Journal of Applied Economics in Developing Countries (P-ISSN 2354 – 6417)
Vol. 6 No. 2, September 2021, Page 74-91 (E-ISSN 2685 – 7448)

THE ROLE OF ECONOMICS IN EXPLAINING THEFT BEHAVIOR: A LITERATURE REVIEW

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Abstract

This article aimed to review discussions on the role of economics in explaining criminal behavior, particularly theft. From the pioneering work of Becker in 1968 up to the 2013 empirical work of Maddah in Iran, this review has several propositions. First, economics has contributed significantly to understanding many theft-determining factors and policy options derived from those studies. Second, economics alone is good but insufficient to fully understand criminal behavior. A holistic approach is required because the acts are motivated by many drives, rationally and irrationally, which can only be understood triangularly. Finally, theft redistributes income and does not increase welfare, it just waste resources from thief, household, and society.

Keywords: *Economics; Theft; Social Cost*

JEL classification: B55

1. INTRODUCTION

The use of the economic approach in the study of the economics of crime further emphasizes the existence of economics as a science that has a very broad scope of application in explaining various problems in human life. Many literature such as Ehrlich (1973), Heineke (1978, 1988), Greenberg and Kessler (1982), Horvath and Kolomaznikova (2003), Lochner and Moretti (2004), Hardianto (2009), Maddah (2013), and others, almost entirely based on the analytical model first built by Becker (1930-2014) in "Crime and Punishment: An Economic Approach" published in 1968. According to Eide (1999), although Becker was not the first to conduct a discussion on this subject, he is still considered a pioneer because the analytical model built is very comprehensive and is a refinement of the model made by Beccaria (1958) and Bentham (1843) regarding "rational choice theory".

The purpose of Becker's study (1968a) is to answer the question of "how much resources should be spent and how many penalties should be given to create law enforcement?" Then, the methods used in the analysis measure the social harm caused by crime and identify the expenditure on resources and penalties that can minimize the crime. The analysis carried out in this study also has a lot to do with penological issues (criminal science) and theories about criminal behavior. Becker also suggested that this built model could be merged into other theories related to the problem of criminal behavior. In his language, he wrote:

> "It is suggested, for example, that a useful theory of criminal behavior can dispense with a special theory of anomie, psychological inadequacies, or inheritance of special traits and simply extend the economist's usual analysis of choices" (1968a: 170)

Becker divides his analysis model into five interrelated categories of inter-variable approaches. First, the number of crime cases and the costs incurred to commit the crime. Second, the number of cases of crime with the punishments given to the perpetrators. Third, the number

of criminal cases, arrests, and convictions with the amount of state spending spent on the police and courts. Fourth, the number of perpetrators who have been charged with punishment with the costs that must be incurred to give punishment to these perpetrators such as imprisonment and so on. Finally, the number of cases of crime and personal expenses that individuals must bear as a form of protection and vigilance.

One thing that becomes the basis for Becker's thinking in his analysis is the assumption that criminal behavior is no different from economic behavior in general, which tends to pay attention to aspects of profit and loss or what is known as "rationality". However, he also emphasizes that the rationality in question is not only material in nature, but also considerations regarding restrictions on moral and ethical values that apply in society. In fact, criminal behavior, according to him, will not occur if the perpetrators include these moral and ethical considerations, even though the crimes they will commit later can provide benefits and there is no risk of arrest.

Furthermore, in connection with his assumption that criminal behavior is no different from economic behavior in general, there will be an external impact resulting from this criminal behavior on society. In this case, the external impact is negative, called social loss. Then, he put forward a social loss function model that explains the social loss problem. He revealed that the total social loss due to illegal behavior in the form of a crime is the sum of the damage costs (D(O)), punishment costs (C(p, O)), and social losses from punishment (bpfO). Then, based on the analysis model, efforts that can be made to minimize the total social loss are by controlling, the value of the ratio of offenses cleared by convictions to all offenses (p), the penalty per perpetrator arrested (p), punishment per offense for those convicted (f), and number of offenses (O) (Becker, 1968a).

2. RESEARCH METHOD

This article was written according to a simpler “Literature Meta-Analysis” by undertaking five mandatory steps. First, locate all potential studies on the economics of crime. Second, develop consistent criteria and screen studies for relevance and/or quality. Third, identify and record relevant information for each study. Fourth, synthesize and analyze the data into broad findings. Fifth, draw summary conclusions based on the findings (Newman, 2014: 126-127).

Results and discussion of the above processes were described in the next section. Five categories emerged as broad findings, namely [1] the economics theory of crime, [2] empirical studies of the economics theory of crime, [3] special characteristics of the economics theory of crime, [4] social cost, and [5] social cost of theft.

3. RESULTS AND DISCUSSION

3.1. Economics Theory of Crime

Based on the assumption that crime was rational behavior, Becker (1968b) then analyzed the supply side of the illegal behavior or crime (supply of offense). His initial approach was based on an economic analysis of rational choices, namely the assumption that a person would commit a crime if the expected utility exceeded the profit obtained would that person engage in other activities. So, in his words he wrote:

> “Some persons become “criminals”, therefore, not because their basic motivations differ from that other persons, but because their benefits and costs differ”. (1968b: 176).

From this approach, a function of the supply of offense was derived, which is the relationship between the number of crimes committed (O_j), and the probability of being caught if someone commits the crime (probability of convictions per offense) (p_j), the amount of punishment that will be received if caught (punishment per offense) (f_j), and other variables related to the person's personality (portmanteau variable) (u_j).

Based on the function, he explained that if there is an increase in the probability of convictions per offense (p_j) and punishment per offense (f_j), it will tend to reduce the number of offenses (O_j) because the probability of someone "paying the price" for the crime will increase. Similar to the portmanteau variable (u_j), which is a combined variable of other factors that influence a person's willingness to commit a crime, one can also see the effect on the number of offenses (O_j). For example, an increase in income derived from working legally and an increase in compliance with the law by providing more educational values will have an impact on reducing the number of offenses (O_j), or by changing the type of punishment from fines to imprisonment, will also reduce the number of offenses (O_j) because at least as long as the person is in prison, he will not be able to commit a crime (Becker, 1968a).

In his article, Becker assured that this function could be accepted empirically on the basis of support from studies conducted by Smigel (1965) and Ehrlich (1967) (in Becker, 1968a). They conducted an empirical analysis of seven types of serious crimes using a U.S. Federal Bureau of Investigation database. The results of their study showed that the relationship between the number of offenses (O_j) and the probability of conviction (p_j) and punishment (f_j) was negative and significant with a high correlation coefficient.

Ehrlich (1973) then contributed to a supply of offense analysis model with a different approach than had been developed in the years before this article was published. He admitted this in his article "My analysis goes beyond that of Becker and other previous contributions in several ways" (1973: 522). There are at least four differences that he put forward in his study.

First, it incorporated the concepts of punishment and reward (costs and rewards for engaging in legal or illegal activities) rather than considering only punishment in illegal activities alone.

Second, it connected the theory of "participation in illegal activities" and the "general theory of occupational choice" by providing an overview of the decision problems that must be made by individuals who participated in illegal activities towards various other types of work.

Third, the analysis distinguished between the influence of avoidance and prevention of imprisonment on the level of crimes that occured.

Finally, in this study, he not only built a theoretical model, but also conducted an empirical analysis of the interaction between crime and law enforcement activities on the part of government agencies, the police and courts.

Furthermore, another model of the supply of offense function, in spite of the model made by Becker, was introduced by Wolpin in 1978. Wolpin (1978) provided a more specific and detailed model of the supply of offense function from this function. Based on Becker's model, he further broke down the three preferences, namely p, f, and u, into more detailed and specific ones.

Several other models of the supply of offense function with each approach (Eide et al, 2006). However, it can be generalized that most existing models all describe the relationship between the supply theory of criminal behavior and the risks that may be obtained. For example, Allingham and Sandmo (in Eide et al, 2006) built a supply of offense model with the case of "tax evasion". In their analysis, they saw that someone who wants to avoid paying taxes is faced with the problem of "what proportion of their income do they want to report to the tax authorities". So in this case, the probability of detecting the person's real income and the amount of punishment that must be received if caught, influenced the actions to be taken related to the problem at hand. However, according to them, one thing that must be underlined is that this only applies to those who are "aware" of risks and vice versa does not apply to those who are "ignorant" of risks.

Meanwhile, Heineke (1978) in his article "Economic Model of Criminal Behavior", provided a different picture of the behavior model of the perpetrators of crimes. It assumed that an individual allocated his time, not his wealth or income, to engage in legal and illegal activities. According to him, individual income was assumed to be equal to the sum of the three elements: exogenous income, the nominal value of money from gains or losses in legal activities, and the nominal value of money from profits and losses in illegal activities. If a person was caught in carrying out illegal activities, then his income would decrease because there was a fee for that action that must be paid. Thus, some people would choose to specialize in only one type of activity, legal or illegal, and conversely some other people would choose to do both, legal and illegal activities.

If there was even a small increase in the probability of a person being caught and the severity of the sentence given, it would greatly impact individuals who chose to engage in either type of activity. Whereas for individuals who had specialized in only one type of activity, an increase of that magnitude would not have any impact. The model built by Heineke, according to Eide et al (2006), was similar to the portfolio choice model in economics because there was a consideration of the monetary value of physical benefits and freedom in choosing the type of activity.

The various models described above can be concluded with the (comprehensive) conclusions made by Eide et al (2006), who have reviewed more than ten models of criminal behavior in their articles, namely:

> “Crime is deterred by increases in the probability and severity of punishment, and enhanced by increases in exogenous income, and gains from both legal and illegal activities. An increase in various income and gains increases crime because punishment in the case of decreasing absolute risk aversion produces a smaller reduction in expected (total) income. For risk-neutral people, increases in the probability or severity of punishment and decreases in the gains to crime will reduce the supply of crime, whereas changes in exogenous income and the remuneration of legal activity have no effect. Here, changes in the latter income component do not change the bite of punishment” (1999: 351).

In another article, Witte and Witt (2000), who have also reviewed various models of criminal behavior, summarize their conclusions on this matter:

> “It is assumed that participation in criminal activity is the result of an optimizing individual responding to incentive. Among the factors that influence an individual’s decision to engage in criminal activities are (i) the expected gains from crime relative to earnings from legal, (ii) the chance (risk) of being caught and convicted, (iii) the

extent of punishment and (iv) the opportunities in legal activities. Specifying an equation to capture the incentive in the criminal decision is a natural first step in most analyses of the crime as work models. The most important of these gives the relative rewards of legal and illegal activity" (2000: 5).

In these two conclusions, they re-emphasized that almost all of the models that have been reviewed use the expected utility function as the basis for making analytical models. In addition, the approach taken by economics in looking at the problem of criminal behavior makes a general assumption that individuals, in making decisions to act, both legal and illegal, are rational based on the calculation of the costs and benefits of these legal and illegal actions. That is, the perpetrators of crimes carry out their actions the same as people in general in carrying out economic activities because both of them require individuals to be responsive to incentives.

3.2. Empirical Studies of Economics Theory of Crime

In connection with the development of various economic analysis models in crime, positive analysis (based on empirical facts) is needed to test the applicability of these models in the real world. Economists who have more interest in this field have realized this. Since being pioneered by Becker in 1968 with his theoretical model, further studies emerged in the form of empirical studies aimed at testing the model.

Sjoquist (1973) tested Becker's supply of offense function estimation model. He analyzed this function in the behavior of crimes against private property rights (property crime). The results of the analysis showed that the probability of arrest (p), conviction (c), and punishment (f) had a negative and significant effect on the number of property crimes. Meanwhile, the portmanteau variable (u) that he included in the model, namely the average length of schooling, the percentage of urban residents who were white, and the variable population size, had a positive and significant influence on the number of property crime cases that occurred. Apart from that, other portmanteau variables, namely the average wage variable from legal work, population density, and retail goods sales had a negative and significant effect on the number of property crime.

In another study, Ehrlich (1973) apart from building an estimation model for the supply of offense function, also conducted an empirical test of the model using data variations of crimes index of the states in the US in 1960, 1950 and 1940. The results of the regression analysis with Ordinary Least Square (OLS) estimation showed that the probability of convictions and severity of punishment variables had a negative effect on the occurrence of criminal behavior as a whole, but had a positive effect on state spending in financing police institutions. Other variables included in the analysis model were income inequality and the percentage of black people in an area. The income inequality variable had a strong positive effect on property crime (robbery, theft, forced demolition and motor vehicle theft) and a lower effect on crimes against person (murder, rape and beatings). The variable percentage of the black population had a positive influence on all types of crimes that occur. One important conclusion from Ehrlich's study was that perpetrators of crimes against property were more rational in carrying out their actions compared to perpetrators of crimes against persons who according to him were indicated to have more other motivations in carrying out their actions.

Myers (1983) used 2712 individual samples of perpetrators of crimes who had ended their prison terms during 1972 in the US to analyze the effect of the severity of punishment and the probability of convictions on the re-engagement of the perpetrators (samples) in

crime. The results obtained were that there was a negative influence from the severity of punishment and vice versa, a positive effect from the probability of convictions on the re-engagement of the perpetrators (samples) in crime. This study also pointed out other facts, namely that the great opportunity one had when carrying out legal activities, through high wages, had a strong influence in preventing crime.

Meanwhile, Schmidt and Witte (1984 in Eide et al, 2006) used 641 individual samples of criminals in North Carolina state penitentiary, U.S. They found that both the severity of punishment and the probability of convictions were both negative for the occurrence of crimes. In contrast, Trumbull (1989), who used 2000 individual samples of criminals who were freed in the same area, found that all of these prevention variables had no significant effect on the occurrence of crimes.

Finally, based on all empirical studies that aimed to test the accuracy of the estimation model of the supply of offense function, Eide et al (2006) concludes in the following sentence:

> "As a whole, criminometric studies clearly indicate a negative association between crime and the probability and severity of punishment. The result may be regarded as rather firm corroboration of the deterrence explanation obtained from the theory of rational behavior: an increase in the probability or severity of punishment will decrease the expected utility of criminal acts, and thereby the level of crime. It should be remembered, however, that in some studies the effect of an increase in the severity of punishment is not statistically different from zero, and statistically significant positive effect has also occasionally been obtained" (2006: 227).

In addition to empirical studies that aim to test the estimation model of the supply of offense function, other studies have also been conducted to find out what economic factors influence the occurrence of criminal behavior. Greenberg and Kessler (1982) conducted an analysis of 12 independent variables which, according to them, were theoretically relevant as factors influencing the occurrence of various types of crimes and the handling of these cases by the police. Their findings showed that the effect of the number of population on the types of crimes of murder, rape and robbery was positive, but not for other types of crimes. The influence of the population density on the types of robbery crimes was also positive, while the effect on handling cases by the police was negative for all types of crimes.

Further, the percentage of the population under the age of 18 had no effect on the occurrence of crime, but had a negative effect on the handling of cases by the police in cases of beatings and positive in cases of motor vehicle theft. The percentage of the population working in the manufacturing sector had no effect on the occurrence of crime, but had a positive effect on the handling of cases by the police in cases of beatings and negatively in cases of motor vehicle theft. The percentage of the unemployed labor force had a positive effect on homicide crimes, but not for other types of crimes. Middle-income residents had a negative effect on rape cases, but positive for robbery cases.

The percentage of presence of minorities had a positive effect on rape and beatings, but negatively on the handling of cases. The percentage of the black population also positively influenced cases of murder, beatings, robberies and motor vehicle theft. The percentage of families with female heads of household did not have a consistent effect on the occurrence of crime, but had a positive effect on handling cases of robbery and theft crimes. Income inequality had a negative effect on rape cases but did not affect other types of crime. Furthermore, based on regional division, cities in the northern region had more cases of

robbery, while those in the south had fewer cases of rape. Based on the results of this study, it can be concluded that the variables analyzed have varying effects on various types of crime and the level of handling by the police.

Massourakis, Rezvani, and Yamada (1984) made an empirical study that aimed to determine the relationship between the unemployment rate and the occurrence of crimes against property using dynamic time-series techniques on quarterly data from 1973 – 1981. The unemployment variable they analyzed in this study was divided into two categories, namely based on the type of work (white collar and blue collar) and based on race (white, black and Hispanic). Their test results indicated that unemployment, whether based on all types of work or all types of race, had a significant positive effect on the occurrence of robbery crimes and property crime in general. So, according to them, to reduce the number of property crime cases, it is necessary to intensify unemployment alleviation programs based on certain categories (race or type of work) for the existing workforce. In line with the results of this study, Raphael and Ebmer (2001), Edmark (2005), Fallahi, Pourtaghi, and Rodriguez (2012) and Maddah (2013), showed the same results in their study, namely that there was a positive and significant effect between unemployment rates and the occurrence of property crime.

Furthermore, Burguignon (1999), provided a different perspective in viewing the relationship between crime and related economic factors. His analysis was intended to look at the external impact of the irregular development processes of Latin American countries during the last 20 years when this study was conducted. The results of his study showed that the readiness of quality human resources was not matching the most dominant impact of growth in a number of regions. Thus, this actually caused more widespread poverty and widened income inequality in society. So, the rise of crime cases that occurred in the Latin American region, in this case, was a social loss arising from poverty and income inequality.

Another variable that is also used as material for analysis is the education variable. Lochner and Moretti (2004) analyzed the effect of education on individual participation in criminal behavior in the United States. They conducted an analysis using data from three different sources: individual data on criminals still in detention, data on arrests of perpetrators of crimes, and data on reporting cases of crimes. As a result, from the three data sources used, all came to the same conclusion, namely education had a significant effect on reducing the level of individual participation in criminal behavior. They also concluded that education was an investment that would bring social benefits to society while also reducing social losses arising from crime.

In line with the results of the study by Lochner and Moretti (2004), a study conducted by Entorf and Sieger (2010), on 1,800 convicts, 1,200 individual population samples, and panel data on aggregate crime over a period of 25 years in Germany, also showed the same results. There was a significant influence of education on individual participation in criminal behavior in Germany. According to them, a high level of education provided greater opportunities for people to have good prospects in the future in the labor market and prevented someone from participating in criminal behavior. On the other hand, a low level of education often hindered a person's position in entering the labor market and made them vulnerable to engaging in criminal behavior.

In Indonesia, empirical studies regarding the influence of economic factors on the occurrence of crime had also been carried out, one of which was Hardianto (2009). He s the influence of the imprisonment rate of criminals, the wage rate, and government expenditure in the legal sector on the crime rate in 26 provinces in Indonesia in 1997. The data used was

cross sectional data obtained from the Indonesian Central Bureau of Statistics (BPS). The results of the analysis showed that the degree of imprisonment of perpetrators of crimes did not significantly affect the rate of occurrence of crimes in Indonesia. This result was in contrast to previous studies, such as Smigel (1965), Ehrlich (1967, 1973), Myers (1983), Heineke (1978), and others, which suggested that the degree of imprisonment for a crime had a negative and significant effect on the rate of occurrence of a crime. This, according to Hardianto (2009), was due to poverty and weak law enforcement in Indonesia. The implication was that the expected cost due to an increase in the risk of crime in Indonesia was still smaller than the expected benefit, so it did not have a major effect on reducing the expected utility from crime.

Apart from that, the wage rate variable negatively and significantly affected the crime rate in Indonesia. The wage rate variable here was the wage rate for legal work. These results justified the assumptions of the supply of offense theory that an increase in wages for legal work would reduce the expected utility from crime and had implications for a decrease in the number of crimes to occur. Then, the government spending variable had a positive and significant effect on Indonesia's crime level. This meant that an increase in government spending had not been able to reduce the expected utility from crime, so the implications of this increase would not have an impact on reducing the incidence of crime in Indonesia.

3.3. Special Characteristics of The Economics Theory of Crime

Since Becker appeared with his eminent embryonic article “Crime and Punishment: An Economic Approach” in 1968, there can be little doubt that there have been a number of follow-up studies on this theme. The experts involved in it also vary, not only from economists, but also include experts from other scientific fields such as business, law, sociology, social anthropology and of course criminology. The studies that have been developed are also of various types, both in the form of theoretical, empirical, literature review and critical review of previous studies. In this regard, Levitt and Miles (2006) attibute it as a "renaissance" of using an economics approach to the problem of crime.

Some of the many literatures regarding the economics approach to criminal behavior, whether in the form of journals, working papers or paper drafts, have been previously presented. Furthermore, this section attempts to describe some of the special characteristics summarized by Levitt and Miles (2006) in the use of an economics approach to the study of crime. This special characteristic distinguishes the use of the economics approach from other social science approaches to the study of crime. According to Levitt and Miles (2006), these special characteristics are divided into four.

First, there is an emphasis on the role of incentives in determining a person's behavior, be it as perpetrators, victims or interested parties in terms of law enforcement. This emphasis on the role of incentives is based on the assumption in economics that individuals tend to maximize their utility function to the maximum extent, or in other terms, to behave rationally. This assumption was then incorporated by Becker (1968) into his analysis and resulted in an estimation model for the supply of offense function which is still used as a basic reference material for anyone wishing to build a study with a similar theme. This function explains that in making a decision to participate, a criminal will first make calculations regarding his expected utility, namely the ratio between the expected cost and the expected benefit in taking action.

Second, the use of econometric analysis in looking at causal relationships in studies of crime. Using econometric analysis is useful for identifying factors that

statistically influence the occurrence of crimes and estimating how big their influence is. The results of this analysis are useful as a consideration for the government or related parties in formulating policies related to the problem of crime in society. Regardless of its shortcomings, econometric analysis still has a place as material for consideration in determining these policies.

Third, the approach to economics emphasizes generalization in seeing the implications of a policy rather than the implications for specific matters. In carrying out their analysis, economists generally use regional coverage with aggregate data as material for analysis, so that the results obtained are more general and representative, not specific or specific. However, this generalization still does not eliminate the important meanings from the context of the problem under study. So, it is clear in this case that the purpose of using the economics approach in the study of crime is to understand individual behavior in a general context, similar to the analysis carried out by economists on the analysis of the effectiveness of public policy in economics.

Finally, cost-benefit analysis is used to evaluate government policies on crime issues. Cost-benefit analysis provides an overview of the various decision choices that must be taken into one measure: price or money. This simplification into one measuring instrument, price or money, certainly has many drawbacks in its application. This analysis is even opposed by some economists who think that the values of an individual's life cannot be easily simplified into one size, price or money. Even so, cost-benefit analysis is still considered the most reasonable standard of normative analysis in the context of policymaking related to crime control, because various alternative policies are available and the number of costs required and already incurred.

3.4. Social Costs

The term social costs emerged with the discovery of the problem of externalities, which was first discussed by Pigou (1877-1959), in his book The Economics of Welfare. Externalities, according to Pigou, were problems that caused inefficient economic conditions. This was due to the absence of a balanced allocation of resources in society, as Pareto (1848-1923) described at the end of the 19th century. In his article, Rowley (1978) stated that the discussion of this externality problem by Pigou (1920) was also intended as a rebuttal to the theory of "economic efficiency" described by Pareto at the end of the 19th century (1897). According to Pigou, economic efficiency conditions could never occur, because these conditions could only occur if the additional profit or loss (marginal net gain) to society was equal to zero (Cheung, 1978). Meanwhile, in reality, every party in society, be it an individual or an organization/company, had different added value (marginal value) to a resource, so that an economic activity carried out by one party in society would have an impact, be it beneficial or detrimental, to other parties who were not involved (Rowley, 1978).

According to Pigou, the impact caused by an economic activity by one party on another party that was not involved, whether it was detrimental or beneficial, was what was meant by the term externality (Rowley, 1978). Theoretically, Pigou explained that the emergence of externality problems was caused by "differences or discrepancies between private costs (private costs) and social costs (social costs) borne by a person or organization (company) in carrying out economic activities" (Dahlman, 1979: 141). The private cost of an economic activity and the private profit determined the scale of economic activity carried

out by a party concerned. Unlike social costs, it includes costs or profits incurred by other parties who were not involved. Thus, as a consequence of this social cost, the magnitude of the scale of economic activity became too large or even too small to achieve social optimum conditions (Rowley, 1978).

Pigou himself actually did not use the terms "private cost" and "social cost" in his book. He used the terms "marginal private net product" and "marginal social net product". Only later, when he had many followers, the terms "private cost" and "social cost" appeared. According to Cheung (1978), based on the calculation results in his article, the two terms produce the same output, namely "marginal uncontracted effect". Marginal uncontracted effect was the impact caused by one party's economic activity on another party without being accompanied by a prior agreement or transaction regarding this matter between the parties concerned. The example given by Cheung (1978) was a factory which emits smoke waste, damaging the surrounding environment, including the people living in that area. Thus, environmental damage was what Cheung (1978) called the uncontracted effect, a form of negative externality.

The Pigovian version of the concept of externality, as explained, tended to lead to cases in which three parties were involved. A third party was a party that was not involved in the agreement, but was also affected by the agreement between the other two parties, called the "third-party effect" (Lai, 2007). The resulting impact could be in the form of a loss or even a profit for the third party. Then, the impact in the form of profit was known as social benefit, and the impact in the form of loss was known as social cost (Rowley, 1978). So, based on the Pigovian version of the externality concept, what was meant by social costs were costs incurred to compensate for losses suffered from other parties' economic activities.

Then, in 1960, Coase (1910-2013), appeared with his article "the Problem of Social Cost". Its appearance attempts to refute Pigou's concept of externalities and social costs. In terms of meaning, Coase did not really question the meaning of externalities built by Pigou and his followers. But according to Coase (1960), externalities were problems that do not always had to involve three parties, but could occur even if there were only two parties involved. This was also supported by Cowen (1988) in his article entitled "Public Goods and Externalities". He wrote, "externalities occur when one person's actions affect another person's well-being and the relevant costs and benefits are not reflected in the market prices" (1988: 2). The externality meanings built by the three, Pigou, Coase and Cowen, in general, tend to be the same. They also agreed that externalities could be in the form of losses or gains. However, the difference lied between the number of parties involved.

According to Coase, social costs were not too much of a problem from what had been explained by Pigou and his followers. In the first sentence of his article he expressed it as “those actions of business firms which have harmful effects on others” (Coase, 1960: 1). Apart from that, what made him anxious and then gave birth to his own thoughts was regarding the follow-up of the problem of social costs, which almost 40 years before "The Problem of Social Costs" (1960), was considered as a solution to overcome the problem of social costs. According to him, the solution offered by Pigou and Pigovian regarding this problem only focused attention on one party as the party that must be responsible, namely the manufacturing factory as a producer. Some of the solutions offered by Pigou were:

1. First, handing over full responsibility regarding the damage in the surrounding environment to the company.

2. Second, it provides an additional tax value that companies must pay as compensation for environmental damage with varying values according to how much smoke waste they produce, then matched with a monetary value.
3. Finally, removing the manufacturing factory from areas polluted by the environment.

According to Coase (1960), Pigou's approach to the problem of social costs tended to obscure the meaning of externalities and the social costs themselves. In fact, according to him, there was a reciprocal law between the two parties that couldnot be simply ignored. The reciprocal he meant was as follows:

> "The question is commonly thought of as one in which A inflict harm on B and what has to be decided is: how should we restrain A? But this is wrong. We are dealing with a problem of a reciprocal nature. To avoid the harm on B would inflict harm on A. The real question that has to be decided is: should A be allowed to harm B or should B be allowed to harm A? The problem is to avoid the more serious harm" (1960:2).

From this illustration, the previous analysis carried out by Pigou only targeted party A as the producer of negative externalities, as the party that must be responsible for the losses borne by party B. Meanwhile, according to Coase, there was a reciprocal relationship between parties A and B. So if A was required to pay compensation, or take other forms of responsibility, towards B, then B must also be responsible for the losses that A would receive due to the burden of responsibility that must be fulfilled against him (Burton, 1978).

This opinion was later supported by Turvey (1963). He built on the implication analysis from Coase's social cost analysis. He emphasized that the Pigovian solution would prevent resources from being optimally allocated, because the behavior of the recipients of the externalities should also be considered, and they could not go around with the parties producing the externalities. Optimization of resources would only be achieved if the party receiving the externality was also considered in determining the solution to this social cost problem, so that there was no greater loss to the party producing the externality than the burden of responsibility on the party receiving the externality.

Furthermore, in his article, Coase gave an example of the relationship between a doctor and his neighbor, who was a cake-baking entrepreneur. The sound and noise of the cake-making machine at the entrepreneur's house disturbed the doctor in his work practice. But the doctor also couldn't give a ban on the cake entrepreneur because if he did, it would also have an impact on the business continuity of the entrepreneur. In this case, there was reciprocal law. Thus, to determine a solution to this problem, one must look at how much interference the doctor received and how much loss the businessman got if the doctor placed restrictions or even prohibited him. The problem became even more serious with this reciprocal law (Coase, 1960).

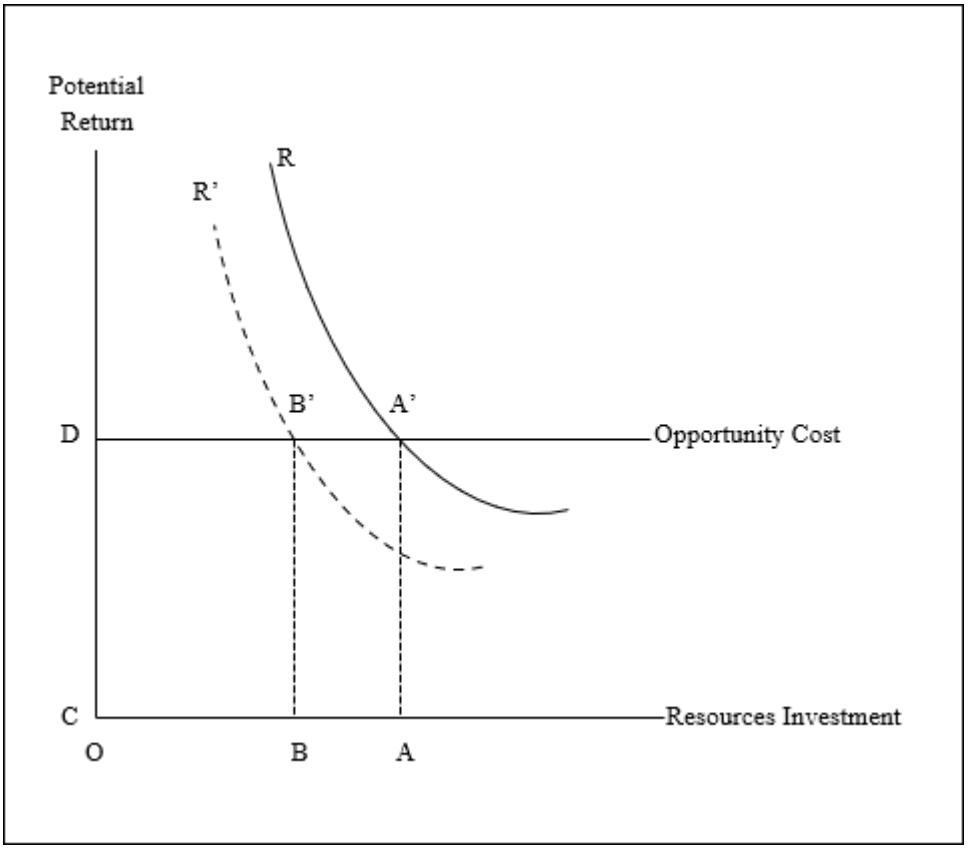
From the example above, it can be interpreted that the amount of loss that the doctor must bear due to interference from the businessman is a social cost. Conversely, the amount of loss that will be obtained by the businessman from the prohibition given by the doctor is also a social cost. That is the reciprocal law of social costs built by Coase. Thus, social costs as a problem can occur anywhere and anytime, even in neighboring life, as the example given by Coase.

3.6. Social Costs of Theft

The discussion of the social costs of theft crime behavior was first published by Tullock (1967) in his article "The Welfare Cost of Tariffs, Monopolies, and Theft". Even though it is not the main topic of discussion, his explanation is quite detailed, accompanied by graphic demonstrations. In his view, just like the monopoly case, if the problem of theft crime was measured using the Harberger partial equilibrium method (1954, 1964), it would also be seen that there was no impact on social welfare or in other words the social costs were zero. This was because theft was purely a transfer of wealth from the victims to the perpetrators of theft. However, even though it was only a transfer of wealth, the existence of this problem caused many social losses. In his language he wrote "the existence of theft has very substantial welfare costs" (1967: 228).

Tullock (1967) then used a graphical demonstration to explain the problem of the social costs of theft to which he was concerned. In summary, he explained three important components of social costs separately: the perpetrators of theft, the household (community), and the authorities (police or court). The explanation is further explained based on the graphical demonstration in Figure 1.

Explanations regarding the two main subjects regarding the social costs of the crime of theft, namely thieves and the household (community), according to Tullock, were interrelated. First, it is explained about the role of thieves based on Figure 1. The vertical line in the figure, “potential return”, shows the potential results that can be obtained by the perpetrator from stealing. The horizontal line "resource investment" shows how much effort and capital the actor invests to operate. While the middle horizontal line "opportunity cost" shows the potential results that actors can obtain based on the same investment value in other jobs. By setting aside the illegality of the theft, if the perpetrator invests business and capital equal to A, then the result to be obtained by the perpetrator is shown by the R curve. From this assumption it is found that the costs incurred by the perpetrator are equal to the rectangular area of AA'DC and the net result from the theft is the size of the triangular area above the A'D line which is cut by the R curve.



Source: Tullock (1967: 228).
Figure 1. Illustration of the Social Costs of Theft

Meanwhile for households (community), the vertical line in the figure shows the amount of savings. The horizontal line "resource investment" shows the amount of resources used for activities to minimize losses due to theft (theft prevention) and the middle horizontal line "opportunity cost" shows the amount of costs used in this investment. If the total investment in resources used is A, then the R curve shows the results obtained from theft prevention activities.

The relationship between the perpetrators of theft and the household (community) in the graphical demonstration above is shown by how high the R curve is produced, and regarding this, there is a dependency between the two. The R curve for thieves depends on how much investment a household or community has made in theft prevention efforts, such as installing security locks, hiring a security unit, and so on. The greater the efforts made by the community to protect against theft, the R curve for perpetrators is degraded to R'. The same is true for the R curve for households (community), it also depends on how much investment thieves make in their efforts to commit theft. The greater the effort a thief makes, such as investing his money to buy a sophisticated lock-picking tool, the R curve for a household or community will be degraded to R'. The connection between the two parties' efforts, be it thieves to carry out actions or households to carry out protection, will gradually

reach a balance. However, according to Tullock, this balance "would be extremely costly to society" (1967: 230).

Everything invested by both parties, both thieves and households, in an effort to take action and carry out such protection is a social cost that is burdened to society as a whole. So, based on Figure 1, the total social costs that burden the community from the crime of theft are in the AA'DC area. That area is the total resources that thieves invest in attempting to commit theft and society in trying to prevent theft, excluding the resources that pass from household to perpetrator because that is simply a transfer of wealth.

In addition to the two main subjects above, Tullock (1967) provides one more illustration based on Figure 1, which is about the social costs to the authorities (police or court) as a result of the crime of theft. In this illustration, the horizontal line "resource investment" represents the total resources invested by law enforcement to prevent and combat theft. The middle horizontal line is the opportunity cost and the vertical line is the potential success of the prevention and control activities. While the R curve is the protection carried out by the authorities to the community with a total investment of A resources. So, the social costs are again in the AA'DC area.

Then, if the protection is successful in reducing the theft rate and reducing the total private investment of the public in carrying out theft prevention, then the R curve will shift to R'. Therefore, the social costs borne by the authorities are smaller in the BB'DC area. Unfortunately, in reality the community believes more in protecting themselves personally than having to rely on the authorities to protect them because this is considered less effective. This is how it happened so that the investment in resources made by the authorities to provide protection is also included in the social costs of theft.

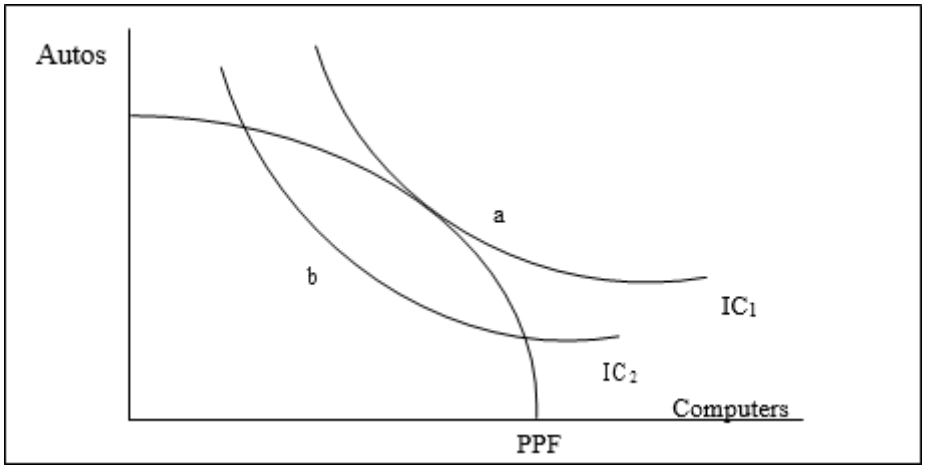
Concluding his presentation of the social costs of theft, Tullock concludes as follows:

> "The total social cost of theft is the sum of efforts invested in the activity of theft, private protection against theft, and the public investment in police protection. The theft itself is a pure transfer and has no welfare cost, but the existence of theft as a potential activity result in very substantial diversion of resources to fields where they essentially offset each other and produce no positive product. The problem of income transfers is not that they directly inflict welfare losses, but that they lead people to employ resources in attempting to obtain or prevent such transfers" (1967:231).

Apart from Tullock (1967), Posner (1975) in his article also mentioned a little about this problem and he agreed with Tullock and wrote:

> "The transfer of wealth from victim to thief involves no artificial output limitation, but it does not follow that the social cost of theft is zero. The opportunity for such transfers draws resources into thieving and in turn into protection against theft, and the opportunity cost of the resources consumed are social cost of theft" (1975: 807-808).

Walker and Bannet (1999) add that there are at least two types of social costs that arise as a result of theft. First, in the form of psychological costs (psychic costs) to the victim, but excluding costs related to the lost money from the stolen goods. An example is the feeling of trauma and psychiatric disorders in victims after the theft. Second, the same as Tullock (1967) and Posner (1975), the social costs that arise, according to them, are in the form of wastage of resources because they are used to carry out acts of theft for the perpetrators, theft prevention for the community and public investment for the authorities.



Source: Walker (2003: 161)
Figure 2. Illustration of the Social Costs of Theft

Furthermore, Walker (2003) uses the illustration of the social costs of theft to provide a general understanding of the social costs in his article which discusses the social costs of gambling (gambling). He gave an example of the production of motorized vehicle and computer manufacturers before and after theft occurred in the community, as illustrated in Graph 2.

Prior to the theft, it is assumed that manufacturing plants, whether motorized vehicles or computers, with all their resources produce curve a. However, when cases of theft began to appear in the community, these resources were no longer fully used for production but partly used by the perpetrators of theft to carry out their actions and partly used by the community to carry out theft prevention. Thus, the resources previously used to produce motorized vehicles and computers are now being used to produce safety locks, alarm systems, etc. This change can be seen in Figure 2, where the production curve drops from curve a to below the production possibility frontier (PPF), namely curve b.

The existence of theft causes a reduction in the resources that can be used to produce the goods that society wants and the shift in the production curve from a to b is the social cost of theft. That's because diverting the resources used to manufacture safety locks and alarm systems is not what society really wants. So in conclusion, the social costs of theft, based on Walker's (2003) illustration, can be measured by the number of motorized vehicles and computers that are not produced because their resources have been diverted to producing safety locks and other items used for theft prevention.

4. CONCLUSIONS

Various literature regarding the use of the economics approach to the study of crime has been presented. Starting from a theoretical study conducted by Becker (1968a; 1968b) to contemporary empirical studies aimed at finding out what factors influence the occurrence of crime. Then it closes with a summary of some of the special characteristics, by Levitt and Miles (2006), which are the differences in the use of economics in the study of crime compared to other social science approaches.

Based on the results of this literature review, it can be concluded that economics in the study of crime, although its contribution is quite real, still cannot be used as the sole basis for

understanding the problem as a whole. A complete understanding of criminal behavior can only be obtained when a holistic review has been carried out from various scientific perspectives. Because this criminal behavior is related to individual behavior, both rational and irrational, motivated by many motivations. In fact, even Becker, as the first person to build a model of the rationality of criminals, emphatically said in his Nobel award speech, that:

> "I have tried to pry economists away from narrow assumptions about self-interest. Behavior is driven by a much richer set of values and preferences" (1992: 38).

Starting from an axiom about: "what makes theft so dangerous for society, when in fact, it is only the redistribution of wealth from victims to thieves!" From there, Becker finally found his own answer. Namely that theft is not just redistributing wealth, but in it there are activities which in his language are called "socially unproductive". He refers to activities to prepare acts of theft for perpetrators and activities to protect themselves from theft for the community. It is termed that way because these activities do not produce anything, instead there are resources that are wasted such as firearms for the perpetrators and an extra security system for the community. A collection of resources that are wasted from that activity then becomes the social cost of theft.

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