# Using Contracts to Measure the Law

## *An Application to IPR Systems and Technology Licensing Agreements*

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# Assessing Institutional Performances: The Challenge

- Two main approaches
  - Historical "quasi-experiment": Acemoglu et al. [2001], Engerman et Sokolov [2002]
  - Comparative Institutional Analysis based on Institutional indicators: Kaufman, La Porta et al., etc
- Indicators: How to "measure" qualitative differences?
  - Survey among experts
  - Measure of key institutional characteristics (e.g. Djankov)

  ⇒Numerous subjectivity biases
- New Methodology based on "Objective" assessment by actual economic agents through their revealed preferences Inspired by Oaxaca [1973] on discrimination on the labor market

# IPR Controversies

- Knowledge base economy => IPR reforms in many countries (with the lead in the US)
  *Stronger rights to IPR holders*
- Strong criticisms in the beginning 2000's (e.g. Jaffe & Lerner [2004]; Scherer [2004, 2006])
  *Too strong IPR protection deters innovation and raises antitrust issues in downstream markets*
- Today the theory of the protection (incentives)/diffusion (availability of innovation, spill-over) dilemma is well developed
  The question is to measure: Posner [2002] or Gallini [2002]

# IPR Impacts: the Challenge

- Main institutional factors influencing innovation
  - IPR
  - R&D, S&T Policies
  - Industrial organization
  - …
- IPR's strength (actual costs and extension of exclusive rights of use)
  - Legal rule:
    - IPR law: type of exclusive rights; extension; duration; etc.
    - *Side effects of other laws and regulations (e.g. public health)*
  - Implementation
    - Public institutions:
      - IPR institution design and organization
      - Quality of the judicial system
    - *Private institutions*
  - *Informal institutional framework*

# IPR assessment the existing methods

- Assessing the supply of legal protections
  (e.g. Rapp et Rozek [1990], Ginarte et Park [1997], Seyoum [1996], Ostergard [2000])
  Two weaknesses
  - Choice of variables
  - Aggregation methodology
- Assessing the demand for legal protection
  (e.g. Sherwood [1997] ; Lee et Mansfield [1996]) on direct investment
  - All transmission mechanisms are taken into account
  - Actual effects — even subjective ones — are taken into account (if adequate control variables)
  - Less selection biases and incentives biases than for panels of experts

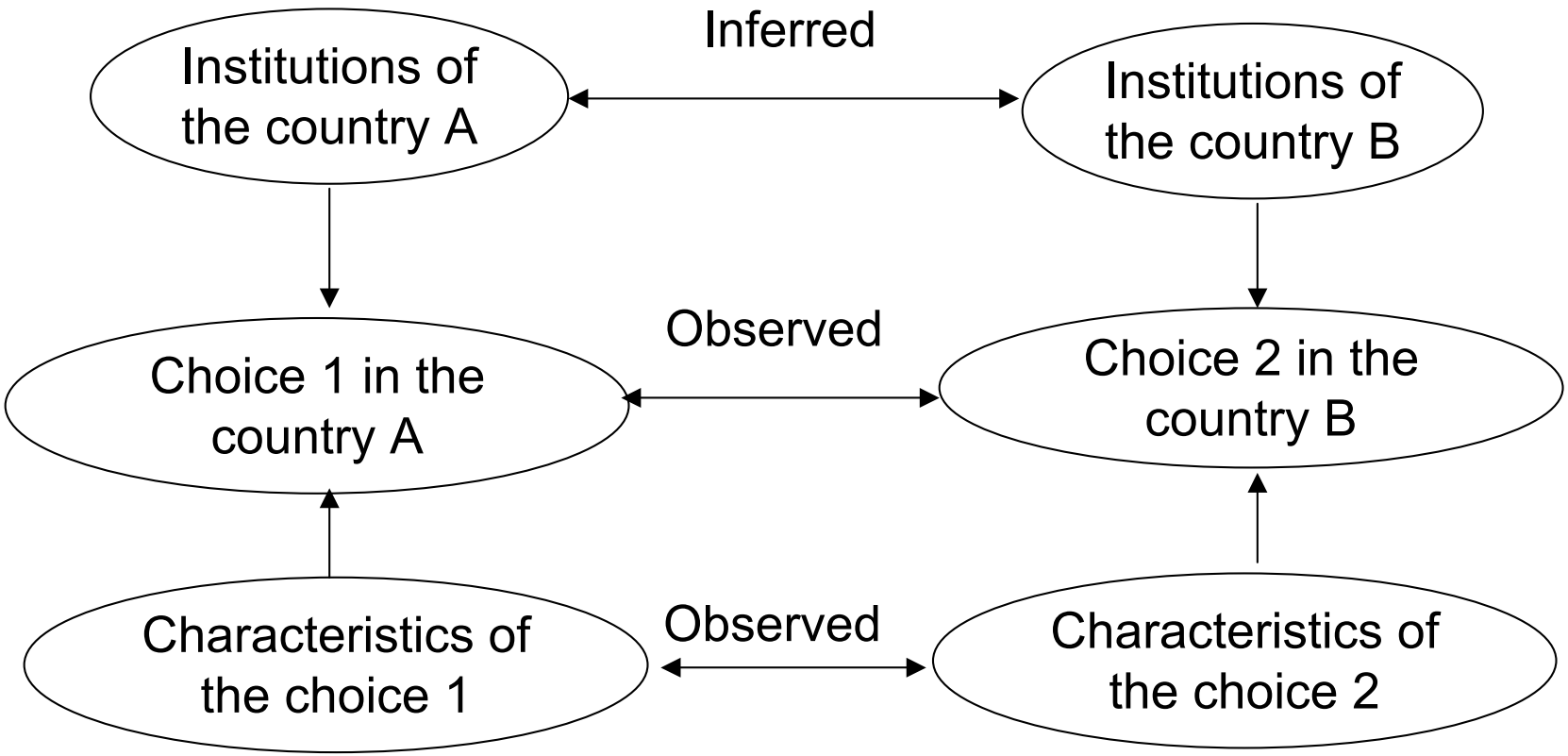
# Usual Challenges in building indicators of institutional supply

- Measure
  - Panels of Experts
    - Information bias
    - Private interests (and de facto lobbying)
    - Herd behaviors
  - Public (users) Surveys:
    - same as experts + lack of competence
    - … while opinions matter in terms of institutional mechanisms
- Aggregation techniques
  - Equal weighing
  - Non statistical evaluation
  - Regressions
  - Data analysis
  - Discriminatory Procedures

# What are the good proxies to measure the Strength of IPRs

- Innovation, but
  - Many other factors than IPR impacts on innovation
  - The theoretical impact of IPRs strength on innovation is controversial: Incentives but complex effects of monopoly positions + Transaction costs (anti-commons) + Motivations (Crowding-out effects)
  - The impact of IPRs on innovation is the issue
- Propensity to license, but
  - Conflicting influences
    - Lower transaction costs
    - Defensive and Strategic licensing, conflict resolution tool
- Licensing agreements
  - No biases as governance arrangements are complementary to institutional capabilities

# The Methodology



# The Specificity of Knowledge Transfers

- Complexity
  - The diversity of knowledge embodiments => Many Resources
  - Tacit knowledge => Emission and Absorption efforts
    (Sunk Costs)
- Relational Hazards
  - Uncertainty about the Value of Knowledge (Arrow)
    => *Royalties => Ex-post mutual interdependence*
    *(low remuneration + Risk)*
  - Double Moral Hazard = f (Ex-post mutual interdependencies)
    (Costly Safeguards)
  - Capture of the value of the licensor's intangible assets
    (High Risk)

# The determinant of Payment Schemes

- Explained variable: Pure royalty vs. Mixed or Fixed Fee
- Explaining and control variables

| Variable | Definition |
|---|---|
| *trantacit* | Variable varying from 0 to 5 as the price of the license includes know-how transfer, management methods, technical assistance, personnel delegation and training for the licensee. |
| *trancod* | Variable ranked between 1-5 depending on whether the contract covers model transfers; brandname, plans and red book transfers; development and test data; commercial and marketing data |
| *lienk* | Dichotomous variable equals to 1 if the partners belong to the same industrial group |
| *restgeo* | Dichotomous variable equals to 1 if the use of the technology is restricted to a precise location |
| *redmin* | Dichotomous variable equals to 1 if there is minimum royalties to pay each year |
| *recipro* | Variable varying from 0 to 3 if the license includes a patent transfer, a trademark transfer, or an input transfer from the licensee to the licensor |
| *cdtfr* | Dichotomous variable equals to 1 if the licensor is French |

# The database and the data

## 61,244 Contracts signed between 1904 and 1998
## 2,798 "Active" TLAs

| Industry Name | Total Number of Contracts in the Data base | % of Payments made by French Firms in 1997 | % of Payments received by French Firms in 1997 | Number of Contracts in the Sample | % of the sample |
|---|---|---|---|---|---|
| Mechanical Machines and Tools (05) | 150 | 6,46 | 1,41 | 101 | 18.26 |
| Automobiles and Terrestrial Transportation Material (07) | 93 | 4,09 | 9,03 | 40 | 7.23 |
| Electrical Appliances and Machines (08) | 72 | 1,62 | 1,37 | 34 | 6.15 |
| Basic Chemicals (10) | 119 | 6,94 | 4,25 | 58 | 10.49 |
| Pharmaceutical Products (12) | 474 | 39,55 | 37,16 | 117 | 21.16 |
| Domestic Appliances and Dom. Equipment. (20) | 54 | 0,22 | 12,54 | 31 | 5.61 |
| Agriculture, Fishing, Forestry (30) | 298 | 3,03 | 0,94 | 35 | 16,4 |
| Other (22 industries) | 1315 | 38,03 | 33,23 | 77 | 13.92 |
| TOTAL | 2798 | 100,00 | 100,00 | 553 | 100.0 |

# Econometric Results

| *Variables* | Whole sample | Whole sample | Germany | Great Britain | United States |
|---|---|---|---|---|---|
| *trantacit* | -0.2520*** | -0.2462*** | -0.3580*** | -0.0790 | -0.2436** |
| | (-4.39) | (-4.42) | (-3.27) | (-0.79) | (-2.51) |
| *trancod* | 0.2422*** | 0.1872*** | 0.3684** | 0.1806* | 0.2542** |
| | (3.36) | (2.80) | (2.52) | (1.81) | (1.99) |
| *recipro* | -0.2490 | - | - | - | - |
| | (-1.58) | | | | |
| *redmin* | -0.1670 | - | - | - | - |
| | (-0.86) | | | | |
| *lienk* | 1.4609*** | 1.5150*** | 1.0938** | 1.280*** | 1.7623*** |
| | (6.14) | (6.57) | (2.31) | (3.87) | (3.69) |
| *resgeo* | -0.8302*** | -0.8483*** | -1.0998*** | -1.0221** | -0.5180 |
| | (-3.29) | (-3.44) | (-2.58) | (-2.34) | (-0.96) |
| *condtfr* | -0.0477 | - | - | - | - |
| | (-0.30) | | | | |
| *Constant* | 0.1061 | 0.0378 | 0.5992*** | -0.0340 | -0.7562 |
| | (0.70) | (0.30) | (2.95) | (-0.15) | (-3.19) |
| Observations | 330 | 330 | 104 | 120 | 106 |
| Pseudo $R^2$ | 0.1965*** | 0.1885*** | 0.1897*** | 0.1837*** | 0.1650*** |

# The Assessment of Institutional Differences

| | Total Gap | Difference due to the characteristics of the transactions | Institutional gap |
|---|---|---|---|
| *Reference: Germany* | | | |
| Germany – Japan | 0.46854 | 0.088154 | 0.374787 |
| Germany – United States | 0.06987 | -0.054291 | 0.121375 |
| *Reference: Japan* | | | |
| Germany - Japan | 0.46854 | 0.101513 | 0.361428 |
| United State - Japan | 0.39867 | 0.127144 | 0.268713 |
| *Reference: United Stat e* | | | |
| Germany - United State | 0.06987 | -0.069411 | 0.136495 |
| United State - Japan | 0.39867 | 0.189001 | 0.206856 |

German IP Instit Envrnt > US IP Instit Envrnt > Japan IP Instit Envrnt

# Discussion

- Strength
  - Less biases
  - Highly flexible
- Conditions
  - Established theory (however possibility to control thanks to other provisions/legal choices)
  - Data demanding
- Weaknesses
  - Assumption that the explanatory variables are independent from the institutional environment Potential National
  - Potential joint impact of the other institutional dimensions (e.g. contract law)
  - Cognitive/Cultural/Geographic Bias (call for circular test and problem of transitivity of preferences)
  - Potential circularity of the reasoning
  - Time lag: Adapted only to the analysis of structural institutional effects