



Use of quantitative criminal data in the Ministry of Justice, the Netherlands

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1. Data sources available
2. PMJ: forecasting
3. (Discussion on the decrease in crime)



1. Data Sources

- Survey data: victim surveys, also offender surveys
- Data from CJS organizations, such as Police, Prosecution, Courts
 - Microlevel
 - Privacy issues
- Data from outside CJS: demographic, economic, education, income
 - Macrolevel
 - Microlevel through Statistics Netherlands
- New areas: Internet, Social media, sensor data



1. Data Sources: Safety Monitor

- Large annual survey, >60k respondents
- Crimes, Safety, but also opinion on Police
- Both national and local level
- Sample taken from kind of SN, so linking with other datasets possible



1. Data Sources: Police data

- Recorded crime
- Suspected offenders
- Again: linking with other datasets possible



1. Data Sources: Prosecution and Courts

- Combined system for Prosecution and Courts
- Both cases and persons
- Again: linking with other datasets possible



2. PMJ: forecasting

On the interaction between forecasts and policy decisions

The challenge:

- How many resources do we need in the field of justice in the coming years?
- Police, judges, prosecutors, prison cells, probation officers, legal aid, ...?



2. PMJ: forecasting

On the interaction between forecasts and policy decisions

The challenge:

- How many resources do we need in the field of justice in the coming years?
- Police, judges, prosecutors, prison cells, probation officers, legal aid, ...?
- In the Netherlands we developed a forecasting model to be used for budgetting the justice field



2. PMJ: forecasting

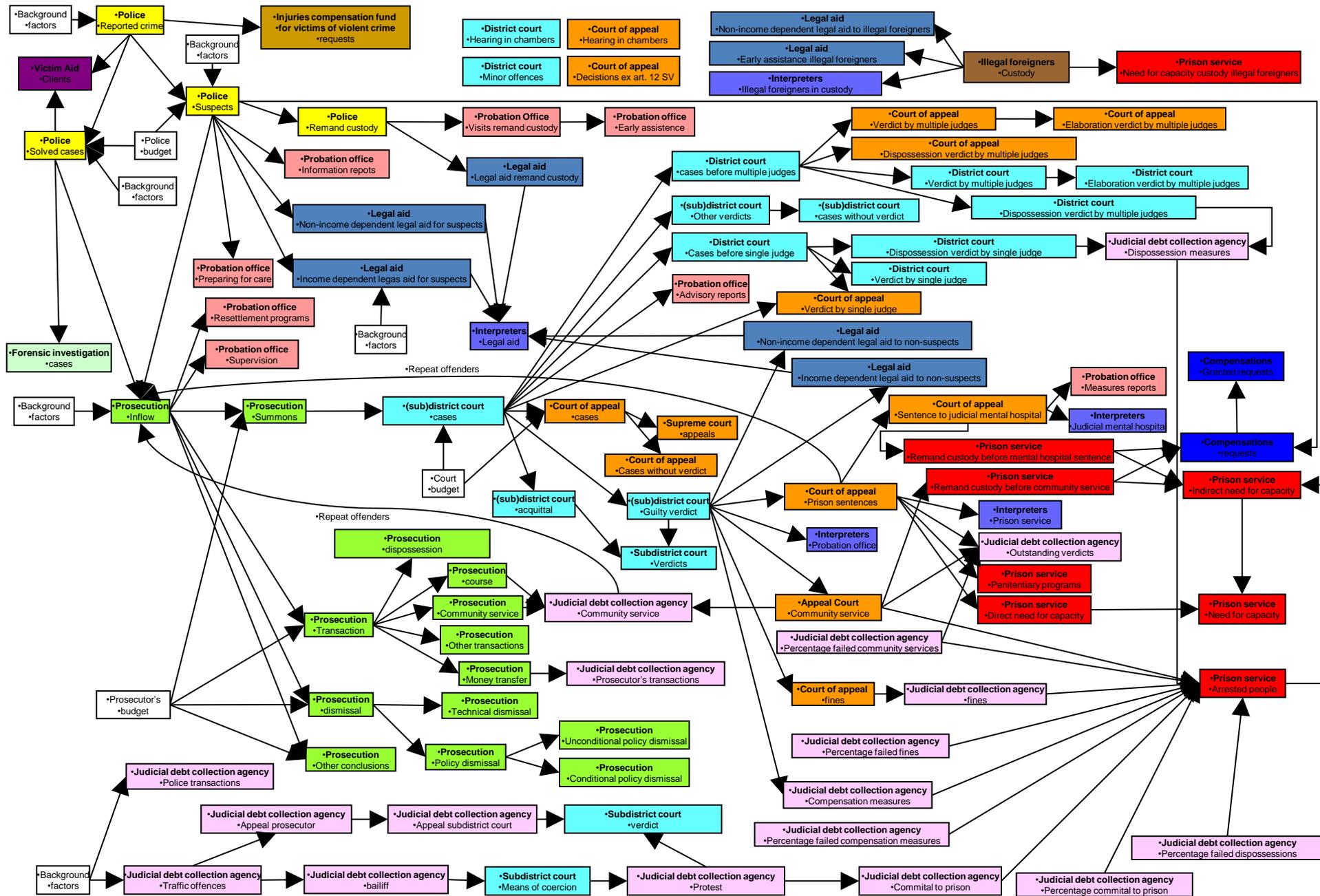
- a) **Description of the system**
- b) **How is it actually used in the budgeting process?**
- c) **Are our forecasts accurate?**



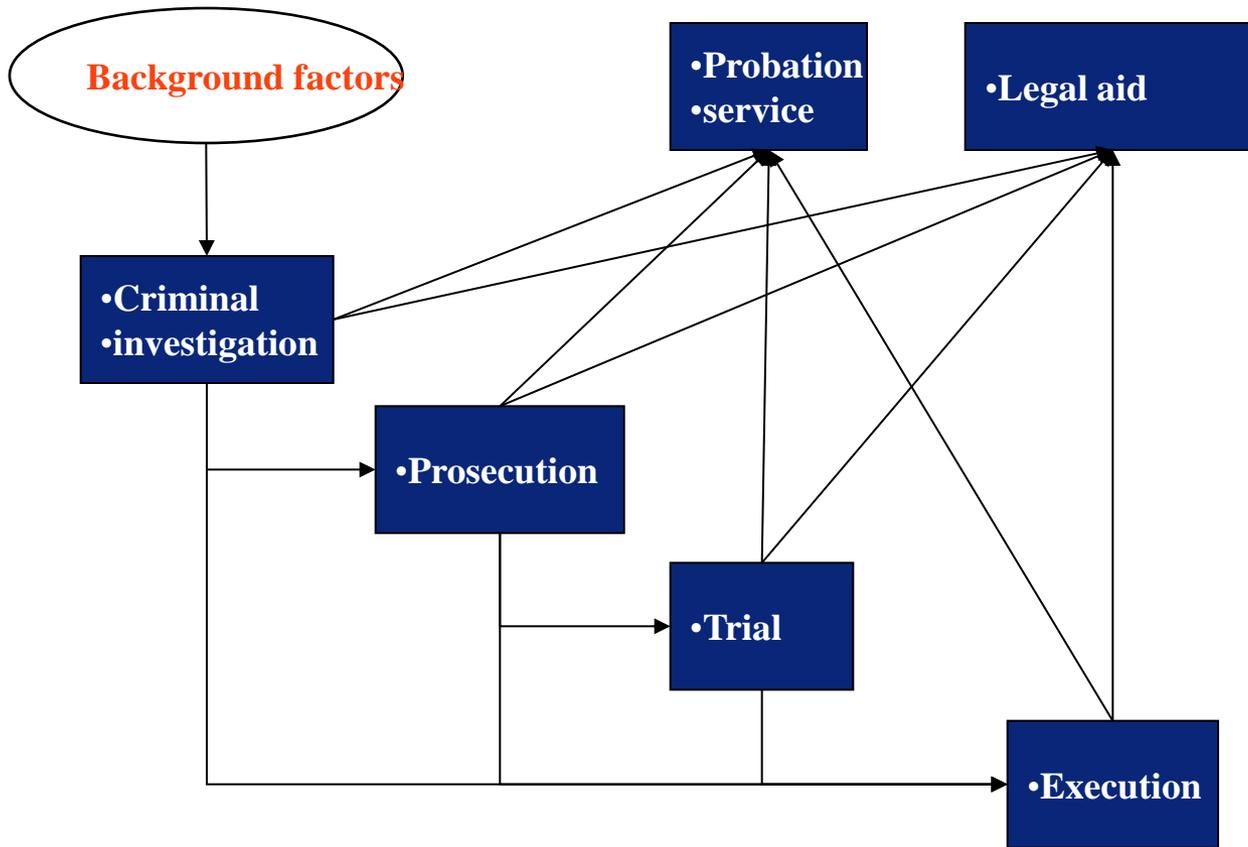
2a. PMJ: forecasting *description of the system*

- **Information flows between organizations that are part of the field of Justice can be modeled as a network**

•Criminal Justice Chain model, adults, version 2004



Criminal justice network





2a. PMJ: forecasting *description of the system*

- Information flows between organizations that are part of the field of Justice can be modeled as a network
- **Developments outside the Justice field influence the information flows as well**

Exogenous factors



The exogenous factors describe circumstances under which crimes or conflicts are more likely to occur.

These circumstances are described in criminological theories or theories about conflicts.

These theories are too abstract and are translated into quantifiable factors.

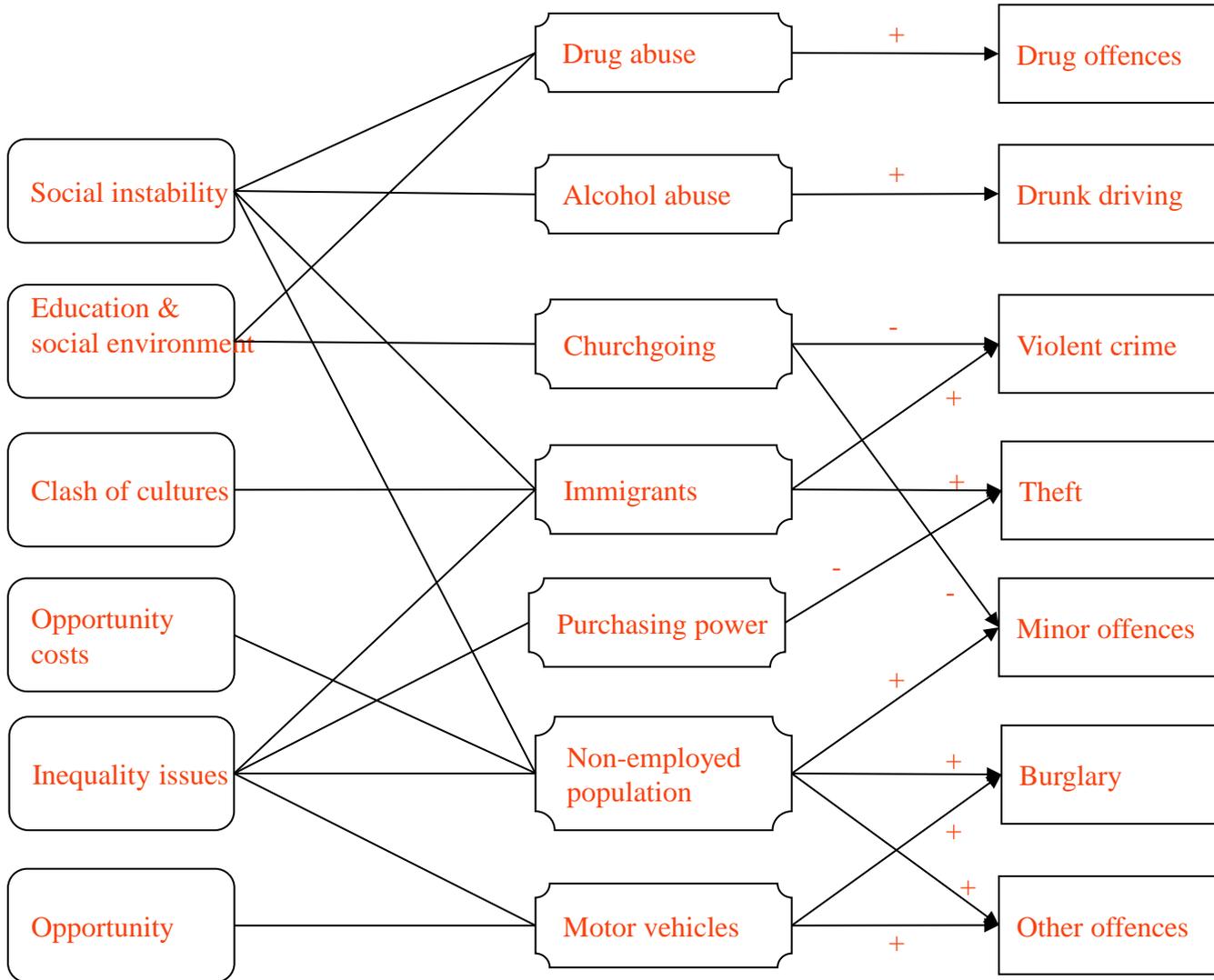
4 categories:

- Demographic developments
 - E.g. population, number immigrants
- Economic developments
 - E.g. Working labour force, average income
- Social problems
 - E.g. alcohol and drug abuse
- Institutional factors
 - E.g. cost of lawyers, number of police officers

Social problem

Background factor

Type of crime





2a. PMJ: forecasting *description of the system*

- Information flows between organizations that are part of the field of Justice can be modeled as a network
- Developments outside the Justice field influence the information flows as well
- **The system consists of a large number (3500) of regression equations of the following form:**



$$\begin{aligned} \Delta \ln (\textit{reported violent crime}) &= 0.95 \Delta \ln (\textit{population}) \\ &+ 0.694 \Delta \ln (\textit{percentage of religious people}) \\ &+ 0.148 \Delta \ln (\textit{children involved in divorce proceedings}) \\ &+ \textit{regression error term} \end{aligned}$$

$$\begin{aligned} \Delta \ln (\textit{interrogated suspects violent crime}) &= \\ &0.265 \Delta \ln (\textit{reported violent crime}) \\ &+ 0.884 \Delta \ln (\textit{police capacity}) \\ &+ \textit{regression error term} \end{aligned}$$



2b. PMJ: forecasting

how is it actually used in the budgeting proces?

- **In summer year t forecasts are made for $t+1$ to $t+6$, based on actual data until $t-1$ (and forecasts for exogeneous variables from t onwards)**



2b. PMJ: forecasting

how is it actually used in the budgeting proces?

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- A few months later the forecasts are finetuned using preliminary data for year t . This results in so-called ‘policy-free’ forecasts



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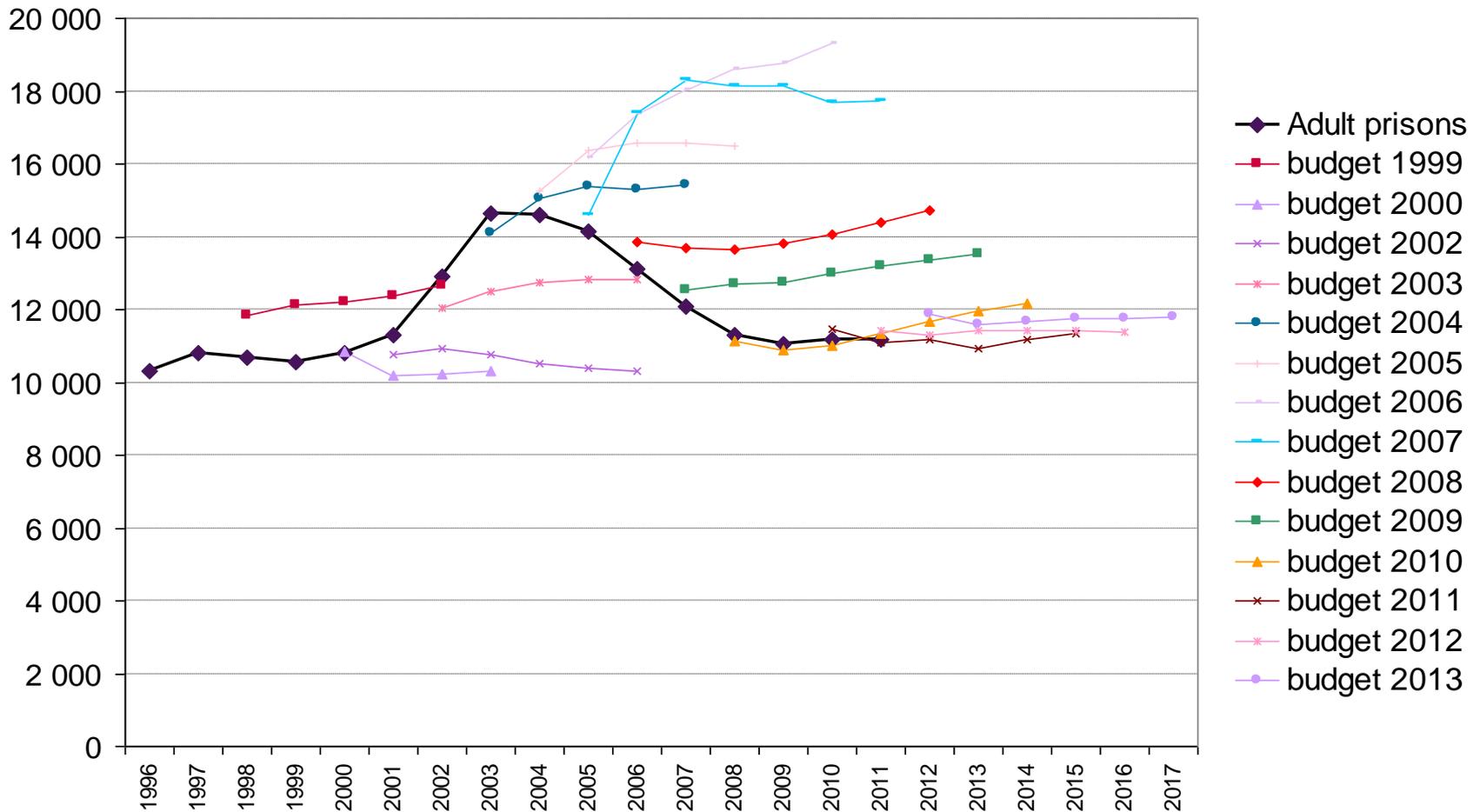
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- **Next, the Justice organizations add changes to the outcome of the model when changes in policy so requires. This gives ‘policy-rich’ forecasts and is the basis for budget negotiations with Ministry of Finance**



2c. PMJ: forecasting
Are our forecasts accurate?

The simple answer is “NO” !!

Need for adult prison capacity





2c. PMJ: forecasting

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Main reasons:

- **Dependent on the quality of forecasts for external variables**
- **Self-fulfilling and self-denying**
- **Slow in reacting on break in trends**



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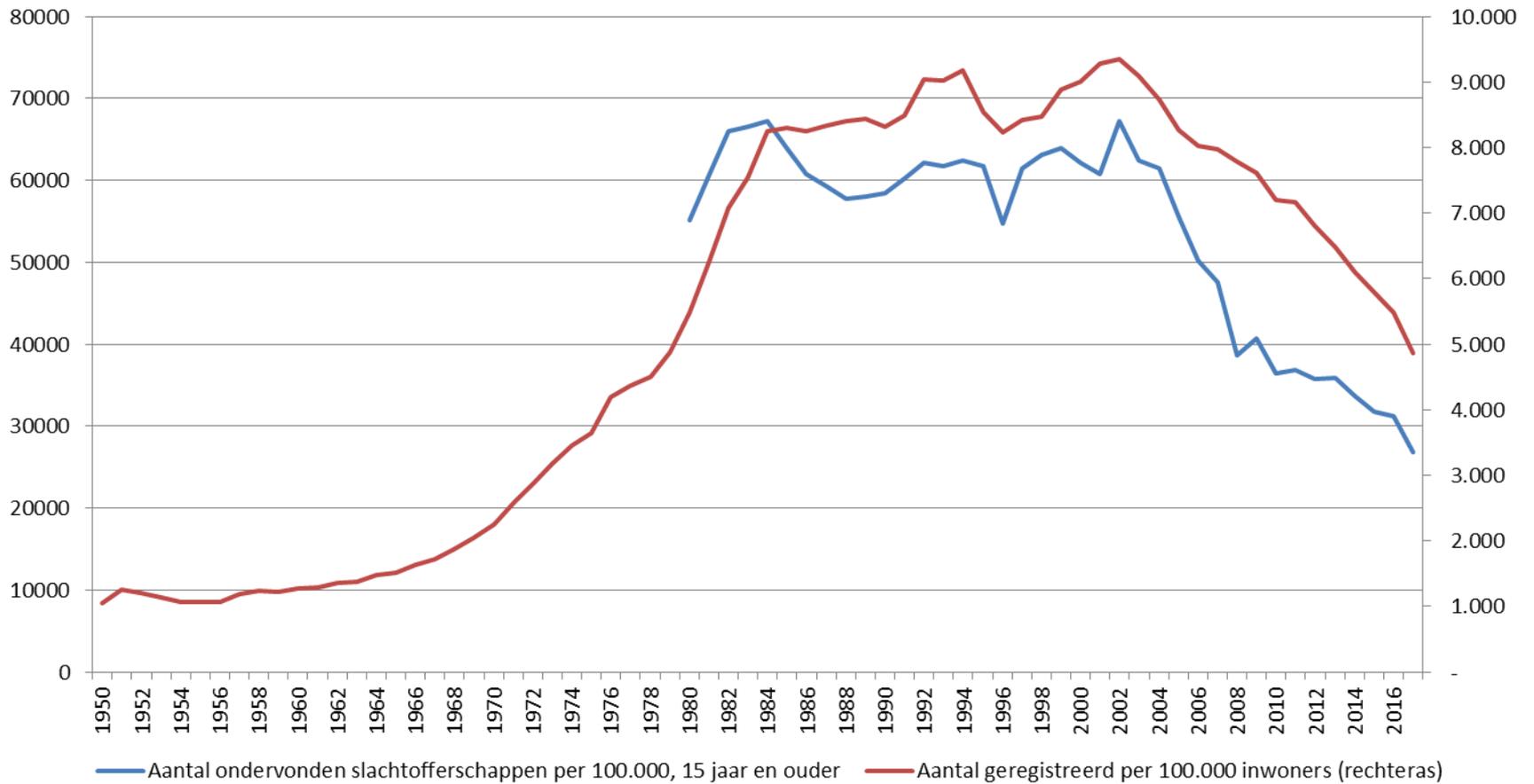
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A few years ago external review. Conclusions:

Outside review

Conclusions:

- In the short term (up to three years ahead) the forecasting model is better than simple alternatives such as keeping everything constant, trend extrapolation and simple time series methods.
- In the long term no differences between forecasting model, trend extrapolation and simple time series methods.
- Keeping constant is always worse than the forecasting model.
- Adding the estimated effects of new policy/legislation does not improve the forecasts





Total recorded crimes per 100k 1950 - 2014

