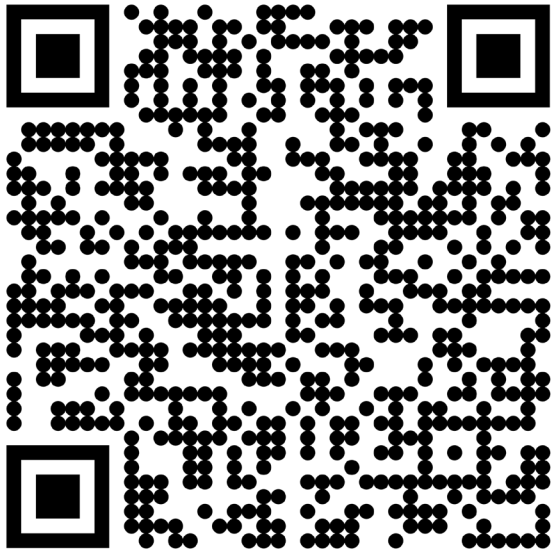# From 'light crime but severe penalty' to 'punishment fits crime': an empirical study on embezzlement and bribery crime in China

Huabing Li (Bing)

Before we start …

You can access the full paper by…

Scan the QR code

huabing.li/files/Punishment_Fits_Crime.pdf

Visit the web link

I. 'Punishment fits crime'

I. 'Punishment fits crime'

Cesare Beccaria   →   Jeremy Bentham   →   Immanuel Kant   → …

I. 'Punishment fits crime'

'Heavy-penaltyism' in China

- Qin Dynasty: even if a bribe of only one coin is taken, the person shall be branded on the forehead and punished to building the city.

- Ming Dynasty: torture, such as amputation, flaying or even slow slicing.

- 'Great Culture Revolution' and 'strike hard': lack of necessary respect for basic human rights

I. 'Punishment fits crime'

As a result, a series of questions arise

- Should China change the system of heavy-penaltyism and introduce reforms to 'punishment fits crime'?

- Will such reforms lead to a decrease in the deterrence of criminals, which in turn will lead to a series of social problems?

- Is there any scientific way to get the discussion beyond just endless argue and debate?

- And can China's reforms provide some insights for other countries?

II. The new *Judicial Interpretation*

II. The new *Judicial Interpretation*

With heated arguments, in 2016 …

Interpretation of Several Issues concerning the Application of Law in the Handling of Criminal Cases of Embezzlement and Bribery (hereinafter referred to as the *Judicial Interpretation*) promulgated.

￥30,000

￥5,000

Sentencing start point

￥3,000,000

￥100,000

The amount is especially large

II. The new *Judicial Interpretation*

Embezzlement and bribery crime

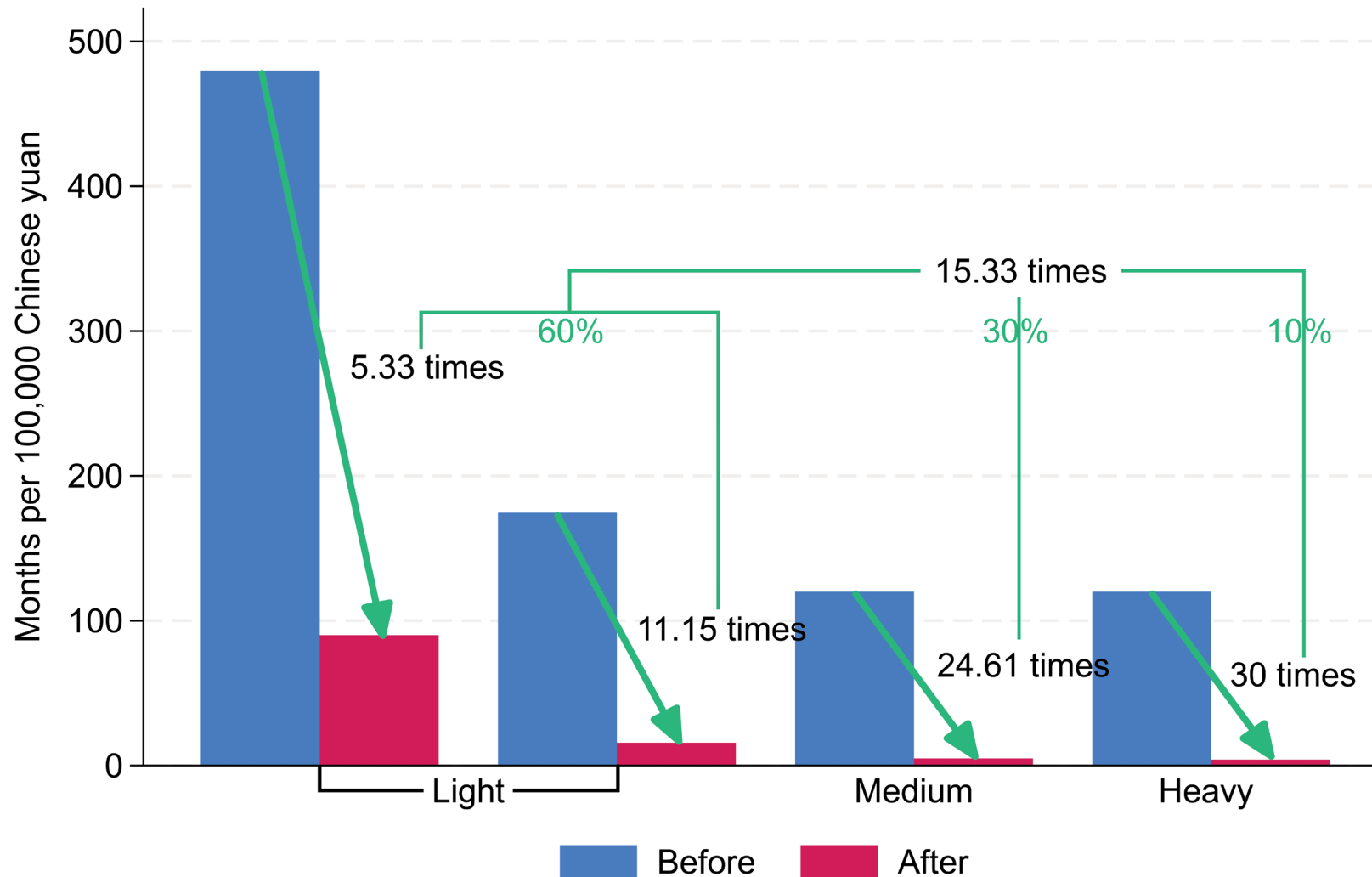Embezzlement crime

Bribery crime

Misappropriation of public funds

Organizational bribery
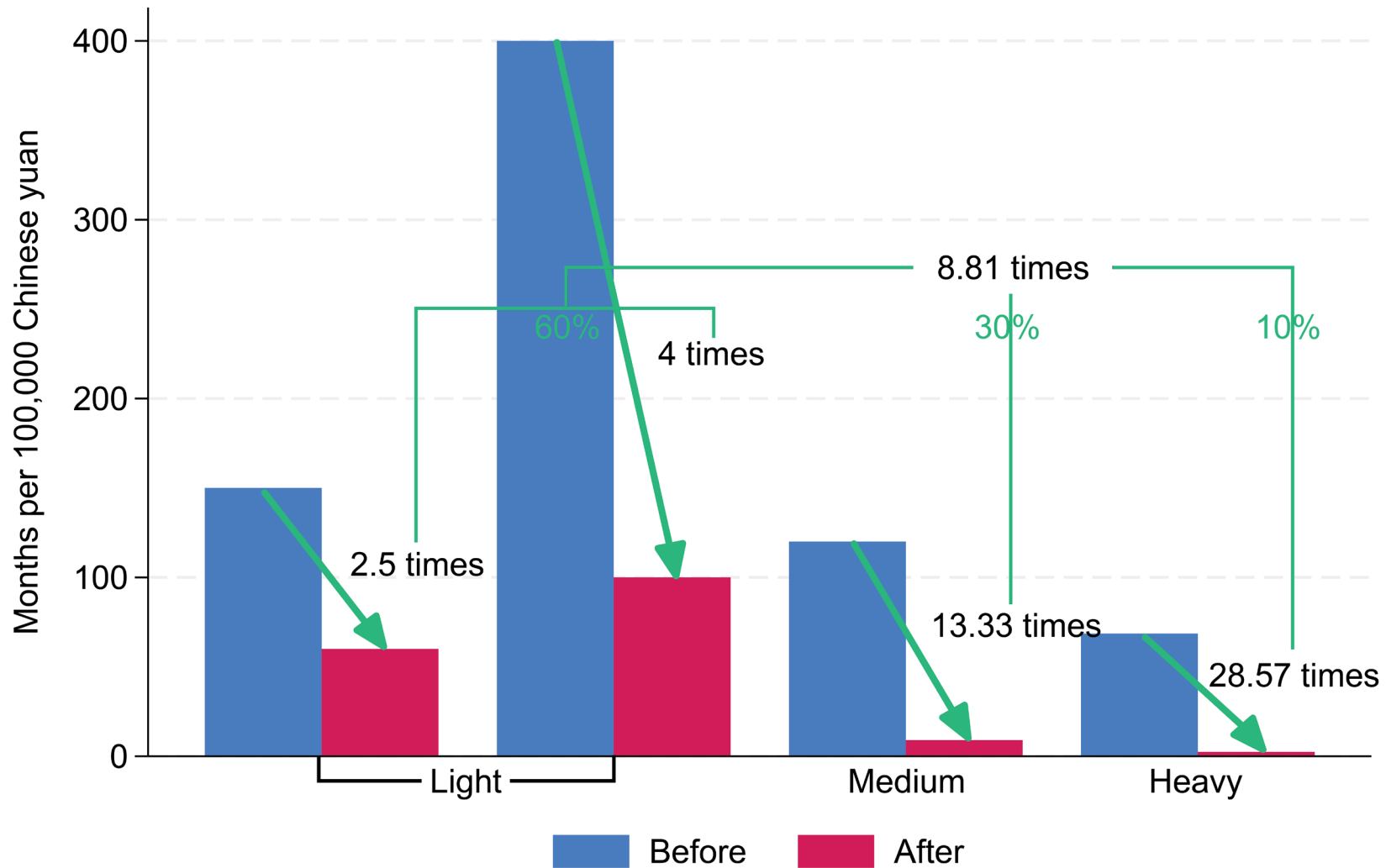
Bribery through the use of influence and advantage

...

Embezzlement crime

Bribery crime

Misappropriation of public funds

Embezzlement and bribery crime

Organizational bribery

Bribery through the use of influence and advantage

...

II. The new *Judicial Interpretation*

The first question

In order to discuss whether the *Judicial Interpretation* has facilitated the shift to 'punishment fits crime', the core is to verify whether does it reduce punishment to embezzlement and bribery crime offenders—and if it does, what are the mechanisms and reasons?

- Hypothesis 1a: The *Judicial Interpretation* did reduce the average penalty.

- Hypothesis 1b: The *Judicial Interpretation* did not reduce the average penalty.

II. The new *Judicial Interpretation*

The second question

Has the *Judicial Interpretation* led to more cases of embezzlement and bribery crime and a greater negative impact on society, that is, reduced deterrence and prevention of crime?

- Hypothesis 2a: The *Judicial Interpretation* did exacerbate the crime.

- Hypothesis 2b: *The Judicial Interpretation* did not exacerbate the crime.
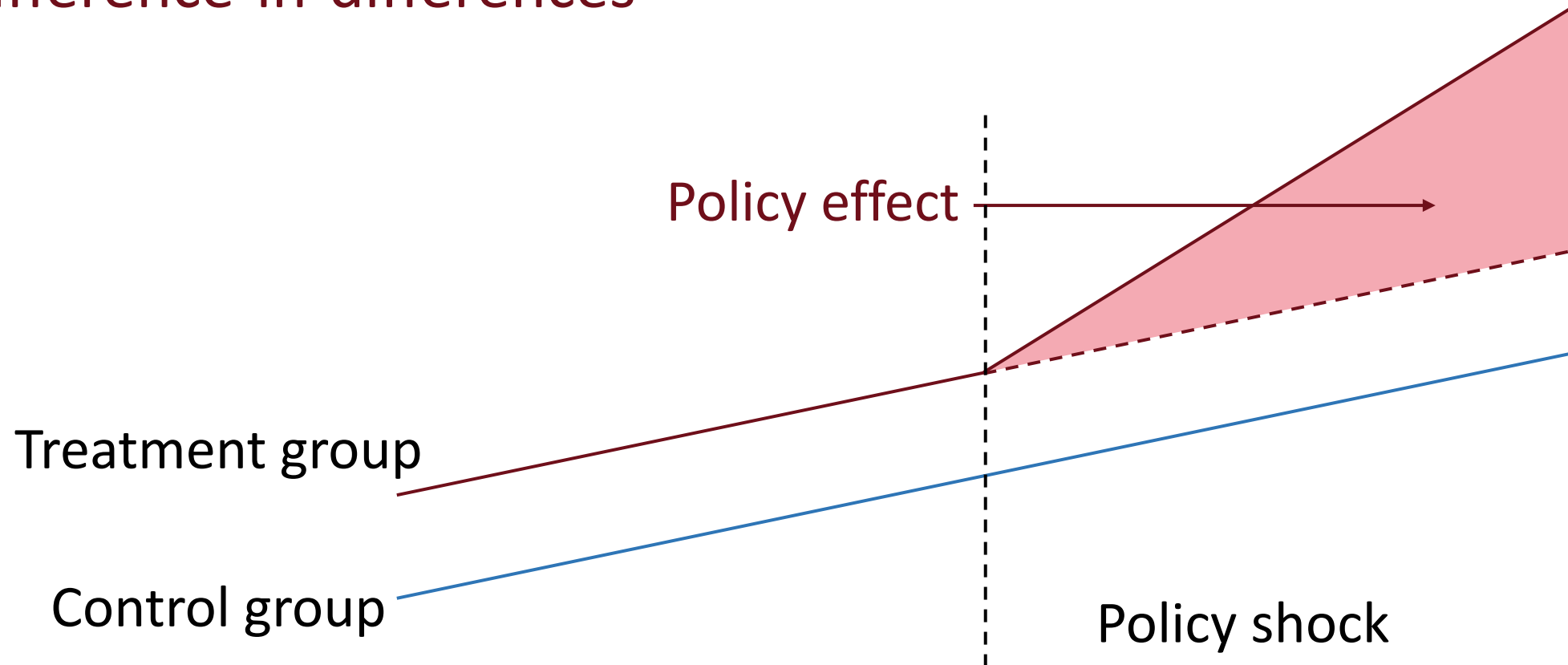
Let's test them empirically!

III. Did the *Judicial Interpretation* reduce the average penalty?

III. Reduce the average penalty?

Difference-in-differences

Policy effect

Treatment group

Control group

Policy shock

III. Reduce the average penalty?

Difference-in-differences

$$Y_{it} = \alpha + \beta D_i + \gamma T_t + \boxed{\delta(D_i \times T_t)} + \sum \eta Z_{it} + \varepsilon_{it}$$

$\mathrm{E}(Y_{it}|D_i,\ T_t)$	$T_t = 0$	$T_t = 1$	Difference
$D_i = 0$	α	$\alpha + \gamma$	γ
$D_i = 1$	$\alpha + \beta$	$\alpha + \beta + \gamma + \delta$	$\gamma + \delta$
Difference	β	$\beta + \delta$	δ

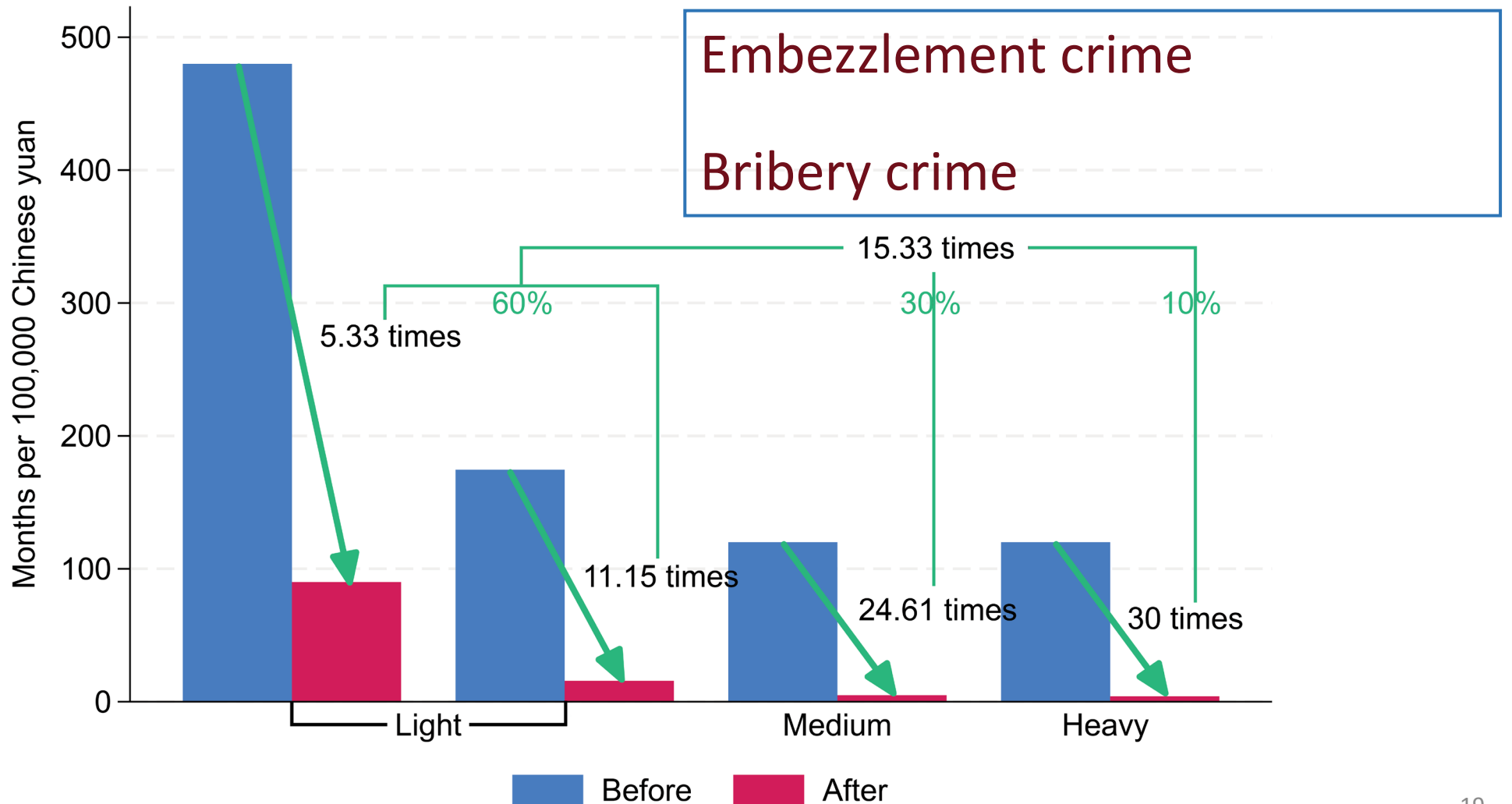# III. Reduce the average penalty?

Where is the control group?

$$Y_{it} = \alpha + \beta D_i + \gamma T_t + \delta(D_i \times T_t) + \sum \eta Z_{it} + \varepsilon_{it}$$

$$Y_{it} = \alpha + \beta I_i + \gamma T_t + \delta(I_i \times T_t) + \sum \eta Z_{it} + \varepsilon_{it}$$

See Nathan Nunn & Nancy Qian, 'The Potato's Contribution to Population and Urbanization: Evidence from a Historical Experiment' (2011) 2 *The Quarterly Journal of Economics* 593.

III. Reduce the average penalty?

III. Reduce the average penalty?

Misappropriation of public funds
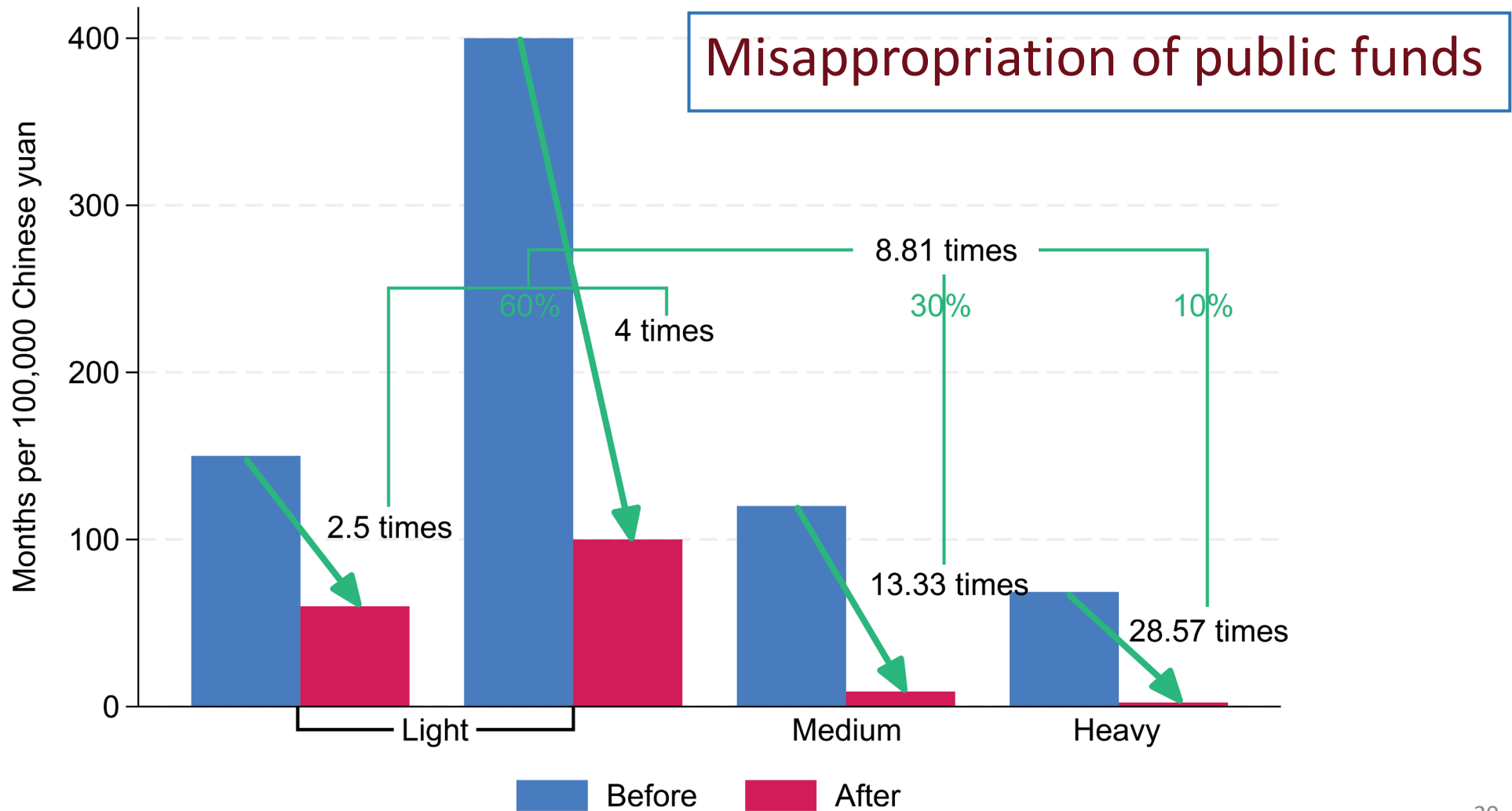
III. Reduce the average penalty?

Novel panel data

- Data source: *China Judgement Online*
- Time: from 2001 to 2020
- Content: full-text verdicts
- Amount: 67,691
- Matched with: *China City Statistical Yearbook*
- Cities: 296 cities

III. Reduce the average penalty?

Variable	N	Mean	Median	SD	Min	Max
Average sentence	7,159	35.14	27.60	29.98	0.00	350.00
Number of cases	7,159	9.46	6.00	11.77	1.00	179.00
Total sentence	7,159	309.91	160.01	506.05	0.00	10,168.19
T_t	7,159	0.55	1.00	0.50	0.00	1.00
I_i	7,159	12.72	14.34	2.52	8.81	14.34
$I_i \times T_t$	7,159	7.02	8.81	6.57	0.00	14.34
Log of population	7,159	5.96	6.00	0.70	2.94	8.14
Log of GDP	7,159	7.35	7.29	1.02	3.46	10.56
GDP growth rate	7,159	7.84	8.00	3.93	-20.63	28.60

III. Reduce the average penalty?

Share of secondary industry	7,159	45.17	45.75	10.62	10.60	81.82
Share of tertiary industry	7,159	43.39	42.68	10.39	15.16	83.87
Log of fiscal revenue	7,159	14.04	13.93	1.11	9.40	18.09
Log of social consumer goods	7,159	15.68	15.64	1.05	11.56	18.89
Log of road area	7,159	7.19	7.09	1.00	3.95	10.34
Log of road passenger volume	7,159	8.29	8.30	1.12	2.20	12.18

III. Reduce the average penalty?

$$Average\ sentence_{it} = \alpha + \beta I_i + \gamma T_t + \delta(I_i \times T_t) + \varepsilon_{it}$$

$$Average\ sentence_{it} = \alpha + \sum \beta u_i + \sum \gamma v_t + \delta(I_i \times T_t) + \varepsilon_{it}$$

$$Average\ sentence_{it} = \alpha + \sum \beta u_i + \sum \gamma v_t + \delta(I_i \times T_t) + \sum \eta Z_{it} + \varepsilon_{it}$$

III. Reduce the average penalty?

Variables	(1) Average sentence	(2) Average sentence	(3) Average sentence
$I_i \times T_t$	-1.087***	-1.061***	-1.035***
	(-5.02)	(-4.14)	(-4.11)
Control variables	No	No	Yes
City FE	No	Yes	Yes
Year FE	No	Yes	Yes
Observations	7,159.00	7,159.00	7,159.00
Number of cities	296.00	296.00	296.00
R-squared	0.103	0.148	0.154

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

III. Reduce the average penalty?

Robustness test

- Parallel trend test (by line graph)
- Parallel trend test (by regression including lag and lead terms)
- Go back to standard difference-in-differences
- Drop death sentence and life sentence
- Random drop half of control variables
- Drop four big cities: Beijing, Tianjin, Shanghai and Chongqing
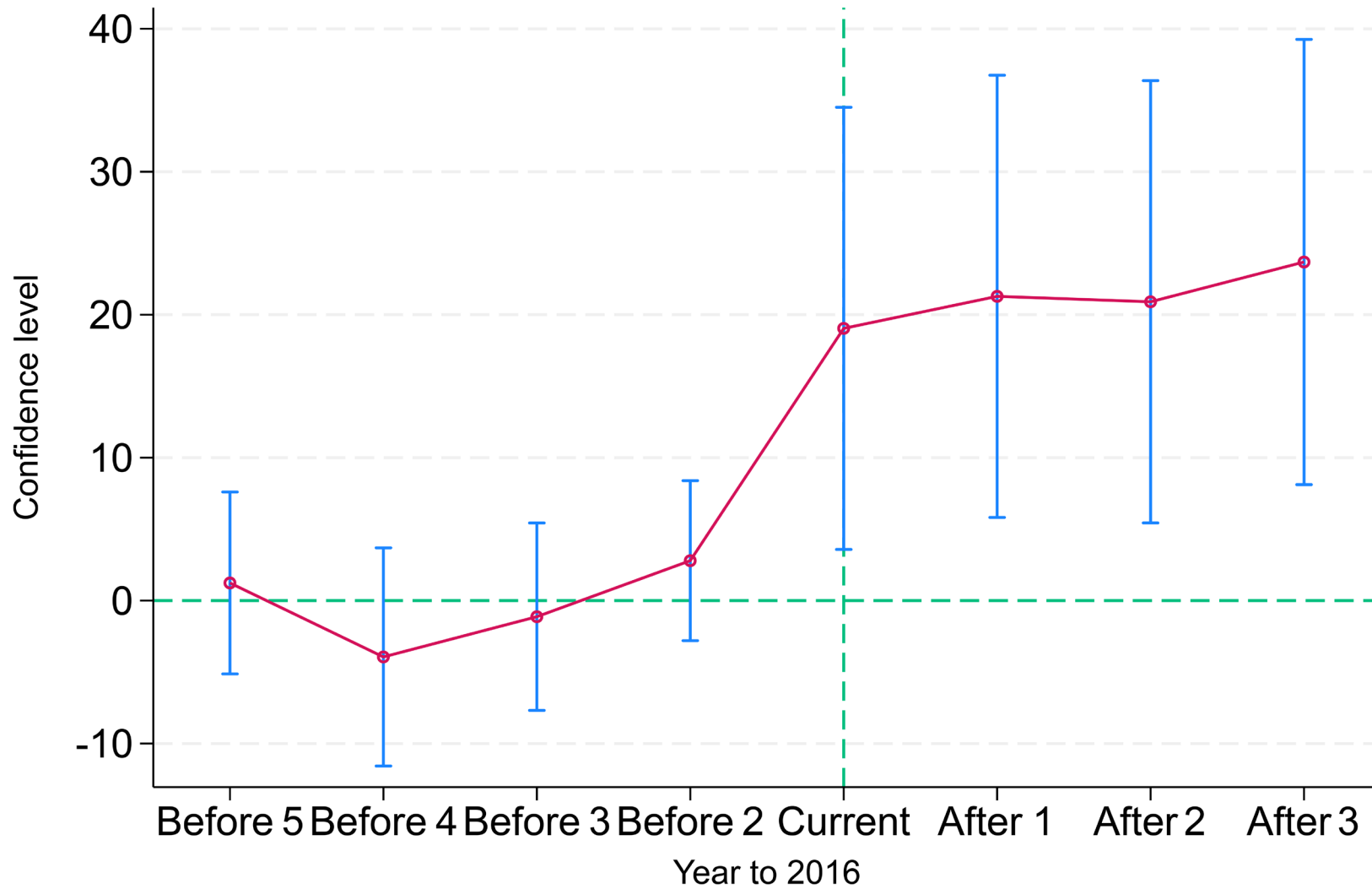- Placebo test: Change shock time to 2013

III. Reduce the average penalty?
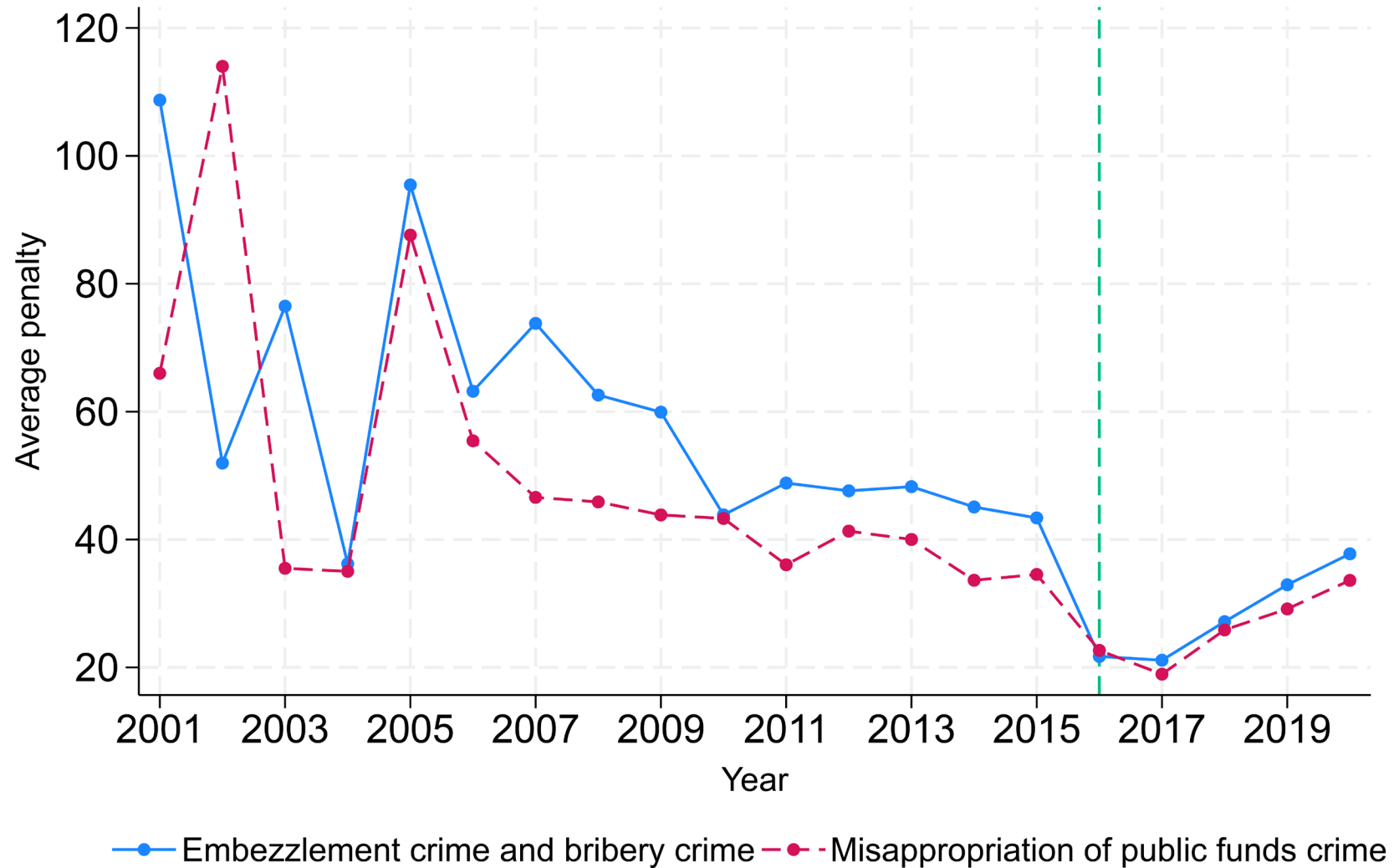
III. Reduce the average penalty?

III. Reduce the average penalty?

Variables	(4) Average sentence	(5) Average sentence	(6) Average sentence	(7) Average sentence	(8) Average sentence
$D_i \times T_t$	-6.747*** (-4.11)				
$I_i \times T_t$		-1.073*** (-4.11)	-1.046*** (-4.12)	-0.972*** (-3.84)	-0.433 (-0.83)
		...			

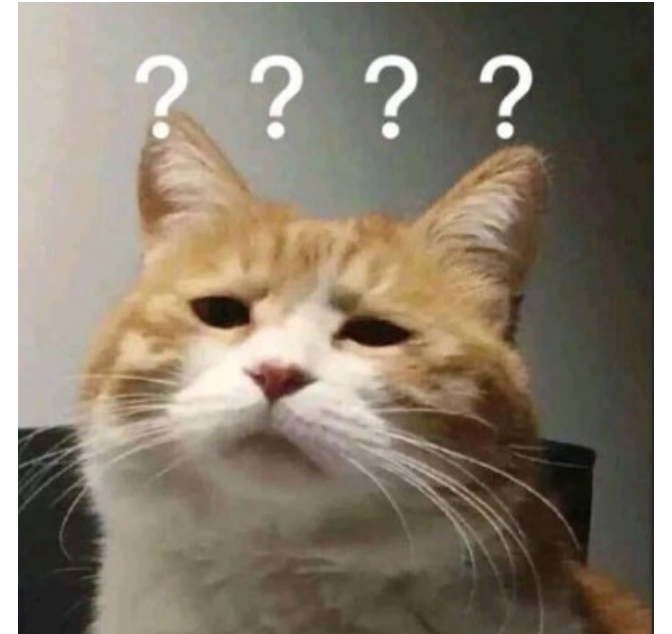Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

III. Reduce the average penalty?

So far so good?

- Our solid conclusion now is: The *Judicial Interpretation*, which aims to reduce average penalty, indeed reduces average penalty.

- "I came to Rotterdam ... only for this"?

We're not just interested in yes and no, we're interested in why!

- What's the mechanism?

III. Reduce the average penalty?

Gary Becker's criminal model

$$B > pF$$

$$B - \mathrm{E}(f|G) > w - \mathrm{E}(f|I)$$

Similarly, utility function of a potential offender can be expressed as

$$U_i = (1-p)B_i - pL_i$$

in which $B(m)$ is a nonlinear function of money m because the marginal utility of money to people is decreasing, and $L(m) = k_j m + \varepsilon$

III. Reduce the average penalty?

On this basis, the aim of the potential offender is to maximize the utility function to give himself the maximum net benefit:

$$\mathrm{argmax}\, U_i = = \mathrm{argmax}\, (1-p)B(m_i) - pL(m_i) \iff \frac{\partial U_i}{\partial m_i} = 0$$

$$(1-p)\frac{\partial B(m_i)}{\partial m_i} - p\frac{\partial L(m_i)}{\partial m_i} = 0 \iff (1-p)\frac{\partial B(m_i)}{\partial m_i} = \boxed{pk_j}$$

Conclusion

How to design the steps of marginal deterrence is very important!

III. Reduce the average penalty?

Marginal deterrence

The original law divided the sentencing amount standards very unevenly, which leads to the fact that the marginal deterrence of the law decreases rapidly as the amount of corruption and bribery rises.

However, this situation is improved with the introduction of the 2016 *Judicial Interpretation*. The steps and tiers of marginal deterrence are more rational designed in *Judicial Interpretation,* so that no longer encourage opportunistic embezzlers to commit more serious crimes.

III. Reduce the average penalty?

Imagine a evil cat want to bribe …

¥ 100,000 ⟶ 10 years

Another ¥ 100,000 ⟶ Another 3 years

Another ¥ 100,000 ⟶ Another 1 year

...

Another ¥ 100,000 ⟶ Another 1 month

...

III. Reduce the average penalty?

Variables	(9) Average sentence	(10) Serious case ratio	(11) Average sentence
$I_i \times T_t$	-1.035***	-0.004***	-0.745***
	(-4.11)	(-9.36)	(-4.33)
Serious case ratio			118.257***
			(50.73)
	...		
Sobel Z			-0.545***
			(-12.34)

Note: $*\, p < 0.10$, $**\, p < 0.05$, $***\, p < 0.01$.

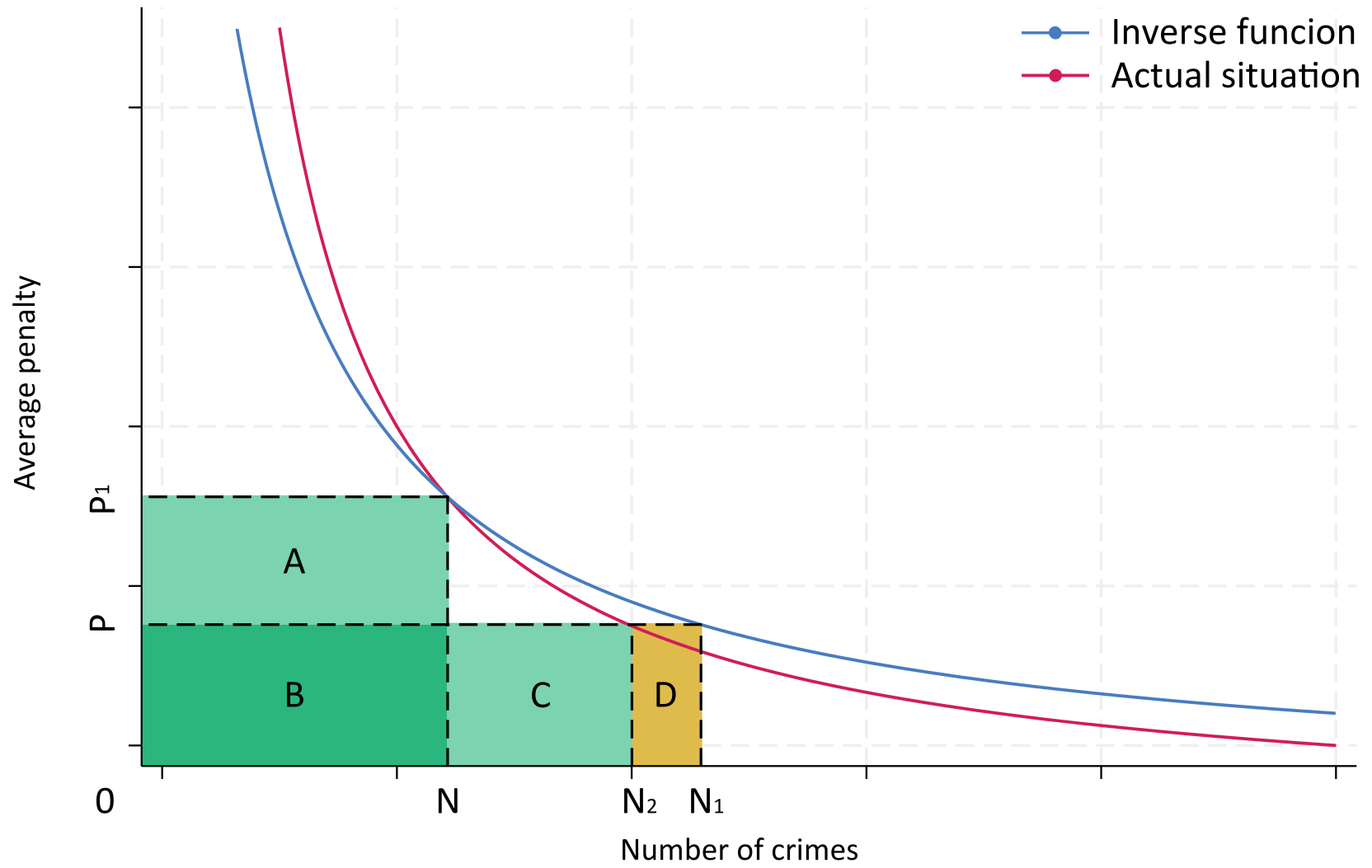# IV. Did the *Judicial Interpretation* exacerbate the crime?

IV. Exacerbate the crime?

Variables	(12) The number of cases	(13) Total sentence	(14) Light case ratio	(15) The number of cases
$I_i \times T_t$	0.473***	-9.351***	0.008***	0.471***
	(6.85)	(-3.29)	(10.20)	(6.88)
Light case ratio				1.070***
				(3.30)
		...		
Sobel Z				0.004**
				(2.11)

Note: $*\, p < 0.10$, $**\, p < 0.05$, $***\, p < 0.01$.

IV. Exacerbate the crime?

Wish you a happy day!

Huabing Li (Bing)