Endogenous Legal and Political Institutions.

Carmine Guerriero
Website: http://sites.google.com/site/carmineguerrieroshomepage/

ACLE and Department of Economics, University of Amsterdam

ESNIE, Ninth session. *Cargèse*, *France*. June, 2, 2010.

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- build on the theoretical intuition that proportional elections induce parties to seek consensus in the population at whole;
- provide empirical evidence that majoritarian elections lead to smaller welfare programs than proportional elections do.

... Versus Endogenous Institutions.

Is this approach correct? I.e., given that for a sample of i units the theory foresees the following relation among welfare programs y_i, controls $\mathbf{x}_i$ and the majoritarian rule δ_i:
$y_i = \delta_i + \beta \mathbf{x}_i + \epsilon_i$,
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Let the random utility model (Mansky, 1977) describe institution selection by unit i:

$$\delta_i = 1 \leftrightarrow \gamma\mathbf{w}_i + \eta_i \geq 0$$

$$\delta_i = 0 \leftrightarrow \gamma\mathbf{w}_i + \eta_i < 0$$

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If η and $\mathbf{w}$ are uncorrelated, OLS are consistent whenever the institutional design is random once we have controlled for $\mathbf{x}$. In particular, if the variables in $\mathbf{w}$ are a subset of the variables in $\mathbf{x}$, conditional independence is satisfied if the random terms ϵ_i and η_i are uncorrelated—i.e., recursivity of the performance and index models.

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The Art of Instrumental Variables.

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1. correlated with the institution δ_i;
   weak instruments: as this correlation becomes weaker, the partitioning of δ_i into exogenous and endogenous components becomes more arbitrary;

2. uncorrelated with the error term ϵ_i;
   overididentification restrictions: if we have more instruments than institutions, the model is overidentified and we can test for the exogeneity of the additional instruments. Under the nul hypothesis at least one instrument is exogenous.
   Crucially we need to make sure that there are no omitted variables in the index models that correlate with the instrument and η_i.

The Aghion, Alesina and Trebbi (QJE, 2004)'s critique.

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In theory: Too few ex post checks and balances enhance the risk of a tyranny of the majority; too many jeopardize legislation. In a fragmented world, even if it is optimal to choose less insulation to guarantee plurality, in practice special interests push for insulation. *In the data*: cultural fractionalization is related to more insulation.

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Alesina, Glaeser, and Sacerdote (Brooking, 2001) show that fragmented societies are unable to agree on common public goods: i.e., there is an inverse relationship between the size of government social spending and ethnic fractionalization.

- An omitted variable failure: the Persson and Tabellini (2003)'s estimates which are partially corrected for endogeneity could be inconsistent.

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- Endogenous Legal Systems: a few words on Guerriero (2009).

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4. Are the model's conclusions robust under different set ups?

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   - can you say something about the timing of the reforms or the relative power of the implemented rule?
3. Endogenous institutions and economic outcomes; does the bias make sense?

The Political Economy of (De)Regulation: Theory and Evidence from the U.S. Electricity Market.

Economists have long maintained that not only competition assures allocative efficiency but that it also deliver dynamic advantages (Raith, 2003; Baggs and de Bettignies, 2007): thus, regulation should be enhanced in response only to:

- market failures or specific technology (Baumol and Klevorich, 1970);
- powerful special interests (Stigler, 1971; Glaeser and Shleifer, 2003; Aghion et al. 2009; Pinotti, 2009).

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- powerful special interests (Stigler, 1971; Glaeser and Shleifer, 2003; Aghion et al. 2009; Pinotti, 2009).

Yet, deregulation seems to have delivered very modest efficiency gains and a few works have emphasized the possible superiority of regulation in assuring higher cost reducing investments (Averch and Johnson, 1962; Aghion et al., 2005; Vives, 2008)?

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Could we prove that, under minimal and reasonable assumptions, a benevolent government should choose between competition and regulation trading off static and dynamic efficiency—i.e., prices and incentives to invest in cost reduction?

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Also, if this is the case, how this trade off is affected by the preferences of the politicians' constituencies and the implicit incentives of regulators?

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1. A wide body of evidence claiming that deregulation can deliver lower costs but not considering its endogeneity (Alesina et al, 2005; Bushnell and Wolfram, 2005; Parker, Kirkpatrick and Zhang, 2008; Craig and Savage, 2010);

2. Other works providing evidence but no theoretical justification of the endogeneity of regulatory institutions (Ka and Teske, 2002; Duso and Röller, 2003; Knittel, 2006; Zhang, 2007; Craig and Savage, 2010).
Exceptions: Guerriero (2009, 2010).

Main Contributions.

Three main contributions:

1. Building on a long literature on incentives and competition (Laffont and Tirole, 1993; Armstrong and Sappington, 2006) I prove that, whenever the demand is sufficiently inelastic, the choice between competition and regulation reduces to a static versus dynamic efficiency trade-off;

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2. Thus, deregulation is more likely when the rents left by regulation are lower and the reformer's dynamic efficiency concerns weaker;

3. This is consistent with American states electricity market data. Also, the endogenous impact of deregulation on the medium-term cost-reduction is stronger than that documented until now (Fabrizio, Rose and Wolfram, 2008).

An Example: Deregulation in the U.S. Electricity Market.

Competitive pressures:

- Until the beginning of the 1980s, PUC regulated investor owned utilities under cost of service;
- Some experimentation with incentive regulation;
- Wide reforms from the mid-1990s so that today IOUs own only a small fraction of generating capacity and retail rates are linked to the bid clearing second-price auction-based wholesale markets (Fabrizio, Rose and Wolfram, 2008).

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Public officials' incentives: The details of reforms are decided during rate reviews often initiated by the state government (EIA, 2003). Within these open quasi-judicial hearings, commissioners, who are either elected or appointed, cover an information gathering role (Gormley, 1983; Friedman, 1991).

Technology.

The representative consumer's demand is $q(p) > 0$ for $p \in [0, \bar{p})$ and $q(p) = 0$ for $p \geq \bar{p}$. Also, $q'(p) < 0$ for $p \in [0, \bar{p}]$ and the gross surplus is $S(p) = \int_p^{\bar{p}} q(x)\, dx$; both $q(p)$ and p are common knowledge.

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A firm maximizes the rent U which is the sum of the profits $\pi(p, c) \equiv q(p)(p - c)$ and a transfer $t \geq 0$ under regulation. The latter brings social costs $1 + \lambda$ with $\lambda \geq 0$ measuring taxation distortions.

Social Welfare.

When society attaches a weight $\alpha \in [0,1)$ to the firm's rent, social welfare is $S(p) + \alpha U - (1+\lambda)t = S(p) + (1+\lambda)\pi(p,c) - (1+\lambda-\alpha)U = w(p,c) - (1+\lambda-\alpha)U$. Assume $\lambda = 0$ and:

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A1: *The direct demand is such that* $q''(p)(\bar{p} - c_L) + q'(p) < 0$ *and its elasticity* $\varepsilon_{p,q} = -q'(p) p / q(p)$ *is strictly lower than 1.*

Timing.

$t = 1$.—At the Constitutional table, society learns the nature of the regulatory environment; next, she chooses between regulation and competition on the base of the expected welfare under the two conducts and a preference shock $\delta \in [-\infty, \infty]$ with density f and $E(\delta) = 0$ (Mulligan and Shleifer, 2005; Aghion et al., 2009; Pinotti, 2009). Under regulation, a menu of (t, p) pairs are offered to the monopoly; the contract is conditional on the firm's report of c but not on the level of investment.

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$t = 2$.—The monopoly or each oligopoly commit an unobservable investment of cost $\psi(I) \geq 0$ such that the probability of c_L becomes $(1 + I)/2$ and that of c_H becomes $(1 - I)/2$. $\psi(\cdot)$ is strictly increasing and strictly convex.

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$t = 4$.—Under regulation the firm executes the contract if she finds it acceptable. Under competition each firm announces a price. If the latter is lower than the one played by the opponent, the firm serves the whole market at this last price; if the two bids are equal, the market is split. Same equilibrium as under symmetric information.

Pricing: Regulation Versus Competition.

Regulation.—Exploiting the revelation principle (Myerson, 1979), the regulator optimally offers the firm a menu of (p_i, t_i) contracts with $i \in \{L, H\}$ contingent on the firm's report of c. The equilibrium envisions a binding low cost firm's IC constraint or $q(p_L)(p_L - c_L) + t_L = q(p_H)(p_H - c_L) + t_H$ and a binding c_H firm's IR constraint so that: $U_H = 0$ and $U_L = \Delta q(p_H)$. The expected social welfare is:

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$$\frac{1+\hat{I}^R}{2}\left[w_L(p_L, c_L) - (1+\lambda-\alpha)\Delta q(p_H)\right] + \frac{1-\hat{I}^R}{2}\left[w_H(p_H, c_H)\right] =$$
$$\frac{1+\hat{I}^R}{2}S(c_L) + \frac{1-\hat{I}^R}{2}S\left(\hat{c}_H^I\right), \text{ with } \hat{c}_H \equiv c_H + \left(1+\hat{I}^R\right)\left(1-\hat{I}^R\right)^{-1}(1-\alpha)\Delta.$$

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$$\frac{\left(1+\hat{I}^C\right)^2}{4} S(c_L) + \frac{\left(1-\hat{I}^C\right)^2 + 2 - 2\left(\hat{I}^C\right)^2}{4} S(c_H) + \frac{1-\left(\hat{I}^C\right)^2}{2}\alpha\Delta q(c_H).$$

Cost Reducing Investments: Regulation Vs. Competition.

Under competition: $\hat{I}^C = \arg\max_{I \geq 0} (1/4)(1+I)\left(1-\hat{I}^C\right)\Delta q(c_H) - \psi(I)$.
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Under A1, $2q(\hat{c}_H) > q(c_H)$ and, in turn, that $I^R > I^C$.

The Static Versus Dynamic Efficiency Trade Off.

For $\delta = 0$ competition prevails if: $\frac{\left(1+\hat{I}^{C}\right)^{2}}{4} S\left(c_{L}\right) + \frac{\left(1-\hat{I}^{C}\right)^{2}+2-2\left(\hat{I}^{C}\right)^{2}}{4} S\left(c_{H}\right) + \frac{1-\left(\hat{I}^{C}\right)^{2}}{2} \alpha \Delta q\left(c_{H}\right) > \frac{1+\hat{I}^{R}}{2} S\left(c_{L}\right) + \frac{1-\hat{I}^{R}}{2} S\left(\hat{c}_{H}\right)$.

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P1: Under assumptions A1 and A2—i.e., $\psi'(1/2) \leq (\Delta/8)\, q\left(c_{H}\right)$, the probability of adopting competition $F\left(W^{C} - W^{R}\right)$ falls with α.

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Static Efficiency.

Information: Regulators' Implicit Incentives.

In $t = 2$ the Constitutional table directly offers the firm (t, p) pairs conditional also on a signal on c observed by the regulator between $t = 3$ and $t = 4$. If $c = c_L$ w. p. $\gamma \in [0, 1]$ the Constitutional table sees c_L and w. p. $1 - \gamma$ she remains uninformed. If $c = c_H$, she always remains uninformed. This time:

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$W^{R,S} = \frac{1+\hat{I}^{R,S}}{2} S\left(c_L\right) + \frac{1-\hat{I}^{R,S}}{2} S\left(\hat{c}_H^S\right)$
where $\hat{c}_H^S \equiv c_H + \left(1 + \hat{I}^{R,S}\right)\left(1 - \hat{I}^{R,S}\right)^{-1}(1 - \gamma)(1 - \alpha)\Delta$. The monopoly invests $\hat{I}^{R,S} = \arg\max_{I \geq 0} (1/2)(1 + I)(1 - \gamma)\Delta q\left(\hat{c}_H^S\left(\hat{I}^{R,S}\right)\right) - \psi(I)$.

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In $t = 2$ the Constitutional table directly offers the firm (t, p) pairs conditional also on a signal on c observed by the regulator between $t = 3$ and $t = 4$. If $c = c_L$ w. p. $\gamma \in [0, 1]$ the Constitutional table sees c_L and w. p. $1 - \gamma$ she remains uninformed. If $c = c_H$, she always remains uninformed. This time:

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Information.

Strategic Deregulation.

The reformer is an incumbent party $\tilde{m}$: either the pro-shareholder *Re* or the pro-consumer *De*. Ex post the firm eventually commits an investment of fixed cost $\bar{I} > 0$, expected value $\pi\bar{I}$ with $\pi \equiv \bar{\pi}\delta + \underline{\pi}\,(1-\delta) > 0$ and $\bar{\pi} > 0 > \underline{\pi}$. Next $\tilde{m}$ faces an election with exogenous winning probabilities $x_{\tilde{m}}$ and the winner m implements an aid $\rho_m > 0$ proportional to the firm's rent and paid out to the firm if the investment is committed. Only c_L invests if $(1+\rho_m)\,\hat{U}^j + \underline{\pi}\bar{I} \geq 0$.

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$\tilde{m}$ evaluates the ex-post PC at the shadow price $\chi_{\tilde{m}}$ and the aid $\rho_m\hat{U}^j$ at λ. Also, $\tilde{x} \equiv \rho_{De}x_{De} + \rho_{Re}x_{Re}$ and **A.3**: $\rho_{Re} > \rho_{De}$; $\chi_{Re} > \lambda > \chi_{De}$.

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P3: Under assumptions A1, A2 and A3, the probability that competition is selected falls with the reformer hold on power $x_{\tilde{m}}$ and is greater if she is pro-consumer.

Extensions.

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1. The number of Bertrand competititors is higher than two;
2. The competition is a' la Cournout;
3. The shadow cost of public funds is positive;
4. The regulator can committ to reimburse investment expenses.

Remark: Need to prove that the impact of α and γ, through $\hat{I}^R$ and $\hat{c}_H^I$, on the welfare under regulation is unaffected and that regulation preserves its dynamic advantage.

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Robustness.

Testable Predictions.

Prediction 1: The likelihood of a reform toward more competition will fall:

1. when regulators are appointed;
2. with society's concerns for cost-reducing investments;
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Prediction 2: Production costs could be either greater or lower under competition.

Why? Because competition will assure a lower expected ex ante cost whenever:

$$\left[2\frac{1-(\hat{\imath}^C)^2}{4}+\frac{(1+\hat{\imath}^C)^2}{4}\right]c_L+\frac{(1-\hat{\imath}^C)^2}{4}c_H<\frac{1+\hat{\imath}^R}{2}c_L+\frac{1-\hat{\imath}^R}{2}c_H$$

$$\leftrightarrow \frac{1-2(\hat{\imath}^R-\hat{\imath}^C)-(\hat{\imath}^C)^2}{4}(c_L-c_H)<0$$

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Institutions.—*Deregulation* equals one for states—or plants in states—that restructured beginning in the year of the first hearing and zero otherwise.

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Information gathering.—*Reg_Elec* equals 1 if regulators were elected, 0 otherwise.

Methodology.

Logit with dependent *Deregulation*. Look at the marginal effects—the percentage variation in the likelihood when the control rises by 1% holding other controls constant. Remark: Similar results when the dependent is *Law* or switching to the ordered logit with dependent *Der_Ord*.

Table 1: Deregulation — Logit.

	The dependent variable is the likelihood of: *Deregulation*			
Elec_Reg	0.015 (0.028)	- 0.001 (0.017)	0.015 (0.027)	0.009 (0.024)
Mc_Labor(-3)	- 0.007 (0.016)			
Mc_Fuel(-3)		- 0.082 (0.013)***		
Ratio_Mlc(-3)			- 0.004 (0.007)	
Ratio_Mfc(-3)				- 0.105 (0.034)***
Republican	0.035 (0.029)	0.018 (0.020)	0.034 (0.029)	0.027 (0.027)
Majority	- 0.077 (0.037)**	- 0.038 (0.027)	- 0.075 (0.038)**	- 0.069 (0.035)**
Der_Nei	0.414 (0.051)***	0.256 (0.047)***	0.411 (0.052)***	0.392 (0.051)***
Pseudo R^2	0.45	0.48	0.45	0.46
Log Pseudo-Likelihood	- 169.29	- 159.60	- 169.18	- 165.58
Number of Observations	688	688	688	688

Notes: 1. Robust standard errors—z distribution—in parentheses;
2. The entries are marginal effects and *** denotes significant at the 1% confidence level; **, 5%; *, 10%.

Ordered Logit.

Methodology.

Examine whether deregulation pushes the firm to use a better mix of inputs given prices, estimating by OLS and GMM the input use equations (Fabrizio, Rose and Wolfram, 2007):

$$\ln\left(N_{p,t}\right)=\beta_1^N \ln\left(Q_{p,t}^N\right)+\beta_2^N \ln\left(P_{p,t}^N\right)+\mathbf{j}'\mathbf{x}_{p,t}^N+\gamma_{p,t}^N+\alpha_p^N+\delta_t^N+\varepsilon_{p,t}^N$$

$N_{p,t}$ is *Ln_Emp* or *Ln_Nfe* or *Ln_Btu*;
$Q_{p,t}^N$ is the annual net MWh generation for plant p in year t;
$P_{p,t}^N$ is the price of the input $N_{p,t}$—i.e., the BLS annual wage bill in dollars divided by total employment for *Ln_Emp* or *Ln_Nfe* and none for *Ln_Btu*;
$\mathbf{x}_{p,t}^N$ gathers the determinants of deregulation which cannot be excluded by the input use equation and a dummy for the presence of a FGD scrubber;
$\gamma_{p,t}^N$ is the dummy *Deregulation*; α_p^N are plant fixed effects; δ_t^N are time effects.

A World of Biases.

Notice that the bias could go either way:

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- it could be positive because deregulation could correlate with unobserved low cost-reducing effort by a state with weak cost reducing investment concerns;
- it could be negative because deregulation could correlate with unobserved forces increasing the efficiency of the information gathering technology and, in turn, lowering the firm's cost reducing investments under regulation.

Table 2: Input Use — OLS Versus Difference GMM.

	The dependent variable is:					
	Ln_Emp	*Ln_Emp*	*Ln_Emp*	*Ln_Btu*	*Ln_Btu*	*Ln_Btu*
Deregulation	- 0.069 (0.010)***	- 0.127 (0.032)***	- 0.082 (0.026)***	- 0.021 (0.007)***	- 0.153 (0.081)*	- 0.095 (0.047)**
Estimation	OLS	GMM	GMM	OLS	GMM	GMM
Instr. count		25	25		24	24
Hansen test		0.51	0.14		0.34	0.98
AR(2) in res.		0.52	0.11		0.05	0.17
R^2	0.37			0.97		
Number of obs.	8059	8059	8059	8059	8059	8059

Notes: 1. All specifications consider also *Elec_Reg*, *Republican*, *Majority*, *Ln_Mwhs* and *Scrubber* and fixed plant and time effects; those in columns (1) to (3) include also *Wage*;
2. Robust standard errors in parentheses; Windmeijer correction in col. (2), (3), (5), (6);
2. In the GMM model the endogenous variable is *Deregulation* and the excluded instruments are *Mc_Fuel*(-3) (*Ratio_Mfc*(-3)) and *Der_Nei* in columns 2 and 4 (3 and 6).

Standing on the Shoulders of the Giants.

Despite the relevance of regulatory institutions to economic development, their determinants are still poorly understood: I developed a property right on sunk investments theory of "endogenous market institutions" (Guerriero, 2009 and 2010).

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Avenues for further research:

- What about service quality (see Ajodhia and Hakvoort, [2005])?
- Endogenous impact of competitive pressures in other markets as the pharmaceutical or commercial banking ones.

Legal Origins.

The Legal Origins project (see La Porta et al., 2008) has been using the fairly random assignment of the Civil and Common Law traditions to a great part of the World to:

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Three maintained assumptions:

1. institutional variation;
2. exogenous assignment;
3. institutional persistence.

Institutional Variation and Transplantation.

Two main institutional structures differentiating the two traditions (Merryman, 1969; Damaska, 1988; Zweigert and Kötz, 1998):

- Law making institutions: Civil Law relies on statutes—Statute Law; Common Law entrusts appellate judges the legislative power—Case Law.

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Exogenous Assignment: While Common law was transplanted into England's ex-colonies, Civil law was exported from continental European countries to Latin America, Africa and Asia; a small group of countries, for example Ethiopia (David et al., 1995), adopted the European codes most fashionable at the time.

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Persistence: legal scholars (Roe, 2004) documented a wide convergence—*e.g.*, countries to which Case law was transplanted are relying more heavily on codes. So:

- wrong codification and possibly endogeneity.

Research Question and Main Contributions.

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3. The data nicely met the testable predictions, whether or not IV are employed.

Main Intuition.

Consider a society interested in the regulation of an harmful act. Citizens are heterogenous in their preferences over the harshness of punishment, which can be selected either by randomly picked appellate judges—Case law—or by a corruptible Legislator whose outside option is the optimal mean rule—Statute law.

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Due to *stare decisis*, judges' biases offset one another at the cost of volatility of the law. Under Statute law, instead, the Legislator chooses rules that are certain but biased whenever one group is favored. The latter happens when cultural heterogeneity is sufficiently high and/or the political process is sufficiently inefficient.

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When the extent of cultural heterogeneity is sufficiently low Statute law always prevails over Case law because certain and unbiased. When, instead, heterogenity becomes high enough Case law could prevail when democracy is sufficiently weak.

A Powerful Approach to Politics, Law and Economics.

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- Such distribution is not random but it is the result of technological or historical shocks and of the welfare maximizing choice of society or a part of it.
- Constructive Destruction: exploring further the selection, evolution and impact on economic performance of legal institutions is a crucial but challenging task, which requires rigorous theory, careful data collection and solid statistical work.

Institutional Choice With No Investments.

Competition is chosen when $W^C > W^R + \delta$ that, for $\delta = 0$, rewrites as:

$$\frac{1}{2}\left[\frac{S(c_L)+S(c_H)}{2} - \frac{S(c_L)+S(\hat{c}_H)}{2}\right] > \frac{1}{2}\left\{\frac{S(c_L)+S(\hat{c}_H)}{2} - \left[S\left(c_H\right) + \alpha\Delta q\left(c_H\right)\right]\right\} \leftrightarrow$$

$$2\left[S\left(c_H\right) - S\left(\hat{c}_H\right)\right] + 2\alpha\Delta q\left(c_H\right) > \left[S\left(c_L\right) - S\left(c_H\right)\right].$$

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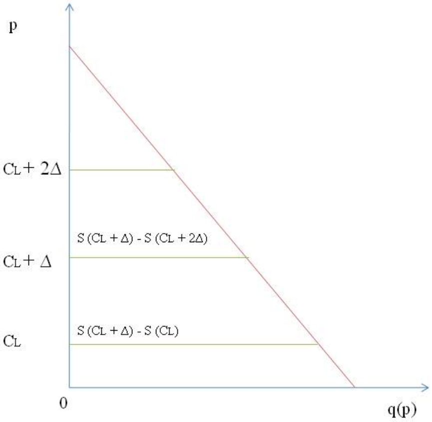
$2\left[S(c_H) - S(\hat{c}_H)\right] + 2\alpha\Delta q(c_H) > \left[S(c_L) - S(c_H)\right].$

Lemma 1: For $\delta = 0$, competition always outperforms regulation when $2\left[S(c_L+\Delta) - S(c_L+2\Delta)\right] > S(c_L) - S(c_L+\Delta)$. Also, the probability of adopting competition rises with society's investment concerns α.

Inelastic Demand.



The Information Gathering Technology.

$\gamma_s = \theta e_s$ where $\theta \in [0, 1]$ is the random ability, $e_s \in [0, 1]$ is the effort, and $s = \{A, E\}$ indexes implicit incentives. θ has mean $\bar{\theta}$ and is drawn from a density g.

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The regulator maximizes: $P + \tau [B(e_s) - C(e_s)]$ where $C' > 0$, $C'' > 0$, $B^E(e_E) = \Pr\left\{e_E \geq \bar{\theta} e^{\exp}\right\}$, $B^A(e_A) = \mathrm{E}_\theta [E_\theta (\theta \,|\gamma_A, e_A{}^{\exp})]$.

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Whenever $g(\bar{\theta}) > 1$, elected regulators exert more effort than appointed ones do.

Return 2

Robustness: Competition.

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Cournout Competition.—With symmetric information on c, free entry at $\kappa \geq 0$ and downward sloping best replies or $P' + P''q\left(c, i, N - i\right)$, where $q\left(c, i, N - i\right)$ is the choice of a c firm when, among the N entrants, i have type c_L and $N - i$ a type c_H:

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- if the elasticity of the demand is not too low, a price respecting the usual Bertrand conditions and strictly greater than the mean marginal cost exists;
- for a sufficiently low entry cost and sufficiently efficient investment technology, the firm's incentive to invest are lower under competition.

Robustness: Regulation.

A positive shadow cost of public funds.—The equilibrium Ramsey pricing rule is implicitly defined by $p + \lambda (1 + \lambda)^{-1} q(p) [q'(p)]^{-1} = c$ so that $\partial p / \partial c > 0$:

Robustness: Regulation.

A positive shadow cost of public funds.—The equilibrium Ramsey pricing rule is implicitly defined by $p + \lambda (1 + \lambda)^{-1} q(p) [q'(p)]^{-1} = c$ so that $\partial p / \partial c > 0$:

- the level of investment continues to be higher under regulation;
- the effect of a change in α and γ on the welfare under regulation is multiplied by $\partial p / \partial c$; provided that a condition similar to A2 holds and the elasticity of the demand is sufficiently low, the model conveys the same message.

Robustness: Regulation.

A positive shadow cost of public funds.—The equilibrium Ramsey pricing rule is implicitly defined by $p + \lambda\left(1+\lambda\right)^{-1} q\left(p\right)\left[q'\left(p\right)\right]^{-1} = c$ so that $\partial p/\partial c > 0$:

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Regulatory commitment.—When an ex post participation constraint is imposed:

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A positive shadow cost of public funds.—The equilibrium Ramsey pricing rule is implicitly defined by $p + \lambda (1+\lambda)^{-1} q(p) [q'(p)]^{-1} = c$ so that $\partial p / \partial c > 0$:

- the level of investment continues to be higher under regulation;
- the effect of a change in α and γ on the welfare under regulation is multiplied by $\partial p / \partial c$; provided that a condition similar to A2 holds and the elasticity of the demand is sufficiently low, the model conveys the same message.

Regulatory commitment.—When an ex post participation constraint is imposed:

- the level of investment under regulation, when contractible, would still be inefficient but higher than the one under competition. The rule giving p as a function of c would be unaffected;
- when investments are not contractible, $\hat{c}_H$ would be distorted even more in order to take into account the moral hazard in investment constraint. Regulation retains its dynamic advantage and, under a condition similar to A2 and with sufficiently inelastic demand, the model's message survives.

Return 3

Table 3: Deregulation — Ordered Logit.

	The dependent variable is: Der_Ord			
Elec_Reg	1.324	1.155	1.317	1.300
	(0.496)	(0.445)	(0.489)	(0.482)
Mc_Labor(-3)	0.881			
	(0.200)			
Mc_Fuel(-3)		0.256		
		(0.078)***		
Ratio_Mlc(-3)			0.931	
			(0.083)	
Ratio_Mfc(-3)				0.338
				(0.174)**
Republican	1.313	1.201	1.307	1.255
	(0.407)	(0.378)	(0.402)	(0.396)
Majority	0.461	0.538	0.476	0.450
	(0.212)*	(0.240)	(0.224)	(0.198)*
Der_Nei	322.495	201.726	322.2	340.21
	(146.318)***	(91.439)***	(146.14)***	(155.60)***
Pseudo R^2	0.45	0.48	0.45	0.46
Log Pseudo-Likelihood	- 169.29	- 159.60	- 169.18	- 165.58
Number of Observations	688	688	688	688

Return 4