Why do Europeans steal more than Americans?

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Abstract

Property crime is today more widespread in Europe than in the United States, while the opposite was true during the 1970s and 1980s. In this paper we study the determinants of crime in a dynamic general equilibrium model with uninsured idiosyncratic shocks. We focus on Germany, and compute the contribution of various factors to the total change. We find that the most important factor explaining the reversal are changes in the probability of apprehension and prison duration for the United States, and demographic changes for Germany. Changes in labor tax rates and transfers are unimportant for the United States. For Germany they have non-negligible effects, but they go in opposite directions and tend to offset each other.
1 Introduction

The total crime rate is now higher in the five largest European countries (France, Germany, Italy, Spain, and the United Kingdom, henceforth “Europe”) than in the United States, while the opposite was true during the 1970s and the early 1980s. This pattern holds, in particular, for property crimes (theft of any kind, larceny, breaking in, burglary, and fraud). These facts were first documented by Buonanno, Drago, Galbiati, and Zanella (2011), who label the pattern “the reversal of misfortunes”. Figures 1–4 illustrate such a pattern.

Figures 1 and 2 report the aggregate total and property crime rates in Europe (cases known to the police per 1000 inhabitants) and in the US.1 In terms of the total crime rate, Europe took over the United States at the beginning of the 1980s, following a slowdown of crime trends in America. However, it is not until the beginning of the 1990s that a substantial gap opens up. At that time the European total crime rate was still growing (before leveling off at mid-1990s) while the US began experiencing a well-known, prolonged fall in crime rates. The behavior of the property crime rate is very similar, except that Europe got ahead after the beginning of the 1990s. During the 2000s Europe experienced a decline in property crimes slightly faster than the US, but this was not enough to undo the previous reversal: the Europe to United States ratio of property crime rates is still about 1.2, while it was 0.3 back in 1970.

Figures 3 and 4 report these same data after disaggregating Europe. The single European countries represented in this picture have experienced similar changes in the total crime rate, despite the marked differences in levels. In particular, the level and dynamics of crime rates in France, Germany and the UK were comparable to the corresponding levels and dynamics in the United States during the 1970s. But no slowdown during the 1980s and no turnabout during the 1990s took place in these European countries, although we do see a leveling-off during the 1990s. In the meanwhile, Italy and Spain (whose crime rate was less than 1/4 of the American level during the early 1970s) also took over the United States total crime

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1 The European crime rate is weighted by the population of each country. Buonanno, Drago, Galbiati, and Zanella (2011) show that the pattern is robust to correcting for cross-country differences in underreporting based on surveys of victims.
rate between the late 1990s and the early 2000s. In terms of growth rates, the one exception is the UK, which experienced a rapid decrease of the total crime rate after the early 2000s. This decline, however, follows a rapid increase which set in during the 1980s. As for the disaggregated property crime rates, France, Germany and the UK experienced an increase similar to the United States during the 1970s, although the level was below the American one. Property crime in Spain and Italy were a fraction of the United States level during the 1970s, but increased much faster during the 1980s. The UK overtook the United States during the early 1980s, in the course a process which lead to the doubling of the incidence of property crimes in Britain in just 10 years. Germany followed suit during the early 1990s, and France and Spain around 2000. However, the total crime rate in France is now again below the American one. Italy is the only country among those represented where the property

Figure 1: Total Crime Rate
Europe includes France, Germany, Italy, Spain and United Kingdom.

**Figure 2: Property Crime Rate**

crime rate never jumped above the United States, although the two are now quite close.

These trends and the remarkable Europe–US reversal beg the question why the dynamics of crime diverged so much across the Atlantic. What made the European countries we are considering so similar to each other as so different from the US, in terms of crime trends, during the 1990s? In their empirical investigation, Buonanno, Drago, Galbiati, and Zanella (2011) consider a number of factors but can only conclude that the different incarceration policies in Europe and in the US account for 17% of the reversal of total crime and 33% of the reversal of property crime. Clearly, there is a lot to be explained. The limitation of purely empirical analyses is that they require exogenous sources of variation which are typically hard to find. Furthermore, they leave little room for policy experiments in the presence of general equilibrium effects.
In this paper we answer the question “what accounts for the ‘reversal of misfortunes’ between Europe and the US?” in an aggregate, dynamic general equilibrium model of crime, in the tradition of Becker (1968). By so doing, we provide a theoretical counterpart to empirical investigations of this question. Following İmrohoroğlu, Merlo, and Rupert (2004), we calibrate and simulate a model in which finitely-lived heterogeneous agents subject to a borrowing constraint supply labor inelastically to stochastic work opportunities, receive benefits when unemployed, pay labor taxes when employed, face crime opportunities, and may end up in jail if they choose to take up such opportunities. The economy is essentially a Bewley economy where the agents cannot insure against the stochastic employment shocks in the private market, and have to rely on self insurance and available public insurance. For the moment, this exercise includes and compares the United States and Germany.\(^2\) We

\(^2\)Data collection that will enable us to include all of the remaining largest European countries is ongoing.
calibrate the models to reproduce the observed crime rates in 1980. We then evaluate the changes in other years, most notably in 2010. We show that a properly calibrated model is able, for Germany, to explain both the increase in the property crime rate during the 1990s and the subsequent decrease. For the United States, we are able to match the rapid decline of crime after 1995, although the model is not able to account for the decline of crime in the early 1990s. It is worth noticing that some of the factors emphasized in the empirical literature (such as the legalization of abortion, Levitt (2004)) are not included in our model. Overall, however, the model is able to explain the reversal between the United States and Germany: In 1980, the crime rate was 1.9 percentage point higher in the United States, while in 2010 it was 0.4 percentage point higher in Germany. While the 1980 difference is calibrated, the model predicts that in 2010 the crime rate in the United States should be 0.6 percentage point lower.
We compute the contribution of the changes in the probability of apprehension, expected prison duration, tax and transfer policies, demographic changes and other factors. We find that the factors that are critical for changes in the US crime rate are largely irrelevant for Germany and vice versa. For the United States, two the most important factors are the increase in the expected prison length and in the probability of apprehension. Both of them have increased significantly since mid 1990’s and can explain a large fraction of subsequent decrease in the crime rate. In Germany, those factors have changed very little overall and contribute almost nothing to the explanation of the crime rate in 2010. They do, however, contribute significantly to an temporary increase in the crime rate in mid 1990s.

For Germany, the single most important factor are demographic changes. Population aging has decreased the crime rate by about 40% since 1990. Increases in labor tax rates contributed to an increase in the crime rate as well. On the other hand, changes in transfers contributed to its decrease. Taken together, the opposing effects of taxes and transfers on the equilibrium crime rate tend to offset each other.

2 Model

We use a dynamic general equilibrium, Bewley-type model with uninsured employment shocks. There is a large number of individuals who live for $J > 0$ periods. Individuals are heterogeneous along two dimensions. First, they are characterized by a given type $i = 1, 2, \ldots, I$ which determines their earning processes. Second, they have different initial assets. Agents maximize expected discounted lifetime utility,

$$
E \sum_{j=1}^{J} \beta^{j-1} U(c_j),
$$

where $\beta > 0$ is the discount factor, $c_j \geq 0$ is consumption of a type-$i$ agent at age $j$, and $U : \mathbb{R}_+ \rightarrow \mathbb{R}$ is period utility. We assume that $U$ is strictly increasing and strictly concave.

Agents face a stochastic earning opportunity, embedded in labor market status $s \in S =$
\{e, u\}, in every period. If \( s = e \) then the agent has a work opportunity, which he takes because leisure has no value in this model. Therefore, this agent is employed. If \( s = u \) then the agent is unemployed. The employment status follows a Markov process with transition probabilities \( \pi_j(s', s) \), where \( s' \) and \( s \) denote future and current status, respectively, in two adjacent periods.

Employed agents supply \( h \) hours of work inelastically and, if they are of type \( i \), they supply \( h \epsilon_j^i \) efficiency units of labor at age \( j \). Pre-tax earnings are given by \( wh \epsilon_j^i \), where \( w \) is the wage rate. The government imposes a flat tax on earnings at rate \( \tau^i \), and provides unemployment benefits equal to fraction \( \theta \) of the pre-tax earnings of a type-\( i \), age-\( j \) worker. In addition, the government provides lump-sum transfers \( T \).

Therefore, the after-tax and after-transfers earnings of a type \( i \) agent at age \( j \) are:

\[
y_j^i(s) = \begin{cases} 
(1 - \tau^i)wh \epsilon_j^i + T, & \text{if } s = e \\
\theta wh \epsilon_j^i + T & \text{if } s = u. 
\end{cases} 
\]

Each individual, including criminals, faces a probability \( \pi_o \) of being a victim of crime. If victimized, the individual loses a fraction \( \alpha \) of his disposable income from legitimate activities. For simplicity, we assume that criminals do not have the ability to target their victims based on their income and simply steal a fraction \( \alpha \) of the average income \( \bar{y} \) in the economy. Criminals face a probability \( \pi_a \) of being apprehended. A criminal who is being apprehended goes to jail. Here, for expositional simplicity, we assume that the criminal goes to jail for one period. Periods shorter than one period can be incorporated by assuming that the individual spends the remaining fraction of a year as unemployed. The length of the prison term can also be generalized for time longer than one period, although at the expense of additional notation. If a criminal goes to jail, he consumes \( \bar{c} \), and his assets grow at the rate of interest \( r \). He does not make any choice.

If an individual choose not to be a criminal then his budget constraint is, according to
whether the individual is victimized or not,

\[
c_i^j + a_{j+1}^i = \begin{cases} 
(1 + r)a_i^j + y_j^i & \text{with probability } 1 - \pi_v \\
(1 + r)a_i^j + (1 - \alpha)y_j^i & \text{with probability } \pi_v.
\end{cases}
\] (2)

If an individual chooses to be criminal then his options and possible outcomes are as follows:

\[
c_i^j + a_{j+1}^i = \begin{cases} 
(1 + r)a_i^j + y_j^i + \alpha \bar{y} & \text{with probability } (1 - \pi_v)(1 - \pi_a) \\
(1 + r)a_i^j + (1 - \alpha)y_j^i & \text{with probability } \pi_v(1 - \pi_a)
\end{cases}
\] (3)

\[
(c_i^j, a_{j+1}^i) = (\bar{c}, (1 + r)a_i^j) \quad \text{with probability } \pi_a.
\] (4)

Agents in the economy face an exogenous borrowing constraint

\[
a_{j+1}^i \geq \bar{a}_{j+1}^i,
\]

where \(\bar{a}_{j+1}^i = 0\). The agents have no access to private insurance markets.

The timing is as follows. First, the agents make a choice whether to become criminals or not. Then a random draw determines if the individuals are victimized, and whether a criminal is apprehended. Finally, individuals that are not apprehended make their choices of consumption and savings. Let \(V^i_{c,j}(a, s)\) be the value of having assets \(a\) at age \(j\) if the consumer is of type \(i\), and has employment opportunity \(s\). The value is a maximum of the value of committing a crime, \(V^i_{c,j}(a, s)\) and the value of not committing a crime, \(V^i_{nc,j}(a, s)\):

\[
V^i_{j}(a, s) = \max \{V^i_{c,j}(a, s), V^i_{nc,j}(a, s)\}.\] (5)

To determine \(V^i_{c,j}\) and \(V^i_{nc,j}\), define first \(v^i_j(y, a, s)\) to be a generic value of having current income \(y\):

\[
v^i_j(y, a, s) = \max_{a' \geq a_{j+1}^i} \left\{ U \left( (1 + r)a + y - a' \right) + \sum_{s'} V^i_{j+1}(a', s') \pi(s', s) \right\},
\]

9
and $\tilde{v}_j^i(c, a, s)$ be the value of spending the current period in prison,

$$\tilde{v}_j^i(c, a, s) = \left\{ U(c) + \sum_{s'} V_{j+1}^i ((1 + r)a, s') \pi(s', s) \right\}.$$  

Then the values of committing a crime and not committing a crime are written as

$$V_{c,j}^i(a, s) = (1 - \pi_v)(1 - \pi_a)v_j^i(\alpha\bar{y} + y_j^i, a, s) + \pi_v(1 - \pi_a)v_j^i(\alpha\bar{y} + (1 - \alpha)y_j^i, a, s) + \pi_a\tilde{v}_j^i(c, a, s)$$

$$V_{nc,j}^i(a, s) = (1 - \pi_v)v_j^i(y_j^i, a, s) + \pi_vv_j^i((1 - \alpha)y_j^i, a, s).$$

Let $c_j^0(a, s) \in R^+$ be the optimal consumption function, $g_j^0(a, s)$ be the optimal asset accumulation function, and $l_j^0(a, s) \in \{0, 1\}$ be the optimal crime decision, where $l = 0$ denotes a decision not to commit a crime, while $l = 1$ denotes a decision to commit a crime. Let also $\lambda_j^i(a, s)$ denote a measure of agents of type $i$ at age $j$ who have assets $a$ and current shock $s$.\(^3\) The measure is determined by the following equation:

$$\lambda_j^i(a', s') = \sum_{(a, s): a' = g_j^i(a, s)} \pi_j(s, s')\lambda_j^i(a, s),$$

where the initial measure $\lambda_0^0(a, s)$ is given. The aggregate crime rate and the average earnings in the economy are given by

$$\chi = \sum_{i,j,a,s} \gamma_i\mu_j\lambda_{i,j}(a, s)l_j^i(a, s)$$  \hspace{1cm} (6)

$$\bar{y} = \sum_{i,j,a,s} \gamma_i\mu_j\lambda_{i,j}(a, s)y_j^i(s)$$  \hspace{1cm} (7)

\hspace{1cm} (8)

There is an aggregate production technology that transforms capital $K$ and labor $N$ to

\(^3\)For simplicity, we assume that there is a countable number of asset levels.
output \( Q \):

\[
Q = BF(K, N),
\]

where \( F : \mathbb{R}_+^2 \to \mathbb{R} \) is increasing, concave, and constant returns to scale. Capital stock depreciates at rate \( \delta \in (0, 1] \). Profit maximization requires that the wage rate and the interest rate are equal to their respective marginal products:

\[
w = BF_N(K, N) \tag{9}
\]
\[
r = BF_K(K, N) - \delta. \tag{10}
\]

**Stationary Competitive Equilibrium**

The stationary competitive equilibrium consists, for given tax policies \( \tau, T, \theta \), of functions \( \{c_j^i, g_j^i, l_j^i, V_j^i\} \), distribution functions \( \{\lambda_j^i\} \), aggregate factor demands \( K \) and \( N \), prices \( r \) and \( w \), and victimization probability \( \pi_v \) such that

1. \( \{c_j^i, g_j^i, l_j^i, V_j^i\} \) solves the household’s dynamic problem (5),

2. \( K \) and \( N \) satisfies (9) and (10),

3. asset market clears:

\[
\sum_{i,j,a,s} \gamma_{i,a} \lambda_{i,j}(a,s) g_j^i(a,s) = K,
\]

4. victimization probability is consistent with the aggregate crime rate:

\[
\pi_v = \chi,
\]

5. government budget constraint clears:

\[
G + (1 - \pi_a \chi)T + \theta y^u + \pi_a \chi \bar{c} = \tau y_s + \pi_a y^{conf},
\]
where \( y^a = \sum_{i,j,a} \gamma_{ij} \mu_j \lambda_{ij}(a, s) w h \varepsilon^i_j \) and \( y^\text{conf} = \sum_{i,j,a,s} \gamma_{ij} \mu_j \lambda_{ij}(a, s) l_j^i(a, s) (w h \varepsilon^i_j + \alpha \tilde{y}) \), with \( \chi \) and \( \tilde{y} \) are given by 6 and 7.

3 Parameters and Calibration

When examining the determinants of crime, we focus on selected years from 1975 to 2010, at five year intervals. We also restrict attention to the United States and Germany. For all the years and for both countries we compute the stationary steady state for the economy. The benchmark year 1980 is special, because we calibrate the consumption level \( \bar{c} \), for which very little data is available, to be such that the model crime rate in 1980 matches the one observed in the data. For the remaining years we keep \( \bar{c} \) fixed at its 1980 value.

Utility and Production Function

People are assumed to love from age 15 to age 65. Model period is set to one year, and so we set \( J = 51 \). Utility function is logarithmic, \( U(c) = \ln c \). The discount factor is calibrated to be such that, in equilibrium, the asset market clears. The age distribution \( \mu \) is taken from the Bureau of the Census for the United States. For Germany, we use data from Eurostat. We set \( I = 3 \) and consider skill levels corresponding to the following categories: less than high school, high school degree but no higher degree, and college degree and more. The shares of each educational category \( \gamma \) are from the Barro-Lee Dataset (see Barro and Lee (2010)).

The production function parameters are standard. The production function is Cobb-Douglas, \( F(K, N) = K^{1-\eta} N^\eta \), and set labor share \( \eta = 0.64 \). The depreciation rate \( \delta \) is set to 8\%, and we calibrate the interest rate \( r \) to be consistent with capital-output ratio of 2.8. The resulting interest rate is \( r = 0.505 \). The calibration of the production side is very similar to the calibration in İmrohoroğlu, Merlo, and Rupert (2004).
Earnings

We assume that if an individual is employed, he spends a fraction $h = 0.45$ of his time working, leading to an average labor input of one-third. The age-earnings profiles, $\varepsilon^i_j$, are constructed from the Current Population Survey for each year by regressing the log of real weekly earnings on age, age-squared, and dummy variables for different human capital types. The details can be found in İmrohoroğlu, Merlo, and Rupert (2004). The labor tax rate $\tau^l$ is set equal to one minus the labor tax wedge, as computed from McDaniel (2007), and subsequent updates. The labor tax rates are shown in Table 1 for United States and Germany. As is well known, the labor tax rate is higher in Germany, and has been rising in 1970’s and 1980’s. It has been relatively stable after that, at around 47%. In the United States, the labor tax rate has been relatively constant at around 25%.

In the event that an individual becomes unemployed he receives unemployment insurance with a replacement rate $\theta$, which is computed as follows. Let $d^u$ be unemployment duration, expressed as a fraction of a year, and $\theta^{UI}$ be the gross unemployment insurance replacement rate. We compute $\theta$ as

$$\theta = (d^u \theta^{UI} + 1 - d^u) (1 - \tau^l).$$

That is, the model replacement rate takes into account that individuals are unemployed only for a fraction of a year, and work for the rest of the year. The unemployment duration is computed from the OECD labor force statistics, and the gross unemployment insurance replacement rate are the Gross Replacement Rates of average Production Worker (APW), as computed by OECD. The resulting values of the average replacement rates are in Table 1. While the unemployment insurance rates are lower in the United States, the unemployment duration is significantly shorter in the United States as well. The second effect dominates, and the effective replacement rates are higher in the United States.
### Time Varying Model Parameters

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<td>5.96</td>
<td>6.83</td>
<td>6.55</td>
<td>6.49</td>
</tr>
</tbody>
</table>

Table 1: Model Parameters, United States and Germany

### Unemployment

To determine the transition probabilities \( \pi_j(s', s) \), we need data on age specific unemployment rates \( u_j \), and on unemployment duration \( d^u \) (which is assumed to be age independent). Given that, we construct the transition probabilities so that the fraction of the time the employment opportunity is offered equals the employment rate of that age group. Specifically, the probabilities are determined recursively by

\[
\pi_j(u, u) = 1 - \frac{1}{d^u} \\
\pi_j(e, u) = \frac{u_j - \pi_j(u, u) u_{j-1}}{1 - u_{j-1}}.
\]

Both the unemployment rates are the unemployment duration are taken from OECD’s Labor Force Statistics.
Crime Data

An important input into the model are the probability of being apprehended $\pi_a$, and the expected prison duration $d^p$. The probability of apprehended is taken to be the same as the clearance rate. The clearance rate is defined in the United States as

$$\text{clearance rate} = \frac{\# \text{ of offenses cleared by arrest or exceptional means}}{\# \text{ of offenses}}.$$  

Here "cleared" means that at least one person has been arrested, charged with an offense, and turned over to the court for prosecution.\(^4\) Being cleared does not mean that the person is sentenced for the offense. We factor in the probability of being sentenced to the expected prison duration. The expected prison duration is computed as the average length of prison sentences multiplied by the fraction of offenders sentenced to prison.

In collecting data we focus on property crime, which includes robbery, burglary, theft, motor vehicle theft, and larceny. Both data are again in Table 1. For the United States the data on clearance rate are taken from Table 25 of FBI’s "Crime in the United States” publication, and the data on expected prison duration are from Bureau of Justice’s ”Sourcebook of Criminal Justice Statistics”\(^5\). For Germany, the data on clearance rate are from Bundeskriminalamt’s “Police Crime Statistics”, and the expected prison duration is computed based on the data reported in Albrecht (2013) and come originally from Statistisches Bundesamt’s Strafverfolgung publication.

The data show several things. First, Germany has a significantly higher clearance rate than United States. On average, the German clearance rate is about 60% higher in Germany. Seconds, German clearance rate has been relatively stable over time, with the exception of 1990 and 1995, when it was significantly lower. German unification and changes after the fall of communism in Eastern Europe are likely responsible for the decline. Third, United States have experienced periods of lower clearance rate in early 1980’s, and in early 2000’s, but no overall trend in the clearance rate.

\(^4\)Exceptional means include nonstandard cases, for example when the offender has died by suicide.
The expected prison duration is significantly higher in the United States than in Germany. An average, a sentenced German offender expects to serve around 6.5 months in 2000’s, while in the United States he expects to serve around 17 months. This can be either due to a higher probability of sentencing, or due to the average length of prison sentences. The difference is due to both: United States are more likely to sentence an offender, and, conditional on sentencing, the offenders serve more time. Over time, the expected prison duration has decreased in Germany, with an especially stronger drop in early 1990’s. On the other hand, the expected prison duration in the United States has increases, and the increase has been especially large since mid 1990’s. The increase in the United States is mostly caused by an increase in the fraction of offenders being sentenced, rather than in the length of the prison sentence.

The parameter $\alpha$ that characterizes criminal earnings from property crimes, as well as the costs of property crime to victims is set to be 0.15 (see Imrohoroglu, Merlo, and Rupert (2000)). While in prison the criminal receives a per-period consumption level $c^p$. Given that there is little data on consumption and utility while in prison, $c^p$ is used to calibrate the model to match the crime rate in the benchmark year 1980. The calibrated value of $c^p$ is equal to 0.034 for the United States, and 0.053 for Germany. Given $c^p$, the consumption level $c$ is given by

$$c^j_i = d^p c^p + (1 - d^p) \theta h \xi^i_j$$

where $d^p \in [0, 1]$ is the expected prison duration, as a fraction of a year.

To compute the model, we set the maximum asset holdings $\bar{a}$ about 20 times the annual income of an employed individual, so that the upper bound is never binding. We also discretize the set $A$ by using a log-equispaced grid on $[a, \bar{a}]$. We also set the borrowing constraint $g$ equal to zero. Finally, we assume that the initial asset distribution is uniform over the bottom 20% of assets.
### 1980 Benchmark Economy

<table>
<thead>
<tr>
<th></th>
<th>USA</th>
<th>Germany</th>
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<tbody>
<tr>
<td>Percent of criminals that are employed</td>
<td>0.774</td>
<td>0.846</td>
</tr>
<tr>
<td>Percent of criminals that are unemployed</td>
<td>0.226</td>
<td>0.154</td>
</tr>
<tr>
<td>Percent of criminals that are recidivists</td>
<td>0.626</td>
<td>0.372</td>
</tr>
<tr>
<td>Percent of criminals that are 18 years and younger</td>
<td>0.730</td>
<td>0.938</td>
</tr>
</tbody>
</table>

Table 2: 1980 benchmark, United States and Germany

## 4 Results

In Table 2 we display several properties of the benchmark economy in 1980 related to crime behavior. The results show that a majority of criminals are employed. Only 23% of US criminals and 15% of German criminals are unemployed. While we do not have German data, the evidence for the United States is consistent with our findings, as documented by İmrohoroğlu, Merlo, and Rupert (2004): according to the Bureau of Justice Statistics, in 1979 only 29% of all criminals were previously unemployed. In both countries, and especially in Germany, the vast majority of criminals are 18 years or younger. This is much higher than what is found in the data. İmrohoroğlu, Merlo, and Rupert (2004) show, however, that introducing stigma, where past criminals face lower wages in the future, significantly reduces juvenile delinquency, and improves the fit of the model.

Figure 5 shows the performance of the model in all the selected years. It shows the crime rate in the model, and compares it to the property crime rate, as shown in Figure 2. The model tracks changes in the German crime rate remarkably well. It captures both the increase in the crime rate until 1995, and its decline after that. For the United States the results are mixed for early 1990’s, but the model captures the rapid decline in the crime rate after 1995 well.

Looking at relative differences, in 1980, the crime rate was 1.9 percentage point higher in the United States, while in 2010 it was 0.4 percentage point lower. The model predicts the change well. While the 1980 difference is calibrated, the model predicts that in 2010 the crime rate in the United States should be 0.6 percentage point lower.
Disaggregating the Changes

In what follows, we will disaggregate the overall changes to determine the contribution of the key parameters of the model. We keep the values of the probability of apprehension, prison length, labor taxes at the 1980 level, one at a time, and determine the counterfactual crime rate. Table 3 shows what the counterfactual crime rate would have been in 2010, had the key factors, one at a time, stayed constant at their 1980 level. Figures 6 and 7 then illustrate the counterfactual crime rates for all the selected years for selected key factors.

A brief look at the table shows that the changes in the crime rates in USA and Germany were overall caused by different factors. In the United States, changes in the probability of apprehension and prison duration were of key importance. In contrast, changes in those parameters contributed only mildly to a decrease in crime in Germany, where changes in tax
and transfer policies, and especially changes in the age distribution, were of key importance.

As figures 6 and 7 show, changes in the probability of apprehension are mostly responsible for the decline in the crime in 1980’s and 1990’s in the United States, and for the spike in the crime rate in early 1990’s in Germany. In the absence of all changes in the probability of apprehension, the crime rate in Germany in 1995 would be only 3.5% instead of almost 5.5%. The decline in the probability of apprehension is thus responsible for about a third of the crime rate in 1995. On the other hand, in the absence of changes in the probability of apprehension the crime rate in 2010 would be 82.6% higher in the United States, and only 9.4% higher in Germany.

Changes in the expected prison duration are the most important factor behind the decline in the U.S. crime rate in 2000’s, but are relatively unimportant for the overall changes in the crime rate in Germany. If the expected prison duration was the same as in 1980, 2010 crime rate would be 136.7% higher in the United States, but in Germany it would stay unchanged. As table 1 shows, United States have increased the expected prison duration by almost seven months since 1980, while at the same time almost no changes in the prison duration occurred in Germany.

Increases in the labor tax rate have significantly contributed to a higher crime rate in Germany, while in United States they are not a relevant factor. Lower tax rates on earnings

<table>
<thead>
<tr>
<th>2010 Crime rate, Decomposition</th>
<th>USA</th>
<th>Germany</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010 Crime rate, model</td>
<td>1.9</td>
<td>2.6</td>
</tr>
<tr>
<td>Relative to 2010 crime rate, percentage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1980 probability of apprehension</td>
<td>182.6</td>
<td>109.4</td>
</tr>
<tr>
<td>1980 prison duration</td>
<td>236.7</td>
<td>99.9</td>
</tr>
<tr>
<td>1980 labor tax rate</td>
<td>103.9</td>
<td>75.9</td>
</tr>
<tr>
<td>1980 replacement ratio</td>
<td>100.2</td>
<td>129.4</td>
</tr>
<tr>
<td>1980 unemployment rate and duration</td>
<td>65.8</td>
<td>97.6</td>
</tr>
<tr>
<td>1980 type distribution</td>
<td>93.1</td>
<td>113.3</td>
</tr>
<tr>
<td>1980 age distribution</td>
<td>107.3</td>
<td>142.9</td>
</tr>
</tbody>
</table>

Table 3: Counterfactual 2010 values with 1980 parameters
makes prison consumption less attractive, because the potential foregone earnings are higher (recall that if an individual goes to prison, he spends the rest of that period as unemployed). Hence lower tax rate on earnings decreases the crime rate. Germany has increased its labor tax rate by almost 4 percent since 1980, while in the United States the labor tax rate decreased. Had the German labor tax rate stayed constant at its 1980 level, the crime rate would be decreasing throughout 1990’s and 2000’s, and would be only 75.9% of the crime rate in 2010.

On the other hand, increases in the replacement rate have contributed to a lower crime rate in Germany, while again being insignificant in the United States. Lower replacement rates make crime opportunities more attractive, because prison consumption increases relative to the earnings of the unemployed. Thus, lower replacement rates increase crime. Overall, the contribution of the tax changes roughly cancels out the contribution of transfer policies in Germany.

One of the key factors behind the decline in crime in both countries are demographic changes. This factor is of first-order importance in Germany, where, in the absence of demographic changes, the crime rate would be higher by 42.9%. In the United States this effect is smaller, and the 2010 crime rate would have been higher by 7.3%. This is to be explained by the fact that German population is aging faster than U.S. population, and most of the crime is committed by younger people, as shown in Table 2.

Germany with U.S. Crime Policies

To be completed.

5 Conclusions

We study the determinants of the “the reversal of misfortunes” between Germany and United States. In 1980 the crime rate was 1.9 percentage point higher in the United States, while in 2010 it was 0.4 percentage point lower. We construct a dynamic general equilibrium model,
and show that it can explain the drop: the model predicts that in 2010 the crime rate in the United States is 0.6 percentage point lower.

We decompose the results into the contribution of various factors, and find that the changes in crime in the United States are mostly caused by changes in the prison length and probability of apprehension, in Germany they are mostly caused by changes in the tax and transfer policies, and demographic changes.

References

Figure 7: Crime Rate, Germany: Contribution of Key Factors

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İmrohoroğlu, A., A. Merlo, and P. Rupert (2004). What accounts for the decline in crime?
*International Economic Review* 45(3), 707–729. 5, 12, 13, 17
