Measuring and explaining organizational structure across firms and countries

Preliminary, 1st August 2007

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Motivation

• Large theoretical literature on firm organization but much less empirical work
  – Some good industry-specific studies
  – But lack of consistent high quality firm-level data across countries

• Why such persistent differences in firm performance within detailed sectors? (Gibbons et al, 2007)

• We collected new firm-level data on organizational structure
  – Developed in-house ‘double-blind’ survey technique
  – Surveyed 3,500+ firms in 12 countries (US, Europe and Asia)
  – Matched to variety of other firm, industry and country level datasets
Today we will focus on preliminary results on decentralization

- Large cross-country and cross-firm variation in decentralization

- **Main finding**: Firms in high trust areas (more social capital) are more decentralized. Higher congruence between principal (CEO) and agent (plant manager)

- **Other findings**:  
  - Decentralization positively linked with stronger product market competition  
  - Subsidiaries of foreign multinationals have organizational practices that are similar to those in their home country
Measuring and explaining organizational structure across firms and countries

- Data Collection Methodology
- Exploring the raw data
- Interpreting the data
- Summary
Data Collection

In Summer/Fall 2006 (CEP in LSE) we collected firm level measures of:

1. **Management practices**
   - Lean manufacturing shop-floor operations
   - Performance and target management
   - People management

   Same 18 questions used in Bloom and Van Reenen (QJE 2007)

2. **Organizational Structure**
   - **Plant Manager Autonomy** (decentralization)
   - Shape of hierarchy

New section
Measuring Organizational Structure

1) Developing organizational questions
   • 10 Organizational questions
   • ~45 minute phone interview of (manufacturing plant) managers

2) Obtaining unbiased responses ("Double-blind" interviews)
   • Interviewers do not know the company in advance
   • Managers are not informed (in advance) they are scored

3) Getting firms to participate in the interview
   • Introduced as “Lean-manufacturing” interview, no financials
   • Endorsement of national, well-recognized institutions (e.g. UK Treasury)
   • Run by 47 MBAs or similar (loud, pushy & business experience)
• Video
Defining decentralization

• Measure Plant Manager Autonomy from CEO along four dimensions:
  – Max Capital expenditure without signoff from CHQ (continuous)
  – Hiring senior employees (discrete, 1 to 5)
  – Introduction of new products (discrete, 1 to 5)
  – Sales and marketing (discrete, 1 to 5)

• Autonomy questions z-scored and combined into a single index (also look at individual components)

• Include ancillary questions to measure other dimensions of org
  – Layers in plant and firm
  – Plant manager span of control (no. of direct reports and people)
  – Workers’ autonomy
The questions in detail

To hire a FULL-TIME PERMANENT SHOPFLOOR worker what agreement would your plant need from CHQ?

What is the largest CAPITAL INVESTMENT your plant could make without PRIOR authorization from CHQ? (ignore form filling)

[PLEASE CROSS CHECK ANY ZERO RESPONSE BY ASKING "what about buying a new computer - would that be possible?", and then probe...]

Where are decisions taken on new product introductions - at the plant, at the CHQ or at both?

How much of sales and marketing is carried out at the plant level (rather than at CHQ)?
Sample of over 3,500 firms

- Obtained 63% coverage rate from sampling frame
- Response rates uncorrelated with performance measures
- Sampled manufacturing firms 50 to 5000 employees (median ~300)

Number of interviews conducted
**Internal validation suggests reasonable data quality (surveying different plant managers in same firm with different interviewer)**

Correlation between 1st and 2nd interview using deviations from noise controls, 72 firms

Correlation 0.51
(p-value <0.001)

Note: scores deviations from interviewer dummies and other “noise” controls
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Plant manager autonomy varies across countries

Most centralized
- Asia
- Southern Europe

Least centralized
- Anglo-Saxon countries
- Scandinavian countries

Note: Autonomy normalized to be mean zero in sample as a whole, * 32 firms only
Plant manager autonomy varies across firms within countries.
Association between manager autonomy and other firm features looks sensible

Table 1: Descriptive Statistics

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Notes: Firm controls include global size, MNE status, listing status, age, ownership dummies, dummy if CEO is onsite. Noise controls include analyst dummies, day of week, reliability score, manager’s seniority and tenure. Size and a dummy for CEO on site controlled in all columns.
Low correlation between Autonomy and Labor productivity (different from management quality)

Corr = 0.05
P-value = 0.06

bandwidth = .8
Measuring and explaining organizational structure across firms and countries

- Data Collection Methodology
- Exploring the raw data
  - Interpreting the data
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Interpreting the data

- We are interested in understanding the “deep” determinants of organizational structure (sources of exogenous variation in organization)

- A first set of preliminary focus results looks at a specific cultural factor, Trust

- Ongoing research looking at other potential determinants beyond culture
  - Competition (some early results here)
  - Ownership, heterogeneity, technology, etc.
Delegation and trust in the literature

• Delegation depends on alignment of interests between principal (CEO) and agent (plant manager)
  – Agent has better local information than principal
  – But agent’s interests deviate from principal

• Similarity of interests will increase likelihood of delegation (i.e. “congruence parameter” is higher)

• Trust affects principal’s prior belief systems on alignment of agent’s interests, so that higher levels of trust likely to lead to higher delegation in equilibrium
Delegation and trust in our empirical analysis: Cross country variation

• Measure trust using standard social capital variables
  – Country measures of trust using the World Value Survey
  – “Trust” is the percentage of people answering yes to the question:

    “Do you believe that people can be trusted?”

  – Used by others in the social capital literature e.g. Knack & Keefer (QJE, 1997); Guiso, Sapienza, Zingales (AER, 2004); Glaeser, Laibson, Scheinkman & Souter (QJE, 2000); Putnam (1993)
Firms from high trust countries are more decentralized

• Correlation 0.70
  (significant at 1%)

Note: Graph based on 2,955 observations. The country means are based on the firms’ country of origin.
Delegation and trust within country variation

• Cross country correlations are misleading because of omitted variables

• Exploit firm level data to run within country variation across regions. Holds constant common country characteristics

• Work at the regional level (97 regions across 12 countries)

• Also controls for firm characteristics (age, size, skills, ownership, industry, etc.) and regional characteristics
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Country Dummies (12) NO NO YES YES YES
Regional controls (3) NO NO YES YES YES
Industry Dummies (121) NO NO YES YES YES
Firm Controls (5) NO NO NO YES YES
Noise Controls (51) NO NO NO YES YES

Notes: Standard errors clustered by 97 regions. Firm controls include global size, multinational status, listing status, age, ownership dummies, dummy if CEO is onsite. Noise controls include analyst dummies, day of week, reliability score, manager’s seniority and tenure. Regional controls include regional population and GDP per capita. Regional controls are GDP per capita, regional population and regional skills.
Delegation and trust in our empirical analysis: Multinationals

- MNE show organizational similarities with firms in their country of origin, possibly because of cultural factors

- Which characteristic is more important for MNEs?
  - Trust in region of location
  - Trust in country of origin

- Answer: A bit of both…
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<td>0.522**</td>
<td>0.530*</td>
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<td>(0.262)</td>
<td>(0.276)</td>
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<td><strong>Trust in cty of origin</strong></td>
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**Notes:** Standard errors clustered by 97 regions and country of origin. Firm controls include global size, multinational status, listing status, age, ownership dummies, dummy if CEO is onsite. Noise controls include analyst dummies, day of week, reliability score, manager’s seniority and tenure. Regional controls include regional population and GDP per capita.
A Possible Confounding Factor: Competition

• UK/US highly decentralized and more competitive. Is competition linked to delegation? Relationship is theoretically ambiguous.
  – Information framework
    • In highly competitive sectors decisions are very time sensitive: local information of the plant manager is more valuable
    • But if many firms then easier for CEO to learn from other firms
  – Incentive contracts (complementary with decentralization)
    • More incentive contracts because competition (a) disciplines manager reducing the conflict of interest, (b) greater sensitivity of profits to managerial effort
    • But lower profits so less to gain from higher effort in incentive contracts

• Test the role of competition on delegation using industry-country specific inverse of the Lerner index
### Table 5 - Autonomy and Competition (N=2845)

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<td>(0.800)</td>
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**Notes:** Lerner Index is median profit (EBIT)/sales ratio in an industry-country pair. Standard errors clustered by 97 regions. Firm controls include global size, multinational status, listing status, age, ownership dummies, dummy if CEO is onsite. Noise controls include analyst dummies, day of week, reliability score, manager’s seniority and tenure.

- Result consistent with:
  - Positive effect on performance related pay/managerial effort (Cunat and Guadalupe, 2007; Bloom and Van Reenen, 2007)
  - Firm-level measures of competition positively associated with decentralization (France: Acemoglu et al, 2007; Germany/Austria Marin and Verdier, 2006)
Trust significant together with competition and country of origin important for both

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3. Interpreting the data

4. Summary
Summary of Results

• New data on organizational structure across 12 countries - raw data shows significant cross-country heterogeneity in organizational structure

• Preliminary results look at role of trust
  – Trust positively correlated with autonomy of plant manager
  – Robust to experiments including competition; multinational’s origin matter

• Next steps include
  • Economic implications of different organizational structures e.g. differential productivity growth across US and EU
  • “Shape” – hierarchical levels and span of control
Back up
MY FAVOURITE QUOTES:

The Swedish manufacturing goals

*Production Manager:* “Workers individual goals? They just want to go home!”

Americans on geography

*Interviewer:* “How many production sites do you have abroad? *Manager in Indiana, US:* “Well...we have one in Texas...”

The difficulties of defining ownership in Europe

*Production Manager:* “We’re owned by the Mafia”

*Interviewer:* “I think that’s the “Other” category........although I guess I could put you down as an “Italian multinational” ?”
Plant Manager: “Modern manufacturing? Yes, I have heard about it, but it doesn’t make any sense at all, does it?”

Interviewer: “How do you identify your star performers?”
Manager: “This is India, everyone thinks he is a star performer!”

Interviewer: “How do you keep your top performers?”
Manager: “I am a star performer and I want to leave!”
Selection Issues

• Low trust areas specialize in industries/firm forms that do not need decentralization
  – E.g. small firms, family-owned/run, low-tech, etc.
• Some evidence of this in Schleifer et al (e.g. Italy has many small family run firms)
• Controlling for selection through industry dummies, etc. makes identification of the positive effect of trust on decentralization harder
How many people are in the firm?  

Please say "Now I want to talk about the firm hierarchy". Then iteratively ask "Who does a shop floor worker report to?", "Who would [their boss] report to"... Keep asking until you reach the CEO.

Number of levels in the firm BETWEEN the shopfloor and the CEO: 
For example a firm with CEO, COO, Plant Manager, and Shopfloor has 2 levels between CEO and Shopfloor (the COO and Plant Manager)

The levels have changed in the last 3 years

Number of levels added (negative for subtracted)

Please confirm back to them the reporting levels between Plant management and shopfloor

Number of levels in the plant BETWEEN the shopfloor and the Plantmanager:
For example a firm with CEO, COO, Plant Manager, and Shopfloor has 0 levels between Plant Manager and Shopfloor

How many people are in the plant?

How many people directly report to the PLANT MANAGER (i.e. the number of people the PLANTMANAGER manages directly in the hierarchical layer below him)?

How much do managers decide how tasks are allocated across workers in their teams?

Who decides the pace of work on the shopfloor?
MANAGEMENT LINKED TO PERFORMANCE IN ALL THE COUNTRIES (NOT JUST ANGLO-SAXON ONES)