

**UNIVERSITY OF JYVÄSKYLÄ**  
**School of Business and Economics**

**An Economic Perspective on  
Crime, its Costs, Crime Fighting and Rehabilitation  
Efforts**

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Title An Economic Perspective on Crime, its Costs, Crime Fighting and Rehabilitation Efforts	
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<p>Abstract:</p> <p>This study will examine the economic issues surrounding crime and reintegration measures aimed at prisoners, particularly but not exclusively in Germany. To do so it will be necessary to give an overview about the crime and crime-fighting situation in Germany. The focus is on violent and street crime. White collar crime will be mentioned only briefly.</p> <p>The starting point will be to examine the cost of crime and the problems concerning its measurement. These include for example the economic costs of murder or the largely ignored cost of rehabilitating the victims of crimes such as rape. They often suffer from severe trauma. Further it will prove necessary to add the indirect, immaterial costs of crime and the private expenditure on security to the direct costs of crime such as public security expenditure on police and prisons.</p> <p>In order to provide an economic framework for the understanding of crime use will be made of the Becker model of crime. It basically regards crime as a consequence of rational agents reacting to illegal activities yielding higher expected returns than legal ones. One of its main predictions being that a high likelihood of detection and conviction is a major deterrent.</p> <p>The explanatory power of the Becker model (and its limits) will be explored by looking at various aspects of crime and by looking at crimes that provide the offenders with a utility level that no legal alternative can provide from the offenders' perspective. Further, an overview over various crime related topics such as guns and drugs will be provided. A short excursion looks at the role psychology and happiness play in Becker's theory. This model is tested by looking at commonly encountered criminological facts. Also its implications for crime reduction efforts in prevention, deterrence and rehabilitation will be outlined. The special focus will be on volunteers and their link to the economic model of crime.</p> <p>The conclusion stresses three main aspects: Firstly the importance of further research to improve the estimates of the costs of crime; secondly the role Becker's theory can play in informing crime reducing activities by the police, the legal system as well as the labour market and education policies; and thirdly the necessity to establish a nationwide, long-term data bank for recidivism. Such a data bank is a crucial precondition for any meaningful cost-benefit analysis of reintegration and prevention measures.</p>	
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# 1 Introduction

## 1.1 Outline of the Study

Before proceeding to the study itself, an overview might be in order. The main aim of this study is to research what economic theory has to contribute to crime reduction efforts. Of particular interest is the impact of volunteers, especially of prison volunteers on rehabilitation efforts and recidivism in Germany. Becker's economic model of crime will be used as theoretical framework.

To set the stage for the discussion and also to motivate the study, Chapter One provides an overview of the crime situation in Germany. Stock taking of actual crime is complicated by various factors, which will be outlined below. Chapter Two is dedicated to highlighting the issues surrounding the costs of crime. It is complicated to accurately estimate those cost components of crime that official statistics do not capture. However, attempts to do so have been made by economists and the issues surrounding this topic as well as the solutions found to date will be discussed. Chapter Three attempts to explain why there is crime in the first place based on Gary S. Becker's theory of crime. His central claim was that people engage in illegal activities if the incentives they face render such activities to be the utility maximizing option. The backbone of his theory as well as its implications will be presented. Additionally an overview of economists' findings concerning crime and its linkages with various factors will be presented to provide a fuller picture. As discussed in Chapter Four, Becker's theory is able to explain many of the facts typical of crime. His theory also informs policing strategies and prevention and rehabilitation measures which are presented in Chapter Five. The focus is on volunteer related projects in Germany and in particular on the results of a survey of volunteers visiting prisoners undertaken by the author. The conclusion stresses the lessons to be drawn from the literature to date and outlines an agenda for future research which would help to illuminate important, and as yet un-answered questions.

## 1.2 The Crime Situation in Germany

Amidst a flurry of headlines decrying the supposedly ever rising level of violence in Germany, particularly of youth violence and the heated political debates surrounding crime, the best measures to combat it have been discussed. Proposals range from immediate one day arrests to generally harsher, or merely swifter punishment (as delinquents are confronted with the consequences of their crimes sometimes as much as one year later). Even the expulsion of foreign criminals has been proposed. The then Hessian prime minister Roland Koch demanded that offenders be punished much more severely. His state's Jugendamt (government agency responsible for neglected or problematic children and youngsters) had sent a 16 year old violent Russian-German offender to Siberia as a reintegration measure (Hickmann & Schultz 2008).

This was in line with many people who expressed concerns that the state is too lenient with offenders and has failed to mete out harsh punishments. The so called Erlebnispädagogik (adventure-pedagogy) seemed to epitomize this leniency and was criticized for being expensive, and rewarding undeserving criminals with nice adventure trips run by romantic social-pedagogues whereas well behaved kids get nothing (Schultz 2008). While these debates in Germany were fuelled by various state and municipal elections the debate nevertheless made clear that there is no consensus in society on how to deal with crime.

Neither prevention measures nor reintegration measures are universally accepted. This is not only the problem of an ill-informed public but also due to a lack of research in criminological matters in Germany. It lags behind various other countries in that respect, especially the USA.

Comparatively unnoticed goes white collar crime. However, the mismanagement of firms by managers is often regarded as a crime. Even though economic theories particularly aimed at explaining white-collar-crime will not be covered due to limited space, it will be presented below to provide a more complete picture of crime in Germany, which will be discussed in some detail in the remainder of this chapter.

## 1.3 White- and Blue Collar Crime

Though often overlooked albeit its omnipresence is so called white-collar-crime. For the purpose of this thesis white collar crime will be defined as crime predominately (though not exclusively) committed by employees against their employers or customers, such as for example corruption, embezzlement etc. Crimes committed by firms against customers are also regarded as white collar crimes in this paper. The latter comprises, for example flaunting safety regulations, and conspiring to keep prices high in order to receive monopoly rent. This approach is inspired by Braithwaite's definition of white collar crime



which runs as follows: “white-collar crime involves the illegal abuse of the power inherent in white collar occupational roles” (Braithwaite 1979 : 187).

The German crime statistics unfortunately do not have a special category for white-collar-crime but rather list the various crime categories such as murder, fraud embezzlement, and so on. It will be necessary to exclude computer crime as in all likelihood the majority of cyber-criminals are not employees robbing their companies, but rather anonymous hackers that commit crimes unrelated to their job position; nor are their victims necessarily connected to them via their official work. For similar reasons fraud will be excluded. Violations of patent rights need to be excluded as well as many of those offences are likely to be committed by people downloading songs or films rather than employees in e.g. research & development departments betraying company secrets to a rival firm.

Without doubt this approach will underestimate white-collar-crime to some extent, but it is expected that the data will even out once those categories of crimes are included where the majority of crimes (though not all) fulfil the occupation criteria. Underestimation on the one hand and overestimation on the other is likely cancel each other out to some extent, yielding a more acceptable overall estimate of white collar crime. Included in white collar crimes are: corruption, violating competition laws, malpractice<sup>1</sup>, embezzlement, violations of insolvency laws, environmental crime, economic crime. The detection rates are quite high, probably because it is not too difficult to pin down the culprit once the crime has been detected in the first place (see TABLE 1). Environmental crime is the exception. This category includes the illegal dumping of potentially harmful trash, something people do only when they feel unobserved. Tracing the rubbish back to them is probably rather hard.

TABLE 1: White Collar Crime in Germany 2008

	2008	2007	change in percent	detection rate 2008
violation of competition laws, corruption and malpractice	6 329	6 629	-4.5%	79.5%
embezzlement	32 379	37 075	-12.7%	98.1%
violations of insolvency law	5 129	5 484	-6.5%	99.0%
environmental crime <sup>2</sup>	14 999	16 528	-9.3%	57.9%
economic crime	84 550	87 934	-3.8%	92.5%

Source: BKA, 2008, pp. 27-31

The first thing to note about street crime is that it actually fell by 5.0 % in 2008,

- 1 The German term “Amtsdelikt” goes beyond the meaning of the English legal term “malpractice”. Here it is meant to include not only violations by professionals especially in the legal and medical profession but also any breach of law by civil servants that they have committed in their official capacity.
- 2 The number of recorded environmental crimes depends greatly on the investigative effort of the authorities

contrary to public perception. The gap between reality and perceived reality is important to keep in mind as perceptions play a role in the reported rate of crime as well as in its economic consequences (the propensity to report a potential crime is higher if offender looks foreign see Chapter Two).

According to the police 6 114 128 crimes were committed in Germany in 2008. Since these are only the reported crimes the real number is likely to be higher. However, the number of reported crimes fell by 2.7 percent in 2008. Of these more than 6 million reported crimes 210 885 belonged to the category of "Gewaltkriminalität" (violent crimes), 2 266 of which were cases of murder and manslaughter, 7 292 cases of rape and sexual assaults. The remaining cases of violent crimes are light assaults and assaults in the context of a robbery. Overall most crimes are thefts and "street crime" numbering almost 4 million cases. Fraud is another important category of crime with just under 900 000 cases, as is damage to property with another 800 000 cases. Libel, computer fraud, white-collar crime in a wider sense and crimes involving intellectual property rights among others make up the remainder of cases, see TABLE 2 (Bundeskriminalamt (BKA) 2008a : 27-28).

TABLE 2 Crime in Germany 2008

total number of crimes:	6 114 128
thefts and light street crimes	3 933 438
fraud	887 906
damage to property	799 179
violent crimes	210 885
of these: -murder	2 266
-rape and sexual assault	7 292

Source: BKA, 2008a, p. 27-32

As for the ethnic make up, 77.9% of those found guilty in 2007 held a German passport, 22.1% were foreigners (Statistisches Bundesamt 2008a : 94). The biggest groups in 2006 were the Turks with 42 278 convicts, followed by the Italians (9 753) and nationals of states formerly belonging to Yugoslavia (7 774) (Statistisches Bundesamt 2007a : 72).

The detection rate (the rate of crimes for which the offender is identified) remained with 54.8% close to its all time high of 55.4% in 2006 (Statistisches Bundesamt 2007a : 27 ; BKA 2007 : 2). Generally speaking the detection rate pertaining to violent crimes is quite high. For rape and sexual assault it is 82.2 %. Most reported cases of child abuse were resolved (82,1%), as were 82.3% of bodily assault and 97% all murder and homicide cases. Also high was the detection rate for crimes against the laws prohibiting drugs with 94.5% (BKA 2008a : 27-28, 34).

Low are the detection rates for street crime and theft. In only 5.7% of cases of pickpocketing and just over 10% of all bike thefts are the guilty ever

found, see TABLE 3 (Statistisches Bundesamt 2008a : 57). These crimes are basically never cleared up, but even the high detection rates for more severe crimes is misleading as not all crimes are reported to the police (BKA, 2008a : 27-34).

TABLE 3 Detection Rates in Germany in 2008

overall detection rate	54.8%
theft (pick pocketing)	5,7%
theft (bikes)	10,5%
other sexual assaults	79.8%
child abuse	82.1%
rape and sexual assault	82.9%
bodily assault	83.2%
drug related crimes	94.7%
murder and homicide cases	95.5%

Source: BKA, 2008a; Statistisches Bundesamt, 2008a

## 1.4 The Courts and Their Case-Loads

That amount of crime resulted in 4 868 930 new preliminary investigations in 2008. This is the fourth consecutive decrease since 2004, when almost 5 million new cases were handled. Additionally there was a backlog of 643 001 cases in the beginning 2008. The justice system handled more than 4.9 million cases which reduced the backlog by the end of 2008 to 608 379 cases, the smallest backlog in seven years (Statistisches Bundesamt 2008b : 13).

While this gives an impression of the amount of judiciary work involved in battling crime it tells us little about the number of suspects and the numbers of those found guilty as one offender might vary well be involved in a number of crimes.

In 2006 for example 5.26 million cases were brought to the attention of the police. The perpetrators were detected in 2.86 million cases. This number reduced -upon eliminating cases committed by the same person and correcting for suspects below the age of 14 (below that age convictions are illegal)- to 1.79 million suspects. 732 003 were found guilty and of those 41 324 received prison sentences without probation (all numbers excluded driving violations) (Brings 2008 : 297).

This massive workload was dealt with by 688 courts employing a total of 51 287 staff of which 20 138 are judges (111 of these are at patent courts) and 5084 are prosecutors. The remainder is mainly concerned with administrative issues (Statistisches Bundesamt 2007a : 9, 15-16).

4 876 989 preliminary investigations were undertaken in 2006, which is a slight decrease from its highpoint in 2004 when German courts handled and finished about 4.995 million cases. Of the 4.88 million cases in 2006, 2.6 million were terminated due to a lack of evidence or due to formal mistakes, a further 1.09 million cases were handed over to other authorities or handled in the context of other cases. That leaves 1.19 million cases. Those were brought to court and/or a penalty order was demanded (Statistisches Bundesamt 2010b). This “disappearance” of cases is important as it influences the probability of conviction  $p$ , which plays a big role in the economic theory of crime (see Chapter Three).

## 1.5 Punishing the Guilty

Of those adults found guilty in 2006, 80% had to pay a monetary fine, the remaining 20% were given prison terms. See TABLE 4 for details on the length of prison sentences<sup>3</sup>.

A more detailed breakdown of the various kinds of punishment is available only for the former West Germany (including Berlin). 751 400 (including those treated by the law as youngsters<sup>4</sup>) were found guilty by the courts. Of those 69%<sup>5</sup> were ordered to pay fines (Brings 2008 : 300-301). About 12% of delinquents were ordered to spend some time under arrest or to do some “social work” such as cleaning public parks, or removing graffiti or something equivalent. Roughly 13% were on probation but had received prison terms and 6% were imprisoned (Statistische Bundesamt 2007b).

The ratio of monetary fines of total fines has been roughly stable for many years (Statistisches Bundesamt 2007b : 301). This is surprising given the rising public pressure for higher punishments. Many politicians as well join the chorus demanding higher punishments, for example the former head of state of Hesse and the Bavarian minister of the interior, Mr. Herrmann (Anon 2007; Hickmann & Schultz 2008). However, 989 experts and practitioners in that field joined a resolution pointing out the dangers of a policy of deterrence. According to them making sanctions more punitive increases crime rather than deter it (Berufsverband Strafvollzug 2009).

This renewed controversy about the appropriate level of punishment follows many years of rising punishment levels driven by a public desire for more deterrence, the main argument for higher punishment levels being that

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3 This seems to apply for adults above 21 as well as minors (up to 21), but Brings 2008 is not clear about that

4 Whether or not a person between aged 18-21 is regarded as a minor (aged 14-17) before the law depends on the crime and the maturity of the person in question. The relevant paragraphs are §1 and §150 in the JGG (YouthCourtLaw); Bundesministerium der Justiz, 2010

5 The 69% number includes only adults paying fines, offenders below 21 who had to pay monetary fines are included among the 12 % doing social work.

they supposedly scare people from committing crime. As will be seen below, punishment levels do indeed play a role in the economic theory of crime (see Chapter Three).

The increase in possible punishment levels for 40 different crimes and offences took place in the 90s. The courts' decisions then followed suit in subsequent years. Rapidly rising imprisonment figures between 1991 and 2003 by almost 40% are largely explained by this tendency of harsher sentencing. It increased the likelihood as well as the average length of imprisonment. Paradoxically these harsher sentences for violent crimes are handed out on probation more frequently than before (Windzio 2007 : 8-9, 13).

TABLE 4 Punishments in 2006

prison- terms (incl. prison terms on probation)	124 663
-up to including 1 year	93 896
-more than 1 year up to 5 years	28 958
-more than 5 years up to 15 years	1 715
-life sentences	94
“punishment arrest” (only applicable to army members)	31
monetary fines	520 791
total	645 485

Source: Brings, 2008, p. 301

## 1.6 The Prison System and Recidivism

“Accommodation” for the prisoners is provided by 195 prisons (2007), 27 prisons less than in 1995. Those 195 prisons had a capacity of 80 708 places, 90% of which were occupied, which implies 72 637 prisoners. One point to note however is that these figures do not only include those who were found guilty by courts but also those who are awaiting trial<sup>6</sup>. The prisons system is operating close to its capacity. It has done so since 2000 when 92% of all places were occupied, in 2003 even 101% were in use (Statistisches Bundesamt 2007a : 76; 2009c : 90). In 2006 Bavaria's medium security prisons were the most overcrowded of any German state with a shortage of about 1000 places (Brings 2008 : 303). For that reason Bavaria began to expand its prison system in recent years. A new prison for women was built in Munich to replace a smaller and dilapidated one. However, Bavaria's prisons are still overcrowded. The ratio of prisoners to prison places reached 105% in 2009 (Bayerisches Staatsministerium

<sup>6</sup> Detention pending trial is chosen when the accused is deemed likely to try to escape, or to remove evidence and there is a very strong suspicion (“dringender Tatverdacht”) that he did commit the crime

der Justiz und für Verbraucherschutz 2007; 2009: 75). Over-occupation is problematic because it jeopardizes security of personnel and inmates alike. A horrific murder in 2006 amply illustrated this point, when three prisoners tortured their fourth cell mate to death. Unfortunately this was not the only case of murder behind bars (Jüttner 2006).

In Germany as a whole 5 921 prisoners were permanently in psychiatric hospitals, 2 615 were permanently in institutions treating drug and alcohol abuse and 825 were temporarily in one of these institutions in 2006 (Statistisches Bundesamt 2008a : 92).

For many the crime that brought them to prison was not their first, 66,2% of all those sentenced to prison had a prior conviction. Of those 23,3% had one prior conviction, 35,8% had 2 to 4 prior convictions, 29,2% had 5 to 10 prior convictions 11,7% had more than 10 convictions. For 80,1% the most severe prior conviction was a prison term. This high rate of re-offending, raises serious questions about the effectiveness of the chosen methods of punishment (Statistisches Bundesamt 2008a : 94). However, the criminal capital approach presented in Chapter Three provides a possible explanation for this otherwise puzzling fact.

## 1.7 Costs of the Courts, Police and Prisons

The aforementioned machinery of tens of thousands of government civil servants, upkeep of the judicial system and the police force all add to the cost of crime. This particular component of the costs of crime is commonly referred to in the literature as apprehension and conviction costs. The cost of maintaining prisons and looking after the prisoners come on top of these. Both cost components play an important role in determining and minimizing the social loss from crime as defined in Becker's theory (see Chapter Three).

To return to the actual figures, in 2006 the expenditure on interior security (or conviction and apprehension costs) by the 16 German states and the federal government on all these items summed up to 33 238 million Euro, which equalled 5.6% of public expenditure in that year. It was considerable bigger than defence spending which amounted to roughly 24 billion Euro.

Spending on interior security also has increased in each year since 1992, in total by almost 45%. Fuelling this growth were the East German states in particular. Initially they spent little on security compared to their Western counterparts. Then they more than doubled their expenditure from 19.6 million Euro to 39.9 million Euro per 100 000 inhabitants. Overall the average security expenditure in Germany per 100 000 inhabitants is 36.7 million Euro in 2006. Interestingly poorer German states spend more on security per capita than richer ones (discounting the city states). They also employ more police (Schulze-Steikow 2007: Graphs 1-4).

Police numbers per capita have fallen since 2000 from 333 to 324

members of the police force per 100 000 inhabitants in 2006 (Schulze-Steikow 2007: Table 5). This reduction of the police force despite growing concerns about crime reflects the budgetary pressures the German states are under. They are funding their police forces. Any savings made there directly benefit their budgets (Bundesministerium des Inneren 2009a). Meanwhile the police is overstretched and fears it will be unable to do its job well, especially when the states do cut their numbers by up to 20% as is under discussion in some states (Gewerkschaft der Polizei 2009). Police numbers and good policing results however do not necessarily go hand in hand, though it does in Denmark, Austria, Belgium and Germany. Finland on the other hand achieved a good performance with a comparatively small police force (van Dijk, et al. 2005 : 79-82). Another attempt to control costs was reducing the number of state prosecutors by around 6% between 1995 and 2006 (Statistisches Bundesamt 2008a : 15).

## 1.8 Cost Cutting Measures

Big savings were expected by the introduction of Public-Private-Partnerships (PPPs) in the prison sector. However, these turned out to be costly and bureaucratic experiments. Governments need to specify exactly what safety standards they want and how these shall be achieved, as any change after the contract is signed is costly. In Munich's new prison for women for example one door was relocated to a new position. Not building it at its old spot got the government a reduction of 100 Euro. The investor charged 1000 Euro for installing the same door a few meters away. It is the same story for anything the government did not exactly specify in its contract, which drove up costs<sup>7</sup>. On the other hand writing a complete contract for a building as complex as a prison is costly, too, if at all possible. The initial cost savings of a few percent disappear overtime as one needs to pay the investor for building and financing the project<sup>8</sup>. This is by no means pertaining only to the prison in Munich, other PPP prison projects in Germany such as in Hesse and Saxony-Anhalt fared no better (Hickmann 2008; Berufsverband Strafvollzug 2009b). PPP projects compared badly with traditional government built and run prisons. They had higher costs and less flexibility. The newly built private prison in Hesse, JVA Hünfeld has higher costs per day and prisoner (83.18€) than the JVA Darmstadt (79.28€), a comparable state run prison (Hickmann 2008). Additionally privately run prisons often employed security staff that was insufficiently trained, something the Bavarian government vouched not to do in order to staff the new prisons (Landesarbeitsgemeinschaft ehrenamtlicher Mitarbeiter im Strafvollzug Bayern e.V.: 9-11). It also stopped any further PPP projects (Berufsverband Strafvollzug 2009a; Bayerisches Staatsministerium der Justiz und für Verbraucherschutz

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7 Notes taken during a guided tour through the new prison, 2009

8 Notes taken during a guided tour through the new prison, 2009

2007). After all the average costs of Bavaria's state run prisons per day and prisoner was 72.2€ (incl. building and maintenance costs) in 2008, 13,2% below the costs of the private JVA Hünfeld (Bayerisches Staatsministerium der Justiz und für Verbraucherschutz 2009 : 101).

Even in Britain PPPs are under heavy fire in the prison sector. In the most recent round of cutting prison budgets by 7% the burden of budget cuts falls entirely on state run prisons as privately run prisons have long term contracts. Some of these even have higher costs than their governmental brethren, but by virtue of their contracts they are exempt from any cost cutting whereas the governor of a state prison told the Guardian, that his "prison regime would have to change, with possibly dangerous consequences. Twenty-three hours' lock-up would not give me 7% efficiencies. Even application of reduction of prisoner visiting days by half does not get me there" and he continued "safety, security and decency will be thrown out of the window. The potential for prisons to blow is about as heightened as it gets in my view." (Travis 2009). PPPs therefore can hardly be regarded as the cost cutting panacea they were trumped up to be.

In many countries prisoners work not only (or predominantly) any more to acquire new skills or to have something worthwhile to do, but to contribute to the costs of maintaining prisons. In Italy and Austria for example call centres are operated within prisons (Frank 2008; Stöcker 2006). Another example for new business ideas behind bars is breeding quail (Klüver 2010). More traditionally carpentry, baking and dry cleaning have been among the services German prisons offer customers, also cars can be repaired in prisons. Even companies like MTU and BMW are among the prisons' customers (Nitschke 1999; Arbeitsbetriebe der Bayerischen Justizvollzugs-anstalten).

As long as profit is the secondary motive the profits generated by these activities usually cover only a small share of the costs, in 2008 15.4% (Bayerisches Staatsministerium der Justiz und für Verbraucherschutz 2009 : 100-101). In case such a business behind bars really turns a prison into a profit making institution another danger arises, as will be discussed in Chapter Three. It also should be noted that the main "business" of a prison is a reduction in crime and its costs. Prison costs therefore should be compared with the amount of damage society is spared because criminals are incapacitated, rather than looking narrowly at monetary income from prisoners' work.

The scope for cost-cutting is limited. Reducing for example staff numbers of the police runs the risk of offsetting lower security expenditure with higher costs due to unchecked crime (e.g. more burglaries). This leaves two main ways of reducing the cost of crime, either via better prevention/deterrence or via higher efficiency when it comes to reintegration measures. Economic theory points to training and labour related policies to achieve these ends (see Chapter Three). First though the total cost of crime needs to be estimated. This will be attempted in Chapter Two.



## **2 The Problems of the Correct Measurement of Crime and its Costs**

### **2.1 Measuring the Amount of Crime**

#### **2.1.1 General Remarks**

Hypothetically one only needs to know the exact number of crimes committed, their nature and the damage done in each instance to calculate the exact total damage due to crimes. Unfortunately none of these things are easily accomplished in reality. It is difficult to determine the exact number of crimes committed, and even more difficult to determine the damage done in each case. Whereas the costs of crimes such as vandalism or theft, at least the material costs, are relatively easily calculated the psychological costs are not. Given that a handbag was stolen, the price for buying the stolen bag plus the good(s) it contained plus any expense victim incurred in order to get in touch with the insurance, the police and so on make up the material costs. The psychological damage victim of a small offence like theft may experience might not only involve many sessions of costly therapy, more taxi rides instead of walking home but avoiding similar circumstances even if that means a loss in the quality of life.

This section first deals with the problems surrounding the correct measurement of the amount of crime, and then proceeds to present a potential remedy, namely victimization studies. Once the issues surrounding the measurement of crime have been explored section 2.2 will introduce some components of the cost of crime that do not appear in the official police estimates. The focus will be on assigning a money value to crimes such as murder and rape.

The most basic problem, especially if one compares crime rates over time, or across countries is the definition of what constitutes a crime. By

lawmakers decree crime rates can rise or fall. In 1969 for example adultery and blasphemy were de-criminalized in Germany (Schwind 2009: 4).

Different societies judge the same action e.g. homosexuality as crime or as permissible. Technological change adds new categories of crime and changing living conditions necessitate a re-evaluation of the seriousness of some crimes (Christie 1994 : 20-29) points out that in small rural societies a loss of reputation is far more significant than it is in big urban agglomerations. He argues that this is why slander and libel used to be considered as more serious crimes in the past than today; at least in urbanized countries like Norway. The rise of the internet might actually render reputation more important again as future business partners, prospective employers and spouses might unearth unflattering (though perhaps wrong) information on the internet and act accordingly.

Technological development is another driver of change in the field of law. With the rise of computers new categories of crime became possible. Initially there were no explicit laws against computer crime in Germany, but as the lawmakers filled the gap, the number of crimes that can be reported rose (Schwind 2009 : 5-6). Given a highly detailed set of data one could attempt to exclude whatever has been (de)criminalized over time, when conducting long term studies. Unfortunately the problems of measuring crime do not stop there.

### 2.1.2 Reporting Behaviour

Some thefts, for example the child taking money out of the parents' wallet and such like are often not even seen as crimes because the parents know that this was just a small misdeed of a rather well behaved child, they "know too much" as Christie put it, to report such minor things to the police. However, were a stranger to do those things these acts would most likely be reported (Christie 1994 : 22-23; Brings 2008 : 297).

This brings us to a problem central to measuring crime, unreported crimes. At any point in time some crimes are not reported because victims, witnesses or criminals are not coming forward. These crimes subsequently are omitted in the statistics. In the example above, of the thieving child, the two most common factors for not reporting crime coincide. 40% of crime victims that had not involved the police attributed that to the pettiness of the offence and a quarter of non reporting victims said that they or family dealt with the problem (van Dijk et al. 2005 : 70).

When the feeling prevails that the police is powerless anyway, for example in cases of vandalism and theft, crimes are usually reported for insurance reasons rather than because people expect the police to be able to find the respective culprit. Identifying the criminal in these cases is unlikely as could be seen above in TABLE 3. Further, it might not be worth it for the individual to "go through the motions" if the theft involved only a small monetary value (Brings 2008 : 297). Some shops though operate an "all thefts are reported" policy, the odds to catch a shoplifter once he/she has been noticed are quite

high at 92,9% (BKA 2008a : 27).

Another factor influencing reporting behaviour is shame. Rape victims for example often are or were loath to report that they had been raped. Though women in general can expect a more understanding reception nowadays when they report being raped, it still may take a lot of courage to overcome the feeling of shame. This is especially true for homosexuals who often feel so humiliated that they do not even tell their partner or closest friends about it and especially not the police (Loerzer 2009).

Minorities who feel that the police do not care about them, might not report all crimes of which they are aware. This can be particular true of foreigners living in Germany who are afraid to involve the police be it because they are illegally in Germany, or have come to be wary of the police for other reasons (Brings 2008 : 297).

Police in Germany engage in ethnic profiling on a grand scale. One huge data mining effort by German authorities targeted Muslims-among others- and brought no results despite reviewing the personal data of 8.3 million people. Targeting people for ethnicity is not only a waste of manpower that could be better employed by looking out for people who fit the behavioural profiles of offenders rather than ethnic ones but it also alienates the targeted ethnic communities and reinforces stereotypes (Open Society Institute 2009 : 7-8, 11-14, 32).

The first effect is likely to reduce the willingness of minority members to report crimes to the police or act as witnesses. The second is likely to increase the role that ethnic background plays when it comes to the willingness to report a crime. Studies showed that Germans (natives as well as those with a foreign background) are more likely to report suspicious behaviour and crimes committed by "foreigners"(people who are, or seem to be of foreign origin) than Germans (Elsner & Molnar s.d. : 18).

It has also been noted by organisations such as Amnesty International that ethnic profiling and police abuse of minorities often go hand in hand. Trust and cooperation between the ethnic minority and the police seems far fetched, if the police itself is perceived as overstepping the law and being the enemy (Open Society Institute 2009 : 37-40, 44, 47-50).

In addition, official crime statistics suggest another reason for why foreigners might be avoiding the police. Among young men of foreign background the incidence of crime is higher. However, the term "foreigner" needs to be clarified. The statistics include crimes committed by tourists, by foreigners passing through Germany and by refugees temporarily living in Germany. Once refugees from e.g. Ex-Yugoslavia began to leave Germany, crime committed by foreigners fell (Elsner & Molnar s.d. : 3). The different age and gender -structure also has to be taken into account, as there are more men, more young men and more inhabitants of cities among foreigners than in the native population. Furthermore crimes need to be excluded that only foreigners can commit such as live in Germany illegally, or work without a work permit (Steffen & Elsner 2000 : 4). In 2004 23.9% of all crimes committed by foreigners

belonged to these foreigner specific categories (Entorf 2005 : 13).

Nevertheless, according to a study in Munich by the criminological research group of the Munich Police Force, 19.6% of the 14-17 year old youngsters with a foreign background commit violent crimes compared to 12% of their German counterparts. This is also supported by a victimization study conducted for Munich. However, that might be due to the specific situation in the region of Munich. Perhaps these studies did not correct for the differing social background of native Germans and Germans of foreign background. Germans of foreign background are on average poorer, less educated and less likely to have a job than native Germans (Steffen & Elsner 2000 : 4-6, 10-12). However, the majority of studies conclude that youngsters with a foreign background are more criminal than youngsters with German parents (Baier, Pfeiffer & Windzio s.d. : 245).

Sometimes even the police itself can be an obstacle to reporting crime. There are instances when police refused to take down crime reports (Schwind 2009 : 24). Location also affects the willingness to report crimes. In the country side police stations are often difficult to reach and the feeling of shame discourages many from reporting a crime in close knit rural communities (Schwind 2009 : 31).

When it comes to close knit communities family membership also affects reporting behaviour. Serious crimes such as rapes and abuse go often unreported when children are at the receiving end as they are dependent and often unable to get outside help (Brings 2008 : 297).

Even the perception of the severity of crime influences reporting behaviour. There are indications that reported rises in youth violence in Germany are largely due to a higher report rate than to more actual crimes (Brings 2008 : 297). As society became more sensitive towards violence, such behaviour is reported, which in earlier years would have fallen under the "boys will be boys" heading (Windzio 2007 : 18). Most violent crimes in Germany are still committed by males (BMI 2008 : 5, 11).

### 2.1.3 Victimization Studies and Self-Reporting

In order to attribute a rise in reported crime to a higher report rate rather than a generic change in crime one needs to have some instruments that allow double checking whether reporting behaviour or actual crime changed. Victimization studies are one possible tool. In these surveys the participants are asked if they became victims of crimes and whether or not they reported it.

Unfortunately Germany has not taken part regularly- or even frequently- in victimization studies (EUICS) for a long time. 1989 was the first time and for more than a decade the last time (Entorf 2005 : 11-12). It took part in the international crime victimization survey in 2005. The data is collected by Gallup Europe and analysed by the Max-Planck-Institut in Freiburg (EUICS Consortium 2009). A new round of international victimization studies started in spring 2009 (University Tilburg 2009).

Within Germany however, victimization studies have been done on a regional and city level. These help to illuminate the extent of under-reporting and what kind of crimes tend to be under-reported. Exemplary for that approach stands the study by the KFN, Kriminologischem Forschungsinstitut Niedersachsen e.V. (Criminological Research Institute of Lower Saxony) of pupil victimization and delinquency in various German cities, among them Munich, Stuttgart, Hannover and Schwäbisch Gmünd. Those victimization studies show rather stable or even declining figures concerning violent crime whereas reported figures rose, so a bigger share of total crime is reported (Baier 2008 : 72-74).

These general trends however mask diverging trends in some subsections of youngsters and also disparities between cities. In Hannover crimes/offences committed by Turkish youngsters fell, whereas it rose in Munich. Interestingly Hannover is trying an innovative integration approach aimed specifically at Turkish youngsters by providing native Germans as reading buddies. This project will be presented in more detail in Chapter Five (Baier 2008 : 74; Abold, Baier & Pfeiffer 2008).

Questionnaires asking pupils about their delinquency and contact with the police yielded the same results regarding the amount and severity of violent crime as those asking pupils about their experiences as crime victims. Self reported delinquency fell, but the rate of delinquents who had contact with the police rose, which indicates that a higher share of crimes and offences is reported now than used to be the case. As a consequence of the trend to report more crimes and offences, even minor ones a rising number of preliminary investigations in court are being terminated due to a lack of evidence or the pettiness of the offence (Baier 2008 : 14, 23-28). A rise in the tendency to report crime was also found by the aforementioned EUCIS study (van Dijk et al. 2005 : 69).

There are problems surrounding the self-reporting of delinquency, mainly the reporters' honesty and memory are questioned. Some might exaggerate their delinquency, others might play it down and some might simply have forgotten some of their offences or crimes (Braithwaite 1979 : 17-21). In the case of the aforementioned study in various German cities the answers of victims and delinquents yield a relatively consistent picture (particularly for Munich), which suggests that accuracy is roughly adequate, though not perfect (Baier 2008 : 27-28).

Unfortunately in general the EUCIS found little relationship between official crime statistics and the crimes reported by victims. This holds true for any participating EU country. In some countries, e.g. Ireland and Estonia official crime figures severely underestimate the actual victimisation numbers. Other countries such as e.g. Finland and Germany are safer than police statistics suggest. In these countries crime is over-reported according to the EUCIS measure. This might be due to the fact that the study bases its measure on the victim reported prevalence rate of only ten different crimes, rather than all crimes, but this issue is not explored in the survey (van Dijk et al. 2005 : 25).

### 2.1.4 Imprisonment Figures and Crime

Changing imprisonment figures over time should not be used as proxies for crime. They do not necessarily reflect trends in actual crime, but might merely reflect changing attitudes towards it. In Germany for example imprisonment numbers grew by 40 % in 10 years but reported crime only by roughly 23% over 26 years (Brings 2008 : 303-304).

Even in any given year there is often no link between crime and imprisonment. Christie (1994 : 26-30, 48-52, 92-93) points this out for various European countries and the USA. To get an impression of how arbitrary incarceration rates can be, examine TABLE 5. The country with the highest amount of reported crime, Iceland has the lowest incarceration rate despite a higher homicide and rape rate than for example Germany which has an incarceration rate twice as high despite a level of recorded crime that lies almost 60% below Iceland's. Finland also combines higher, reported crime, homicide and rape rates with a lower incarceration rate than Germany (Statistisches Bundesamt 2009a: Section A.10.1 ).

TABLE 5 International Comparison of Crime and Imprisonment Numbers

country	year	total of recorded crimes	recorded assaults	recorded homicides	recorded rapes	prisoners
Germany	2006	7 628	618	0.9	9.8	95
Estonia	2006	3 868	293	6.8	11.4	333
Finland	2006	9 825	587	2.1	11.7	75
Iceland	2004	17 952	400	1.1	17.8	40
USA	2006	3 765	n.a.	5.6	30.5	738

Source: Statistisches Bundesamt, 2009a

Fortunately in Germany's case reported crime and actual crime as suggested by victimization studies is very similar. Therefore the reported number of crimes can be used as reasonable proxy for the actual prevalence of crime. Indeed crime in Germany (including youth crime) tended to fall rather than rise in recent years despite increased media coverage (BMI 2010). Once the number of crimes is determined with relative certainty one has reached the half-way point to calculating the costs of criminal acts such as rape, murder and other violent acts.

## 2.2 Measuring the Cost of Crime

Criminals are not only costly to detect, to prosecute and imprison, but their crimes themselves constitute a huge monetary damage to society. For 2008 the Federal Police Office estimated the burden of crime to be 9.96 billion €, almost half (44,5%) of which was due to the 84 550 reported economic crimes, which amounted to 1.4% of all reported crimes in 2008. The other 98.6% of the more than six million crimes were responsible for the remaining 55.5% of damage done (BKA 2008b : 7-8). This is surprising given the small number of crimes that account for more than 3.4 billion € damage, particularly because the non-economic crimes include rape, murder, homicide, sexual assault and serious bodily assault. One would expect each of these crimes to cause serious economic damage to the victim and society. So how come 1.4% of all crimes can account -according to the BKA- for 53% of all economic damage caused by crime?

As will be seen below this is due to the official statistics failing to measure all aspects and effects of crime, as well as not including private prevention measures. To gauge the cost of crime correctly it is necessary to estimate the value of life and to include costs of crime that go unreported in official estimates such as the cost of changed behaviour, the costs of treating victims medically and psychologically as well as private expenditure on security measures such as security guards, locks and so on. This section will examine these issues in turn.

### 2.2.1 How to Measure the Value of a Statistical Life (VSL)

For many people simply the thought of attaching a monetary value to something as priceless as life is revolting. However, the traditional approach taken in Germany, namely not attaching any monetary value to a life is hardly better morally speaking and certainly less realistic. After all the average individual would be working and thereby contribute most tangibly to the financial well-being of society via taxes and production, not to mention less tangible contributions to society such as parenting and volunteering.

This following section will draw heavily on the work of Spengler (2004) who applied various methods to gauge the value of a statistical life in a German context. He explores many different approaches. However, I will focus on the market approach, or to be more exact, the wage compensation differentials because this is the method Spengler eventually uses to derive a monetary measure for the value of a life.

Before one delves into the details of the compensating wage differentials approach it is worthwhile to clarify what exactly is meant when the term "value of a statistical life" is used in this work. It should be noted that we are talking not about the value of life of any particular individual, but about a statistical concept that allows a figure to be attached to the value of life and health that is true in general, the value of a statistical life (VSL).

The literature (Spengler 2004 : 107-108 ) provides a good example to illustrate the concept of the value of a statistical life. Picture a football stadium filled with 10 000 people. A random person is threatened by imminent death. Everybody is now asked how much he or she would pay to save this random (and unknown) person's life. Everybody has a chance of 1/10 000 to die, so nobody is likely to volunteer astronomical amounts of money as they would if they were asked how much they would pay to save their own lives presuming they had the money. Lets assume everybody were willing to pay 300 € to avert the risk of death from one of their midst those 10 000 people together would be willing to pay 3 million € to save one statistical life. In other words reducing the risk of death from 1:10 000 to 0: 10 000 is worth 3 million €.

This suggests that whatever measures could be taken for up to 3 million € to reduce the risk of death by 1/10 000 should be taken. Consequently any measures costing more than 3 million € to reduce the risk by 1/10 000 are not cost efficient. This does not imply however, that one should stop rescue efforts for any individual that is threatened by imminent death once the 3 million € threshold is being reached. It is purely a measure that helps to conduct a cost-benefit analysis of measures to be taken to reduce statistical risk. Decisions over life and death are not within the realm of economics, nor should they be.

In its proper sense the VSL is used in the USA for example by the U.S. Office of Management and Budget, which demands that all federal U.S. authorities conduct a cost benefit analysis for all existing and planned regulations (Spengler 2004 : 107-108). The EU also uses the VSL approach in addition to others to estimate the monetary benefits of environmental protection (Europa Press Release RAPID 2007).

As could be seen above the VSL is not decided upon by any institution or individual, rather it is derived from analysing the willingness-to-pay (in order to reduce risk) of many individuals, or as will be seen below by aggregating compensating wage differentials to capture how much more money risky jobs need to offer to make up for the increased risk to life and health. This also means that the required information is indirectly volunteered by individuals rather than obtained via pressure (Spengler 2004 : 105-108).

### 2.2.2 Estimating the VSL: Compensating Wage Differentials

The idea behind the concept of compensating wage differentials is that if there are two jobs one of which involves lots of heavy and dirty work, job A, whereas the job B is easy and clean, prospective employees would all want to get job B. For the job A to appeal the prospective employer should offer more money, if he wants the best suited candidate. The best suited individual for job B has more chances of getting a cleaner job *ceteris paribus* than any of the less desirable applicants for job B. So there is a trade off between the non-monetary aspects of a job, prestige, the working environment and the monetary aspects such as for example health insurance cover, and salary. This trade off gives rise to the so called wage compensation differential, that part of the wage that



makes up for unpleasant characteristics of the job.

This concept does not only account for dirt, heavy manual labour and noise but also risk. Sometimes unions even have explicit risk-compensation pay negotiated for their members, e.g. fire fighters and police men. This is for example the case in the state of North Rhine Westphalia (Schattenblick 2009). In Berlin the risk compensation for fire-fighters amounts to 127.38 € per month after two years in the service (Richter, 2002). There are also security risk premiums (depending on base salary) between 115.04€ and 191.7 € per month, pilots get between 294.50 € and 460.16 € per month. Prison guards get 95.53 € per month (Spengler 2004 : 109-110). After a recent school shooting in Germany during which teachers were killed, the “Deutscher Philologenverband” (the association representing teachers in Germany) demanded to get paid a risk premium as well (Anon 2009).

The underlying simplifying assumption of the theory of the compensating wage differential is that workers' wages are solely dependent on the risk. Therefore workers' wages need to rise with risk. Firms, however, are willing to invest more in on-the-job-safety only in exchange for lower wages. If a firm offered a salary of 20.000 and the annual risk of lethal accident connected to it is 0.0005 and another wage and risk combination offered by the firm and acceptable to the employee is (21.500, 0.001) then one can calculate the wage increase a worker needs to accept an increase in the riskiness of his job. Assuming a linear contract curve a worker would accept an additional risk to die of 1:10 000 only if he were paid  $1/10.000 * 21.500 - 20.000 / 0.001 - 0.0005 = 300€$ . If one were to do that for 10 000 workers one arrives at a figure for the compensating wage increase needed for all workers to accept an increase in the risk to die. In this example that would be  $21.500 - 20.000 / 0.001 - 0.0005 = 3$  million € (Spengler 2004 : 110-114).

The next step in the process is formulating a regression model. The difficulty here is that wages do not depend only on risk but also on the age, education and experience of the worker. To that purpose a so called hedonic regression will be used. Given suitable data, hedonic regressions allow for the explanation of the price of a good via characteristics, that have no market price when considered by themselves.

Schaffner and Spengler use data on job changes only, this allows to control for unobserved heterogeneity. An additional advantage of that approach is the reduction of measurement error and the resulting bias. Secondly a 5-year mean risk was used rather than a measure based on one year. This reduces measurement error, but allows changes in risk over time due to technological development to be taken into account (Schaffner & Spengler 2010 : 16-17).

The compensation payments for workers and their families make up for income lost and material damage. The more compensation payments effectively insure workers against material damages and loss the less these losses affect the compensating wage differential. What is picked up still in the compensating wage differential is due to immaterial damages, the losses in the non-monetary

quality of life that come from not being able to walk any more or in case of a lethal injury, the deep loss for the family. Consequently the VSL calculated based on compensating wage differentials also becomes more what is needed to estimate the true costs of crime, a monetary measure of the loss to society due to injury and death (Spengler 2004 : 114-119).

For the actual estimation Spengler is performing hedonistic wage regressions. To that end individual job data as well as the risk of lethal injury for each job need to be combined first. The data set used is the IABS, a subsample of the employment data collected by the "Beschäftigungsstichprobe des Instituts für Arbeitsmarkt und Berufsforschung" (IAB). It is a randomly selected 1% sample of those German employees who are subject to compulsory social security contributions. Not included are self-employed, civil servants, professional soldiers, conscripts (community service and military), judges, full time students and the marginally employed, because all these groups are not subject to compulsory social security contributions (Spengler & Schaffner 2007 : 16-17).

The IABS provides information about the gender, age, nationality, marital status, education and vocational training, the actual occupation and job position (plus information on full time/part time), the exact number of days worked per year, the income (before taxes and social security contributions) up to that income level that requires compulsory social security contributions. Further the identification number of the employing firm, the industry the firm belongs to and the regional break down is provided.

The sample will be restricted to male blue collar workers for two reasons. Only 2% of blue collar workers have an income that exceeds the maximum income level up to which social security contributions are compulsory, therefore for 98% their income is recorded uncensored and correctly. Secondly, compensating wage differentials are of more actual relevance for male blue collar workers as they make up the majority of people holding potentially dangerous jobs (Spengler & Schaffner 2007 : 23).

Subsequently it is merged with data sets provided by the "Gesetzliche Unfallversicherungen (UVs)", these are collection of agencies that handle compulsory social security contributions and insurance against accidents (Spengler 2004 : 165-176). Judges, civil servants, soldiers are exempt as their employer, the federal government bears their risks directly (Spengler & Schaffner 2007 : 21).

The UVs collect information about accidents on the job, whether they were lethal/non lethal and sometimes also whether the accident resulted in an impairment of earning power of at least 20%. Data concerning accidents on the way to and from work are also collected. The big three agencies doing such data collection are the "Hauptverband der gewerblichen Berufsgenossenschaften" (HVBG) and the "Bundesverband der Unfallkassen" (BUK). A third important agency, the "Bundesverband der landwirtschaftlichen Berufsgenossenschaften" (BLB) insures most of the people working in agriculture, forestry and husbandry, which are more accident prone fields. It was unfortunately not able

to provide sufficiently detailed data, which is why its data set was excluded. (Spengler 2004 : 176-181).

The result was one of the first systematic VSL studies for Germany and thanks to its dataset a panel structure was possible, which allowed to control for unobserved heterogeneity. Not controlling for unobserved heterogeneity can falsify estimates upwards. However, Spengler's approach also eliminated some cross sectional variation that reflected proper compensating wage differentials. Thus he underestimated the VSL. In a new study he used data on job changers to evaluate the VSL which allowed him to control for unobserved heterogeneity while simultaneously picking up the compensating wage differential more fully than in his 2004 estimation. The resulting VSL for Germany is 2.0 million €, which is slightly closer to the values found in previous, international studies (Schaffner & Spengler 2010 : 15-18 ).

Estimates of the VSL for the US are often in the 5-12 million \$ range, for Canada the range is 3-6 million \$. Closer to Germany, in Austria the VSL was estimated to be 3.9 million \$ and studies for Switzerland estimated the VSL to be 6.08 million \$ and 8.31 million \$ depending on the used data. His estimates are somewhat lower than those of the studies above which is due to his database allowing to control for unobserved heterogeneity (Spengler 2004 : 119-121, 223-224).

A previous study by Spengler (2004: 213-226) illustrated the importance of controlling for unobserved heterogeneity as well as the existence of gender differences. Women are more risk averse than men and severely under-represented in risky jobs in Germany. The different values for “workers only” and “males only” is due to the different salaries/ wages and risk aversion for each group. TABLE 6 illustrates these points. All values are estimated VSL for the risk of a lethal accident and the average value of a 5 year period was chosen for cross-sectional studies.

TABLE 6 Comparison of Estimation Results

VSL in million Euro for	cross-sectional	panel
all employees	4.49	1.65
males only	4.32	1.72
females only	7.27	1.43
workers only	2.83	1.22

Source: Spengler, 2004, p. 224

This suggests that separate estimations of the VSL (based on the compensating wage differentials job changers) for women and men might have been instructive. However, since Schaffner & Spengler (2010 : 15-27) suggest to use a VSL of 2 million €, this value will be used below to estimate the true cost of fatal crimes.

It should be recognised though, that the VSL calculated on the basis of

wage compensating differentials gives only those material costs of crime besides the immaterial ones that the workers themselves would have to bear. Not included in any of the aforementioned VSL results are all material costs such as the medical cost borne by the health insurance, the part of the income loss due to lower future worker productivity compensated for by the UV and for example the profit loss borne by the employer who needs to find a substitute for the injured worker, which might well be less experienced and have lower productivity (Spengler 2004 : 162-163).

These costs have been estimated by the "Bundesamt für Straßenwesen" (BASt<sup>9</sup>) to be equal to be 1.16 million € per victim of lethal accidents. Severe, but non-lethal injuries were estimated to carry a price tag of material costs to the tune of 87 269 € per victim (excluding the car removal and repair costs as well as possible damages to the road) (BASt 2006).

In order not to count material losses twice Spengler assumes that half of these material costs estimated by BASt are already included in the VSL he estimated. Which leads to a VSL for purely immaterial aspects of life of 1.42 million € and a total value for VSL of 2.58 million € (for methodology see Spengler 2004 : 225-230).

Applying his panel results to the number of deaths due to crime in 2008 in Germany following costs emerge. There were 694 cases of murder, 1 572 cases of manslaughter and 882 cases of murder due to negligence. Deaths caused by illegal terminations of pregnancy will not be included, as abortions are a contentious subject. Included will be bodily assaults that caused death in 105 cases and rapes that caused death with 3 cases. In total (excluding deaths due to traffic accidents and deaths due to negligence) 2 374 deaths will be included in the calculation (BKA 2008a : 34-36). The total VSL equal to 2.58 million € will be used. Therefore the economic damage due to fatal crimes is estimated to be 6 124.9 million € in 2008.

As could be seen in the results of the VSL panel study 2004 a more exact estimation of costs would require knowing the VSL and the numbers of victims of fatal crimes respectively for each gender and socio-economic status in working life (at least roughly) as well.

Those 6.1 billion € damage just due to crime with death as a consequence increases the official estimate of the costs of crime by the BKA of 9.96 billion € by about 60% to 16.08 billion € (BKA 2008a : Appendix Table 7). One should keep in mind that even these figures do not include death due to negligence, which would raise the cost of crime by another 2 275.6 million € to 18.36 billion € in total, adding around 85% to the official estimate of the total damage caused by fatal crimes. It should also be noted that the police never estimates immaterial damages or even the cost to replace stolen or damaged goods but only what those stolen goods would have been worth now, if their owners had sold them. Both factors tend to underestimate the cost of crime.

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9 The BASt is a research institute within the Ministry of Transport, Building and Urban Development

### 2.2.3 Costs of Victimization

More or less completely unreported is damage done by rape, assault, murder and kidnapping. The official cost of 44 kidnappings was less than 30 000 € in total, 27 of which supposedly caused material damage of below 15 € each according to the police (BKA 2008a : Appendix Table 7). Obviously the costs to the victims will have been much higher, be it in income lost (time spent reporting the crime, at doctors, in court, being incapacitated), medical costs, therapy and so on. Unfortunately such estimates are not even known to Germany's most prominent organization for crime victims, the "Weisser Ring" (2009). They do have figures, however, on the amount the organization itself spends on helping victims as well as figures to what extent the government reimburses victims for their expenses and suffering as it is required to do by the OEG, the "Opferentschädigungsgesetz" (Victim-Compensation-Law).

First, the financial help the organization "Weisser Ring" provides will be addressed. It focuses on victims of severe crimes who experience economic hardship as a consequence. Therefore it is no surprise that the majority of recipients were victims of violent and sexual offences. They made up almost 70% of the 17 821 recipients. Per capita 295 Euro were given, 5 258 325 Euro in total. Almost 50% of the funds are used to obtain (initial) legal advice, another 40% go to unspecified "emergency help and victim help". The remainder is used predominantly to sponsor an initial counselling session determining whether therapy is needed or not (Weisser Ring 2008a : 2-9).

In other words this organization does not bear the cost of crime itself but extends a helping hand to the victims and in cases of murder/manslaughter to their relatives. Nevertheless helping everybody who fell victim to a violent crime (210 885) minus the cases of murder/manslaughter and crimes with the consequence of death (3256) in a similar manner would add another 61.25 million € to the cost of crime (BKA 2008a : 27).

The OEG is meant to deal with the material damage crime victims incur by bearing treatment costs, providing one-of-payments depending on the level of injury and life long rents depending on the level of injury or situation (widows for example can get rents). This law does not cover victims of car accidents (Bundesministerium für Arbeit und Soziales (BMAS) 2009).

The public is not very aware of this law's existence (Weisser Ring 2008c), which explains the low application rate of victims of violent crime of 10.57%, which equals 22 175 applications. Only 8 307 applications were successful. 6 766 received compensation for treatment costs and the remaining 1 541 received rents (Weisser Ring 2008b). The compensation levels can vary significantly as the following two real life examples illustrate. In the first example a young man was attacked and repeatedly beaten by skinheads. His left eye was injured and it lost the power of sight. His application under the OEG was accepted and his injury was regarded as reducing his ability to work by 30%. He will receive 115 € per month for life (Landkreis Breisgau-Hochschwarzwald Versorgungsamt

2009).

Assuming he was 20 when it happened and that he has the average life expectancy of a male German he will on average live for another 57 years (Statistisches Bundesamt 2010d). Over his lifetime his rent will amount to 78 660 €. This sum implies a monetary value of 262 200 € for a 100% reduction in the ability to work. Compared to the VSL or average annual income of 41 468 € (Statistisches Bundesamt, 2010a)<sup>10</sup>, this seems low, especially if inflation is taken into account.

However, the agencies administering the OEG also pay out considerable sums. A woman who suffered severe brain damage after having been attacked by her drunk partner with a wooden stick was regarded as having lost all ability to support herself. She needs around the clock care which is paid for by the state and receives a rent of 602 € per month. In total the government is paying her 10 192 € per month to cover all medical care costs, the help around the house and the aforementioned rent. This amounts to 122 304 € per year (Statistisches Bundesamt 2010a). Assuming that she is 30 years of age and she reaches 82 (the average female life expectancy), she will receive 6.36 million € in total (Landkreis Breisgau-Hochschwarzwald Versorgungsamt 2009 ; Statistisches Bundesamt 2010c). This lies considerable above the VSL the study suggested but it covers only medical costs and living expenses and no damages for the lost quality of life.

While the first example seems to be of particular thrift both share the feature of no compensation for immaterial losses due to crime. Both examples point to the same conclusion (as do all other cases described on the web page), namely that this law aims at compensating victims on a need basis rather than for the actual total damage done. This is borne out in the official countrywide statistics as well. About 200 million € were spent by the federation and the states in 2008 on the victims of crime, but this figures includes four more categories unrelated to being victims of crime. These are, to name just a few: payments to prisoners of war, (and if applicable to their families as well) and army recruits who were injured in the line of duty (BMAS 2009a : 284-285). The actual expenditure by the federation and the states under the OEG alone came to 182 069 095 € in 2008 (BMAS 2009b).

Dividing that by the 8 307 applicants that claimed benefits under the OEG successfully the average payout amounts to 21 918 € per victim. That overstates the average amount a claimant receives as all those receiving rents for life are included in the 182 million € payout, but not in the number of claimants given by the Weisser Ring for 2008. Adding recipients of rents from 2005 to 2007 to the 8 307 recipients in 2008 the total number of claimants rises to 13 359 and subsequently the average payout falls to 13 629 €. The numbers of recipients from 2000 to 2008 add up to 21 274 claimants which would mean 8 558 € per recipient on average. Some recipients will die in any given year but the law dates back to 1976 which renders recipient numbers considerable above

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<sup>10</sup> Before deductions (taxes, social security and so on) in 2009 for full-time employees in services and industry.

20 000 likely and therefore average compensation below 8 558 € (Weisser Ring 2008c)<sup>11</sup>.

Given that the average VSL was estimated to be 2.58 million € it becomes clear that the OEG numbers understate the true cost of crime even taking into account that they deal mainly with non lethal crimes, though wives of murder victims for example can claim benefits under the OEG. A widow and mother of two under-age children for example was eligible to receive 1 484 € per month, which will fall to around 1 000 once the children are grown up (Landkreis Breisgau-Hochschwarzwald Versorgungsamt 2009). Again the total compensation over a lifetime falls far short of the estimated VSL.

The damage done even by non-lethal violent crime and rape is far higher than the discussion above suggests for two reasons. Firstly, because no damage is reported by the police unless things were destroyed/damaged, plus their reported value will tend be lower than their replacement costs. Secondly, medical, legal, psychological treatment costs are not reported. Somebody who becomes crippled as a consequence of a violent attack, incurs a handicap and loses his job because of it will not have suffered material damage according to police statistics. The police also does not attach any monetary value on (psychological) pain, or lost quality of life.

Using Spengler's method would suggest 1.42 million € as measure for life's immaterial value. Together with the estimated material costs the total VSL is 2.58 million € (Spengler 2004 : 225). Even assuming that rape, severe physical attack or injury amount to just 10% of that value puts their costs into six digit figures versus the paltry sums suggested by the payout practice under the OEG, or the 1 € suggested by official statistics.

However, choosing at whim a percentage of the total value of a statistical life seems too random. Looking at cost estimates for these kinds of injuries provided by two American, one English and one German study, yields the following result (see TABLE 7):

Violent crimes need to be divided into fatal violent crimes (which were discussed above), severe physical assaults, robberies and rapes/sexual assault to gauge their economic impact correctly. Obviously fatal and non fatal crimes have very different consequences but even non fatal violent crimes such as robberies and severe physical assault differ in their cost estimates.

#### 2.2.4 Assaults: Aggravated Assault

The British values are very low compared to all others (see TABLE 7), however this might be explained by the fact that they do not include intangible losses. The German estimate for aggravated assault is surprisingly large though it also does not include intangible losses.

First, it is necessary to exclude the prosecution costs to make it more comparable to the other estimates. The total public expenditure on internal security in 2006 of 33 238 million € is used to deal with over six million crimes,

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<sup>11</sup> For more information about the OEG see BMAS 2009c and Bundesministerium der Justiz 2009

TABLE 7 Comparison of Estimates for Non-Fatal Violent Crime

study		Home Office UK <sup>12</sup>	Miller, Cohen, Rossman (1993) <sup>13</sup>	Miller, Cohen, Wiersema (1996) <sup>14</sup>	BASt (2006) <sup>15</sup>
crime					
rape,sexual assault		31 438 (35 179 <sup>16</sup> ) in € 31 693	47 424 (82 736 <sup>17</sup> ) in € 57 456	87 000 (130 247 <sup>18</sup> ) in € 90 449	n.a.
severe physical assault		21 422 (23 971) in € 21 596	14 738 <sup>19</sup> (25 712) in € 17 856	14 000 <sup>20</sup> (20 959) in € 14 555	87 269 (93 640) <sup>21</sup> in € 93 640
estimate is given and includes		per crime: total monetary (defensive and insurance costs , medical/mental health costs), lost output, justice system costs, no: quality of life component, costs to employer	per crime: total monetary (medical, emergency, mental health) productivity and quality of life; no: legal costs, employers costs, prevention of future crime costs	per victimisation: monetary (emergency, victim/medical services, administration, mental, health), productivity, quality of life	per victimisation (death in a car accident): All Material expenses: out of pocket, productivity, legal, police medical, no: quality of life component <sup>22</sup>
adj. for justice system and prevention costs	sexual assault /rape	28 360 € <sup>23</sup>	57 456 €	90 449 €	n.a.
	aggravated assault	7 132 € <sup>24</sup>	17 856 €	14 555 €	75 970 €

12 Home Office UK 2005: 7 Table 2.1; estimates in 2003 GBP

13 Miller, Cohen & Rossman 1993:195 exhibit 4; figure was chosen to insure that crimes similar to those in the PKS are chosen; incl. attempts; prices in 1989 \$

14 As quoted in Cohen 2005 : 42-43 figures incl. attempts; prices in 1993 \$

15 BASt 2006 estimate in € prices 2004

16 Office for National Statistics 2009; Adjusted for 2009, prices rose by 11.9% since 2003

17 Adjusted for inflation via US Inflation Calculator 2009

18 Ibid

19 Miller, Cohen & Rossman 1993 : 195 they make no difference between serious and non serious assault, value probably distorted downwards

20 Miller , Cohen & Wiersema 1996 : 16 Exhibit 4 Column 3 per victim assaults (any) without risk of death

21 Statistisches Bundesamt 2009b; adjusted by 7.3 % according to CPI seasonally adjusted

22 Spengler 2004 : 225

23 A stable ratio of prosecution cost and defensive & insurance expenditure to total material cost was assumed; 3 298 GBP due to justice system costs plus 8 GBP for defensive expenditure and insurance source: BMAS 2009b

24 See footnote 18 for methodology, and BMAS 2009b for source; numbers in this case: 14345 GBP for justice system plus 2 GBP for defensive expenditure and insurance



## NOTES TO TABLE 7

figures are rounded; Source: see footnotes in table; in brackets: inflation adjusted values; for currency conversion to € see footnote<sup>25</sup>

resulting in a cost per crime of 5 436 €. However, this includes those crimes where no culprit was ever identified and petty crimes as well. Pretending that all public expenditure is used to prosecute violent crime yields an estimate of prosecution costs of 157 661 € per violent crime. The truth must lie in between these results. Since many crimes might have been committed by the same person and the cost of investigations leading to court is likely to be higher than the cost of those investigations that are terminated due to the pettiness of the offence or the lack of evidence, looking at the number of suspects might give a better idea of the average prosecution cost. In 2006 the authorities handled 1 881 000 suspects (Lorenz & Brings 2008 : 6). Dividing the public expenditure on security by the number of suspects yields prosecution costs of 17 670 € per suspect. Since many serious violent crimes are usually not committed by the same suspect in any given year (due to the high detection rate and the incapacitation effect) I will use this number as the average prosecution cost per violent crime. It is higher than the UK's 14 464 € prosecution costs for aggravated assault, but within close range. That leaves a purely material cost estimate of 75 970 € per aggravated assault.

However, BAST did this estimation for non-fatal car accidents. On average a person involved in a car accident might suffer multiple (severe) wounds and more police, ambulances and fire men are likely to be needed than in a sexual/aggravated assault case. Thus material aspects are likely to be overestimated.

Another point to bear in mind is that the estimates in columns 2 and 3 of TABLE 7 include attempts, too, whereas column 4 does not. Underestimation is therefore likely to some extent in columns 2 and 3. According to the PKS murder and manslaughter have a high attempt ratio of 71.1% (BKA 2008a : 33). Stabbing somebody but not succeeding in killing the victim would result in non-fatal violent crime counted as aggravated assault in the German police statistics.

Despite this tendency of the American figures to underestimate the actual costs of "successful" assaults the resulting estimate is probably less distorted than one based on BAST. For best results the Miller 1996 estimate of 14 555 € (inflation adjusted) will be used as it is more up to date than the study by Miller et al. from 1993. Since 151 208 severe assaults (excluding rape/sexual assault, robberies and fatal crimes) were counted in Germany in 2008 (BMI 2008 : 27), the damage to victims amounted to 2 201million €.

### Light Bodily Assault

According to Miller et al. 1996 assault without injury, which fits best to what

<sup>25</sup> European Central Bank (ECB) 2009; rounded figures were used: 1€= 1.44US\$, 1.4398; 1€=0.90 GBP, 0.90080

German statistics refer to light physical assault, costs the victim 2 000 \$ in prices of 1993 (Miller, Cohen & Wiersema 1996 : 9 Table 2). Inflation adjusted (2 994.2\$) and converted into Euro that yields 2 079.3 €<sup>26</sup>. About 367 291 light assaults occurred, yielding total victim costs of 782.4 million €.

### 2.2.5 Robberies

Since the afore mentioned British study does not include a “quality of life” component and the BASt did not estimate the impact of a robbery only the two American studies will be used.

TABLE 8 Cost Estimates for Robbery

crime	Miller et al 1993	Miller et al 1996
robbery	19 486 \$ ( in 1989 \$) 33 995 \$ (2009) 23 608 € (2009)	10 000 \$ (in 1993 \$) 14 971 \$ (2009) 10 397 € (2009)

Source see TABLE 7; the original in brackets and the inflation adjusted values below

The huge discrepancy between these values is due to Miller 1993 including only robberies that resulted in physical injuries whereas in the subsequent study also attempts were included. One estimate is likely to be distorted upwards, whereas the other one is likely to be distorted downwards. Taking the average is no solution because one does not know to what extent these distortions cancel each other out and the resulting value of 17 000 € would be far higher than the value suggested for Germany in the literature, namely 8 500 €. Since that value was put forward in 2005 and based on the estimate by Miller et al 1996 the original 1996 estimate will be used, adjusted for inflation (see TABLE 8). Each of the 49 913 robberies in 2008 is estimated to have cost 10 397 € which yields a total damage of 518.95 million €.

### 2.2.6 Sexual Assault /Rape

Again the British estimate left out the non-tangible components of quality of life lost due to rape. If that were included it is likely to be close to the American studies, after all in rape cases quality of life lost is responsible for a sizeable part of total cost (Miller, Cohen & Rossman 1993 : 194-195). The BASt did not provide an estimate for rape. This leaves the two American studies. Their estimates are relatively far apart. Probably the Miller et al. 1996 estimate is higher because it looks at one victimization, which could cover multiple injuries whereas Miller et al. 1993 estimated one injury only. It seems more sensible to use the Miller et al. 1996 estimate for one victimisation since the other estimate necessitates estimating the average number of wounds per victimisation.

Sexual assaults have a failure rate of 16.6% (BKA 2008a : 33) in Germany

<sup>26</sup> US Inflation Calculator, 2009; Exchange rate used 1€=1.44\$; ECB, 2009

which implies 108 452 € of victim costs per completed rape. However, since German failure rates might differ from US rates, the inflation adjusted value of 90 449 € of victim costs per rape will be used. In 2008 the police counted 7 292 rapes and sexual assaults. Total victim costs therefore reached 659.6 million €.

## 2.3 Other Expenditure on Crime

### 2.3.1 Private Expenditure on Security

Missing so far is another important component of the costs of crime, namely private expenditure on security. After all people would not spend money on private security guards, security locks, alarm bells and other measures if there was no crime. In 2008 Germans spent 21 billion € on private security. A third, 7.1 billion € were spent on preventing burglaries. IT security was the second biggest item at over 4.8 billion €. Most of that is likely done by companies protecting their computer networks rather than individuals buying programs for private use. Most private<sup>27</sup> security expenditure is by companies, while government procurement (for example schools, libraries, museums) makes up only 20% to 25% of the total (Arbeitsgemeinschaft für Sicherheit der Wirtschaft & VDI/VDE Innovation+Technik GmbH 2008 : 215-216).

Expenditure of the average German on security (living in a city) was estimated to be 170 \$ in 2005. Adjusted for inflation, the expenditure is 173.74 \$, equal to 120.6 € (Statistisches Bundesamt 2009b)<sup>28</sup>. That might underestimate actual expenditure as the market for security rose by 6%-8% annually in recent years while inflation was much lower. Since it is not clear what the cut off point was when the “urban population” of Germany was determined, the figure for private expenditure on security will be calculated as follows: From the total figure of 21 billion € the 25% government procurement (5.25 billion €) will be deducted. That leaves 15.75 billion € as truly private expenditure on security.

### 2.3.2 The Opportunity Cost of Crime

Criminal activity has an opportunity cost, namely that legal activity that did not take place because criminals themselves preferred to engage in illegal activities and the time potential victims spend on securing their assets, locking and unlocking their doors, cars, or bikes for example. Anderson (1999 : 621-624) estimated the various components of the opportunity cost, the time perpetrators loose planning and executing their crimes as well as the time lost in prison. He also added the time victims loose due to victimization and due to time spent securing their assets, or on neighbourhood watches. His estimate for the USA

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27 “Private” refers here to security expenditure other than government expenditure on the police and the justice system.

28 Inflation Dec-2007-Dec.2009: 2.2%; ECB, 2009, Exchange rate used 1€=1.44\$

comes to roughly 130 billion US-\$ (in 1997 dollars).

Since these costs are not officially estimated in Germany and hard to obtain, only the value of the time lost due to imprisonment has been calculated here. To this end the number of prisoners in 2007 in Germany, 72 637 was multiplied with their estimated annual income if they were free.

This income is guesswork. In order to achieve a somewhat reliable figure the average salary of a German working in the country's low-wage sector has been estimated. The data for this estimation was obtained from a report by the Deutsche Arbeitsagentur (German Employment Office) (Frank & Grimm 2010 : 12, 47). It provides figures for the number of people in full-time employment earning up to 400 €, 800 €, 1000 € and 2000 €. Officially in 2009 anybody earning 1784 € or less belongs to the low-wage sector. Those earning between 1784 up to 2000€ are not relevant here. Their number was estimated and excluded from the calculation. As average salary for each income bracket the mean income was taken. For a more detailed breakdown see Appendix 1. The result was an average monthly income of 1244 € in the low wage sector. Multiplied by the number of prisoners this aspect of the opportunity cost amounts to 1.08 billion €.

This could be a conservative estimate. Anderson (1999 : 621-624) points out that criminals are risk takers and exhibit an entrepreneurial streak which should allow them to earn a decent salary. On the other hand they are often relatively uneducated, lack proper work experience and employers are likely to be biased against them and pay less. This is why the German low-wage sector was chosen as frame of reference as people earning these low wages tend to be uneducated, young and inexperienced, which is true for many criminals, too. Also foreigners are over-represented in the German low-wage sector, they might experience a bias against them, as do ex-convicts.

## 2.4 The Total Costs of Crime

### 2.4.1 Summary

Before moving on to the next chapter a overview of the costs of crime is in order (see TABLE 9). The material damage due to all non-fatal/non-violent crime is estimated to be 9.96 billion €. This includes white collar crime already. However, estimating it correctly is hard. Firms often do not report these crimes to the police even if detected because they fear to damage their image should the crime become known to the public. Measuring the damage even when detected and reported is not necessarily easy either. White collar crime has been included here only in as far it was included and its costs represented correctly in the official statistics because of the limited space available here.

Fatal crimes cost 8.4 billion € on top of the material damage due to all other crime. It should be remembered that Spengler's VSL is lower for

methodological reasons than other VSLs, this estimate is therefore rather conservative.

Providing the kind of initial counselling and emergency help to victims (of serious violent crimes) which the organization "Weisser Ring" provides would add another 62.25 million € to the total cost of crime even though the sum per victim is paltry at 295 €. No actual treatment costs, no compensation for immaterial losses, nor costs of long legal disputes are paid.

The OEG provides benefits of 182 million € per year, which neither covers all victims of serious violent crimes, nor does it cover the total cost of crime but focuses on what is needed for survival, e.g. healthcare costs. Immaterial losses such as quality of life are not compensated in practice nor are necessarily the full material losses compensated for. Extending even the sum of 8 558 € on average to each victim of a serious violent crime (excluding fatal crimes which are included above) in 2008 would add another 1 776.9 million. € to the bill, even though these sums are far below the VSL<sup>29</sup>.

Non fatal but serious crimes such as rape/sexual assault, robberies, aggravated assault and light bodily assault together add another 4 161.95 million € to the cost of crime. The public expenditure for security raises the bill by another 33.2 billion €, private security expenditure by 15.75 billion €. Opportunity cost adds just over 1 billion €. In total all costs of crime, material and immaterial, public and private crime prevention and crime prosecution plus opportunity cost amounted to 72.7 billion € in Germany in 2008. This is probably an understatement for reasons discussed above.

An American study by David A. Anderson (1999) found that the official cost of crime figures multiply as more and more of its indirect costs are taken into account. While public expenditure on the police, the correction system and prosecution add to "only" 102 billion US-\$ (in 1997 Dollars), his final estimate which includes for example the private expenditure of security, the VSL, immaterial damages and so on puts the cost of crime per year in the USA at 1 102 billion US-\$ (net of transfers). It therefore lends credibility to the estimate here, which is a multiple of the official figure.

#### 2.4.2 Costs of Crime Not Taken Into Account

A number of cost categories were neither estimated, nor included here, because reliable data is hard to come by. The extent to which costs might remain unreported is illustrated by a finding presented by Kleiman (2009 : 16-21). Asking Americans in a survey how much they would be willing to pay to reduce the risk of being burgled the resulting number was many times above the actual material cost. While this approach has its weaknesses it nevertheless suggests that people take into account big immaterial costs and private security expenditure, which were at least partially captured above, as well as a number

<sup>29</sup> Such an extension would require changing the eligibility criteria, only innocent victims of crime can receive help now. Known criminals are not eligible, irrespective what damage they suffered. People can also be denied benefits now if their conduct led to the crime, e.g. provoking an opponent who then subsequently stabs the initiator.; see BMAS 2009c

of other factors that a harder to measure. It also implies that people might be supportive of extending public security expenditure.

In general the true extent of white collar crime is hard to gauge as companies are often unwilling to make internal failures public. Some immaterial damages are still missing in cases of kidnapping, burglary and less serious crimes that nevertheless might shock the victim, perhaps even so far as to induce a change in behaviour. Further it should be remembered, that the opportunity costs have not been captured fully with the estimate above, either.

TABLE 9 Summary of Costs of Crime in 2008

category of cost:	cost in billion Euro:
material damage due to all non-fatal/non violent crime according to official statistics	9.96
fatal crimes	8.4
non-fatal, serious crime	4.16
public expenditure on security	33.2
private expenditure	15.75
opportunity cost	1.08
total	72.7

Arbeitsgemeinschaft für Sicherheit der Wirtschaft & VDI/VDE Innovation+Technik GmbH 2008; Statistisches Bundesamt 2009b

Some economists also investigated the consequences of crime. Their focus was on Italy, Denmark and Germany for data availability reasons. They find that high crime rates tend to hamper growth of GDP per capita as well as reduce employment opportunities (Entorf & Spengler 2000 : 16-19). It also indicates that there is the risk of a vicious cycle, unemployment leading to crime which further impedes growth leading to potentially more unemployment and more crime. On the other hand at some point overall economic conditions could have deteriorated by so much that opportunities for crime are also declining and no further increases in crime take place. Whether or not this is the case or where exactly a region stands in the cycle is an empirical question. It was also pointed out that the observed relationships probably hold in many more European countries, but the data available at that time did not allow to prove it.

A similar relationship holds for small regions, such as parts of a city. Kleiman (2009 : 21-22) points out that high crime areas are unattractive for businesses, which reduces locally available job opportunities. In turn reduced legal job opportunities increase the attractiveness of illegal activities. These foregone possibilities for economic growth and its potentially crime inducing consequences should be included in a complete cost of crime estimation.

People also might take out more insurance (and /or have to pay higher premiums) to insure their property in crime ridden areas. Fear of crime might induce some to do the same even in safe areas. Therefore fear of crime itself can

be another cost factor, partly but not completely covered by including private expenditure on security. It has been argued that the costs of fearing crime should not be counted towards the cost of crime as fear is irrational and not necessarily linked to the actual level of crime prevalent in the respective community (Bräuninger et al. 2008 : 23-27).

However, overblown media coverage is not solely responsible for fear of crime, since there would be no media coverage of crime (and no fear of crime) without the existence of crime. Therefore costs such as reduced income for restaurants and cinemas in the evenings (because people prefer to stay indoors), or lower property values in areas seen as crime ridden are some of many factors that would need to be estimated and included as well.

Becker (1968) argued that costs of crime need to be corrected downwards for the income it generates for criminals. From society's point of view a theft is an involuntary transfer of wealth from one individual to another, but total wealth stays the same. This is conditional on no transfer cost and the victim not asking the police for help or taking any precautionary measures for the future nor needing medical or psychological assistance after the theft. It also presupposes that money was stolen. Stolen goods usually have a much lower sales price on the black market than it costs the victim to buy them again new legally.

A personal example illustrates the above point: While in New York, my backpack was stolen. It was full to the brim, but except for a few dollars in notes and 20 German Marks in cash it contained schoolbooks which I had needed to prepare for examinations right after my holiday. Among them were books on Physics, Ancient Greek and Latin, and my personal notes and a tape with church music. While the thief might very well have been in need of something spiritual, a German school book for Ancient Greek in New York is almost certainly worthless. For me on the other hand, it was very expensive to replace all books and time consuming to re-copy all my notes. In other words, this was not a simple transfer of wealth, the thief gained only a tiny fraction of the wealth I lost. The buyers of stolen goods might profit, too, but some dead-weight loss is likely to remain in most cases of theft.

Therefore I neither tried to estimate the income perpetrators of burglaries and robberies might have gained, nor deducted the income from the costs of crime. Particularly so because the German police statistics use a valuation method which provides a low estimate of the material damage due to thefts and crime in general to start with.

## 3 The Economics of Crime

### 3.1 Becker's Theory of Crime

As Ehrlich points out in his 1973 paper "Participation in Illegitimate Activities: A Theoretical and Empirical Investigation" that traditionally criminal behaviour was explained by the circumstances, upbringing, or even the character of the perpetrator. Seen from that perspective there are some people who are inherently and always criminal, unless a treatment (therapy for example) is possible (Ehrlich 1973 : 521-522). Authors such as Becker and Ehrlich were among those in the 1960s and 1970s who claimed that objective economic incentives determine whether a person will engage in criminal behaviour or not. In other words, given the right incentives anybody would commit crimes. This was a radical departure from the dominant thinking about crime of that time though it was in the tradition of earlier thinkers such as Beccaria and Bentham, both of which realized the role economic rewards play in crime (Becker 1968 : 209).

Ehrlich (1973) built in his work on Becker's model from 1968, extending it by including for example the problem for an individual how to optimally allocate time between illegal, legal and leisure activities, which in his model could be pursued in a complementary fashion and were not necessarily mutually exclusive. His model also more fully captured gains and benefits of illegal and legal activities as well as allowed for the differentiation of deterrent and incapacitation effects. Ehrlich even managed to estimate the magnitude of a response rather than just its direction if external factors for a specific offender change. He complemented this extended theory with an empirical section that confirmed his hypotheses. While his study provides more detail his findings are generally in line with Becker's more basic model.

Two studies by Block and Lind (1975a, b) present an alternative model of crime, but their findings do not call into question Becker's main results, but rather derive them differently, for example without the need for the assumption



that offenders be risk-loving. They do however point out problems related to Becker's treatment of fines as alternatives to imprisonment. For this see the section on fines below.

Also in 1975 Block and Heineke pointed out in their "A Labor Theoretic Analysis of the Criminal Choice" that the theory implications of previous work rely on specific restrictions on preferences. Therefore in the general case empirical evidence alone can determine the relative magnitudes of the effects of e.g. law enforcement activity and the pay of illegal activities on criminal activity.

Ann Dryden Witte (1980) made an attempt at "Estimating the Economic Model of Crime with Individual Data". The model chosen drew on the work of Block, Heineke and Ehrlich. The results of the estimation support Becker's model, too. The support is somewhat weak, but as is pointed out by Witte the data set (ex-prisoners after release) and some issues surrounding the statistical method chosen are likely to be responsible for the relatively weak support as well as an unexpected sign for the coefficient for serious income offenders. This particular finding is attributed to serious income offenders usually being drug users and as such less responsive to incentives than other criminals.

Ehrlich's article "Crime, Punishment, and the Market for Offenses" in 1996 focuses on the relative importance of negative incentives (probability of detection, severity of punishment) versus positive incentives (e.g. salaries in legal sector) without calling into question Becker's main findings. Ehrlich though does suggest that in some circumstances the deterrence effect of the severity of punishment might be bigger than the deterrent effect of the likelihood of apprehension and conviction.

However, the added detail of these studies and their differing models notwithstanding, their findings are broadly in line with Becker's model. Even the assertion of Block and Heineke (1975), that empirical investigation alone can determine the size of behavioural relationships did not invalidate Becker's model as a plethora of modern empirical studies support his findings. Since Becker is the original inspiration for these subsequent papers, and since his model is more straightforward to set out while still allowing to derive the implications that are of relevance in this study, his model will be presented below.

Becker used the concept of social loss in his 1968 paper "Crime and Punishment: An Economic Approach" as a measure of the cost of crime which includes the costs of apprehension as well as the damage done by the criminals. He chose the specific form:

$$(1) \quad L = D(O) + C(p,O) + bpfO \quad (\text{Becker 1968 : 181})$$

The social loss  $L$  consists of the damages due to offences  $D(O)$  and the costs of apprehending and persecuting (but not what it costs to punish, e.g. imprison) the criminals  $C(p,O)$ .  $O$  always stands for the total number of offences,  $p$  stands for the probability of bringing a criminal to justice i.e. convict him. At its

extremes the probability of conviction  $p$  would be 0 indicating that no criminal is convicted, or 1 indicating that all are convicted. Usually the probability of conviction lies between 0 and 1. It is assumed that the probability of conviction  $p$  can be freely chosen, though in reality it would be  $C$ . The probability of no conviction is given by  $(1-p)$ . The damage due to offences is rising with the number of offences, as does the cost of apprehension and convictions  $C(p, O)$ . The latter rises as the level of  $p$  rises.

Initially he had included “ $a$ ” indicating the activity level in the function of apprehension cost, but it was not included in the social loss function. As apprehension activities rise, so should convictions as crimes are solved and evidence is found so  $p$ , the conviction rate can reasonably well reflect the activity level.

Taken together  $bfpO$  measures the loss to society due to the punishments the convicted receive. In this term only  $b$  and  $f$  need further explanation. The punishment that is meted out per offence to the convicted is given by  $f$ . The coefficient  $b$  measures to what extent the punishment  $f$  affects people besides the convicted criminal. It provides a measure for the damage done to society by punishing the criminals. The rationale behind it is, that society has to foot the bill when a criminal is punished e.g. by imprisonment. Society therefore is also affected by the punishment the criminal receives, even if one disregards personal issues e.g. a breaking marriage, or children missing their father. The size of  $b$  differs with the kind of punishment chosen. Its range is between 0 and 1. Here it is assumed to be a given constant (Becker 1968 : 175-189). For a breakdown of values of  $b$  see TABLE 10 below.

TABLE 10 Values of  $b$

b-Value	$b=0^*$	$b>0$
kind of punishment	monetary fines	torture,probation,parole,prison, most other punishments

\*this assumes no transaction or collection costs; Source: Becker, 1968, p. 180

The number of offences  $O$  are given by  $O = (p,f,u)$ . Here the probability of conviction  $p$  and the punishment level  $f$  are both assumed to be negatively related to the supply of offences  $O$ , as they rise the number of offences falls. Interestingly  $u$  stands for a “portmanteau variable representing all these other influences”(Becker 1968 : 177). He was not explicitly referring to these factors (for more on  $u$  see section 3.1.3). Though Becker did not go into much detail concerning  $u$  he provided one example how it can change the supply of offences. If e.g. education levels were to rise,  $u$  would rise, because more and better paid legal activities become available and illegal activities would fall (Becker 1968 : 177).

### 3.1.1 Optimality Conditions

In order to minimize social loss one needs to examine the optimality conditions

of the L function and its implications. The section below will summarize the main points, a mathematical treatment can be found in Becker's original text. He assumed that the derivatives of the general social loss function with respect to damages D, costs C and bf would be bigger than 0 and that the social loss function L specified above is indeed identical to the real social loss function. Further, Becker assumed that b is greater than zero and chose p rather than C as decision variable. Then those first order conditions of L with respect to the probability of conviction p and the punishment level f need to equal zero, to minimize the social loss L. If the resulting expressions for the first derivative of the number of offences with respect to f and p,  $O_f$  and  $O_p$  are both positive, then the first order conditions of L with respect to the punishment level f and probability of conviction p can be re-arranged to yield:

$$(2) \quad D' + C' = -bpf \left(1 - \frac{1}{E_f}\right) \quad \text{and} \quad (3) \quad D' + C' + C_p \frac{1}{O_p} = -bpf \left(1 - \frac{1}{E_p}\right)$$

$$\text{where (4) } E_f = -\left(\frac{f}{O}\right) * O_f \quad \text{and} \quad (5) \quad E_p = -\left(\frac{p}{O}\right) * O_p \quad \text{Becker 1968 : 181-182}$$

These form the starting point for an analysis of behavioural relations. First, it should be noted that the probability of conviction p and the punishment level f often move in the same direction, though not always.

Should marginal apprehension and conviction costs C' or marginal damages D' for a given number of offences increase, then the optimal number of offences decreases and the probability of conviction p and the severity of punishment f must rise. If  $C_p$ , the second cost component of apprehension and conviction costs increases, then the cost of manipulating the number of offences via the probability of conviction p increases, but remains the same for changing them via the severity of punishment f. Consequently the optimal value of likelihood of conviction p should fall and that of the severity of punishment f rise. It does so only partially, so the total number of offences rises. In case both components of apprehension and conviction cost (C' as well as

$C_p$ ) rise, for example because the salaries of policemen rose, the punishment level f has to increase. The direction of the change in the probability of conviction p and the number of offences O depends on the relative size of the changes in marginal costs of apprehension and conviction C' and  $C_p$ , the costs depending on changes in the probability of conviction p. On the other hand improved technology e.g. DNA testing tends to reduce both, C' and  $C_p$  the cost component tracking the apprehension and conviction costs depending on changes in the probability of conviction p. Whereas the effect on offences and the probability of conviction p is unclear, the severity of punishments f meted out, would have to decline as police technology improves.  $C_p$  and to some extent marginal apprehension and conviction costs C' differ depending on the crime. Murders are often easier to solve than a case of pickpocketing, unless somebody manages to catch the thief in the act (Becker 1968 : 185-189).

Changes in elasticities produce different effects depending on whether

$b=0$  or  $b>0$ . The effect I want to focus on is (if  $b>0$ ) that a reduction in elasticity with respect to  $p$  ( $f$  respectively) increases the optimal number of offences and reduces the optimal value of  $p$  ( $f$ ) and can be partly compensated by increasing  $f$  ( $p$ ). This suggests that crimes with a low elasticity to the harshness of punishment  $f$  should be punished less severely than those with a high elasticity with regards to the severity of punishment  $f$ . Generally speaking crimes committed in "the heat of the moment" such as unpremeditated murder could be regarded as having a low elasticity with regards to the level of punishment  $f$ . Offenders with reduced mental capabilities also are unlikely to react much to the severity of punishment. Punishing them harshly therefore makes little sense. Interestingly enough both implications can be observed in practice.

As for increases in  $b$ , the measure to what extent punishing the convicted impacts negatively on society, the implication is that the severity of  $f$  should be lowered to minimize social losses. The higher  $b$  is, the lower the level of punishment  $f$  should be. Conversely the probability of conviction  $p$  should rise. In the presence of apprehension and conviction costs and positive  $b$  the optimal level of offences is always above 0, as the conviction of all criminals would cause apprehension and conviction costs to spiral out of control. If those apprehension and conviction costs and  $b$  were zero, it would be optimal to set the probability of conviction  $p$  equal to 1 and convict all offenders.

Also noted should be that there is a trade-off between higher apprehension and conviction efforts, which would raise the probability of conviction and the total costs of apprehension, but lower damages as less offences are committed (Becker 1968 : 180-193).

### 3.1.2 Private Security Expenditure

Before moving on to the implications, extensions and debates his theory ignited, Becker's main points about private security expenditure will be swiftly summarized. Again he formulated a loss function, this time for the individual.

$$(6) \quad L_j = H_j(O_j) + C_j(p_j, O_j, C, C_k) + b_j p_j f_j O_j \quad (\text{Becker 1968 : 200}).$$

Its constitutive parts are the harm done to the individual  $j$ ,  $H_j$ , which is a function of the offences  $O$  committed against individual  $j$ ,  $O_j$ . The second term captures the costs the individual  $j$  incurs when trying to secure a conviction of the perpetrator,  $C_j$ . It is related positively to the probability of detection and conviction prevailing in  $j$ 's case  $p_j$  and  $O_j$ , but negatively to  $C$  and  $C_k$ .  $C$  represents the public expenditure on security.  $C_k$  stands for the private security expenditure of other people. The third and last term shows the loss accruing to the individual  $j$  from the punishment "his" or "her" offender(s) receive(s). This is a function of the in  $j$ 's case prevailing  $b$ ,  $p$ ,  $f$  and  $O$ .

The first part is straightforward enough, but the specifications of the latter two have interesting implications. The cost the individual must bear to get "his"/"her" offender convicted is not only negatively related to public expenditure on apprehension and conviction, but also to the security

expenditure of other individuals. There is a trade-off between the various sources of security expenditure, which gives rise to a free-rider problem. An individual might decide to benefit from the resources spent by others on security, but not contribute himself. Further, there is a trade-off between individual harm and individual expenditure against crime. This suggests that even for any given individual the loss minimizing number of offences might not equal zero.

The last component of the individual's loss function, the loss the individual has to bear from the punishment of his offender, is similar to the last term of the social loss function. However, since the individual has to pay only a tiny fraction of the total costs of expensive punishments, e.g. imprisonment, his losses from imposing costly penalties are small. Victims therefore may lobby for penalties that are more severe than those that would minimize the social loss function.

Offenders on the other hand might substitute away from individuals with high expenditure on safety to individuals with low expenditure. Thus people who take precautionary measures might benefit more than a look at the numbers of offences in reaction to private security expenditure suggests (Becker 1968 : 200-201).

### 3.1.3 The Willingness to Commit a Criminal Act “u” and Happiness

#### 3.1.3.1 Happiness and “u”

Many prisoners had rather difficult, sad lives already before incarceration. Therefore one might suspect that unhappiness is linked to crime. If so, happiness needs to rise to reduce crime. Happiness, one might assume will rise with income as economic thinking seems to suggest. However, this is a point of debate within the field of happiness economics.

Hagerty and Veethoven (H&V) 2003 and 2006 contend that happiness rises with absolute income<sup>30</sup>. A look at the Gallup monthly report's section on the well being of Americans for various income levels seems to support this claim as on average people in higher income brackets reported higher well-being (Gallup-Healthways 2010 : 4). If that were true people with the highest salaries should tend to be the happiest and (according to our speculation) also the least criminal. However, to be a top earner one usually needs a good education and good social skills, both of which render illegal occupations (except for white collar crime) less profitable than legal ones.

On the other side of the debate is Easterlin (2003 : 11176-11183), who claims that absolute income raises happiness only up to a certain point because aspirations rise as income does. Above that point only high relative income raises happiness. Various other studies e.g. by Di Tella et al. 2003 support his position (Powdthavee 2007 : 12-13). Kahneman and Deaton (2010 : 16489-16493)

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<sup>30</sup> See H & V 2003 for caveats; see H & V 2006 for information on why their results differ from Easterlin's.

find that once the annual income reaches 75 000\$ additional income does not yield more happiness (though it increases life satisfaction). Other factors influencing happiness according to Kahneman and Deaton are health , social life (or lack thereof) and habits such as smoking. Di Tella et al. 2003 also points out that studies that measure the happiness of different people at one point in time tend to find evidence that absolute income increases happiness though long term studies of the same people find no such connection as income rises. Gallup does the first whereas Easterlin conducted cohort studies. Other factors influencing happiness are for example: work, family and health (Easterlin 2003 : 11176-11183). Oswald (1997 : 1823) adds that the self-employed, highly educated and retired are among the happiest.

To be very happy and, according to our speculation, law-abiding thus requires a relative income that is high and high enough to compensate for any possible shortcomings in other areas. If the relative income is just average (or low), health, job, and the family situation need to be good enough to compensate for the average (or low) relative income. Otherwise happiness would be low and therefore criminal activity supposedly high.

In the case of high relative income causing happiness educational achievements and social skills are most likely rather high, thus offering a Beckerian explanation for low criminality of these individuals (again excluding white collar crime). The same applies if income is high in absolute terms. Should the relative income be average or low the other factors would have to compensate for that to achieve high happiness levels. Those with low relative incomes are most likely those with the least education, training and social skills. According to Becker these are exactly the people most likely to engage in illegal activities. Given the high death rate of street criminals (as seen in section 3.2.4), their level of "health" seems rather low. Kleiman (2009 : 128) even states that leading a criminal life entails bad long term health consequences. Their legal jobs are likely to be unattractive (if they have any), and exceptionally stable and happy families under difficult circumstances seem implausible.

Thus it seems theoretically quite likely -irrespective of the position taken in the debate within happiness economics-, that high criminal activity and unhappiness go together, but do not directly cause each other. Rather, both could be influenced by underlying factors such as education and income.

Comparing happiness levels with reported crime rates also does not prove a causal relationship between crime and happiness, as can be seen below (TABLE 11). The total crime figures of the USA, Poland and Russia are lower than Switzerland's, even though Switzerland has higher happiness figures. On the other hand Germany has only half Swedish figures for total crime, despite lower happiness. Total crime figures could be inflated by including petty crimes in some countries that are not counted as crimes or reported in other countries. However, looking at the homicide rates where definitions and detecting the crime are more likely to be similar also reveals no clear relationship between crime and happiness. Poland and Sweden do have similar homicide rates but different happiness levels. A similar relationship holds for Switzerland and

Germany.

This might be because the happiness data are from the year 2000 (OECD 2008 : 245), whereas the crime rates are from 2003 to 2006 depending on the country (Statistisches Bundesamt 2009). Perhaps crime and happiness data for the same year would yield a better match.

Varying reporting behaviours across countries might also play a role as might differing conviction rates. Some countries might have stricter requirements for conviction than others. For meaningful statistical analysis the sample of countries is too small.

TABLE 11 Happiness and Crime

country	happiness mean on scale 0-10	happiness adjusted for Inequality index 0-100	total crime	homicides	rapes
			per 100 000 inhabitants		
Switzerland	8.3	73	3 865	0.8	8.6
Sweden	7.9	69	13 493	1.3	40.8
USA	7.4	67	3 765	5.6	30.5
Germany	6.9	64	7 628	0.9	9.8
France	6.7	58	6 402	1.7	17.6
Poland	5.8	50	3 377	1.3	5.3
Russia	4.1	35	2 478	21.5	n.a.

Sources: OECD 2008; Statistisches Bundesamt 2009

Though happiness and crime seem to have no direct connection, there is a link between Becker's  $u$  and happiness. Many of happiness' constituent parts such as education, having a good job (in order to reach the 75 000\$ of annual income), health, social life and habits such as smoking are included in  $u$ , too. According to Becker,  $u$  was -together with the probability of detection  $p$ , and the severity of punishment  $f$ - one of the three factors determining the number of offences  $O$ . So, one should expect a link of some kind between happiness and crime to show up in the data. Even if no causal relationship existed, at least some correlation seems likely. Difficulties in measuring happiness might obscure a potential relationship. The small sample of countries and their happiness levels also hardly favours meaningful analysis. Last but not least the inverse relationship between blue-collar crime, education and legal income possibilities, namely more education, higher income prospects in the legal job market, less crime does not apply to white collar-crime. In the case of the latter the reward to crime rises with education and the position within a firm, both of which can increase happiness. This might help to veil a potential link between crime and happiness.

### 3.1.3.2 The Meaning and Modelling of u

In any case Becker did not mention happiness explicitly, though he mentioned “psychic rewards” (Becker 1968 : 177). How these are to be modelled was not his concern in his seminal work. He also did not specify any functional form for “u” at all. Its functional form would depend on what “u” is meant to capture.

To answer that is not easy. Becker subsumed into “u” “the income available to him [the criminal] in legal and other illegal activities, the frequency of nuisance arrests, and his willingness to commit an illegal act”. Rising education for example effects the pay off from legal work and thus influences the relative attractiveness of legal versus illegal activities. Unfortunately he does not state what “u” stands for concretely, rather he asserts that all, the probability of conviction  $p$ , the level of punishment  $f$  and “u” are influenced by “intelligence, age, education, previous offence history, wealth, family upbringing, etc.” (Becker 1968 : 177-178). A long previous offence record for example most likely increases the chance of being detected when committing a new crime as police are likely to check known offenders first.

However, since all these aforementioned factors influence the relative pay-off of legal versus illegal activities and the willingness to commit a crime it stands to reason that “u”, the “portmanteau variable representing all those other influences” captures these factors more fully than either the probability of detection  $p$ , or the severity of punishment  $f$ . It is this wide range of “u” that allows it to explain some of the 13 criminal facts (such as numbers 6, 9 and 11 in Chapter Four), that can not be sufficiently explained by Becker's core claim alone.

For modelling “u” this could mean in its simplest form that intelligence ( $i$ ), age ( $a$ ), education ( $edu$ ), wealth ( $w$ ) and family upbringing ( $fu$ ) should probably enter into it as crime reducing factors and previous offence history ( $poh$ ) and e.g. drug problems ( $d$ ) (which after all might influence the willingness to commit a crime) should enter into “u” so as to increase crime. A very simplified version of  $u$  thus might look like this:

$$(7) \quad u = i + a + edu + w + fu - poh - d$$

In this version a big  $u$  would reflect the predominance of crime reducing factors and imply a reduced criminal activity compared to a lower  $u$ . However this simple form of  $u$  is problematic on various counts.

Firstly many factors such as education need to be defined more clearly, for example as years of schooling. However, reaching a school or high school diploma is likely to influence job opportunities much more than a year of schooling more that does not lead to a diploma. On the other hand two young men where one got his high school diploma and the other dropped out just three months before are likely to differ much more in respect to their job opportunities. Therefore measuring education by school and university diplomas seems a better choice than years of schooling or at university.



Other factors such as family upbringing, or drug problems also need clearer definitions as there are dysfunctional biological families and capable single or foster parents. Further, one would need to decide if family upbringing is measured on a scale to capture degrees, or rather break it up into different components such as: good relationship to parents, siblings, single child, liberal education style and so on. Also not every kind of addiction carries the same social stigma. Smoking is regarded as acceptable, alcoholism already less so and injecting drugs into one's veins at the office desk reduces job opportunities drastically.

Besides these problems of definitions age poses a problem of its own as crime increases on average in age from birth to early adulthood but falls again as people age-out of their prime crime years. An ever increasing linear function that implies "the older-the more criminal" therefore can not be recommended.

Another problem is that the factors encapsulated in "u" are also related to each other. A dysfunctional family might well induce a drug problem. Drug addiction might impact on schooling negatively. Problems at school can increase the problems within the family.

Wealth and intelligence pose a different problem. Even though they were included as crime reducing factors, this is not a given. They are ambiguous as wealth could also lead to a youngster concluding that daddy's millions render the need for schooling and work obsolete. Should the fortune be lost subsequently the youngster has neither money, nor a school or university diploma. In that situation illegal activities might start to look rather tempting.

Intelligence definitely renders it easier to achieve good outcomes at school, but it also makes it easier to plan clever crimes, to take into account factors the typical criminal would overlook. It has also been noted that some highly intelligent kids (when they are not recognized as such and fostered accordingly) actually fail at school out of boredom and unwillingness to go along with things just because the teacher says so rather than for a compelling reason.

Therefore a functional form has to be found that allows for this possible ambiguity. Also some regressors such as the ones meant to capture drug addiction, or education (measured by school or university diplomas) can take on only two values. The value 1 if they have a diploma or addiction, or 0 if not. Intelligence can not take on negative values. Modelling all these characteristics and the interdependencies between some of these factors plus finding an adequate functional form and regression method for the required testing of the resulting specification will not be undertaken here.

### 3.1.3.3 Becker's "u" and Psychology

While all of these factors in "u" have probably a bearing on crime and also influence the wages available in the legal sector, these factors themselves are rather sociological than economical in nature. Indeed Becker defined the income an offender receives as "monetary and psychic". He went one step further by

including in “u” the “willingness to commit an illegal act” (Becker 1968 : 177). “U” therefore has two aspects, one related to nuisance arrests, police effort and everything involving the prospects in the labour market and a psychological one.

This psychological aspect of “u” opens the door to explain crimes unrelated to any material benefit for the offender, such as rape and child abuse. Barring the cases where videos are produced and sold, or people are forced into prostitution neither crime has a monetary aspect to it. Nor is there a legal alternative in a paedophile's mind to having sex with a minor, nor does a rapist necessarily regard consensual intercourse as alternative, if he did, he just would need to find a consenting sexual partner. Invoking Becker's “willingness to commit a crime” aspect of “u”, and the psychic reward from committing the crime for the offender, can explain any crime that the monetary rewards aspect alone could not.

However, given that Becker aimed at replacing the sociological/psychological approach that focused on individuals with a generally applicable approach based on income, the probability of conviction and the severity of punishment, it seems stretching his theory too far to rely on u's psychological aspect to explain facts such as points 6, 9, 11 in Chapter Four. Especially as neither factor, the “psychic rewards of crime” nor the “willingness to commit a crime” are part of the pantheon of variables traditionally looked at by economists, both properly belong into the realm of psychology. One also had to address the deeper question, “Why do some people enjoy committing these crimes, or are at least willing to do so ?” Using u's psychological aspect as explanation in cases otherwise inexplicable by Becker's theory runs counter to his intentions. After all he contended that “a useful theory of criminal behaviour can dispense with special theories of anomie, psychological inadequacies, or inheritance of special traits and simply extend the economist's usual analysis of choice” (Becker 1968 : 170).

### 3.1.4 Becker Theory Summary

His application of price theory to a social problem extended the subject material economists grapple with to a new field, the economics of crime. Becker claims that criminal offenders are merely rational utility maximizers who happen to be faced with incentives that render illegal activities more rewarding than legal ones. Therefore anybody could commit crimes, provided that allows maximising utility, no “criminal character” is required, which means nobody is a “born” criminal or becomes one because of a difficult childhood. Therefore no rehabilitation measures or therapy are required. On the other hand his theory implies that policies that affect educational outcomes and the labour market have a role to play in crime fighting efforts.

In general Becker highlighted that any recommendation depends on the offenders' attitude towards risk. If offenders are risk loving, increasing the probability of conviction  $p$  has more effect on the supply of offences than raising the punishment level  $f$  (Becker 1968 : 178). Were risk neutrality to

prevail the best approach would be to lower  $p$  almost down to 0 so as to reduce apprehension costs and raise  $f$  by so much, that  $pf$  together achieve the optimal number of offences. In the case of risk avoidance the same prescription would prevail.

These recommendations depend on  $b$  not being smaller than 0. However, since he suggests no punishment for which  $b < 0$ , i.e. the social loss is negative (society actually benefits), the implications for this case will not be included here. Becker contends that offenders are risk lovers in the relevant ranges. Consequently the conviction rate  $p$  plays a larger role in deterrence than the harshness of punishments  $f$ . Punishments, as outlined in more detail below should be fines, whenever possible (Becker 1968 : 181-185).

In the version presented above Becker's theory does not take into account the effects of taxation. Other economists explored what happens when taxes are included, for example Avraham D. Tabbach 2003. He identified a "crime effect", i.e. that depending on the previous tax regime and the shape of the change not only the relative payoff of legal and illegal work change, but also the perceived riskiness of illegal activities and the offenders willingness to bear risk, which renders predictions about the likely consequence of a tax regime change very difficult, it often becomes an empirical question<sup>31</sup>.

As discussed above, Becker employed the variable "u" in order to explain the supply of offences. Using its psychological aspect amounts to reintroducing psychology into Becker's theory. This would allow it to explain behaviours and facts otherwise beyond the reach of his theory. However, "u" was not meant to be used in this way since he aimed at an economic rather than a psychological understanding of crime.

## 3.2 Becker's Theory and Important Issues in the Economics of Crime

### 3.2.1 Ideal Punishment- Fines

As could be seen in TABLE 10 above,  $b$  is assumed to be 0 for fines and higher for most other kinds of punishment. Charging fines and thereby setting  $b$  equal to zero causes the term  $bpfO$  of the social loss function (1) to drop out. Thus  $L$  is reduced, which is why Becker argues for wider use of fines, rather than incarceration or other punishments. In his opinion fines have the advantage of minimizing the loss to society by crime for two reasons. Not only are victims fully compensated at the margin, but punishing via fines saves expenditure on non-monetary punishments such as parole and imprisonment.

Additionally fines require less knowledge by policy-setters than other

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<sup>31</sup> The exact results depend not only on the existing tax scheme, the planned reform, but also on how tax revenues are spent, whether or not leisure time is fixed and on returns from any activity being monetary only. For a detailed discussion see his work.

forms of punishment. The prerequisite for the use of optimal fines is knowing the marginal harm and gain as well as marginal apprehension and conviction costs. On top of that other kinds of punishment such as imprisonment require knowing the elasticities of responses to changes in punishment. Clearly this information is difficult to obtain, as controversies about the pure deterrent effect of guns and capital punishment illustrate (Becker 1968 : 194). For more details on these topics please refer to the respective sections below.

Becker admits that some crimes might cause so much harm, that offenders lack the resources to compensate fully by fines. This is the case for example for murder. In these circumstances penalties like imprisonment are recommended. This principle is extended to cover all cases where an offender lacks resources to compensate society fully. Offenders then would have to be punished additionally by non-monetary penalties. Since imprisonment is costly, sentences for those who can not pay their fines fully should be light, as the threat of prison serves mainly to make them willing to pay as much as possible. He also suggests an instalment plan to allow offenders to pay their fines over time fully, which would benefit poor offenders as they might be able to avoid prison. Society would benefit by not needing to pay for their imprisonment.

Strongly rejected is the idea of relating fines to the offender's income. Fixed fines are advocated on the grounds that prison terms and other non-monetary penalties are not related to income, therefore monetary fines should not be related to income either. Whether penalties are measured in time units or monetary units is irrelevant in his opinion (Becker 1968 : 193-200).

Block and Linde (1975a, b) highlight two problems of Becker's account on fines. Here the focus will be on Becker's problematic recommendation of shorter prison sentences for those who can not pay the alternative fine. Everybody then has an incentive to pretend not to be able to pay the fine, if prison is comparatively cheaper. So the prison sentence needs to be at least as unpleasant as the fine from the offender's point of view to persuade him to pay the fine rather than go to prison.

Friedman's analysis of the law enforcer's incentives points to the risk that replacing inefficient punishments such as imprisonment (because it is costly for society) with efficient ones (such as fines, where one person's loss is another person's gain and society as a whole does not loose, if there are no further costs involved) carries.

Friedman's starting point is the rather polemic question "Why not hang them all?" If law enforcers, witnesses and even victims benefit from convicting somebody for a crime then there is a strong incentive for rational self interested agents to put their own advantage over justice and convict even innocent people, or at least start prosecuting them to force the accused to offer a lucrative out-of-court settlement. Inefficient penalties such as imprisonment on the other hand do not benefit the law enforcers nor the witnesses unless the accused actually did commit a crime (by incapacitating the offender). So, not "hanging them all" but using inefficient punishments imposes costs on society in order to act as a deterrent to convicting the innocent and to help avoiding the rent

seeking problem (Friedman 1999 : 259-264).

Therefore turning prisons into profit making enterprises is potentially risky. It gives those in charge of the prison system a strong incentive to keep people in prison as forced labour and it might persuade them that business concerns should take precedent over rehabilitation and security. For example therapy could be cancelled to increase the hours the prisoner is available for work, or even unsuitable prisoners could be allowed to work outside the prison because there is demand for their labour e.g. on building sites or for gardening work. The economic value of prisoners was one of the reasons why post-soviet Russia was loath to reform its prison system and especially its prisoner work-colonies (Christie 1994 : 76).

This insight also explains why using capital punishment is potentially risky. Given that death is something most people wish to avoid they would be willing to accept out of court settlements even when innocent. This in turn means that there is an incentive to accuse them of a crime punishable by death in the first place. Money or other advantages could be extracted which would turn an inefficient penalty (barring use of the body e.g. organ donations) into an efficient one. Another aspect is based on a model of politics developed by Becker and Stigler in which the political class sells political outcomes to the highest bidders. Every interest group can bid. The interest group that is best able to organize its members and raise revenue to bid for political outcomes will prevail. Now suppose that criminal defendants find it hard to get organized and raise money, but potential victims and taxpayers are better able to raise revenue. They will then prevail in the political arena. According to Friedman criminal defendants are often poor, which leads to the assumption that they are less capable than taxpayers and victims to bid for political outcomes. Since the highest bidders determine political outcomes, politicians then could have an incentive to over-enforce the law, unless punishment itself is costly to society (Friedman 1999 : 267-269).

Becker also suggests an explanation as to why society so often expresses anger towards former prisoners. They have not paid their dues. In other words, if those convicts were to pay larger fines, they would be confronted with less anger, or in case they were able to fully compensate financially for their crime(s), none. Conversely the fact that convicts that are punished by fine are neither hated, nor punished by another non-monetary penalty illustrate in his opinion how beneficial it is to demand that convicts repay their debt to society.

This argument seems to be upside down, after all offences punishable by fine only are usually small offences. Those criminal acts that carry with them imprisonment, especially if the prison sentence is long are usually very severe crimes, such as rape, murder, paedophilia, kidnapping, torture. It is the offence that causes society to express horror and anger towards the murderer and rapist, not the fact that they did not have to pay a fine, or a fine smaller than the harm done. While Becker -who assumed that in general humans are self interested- would contest this, new insights into the behaviour of humans showcase that fairness is highly valued.

In an experiment, the so called ultimatum game, one person was given a certain amount of money which the subject could share as he saw fit with another individual. If the second individual accepted what was offered both could keep their shares of the money. In case the second person rejects the amount offered nobody would get anything. The amount of money handed out was fixed and known to both participants. As it turns out, if the share offered is too small, the second person tends to reject it even though then neither receives anything. It was found that the majority of individuals display concern for fair behaviour. Only a minority, though a relatively large one of 20-30 % of the participants acted completely selfishly (Fehr & Gächter 2000 : 3-5).

Given that the majority of people are willing to forgo a gift because they want to punish their partner for his greed does it really seem plausible that a suitably high monetary fine is all what is required to make society willing to accept a murderer back into it? The value placed on fair behaviour rather suggests that society will not accept purely monetary fines for heinous crimes because the offence inherently offends their sense of decency, not because monetary compensation is too low.

On a related note, if one were to accept that all crimes should be punished by fines and prison were reserved for those unable to pay two problems could emerge. Firstly, if one were to use the figures calculated in Chapter Two for e.g. a non fatal rape (90 449 €), or of roughly 2.6 million € for fatal crimes to determine the adequate fines and these crimes were punishable by imprisonment only if the perpetrators are too poor to pay the fine, then what once was a crime that carried long prison sentences and social stigma becomes the "guilty pleasure" of the rich. Given enough money offenders could rape, murder and abuse children to their hearts' delight, provided their bank accounts allow the payment of the fines. Whereas thieves unable to pay their small fines would have to go to prison, the millionaire rapists would go free to pursue their pleasures. Admittedly under such a fine based system a murderer would have to be a multi-millionaire to walk free in Germany, but letting paedophiles, rapists and murderers in liberty, just because they are able to pay is hardly a system that protects citizens from harm (no or reduced incapacitation effect, nor a deterrent), nor is there any justice.

Secondly, one might suggest that the fines simply have to be increased so as to make sure nobody can pay them, not even the multi-billionaires. Then, admittedly the two class system would be gone, society would be protected from convicted offenders and an incapacitation effect should lower crime, but imprisonment costs then would be prohibitively high, the social loss would almost certainly not be minimized. Another option would be to hand out relative fines (depending on income), rather than absolute ones, but that idea was strongly opposed by Becker in his article and will not be pursued here further.

Polinsky and Shavell (1991) point out that there is good reason in a world of varying levels of wealth to set fixed fines below the highest fine the person with maximum wealth could pay. The term  $pf$  in Becker's social loss function

implies that social loss can be minimized by lowering the probability of conviction  $p$  and raising the harshness of penalties  $f$  to compensate, because a low probability of detection and conviction will lower apprehension costs. Then the role to keep deterrence stable has to be taken on by the severity of punishment.

However, given different levels of wealth in the real world choosing  $f$  so high as to deter the richest means that others can not pay the fine, perhaps not even a significantly lower fine. For them raising the fine to its maximum level has no added deterrence effect, so  $f$  can not fully compensate for a lower  $p$ , crime would rise. An optimal fine therefore might well be far below what is required to deter top earners and rather be in a range that deters the majority.

Let us assume for illustration purposes that the richest person can afford a fine of 1000 €, all other just of 100 €. Those poorer people are as deterred by a 100 € fine as a fine can ever deter them. Raising the fine above 100 € and lowering the probability of conviction  $p$  to compensate has no additional deterrence effect due to the fine on the poorer individuals, but lowers deterrence due to a lower likelihood of getting caught (Polinsky & Shavell 1991 : 618-620)<sup>32</sup>.

This also suggests that (even setting aside moral considerations) severe violent crimes should not be punished by pecuniary penalties alone as their optimal values will not deter the better off. Another important effect of fines rather than imprisonment is that the incapacitation component of deterrence is lost. All of this suggests that relying on fines alone as penalties for serious crimes is not a good option, irrespective of their level.

### 3.2.2 Detection and Conviction Costs

A simple way to lower detection cost was suggested by Miceli and Segerson (2004: 14, 25-27), who explored the implications of punishing a group of people who harbour an offender in their midst. If one punishes the group rather than investigates who committed the crime, detection and apprehension costs are reduced. The main drawback is that the "error costs", the costs relating to the punishment of the innocent increase. In their final analysis it depends on the objective (fairness or deterrence) and detection costs whether or not group punishment was the economically better option. If detection costs are low, individual punishment yields usually the better choice irrespective of the objective. Should detection costs be high (or exerting detection efforts not be possible) group punishment is better if fairness is desired and equal to individual punishment when deterrence is the main goal. In case detection costs are low (or detection efforts fairly easy) individual punishment is preferred irrespective of the desired goal. Interestingly Becker predicted less severe punishments as detection and apprehension costs fall, apparently falling detection and apprehension costs allow "the punishment to fit the crime" better

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<sup>32</sup> They assume that  $p$  is independent from wealth and that social welfare includes the benefit offenders derive from their actions

in every aspect.

Detection and apprehension costs figured prominently also in an article by Polinsky and Shavell (1992 : 133-148). They explored whether or not detection costs should be added to the fine the convicted has to pay. As it turns out one needs to differentiate between fixed and variable enforcement costs. The latter encompasses the fixed cost responsible for detection of the crime (for a given probability of conviction) whereas the variable part refers to the actual cost of imposing a fine. Thus an offender should pay a fine equal to the harm he caused plus the variable enforcement costs. In real life this can occur at court, when the losing party is asked to pay a fine and bear the costs of the trial.

Further, they analysed the effects of very low and very high variable and fixed enforcement costs respectively on the optimal detection level  $p$ . Given high enough detection costs it would be optimal not to apprehend anybody, since the marginal harm of an offence is below the marginal cost of apprehending it. The same effect can also be observed in Becker's social loss function. For a detailed account on how optimal probability of detection  $p$  varies with variable and fixed detection costs see Polinsky and Shavell (1992 : 133-148).

The role of  $p$ , the likelihood of conviction was addressed also by Steven Levitt. He found no empirical evidence for the effectiveness of better policing technology and practices in reducing crime, though he expected it to have a positive effect. He was able though, to ascertain empirically that an increase in the police numbers does tend to reduce crime. He did so by comparing the crime development of American cities whose politicians had to face elections and increased police numbers with cities that did neither hold an election nor hired more police. Mayors eager to get re-elected hired additional police men even when the crime rate is flat, in order to secure the law-and-order vote. The rationale behind Levitt's approach was to avoid the trap one often encounters: a lot of police in areas with high crime rates and small police forces in areas of little crime, which could be misread. The causal link goes from high crime via concerned citizens clamouring for better protection to a bigger police force, not the other way round (Levitt & Dubner 2005 : 126-130).

As mentioned above more police does deter crime. It might do so in two ways outlined by Becker. First by detecting and apprehending offenders who -if they receive a prison sentence- are incapacitated and secondly by scaring off potential offenders, who face a higher risk of detection. Corman and Mocan (2000) even found that a 10% rise in police lead to a fall of 10% in crime (in Levitt & Miles 2006 : 152). One word of caution though, Dills, Miron, Summers (2008: 6-7, 21)<sup>33</sup> found in a literature overview that Levitt's results are "sensitive to a coding error". They do not find empirical evidence that supports the-more-police-less-crime claim unequivocally, but they do concede that more police probably does deter crime. Kleiman (2009 : 105-106) notes that it depends on how police are used. If they measure success in the reduction of crime rather

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<sup>33</sup> They measure police per capita which seems problematic as high crime regions might have more police than low crime areas.



than arrests rates their activity does reduce crime.

### 3.2.3 Labour Market and Crime

A crucial feature of Becker's theory of crime pertains to the earning prospects available in the criminal versus the legal sector. Theoretically an increase in the earnings available in the legal sector should entice former participants in illegal activities and potential first time offenders to choose legal activities instead. Improving labour market conditions also should reduce crime, not only because wages might rise but also because more jobs are offered to people with low skill and education levels. These two possible paths to reducing crime implicit in Becker's work spawned a huge literature in economics. Machin and Meghir (2004) found evidence for the UK that low salaries and bad job prospects for the least skilled do indeed lead to more property crime in the presence of higher returns to criminal activity.

Freeman (1991) stresses that criminal activity reduces long term prospects in the legal sector. He finds evidence that it is rational for disadvantaged youths to "choose" crime only in short run. Due to the high number of uneducated among the group of offenders he advocates any kind of training and schooling program that has at least some effect in order to reduce crime. In his 1994 paper Freeman again found a link between the labour market, economic inequality and crime. Freeman also pointed out that there is a group of repeat offenders. This also applies to Germany, as has been presented in Chapter One. A literature overview by R.B. Freeman (1999 : 3554-3556) complements the aforementioned results. Among others he refers to Grogger's (1995) findings that wage and employment effects of imprisonment vanish over time. Further, imprisonment has a bigger effect than parole or any other non-institutional punishment.

Robert Witt and Ann Dryden Witte (2000) unearthed indications that rising labour market participation of women tends to increase crime. They differentiate between a higher short run effect and a slightly lower long run effect. Presumably it takes schools, families and others time to adjust to the new situation (to the extent adjustment is possible at all) and provide youngsters with the supervision and care formerly provided by the stay-at-home mother.

Hamermesh (1999) investigated the crime-timing-of-work link and found that the homicide rate and the shift of working time from nights to the day time are connected. Potentially then economic activity might shift into less efficient time slots due to crime, which would add to the burden of crime calculated in Chapter Two.

In a departure from Becker's model specification Tetsuji Hamada, Tadashi Hamada and Johan King (1991) assumed that criminals and non criminals differ by birth in their attitude towards risk, whereas Becker did not assume that criminals and non criminals differ in general in their basic make up. Unlike the three authors who assumed criminals to be risk loving by birth, he merely expected those who do commit crimes to exhibit risk loving over the

relevant range of the probability of detection and conviction  $p$  and the severity of punishment  $f$ . However, this difference notwithstanding, these three also find a link between bad labour market conditions and higher crime and vice versa.

Imai and Krishna (2004) claim that it is the prospect of losing one's job in the future more than having one now which causes people to abstain from illegal activities. This fear of losing one's job in the future due to criminal activity is also the reason why early intervention programs raising skill levels and education are more effective than intervention after the fall. They argue that later interventions in effect reduce the punishment for offenders from losing their original job, thereby reducing deterrence. However, they recognize the need for further research and different specifications to be absolutely sure their results hold.

Grogger (1998) points out that the racial difference of crime rates between whites and blacks in the US is to some extent explicable by the different employment and wage opportunities these groups face. The phenomenon of youth criminality that falls as people age is attributed to the improving wages as people age.

Poutvaara and Priks (2007) added a voice of caution to this chorus of "improve labour market conditions and/or chances of hitherto disadvantaged people in the labour market and crime will fall". They use the observation that unemployment usually increases property crime but not violent crime as their starting point.

A gang-crime model is proposed to explain what happens when labour market conditions improve. The leader derives utility from the number of gang members and from the crimes committed by them. As the legal alternative starts to become better due to an improving labour market the opportunity cost of being in a gang rises. This is especially true for those who ascribe a relatively low value to gang membership. Since only the respective individuals know how much they value being in a gang and those with high values might copy the behaviour of those with low values the gang leader has a problem. Either he accepts that the number of crimes committed by his gang falls as the labour market improves, which might well mean that the crime per capita ratio falls below the threshold that was set for membership originally, thereby reducing his authority, or he settles for a smaller, but more criminal gang by shifting the crime requirement upwards (e.g. more violent crime) so as to weed out all those of his followers who place little value on gang membership. Poutvaara & Priks therefore recommend a combination of improving the employment situation and increasing policing in already troubled neighbourhoods.

One might wonder if the gang leader could be motivated to "up the ante" not only by prestige but also by a desire to ensure the loyalty of his followers. Thus he might want to lower the risk of being betrayed by his men. Those who commit very few (and light) crimes have probably more to gain from cooperation with the police than those who committed many (serious) crimes.

Improving economic conditions could also lead to more crime, depending on how the labour market develops. Should inequality rise because the higher skilled benefit disproportionately from economic growth compared to the un-skilled (or less skilled) members of the labour pool crime could rise. Freeman and others mentioned above noted that in passing, Kelly (2000) went into more detail. Inequality was found to impact on crime, even after he had controlled for many other possible factors such as for example poverty and race. Surprisingly it is affecting violent crime, rather than property crimes. Perhaps this is due to the geographical distance between the poor and the rich in the US thus reducing opportunity.

Becker's theory implies that crime could be reduced by increasing the expected utility streams in legal activities, for example, via higher salaries, or better job opportunities for those at the bottom of the labour-market. That in turn would necessitate (more) education, to qualify potential offenders for better paid legal jobs. If people really choose to commit crimes because legal activities do not yield enough expected utility, then labour market and education policies become complements to the traditional crime fighting strategy based on the police and courts.

However, while employment and earnings have a clear link with crime it is not "the determinant" of crime, because people might participate in both, legal and illegal activities. Also, people who feel strongly about the law do not commit crimes, even if unemployed (Freeman 1999 : 3543).

### 3.2.4 Capital Punishment

Ironically given Becker's insistence on using fines rather than other punishments his theory was often used to argue for harsher punishments, such as longer imprisonment and capital punishment. The latter was also defended by Becker himself. He assumed that death would be the ultimate price, even for a hardened murderer and cheap for society, since it does not cost much to kill someone (Donohue & Wolfers 2006 : 3-4).

A widely publicized estimate of the deterrent effect of the death penalty by Isaac Ehrlich (1975 : 397-417) stated that one execution reduced the number of murders committed by 8. He had examined the time period 1933-67. Ehrlich argued that there is no reason to assume that people who know one another react less to incentives than strangers. Thus he tried to deal with the argument that murders unrelated to material motives are beyond economics. His approach was to make the utility of the potential murder to some extent dependent on the utility of the potential victim. Indeed, interdependence of utility would be more likely if people knew each other. In case of hate the murderer presumably experienced an increase in utility as the victim's utility decreases. Further, he stated that capital punishment exerts a deterrent effect beyond the incapacitation effect. Therefore he argued for the death penalty, though he acknowledged that intervention on the labour market and education could also reduce murder.

Given Becker's framework and Ehrlich's estimate the death penalty looked very tempting. It raises punishment  $f$  to very high levels, which might allow even a lowering of the probability of detection and conviction  $p$  and therefore lower detection and apprehension costs without a rise in crime. Costs would not only be lower because of the lower probability of detection and conviction, but because killing someone costs less than imprisoning a person. That at least might have been expected, but in a democracy like the USA the legal proceedings and the resulting long period spent on death row before the execution renders capital punishment very expensive. For the State of North Carolina the expenditure per execution amounts to 2.16 million \$, more than the maximum penalty life in prison would cost (Donohue 2005 : 48-49). As Donohue put it "if the threat of death were immediate, inescapable and known and understood by all, I doubt many would reject the deterrence hypothesis" (Donohue 2007 : 9). However, in reality none of this might be true.

Follow up work on Ehrlich's article discovered, that his results are not robust and vanish if the specification is changed just slightly. It was also pointed out by Steven Levitt, that only 1 out of every 200 murderers is executed, which transfers to 0.5% (Donohue 2005 : 48-49)<sup>34</sup>. This compares rather favourably with the death rate found by Kennedy, Piehl and Braga (1996) among Boston gang members of 1.5-2% (in: Levitt & Venkatesh 2000 : 786). Levitt and Venkatesh (2000 : 755-759, 786-789) obtained an even higher number in their study. According to them each year 7% of street level drug-sellers get killed. They encountered a great readiness to accept death by footsoldiers. Levitt and Venkatesh speculate that actual death rates might be higher than the street-level dealers originally expected. However, they investigated just one gang. Nevertheless life on the streets seems more likely to lead to a premature death than being a convicted murderer.

In addition to that Anderson (2002 : 8-12, 21-22) found that the majority, 73% of prisoners convicted for murder and non-negligent manslaughter did not expect to be caught, or did not even think about the chance of that happening at all. If one expects to remain undetected and therefore not convicted, the punishment level becomes irrelevant. Of course the most relevant group to ask would be potential murderers, but still it is interesting that so many who in Becker's theory "decided" to commit murder did not think about the probability of detection and conviction, thereby effectively setting it to 0 which renders punishment  $f$  in effect nought as well.

Anderson also mentions that the knowledge about detection and conviction probabilities varies with the crime. Offenders who had committed violent crimes (presumably more impulsive crimes) were much less informed about the probability of detection  $p$  and the punishment level  $f$  than for example burglars and thieves. In his sample of prison inmates 89% of the most violent offenders had neither expected to be caught, nor did they know what punishment awaits them if there were caught .

I encountered something similar in an, admittedly very small, sample of

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34 He referred to Levitt's work

prison inmates in Munich. Half had not thought of the consequences of their actions at the time they committed their crime, 80% did not know the potential penalties. Roughly a third had expected to remain undetected<sup>35</sup>. Becker stated that in his experience criminals living in high crime areas know the possible punishments and detection risks very well (Becker 1995 : 9).

This apparent contradiction is probably due to the fact that those criminals Becker had referred to are mainly into theft, robbery, property crime in general. These crime are committed by many and frequently enough without serious consequences after the first encounter with the law so that a criminal knowledge base can be accumulated and experiences shared. For violent, especially fatal violent crime the chances of doing so are slim as the detection and conviction rates are much higher and no detected and convicted murderer is released back onto the streets until after he served his sentence.

In my personal experience during the 1,5 years of volunteer work with sexual offenders in prison, I encountered people who often had no criminal record prior to the crime they were imprisoned for, nor had they known criminals before they became convicted. Within their families, (former) circle of friends and neighbours they were the only criminals, had no prior knowledge of detection risks or penalties.

Summing up it seems fair to say that the knowledge offenders have about the probability of detection and conviction and the severity of punishment f depends on the crimes they are engaged in. Crimes that allow for frequent repetition either because detection rates are low, or because initially the response of the law is mild would allow the accumulation of relevant knowledge about the probability of detection and conviction and the harshness of punishment whereas serious crimes that are more often detected and carry severe punishments do not allow that until the convicted are in prison. Further, given the high risk of dying that a criminal way of life entails compared to the risk of being executed even after having been convicted for murder, a deterrence effect of capital punishment on criminals seems rather unlikely.

On the contrary, Levitt, Katz and Shustorovich even found that the death penalty might increase the number of murders (Donohue III 2005 : 49). Ironically a paper by the same trio discovered that bad prison conditions (measured by deaths in prison) do seem to deter crime, even though the death penalty does not (Katz, Levitt & Shustorovich 2003 : 318-343). This lets Donohue conclude, that "abolishing the death penalty would save American taxpayers more than 150 million dollars per year at no apparent cost to society" (Donohue III 2005 : 49).

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35 Survey of prisoners conducted by the author in Stadelheim, München in 2009, data available upon request. Due to the very low rate of returned questionnaires the results are not scientifically valid, however the results are of interest as a case study and to be evaluated in conjunction with more representative studies. The prisoners asked do not fall into any specific category but exclude the insane and those awaiting trial.

### 3.2.5 Gun Crime

Inspired by the “if crime becomes risky enough criminals will desist” logic inherent in Becker's theory, Lott Jr. & Mustard (1997 : 129-201) claimed that law abiding, sane citizens should be allowed to carry concealed hand guns. They claimed that homicides and rapes are reduced, though property crime where no contact with the victim takes place increases. Substitution of one crime for another depending on a relative change of their respective punishment levels would seem to be in line with Becker's theory. Lott Jr. and Mustard also found that an increase in the arrest rate alone deters crime, even if no conviction follows.

Mialon and Wiseman (2005) found that gun control yields benefits for society. The exact benefits would depend on the regime, marginal gun control leads to less gun crime but more other crime, whereas full gun control eliminates gun crime completely. They feel that this imposes too big a restriction on individual liberty and advocate instead severely punishing gun crime, thus eliminating it while leaving the right to bear arms intact. From a European perspective their result that full gun control would put an end to gun crime looks most interesting.

However, some of their modelling choices are not very realistic. For example they assume that in a gun fight between the victim and the criminal each has a 50% chance to get shot. This seems implausible in reality, since a criminal should have more experience than the typical victim in both, how to handle a gun and how to handle himself in dangerous situations.

If however, it comes to a shoot out between victim and perpetrator and one of them is injured or worse dies, whereas before the victim would have e.g. handed over the wallet then this seems to be a harsh trade-off to advocate, even economically, if the VSL is anything to go by.

A related issue is their demand to differentiate between the unproblematic “self-defence gun” and the problematic “criminal gun”. If, in the course of self-defence a burglar gets killed, does his death count towards the cost of crime, though self-defence is no crime? Their proposal could lead to the underestimation of the death toll and costs of gun related violence if only murders, but not deaths due to self defence are included. It might seem petty to ask an “accounting” question, but any policy designed to reduce harm to society needs to be based on sound data.

On a related note, a recent report found that “...in 2009 ten states (Arizona, California, Georgia, Florida, Indiana, North Carolina, Ohio, Pennsylvania, Texas and Virginia) supplied almost half the interstate-trafficked guns recovered at crime scenes” in the USA. Another report found that “...90% of the guns recovered from crime scenes in Mexico and traced led back to American dealers.”(Anon 2010b). This suggests that any study on gun related violence has to be designed carefully to take into account the effect gun laws in any particular state of the USA or the country as a whole have on gun violence. Limiting a study only to one or a few states or only to the USA means in effect

excluding a wide range of consequences and potentially falsifying results.

Dezhbakhsh and Rubin (1999) drew on existing economic models of crime to incorporate the effects of gun laws with the result that any change in crime and its direction depend on a variety of economic, social and demographic factors of the respective region. After employing some refined statistical methods they found a much smaller reaction to concealed handgun laws than Lott and Mustard. A slight decrease in murders, but increases in other categories of crime for example robbery were observed. For many other crime categories results were ambiguous.

Duggan (2001 : 1109-1112) found that guns increase homicide considerably, but have no significant effect on any other crime. Ayres and Donohue (2003a) emphasized at length that any result crucially depends on the statistical model chosen and the aggregation level as well as the availability of data. Their overwhelming result was that no clear conclusions can be drawn as one specification finds increases in crime, another yields a result somewhat similar to Dezhbakhsh and Rubin in that some states would experience higher crime, whereas other would benefit from lower crime. What was confirmed though was the lack of robustness of Lott's and Mustard's original results and that there is no statistically reliable evidence for the "more guns, less crime" hypothesis. That however led to proponents of this theory, for example Florenz Plassmann and John Whitley and its opponents e.g. Ayres and Donohue to engage in an exchange without fundamentally new results (Ayres & Donohue III 2003b : 1371-1398).

### 3.2.6 Abortion

Though not part of Becker's original theory I would like to present two issues relevant to the crime debate, especially related to the huge drop of crime observed in the US starting in the nineties, namely abortion and illicit drugs (Freeman 1999 : 3563).

One explanation for the big drop in crime is legalized abortion, an argument put forward by Levitt. His reasoning was simple: Legalizing abortion rendered it affordable for women with a low socio-economic standing, possibly living in difficult circumstances, who might feel unprepared or simply did not want a child. Those are exactly the factors that render a future criminal career of the child (if it were born) more likely. Due to legalized abortion lots of these potential future criminals were never born, once their cohort entered the usual age of starting criminality, crime began to fall (Levitt & Dubner 2005 : 136-144). This hypothesis ignited a heated discussion in the USA. Joyce (2006 : 1-3, 19-24) found Levitt and Donohue's (LD) results lacking in robustness and their estimates to be insignificant. Foote and Goetz (2005) criticize the omission of an interaction term, something LD acknowledge but claim that including it renders their results stronger (Donohue III & Levitt 2008 : 1-3, 13-15). LD's argument seems plausible, but as far as the empirical evidence goes it seems fair to say that no agreement has been reached yet.

### 3.2.7 Drugs

However, a less contentious but important aspect of crime is the drug-crime link. As Levitt and Venkatesh discovered that for most street level drug dealers it is less the actual income generated by the illegal activity that lured them, but rather the hope of eventually moving up the hierarchy, where the profits of the drug trade are. Freeman (1999 : 3551-3556) however finds that the majority of literature points to higher pay for drug selling than legal alternatives. The same seems to be true in general for illegal versus legal activities for those who commit crimes.

Legalizing drugs, or even handing them out on prescription as a state monopoly could terminate drug dealing "over night" and also those crimes committed by junkies to finance the habit (crime for profit). Along this line of thinking Jofre-Bonet and Sindelar (2002 : 18-26) recommend drug treatment programs as a possibility to reduce drug crime and crime for profit, despite some caveats and the need for further research to arrive at a detailed cost-benefit analysis of drug treatment versus incarceration.

Dills, Miron and Summers (2008 : 17-19, 21) found that forcing the drug market underground and the changing strictness of enforcement over time explains the varying development of crime in different locations and that there is a clear link to crime in particular to violent crime. Underlying these symptoms is the lack of an alternative dispute resolution system.

Their findings imply that legalizing drugs would have the beneficial effect of lowering crime Donohue (2005 : 52-53) predicted. He identified two additional benefits from legalizing drugs. First, law enforcers are freed from pursuing addicts and low level dealers to pursue those who committed more serious crimes. Since the US spends about 40 billion on its fight against drugs that saving would be considerable. Second, he refers to Levitt's findings, that drug-related criminals crowd out more serious criminals in prison. As more people are incarcerated for drug related crimes less people are sent to prison for other crimes. In the US about 400 000 people are incarcerated for non-violent drug-crimes, 50 000 for marijuana alone. This suggests the possibility of an increase in non-drug related crime as violent offenders might go free whereas non-violent drug offenders are imprisoned. It can also not be ruled out that incarcerating non-violent drug criminals could further their criminal careers (Dills Miron & Summers 2008 : 19).

Another benefit of eliminating the underground drug market would be the likely reduction in the homicide rate. A very conservative FBI estimate puts the rate of homicide related to drugs at 5% (Donohue III 2005 : 52-53).

Summing up, drug related crime does affect the overall crime rate significantly and moving from a war on drugs which creates massive illegal profits for organized crime to legalizing drugs is likely to yield significant benefits. Consumption could be limited by either subjecting drugs to VAT and hunting tax evaders as Donohue (2005 : 52-53) suggested, or via a state monopoly with doctors handing out drugs or substitutes on prescription as is



done already in some cities. Zürich for example is running a drug substitution program (InfoSet Direct 2010).

Kleiman (2009 : 149-164) contends that even forced drug treatment programs work and are cost-effective. If on the one hand the treatment is a success, then a drug addict stops taking drugs thereby reducing demand for them and doesn't need to commit crimes to finance his addiction. If on the other hand the treatment fails, the patient returns to drug taking and criminal activity afterwards, but while the treatment lasts, the number of offences falls, while simultaneously expensive and scarce prison space is freed up. So either way drug treatment programs help to reduce crime and costs by reducing the crowding out and criminal capital accumulation effects.

### 3.2.8 Prisons

One of the most recent papers dealing with that aspect is by Bayer, Hjalmarsson and Pozen's (2009 : 105-106, 125-138) "Building Criminal Capital behind Bars: Peer effects in Juvenile Corrections". Apparently young offenders who committed the same kind of crime learn from each other if they live together in the same correctional facility. They also tend to create and extend criminal networks. This additional knowledge pertaining to the crimes the offender was convicted for leads to increased specialization, which increases returns from illegal activity. The authors found significantly higher rates of recidivism for those who served time together with people who committed similar crimes. Surprisingly people do not seem to branch out to new crime categories, if they were put together with people convicted for other crimes. No peer effects were found in these cases.

Therefore estimates of the crime reducing net effect of prisons (incapacitation and deterrence versus crowding out, criminal capital and other effects) have become lower in recent years. Donohue (2005 : 48) claims that raising imprisonment numbers by 10% reduces crime by 2%, a result that is too high according to a later study by Useem and Piehl. They estimated reduction in crime due to 10% more people behind bars to amount to only 0.5%. This also depends on the imprisonment figures the country or state started with. Those U.S. states with the highest ratio of citizens behind bars would probably increase crime rather than hinder it by imprisoning even more people (Anon 2010a).

This is not only due to the effects described above (such as the crowding out effect of serious criminals by mass-incarceration of low level drug offenders), but also due to reduced social stigma of prison-sentences once many in a community have been incarcerated. Indeed the opposite can be observed in some communities, having been in prison bestows stature rather than stigma. However, employers will still tend to regard a prison term as stigma, which reduces job prospects, so illegal activities become more attractive after release.

Other findings point to a rise in gang influences within prisons as the prison population rises, unfortunately without necessarily weakening the gangs

outside of prison. So the gangs become a force in-and outside the prison with considerable power of intimidation.

Further, each additional prisoner is on average less criminal than the one incarcerated before, a kind of diminishing returns to scale of imprisonment. Assuming that first the most dangerous are incarcerated, less and less dangerous criminals (on average) take up valuable resources, as the prison population grows. The median prisoner is far less criminal than the average one. Also as people age their criminality falls on average, the same applies to prisoners. Keeping those over e.g. 30 in prison costs a lot of money, more than might be warranted by their average criminality after release. (Kleiman 2009 : 89-92, 109-116). Some states in the US have moved so far into the diminishing returns side that a further rise in prison population would increase damage to society and crime, rather than reduce it (Anon 2010a).

For Germany though this does not yet seem to be true according to a recent study of the penal system by Horst Entorf, Susanne Meyer and Jochen Möbert, published in 2008 (Storbeck 2008). Imprisonment of a criminal costs 35 000 € and avoids 50 000 € damages a year, but for methodological reasons it is not possible to assume these numbers hold for consecutive years.

It is clear however, that prison space is costly everywhere, which explains efforts by various governments to make it less so via e.g. privatization or allowing private businesses to employ prisoners. For the potentially perverse incentives that can arise when prisons are turned into less costly institutions or even start resembling businesses, see the section on fines.

Another option is to transfer the less criminal prisoners from the prison system to an alternative punishment, for example on to parole. For that to work parole needs to be enforceable and actually be enforced. As suggested by theory and confirmed in practice swift and certain punishments deliver better results than much harsher punishments that take a long time to come.

Hawaii instituted a program, called H.O.P.E. (Kleiman 2009 : 34-41, 96-98) along these lines. Parolees routinely had to take drug tests which were announced just a few hours in advance. Everybody who had violated parole conditions (such as not taking drugs) would be brought before a judge and sent to jail for a few days. Soon the parolees realized that the state means business and compliance rose dramatically. In effect the program easily paid for itself by avoiding the second long term prison sentence they would have had coming if they had fallen foul of parole conditions. Also offences fell as drug consumption fell and curfews were respected.

This outcome could be achieved only because the judge, the prosecution, police and parole officers co-operated and set out clear rules (which were communicated to offenders) and worked together streamlining bureaucracy and designing painful but short penalties to render punishment swift and certain.

While this is an example for reform within the usual crime fighting system to avoid expensive and potentially counterproductive incarceration (especially in states/countries that already have a big prison population), the

theory can also be applied in other ways to reduce crime. Some of those alternative measures will be explored in Chapter Five.

### 3.3 European Studies on Economics and Crime

Enlightening as these mostly America-/Canada-/UK -based studies are, the question arises if these results were to hold for Europe, too. Admittedly Europe itself is quite diverse which could mean that even results that hold in one country do not hold to the same extent in another one.

Matti Viren (2001 : 1874-1878) provides one European study employing a Beckerian style theory (people reacting to incentives) combined with a labour-leisure model not unlike Ehrlich's model. He chose Finland as the setting of his empirical study. One advantage was the good data available for Finland. In his paper "Modelling Crime and Punishment" he uses an economic model of (property) crime that allows for heterogeneity among the individuals and varying degrees of involvement in criminal activity rather than a clear cut between only-legal or only-illegal activity. Furthermore he allowed for criminal activity to be regarded as either work or leisure. Depending on the attitude less or more time is devoted to it. His results were that transfer payments reduce crime, but unemployment did not raise crime. Viren suggested that the latter might be a peculiarity of Finland. One might speculate that in Finland the unemployed receive enough help to desist from crime. The effect of income on crime is ambiguous as higher income increases legal earnings but also the opportunities to commit property crime. Unfortunately the data did not allow the estimation of the net effect. In general however, Viren did find a connection between crime and legal work opportunities or rather the lack thereof. He identified a deterrent effect due to the apprehension rate as well as the punishment level with the apprehension rate probably being the more important deterrent. Another similarity with Becker's result was that criminals are risk loving.

Fortunately a German study by Entorf and Spengler (2005 : 543-552) points in the same direction. They found that arrest and in particular high conviction rates deter, less so the actual punishment. Arrest rates deter property crime, but not violent crime. Raising conviction rates deters violent crime. They suggest it has to do with victim and perpetrator knowing each other (in the case of a violent crime), which renders clearing up the crime more likely, so variations in the detection rate are less likely to play a big role. That there is a deterrence effect on violent crime is in line with Becker, who stated that even offences that are commonly regarded to be spontaneous, like unpremeditated murder do not seem to differ in their reaction to the probability of detection and conviction  $p$  and the severity of punishment  $f$  from premeditated crimes (Becker 1968 : 204-205).

Adults were found to be more deterred than youth. Two reasons suggest

themselves, the lower punishments meted out for youths and a lack of maturity resulting in a failure to appreciate the consequences of their actions. Levitt argued that youngsters react to changes in the penal code (e.g. once they come of age) by reduced crime, something others contend (Entorf & Spengler 2008 : 5).

In 2008 Entorf and Spengler (2008 : 10-32) reaffirmed their earlier findings and argued for the importance of bringing cases to court and formal punishment to achieve deterrence. Informal sanctions and not bringing cases to court fail to deter. The extent of the problem becomes clear if one recalls data introduced in Chapter One which showed that the share of cases not reaching court, or dropping out there is above 50% in Germany. That potential offenders react to the probability of detection and conviction  $p$  rather than the harshness of punishment  $f$  was also a prediction of Becker, based on the assumption of criminals being risk lovers.

Further, evidence that the results found in the USA hold in Europe, too, is provided by a 2009 study by Saridakis and Spengler (2009 : 1-9) focusing on Greece. They showed a link between unemployment and property though not violent crime. The exception was rape. Once they differentiated between male and female unemployment they discovered that a rise in male unemployment tends to increase rape.

In an earlier paper Entorf and Spengler (2000 : 11-19)<sup>36</sup> used European regional data to empirically test various theoretical factors of crime. As in the American data wealth and unemployment increases property crime. Crime is also linked positively to drugs, which in turn also depend positively on unemployment and wealth, in addition to other factors.

In general, activity e.g. the overall employment rate was found to increase crime. Possible reasons include that people commuting to work are easier and more visible targets than those staying at home. Also their salaries allow the accumulation of property that can be stolen. Economic activity seems to provide the illegal opportunities people like to take advantage of especially if they themselves are unemployed. Urbanity was also found to contribute to drugs offences as well as to crime in general. A similar relationship holds for family disruption. They speculate that increased divorce rates and female labour force participation reduce parental oversight and leave children and youngsters more susceptible to negative influences. As could be seen in the preceding labour market section a link between crime and female labour force participation was found in US data, as well.

### 3.4 Concluding Remarks

Overall Becker's insights seem to hold for the USA and other Anglo-Saxon countries as well as for continental Europe. His main contribution was to see

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36 Some caution is warranted as the results do depend to some extent on the aggregation level

criminal behaviour as rational choice in the face of uncertainty with the probability of detection and conviction  $p$ , the severity of punishment  $f$  and the respective earnings possibilities determining whether or not an individual chooses crime or legal work. Ehrlich's extension allowed to take into account overall time spent on earning-activities, as well as leisure time.

Despite the explanatory power of Becker's model of crime as exemplified by the drugs-crime channel and the labour-market-crime linkages this model can not explain all crime. In fact in some cases the empirical evidence is contested even for plausible theory predictions such as the "more police-less crime" link, or more controversial yet, the abortion crime link. The latter though was not predicted by theory.

Becker had wished to move away from the sociological/psychological view on crime, but even his theories are not completely free from factors traditionally regarded as psychological ones, such as the "willingness to commit a crime", one of the two aspects of "u". Some crimes seem to be rooted in psychological needs of the perpetrator rather than related to monetary rewards or the prospects of detection and punishment. Paedophilia for example can not be explained within Becker's framework without substituting economic variables for psychological ones. There is therefore a limit to what his theory can potentially explain. Intuitively it makes most sense to apply it to somehow property or money related crimes whereas trying to apply it to crimes due to mental problems and unusual or highly problematic psychological profiles are probably best left to psychologists. This is especially true as Becker wanted to move away from looking at individual and special cases (Becker 1968 : 170).

Another problem in determining which subject provides better insights is that salaries in legal occupations often increase with age because: Firstly, educational levels rise (school, high school, university); secondly, the entry in the professional workforce takes places and thirdly, work experience is rewarded. On the other hand from a psychological/sociological view age brings with it maturity and the acceptance of responsibility as difficult transition phases from childhood to adulthood, from school to work and from less serious relationships to relationships that are meant to last long term are mastered. Age is a proxy for both legal income possibilities in Becker's economic theory of crime, as well as a maturing process that tends to reduce delinquency from a psychological/sociological point of view.

Therefore it is hard to say which field explains crime better. However, that is posing the wrong question. Each field contributes to the understanding of crime, highlighting different causal relationships. Together they offer a wide choice of methods to prevent and combat crime.

Besides the traditional route, increasing security expenditure, labour market and education policies could be used to that end. Employing policies based on that model presupposes that Becker's theory indeed can explain often observed criminological facts. Whether it does will be explored below.

## 4 Can Becker's Model Explain Commonly Found Criminological Facts?

How well Becker's theory fits the observed facts will be discussed below. To do so a list of criminological facts will be used, that -according to Braithwaite- any theory of crime should be able to explain. Does Becker's theory of crime predict or at least explain accurately who is likely to commit crimes? Is it right about the ways to reduce crime? The 13 criminological facts identified by Braithwaite are presented (and quoted) below in italics (Braithwaite 1989 : 44-50). A short evaluation of Becker's theory is included under each fact.

1. *"Crime is committed disproportionately by males."*

There is no mentioning of gender in Becker's theory. However, perhaps there is something gender specific about the pay of legal and illegal activities. The legal activities of women are often less paid, even if similar positions are compared. Taken on its own, this would suggest more crime by females, but many illegal activities are probably not open to women, or they receive little pay, which could more than compensate for lower pay in legal activities. After all, hired killers, pimps, drug dealers, pirates, gang members and cartel bosses, their lawyers and accountants tend to be male (BMI 2008 : 5, 11)<sup>37</sup>.

2. *"Crime is perpetrated disproportionately by 15-25 year olds"*

Depending on the country education, even at university level up to the master's degree is either finished or will be shortly around the age of 25. Therefore the pay in legal activities is likely to increase sharply as students switch from student jobs to their professions and other youngsters benefit from a few years of work experience and/or training on the job. While the legal sector starts offering higher salaries the illegal sector has not necessarily a reward for education, so no improvement in utility can be expected in the latter. Therefore a decrease in illegal activity from around age 25 onwards can be explained within Becker's

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<sup>37</sup> Most criminals are male in Germany, especially in the case of violent crime.

framework. Grogger (1997) found that salaries tend to rise with age (see labour market section)

3. *"Crime is committed disproportionately by unmarried people."*  
This sounds curious, but at least in Germany married people usually earn more and are in a better tax regime, both of which renders the pay off and therefore expected utility from legal activities higher than for unmarried people. However, the more important factor seems to be that people, at least in Germany, tend to marry when they have finished their education and found a job, often after having lived together for many years. So by the time people marry they usually have a degree, job and work experience. Under these circumstances legal activities often offer higher returns than illegal ones.
4. *"Crime is disproportionately committed by people living in large cities."*  
A city should offer a wider range of legal as well as illegal activities. This does not explain more (reported) crime in urban areas. Rural communities offer less anonymity, this would imply that the likelihood for apprehension and conviction is higher (once a crime was reported) in the countryside than it is in cities. A higher probability of conviction  $p$  should reduce expected utility from illegal activities and (given everything else stays the same) lead to less offences.
5. *"Crime is committed disproportionately by people who have experienced high residential mobility and who live in areas characterized by high residential mobility."*  
Mobility played no role in Becker's analysis but presumably there are two different possible reasons for people to experience high residential mobility. One possibility is that people are forced to move from location to location because the job requires it as is the case for soldiers, some government officials, specialists and managers. This would imply high returns from legal activities and low participation in illegal ones. On the other hand people might experience high mobility because they hold insecure, temporary jobs and are frequently forced to move to find another one. In that case illegal activities might offer more than legal ones, which would increase the likelihood of participation in illegal ones. Also these people will be forced to live in cheap areas. Their neighbours probably share the same fate, which would explain that areas of high social mobility have higher crime rates. As the second interpretation shows, this point also can be explained using Becker's work.
6. *"Young people who are strongly attached to their school are less likely to engage in crime."*  
Since youngsters might feel attached to their school for other reasons than high educational and occupational aspirations this case is beyond Becker's model. Some might feel attached to their school only because their friends go there. There is one way (via "u") this might be explained (see section 3.1.3).
7. *"Young people who have high educational and occupational aspirations are less likely to engage in crime."*

While it is common sense that people with high goals in life have to allocate their time accordingly to have success and do not want to risk losing scholarships/internships by becoming a criminal, it requires youngsters to take a long term view. Somebody who holds a scholarship might actually experience higher returns from legal than from illegal behaviour, but for the rest there is no reason why returns from legal activity should be higher than those from criminal activity in the present. They will most likely be higher only in the future. Becker's theory might be stretched to accommodate this case by allowing for different time periods and by showing that the expected utility of legal activities in the present and the future outweigh the alternative of illegal activities now and running the risk of not being able to participate in legal activities later due to legal requirements or stigma.

8. *"Young people who do poorly at school are more likely to engage in crime."*

If doing poorly at school reflects sloppy work attitude and/or low mental abilities, then employers might prefer to hire those who do well at school, which would lead to reduced employment opportunities for the others, rendering illegal activities more tempting.

9. *"Young people who are strongly attached to their parents are less likely to engage in crime."*

This fact is hard to explain using Becker's model, except for relying on  $u$ , one of the factors determining the number of offences. For a discussion of  $u$  see section 3.1.3.

10. *"Young people who have friendships with criminals are more likely to engage in crime themselves."*

The reason could be that friendships with criminals bring with them some inside knowledge which could either increase the monetary reward from crime and/or reduce the likelihood of getting caught, both of which will increase the expected utility from crime. Conversely being known for a close friend of criminals might scare off potential employers offering legal jobs, thereby reducing legal opportunities.

11. *"People who believe strongly in the importance of complying with the law are less likely to violate the law."*

While this seems plain common sense, there is no explanation for it to be found in Becker's framework, except  $u$ . See section 3.1.3 for a discussion of  $u$ .

12. *"For both women and men, being at the bottom of the class structure, whether measured by socio-economic status, socio economic status of the area in which the person lives, being unemployed, being a member of an oppressed racial minority (e.g. blacks in the US), increases rates of offending for all types of crime apart from those for which opportunities are systematically less available to the poor (i.e. white collar crime)."*

Here the interplay of legal versus legal work opportunities comes to the fore. Whoever is at the bottom of the class structure will have, (on average) worse paid jobs than those on the top. Potential legal incomes are considerably lower, if at all available, whereas illegal activities pay



just as well for those at the bottom of the class structure as for those on the top. Therefore higher returns from crime than from legal work are possible and even likely as the people at the very bottom also tend to lack education and relevant work experience. White collar crime is a special case as by Braithwaite's definition (see p. 9) it constitutes illegally taking advantage of a position of trust within a firm or organization to enrich oneself. Those who qualify for these jobs need an education and are not at the bottom of society, neither from an educational, nor from an income or status perspective.

13. *"Crime rates have been increasing since World War II in most countries developed and developing<sup>38</sup>."*

Braithwaite mentions that Japan is the exception to this fact. However, it would be too wide a topic to discuss whether or not crime in every country except Japan rose since WWII. For Germany though, it is definitely true, crime rose from 3018 cases per 100 000 inhabitants in 1955 to 8337 cases per 100 000 inhabitants in 1993, to decline from then onwards to 7 436 cases in 2008 (BKA 2008a : 30-31 )<sup>39</sup>.

To explain these developments is a bit harder as in the early 50s Germany was relatively poor which would limit the rewards of legal activity, but then on the other hand there was probably less to steal, rob or burgle. Some criminal enterprises such as smuggling cigarettes, or trafficking in humans might have been harder to do given much smaller streams of goods crossing the borders. Drug related crime also emerged only later. Incidentally, borders back then were also much less open than they are today, even concerning legal activities. Barring a simple measurement error in earlier times Becker's theory is only able to explain that if legal activities were relatively speaking more lucrative in terms of expected utility than illegal ones in earlier times.

One trend that might play a role is the progressing urbanisation, which would render the likelihood of conviction smaller and thereby would tend to increase illegal activities up to 1993 and beyond. The subsequent decline starting in the mid 90s could be due to increased punishment levels, which rose significantly in the early 90s.

The above analysis shows that Becker's framework is generally able to explain many of these 13 facts. Whether he was exactly right can be determined only by empirical studies even though some trends seem to coincide neatly, as was the case for fact number 13.

As far as the criminological facts mentioned above are concerned it can be said that they seem to hold true for Germany. Most crime is committed by young, unmarried males in urban areas. It also holds true for Germany, that criminals usually had problems at school and at home, which renders attachment unlikely. Living in poor neighbourhoods is also indicators of

<sup>38</sup> Braithwaite 1989 : 49; second part of 13 left out. It claimed that Japan had a decline in crime from WWII until then. That does not seem very relevant here.

<sup>39</sup> As usual no driving violations are included in these figures.

increased crime in Germany (Schwind 2009 : 63, 70, 186, 196, 227-230, 236, 309-334).

Fact number 2, "Crime is committed disproportionately by 15-25 year olds", was found to be true and explicable by Becker's theory. However, it has been observed by Freeman, to name just one economist (see section 3.2.3), there a small group of repeat offenders exists (see section 1.6) who might continue their criminal careers well after 25 . The obvious question is why? Those who successfully finish their education will probably earn more by joining the legal workforce, but what happens to the others?

If somebody does not finish his education or training his income perspectives might be higher in the illegal sector, but also once the person has been imprisoned or entries on the police record, it will be hard for him to get legal jobs in the future even if he has finished his education. Both point to the possibility of permanently higher returns from illegal activities.

Now that Becker's theory was found to be useful in explaining commonly found criminological facts the question arises to what extent it does shape crime reducing efforts. It's most obvious application would be to raise punishment levels, but more importantly increasing the probability of conviction in order to fight crime. This would require more public security expenditure, which is costly. In fact the costs of increasing the probability of detection and conviction  $p$  and the punishment level  $f$  might surpass the reduction in damages from crime, so the total loss from crime would rise despite lower crime levels.

A German study by Spengler and Entorf in (2005 : 32) found that increasing the probability of conviction and the punishment level by 10 percentage points would reduce damages in Germany by 870 million € a year. However, since it was not possible to estimate the costs of increasing those indicators by 10 percentage points it is not possible to say whether doing so is cost effective.

Kleiman (2009 : 117-135) points out that departments seemingly unrelated to crime fighting such as the departments of health, education and environment could in fact improve security outcomes. Economists found a link between exposure to lead as a child and criminal activity as a youngster. Thus cooperation across departments could reduce crime. The danger though is that saddling these departments with a crime fighting agenda in addition to their primary goals risks that they neglect their original goals.

Due to the high costs of increasing the public security expenditure, cost effective, alternative measures are of particular interest. That is why the focus in Chapter Five will be on alternative prevention and reintegration measures advocated by economists or taken by governments. In a German context volunteering will receive a lot of attention. If found effective, it would provide a cheap means to crime reduction.

## 5 Reintegration and Prevention

Whereas deterrence employs fear of detection and punishment to stop people willing to commit a crime from actually committing it, prevention aims at stopping people from committing their initial illegal act via other means, often using the education and labour market linkages to crime made explicit in the Becker model. The purpose of re-integration is to prevent convicted offenders from committing another crime. The effectiveness of the intervention methods is measured by crimes avoided and by a low recidivism rate respectively.

One policing strategy singled out by Kleiman (2009 : 41-65) for its effectiveness in moving from a high crime equilibrium (that might well entail a lot of police) to a low crime equilibrium (with possibly far less police) is the dynamic concentration of police resources on a easily observable crime. The idea behind it is that given a lot of crime even a big police force can not exercise much pressure on offenders via arrest rates and convictions because their forces are spread too thin. A lack of cooperation with other actors such as the prosecution, parole officers and so on reduces pressure further.

So if these actors were to cooperate to ensure less paperwork, swift reaction and convictions could be achieved. The strategy chosen was to give very short prison sentences, but already for smaller offences so that crime would be costly to offenders quickly without over-incarceration of the population. The police on their part focused resources on an easily observable crime. So it became possible to exert so much pressure via arrests and convictions that the crime in question ceased to be worth the risk and offenders desisted. Once that was achieved a lower level of resources could exert the same kind of pressure to keep that category of crime low. Those resources that were freed up could be moved on to the next crackdown.

It worked in New York in respect to turnstile jumpers and the squeegee men. As a side effect, when arresting the offenders for these crimes the police often was able to confiscate weapons and clear up other crimes additionally (Kleiman 2009 : 41-45). This is an example of a strategy that combines deterrence and incapacitation based on the probability of conviction and the

punishment level with the insight that once a criminal activity stops to “pay”, people will not engage in it any more.

The connections between the labour market and crime are also utilized by many prevention and rehabilitation measures. They aim at improving employment opportunities by either providing extra training/education to the young, or by trying to create more jobs in general.

Other programs seem to be built on the idea behind the abortion-crime link literature, namely that unwanted children or children born to parents ill-suited to care for a child (e.g. because they are without job and/or education, or use drugs) are much more likely to choose a criminal career than others. Many projects aiming at crime prevention took a leaf out of Becker's theory and subsequent research in economics, particularly in the USA.

## 5.1 Reintegration and Prevention Programs in the USA

The Children's Aid Society Carrera program is a three year after school programme aiming at 13 year olds and provides them with various components such as work, academic, sports and arts as well as tutoring and homework support. Sexual education and family life education is also included. Participants are 70% less likely to become parents within 3 years after the end of the program than the control group. Improving the job prospects of teenagers apparently helps to reduce the number of children that are unwanted or born to parents struggling to cope with life (Donohue III 2005 : 56).

Somewhat similar is the nurse family partnership program in which a nurse visits parents repeatedly throughout pregnancy and helps with the preparations for the child, as well as with any domestic issues the parents might have. The program was a success in the USA, not only in its outcome, less crime, but also financially. This programme has been running in the USA in some cities for over 20 years by now. An evaluation showed that by the child's fourth birthday the savings to society surpassed the costs of providing the initial assistance. Over the course of 20 years the savings were four times as big as the costs. Cases of child abuse or neglect were 48% lower than in the control group. The number of arrests from puberty onwards of those who took part in the programme as a baby fell by almost 60% (Pro Kind 2008).

One more example of a successful prevention measure that intervenes early is the Perry Preschool program, which focuses on 3 to 4 year old preschoolers of families with a low socio-economic standing. A teacher visits participants at home to facilitate involvement of the whole family in the program. It runs for 2 years, for seven months per year. During those seven months the children and families are visited for 2,5 hours a day, 5 days a week, plus the aforementioned weekly visits by a teacher. The results were deemed “promising” by the “Center for the Prevention of Violence” of the University of Colorado, Denver. The results ranged from better behaviour at school, less

delinquency and arrests, less drug consumption and less violent crime, to better educational outcomes and higher employment rates as well as higher median income (Center for the Study and Prevention of Violence 2006). Donohue (2005 : 55) argued that a massively scaled-up program would be cost effective even if the benefits of the scaled-up program were just half the size of the evaluated program size. This might almost seem too good to be true and indeed Kleiman (2009 : 126) remarks that doubts concerning the effectiveness of the program have surfaced.

The Job Corps program targets teens at risk and provides educational as well as vocational skills training plus counselling. It is cost effective and a well working crime prevention measure. Arrest rates for participants are 16% lower than those for their peers (Donohue III 2005 : 55).

Other often discussed programs include Midnight Basketball, correctional boot camps and Scared Straight (at-risk youngsters are taken to prison to see first hand what it is like). These were also found to be ineffective in a study by the University of Maryland's Department of Criminology and Criminal Justice in 1996/1997. A Big Brother/Sister Program on the other hand seemed much more promising. As far as cost effectiveness is concerned incentive based crime prevention programs tend to exceed those of early social interventions (Freeman 1999 : 3557-3558).

## 5.2 Programs in Germany

In Germany prevention projects are often undertaken as pilot projects, or only for a limited period of time or limited to a particular region. The latter is due to the federal structure of the country, each state has its own police force and is responsible for law and order within its borders. Only if individual states choose to cooperate is there a possibility for nationwide projects. Even within the states administrative regions do not necessarily cooperate unless the state in question decides to implement a project state-wide.

Also prevention is usually regarded as remit of the police which is supposed to achieve prevention by informing citizens about e.g. proper locks for doors, on how to protect oneself against pickpockets, or how to behave in dangerous situations. The police distribute flyers and offer courses. Further, the police are supposed to prevent crime by being "present" in the streets and by achieving high detection rates.

The justice system is supposed to supply the punishment side of prevention, by being swift and tough. Even though additional prevention measures would surely not go amiss they are not commonly used. A 2001 report lists only 5 prevention and reintegration projects in Germany from the 80s through to the time of the writing of the report. Some projects surely were not included because the report mentioned only those measures that were evaluated empirically. However, due to the small sample size of the projects

and (sometimes) the lack of a control group even promising approaches could not be finally evaluated.

### 5.2.1 Projects in Prison

As was hinted above, reintegration measures in Germany are not coordinated nationwide but rather depend on the policies of the respective state. However, since the law prescribes that prison is an institution meant not only to incapacitate the inmates, but also to rehabilitate, reintegration efforts by the state usually take place within the prison system itself. The focus is usually on therapy, education and training. Not every prison though offers all the options available within the system. However, one can apply to be transferred for example to a prison that does offer the course leading to the desired school diploma. Another feature of prison as re-integrative institution is that prisoners approaching their release receive support finding a job and flat. An effect of that measure on recidivism could not be found (Freeman 1999 : 3558). In addition to these standard approaches to reduce recidivism, prisons also experiment with new and additional measures.

A prison in Hameln, in Lower Saxony was experimenting with "Anti-Agression Training (AAT)" when it was relatively new in Germany and took part in its long-term scientific evaluation. The results were rather disappointing in that no significant improvement in behaviour was found compared to a control group. Some of those in the control group though had taken part in traditional rehabilitation programs. Therefore AAT might well improve behaviour even though it was not found to surpass traditional methods in effectiveness (Ohlemacher 2001).

An art-therapy project was initiated last year in Stadelheim, Munich's biggest prison. A trained psychologist would come into the prison at regular intervals and paint together with a group of inmates. Those were sexual offenders who had volunteered to take part in that project. Unfortunately there was no rigorous evaluation of its effects, though the psychologist and prison staff were pleased with the observed results<sup>40</sup>. The extent to which traditional therapeutic/psychological approaches are complemented by new methods depends on the respective prison director and the state.

### 5.2.2 The "Boxcamp" Project

There are however, a number of private initiatives that try to complement state efforts. Particular attention is given to repeatedly offending youngsters. In cooperation with the justice system participation in one of these programs is sometimes an alternative to other forms of punishment. Judges choose it often as the offender's "last chance before prison".

Such is the case with the so called "Boxcamp", which is exactly what the

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<sup>40</sup> Presentation by the psychologist and a member of the prison staff in the monthly meeting of the volunteer group "AKEiS", 2009

name suggests, a camp with boxing as central part of the rehabilitation effort. Other integral parts of his concept are “hot chair” style confrontations as well as one-on-one talks with instructors and therapists. More out of the ordinary approaches are sport challenges (such as a few day long biking or hiking tours) undertaken by small numbers of participants together with some of the staff as “caretakers”. Generally speaking emphasis is on strict discipline and after a few weeks, once the kids are used to regular schedules again, schooling becomes an issue. Many of them had skipped schools for years and have not obtained any school diplomas (Anon 2008a & 2008b).

The “Boxcamp” is run by an ex-prisoner, Lothar Kannenberg. Eventually he managed to turn his life around with the help of boxing. He now wants to share his experience with youngsters who have a considerable criminal career behind them and prison awaiting them unless they, too, manage to turn their life around. According to the information he provides, his “Boxcamp” does very well measured by recidivism (20%), also very few youngsters discontinue the treatment (or run away)(Anon 2008a & 2008b). However, there is no scientific evaluation available yet. Fortunately this is about to change as the university of Kassel initiated its evaluation in 2008. Since the aim is to measure potential long-term effects the evaluation study is still running (Universität Kassel 2009).

As far as costs are concerned this school is considerably cheaper than traditionally chosen punishments for repeat offenders at that stage of their criminal careers, such as prisons for youngsters. That cost 260 € per day per person whereas this “Boxcamp” costs 155 €. Unless the camp turns out to be less effective in reducing recidivism than traditional methods used in prison it seems safe to say that savings are considerable, especially if the Boxcamp indeed exhibits lower recidivism rates than prison (Anon 2008b).

### 5.2.3 The “Pro Kind” Project

The success of the Nurse-Family-Partnership program in the USA inspired the German state of Lower Saxony in 2006 to pilot a project named “Pro Kind: Prävention durch frühe Förderung” (Pro Child: prevention via early support) along similar lines. In Germany this assistance continues until the children are two years old. Partners from academia and politics support and evaluate the project on an ongoing basis. Later Saxony and Bremen also joined in the project. In total 700 families are taking part, half of which are in the control group. In 2012 the pilot program will be terminated. Interestingly Lower Saxony and Bremen both belong to the states in Germany regarded as being “soft on crime”, it appears as if they were looking for approaches other than raising the probability of conviction  $p$ , or the punishment level  $f$ , to reduce crime (Kriminologisches Forschungsinstitut Niedersachsen e.V. 2009).

#### 5.2.4 The “Lesepaten” Project

Except for the “Pro Kind” initiative undertaken by three German states none of the successful prevention measures are to my knowledge applied to a German context though a wide range of local initiatives exist. Many of these aim more at re-integration rather than prevention and are often not scientifically evaluated at all.

One notable prevention program is the “Lesepaten” program by the association Mentor e.V. in Hannover (in Lower Saxony), which was spearheaded and evaluated by the KFN. The city of Hannover suffered from a bout of youth violence where youngsters with a foreign background figured prominently. They usually came from a low socio-economic background and due to a lack of educational achievement were almost certain to remain where there were, at the bottom of the socio-economic scale.

In that situation an idea as simple as it was effective was floated: put well integrated adults together with troubled kids and let them read a book together for a few hours each week. The project is ongoing and the results have been very positive. Once the kids who took part in it reached adolescence and with it “criminal age”, the crime rate in Hannover for youngsters dropped while educational achievements rose, especially for those with foreign (i.e. Turkish background). More children of that socio-economic background finished school, more pursued high school than before and fewer became criminal. In Munich on the other hand, where no such city-wide program exists the crime and educational trends for those kids are very different. Whereas the percentage of youngsters of Turkish background who are repeat offenders fell by around 50% in Hannover, it rose in Munich by almost a 100% between 1998 and 2005.

It should be noted that this project is just one of many such projects in Hannover targeting kids of low socio-economic status, kids with problems at school, or kids of foreign background. All aim at improving their educational achievements and they seem to deliver. As for the financial side, these projects are often run exclusively or mainly by volunteers, so costs are low (Abold, Baier & Pfeiffer 2008 : 172-179).

While a cost-benefit analysis is likely to be favourable to these projects the idea behind some of them notably the “Boxcamp” is not directly inspired by economic insights about crime but rather by a sociological /psychological understanding of crime. Youngsters are seen as having lost their way, often because they lacked a father figure, or because they never learned to respect rules, nor experienced a stable support system at home. Actually this approach to crime is common in Germany and even interventions that are in line with economic theory such as facilitating the schooling of prisoners, or providing the possibility to start an apprenticeship in prison are often not directly inspired by Becker's theory but by the wish to “give them something useful to do”, or by common sense “they need to learn something so they can find a job after prison”. A psychological motivation is also behind the next form of intervention in Germany.



## 5.3 Prison Volunteers in Germany

### 5.3.1 Background

One of the most widespread forms of intervention in Germany, namely volunteers visiting criminals in prison, is likewise more motivated by social/psychological considerations than economic ones. Though the reason why states like this particular measure is probably at least partly that it costs them hardly anything. The idea behind it is simply that prisoners either never really were in touch with the legal mainstream of society or loose whatever connection they had while in prison. Many relationships do not withstand the strain that prison imposes, even if the crime itself did not cause a break up. Now, if law abiding citizens come and visit them while in prison, is a bridge created between the inmates and the outside world. Further, the hope is that the volunteers can act as role models. Last but not least prisoners are thus provided with potential sounding boards for their dreams and ideas on how to build a life after prison, especially when the release from prison is approaching. Another feature of the volunteers is that for many prisoners these volunteers are the only non-criminals with whom they have contact who are neither there to evaluate them as the psychologists do, nor to control them. Volunteers also do not necessarily know the criminal history of the inmate they visit. This is done for legal reasons (privacy) as well as allowing the inmate to choose if, what and when he shares from the dark chapters of his past. Basically volunteers are there as people for people with almost no strings attached. Limits to confidentiality exist for example when a prisoner tells his volunteer about things that endanger him or the safety of others. Of course volunteers are expected not to bring any forbidden items into prison and to maintain appropriate conduct.

### 5.3.2 Survey of Volunteers

Despite the omnipresence of volunteers in German prisons the literature about them is sparse. Those few studies that are pertinent to the topic focus on the motivation and experiences of the volunteers rather than their effectiveness in reducing recidivism, neither do cost-benefit analyses play a role in the German literature I surveyed. The KFN produced a study in cooperation with the volunteer organization "Freie Hilfe Berlin e.V." in Berlin in 2001. Recidivism and cost effectiveness was left aside. The problem is the lack of data as was discussed in the beginning. There is neither a nationwide (or even state-wide) data bank covering recidivism, nor are any statistics reliable as there is a time limit on how long any given crime is kept on official records. This time period is extended if a new crime is committed before the time limit for the old entries has been reached. If hypothetically the old entries are supposed to be cleared after 5 years in August 2010, but a new crime and conviction has occurred in

July 2010 all entries are kept on file until July 2015. If on the other hand no new conviction occurred until August 2010 the old convictions will be removed from the official record. Any crime committed after the removal-date is not counted as recidivism. Therefore it is possible for re-offending, convicted criminals to go unrecorded in the recidivism statistics.

In 2008/2009 I undertook a case study to shed some light on the impact of volunteers on recidivism and the cost effectiveness of volunteers. I had hoped that volunteers were keeping track of the prisoners they visited but as it turns out they usually loose touch with their clientèle after a while for various reasons. In most cases (around 80%) volunteers can neither confirm successful reintegration, nor recidivism of the ex-prisoners.

Unfortunately this missing data on recidivism is essential for a cost benefit analysis of volunteering. However, it was still possible to estimate how much the effort put volunteering is worth in terms of money. Before addressing this, below are some general remarks about the survey and the nature of volunteering.

The survey was handed out to just over a 100 volunteers from Bavaria and Baden-Württemberg<sup>41</sup>. In total just over 80 volunteers replied and of those just over 60 had answered the version of the questionnaire that included not only questions on the amount of time and money they spent but also their motivation and experiences as well as questions pertaining to the fate of "their" prisoners after release<sup>42</sup>.

The volunteers were approached at various seminars geared specifically towards them. Due to the initial personal contact the reply rate was high, even though the actual questionnaire was usually mailed. This means volunteers were on their own when they filled out the questionnaire which besides some unclear and missing answers has one major implication, namely that the numbers given for time and money spent are often underestimated.

I infer this from the experiences I had while being part of a volunteer group in Munich, the AKEiS (Committee for Volunteers in the Penal System). Some approached me after they had submitted their questionnaire telling me that they had forgotten some part of their volunteering efforts. More often though I noticed that people were much more present in group activities than they had indicated on the questionnaire. For example, one individual who attended seminars for four days every year and for six days in the year surveyed had indicated that he attended only for one day. Others forgot to take into account the time they spent job hunting with their prisoners.

Similar behaviour could be observed concerning money. People who brought food to the meetings with prisoners forgot to include these expenses, or gave extremely low numbers. In all these cases the reply to my question

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41 One French volunteer took part, too, but was not included because the French and German volunteers operate in very different environments.

42 The survey was conducted in three stages starting with the volunteer organization in Munich AKEiS (of which I was a member) over the course of 2008/2009 as seminars for volunteers in Straubing and Freiburg provided the opportunity to contact volunteers directly.

whether the stated amount of money and time are precise was something along the lines of "Now that we think of it, no!". Almost all expressed great uneasiness about stating the actual (higher) amounts as they give freely of their time and money. Therefore all numbers presented below should be regarded as minimum values.

The volunteer work falls broadly in two categories. Firstly, the time the volunteer spends one-on-one time with the respective prisoner, either in prison or accompanying the prisoner on errands outside<sup>43</sup>. The latter takes place when prisoners approach their release date and the prisoner's personal appearance is required for job search and interviews, or finding a place to stay. Secondly, there are group activities, be it that the volunteers hold their monthly assembly to coordinate their efforts and share experiences, or that volunteers and prisoners meet (in and out of prison) in groups for various activities<sup>44</sup>.

Such activities include the annual flea market<sup>45</sup> organized by volunteers and prisoners, the monthly group meeting in prison, the monthly bowling for ex-prisoners and volunteers, the three to four annual excursion days and the two annual group seminars. In addition, there are special events such as the Christmas celebration (sometimes merely replaces the regular December meeting) with the prisoners, or the annual dinner for volunteers in prison.

### 5.3.3 Results of Survey

Many of these aforementioned activities necessitate preparation. The time factor is considerable, which explains why around 40% of the volunteers are retired. However, all walks of life were represented, students, the full time employed, and the unemployed. The average age was 57 (range 22 to 87). On average people volunteered in that area already for 8 years. Over a quarter volunteered in other organizations as well (church, sport clubs and so on). This high motivation is reflected in the hours the volunteers put in, see TABLES 11 and 12<sup>46</sup>. One should keep in mind that 60% of the volunteers are working or studying full-time.

As illustrated in those two tables a volunteer devotes on average about 30 hours per month to the work with prisoners, including commuting times. Even disregarding commuting, the time investment is considerable with 23 hours per month and volunteer.

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43 Prisoners who served a certain amount of their time already and behaved exemplary and are regarded as no risk to the public can be granted the permission to leave the prison for special errands if supervised. First, a prison guard has to accompany them, then later, if everything worked well, a volunteer suffices as company. The return time to prison is fixed and must be adhered to. Being late is not an option. For some prisoners the permit to leave is essential if they are pursuing a qualification that can not be obtained within prison.

44 The activities of the AKEiS are mentioned in their annual report as well as their protocols, both available upon request from the author. These documents are only available in German.

45 Its proceeds are donated to an association helping female crime victims. It is seen as a way for the sexual offenders (who constitute the bulk of the prisoners visited by members of the AKEiS) to make up for what they did.

46 Strohmeier, 2009

TABLE 11 One-On-One Volunteering With the Prisoner (per month, in hours)

	all volunteers	per volunteer
individual meetings with the prisoner	360	4.5
commuting times	196	2.5
total time	1160	14.5

Source: Strohmeier 2009

TABLE 12 Group-Work (per month, in hours)

	all volunteers	per volunteer
group-work	446	6
commuting times	306	4
total time	1236	15

Source: Strohmeier 2009

This is true for the financial side of volunteering, too, as can be seen in TABLE 13. These expenses are not reimbursed except for the money spent on travelling to and from prisons. The exact arrangement differs from prison to prison, depending on the respective prison's policy. However, not all volunteers get reimbursed, and not all of those who could get reimbursed take advantage of that offer. Also there is often a limit on the amount up to which reimbursement is possible. Therefore, most of the total costs mentioned in this survey are borne by the volunteers<sup>47</sup>.

TABLE 13 Volunteer Expenses (per month, in Euro)

	all volunteers	per volunteer
commuting	1260	16
education/seminars	450	6
total expenditure	3365	42

Source: Strohmeier 2009

#### 5.3.4 Costs and Benefits of Volunteers in Prison

Each year the average volunteer spends 504 Euro, while providing 276 hours of volunteering for which additional 78 hours of commuting were necessary. Given that Bavaria alone has 1550 (Bayerisches Staatsministerium der Justiz und für Verbraucherschutz 2009 : 106) and Baden-Württemberg another 1190 (Justizministerium Baden- Württemberg 2010) volunteers working with prisoners the savings for the government are sizeable. Assuming that the

<sup>47</sup> The AKEiS for example receives financial support for its seminars

number of volunteers per 100 000 citizens and the effort per volunteer nationwide are comparable to the numbers generated in the survey the number of volunteers nationwide is 9687. Their annual expenditure amounts to 4.88 million Euro and 2.67 million hours volunteered plus 756 000 hours of commuting time<sup>48</sup>. Thus it becomes clear that volunteers spend not only a considerable amount of time, but also of their own money. It would be expensive for the government if it had to replace the services volunteers render with paid staff. The exact expense would of course depend on the education level the government would require and the governmental payment structure in force at the time. Currently the lowest average monthly salary is 1540.45 € (this includes annual additional payments) before deductions for a full-time position. This suggests an hourly wage of 9.625 €. Paying the volunteers the lowest wage would thus cost the government 25.69 million €, not counting the commutes (Öffentlicher Dienst Info 2010), see TABLE 14.

TABLE 14 Monetary Benefits of Volunteering for the State

	per volunteer	for all volunteers nationwide (assuming a volunteer density equal to Bavaria and Baden-Württemberg)
time in hours excl. commutes	276	2 670 000
expenditure by the volunteer	504 €	4 880 000 €
costs of paying the volunteer 9.625 € per hour	2 656.5 €	25 690 000 €
total (paying and reimbursing)	3 160.5 €	30 570 000 €

Source: Bayerisches Staatsministerium der Justiz und für Verbraucherschutz 2009; Justizministerium Baden- Württemberg; Peter Strohmeier 2009; own calculations

The government benefits from volunteers not only indirectly via the effort they expend thereby (hopefully) lowering recidivism but also directly because volunteers sometimes substitute for prison guards for example when it comes accompanying well-behaved prisoners on errands trying to find a job or flat. If no volunteer is there to accompany the prisoner a guard would have to go, or more likely in understaffed prisons, the prisoner would simply have to postpone his job and flat hunting until a prison guard is free to go with him. In the worst case that might mean that a prisoner has secured neither a flat nor a job by the time of his release<sup>49</sup>. Such a scenario would hardly improve their chances at successful reintegration.

The advantage for the government is a highly motivated workforce that inspires and acts as sounding boards when it comes to ideas on how and where to find a job or flat. Further, the presence of volunteers allows prisoners to

48 All figures rounded; population figures, see the S. Fischer Verlag 2009 : 143, 151-152; volunteer "density" is 1 volunteer per 8 492 citizens

49 Unless the respective landlord/employer does not demand to meet the prisoner in person.

develop their social skills by trying out new approaches learned in therapy. Volunteers also provide a window into reality and onto the rules and expectations that adults need to fulfil in society in order to fit in well. Ideally volunteers are role models showing how problems could be dealt with constructively and how to treat people. It therefore seems plausible, despite the lack of empirical research, that volunteers do improve the chances of successful reintegration, while also potentially compensating for staff shortages at almost no cost to the government. An added benefit is that volunteers are able to communicate in their respective environment that people with a criminal past are not monsters, and that people can change. This should improve the chances of society accepting ex-prisoners, compared to a scenario in which there is no volunteer-prisoner interaction. Also government efforts at reintegration including the failures can be better understood by a society with volunteers in their midst explaining the difficulties and the tight line governments have to walk between human rights for all and security for the majority.

On the cost side for the government are the reimbursements for commuting expenses if they are offered (and used). If the attendance of seminars is supported financially this adds to the cost of volunteers. In the case of a prison in Munich, Stadelheim, an annual dinner is given for the volunteers at the end of the year. It takes place within the prison and is prepared by the prison staff and the prisoners working alongside them. The costs should be minimal given that the room is free of charge, the prison staff does not receive additional payment for that event to my knowledge and prisoners are paid very little per hour. The biggest expense is likely purchasing the ingredients.

Volunteers are also insured in case of accidents while volunteering. It covers all volunteers, not just those active in prisons. This cost is born by the government. The state of Bavaria for example entered into a contract with an insurer for that purpose in 2007. However, there are a number of limitations and conditions attached to that insurance. For example it applies only to those who are not already insured via the association/club they joined or via any other insurance policy. The actual costs for volunteers in prison therefore should be relatively low, especially since prisons are rather safe places for visiting volunteers (Bayerisches Staatsministerium für Arbeit und Sozialordnung, Familien und Frauen 2009).

In addition the government generally bears the costs of (re)registering and checking on all volunteers annually plus any other volunteer related administrative effort. While these tasks can be surprisingly time consuming depending on the number of volunteers active in the respective prison the actual additional costs due to volunteers are likely to be low as to my knowledge no additional staff is hired to deal with these tasks. Staff acting as liaison in my experience are often highly motivated individuals who dedicate a considerable amount of their leisure time to deal with volunteer related issues.

Total costs therefore are likely to be rather low and surpassed by the benefits provided by volunteers as measured by time and money expended on their activities. A study by the Katholische Stiftungsfachschule München (Kral

& Endres 2008) undertook a cost benefit study of volunteering in various fields such as volunteers manning fire brigades, or volunteers helping young mothers or the elderly. Unfortunately volunteers in prison were not part of their study. However, despite a low assumed hourly wage of 8 € if a volunteer were paid the cost benefit analysis suggested that 1 € of costs generates more than 6 € of benefits, depending on the field and the region.

Volunteers therefore should be seen as valuable resources in the financial sense, too. They could work to society's advantage especially in areas where no special training is required, but a lot of enthusiasm and manpower. To provide the same service on the same scale would be immensely expensive for the state. Just imagine each of the volunteers in Hannover's Lesepaten project had been paid the wage of just above 9 € per hour.

Also projects that seem likely to have a positive impact on society but have not yet been proven to work, or have been found to work but yield a rather low net value to society would be ideal for the deployment of volunteers rather than paid staff, provided the project does not require specially trained staff.

In Hannover teaching pupils to read and write was still the domain of those skilled to do it, the teachers. The volunteers provided the time, energy and encouragement that those pupils who struggled needed to practice what they had been taught at school.

In a prison context that means for example that therapy is firmly in the hands of those psychologists working with the prisoners. Volunteers can provide new impulses and give prisoners the possibility to practice and implement what ever insights they gained during therapy, but providing therapy is not their job.

This kind of cooperation, of leaving difficult tasks requiring special training in the hands of trained and paid staff while supplementing their efforts with volunteers when possible and necessary allows well implemented projects to yield benefits at lower costs than otherwise possible.

### 5.3.5 Becker's Theory and Volunteering

Becker did not mention volunteering in his theory of crime, nor does one of the major factors of his model, the probability of detection and conviction  $p$ , the severity of punishment  $f$  and the level of salaries in the legal sector provide a direct theoretical link to volunteering. The factor “ $u$ ” however does, as it is meant to capture influences determining the relative pay off of legal and illegal activities. Education and upbringing do influence these payoffs (see section 3.1.3). Each constitutes an important factor in forming the technical and social skills respectively companies expect from their employees. This so called “human capital” was explicitly meant to include values, good behaviour and attitudes by theoreticians like Becker (2002).

While the training/schooling provided by the government within prisons clearly aims at compensating for the low level of education and training

of many prisoners, the volunteers assist in increasing the prisoners' human capital. As mentioned in some detail above the presence of volunteers provides prisoners with additional opportunities to learn and practice the required social skills. Thus their immersion in the prison subculture and the concomitant acquisition of what the economic literature calls "criminal capital" is potentially reduced, perhaps even counteracted. At least they are exposed to an opposite influence that could help them to increase their positive human capital. This in turn would mean improved chances of getting a job or a better paid job. Even though families are of utmost importance in teaching their kids the values and attitudes they need for a successful life, volunteers give prisoners the opportunity to engage in some self-improvement and catching-up in that area (Becker 2002).

Therefore volunteering is not without connection to economic theory (or Becker), even though volunteers themselves state religious or psychological motivations more often than reducing recidivism (Strohmeier 2009). They invest in the prisoners' human capital. Incidentally human capital is a topic Becker wrote extensively about stating that "families are the crucial investors in human capital" and that "we have to rely on our people, and basically what human capital does is put people at the centre of any economy, and that is right where they should be" (Becker 2002 : 3). Putting people at the centre is precisely what the volunteers in prison do, too, in line with economic theory, though not inspired by it.

### 5.3.6 Conclusion of Chapter

Summing this chapter up, it becomes clear that the economic theory of crime as developed by Becker and its suggested routes to reduce crime, namely via education inspired a number of programs. The Carrera and Perry Preschool programs intervene exactly at this point, raising educational standards. Participants thus can earn higher wages in the legal sector. While some of the presented programs target the youngsters who are at risk of becoming criminal directly such as those two mentioned above, others, like the "Nurse Family Partnership Program" target their parents.

What they all have in common is that they have been empirically evaluated and found to be cost effective. In general, incentive-based crime prevention programs tend to be more cost effective than early social interventions (Freeman 1999 : 3557-3558). Some are even advocated by economists such as Donohue to reduce crime and its financial burden. It should be noted that raising education alone will leave some categories of crime unaffected at best. White collar crime for example requires a good education because the positions of trust and power that render white collar crime possible are usually unobtainable without it (Lochner 2004 : 30-31).

In the USA the economic way of thinking about crime is far more influential than in Germany, where the efforts at crime reduction such as e.g. Lothar Kannenberg's "Boxcamp" or the widespread system of volunteers are



more influenced by a psychological/sociological approach to crime. The same holds for the schooling and job-training programs in prisons. They are motivated by the experience that youngsters in a stable environment and a steady job are less likely to get into trouble with the law, rather than by economic theories of crime.

However, the “Nurse Family Partnership Program”, a successful American program, has been piloted in Germany and is evaluated empirically. In general one can observe an increased interest in empirical evaluation of crime fighting efforts in Germany. One should bear in mind though that crime reduction measures might very well have a link to the economic thinking of crime even though their introduction was not motivated by it. The German system of volunteers in prison is a case in point, as are the schooling opportunities within the prison system. Neither feature was initiated because of economic insights into the causes of crime, but by a psychological/sociological understanding of crime and the desire to give fellow humans a chance to get their lives in order.

## 6 Conclusion

The topic of crime, its costs and possible crime reduction measures is an extensive and complicated subject matter. This paper aimed at providing a picture as adequately as possible, despite the many areas that would need more space for fuller development. In many cases more research is needed. This is particularly true because the economist perspective on crime is relatively new and many contentious issues have yet to be resolved. This pertains especially to Germany, where research on crime by economists is relatively recent.

What became clear despite measurement problems is that crime directly and indirectly costs German society 72.7 billion Euro annually, a multiple of the official cost of crime estimate. Especially the incorporation of immaterial damages and of the value of lives lost led to this increase in the costs estimate, even though conservative estimates were used and many aspects of the cost of crime have not been estimated at all. This suggests three things: Firstly, the necessity of finding ways to evaluate the remaining cost components and improving the estimates presented here. A more accurate cost estimate allows better informed decisions to be made. One such decision being to what extent resources should and could be spent (even profitably) on reducing crime.

Secondly, intensified research into the causes of crime from an economic perspective and its linkages with economic as well as other factors should be undertaken. This should not be misconstrued as an attempt to invalidate in anyway psychological, sociological explanations of crime and suggestions on how to deal with it. Rather the economic perspective offers additional insights into the causes of crime and thus offers an additional avenue to crime fighting besides more traditional approaches. The justice system (including parole and probation) should be reformed with the insights gained over the last decades in mind. For example society should choose the likelihood of apprehension and conviction  $p$  and the severity of punishment  $f$  carefully. The likelihood of apprehension has been found to deter more than the severity of punishment. Further, the more severe the punishment, the more costs society incurs e.g. via paying for prison sentences. The beneficial incapacitation effect of prison

therefore should be weighed carefully against its costs, the seriousness of the offenders' crime, the likelihood of the offender re-offending and the risk of the offender accumulating criminal capital while in prison. Otherwise society runs the risk of increasing the social loss from crime by over-incarceration as some states in the USA do. Further, society faces a trade-off between high apprehension and conviction costs and lower actual crime rates when choosing a high probability of apprehension and conviction or conversely lower apprehension costs but more crime if a low probability of conviction is chosen. It will depend on the prevailing circumstances which levels of severity and probability of apprehension are minimizing the social loss from crime.

Another result of research was that swift and certain punishments (even if relatively low level) deter more than very severe, uncertain punishments that might be meted out after a long delay. This suggests re-designing the justice system, its procedures and punishments with that in mind. The parole system of Hawaii was transformed by the H.O.P.E. initiative from a sham into an effective and cheap(er) deterrent. This was possible only by co-operation of the police, the judges, the local prisons and parole officers. Such cooperation will often be necessary to successfully implement measures that allow moving from a high crime equilibrium to a low crime equilibrium. While moving from a high crime equilibrium to a low crime equilibrium is costly over the duration of the process, expenditure in the low crime equilibrium can be much lower without any loss of safety. This would free economic resources in the long term and increase economic well-being. Also policing strategies such as "dynamic concentration" could render even the transformation process cheaper than expected.

Last but not least, the other important implication of Becker's theory should not be forgotten: improving education and training especially of those with low levels of education is likely to reduce crime, as is an improvement in legal salaries, or the labour market. So education and labour market policies, even tax and transfer regimes can impact on crime and could be potentially used to reduce it.

Thirdly, rehabilitation schemes and prevention measures should be devised in a way that takes on board the lessons learned in research. Most programs should focus on people of a low socio-economic background and aim at raising educational achievements to make legal employment more profitable (and obtainable). Also programs improving the parents' parenting skills are indirectly recommended by Becker's human capital approach. So far such programs have been more common in the USA than in Germany, but there is change on the way. Some newer projects in Germany such as the "Boxcamp" and a "Family Nurse" type program have been implemented as pilot projects and are under ongoing empirical evaluation. Once a scheme has been found to work in practice it should be scaled-up.

In order to know what works it is vital for Germany to establish a nationwide-long-term recidivism data-bank. To that end such a data-bank should for example contain data about the following aspects: therapy or

potentially therapeutic measures the offender took part in while in prison; any schooling/training the offender might have received; contact with family, friends, volunteers; participation in social groups of any kind, or interest in religious matters; substance abuse problems, its treatment and result; and the extent to which the inmate was prepared for release into society. All these aspects should be addressed in such a recidivism-data-bank additionally to the complete offence history, the track record of earlier arrests, rehabilitation programs, social work and so on. Of course general socio-economic factors such as age, employment status (before imprisonment), education, job training and experience, religious affiliation (if any), family status etcetera should also be part of this data-bank. However, such a detailed data-bank is a thorny subject, as it invades the private sphere of the individual and special arrangements might be necessary to reconcile the constitutional rights of offenders with the legitimate interest of society in knowing which measures work. Nevertheless having detailed and accurate recidivism data is essential for any meaningful empirical evaluation of the prison system, rehabilitation programs and the work of volunteers.

Another important field for future research is the volunteers in German prisons. One aspect of inquiry could be what determines whether or not somebody decides to volunteer, and how much effort is exerted. Economic lifetime allocation models probably could already answer that. However, further research might provide answers to specific questions. More important is another potential focus of volunteer related research, namely their effects on their "charges". Given the high motivation of volunteers and their considerable potential for investment into the human capital of prisoners and ex-prisoners, a lowering effect on recidivism seems likely, but empirical evidence to that effect is missing in Germany. Their work should be evaluated with respect to its effect on recidivism as well as with respect to its cost benefit ratio. An additional point in volunteer related research should be how to improve the results of their work. Since volunteers interact with prisoners in order to help them, being able to draw on scientific insights to become better at that would be of great advantage to prisoners and volunteers alike.

Volunteers play a role in crime reduction efforts outside of prisons, as well. Their impact there also should be evaluated scientifically. In general given the limited knowledge we have about the effectiveness of volunteers today, they are ideal for projects with uncertain or proven but small benefits, at least if the project does not require specialists.

Summing up, there is considerable scope for future research and increased co-operation of the various security related actors such as the police, the courts and prisons as well as government departments such as for health, education and labour that are not primarily concerned with crime fighting in order to improve policies and re-design procedures with crime reduction in mind. Programs that are found to be working and cost effective as pilot schemes should be scaled up and enacted nationwide to bring down the financial burden of crime in Germany, which at almost 73 billion Euro

(conservatively estimated) is considerable.

The potential costs of not working towards the rule of law are described in a recent report by the United Nations Office on Drugs and Crime (UNODC): “Economic analysis has consistently shown a clear correlation between weak rule of law and weak socio-economic performance. Some observers also report a cause-effect relationship: in countries ravaged by crime and corruption, and where governments have lost control of their territory, the poor suffer the most. Services are either delayed or never arrive. Citizens have poor access to justice, health and education and often face rising food prices. Poorly governed countries are the most vulnerable to crime and pay the highest price in terms of erosion of social and human capital, loss of domestic savings, reduction of foreign investment, white-collar exodus (“brain drain”), increased instability and faltering democracy. Seen in this light, the rule of law takes on a whole new importance: when established, it can unleash the welfare potential of nations.” (United Nations Office on Drugs and Crime 2009 : 15).

While this was written with developing countries in mind, the message for a developed country like Germany is clear nevertheless. Its high standard of living and even its potential for economic growth depends partially on the continued rule of law. Any improvements in that area would yield considerable economic benefits. These would be twofold, a safer country in which less people suffer mental and physical pain from victimization while simultaneously freeing and generating scarce resources that can be put to productive use elsewhere to society's benefit.

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## APPENDICES:

### Appendix 1

Calculation of average monthly wage in the low-wage sector in Germany in 2009

income brackets	up to 400 €	above 400 € to 800 €	above 800 € to 1000 €	above 1000 € to 1800 €
number of full-time employed per income bracket	177 040	288 528	596 124	3 688 007*
average monthly income**	200 €	600 €	900 €	1400 €
total monthly income for those employed within this income bracket	35 408 000 €	173 116 800 €	536 511 600 €	5 163 209 800 €
total monthly income for all within the low age sector	5 908 246 200 €			
number of people working in the low wage sector	4 749 699			
average monthly income	1244 €			

Source: Frank & Grimm (2010 : 12, 47); own calculations

\* the percentages per income bracket are given on p.12, Graph 2. Each bracket is 100 Euros wide. This was employed to estimate how many of the over 4 million people in the bracket 1000€-2000€ fall within the 1000€-1800€ bracket, which contains the cut-off point for the low wage sector. Around 80% of those within the 1000€-2000€ income bracket were counted towards the low wage sector.

\*\*Since it is difficult to gauge exactly the percentages of the labour force falling within any given income bracket from the curve in Graph 2 on p.12, no attempt was made to estimate the actual income within the brackets. The mean was chosen instead.



## Appendix 2

Most commonly used abbreviations:

AKEiS	Arbeitskreis der Ehrenamtlichen im Strafvollzug ; Committee for Volunteers in the Penal System
BAST	Bundesamt für Straßenwesen ; Federal Highway Research Institute
BKA	Bundeskriminalamt ; Federal Criminal Police Office
EUICS	European Crime and Safety Survey
JGG	JugendGerichtsGesetz ; The law concerning juvenile trials,literally: YouthCourtLaw
JVA	Justizvollzugsanstalt ; Prison
KFN	Kriminologischem Forschungsinstitut Niedersachsen e.V. ; Criminological Research Institute of Lower Saxony
OEG	“Opferentschädigungsgesetz” ; Victim-Compensation-Law
PKS	Polizeiliche Kriminalstatistik ; Official police statistics on crime
PPP	Public Private Partnership
UV	Gesetzliche Unfallversicherungen ; A collection of agencies that handle compulsory social security contributions and insurance against accidents
VSL	Value of a statistical life