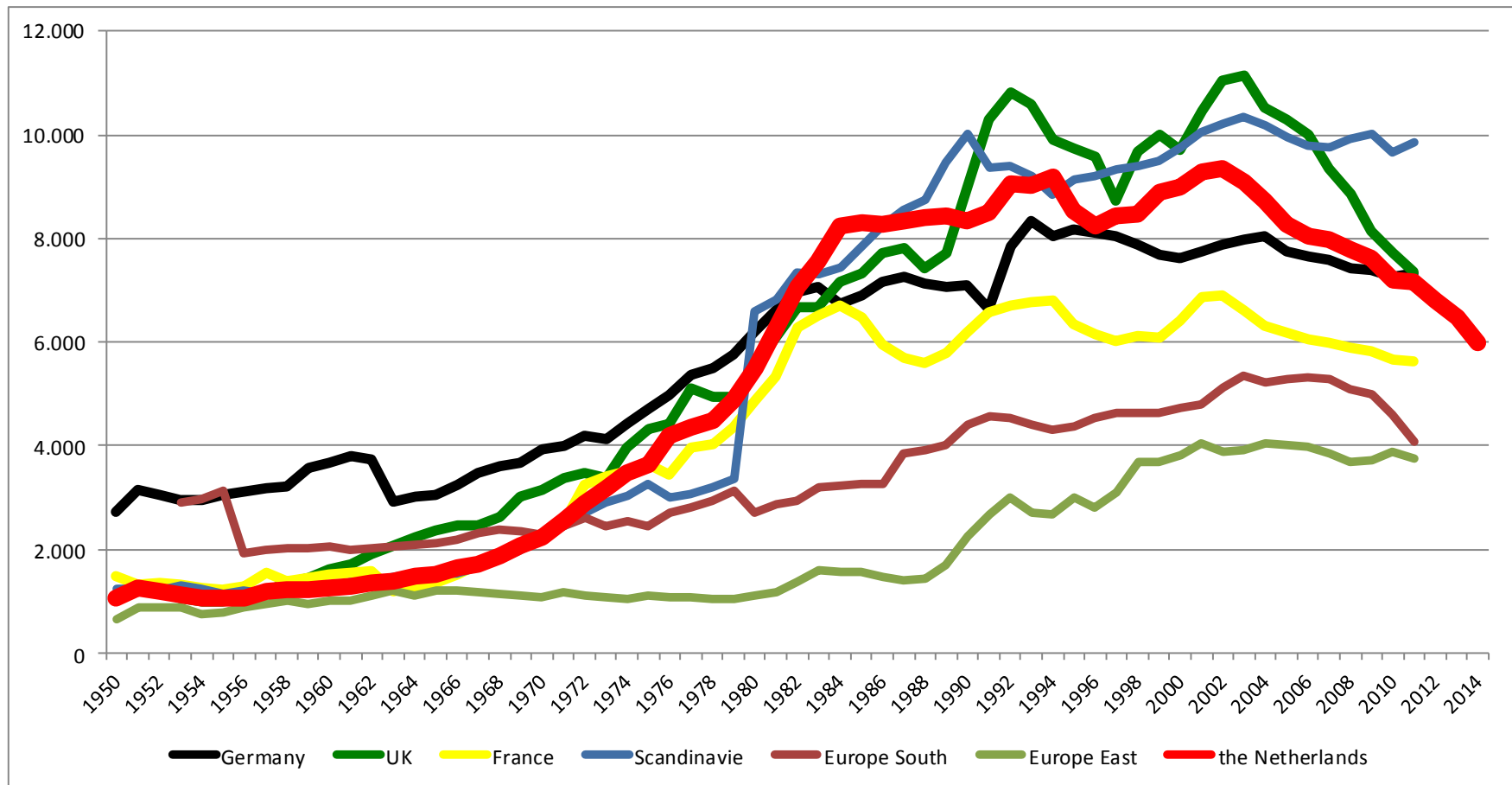# Use of quantitative criminal data in the Ministry of Security and Justice

Paul Smit
September 25, 2017

Total recorded crimes per 100k 1950 – 2014

Use of data

1. The section SIBa within WODC
2. Data sources
3. PMJ: forecasting
4. Two other projects
5. Cooperation with Statistics Netherlands

1.   The section SIBa within WODC

SIBa (Statistical Information and Policy Analysis) is one of the research sections within the WODC.

Main areas are:

- Collecting statistical data, maintaining monitors (mainly criminal data)
- Develop new areas and methods
- Using data, aiding policy making and informing general public

Use of data

2.   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

2.   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

2. Data Sources: Police data

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

# 2.	Data Sources: Prosecution and Courts

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

3.   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, …?

3.   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
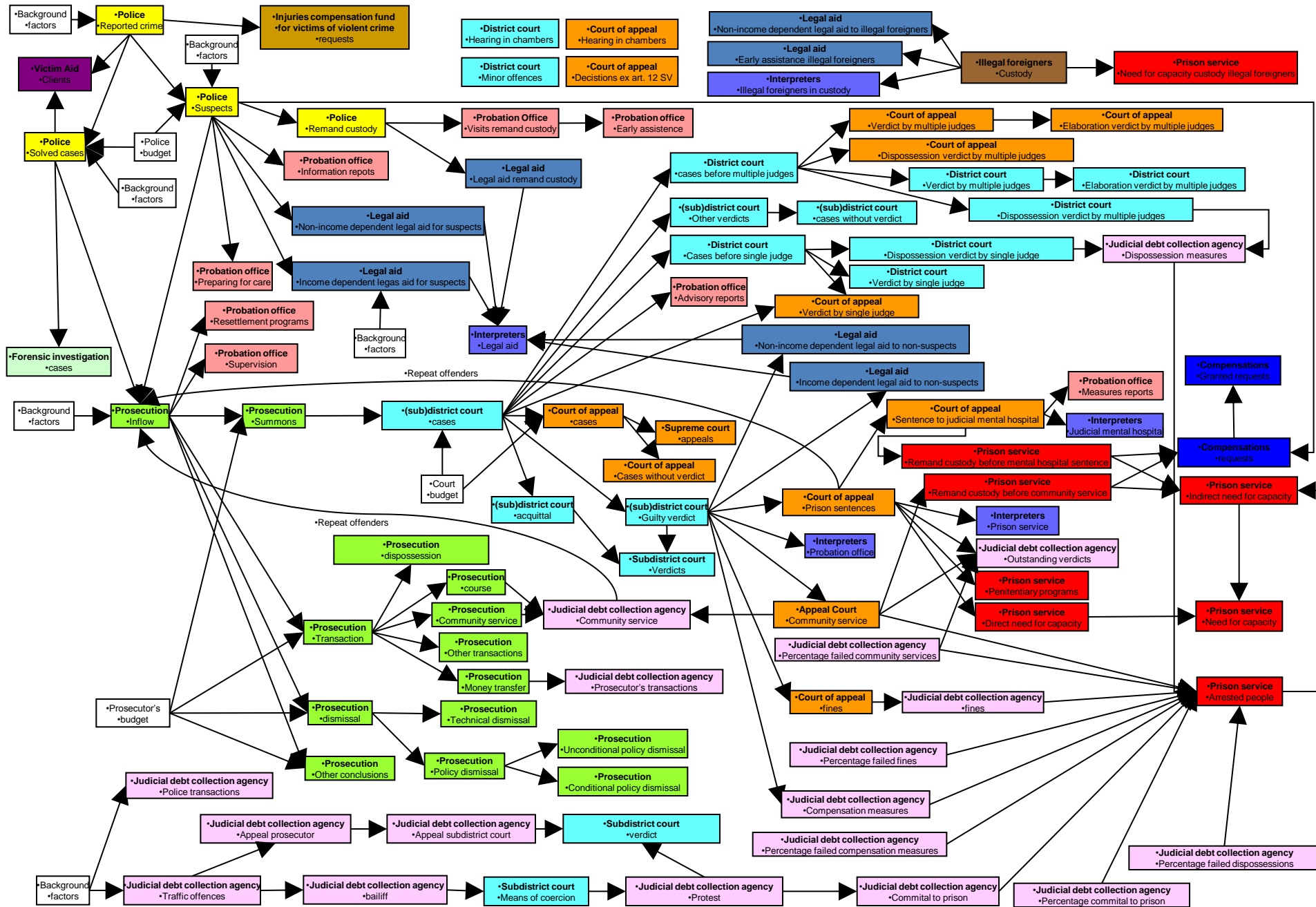
3.   PMJ: forecasting

a) **Description of the system**
b) **How is it actually used in the budgetting process?**
c) **Are our forecasts accurate?**
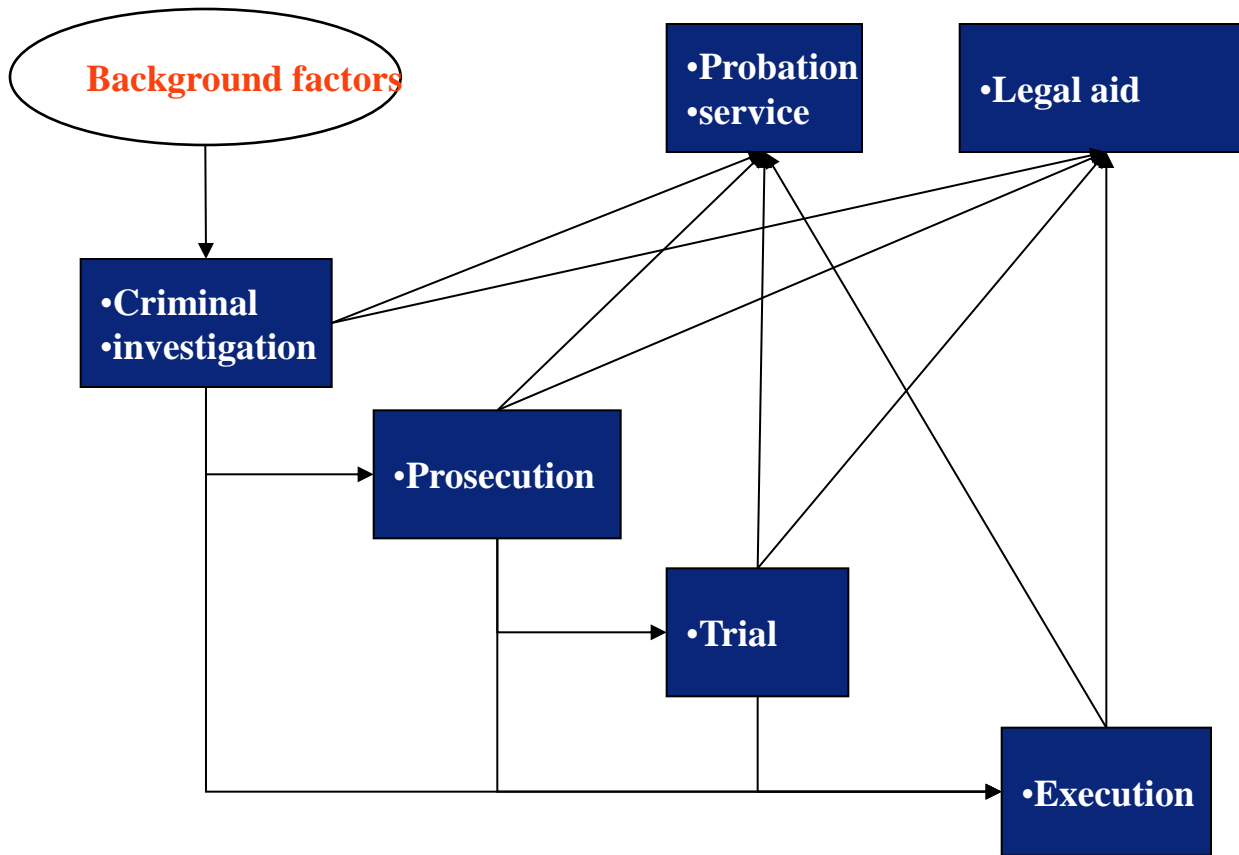
3a. PMJ: forecasting
description of the system

•**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

3a. 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.

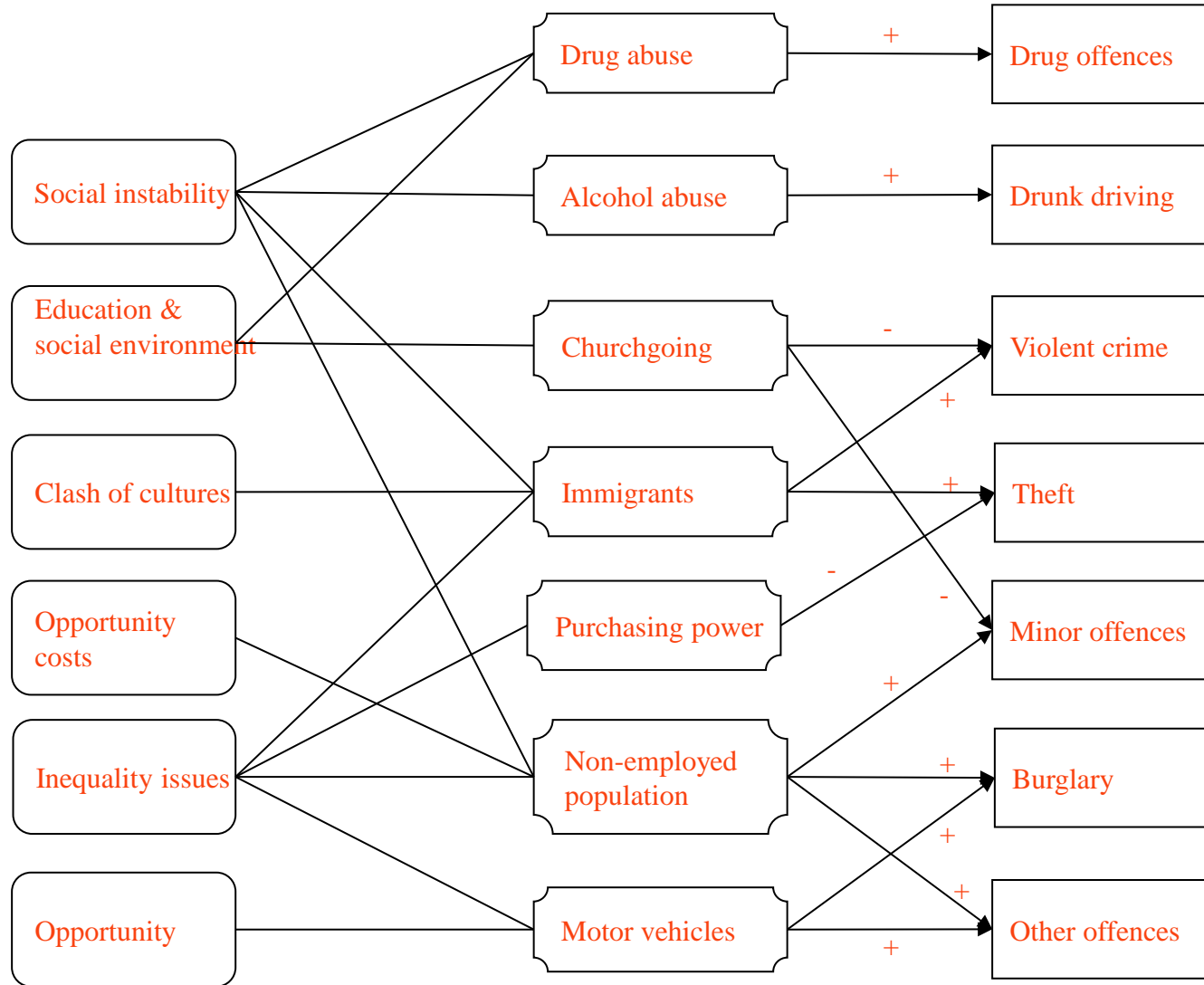These theories are too abstract and are translated into quantifiable factors.

4 categories:

- Demografic 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

Social problem

- Social instability
- Education & social environment
- Clash of cultures
- Opportunity costs
- Inequality issues
- Opportunity

Background factor

- Drug abuse
- Alcohol abuse
- Churchgoing
- Immigrants
- Purchasing power
- Non-employed population
- Motor vehicles

Type of crime

- Drug offences
- Drunk driving
- Violent crime
- Theft
- Minor offences
- Burglary
- Other offences

Drug abuse → Drug offences (+)

Alcohol abuse → Drunk driving (+)

Churchgoing → Violent crime (-)

Immigrants → Violent crime (+), Theft (+)

Purchasing power → Minor offences (-)

Non-employed population → Minor offences (+), Burglary (+), Other offences (+)

Motor vehicles → Burglary (+), Other offences (+)

3a. 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:**

Use of data

Δ ln (*reported violent crime*)= 0.95 Δln (*population*)

　　+ 0.694 Δln (*percentage of religious people*)

　　+ 0.148 Δln (*children involved in divorce proceedings*)

　　+ regression error term

Δ ln (*interrogated suspects violent crime*) =

　　　　0.265 Δ ln (*reported violent crime*)

　+　　0.884 Δ ln (*police capacity*)

　+　　regression error term

3a.   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:**

•**A 'model generator' proposes some 'best' models**

3b.   PMJ: forecasting
how is it actually used in the budgetting 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)

Use of data

3b. PMJ: forecasting
how is it actually used in the budgetting 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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•**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**
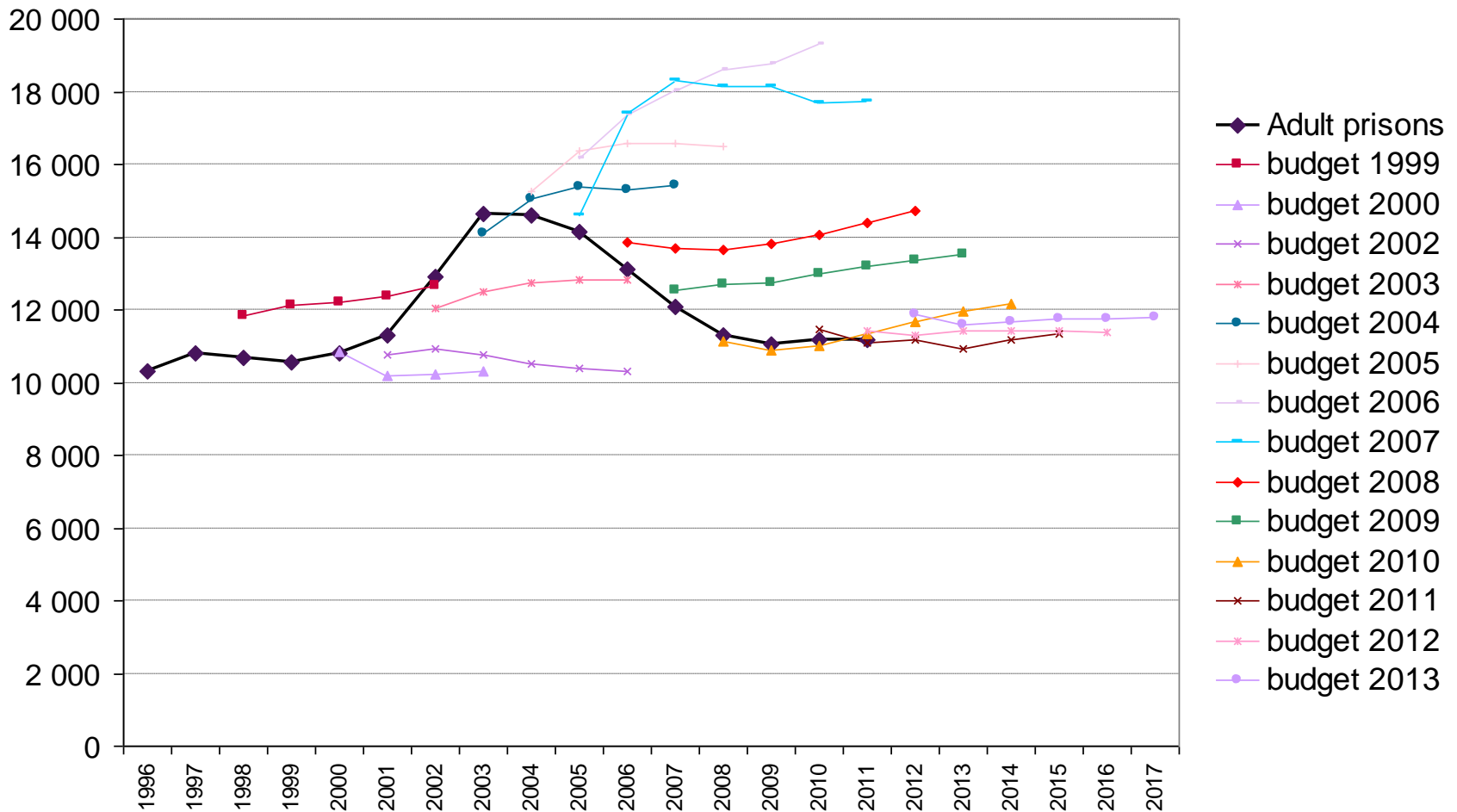
3c. PMJ: forecasting
Are our forecasts accurate?

The simple answer is "NO" !!

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The simple answer is "NO" !!

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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Are our forecasts accurate?

The simple answer is "NO" !!

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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

4. Two other projects

SKM (Criminal Justice Monitor)

- All organizations in the Criminal Justice System contribute (aggragate, quarterly) data to this monitor
- Very complete and timely data
- Helps policy makers to detect unexpected or huge changes in the flow of criminal cases through the CJS

4.   Two other projects

Recidivism Monitor

- Uses primarily a special source of microdata: not case oriented, but person oriented (essentially a criminal record database).
- Includes all active offenders during 20 years (4 million people, over 12 million criminal cases), including their older justice records
- Basis for recidivism (or rather reconviction) research, e.g. what works? (Review of various sanctions by measuring recidivism)

5.   Cooperation with Statistics Netherlands

- WODC/SIBa and Statistics Netherlands have – for a large part – a common 'mission': providing statistical data on crime.
- Since about 20 years close cooperation in publishing results: a yearly comprehensive publication Criminaliteit en Rechtshandhaving (Crime and Law Enforcement)
- Since 1 year development of a common website: www.criminaliteitinbeeld.nl