption per person increases, material gain can more readily be legal and there is less incentive to steal.

Another series of studies, also inspired by Merton's thinking and using for the most part synchronic cross-sections, works to specify the links between income inequality and crime (as these studies are not clearly temporal I will only mention them here). In the United States, S. Danziger and D. Wheeler (1975) showed that income inequalities were associated with a high level of theft and burglary. And though E. Paterson (1991) failed to confirm the existence of a link between income disparities and crime, R. Fowles and M. Merva (1996) found a strong correlation between such disparities and homicidal violence for the 1975-90 period. (6) A number of United Kingdom studies on income disparities and delinquency suggest a link between crime and weakened social cohesion as expressed by income distribution. R. Witt *et al.* (1999), for example, affirm that an increase in income inequality (measured on the basis of wage-earning surveys) influences levels of burglary and violent theft.

In my treatment of French data I have adopted an approach inspired by Hale's analyses while being careful to represent influences deriving from employment trends with specific variables, thereby making it possible to add them to the explanatory models without confusing them with what Field calls the motivating effects of trend in consumption level.

Increased consumption, like decreased consumption for that matter, can have opposite effects on theft. 1) An increase in real consumption indicates an increased volume of goods to be stolen: there are more occasions to steal. 2) This same increase, however –implying an increase in nominal wage in relation to prices– means that criminal activity becomes less profitable compared to legal activity, and this in turn reduces incentive to steal. The first is an opportunity effect deriving from what is there to be stolen; the second is a motivational one, affecting how disposed one may or may not be to seek illegal resources.

The motivating effect is directly related to evolution of the job market. For the last two decades, job market trend has correlated with crime, particularly juvenile delinquency. If we establish categories of unemployed persons, specifying age and educational degree level, the correlation between fluctuations in theft on the one hand and unemployment on the other is striking (see Appendix I). It is natural to think that the situation of the least skilled young persons, rather than that of young persons with educational degrees, influences delinquency. Unemployment is clearly to be included among conditions that favor delinquency: by reducing access to legal status, unemployment increases motives for committing illegal acts (theft and violent crime) and re-

(6) They analyzed cross-sections, so results vary by size of territorial segment studied.

moves obstacles in the way of so acting. This suggests that we should examine whether fluctuations in the mass of thefts depend not only on occasions for stealing but also on fluctuations in employment, and thus on the number of persons to whom delinquency seems the most accessible path.

Sources

In France, time series for crime represent the aggregate of acts recorded by the police and gendarmerie. The number of such acts does not depend primarily on the initiative of the forces of law and order, but on victim-filed charges that are then realized in the form of police reports according to precise criteria. These social constructions reflect the pressure of delinquency and crime, how important it is to victims to file charges, victims' anticipation of authorities' response, and lastly the various ways events are apprehended by the police and gendarmes, as observable in the final reports. Victimization surveys, which have developed only recently in France, provide indicators that have their own qualities and biases (see Robert *et al.*, 1999). There are few of them, and this makes it impossible for the time being to use them as an instrument in chronological studies.

For the long period under study here, 1950 to 1997, we have only two synthetic indicators: theft, and violent crime, referred to in France as crimes against persons. In the last quarter of the twentieth century, an effort was made to systematize data collection by the police and gendarmerie, giving rise to an annual publication, *Aspects de la criminalité en France*, which uses 107 indices describing property offenses, violence and threats of violence, disturbance of public order and regulations abuses, particularly financial illegality and narcotics offenses. Only a few stably defined main categories can be used effectively to represent essential delinquency and crime trends. I have chosen to limit myself to predation and violence and will only be considering theft, violent theft, and assault and battery (see Appendix III).

I used time series published by Robert *et al.* in *Les comptes du crime* (1994) and, for 1995 to 1997, in the *Annuaire statistique de la justice 1999*, to calculate proportion of prison sentences of more than one year. Duration of prison sentences, which is nearly unaffected by pardons, was taken into account to see if expectations on legal sanctions based on severity of sentencing observed in the past acted as a deterrent. I did not, however, use variables on degree of certainty about legal sanctions; this would have been too difficult given the state of available statistics. (7)

(7) French time series on time served in prison are so affected by political components that they are extremely difficult to use. Pardons, of which a vast number were given in 1981 and 1988 [successive elections of the socialist president François Mitterrand], seriously disrupt the figures.

To show consumption trend I used three indices: consumer price, average net wage, and consumption volume. (8) *INSEE's* long time series for unemployment, tabulated by age and educational level, were also used, as well as indexes for manual worker unemployment and overall unemployment rates as defined by the *Bureau International du Travail*.

For interpreting trends, I have introduced an indicator of first marriage for men and a schooling index; cross-section studies and some of my previous research suggest that these factors intervene as regulators of delinquent activity (Lagrange, 1998). For schooling I have used the time series on the length of time young persons remain in school as calculated by the Ministry of Education's *Département de la Programmation et du Développement*, and for first marriage rates among men the raw-data rates regularly published by the *Institut National d'Études Démographiques* in *Population*.

Methods

Long time series are precious for the historian. With the great amounts of information they contain, they offer the possibility of pointing up changes in regulation of the crime phenomenon over time. But they also pose a formidable statistical problem, the fact that they are not stationary. A time series is said to be stationary when average and variance are constant over time and therefore do not depend on length of observation period. (9) Most time-series are not stationary.

To counter the risk of spurious regression due to non-stationary series, two solutions are currently proposed. 1) Differentiating time series so that residuals are stationary, then applying regression analysis to the differences (*ie*, if X_t represents crime rate at time t, using $\Delta X_t = X_t - X_{t-1}$ instead of X_t). But then long-run relationships that may well exist between business cycle and crime rate don't show up. 2) In response to this problem several researchers have suggested using error correction models (Engel and Granger, 1987). This is a two-step process. First, a "naive" regression is performed on undifferentiated time series whose residuals are generally autocorrelated; residuals are then analyzed and a second regression, appropriate to the nature of the residuals, is performed on the now differentiated time series by injecting values from which the residuals of the initial model have been obtained (see Appendix II). Introducing a trend effect or corrector effect in this way adds "long-term memory", as provided by the analysis of rough crime rate series, to short-term determinations. In the last regressions, residuals should no longer be autocorrelated.

(8) The first is an index of 295 items published by the *Institut National de la Statistique et des Études Économiques* (*INSEE*) (1970 for 100 base); the second is *INSEE's* "1998 retrospective" series on average net wages; the third the consumption volume index at 1980 prices (my thanks to L. Cazes at *INSEE* for making the index available to me).

(9) More exactly, when covariances for a given time lapse are determined solely by this lapse.

Crime trend

The two long time series used here –theft and violent crime– show an increase over the second half of the twentieth century that stands in contrast to the decrease in delinquency and crime observed between the late nineteenth and mid-twentieth centuries. Analogous developments, with discrepancies of a few years, may be observed in the United Kingdom, United States, and Germany (the peak for property crime in America was 1981, three years earlier than in France). This means that one overall context seems to have shaped crime rate trends in all these countries, regardless of their institutional differences. In France the rate of violent crime was stable from 1950 to 1975 at around 1.5 offenses per 1,000 persons, began increasing in the early 1980s, and, after a brief drop at the end of the decade, increased at an accelerated rate during the 1990s. This profile differs from that for theft, which increased sharply starting in the second half of the 1950-74 period of rapid economic growth, inflation, and low unemployment known as the *Trente Glorieuses*, and more slightly over the last quarter century, reaching a peak in the mid-1980s, then undergoing ample fluctuations to the end of the period without any clearly marked trend. (10)

Crime rate during the *Trente Glorieuses* was characterized by rapidly increasing property offenses (after the low-water mark immediately following World War II) –four times more thefts proportionate to the population– and near stagnation in violent crime (to the left of the vertical line in Figure I). Theft rates began to go up with the increase in economic activity in the mid-1950s.

During the last quarter of the century (to the right of the vertical line in Figure I), increase in theft slowed and starting in the mid-1980s, stagnated. Violent crime, on the other hand, which began to rise later than theft, progressed at an accelerated rate in the course of the 1980s. These contrasted dynamics for theft and violence over the last 50 years are, in my opinion, symptomatic of two distinct, temporally overlapping crime regimes: crime due to opportunity during the strong growth period, and crime due to economic exclusion during the last quarter of the century.

If we consider fundamental economic and social trends, the last half of the century is split in two. The *Trente Glorieuses* were followed by a period of high unemployment and slowed growth (1975-98). This is attested to by variations in theft on the one hand, consumer prices on the other. While there is a clear correlation between the profiles of price increases and theft from 1952 to 1997 ($r = 0.55$, $p < 0.001$), closer examination shows that in the individual years 1952 to 1976 an increase in one regularly corresponded to a decrease in

(10) While overall trends for theft and violent crime are correlated, annual variations in the series are nearly unrelated. Whether this means that short-term motives for theft differ from those for violent crime or that conditions for acting in the two cases did not coincide, this is quite a remarkable fact, one that indicates the limits of conceiving crime as a unified phenomenon.

the other while during the second period, 1977-97, overall time-series trends and annual fluctuations alike are synchronic (Figure II). (11)

FIGURE I. – ***Theft rate (per 1,000) and violent crime rate (per 10,000)***

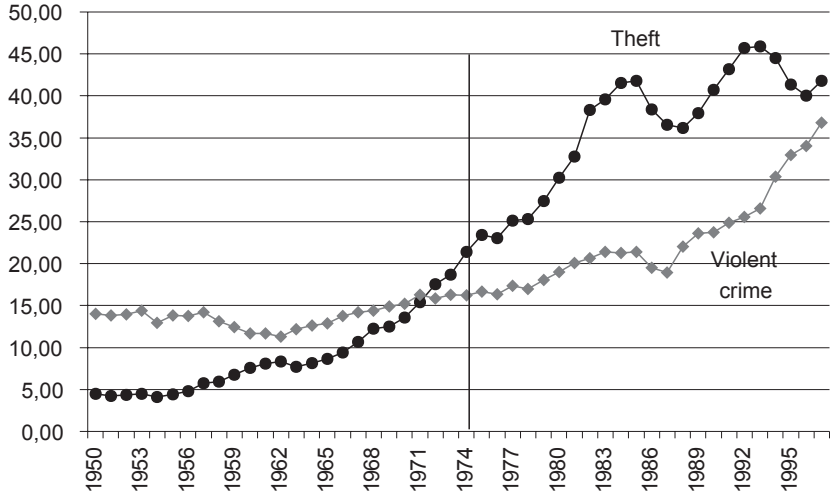
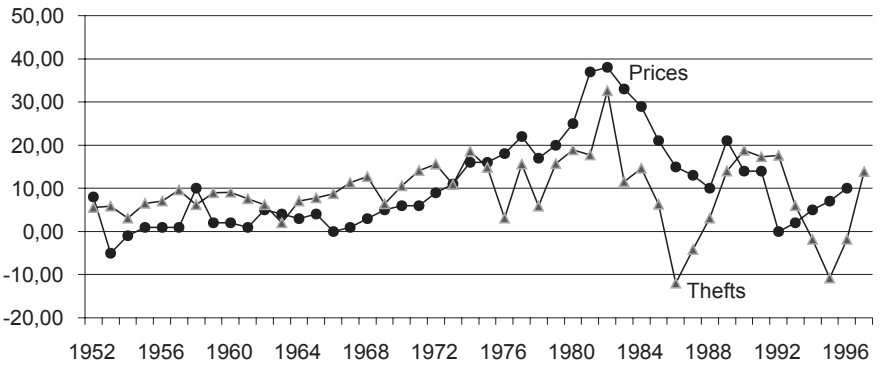


FIGURE II. – ***Theft and consumer prices (first differences)***



(11) Second differences show a negative coefficient for the first period, if very small: -0.12, and a positive coefficient for the second: 0.30.

TABLE I. – ***Stage 1: regressions on undifferentiated series for theft***

Independent variables	$Thefts^*_t$	$Thefts_t$
Period	1950-97	1950-97
Constant	2.7	4.6
$Prices_t$	0.36 (8.3)**	
$Prices_{t-1}$	-0.29 (6.5)	
Average wage for men_t		0.19 (12)
Average wage for men_{t-1}		-0.16 (10)
R^2	0.97	0.98
F significant at	0.0001	0.0001
Durbin-Watson	0.59	0.85

* The time series used as dependent variable is theft rate during year *t*: number of thefts in proportion to population.
** Student's t values are given in parentheses; when *t* is over 2, the coefficient is significant at the 5% level.

TABLE II. – ***Stage 2: regression on differentiated series for theft: error correction models (columns 1, 2, and 3), difference models (columns 4 and 5)***

Independent variables	$\Delta^*(Thefts)_t$ (1)	$\Delta(Thefts)_t$ (2)	$\Delta(Thefts)_t$ (3)		$\Delta(Thefts)_t$ (4)	$\Delta(Thefts)_t$ (5)
Period	1950-97	1970-97	1970-97		1970-97	1970-97
Constant	-0.01	2.22	3.58		-3.3	0.9
$\Delta(prices)_t$	16.5** (3.9)	13.9** (4.0)				0.06 (2.1)
$\Delta(prices)_{t-1}$					0.07 (2.5)	
Δ(net wage rate, $men)_t$			0.14 (1.8)			
Δ(unemployment rate 15-24 without degree)$_t$		2.01 (2.7)	0.41 (2.5)		0.26 (3.1)	0.15 (1.6)
Unemployment rate 15-24, *CEP* level (primary school) ***					-0.21 (3.9)	-0.22 (3.0)
Unemployment rate 15-24, *CAP/BEP* (vocational degrees) /*baccalauréat* (general high school degree) level		-1.75 (2.1)	-0.33 (1.7)			0.25 (2.0)
First marriage, men (reversed)			1.8 (2.5)		3.4 (2.4)	
$Residuals_{t-1}$			-0.25 (2.0)			
$Residuals_{t-2}$	-0.47 (5.1)	-1.7 (3.5)				
R^2	0.51	0.70	0.66		0.69	0.67
F significant at	0.0001	0.0001	0.0006		0.0001	0.0001
Durbin-Watson	2.0	2.1	1.7		2.6	2.2

*Δ Designates the differentiation operator; thus $\Delta(thefts)_t = thefts_t - thefts_{t-1}$; $\Delta(prices)_{t-1} = prices_{t-1} - prices_{t-2}$, etc.
** Logarithm of price index.
*** Time index omitted for non-lagged series.

This fracture in the post-World War II period is not specific to crime. The two periods were very different in terms not only of economic indicators but other aspects of social life. First marriage rates, fairly stable until 1970, fell rapidly from that date until 1985-86, after which we see fluctuations that seem the reverse mirror image of unemployment and crime rate fluctuations. The institution of marriage is a major social regulator, and we can observe that its decline, preceded by the decline in birth rates, fairly coincided with the end of the high growth years and an increase in violent crime and suicide (see Bourgoin, 1999; Chauvel, 1997; Besnard, 1997).

Theft, prices, and unemployment

Analysis of relations between theft rate and economic fluctuations for the 1950-97 period is seriously hampered by the absence in France of long time series. I looked at consumer price and average wage indexes as well as first marriage rates for the period, and the consumption volume index for the 1960-97 period. The unemployment time series used here only begin in 1968 and were introduced only in the second stage of the analysis. (12)

Table I presents regressions on the rough time series, whose residuals were then used in regressions on differentiated time-series. Though the coefficients of determination (R^2) are high, the model is very simplistic. The price coefficient at period *t* is positive and significant, while the price coefficient at *t-1* is negative, which is similar to a direct effect of first difference in prices. The residuals show a high level of autocorrelation, reflecting trend amplitude and relative inertia. The net wage index coefficients are strictly analogous. Consumption volume, however, the variable that accounts most precisely for real consumption, has no significant coefficients when introduced into the regression; nor does first marriage rate for men.

For the second stage, I used simple time-series differentiation (Table II, columns 4 and 5) concurrently with error correction models (Table II, columns 1, 2, and 3), despite the concommitant information loss, given that the number of points is relatively low.

At this stage, regardless of models used –error correction or differentiation– I used first differences for the crime time series, which suffices given that the correlogram for residuals shows significant coefficients at *t-1* but few at *t-2* or for longer time lags (see Appendix II). (13) The "residuals" variable refers to the residuals of the regressions performed on variables in the first stage, lagged one or two periods. In two out of three cases (columns 1 and 2), residual coefficients are sharply significant, suggesting that increase in theft did not depend solely on short-term price fluctuations but also on overall movement for the set of indices, as estimated by regression on the undifferentiated

(12) See *INSEE*, *Marché du travail* [Job market], long time series, 1998.

(13) Thus suggesting degree-one cointegration.

time series. The models estimated in this second stage show nearly no autocorrelation for residuals, a validation criterion for the error correction models. Using average wage index in place of price index tends to weaken coefficient significance. Moreover, I did not obtain a satisfactory model of developments in theft increase rate using consumption volume or real wage index.

When retail price or wage index rises, theft rate also rises, with direct effects of price or wage variations attenuated by gap from the trend as estimated on the undifferentiated time series one or two years earlier. In other words, while price or wage increase moves additional persons to engage in delinquency or intensifies the activity of practicing delinquents, increase in theft will be moderated by inertia for new delinquency starts, which adjusts itself to previous wage and price variable levels. This suggests that perhaps more than ordinary activity, delinquent behavior, motivated by expectation of profit, is subject to limits on "stock": there is a cost to getting started in delinquent activity and it is difficult to get out of such activity; this affects behavior with inertia, as attested to by the strong autocorrelation for rough time series.

From 1970 to 1997, while fluctuations in theft rate continued to depend on changes in wages and prices, they were strongly affected by employment possibilities for young persons without educational degree. In my testing of several unemployment indices, those for males aged 15 to 24, and particularly for males in this age group without degrees, were systematically the best-fitting: short-term variations in unemployment rate for this group are associated with variations in the same direction for theft. That fit is improved if we introduce employment rates for young persons with degrees, anywhere from the *CEP* (*Certificat d'Études Primaires*) [primary school] to the *baccalauréat* [general high school leaving exam]. "With educational degree" unemployment rate indicators systematically have at least a negative coefficient and intervene as correctors, whereas the "without educational degree" unemployment rate always shows a positive coefficient. Though increases in unemployment affect both categories of young person, the negative coefficient for the rate among the former (the degree could be as low as a *BEP* [*Brevet d'Études Professionnelles*, a slightly higher vocational degree than the *CAP*]) moderates theft growth rate. Likewise, in variants 4 and 5, the relative increase in theft rate is pulled up by price rate, unemployment rate among young persons without degree, and decrease in marriage.

While first marriage rate helps explain theft increase, it seems to me less specific than the effect of unemployment and price rates because it may be thought of as induced in part by economic context. When a variable representing prison sentence length was introduced into the regressions –length increased greatly through 1997– the coefficient was in most cases significant; nonetheless, it was also positive, making it hard to see prison sentence length as a motive. This confirms the idea that in a period when number of persons apprehended by the law remained stable due to decline of crime elucidation rates, the increased length of prison sentences was more a response to the increase of crime pressure than a factor of deterrence.

These results lead us to reexamine the meaning of the relations pointed up for the English context by Field and Hale, and specify interpretation of my own results. Field and Hale suggested that theft develops when consumption diminishes or grows slowly and, conversely, decreases when consumption increases rapidly. For them the short-term effect of improved economic context is less incentive to steal, and this effect supplants the increased criminal opportunity brought about by the increased volume of goods and services exchanged. It is curious that they should emphasize the importance of consumption if in fact they are suggesting not an opportunity effect but rather the strength of incentives to act within the law or outside it. Unemployment rate seems a more direct measure than consumption of how hard it is to find or come back into legal sources of income.

Though I agree with Field that socio-economic context helps regulate property crime, it seems to me that the relations between theft on the one hand and consumption and employment fluctuations on the other were not the same during the last quarter of the twentieth century as during the *Trente Glorieuses*. I have isolated a clear unemployment effect in the former period, which suggests that we were then no longer in a context where "opportunity makes the thief" but rather one where the difficulty of finding legal work increased the number of potential delinquents, intensity of criminal activity, or both. It is also true that when Field undertook his research in the mid-1980s the effects of unemployment were not as sharp.

Furthermore, it is the variables representing not real activity volume but nominal wage and price changes, and this over the entire period as well as during the last quarter of the century, that are most closely associated with increase and fluctuations in theft. Relative increase in consumer prices and nominal income does not reflect variations in exchange volume; rather it provides the basis for actors' expectations. The inflation attested to by increase in consumer prices is a measure of the amputation representing "real income" compared to income anticipated on the basis of nominal wages; it can therefore be read as an index of relative deprivation –disappointed expectations. From this perspective, we can affirm that in periods of prosperity, delinquency is increased by frustrated consumption expectations or plans, as much as by increase in exchange volume. Interpreting delinquency as frustration thus supports Merton's hypothesis. We could also conceive of nominal variations in wages and prices as indices of a context in which social life is more intense and people's lifestyle increases their exposure to crime: they are carefree and spend more, even though their buying power has in fact deteriorated (see Cohen and Felson, 1979).

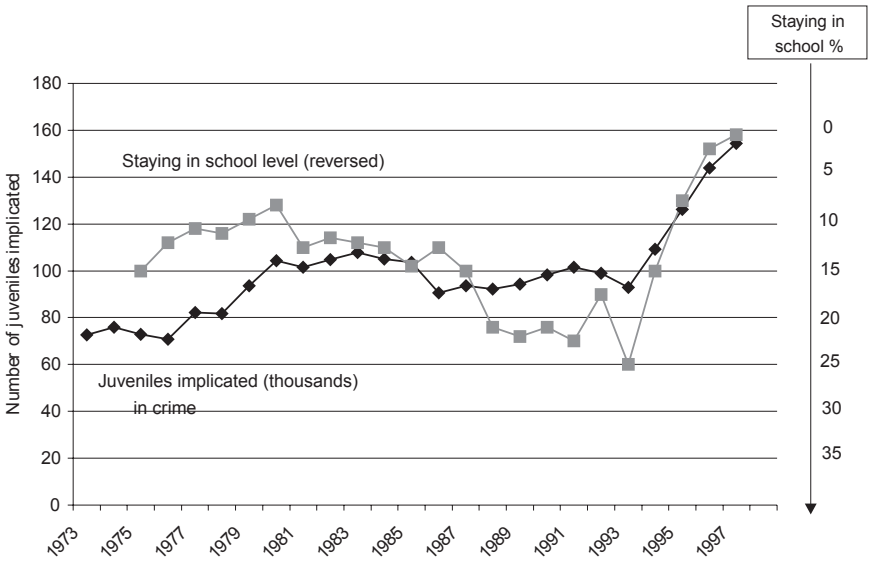
Violence: "crime against persons", violent theft, assault and battery

I studied fluctuations in violent crime using the same procedure as for theft. I did not, however, use time series on homicide, which, though they correlate closely with violent theft, represent such a different and indeed such a

rare phenomenon in France that it has no place in this study. The curve for assault and battery, on the other hand, where the recent trend is one of exponential increase, differs from that for theft.

The proportion of violent crimes committed by young people suggests that we should take into account motives for acting violently, factors that might affect actors' readiness to commit such a crime for the first time. Dispositions in France favoring prolonged schooling were able for a time to slow or attenuate the stimulus to crime constituted by unemployment. It is suggestive to compare data on how long young persons remain in school with that for juvenile delinquency. As schooling became longer, number of pupils leaving the school system fell below number of pupils of school-leaving age: "This was the case from 1988 to 1994, when length of schooling increased by 0.2 of a year per year." (Mini and Poulet, 1999). In 1992, when a generation of 850,000 had reached school leaving age, only 700,000 left; the "staying in school" coefficient was 18%. Between 1974 and 1981, when "staying in school" decreased, the number of minors reported by the police to be involved in criminal activity strongly increased. Conversely, when "staying in school" rates were their highest –1988 to 1993– this number stagnated (Figure III).

FIGURE III. – ***Juvenile delinquency and level of staying in school***



As for theft, I used error correction models. Regressions were first performed on undifferentiated time series, then by reinjecting residuals into a model of first differences. (14) For the undifferentiated time series, the effects

(14) The correlograms for residuals only present significant values for a time lapse of one period, making it advisable not to go beyond first differences.

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of staying in school on violent theft and assault and battery are significant: the decrease in the former is associated with an increase in violence; the converse is also the case. This effect is not mediated by unemployment. Such results suggest that the increase in number of delinquent minors over the period had an effect on violence volume: minors constituted the highest proportion of both violents and victims of violence (Table III).

TABLE III. – ***Stage 1: regressions on rough series for violent crime***

Independent variables	Crimes against persons (1)	Violent theft (2)	Assault and battery (3)
Period	1950-97	1972-97	1972-97
Constant	-1.35	0.11	0.62
$Prices_t$	0.31 (3.9)	0.002 (8.1)	
$Prices_{t-1}$			-0.005 (3.1)
$Prices_{t-2}$			0.007 (3.8)
Unemployment rate 15-24 without degree	_*	0.006 (1.9)	
Staying in school rate	_*	-0.006 (2.0)	-0.013 (3.6)
First marriage rate (reversed)	0.5 (3.3)		
R^2	0.84	0.96	0.86
F significant at	0.0001	0.0001	0.0001
Durbin-Watson	0.3	0.6	0.7

*Figures unavailable for these periods.

While the quality of these differentiated series regressions is below that for theft, the effects of variations in unemployment among young persons without degree and variations in "staying in school" are significant in the expected sense (Table IV).

Though crimes against persons, violent theft, and assault and battery are more autonomous in relation to economic context than theft, they too are affected by price variations, variations in unemployment among young persons without educational degree, and prolonged schooling. We should probably not try to interpret the fact that first marriage rates influence only assault and battery; this particularity is inherent to such analyses. Given that interpretive (*ie*, independent) variables are partially interchangeable indices whose relative consistency alone gives validity to the argument, more weight should be given in interpretation to which variables are implicated and relational directions than nuances in relation specification.

Motivation for violent acts has to do with delinquency "supply". The variables combine in explanatory configurations that are similar to those for theft, but staying in school, the effects of which were incorporated into the lagged residuals, plays a role in explaining the violent crime trend that it did not have

TABLE IV. – ***Stage 2: regressions on series for violent crime: error correction models***

Independent variables	Δ(crimes against persons)$_t$ (1)	Δ(violent theft)$_t$ (2)	Δ(assault and battery)$_t$ (3)
Period	1968-1997	1972-1997	1972-1997
Constant	0.12	0.03	0.05
Δ(prices)$_t$	0.04 (2.0)		
Δ(prices)$_{t-1}$	-0.05 (2.7)		0.002 (1.1)
Δ(unemployment 15-24 without degree)$_t$	0.05 (2.4)	0.011 (4.1)	0.007 (2.1)
Δ(marriage, reversed)$_t$			0.51 (2.9)
Residuals$_{t-1}$		-0.21 (2.1)	
Residuals$_{t-2}$	-0.12 (0.9)	-0.36 (2.7)	-0.04 (0.3)
R^2	0.34	0.49	0.46
F significant at	0.03	0.001	0.007
Durbin-Watson	2.1	1.9	1.7

for theft. Price variable coefficients were not as strong or significant here as for theft over the long term. This supports the idea that the type of interpretation I have proposed here, not narrowly based on crime type but referring instead to general conditions for delinquency, is defined primarily by the potential number of young people moved by resentment, not by volume of opportunity for committing such acts.

*
* *

The increase in opportunities to commit crimes, as attested to by consumer price and wage trends, played a major role during last century's strong growth period, though it influenced property crime rate more than violent crime rate. Though my analyses for that period could not be strictly comparable to those done on data for the last quarter of the century, the intensity of price variable coefficients suggests that "opportunity" logic predominated from 1950 to 1975 and gave crime the meaning of a tax levied on prosperity. During the 1975-97 recession, unemployment among young people without educational degrees was a factor favoring both theft and violence. This phenomenon was probably partially masked during periods when prolonged time in school indirectly influenced the situation of the least "diplomaed" young people. It came into full swing, however, during the last decade of the century. Lastly, tension in relations between the sexes, of which reduced marriage rates provide a very rough index and which intervenes autonomously along with economic-context indices, may also have stimulated an increase in delinquency starting in the 1980s.

In the second half of the period studied,1975-98, the role of delinquency "supply"; *ie*, the potentially delinquent proportion of the population, was affirmed. The lasting slow-down in economic growth (15) turned crime into an activity dominated by supply thus defined, though this was probably temporary. With recession and widespread increase in unemployment, this second impetus to crime and delinquency resulted in the rate rising higher and faster than at any other time. Increased unemployment functioned as an incentive not to play by the rules, one that passed from older to younger brothers. In effect, for boys who had just barely reached the age at which compulsory schooling ends in France –boys who were not personally on the job market– the possibilities and difficulty of engaging in legal activity were perceptible essentially through the experiences of brothers and male friends of brothers and sisters. This process does not presuppose individual awareness of the economic context, but rather the perceptible experience of members of the child's closest circle, and it affected a series of aggregating micro-decisions (Lagrange, 2000).

There seems to me no grounds for interpreting differential unemployment rates in France or increased income inequality in the Netherlands and United Kingdom as indicators associated with cost-benefit type calculations made by individuals. These features more likely bring into play relations between different social strata. They are macrosocial indices of society's degree of cohesion. For the case at hand, long-term increased unemployment and inequality gave a fraction of the most underprivileged boys the feeling that the social contract had been broken, and this in turn made it seem legitimate to them to break the citizens' pact and its insistence on respect for others' property and persons. The degree of violence in citizen relations thus seems linked to a feeling that the social and political domains are characterized by injustice.

If the improvement in employment prospects that has made itself felt since 1998 comes to extend to the least-educated young people, it may yet reduce the propensity to become delinquent. This can only happen if that improvement is not compromised by the logic of opportunity, tied as it is to an increase in inflation, and if public policy in France at both state and regional levels reinforces actions in favor of integrating unskilled young people who have been rejected by the school system.

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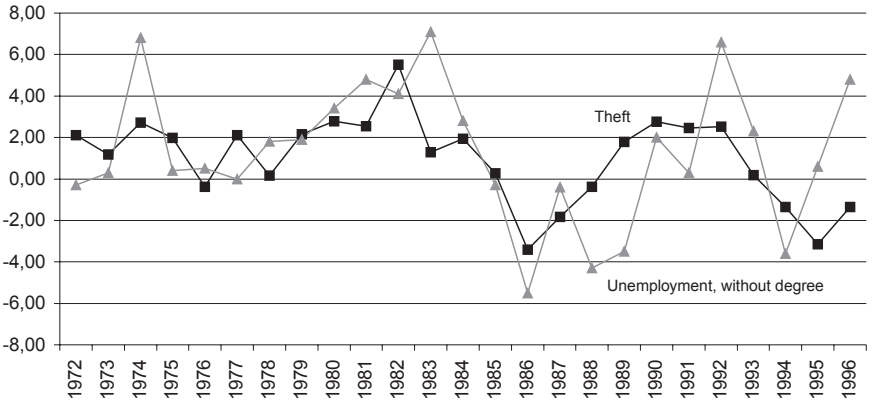
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(15) Annual increase in the buying power of a manual worker's wages was a mere 0.6% from 1975 to 1998, compared to 3.8% from 1945 to 1975.

APPENDICES

APPENDIX I. – ***Theft increase rate and unemployment rate for persons under 25 without degree***



APPENDIX II. – **The principle of error correction or ARIMA (Autoregressive Integrated Moving Average) models**

If X_t is the crime rate for year t and C_t the consumer price index for year t, then a regression on raw data following equation:

$$(1)\ X_t=a+bC_t+u_t,$$

in the presence of a rising trend gives an extremely high coefficient of determination R^2 –and with it the illusion of a strong relation. But Durbin and Watson's autocorrelation of temporal residuals test is poor –far from 2. (16) This is due to the fact that X_t and C_t (the latter representing the explanatory or independent variable) are not stationary; in other words, they show tendency and variance evolution over time. The two classically adopted solutions to this problem consist in either removing one temporal trend from each series and testing fit between crime and prices on gaps from the trend (using the series $X'_t=X_t-\alpha t$ and $C'_t=C_t-\beta t$), or working on first differences, *ie*, $\Delta X_t=(X_t-X_{t-1})$ and $\Delta C_t=(C_t-C_{t-1})$. But doing this means throwing the baby out with the bath in that we lose any long-term link between series. The guiding idea behind error correction models is to determine whether trends for independent and dependent variables are of the same type and if they balance each other. In practice this implies checking that the shapes of the initial series, differentiated to the same degree –first or second usually– are stationary. For example,

(16) Residuals correlation is defined by $cov\ (u_t, u_{t-1})/var(u_t)$.

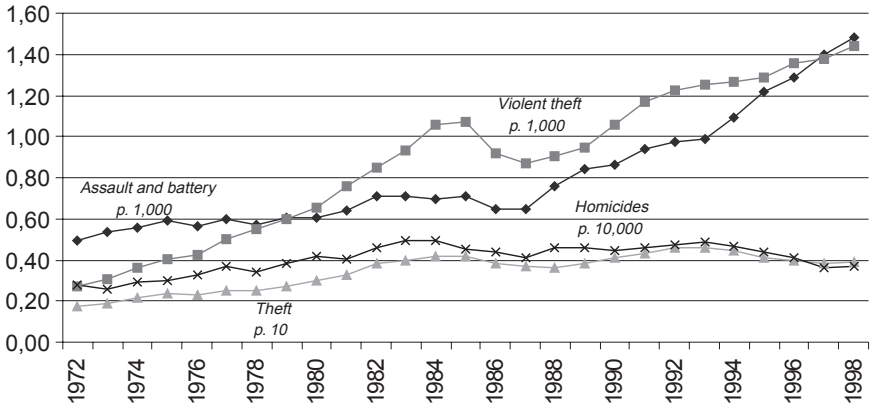
if ΔX_t and ΔC_t are stationary, that means X_t and C_t have degree 1 cointegration. The results are then adjusted, in a procedure that uses both short- and long-term links, by calculating the residuals $\hat{u}_t$ on the basis of (1) and reintegrating them into equation:

$$(2)\ \Delta X_t = a' + b'\Delta C_t + c'\hat{u}_{t-1} + \in_t'$$

where $\hat{u}_{t-1}$ is the residual of the first regression, lagged one period.
$\in_t$ is the classic error term of 0 mean, such that $cov\ (\in_t, \in_{t-1}) = 0$.

Analysis of correlograms enables us to determine time-series autocorrelation values for different time lags (example: X_t, X_{t-k} correlation).

APPENDIX III. – ***Trends for theft, violent theft, assault and battery, homicide, 1972-1988***



APPENDIX IV. – ***Rates for main types of crime***

	Assault and battery (per 1,000)	Violent theft (per 1,000)	Theft (per 10)	Homicide (per 10,000)
1972	0.49	0.27	0.18	0.28
1973	0.53	0.31	0.19	0.26
1974	0.56	0.36	0.21	0.29
1975	0.59	0.40	0.23	0.30
1976	0.56	0.42	0.23	0.33
1977	0.60	0.50	0.25	0.37
1978	0.57	0.55	0.25	0.34
1979	0.60	0.60	0.27	0.38
1980	0.61	0.66	0.30	0.42
1981	0.64	0.76	0.33	0.40
1982	0.71	0.85	0.38	0.46
1983	0.71	0.93	0.40	0.49
1984	0.70	1.06	0.42	0.49
1985	0.71	1.07	0.42	0.45
1986	0.65	0.92	0.38	0.44
1987	0.64	0.87	0.37	0.41
1988	0.76	0.90	0.36	0.46
1989	0.84	0.95	0.38	0.46
1990	0.87	1.05	0.41	0.45
1991	0.94	1.17	0.43	0.46
1992	0.97	1.22	0.46	0.47
1993	0.99	1.25	0.46	0.49
1994	1.09	1.27	0.45	0.47
1995	1.22	1.29	0.41	0.44
1996	1.29	1.36	0.40	0.41
1997	1.40	1.38	0.38	0.36
1998	1.48	1.44	0.39	0.37

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