

**NUMBER OF BIDDERS AND THE  
WINNER'S CURSE: AN EMPIRICAL  
ANALYSIS**

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# Motivation: Empirical

- Growth and need for infrastructure in Europe
- Governments with limited financial resources
- Franchise bidding to private operators seen as the solution (Demsetz 1968)
- Call for new institutional frameworks to develop competitive tendering in Europe:
  - 1989 European directive
  - 1993 “Sapin Act” in France

# Motivation: Empirical (cont.)

- McAfee and McMillan 1987: “the national, regional, and local governments in a typical modern market economy together spend between  $\frac{1}{4}$  and  $\frac{1}{3}$  of national income on goods and services; of this amount, perhaps  $\frac{1}{2}$  is paid by governments to firms via low-bid auctions”
- Guasch 2004:
  - concessions awarded through direct adjudication are far less renegotiated than concessions awarded via competitive tendering
  - Prevalence of aggressive bidding

# Motivation: Theoretical

- Walrasian analogy of markets as auctions: the greater the number of bidders, the better it is.
  - Auction theory:
    - It may be true for private-value auctions:  $c_i = x_i \forall i$
    - It may not be true at common-value auctions characterized by the winner's curse:  $c_i = c \forall i$
    - What if bidders anticipate renegotiations?
- Klein 1998: “*whoever is about to make eternal vows, should test whether he cannot find a better partner*” but “*it is not the number of suitors and the size of the dowry that truly matters for a successful marriage*”.

# Research Question

- What is the impact of the number of bidders on bidding behaviour in toll road concession auctions?

# Toll Road Concession Auctions

- Importance of infrastructure on growth
- First-price, sealed-bid auction
- Private- and common-value auctions:
  - Cost and traffic common uncertainty
  - Input efficiency and stakeholders' preferences
- Differing levels of common uncertainty
- Item auctioned: incomplete contracts → commitment problems (Engel 03, Athias-Saussier 06)

# Propositions

- Proposition 1: *The greater the number of bidders, the more likely bidders will increase their mark-up to correct for cost underestimation and traffic overestimation.*
- Proposition 2: *The greater the degree of common uncertainty, the more likely bidders will increase their mark-up as competition gets fiercer.*
- Proposition 3: *The lower the likelihood of contract renegotiation, the more likely bidders will increase their mark-up as the number of bidders increases.*

# Data

- Dataset consisting of 37 worldwide toll road concession auctions:
  - France, Brazil, Chile, Germany, United Kingdom, Thailand, Canada, Portugal, Hungary, Israel, and South Africa
  - Over a long period of time: 15 years (1988-2003)

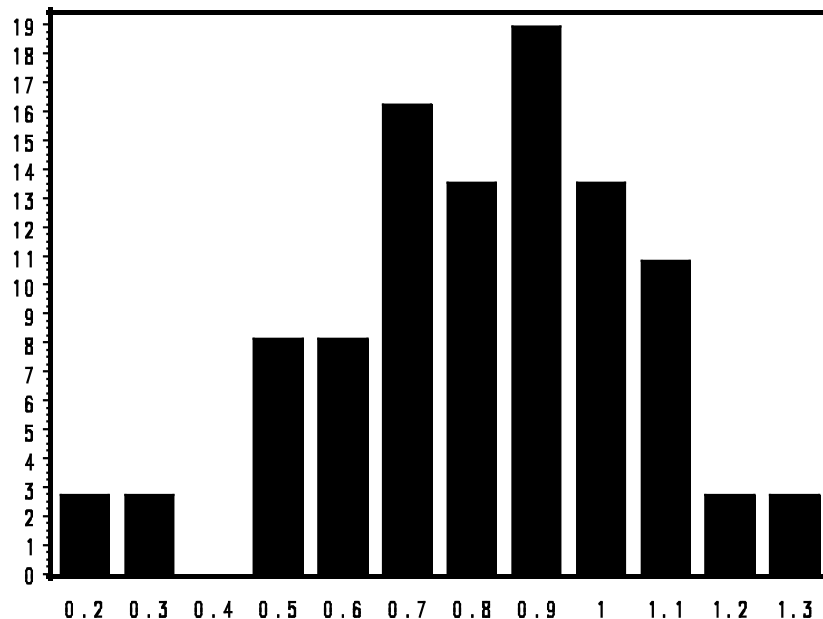


# Dependent variable: Mark-up over traffic estimate

- Traffic forecast: key strategic variable:
  - Assumption: No Mark-up over cost estimate
  - At the same time:
    - less uncertainty on construction costs
    - less information asymmetry between bidders and procuring authorities regarding construction costs.
    - if the builder and the operator are integrated in the same firm, they can only play on traffic forecasts so that the winner's curse effect due to common *cost* uncertainty will impact on traffic forecasts.
  - Methodological weaknesses in traffic forecasting give margin to adjustments

# Dependent variable: Mark-up over traffic estimate

$$\text{Mark-up} = \frac{1}{n} \sum_{t=1}^n \frac{\text{actual}_t}{\text{forecast}_t}$$

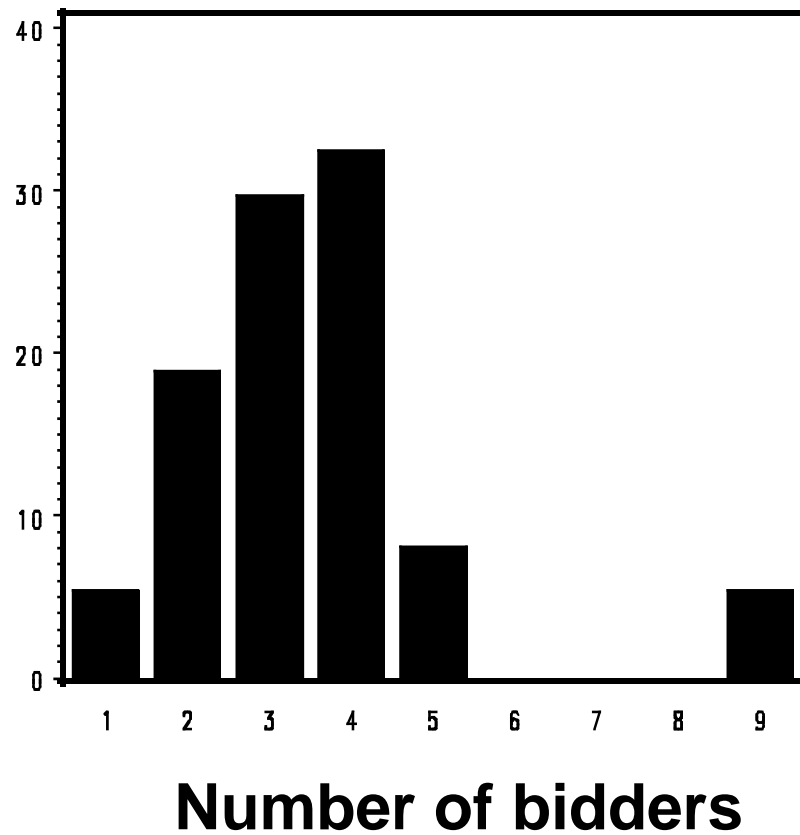


→ Relate the mark-up over traffic estimate to the number of bidders, projects' and institutional environment's characteristics.

# Data: independent variables

Proxy of the level of competition:

- the actual number of bidders

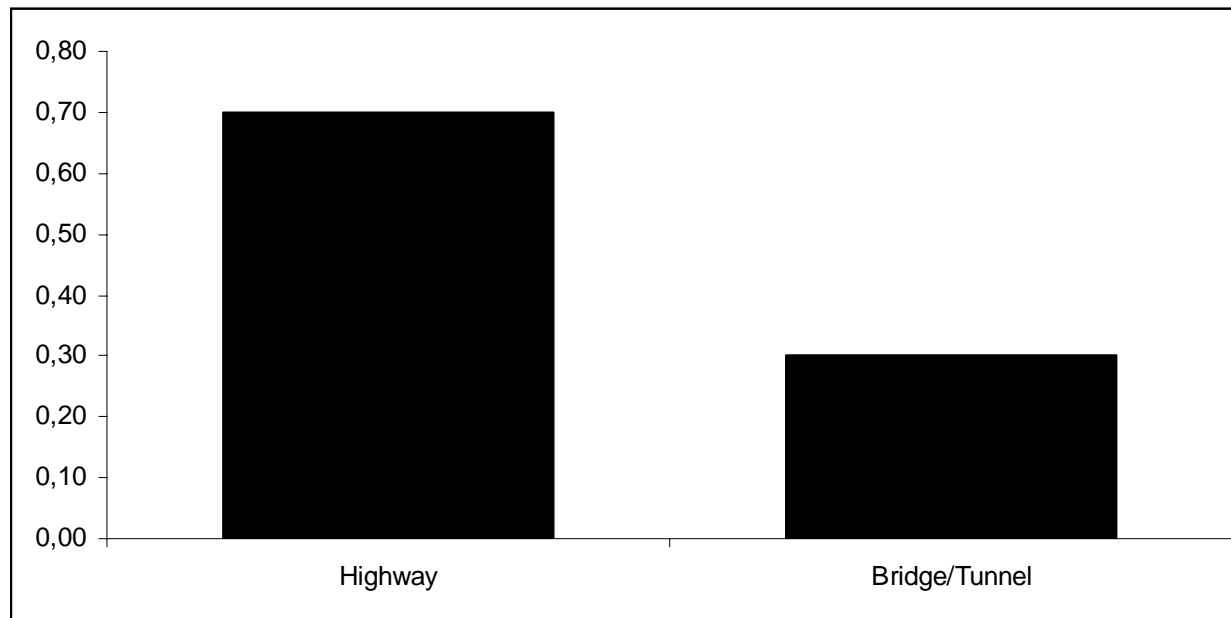


→ *The higher the number of bidders, the greater the mark-up*

# Data: independent variables

Proxy of the differing level of common uncertainty:

- Dummy variable: HIGHWAY interacted with the number of bidders variable.

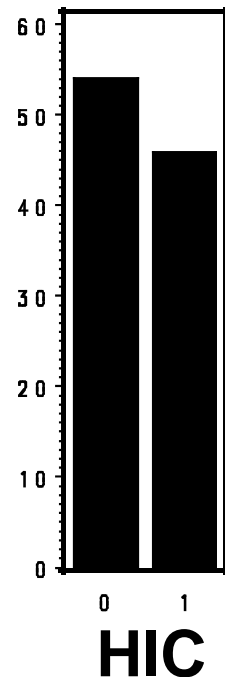


→ *The greater the degree of common uncertainty, the greater the mark-up as competition gets fiercer*

# Data: independent variables

Proxy of the likelihood of renegotiation (Laffont, 2005):

- Dummy HIC (World Bank 2006a) interacted with the number of bidders variable.



→ *The lower the likelihood of renegotiation, the greater the mark-up as competition increases*

# Data: independent variables

- Control variables: length, investment, delay, government experience, concessionaire experience, toll.
- OLS regression model

# Econometric Results

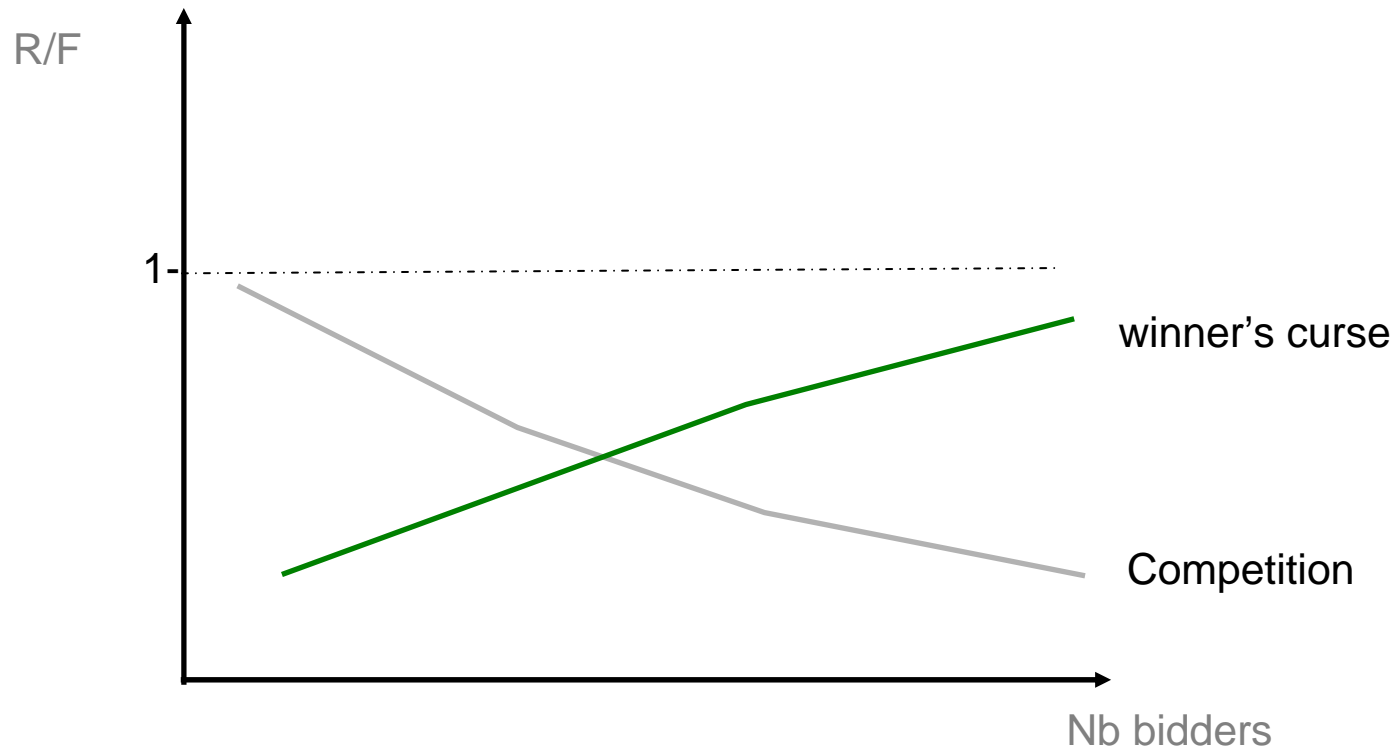
	LOG/LOG			
	Model 1	Model 2	Model 3	Model 4
NB Bidders <sup>a</sup>	0,256* (0,126)	1,451*** (0,368)	1,303** (0,362)	1,192** (0,390)
Highway		1,839*** (0,483)	1,793*** (0,466)	1,538** (0,541)
Highway*NB Bidders <sup>a</sup>		-1,266** (0,384)	-1,146** (0,375)	-1,011* (0,410)
HIC*NBBidders <sup>a</sup>			0,162+ (0,085)	0,278* (0,132)
length <sup>a</sup>				0,059 (0,067)
investment <sup>a</sup>				-0,044 (0,062)
concexp <sup>a</sup>				-0,057 (0,087)
govlearn <sup>a</sup>				-0,006 (0,026)
toll				-0,096 (0,120)
Delay <sup>a</sup>				0,016 (0,116)
Constant	-0,556*** (0,158)	-2,232*** (0,464)	-2,212*** (0,447)	-1,969*** (0,532)
R <sup>2</sup>	0,105	0,422	0,481	0,539
Adj R <sup>2</sup>	0,079	0,370	0,416	0,361
N	37	37	37	37

Significance levels: + 0.10 \* 0.05 \*\* 0.01 \*\*\* 0.001

# Conclusion

- Topic: Impact of the number of bidders on the effectiveness of the award process of toll infrastructure concession contracts.
- Results in agreement with the theory:
  - We show that bidders are cognizant of the winner's curse in such auctions, so that they bid less aggressively when they expect more competition.
  - We find that this winner's curse effect is even larger for projects with more common uncertainty.
- Improvement of the theory: we show that the **institutional environment** is very important because bidders will bid more strategically in weaker institutional environments.
- Policy conclusion: more competition may be desirable !





# Limits and Extension

- The actual number of bidders may not be the best measure of potential competition in these settings (Porter and Zona 2003).
- Auctions versus negotiation debate (Bajari, McMillan, Tadelis 2003, Yvrande 2006)