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# Developmental Theories and Criminometric Methods in Modern Criminology: Analytical Overview

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## Abstract

The scientific interest in studying the functional dependence of crime intensity on socioeconomic processes has led to the emergence of contradictory concepts that are based on different hypotheses. The assessment of the merits and disadvantages of developmental theories shows that each research is valid for certain offenses in certain time and conditions due to the nonlinear development of countries. Therefore the context – economic, social and cultural parameters of development and crime – should be taken into account in order to elaborate the explanatory statements of criminalization. Criminometrics seems to become a scientific brunch engaged in the construction of formal criminological models and their quality evaluation. It creates the possibility to construct models using mathematic methods, separating the essential variables from the inessential ones, identifying variables' dependence (multicollinearity).

Keywords: crime, development, criminometrics, method, criminology.

Not all things that can be counted count and not all things that count can be counted. Albert Einstein.

# Introduction

In the transition to the post-industrial type of operation, many communities have faced the paradox that in contrast to the expected positive and progressive impact created a number of socio-economic and derived there from criminogenic threats and risks, which reflect the adaptive nature of criminal activity to the development. Currently popular concept of sustainable development has evolved from the environmental problems to the problems of security, including the component of criminological security. Accordingly, one of the defining challenges of modern criminology, which focuses on the nature and conditionality of crime, is to identify the dialectical interactions between the indicators of social and economic development and crime rate in order to work out an adequate prevention strategy and minimize factors of criminal acts reproduction on the individual and mass levels.

On behalf of international community the actors of UN Congresses on Crime Prevention and Criminal Justice permanently stressed the links between crime, development and prevention necessity. The Second Congress focused on crime, including juvenile delinquency, "that resulted from social changes accompanying rapid economic development". The Fourth Congress was the first to adopt a declaration, calling on governments to take effective steps to coordinate and intensify their crime prevention efforts in the context of economic and social development. It further recognized that crime in all its forms sapped the energies of nations, undermining efforts to achieve a more wholesome environment and a better life for their people. Under the theme "Crime prevention and the quality of life", the Sixth Congress recognized that crime prevention must be based on the social, cultural, political and economic circumstances of countries. The topic of "Economic and financial crime: challenges to sustainable development" was discussed during The Eleventh Congress [1].

The overarching message from the 13th UN Congress on Crime Prevention and Criminal Justice (will be held in Doha, Qatar, 12-19 April 2015) was that there could be no sustainable development without effectively tackling crime and having respect for the rule of law. Crime destroys livelihoods and has an impact on development. To help countries achieve successful sustainable development, they need to tackle crime and ensure they have effective criminal justice systems in place and respect for the rule of law [2]. This Congress took an income indicator for calculations and deduced that over the period 2003-2013, high-income countries reported decreasing trends for both violent crimes and property crimes, whereas upper-middle-income countries had rising trends for most crimes except homicide, and low- and lower-middle-income countries had diverse trends over the period. Although the different levels of data quality and police practices should also be factored in, these data suggest that crime trends in the past decade are related to the countries' income level [3].

Traditionally in Ukrainian modern criminology the influence of social and economic factors on crime is assumed an acxiom and has been recognized both among policymakers and in academic circles. On the background of numerous theoretical studies the lack of research giving the empirical evidence of the nexus, as well as the connections' tightness between the indicators and certain crime is observed. The qualitative analysis prevails to the detriment of complex data analyzing. The negative impact of crime on societal development is also undoubted among the scholars. But the absence of elaborated methodology of crime cost and harm estimation leads to the inconclusive empirical evidence and to the weak criminological policy.

#### Materials and methods

A complex methodology will be employed in order to make the assessments of modern criminological theories achievements. Taking into consideration that our conclusions will be based on the secondary data of theoretical conceptions we use primarily content analysis, comparative and germenevtic methods.

#### Discussion

The previous studies of the nexus between crime and development were primarily focused on understanding the social nature of crime. At the beginning of XX century scientists predicted that crime would lose its causal base after improvement of public relations. They also considered that social, economic, political and cultural development would lead to a significant reduction of crime. But now optimistic forecasts about its reduction are not justified either in developed or in developing countries.

The classical theory of disintegration put a foundation for contemporary developmental theories and studies in criminological field. Its author, E. Durkheim pointed out that in the process of modernization, rapid social changes disrupt the integrative force of the collective conscience, and consensus on social values associated with traditional society breaks down, resulting in social disintegration (anomie) that becomes the social factor of deviance and crime (Durkheim, 1897) [4].

The academic interest to economic model of crime studies, in particular microeconomic, has grown up since the emergence of G. Backer's fundamental work on analysis the offender's rational choice and the cost of crime as well (Backer, 1968) [5].

Continuing from these scientists, contemporary scholars proposed both theoretical and empirical theses based on criminometric methods describing and predicting the patterns of crime and deviance under development.

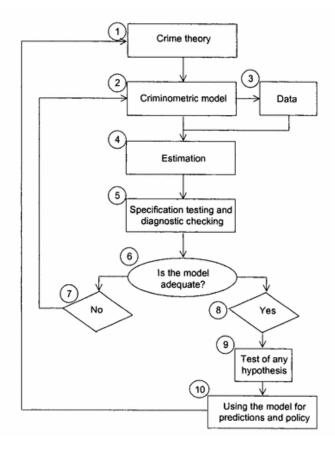
Criminometrics is an example of interdisciplinary scientific synthesis and represents a quantitative (mathematical) analysis of criminological data. This methodology originates from

econometrics and exploits the statistical methods adapted to criminological issues. It allows the construction of complete and reliable quantitative models of complex social processes.

The efficacy of mathematic modeling is called into question in some criminological research. Non-linearity and multifactorial process of society criminalization serves as the main arguments for the opponents.

Disabused in the possibility of rational and purposeful social management, community mainly tents to rely on the processes of spontaneous self-organization resulted in the prevalence of conventionalism for ordering and harmonizing people's interactions. Meanwhile the intuitive theoretical concepts that are not confirmed by empirical quantitative and qualitative research have weak chances for operationalization in practice of crime counteraction.

The expediency of mathematical modeling has been proved repeatedly in biometrics, psychometrics, sociometrics etc. Its achievements stimulated the research of social processes cyclicality and helped to identify recurring cycles in history, sociology, political sciences. The study of time series dynamics and the extrapolation of reviled trends have led to the construction of so-called Harvard Barometer in economy that substantially improved the quality of forecasts of the studied systems' future state. According to Barometer concept the dynamics of the various components of any multi-factor phenomena, including criminal one, comprises factors that are changing far ahead of changes in other components. The property of each curve to repeat the motion of the other curves in certain sequence and with a certain lag has been laid to the basis of the forecast using the Harvard barometer [6, p.127-128]. There are many examples of a particular model representation giving the effective results in one or another humanity science, but it has not found its proper interpretation in modern criminology in Ukraine.



The penetration of mathematical methods into jurisprudence is assumed to overcome the significant difficulties connected with the nature of criminological processes. Most of the objects studied by criminology can be defined as a complex system. The common understanding of the system is a combination of elements interacting with each other, as well as the environment, and forming indurated integrity, unity. The fundamental quality of a complex system is the emergence, in other words the presence of such properties that are not inherent to any of the elements of the

system, but inherent to the system as a whole. Therefore, the analysis method (division into elements and then examining these elements separately) is deficient while studying systems. The complexity of the system is determined by the number of its member elements, the links between these elements, as well as the relationship between the system and environment. A criminal situation has all the features of the system. Schematic description of the steps involved in a criminometric analysis has been performed by Horst Entorf and Hannes Spengler [7, p. 98].

Getting back to the developmental theories essence the meaning of modernization concept should be highlighted.

The modernization approach emphasized the influence of economic institutional and social structural changes (increased socioeconomic development, rapid urbanization, population growth but breakdown in family relations) on criminal behavior. It was based on the assumption that modern transformation results in social disruption that produces alienation and, in the end, criminal activity. This point of view has been well described in studies of Clifford (1963) [8], Clinard and Abbott (1973) [9], Krohn (1976) [10] etc.

One of the greatest achievements in the elaboration of criminological modernization theory belongs to L. Shelley (1981). "Crime has become one of the most tangible and significant costs of modernization", – she deduced in the fundamental study [11, p. 137]. Her analyses divided countries into three groups: developing countries, developed countries, and socialist countries. The level and distribution of criminality were examined in terms of the extent and speed of the urbanization process, the degree of industrialization, changes in the social structures and the impact of the criminal justice system. According to L. Shelley observations of crime under modernization, the rate of property and violent crime increases in the cities, and in rural areas, despite the agricultural potential and migration of people to cities, violent crime dominates. The evidence that the process of modernization has a distinct and consistent impact on both rates and forms of criminal behavior was also demonstrated in the research. Nevertheless Shelley characterized her theory as a more descriptive rather than predictive one.

Comprehensive cross-national studies were represented by Neuman and Berger (1988) [12], Neapolitan (1997) [13], Lafree (1999) [14], Messner (2003) [15] ets. These studies were focused primarily on crime patterns in developed countries.

According to Entorf and Spengler (2000) [16] reporting crime rates are strongly correlated with development: richer countries report a higher fraction of crimes. In some other research significant negative effect of income on crime is observed (Kelly, 2000) [17]. Soares (2004) has deduced that development (income per capita), by itself, does not have any significant effect on crime, although increases in the economy's growth rate reduce the number of thefts; education is also a factor that has negative effects on numbers of thefts and contact crimes. The reductions in inequality and increases in growth and education are associated by the scholar with reductions in crime rates [18].

However Newman (1990) considered that impact of crime on society can be less with an increase in development level, despite the increase in the number of crimes [19].

Aebi and Linde (2014) studied homicide trends in 15 West European countries from 1960 to 2010 and found out that none of the traditional demographic and socioeconomic predictors of homicide was significantly correlated with the rates of homicide. The authors proposed an explanation based on lifestyle approach [20, p. 567].

There were also some scientific attempts to examine the interactions between crime and political management. Pinker (2011) in his comprehensive analysis of the secular reduction of violence across the globe has assigned a decisive role to democracy and its institutions in this process [21]. Karstedt (2015) has found different violence trajectories of contemporary societies, as the different institutional settings and stability generate different violence outcomes. According to this research, institutional and state failure coincides with high levels of interpersonal and repressive state violence [22, p. 471].

Other relevant studies include the assessment of globalization impact on crime. Messner and Rosenfeld (2000) argued for a need to restrain the market and prevent the economy from dominating other institutional realms, with reference to their institutional-anomie theory [23]. Findlay (1999) comprehensively reviewed criminogenic conditions during globalization processes, especially in developing countries [24].

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The issue of reciprocal connection between crime and development was scrutinized not only at macro level, but also at local communities primarily in the environmental criminology field. According to Kick and Lafree (1986) "opportunity" theory modernization and development enhanced urbanization, which decreased interpersonal ties and contact among intimates and acquaintances, thereby reducing interpersonal violence, while development increased opportunities for theft by providing a vast supply of readily available commodities in a time where surveillance and social control was lower [25]. Freedman and Owens (2011) estimated that constructing low-income housing in disadvantaged communities reduced robberies and assaults by about 2 % [26].

A few studies were devoted to the connections between economic crime and economic growth. Asif Islam (2012) has found a negative relationship between firm losses due to crime and economic growth. Expressed in terms of standard deviations, an increase in real GDP per capita growth by 1 standard deviation resulted in a 0.09 standard deviation reduction in the losses due to crime over total sales. The suggested mechanism for this effect is that economic growth increases opportunities elsewhere and thus increasing the opportunity cost of crime. He has also noticed that economic growth is more effective in reducing crime loses for firms with female owners and managers [27].

Moreover, scientists has pointed out the reverse relationship, for instance, the impact of crime on the labor market. Nagin and Waldfogel (1995) demonstrated that a number of convictions for a crime increased the instability of the labor market. Sharp increase in crime in the long term will lead to at least the fact that the lower productivity of criminal populations negatively affects the economy as a whole [28]. In Ehrlich's (1973) opinion, economic growth also serves as an indicator of increasing prosperity and thus the effect on crime may depend on the level of risk aversion [29]. At an international level, an analysis of the effects of crime on economic development is offered by Van Dijck (2007), who has worked out a composite index of organized crime for 150 countries. The analysis underlines how crime tends to depress economic growth through the presence of corruption and a weakening of the Institutional systems, in particular those necessary for long-term economic growth [30].

Over the past decades, many fundamental scientific criminological works have appeared on the territory of the former Soviet Union. They have made a significant contribution to the understanding of crime modifications in connection with the current social and economic processes. The importance of the scientific work of Prof. V. Dryomin (2009) [31] is undoubted. He considered crime as a kind of social practice and also mechanism of criminal activity institutionalization. J. Gilinsky (2004) [32] analyzed deviant and in particular criminal acts through the lens of psychology of consumer society and the realities of social exclusion. V. Shakun (1996) highlighted the impact of urbanization on crime [33].

Criminometric methodology was applied by Y. Andrienko (2001). He explored that violent crime was being replaced by mercenary one under the decline of income inequality, the growth of real incomes and unemployment. His expectation is a further increase in property crime during the sustained economic growth in Russia [34]. Relevant etnometric study helped Y. Latov and N. Latova to find the significant correlations between mentality indexes and the participation of Russians in the shadow economy (including corrupt relations) [35].

## Results

Summarizing the studies we are able to deduce their main statements:

- The increased criminality is an unavoidable consequence of socioeconomic and industrial development (theory of modernization point of view).

- Underdevelopment is the factor of crime (socioeconomic theories point of view, usually rejected by critical criminology).

- Crime delays development (crime and development are considered both as a cause and as a consequence of each other).

- There is no significant interaction between crime and development.

Thus, the academic interest in study of the functional dependence of crime intensity on socioeconomic processes has led to the emergence of contradictory concepts that are based on different hypotheses. The flaws in the methodology of extrapolating of sociological and economic sciences

achievements, exploring the models of interaction within the framework of social mobility status and roles, as well as the development of resources and financial capital, and wealth redistribution into the criminological matter resulted in some phases to quite opposite conclusions about the nature of crime. They are: the statement of the countries progressive criminalization that is not actually confirmed by official statistics within the UN survey; the explanation of crime as a result of poverty, alongside with observing the accelerated pace of crime intensity in countries with high GDP per capita; the statement of some of the most economically developed countries criminological safety (eg, Japan and Switzerland) without adequate justification of their exclusivity among general regularities; the statement that crime tends to oppress development, but comparatively higher crime rate is observed in developed countries. Furthermore, the empirical studies predominantly used cross-national data of Western societies and developing countries. There is a need in studies of the socioeconomic transformations impact on crime in underdeveloped countries. In modern globalized word the risk of using underdeveloped countries with weak government as a base location by transnational organized crime with terroristic and other criminal activities has increased. This problem keeps the attention of international community and demands coherent solutions.

The main demerit of each theory and study is the lack of universality. It means that each theory is valid for certain offenses in certain time and conditions due to the nonlinear development of countries. Therefore the context – economic, social and cultural parameters of development and crime – should be taken into account in order to not only give the description but also an explanation.

Criminometrics seems to become a scientific brunch engaged in the construction of formal criminological models and their quality evaluation. A researcher is able to borrow a rich experience from developed economic and statistical models and examine crime theories and hypotheses through descriptive, correlation and regression analyses. At the same time it is also possible to construct models using multiple regression, separating the essential variables from the inessential ones, identifying variables' dependence (multicollinearity). The contextual analysis of concepts leads to the inclusion variables of different linearity into the regression equation. It enables to analyze systems with essentially nonlinear relationships.

Nevertheless the empirical criminometric study of the nexus between crime and development has some obstacles taking into consideration the next issues.

First of all there are no uniformed, internationally accepted criteria for development assessment. In our research we'll combine different indicators, relevant to economical and social transformations.

Secondly, every scientific research would benefit from high quality data, but the complex nature of crime doesn't allow a direct certain and exhaustive measuring of illegal activities. Moreover, the researcher is obliged to rely primarily on official statistics on reported crimes. It discloses the problem of crime underreporting and underrecording and remains the latent crime out of sight especially under the gaps of crime statistics quality. Perhaps, it may be the main reason of the scientific interest within criminometric methodology to study ordinary violent and mercenary crime and omit other crime types. For example, due to the high level of white-collar and organized crime latency the reliability of obtained outputs can be very low. There were some scientific attempts to fill this gap with data of victimization surveys (Andrienko (2001), Soares (2004)). But this approach is not applicable in Ukraine due to the absence of comprehensive victimization surveys at the national level. Thus, the analysis of secondary data on crime and development leaves uncertain the observance of validity requirements for primary data.

In addition the vast majority of previous studies used cross-national data and designs. Besides the well-known data compatibility problems due to the cross-national differences in definition, procedure, and criminal justice practices, cross-national data do not reflect the intrinsic longitudinal nature of the modernization process under political, economical, and historical contexts of particular countries. In Ukraine even at the national level there is a problem of rather frequent changes in definitions of certain crimes that mechanically impact the data of crime rate in official statistics. This is the case for theft, for example. Considering inflation, growth in income and other factors, the government changed the definition of theft several times during the studied period automatically increasing or decreasing the total crime rate as theft reaches 40 % on average of total crime in Ukraine.

Finally some weakness of criminometric analysis projections should be acknowledged due to the fact that during the calculations of one or more variables on crime factors one cannot consider them all. It is also complicated to establish pace (progression) of criminalization.

## Conclusion

Criminometrics in Ukraine has not been formed as a separate line of scientific and practical activities. But the achievements and success of this methodology in national and cross-national studies allow applying it to Ukrainian criminological realities and enabling to shift from description to explanation and prediction of crime and development reverse interaction.

## Примечания:

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#### Теории развития и криминометрические методы в современной криминологии: аналитический обзор

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Аннотация. Научный интерес к изучению функциональной зависимости интенсивности преступности от социально-экономических процессов привел к появлению концепций, различных противоречивых основанных на предположениях. Оценка достоинств и недостатков теорий развития показывает, что каждое исследование справедливо лишь для некоторых преступлений, совершенных в определенное время и при определенных условиях, учитывая нелинейность развития стран. В связи с этим контекст – экономические, социальные и культурные параметры развития общества и должен приниматься во внимание для выработки объяснения преступности – криминализации. Криминометрика способна стать научной отраслью, которая занимается построением формализированных криминологических моделей и оценки их качества с помощью математических методов, отделяя существенные переменные от несущественных, выявляя взаимозависимость переменных преступности и параметров развития (мультиколлинеарность).

Ключевые слова: преступность, развитие, криминометрика, метод, криминология.