Luck or luxury?
Possible corruption in the car registration process in the Czech Republic

PETER BOLCHA*) AND JAN ROVNÝ *))

*)ANGLO-AMERICAN UNIVERSITY *))CITY UNIVERSITY LONDON, UK

JOURNAL OF PUBLIC POLICY,
VOLUME 36, ISSUE 4 DECEMBER 2016, PP. 603-638

Why care about registration plates?

- Car plates were used as a signal in the history since the cars exist …and they might do so also today. (Zelený and Feuereisl: 2011)
- Higher-status cars get less aggressive responses from other drivers (Doob and Gross: 1968, McGarva and Steiner: 2000)
- Personalisation of car is correlated with driver´s behaviour (Choo and Mokhtarian: 2004)
- In certain countries/times special car plates might signal informal connections of the holder.

Why care about registration plates in Czech Republic?

- Czech RP assignment has been an issue for a while, but no published study (known to us)
- Corrupted behavoir should be detected if possible; this small problem might be connected to deeper issues
- New law was about to be prepared, new findings might help

RQ: is there an evidence for non-random assignment of car registration plates?

Links to other reseach

- sumo-wrestling competitions (Duggan and Levitt: 2002), corruption in basketball tournaments (Wolfers: 2006), check of eBay bids (Giles: 2007); finances used for campaigns reported by political parties (Cho and Gaines: 2007)
- comparison of physical quantities of infrastructure versus the prices paid by the government (Golden and Picci: 2005) or investigation of input costs changes in hospitals (Tella and Schargrodsky: 2003)

Empirical strategy and issues

If car registration plates were truly randomly assigned, the cars' observable characteristics should be **orthogonal** to the randomized section of their registration plate numbers.

- How to get the data?
- How to code the variables?
- Which registration plates are „suspicious"?

Data

- In an Ideal world: we get data from Department for Car Registrations
- Czech reality: collect our own sample
- two workdays from certain week and two times from time intervals 8,00-12,00 and 13,00-18,00
- Start: random, end exogenous (memory of camera)
- Result: 4,200 photos with ??? cars

Types of plates under question

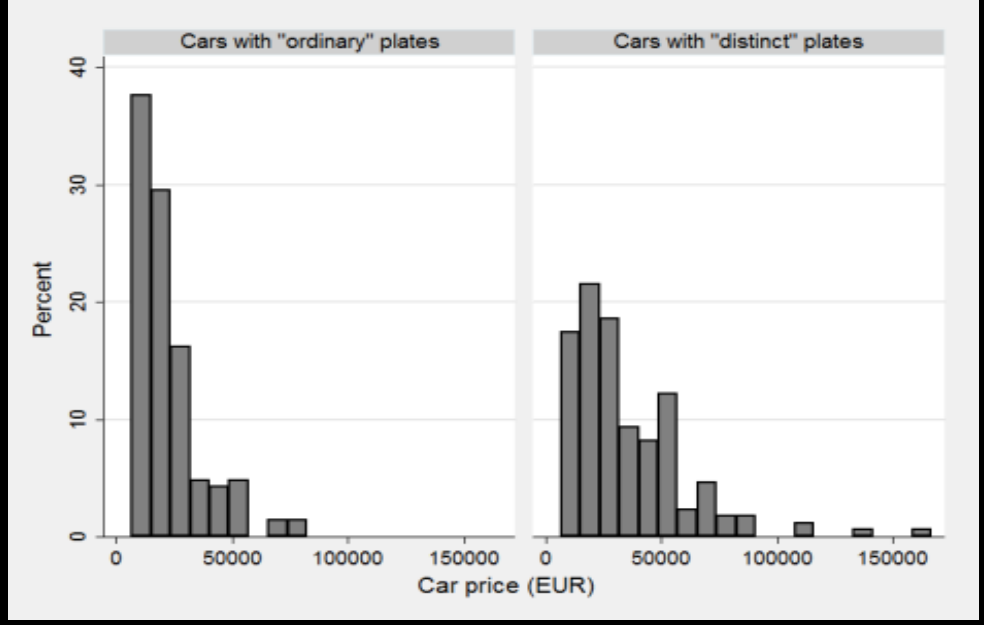


Table 1. Theoretical and observed frequencies of selected types of registration plates

Category	AAAA	ABCD	A000	000A	ABAB	AABB	ABBA	Total
Example	1A2 4444	1A2 2345	1A2 5000	1A2 0007	1A2 3434	1A2 8833	1A2 2332	
Count	13	0	8	14	48	49	45	177
% in our full sample	0.26	0	0.16	0.28	0.96	0.98	0.90	3.54
Theoretical (%)	0.1	0.08	0.1	0.1	0.9	0.9	0.9	3.08

Source: Data collected in the field, our own calculations.

- **Altogether we call them „distinct" plates**

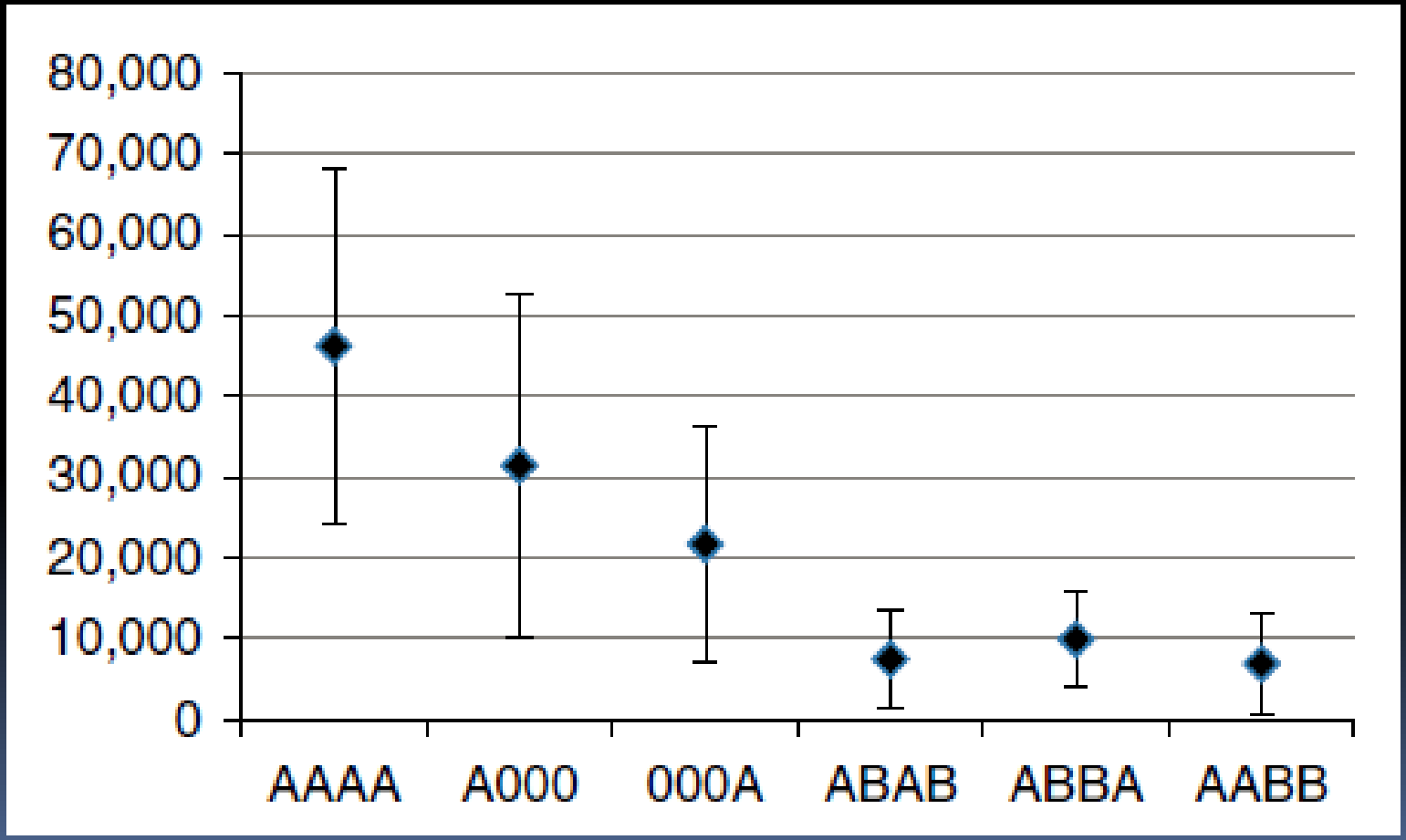
Statistical Test

$$Car\_price_i = \beta_0 + \beta_1 Distinct_i + \beta_{2-4} Measurement1-3_i + \beta_{5-6} LaneX_i + e_i$$

- **Coefficients (standard errors)**
- **Cars with „distinct" plates (all types) are on average 12.965 EUR more expensive (59% more)**

Specifications	A Subsample 1 No controls Equation 1
Constant	22.067 (1.449)***
Distinct	12.965 (2.360)***
Car price (coefficient in %)	–
Measurement 1	–
Measurement 2	–
Measurement 3	–
Left lane	–
Middle lane	–
Observations	282
R^2	0.033

„Distinct“ vs. rest
Price Differences (EUR)



Sensitivity tests

- Sensitivity test 1: another random sample
- Sensitivity test 2: exclusion of outliers (deleted EUR 78.000+ cars)
- Sensitivity test 3: 10% most expensive cars (80% distinct there instead of 46%)

Or.	CRN	Price (min, CZK)	Or.	CRN	Price (min, CZK)	Or.	CRN	Price (min, CZK)	Or.	CRN	Price (min, CZK)
1	59 0008	7 120 000	11	111 0006	2 137 200	21	1 6969	1 923 700	31	2 8888	1 545 000
2	1 7777	4 500 000	12	2 2386	2 106 000	22	10 8000	1 901 250	32	91 3737	1 544 000
3	4 20000	3 655 000	13	48 5003	2 099 000	23	73 5544	1 860 000	33	79 9933	1 542 500
4	1 0007	3 036 000	14	73 5577	2 064 000	24	1 8000	1 851 600	34	72 9696	1 539 500
5	68 6000	2 916 166	15	2 3788	2 047 030	25	48 0040	1 799 000	35	82 8998	1 530 000
6	36 9779	2 354 000	16	52 5462	1 998 000	26	10 7337	1 777 971	36	1 6633	1 500 000
7	38 9696	2 336 000	17	74 0707	1 998 000	27	94 3333	1 710 000	37	96 0005	1 498 570
8	89 0000	2 259 000	18	91 7000	1 985 550	28	80 0022	1 710 000	38	92 8060	1 498 570
9	42 0000	2 227 000	19	51 3431	1 957 700	29	46 7117	1 702 400	39	81 5775	1 497 900
10	32 7711	2 199 000	20	84 2233	1 928 500	30	71 7337	1 629 000	40	1 6254	1 495 000

Media review and interviews with distinct CRN users

Table 4. Reported reasons for the demand and supply of "distinct" registration plates

	Printed and Online Resources (31 Articles)	Personal Interviews (Eight Respondents)
Reasons for obtaining a "distinct" registration plate number		
Aesthetic appeal or lucky numbers	Design (3), easy to remember (3)	Aesthetic (1), lucky numbers (1)
Signal to other drivers	VIP status (14), image (8)	Show status, get respect (6)
Signal to police	VIP status (15)	Get respect (6), easier way to bribe (2)
Reason for issuing a "distinct" registration plate number		
Money	Cash (13)	Cash via intermediator (4)
Exchange for other services	Intermediary (20) (car dealers, person from the office)	Via intermediary(6) (car dealers, person from the office)

Source: Data collected online and in personal interviews.

Conclusions

- We conclude that the RPs in Prague in given period were (nearly certainly) not assigned randomly (the probability we got from the models is much smaller than 1/1000).
- The difference in prices between cars with "distinct" and the rest of the population corresponds to relative scarcity of given group of „distinct plates".
- The new law with paid RPs will not hamper down the potential for corruption (Law N. 239 / 2013, law that changes several traffic laws).

Future

- the data from Ministry of Transportation would greatly help to identify the relation of prices and CRNs better on real random sample with more details about cars
- corruption and traffic experts would gain from investigation of relationship between nice CRNs and traffic accidents
- auctions might both mitigate corruption and increase the gouvernment revenues

Take home

- This paper shows minimalistic way how to identify deviation from a proclaimed rule
- If variable is truly RANDOM, all characteristics should be orthogonal to it
- Check: lotteries in public policy (housing, public grants)
- FRAUD detection: check the distribution the variable is suppose to follow – uniform distribution or for example Benford´s Law (if applicable)

THANK YOU FOR YOUR ATTENTION!!!