University of Zurich

Faculty of Law

Fall Semester 2012

Law & Economics

Economic Analysis of Law

Introduction, economic theory & analytic methods and tools

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Agenda

1. Definition and development of Law & Economics
2. Economic concepts
   - Rationality
   - Supply and demand – elasticity
   - Efficiency
3. Application of economic concepts in law: Law & Economics
   - Descriptive questions – effects of law
   - Normative questions – assessment of law
4. Example: Of Carrots, Sticks and Broken Windows
5. Why should a lawyer / economist be concerned with Law & Economics ?

Law & Economics – Definitions

- Application of economic theory and methods
  - Formation of law
  - Structure of law
  - Legal processes
  - Effects of law
  - Effects of institutions
- Typical and untypical areas
  - Competition, liability, business, tax, labour law etc.
  - Criminal, family, public law etc.

History of Law & Economics
18th Century – Beginnings

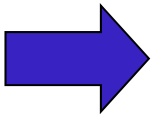
- Hume, Russeau
  - Constitutional law – „collective action“
- Smith
  - Analysis of mercantilism
  - Market prices, monopolies, regulation
- Bentham – utilitarism
  - „Greatest happiness principle“
  - Laws concerning human relations (e.g. Marriage, equality, etc.)
  - Prison reform
  - “natural law”
- But: no complete systematic approach

History of Law & Economics
19th Century – Definition of (Property) Rights

- European movement
  - Commons, Molionari, Menger, Schmoller, Wagner, etc.
- „Explanatory science of rights“
  - Natural law unsatisfactory
    - Distinctions related to different “states of nature” unexplained
  - Unequal rights
    - Economic reasons
    - Institutional reasons
- Scientific nature?
  - Telling stories
  - Generalisations

History of Law & Economics
20th Century

- Chicago School (Demsetz, Coase, Becker, Posner, etc.)
  - Property rights
  - Tort law
  - Criminal law
  - Competition law
- Other movements
  - Black, Tiebout, Tullok, Downs
  - Public law, political economy



Systematic analyses with mathematical and statistical methods and tools (price theory, game theory, regression etc.)

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Economic Concepts - Overview

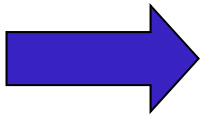
1. Rational choice
   - Optimization
   - Incentives
2. Supply and demand
   - Consumer and producer surplus
   - Elasticity
3. Efficiency
   - Pareto
   - Kaldor-Hicks (extendet pareto efficiency)

Rational Choice (1.)
Opportunity Costs – Preferences

- Decision-making between alternatives
  - Go to cinema or opera?
  - Costs? benefits?
  - Costs (opera) = opera admission + missed movie
  - Opportunity costs: missed alternative
- Individual preferences
  - Money, publicity, love, prestige, etc.
  - Alternatives can be evaluated or/and sorted
    - A is better than B
    - B is better than C
    - Conclusion: A is better than C

Economic Approach (1.)

- Analysis with theory and empirical approach
- Modelling with exceptions
  - Actors are individuals
    - Individual preferences
    - Individual risk-aversion or risk-preference
  - Actors act conscious and „rational“
    - Evaluation of possible alternatives according to preferences
    - Order of alternatives according to preferences

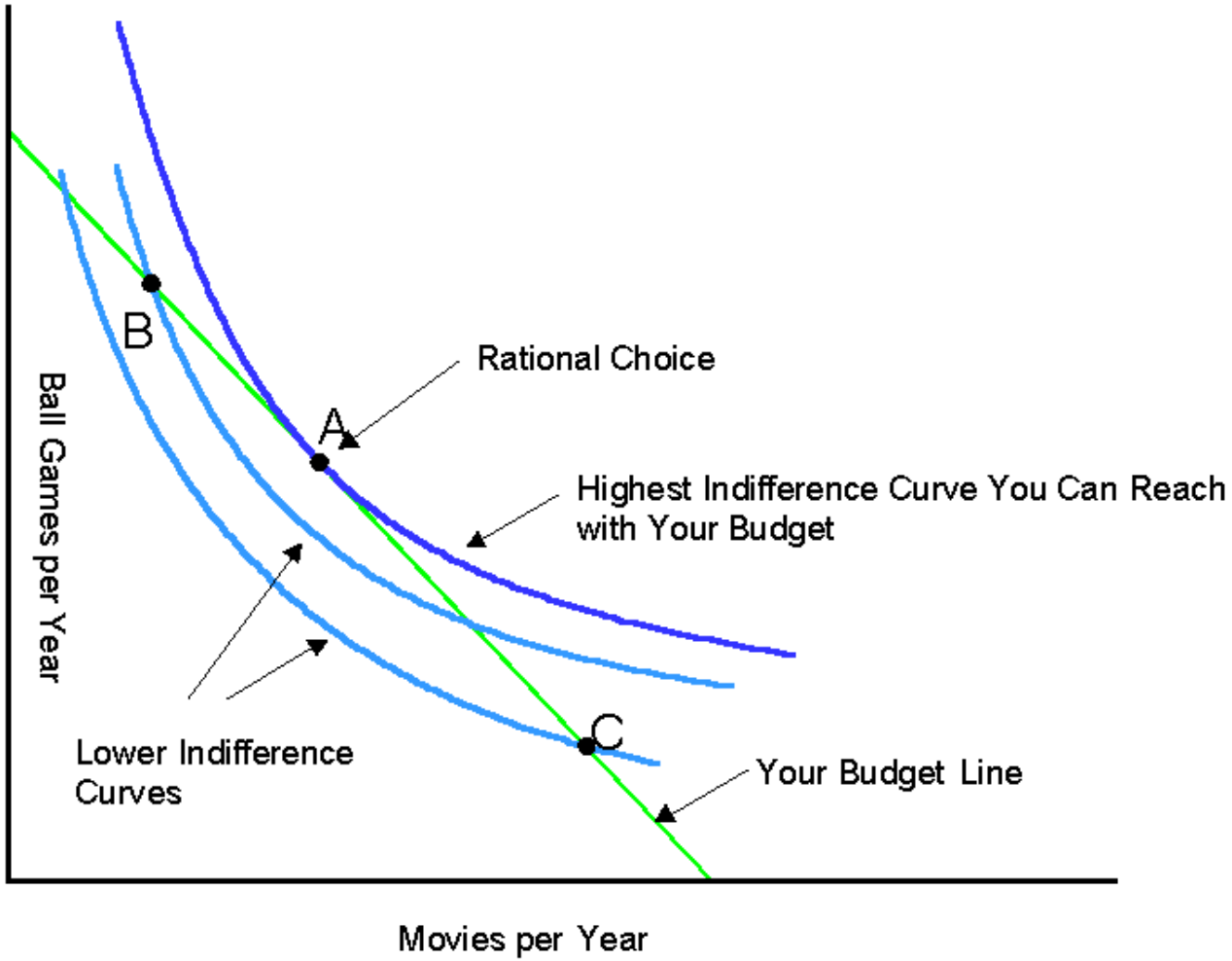


Empirical approach: Individual preferences are made public through acting

Rational choice (1.)
Restriction – Optimization

- Restrictions
  - Money, time, knowledge, etc.
- Decision as optimisation or maximisation
  - Economic actors maximise different target values
    - Firms maximise profits
    - Politicians maximise votes
    - Charities maximise social welfare
    - Individuals maximise their „utility“
- Optimisation: Maximal individual utility with the prevailing restrictions

Rational choice with budget line and indifference curve (1.)

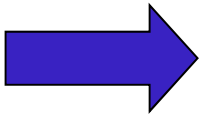


Rational choice
Incentives (1.)

- Economics is behavioural science
  - Preferences stabil
  - Price variable => Incentives variable
- Market prices affect optimisation
  - Supply side
    - Price effects
  - Demand side
    - Income effects
    - Preferences
- Regulation and law affect market prices

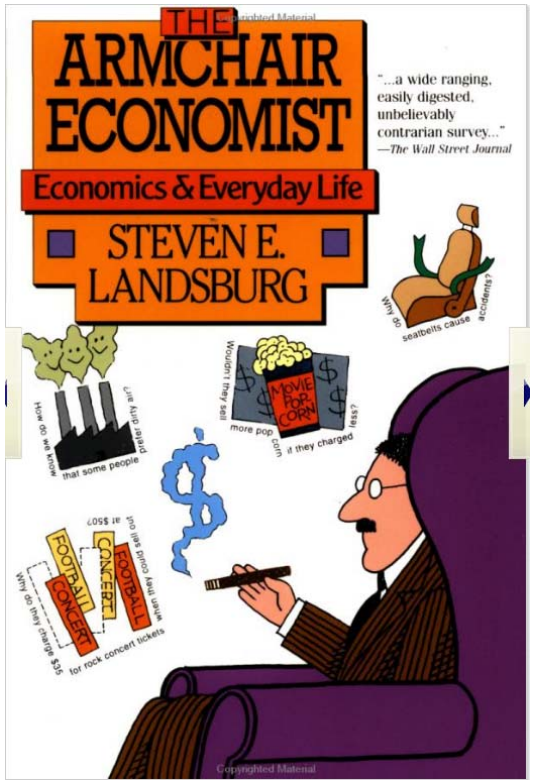
Rational choice
Incentives (1.)

- „How Seat Belts Kill“
  - USA, the 60´s: Regulations for road safety
    - Obligation to wear safety belts, padded dashboards, etc.
  - Effect: Less accidents? More accidents?
  - Effects of ABS?
- Energy efficient electrical devices
  - Totally more or less current consumption?
  - Different relative effects



Incentives are decisive!

Book recommendation: Economics in a Different Way (1.)



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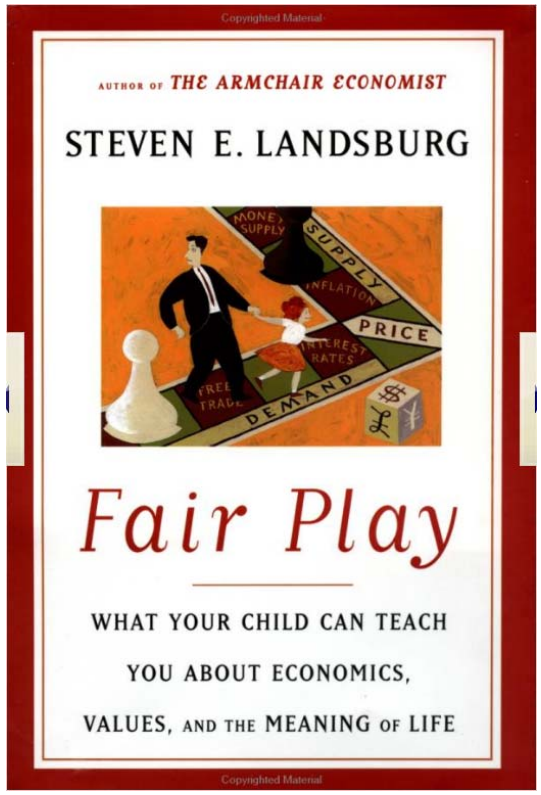

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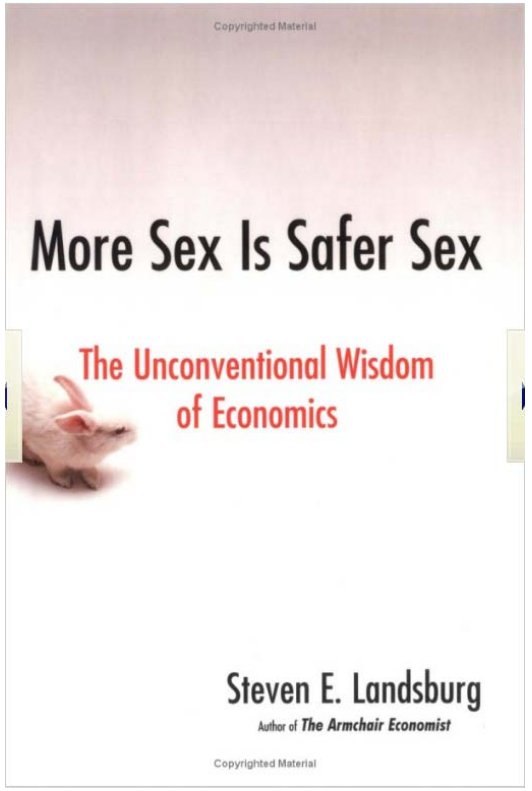

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Supply and Demand (2.)

- Willingness to pay / marginal utility => demand
  - Decreasing marginal utility
  - Consumer surplus
    - Price is lower than willingness to pay
    - Customer segmentation, price differentiation
- Marginal cost => supply
  - Producer surplus
    - Price exceeds marginal costs
- Producer surplus + consumer surplus = total welfare

Elasticity – Substitutability (2.)

- Price increase => less consumption
- Switch to other goods
  - Similarity
  - Absolute price / income
  - Complementary goods
- Long run / short run

Goods	(Source: Heinz Kohler, Intermediate Microeconomics, 3rd ed. 1990)	
	long run elasticity	short run elasticity
Petrol, oil	0.14	0.48
Dishes	1.34	8.80
Newspapers, magazines	0.10	0.52
Car theft	???	???

Efficiency (3.)
Productive Efficiency v. Allocative Efficiency

- Productive efficiency
  - Maximum output from a given input

    or
  - Given output with minimal input
- Allocative or Pareto efficiency
  - It is not possible to make at least one person better off without making another person worse off
  - NO improvement at the expense of others possible
- Fairness aspects
  - No person worse off is seen as fair
  - Research: pareto efficient solutions aren't always perceived as fair

Efficiency (3.)
Kaldor-Hicks or potential pareto

- Potential Pareto efficiency – Kaldor-Hicks
  - Being worse off is possible
  - But: gainers compensate losers
- Extension of an airport
  - Improvement (value 100 millions)
    - Passengers, airlines, jobs, etc.
    - More routes and destinations
  - Deterioration (value 40 millions)
    - Residents, environment, etc.
- Compensation payments
  - Total „welfare“ increases by 60 millions

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4. Example: O
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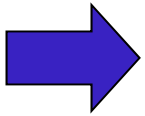
6. f Carrots, Sticks and Broken Windows

What does this have to do with Law?

- „Non-market activities“ governed by laws analysed with economics:
  - Commit a crime?
  - Conclude a contract ?
  - Get married?
  - Go to court or settle ?
  - Drive carefully ?
  - Hire somebody?
  - Pollute the environment?
  - Make somebody a citizen?
  - Sell babies?



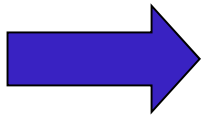
Legal norms affect decisions of individuals, market prices and efficiency in all areas

Application of the Concepts: Law & Economics

- Two questions or types of analysis
  - Descriptive (or positive) analysis
    - Effects of law on behaviour => results
    - E.g. Does death penalty lead to less homicides? Does tax law effect marriage rates? Etc.
  - Normative analysis
    - Effect of the (prevailing) law on social welfare
    - E.g. How much or which consumer protection is „welfare-maximising“?, Does a competition law maximize welfare? Does a legal standard lead to “efficient decisions“? Are trade barriers welfare enhancing/reducing?

Law & Economics
Descriptive Questions

- A marriage market? A crime market?
  - Are there market and non-market activities?
  - Rational choice
    - Cost v. utility of a crime/marriage
  - Law affects cost and utility
  - How do individuals act?
    - Steal, because it is the cheapest way to get an Ipod?
    - Marry to maximise happiness?



Regression analysis provides answers

Descriptive tools: regression analysis

- Cause-and-effect relationship
  - Target variable y
  - Explanatory variable(s) $x_{(i)}$
  - Ex.: y = a + bx + e (linear regression)
- Multiple regression
  - One target variable
  - Several explanatory variables
  - Kind of dependency, strength
  - Error probability, significance
- Example: What makes us happy?

Law & Economics
Descriptive Questions

- Legal norms affect relative prices
  - Family law/tax law decreases the price for marriage
  - Stricter criminal law increases the price of crimes
  - Duty of care increases the price for reckless driving
  - Severe punishments on illegal labour increases the costs/price of illegal labour
  - Compulsory health care increases the prices of health insurance
  - Divorce without assignment of guilt (“no fault”) decreases the price of divorces (and marriages?)

Law & Economics
Normative Questions

- Application of the law
  - Analysis of the application of the law
    - (Pareto) Efficient judgements?
  - Interpretation – discretion
    - „Economic“ interpretation
  - Precedent – legal standard
    - Affects behaviour
    - Reverses „inefficient“ precedents
- Do courts decide welfare-maximising?

Law & Economics
Normative Questions

- Legislation
  - Effect of legislation
    - Do incentives lead to „efficient“ behaviour?
    - Are the right incentives used?
  - Comparative analysis with other states
  - Legislation amendments
    - Analysis of drafts
    - Amendments for „efficient“ incentive structures
- Does law maximise our welfare?

Law & Economics
Three Features

- „Stylizied Models“ and empirical tests
- Descriptive Analysis
  - Rational actors
  - No absolute but central assumptions
  - Statements about the effectiveness of law (“Does lead to...”)
- Normative Analysis
  - Makes normative statements (“Is better than...”)
  - Total welfare as measure

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Law & Economics in use: Of Carrots, Sticks & Broken Windows

- The history about the mule…
  - Carrots => positive incentives
  - Sticks => negative incentives
- The „Broken Windows“ Thesis
  - Misdemeanour offenses are important
  - They lead to more serious crimes
  - Smash windows => observer is not concerned
- Effect: Misdemeanour offenses must be prosecuted in a „severe“ way
  - „Nip in the bud“
  - Prevent further escalation

Requirement I:
A verifiable and plausible model

III. Empirical Model

We estimate crime equations of the following form:

$$\begin{aligned} CR_{it} = {} & \lambda_i + \Sigma\alpha_{ij} CR_{i,t-j} + \Sigma\delta_{ik} ARR_{i,t-k} + \Sigma\Phi_{ip} POL_{t-p} \\ & + \Sigma\eta_{im} MISARR_{t-m} + \Sigma\pi_{in} PRIS_{t-n} + \Sigma\beta_{iq} UR_{t-q} \\ & + \Sigma\gamma_{ir} RMINW_{t-r} + \Sigma\mu_{t-s} TEENS_{t-s} + \Sigma\varphi_{iw} SEAS_w + \varepsilon_{it}, \end{aligned}$$

Source (also for the following illustrations): Corman Hope, Nocan Maci; Of Carrots, Sticks and Broken Windows; Journal of Law and Economics;Vol. XLVIII; 2005.

Of Carrots, Sticks & Broken Windows

- Hypothesis: What impacts crime (CR)?
  - Economic environment (carrots)
    - Unemployment (UR)
    - Real minimum wage (RMINW)
  - Punishment (sticks)
    - Arrest rate (detention per crime) (ARR)
    - Number of NYC-citizens in prison (PRIS)
    - Number of policemen in NYC (POL)
  - Broken windows hypothesis in particular
    - Number of arrests for misdemeanours offenses (MISARR)
  - Control variables
    - Number of people aged 14 – 17 in NYC (TEENS)
    - Seasonal control variables (SEAS)

Requirement II:
Empirical Data – Criminality

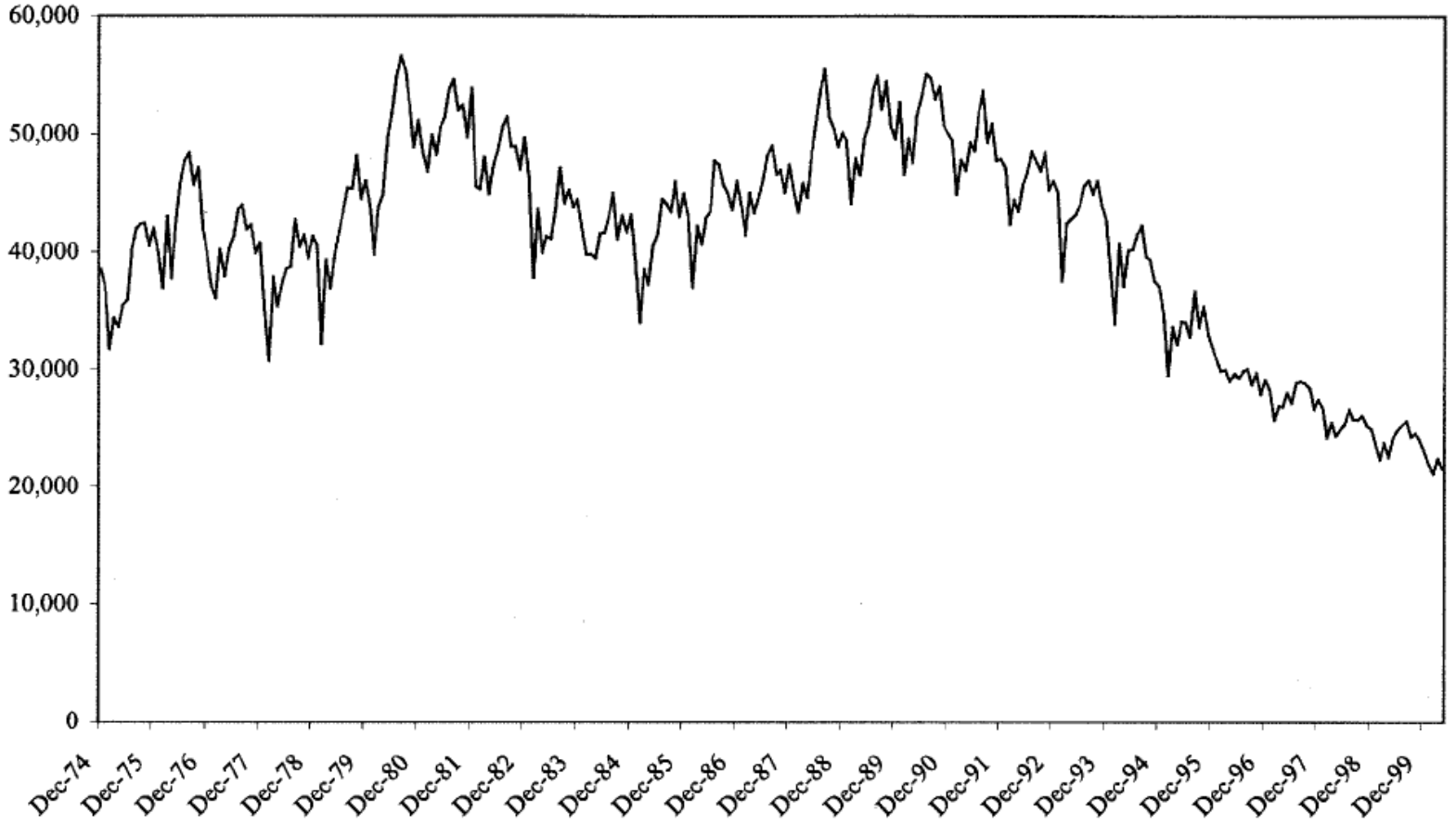

FIGURE 1.—Total felony crimes, New York City

Requirment II:
Empirical Data – Detentions

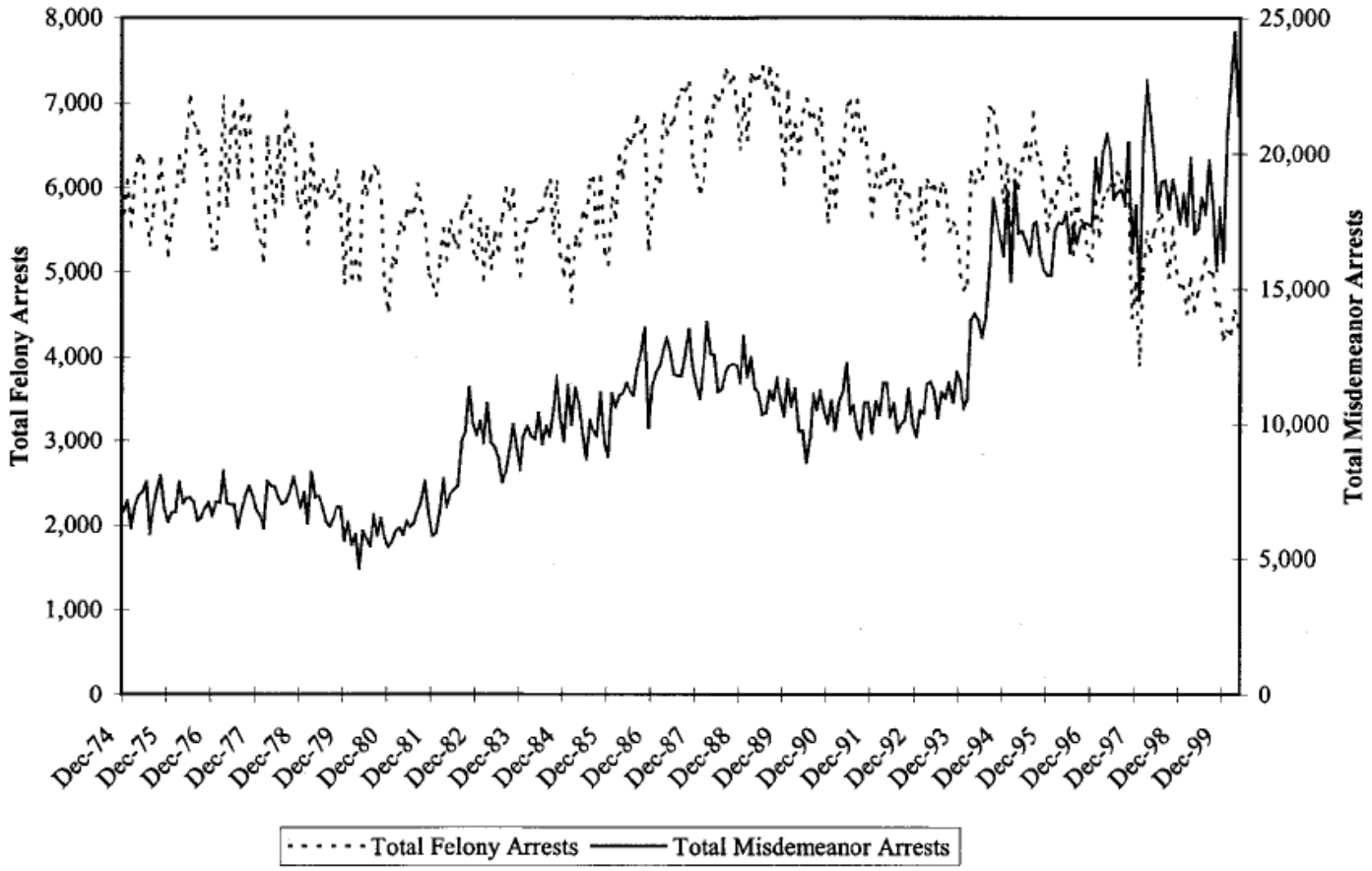

FIGURE 2.—Total felony and misdemeanor arrests, New York City

Requirement II:
Empirical Data – Policemen and Arrested Persons

FIGURE 5.—Number of police officers and number of New York City residents in state prisons

Requirement II: Empirical Data – Total View

TABLE 1

DESCRIPTIVE STATISTICS, DECEMBER 1974–DECEMBER 1999

Variable	Mean	Standard Deviation
Arrests:		
Total misdemeanor	11,149.33	4,131.30
Motor vehicle	742.10	281.31
Burglary	1,116.04	445.09
Grand larceny	1,124.64	221.19
Assault	1,534.62	302.70
Murder	95.87	19.42
Rape	120.73	25.78
Robbery	1,851.90	329.35
Incidence of crime:		
Motor vehicle theft	7,790.27	2,357.92
Burglary	10,697.71	4,130.67
Grand larceny	13,172.66	2,960.88
Assault	2,777.89	703.37
Murder	130.69	40.26
Rape	268.74	67.83
Robbery	6,554.41	1,663.83
Number of police officers	27,426.92	3,612.21
Number of prisoners from NYC	29,708.17	13,406.24
NYC unemployment rate	8.59	1.61
Youth population	486,920.74	30,923.23
Real minimum wage ($)	3.05	.47

NOTE.—NYC = New York City.

Findings: Effects of Control Variables (1/2)

Crime	Coefficient	Standard Error
Murder:		
Arrests (1–5)	−.668**	.226
Police (0–2)	−.508	1.035
Total misdemeanor arrests (1–5)	−.618	.405
Number of prisoners from NYC (1–8)	−.075*	.036
NYC unemployment rate (0–3)	.432	.328
NYC minimum wage (0)	−.660**	.228
Burglary:		
Arrests (1–21)	−.471*	.199
Police (0–1)	−.276	.227
Total misdemeanor arrests (1–2)	−.054	.058
Number of prisoners from NYC (1–18)	−.058**	.023
NYC unemployment rate (0–2)	.162+	.083
NYC minimum wage (0–2)	.327	.321
Assault:		
Arrests (1–4)	−.247*	.121
Police (0–1)	−.031	.218
Total misdemeanor arrests (1–2)	.075	.090
Number of prisoners from NYC (1–5)	−.007	.010
NYC unemployment rate(0–1)	.078	.105
NYC minimum wage (0–1)	.181	.189

Findings: Effects of Control Variables (2/2)

Robbery:		
Arrests (1–12)	−1.322**	.340
Police (0–2)	−.390	.453
Total misdemeanor arrests (1–2)	−.247**	.050
Number of prisoners from NYC (1–11)	−.029*	.008
NYC unemployment rate (0–2)	−.150	.099
NYC minimum wage (0–1)	−.374+	.205
Motor vehicle theft:		
Arrests (1–14)	−1.043**	.250
Police (0–2)	−.577*	.254
Total misdemeanor arrests (1–2)	−.157*	.065
Number of prisoners from NYC (1–8)	−.028**	.008
NYC unemployment rate (0)	.124*	.041
NYC minimum wage (0–2)	−.267	.359
Grand larceny:		
Arrests (1–2)	−.107**	.035
Police (0–1)	−.673**	.247
Total misdemeanor arrests (1)	−.049**	.019
Number of prisoners from NYC (1–4)	−.020*	.010
NYC unemployment rate (0–4)	−.022	.083
NYC minimum wage (0–1)	−.401+	.216
Rape:		
Arrests (1–4)	−.425*	.193
Police (0–1)	−.133	.525
Total misdemeanor arrests (1–3)	−.052	.201

Findings: Elasticities

TABLE 3

ELASTICITY OF CRIME ESTIMATES

Explanatory Variable	Murder	Assault	Burglary	Robbery	Motor Vehicle Theft	Grand Larceny	Rape
(Own) felony arrest rate	−.40	−.20	−.32	−.57	−.51	−.14	−.32
	−.39	−.24	−.27	−.59	−.50	−.10	−.30
Total misdemeanor arrests				−.25	−.16	−.06	
				−.32	−.21	−.05	
Number of police officers					−.56	−.67	
					−.59	−.70	
NYC unemployment rate			.16		.13		
			.19		.16		
Real minimum wage	−.69			−.37		−.40	
	−.63			−.34		−.36	
Number of prisoners from NYC	−.08		−.06	−.03	−.03	−.02	

NOTE.—Elasticity estimates are calculated only for significant variables. The top estimate uses a zero-growth steady-state scenario, and the bottom estimate is calculated using the average of the year-to-year growth rate of the explanatory variable. NYC = New York City.

Findings:
Explanatory Parts in the Changes

TABLE 5

CONTRIBUTION OF VARIABLES TO THE DECREASE IN CRIME, 1990–99

Predicted Decrease in Crime due to Actual Changes in:	Murder	Burglary	Assault	Motor Vehicle Theft	Robbery	Grand Larceny	Rape
Felony arrest rate[a]	29	19	11	1	32	3	16
Misdemeanor arrest rate (increased 72%)				14	21	4	
Number of police officers (increased 35%)				20		23	
Number of prisoners from NYC (increased 24%)	2	1		1	1	<.5	
NYC unemployment rate (decreased 3%)		1		<1			
Real minimum wage (increased 12%)	8				4	4	
Total predicted decrease in crime	39	21	11	36	58	34	16
Actual decrease in crime	73	66	40	73	67	29	46
Predicted decrease/actual decrease	53	32	28	49	86	117	35
Contribution of economic variables (carrots) to the actual decrease in crime	11	1.5	0	1	6	14	0
Contribution of deterrence variables (sticks) to the actual decrease in crime	42	30	27.5	49	81	103	35
Share of deterrence measures in explained decrease in crime	79	95	100	98	93	88	100

NOTE.—Values are percentages. NYC = New York City.

[a] Increases in annual arrest rates from 1990 to 1999 were as follows: murder, 72%; burglary, 65%; assault, 49%; robbery, 56%; motor vehicle theft, 2%; grand larceny, 23%; and rape, 52%.

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Why should legal students/scholars be concerned with Law & Economics?

- Intellectual Enrichment
  - New aspects of law
- Competitive edge in business
  - Expertise, way of thinking => Understand your business partners!
  - Legal policy, legislation
  - Judge => future prospects and assessments
  - Cases, Contracts and settlements with high sums of money
    - Legal representative as investment advisor
    - Contract jurisprudence
- „Inefficient law“ concerns lawyers in particular

Why should economics students/scholars be concerned with Law & Economics?

- Broadening horizons
  - Economics not only for markets and „economy“ in a narrow sense
- Law affects economics
  - Model assumptions are often influenced by law
  - Real world: Law as restrictions
- Competitive edge
  - Law affects every professional and economic sector
  - Positive analysis: potential improvements - Use and fill „gaps“
- Inefficient law
  - Improvement opportunity, exploitation of capabilities