How City Size, Types of Trust and Technology Affect Corruption. A Multilevel Comparative Study

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Summary

- We explore how both local environment and individual characteristics explain incidence of corruption.

- We build on Storper's (2013) intuition about the beneficial effect of combining strong bonding with strong bridging (strong community with strong society) within the cities, translating that intuition into empirical tests.

- More specifically we analyse how *Corruption of officials* & *Corruption of courts*

  are influenced by:

  – *City Size*; *Residing in a Capital City*
  – *Interplay* between *City Size/Residing in a Capital City* & our measures of strength of community and society (based on trust)
  – Access to *Information & Communication Technology*, individually and spatially defined (within the local social neighbourhood)

Contribution I: Corruption as a local phenomenon

- Literature on determinants of corruption focused on either:
  - macro-level analysis (see Treisman, 2007)
  - micro-level analysis: corruption as individual-specific phenomenon (e.g. Hunt, 2004; Guerrero and Rodríguez-Oreggia, 2008; Lee & Guven, 2013).
  - More recently, cross-regional analysis in the context of a specific country (e.g. Del Monte and Papagni, 2007; Beloussova, 2011).

- Corruption is a local phenomenon: a result of local patterns of frequent and face-to-face interactions between private individuals and officials (e.g. Prud'homme, 1995; Tanzi, 1995); it is the unofficial character of corruption that makes it more likely that the corresponding descriptive norms of behaviour have local character.

- We build on Storper (2013) to illustrate the beneficial effects of combining bridging (society) with bonding (community) within cities; this alleviates corruption.

Contribution: Methodology

- We investigate incidence (rather than perception) of corruption at the individual level using data that has not been used before for that purpose.
- We utilize a cross-country micro-level dataset, containing information both on individuals, and on the type of their location, thus allowing for cross-individual cross-local- neighbourhood & cross-country comparison to study the determinants of corruption, distinguishing between the phenomena at different levels.
- We apply the multilevel methodology to show that the determinants of corruption should be seen as neither space blind nor individual-specific; the spatial context matters, and more so at the meso (sub-national) level, where various aspects of informal and formal institutions interplay.
- We combine multilevel modelling with Heckman selection model, where first stage relates to use of courts and interaction with officials.

Theoretical Framework I

- Corruption is a socially embedded phenomenon; it becomes institutionalised without gaining legitimacy (Jepperson, 1991), with individuals and businesses developing consistent expectations about it.
- In a corrupt environment, officials realise private benefits at the cost of businesses and individuals, whereas this practice becomes so widely shared that it is accepted as a social norm.
- To survive in a corruptive environment businesses have to adapt their behaviour to the corresponding informal (local) norms of corruption (Choi & Thum, 2005; Tonoyan & al., 2010).
- Such micro-structures evolve into (informal) institutional arrangements relying on local networks, and can be viewed as meso-level institutions in the context of regional studies (Storper, 2013; Ostrom, 2005)

Theoretical Framework II

- Accordingly, we build upon the institutional theory, in particular Ostrom (2005; 2000; 1998) & the role institutions play in shaping a regional environment that may or may not support wealth creation (Storper, 2013)
  - Institutional structures, shaping patterns of economic agents' behaviour, are located at different levels corresponding to geographic domains.
  - This calls upon the need for multilevel analysis of studying the role of institutions.
  - Within a regional institutional structure we also see different levels: characteristics common to these environment may be described as elements of broader **local society (bridging)**, and more embedded **communities (bonding)** (Storper, 2013).

Hypotheses 1/5

- Larger cities see more corruption than smaller-sized cities due to anonymity of the officials (direct social control being weaker) (Hunt, 2004).
- Larger cities often consist of smaller units swallowed up into larger spatial units without consolidated powers: 'integration with fragmentation' (Storper, 2013). They are often fragmented in terms of power. Larger cities with many small jurisdictions imply localities where consistent expectations are easier to achieve, so individuals more likely to adopt patterns that other individuals practice, including corruptive behaviour, being trapped in a circle of corruption, where corruption becomes a (local) social norm.
- **Hypothesis 1a.** The larger the city size the higher probability of officials' corruption.
- **Hypothesis 1b.** The larger the city size the higher probability of court corruption.

Hypotheses 2/5

- Controlling for their large size, capital cities are likely to see less corruption. Capital cities are typically ‘less fragmented and more centralised in terms of power’, having metropolitan governance structures; they have bigger, more internally heterogenous jurisdictions. Importantly, there is less scope for local social process of learning from other individuals to establish corruption as a local norm.

- **Hypothesis 2a.** There is less corruption of officials in capital cities.

- **Hypothesis 2b.** There is less corruption of courts in capital cities.

Hypotheses 3/5

- Effective formal regional government institutions, seen as complex assemblages of local, semilocal, and regional government shape behavioural patterns of individuals across regions into a functional society (Storper, 2013). Local environments with higher prevalence of institutional trust, associated with more effective governance, facilitate bridging and exhibit lower incidence of corruption.
- Individuals may rely on locally developed informal networks (community), underlining local bonding social structures, as a means to contain (or substitute for) corruptive practices.
- **Hypothesis 3a.** Meso-level institutional trust (**bridging**) will have a positive moderating effect reducing corruption in larger cities.
- **Hypothesis 3b.** Trust in acquaintances and friends within local neighbourhood (**bonding**) will have a positive moderating effect reducing corruption in larger cities.

Hypotheses 4/5

- Institutions that promote **bridging** can lead to effective administration, yet also come with a risk of ignoring the heterogeneity of preferences of individuals and social groups, triggering an effort by them to protect their interest by unofficial means (corruption). Thus, the overall positive effect of a well-functioning bridging institutional environment may not be that strong.
- In turn, **bonding**, while making the demand for corruption lower, may also facilitate it, as corruption relies on close social connections. Thus again, the latter aspect may alleviate the positive impact of the former, making the overall effect of bonding weak.
- That lead us to observe that it **a combination of bridging and bonding** may be most effective in containing corruption: as they mutually amplify the positive aspects and dampen the negative aspects.
- **Hypothesis 4.** An interplay between bridging and bonding type trust is likely to further reduce incidence of corruption in larger cities.

Hypotheses 5/5

Access to ICT technology decreases incidence of corruption as individuals gain access to information and knowledge resources, importantly not just based on their individual access, but also based on technological density they encounter in their local environment (for country-level evidence see Goel et al., 2012; Lio et al., 2011).

- **Hypothesis 5a.** Individual level access to technology decreases individual probability of bribing an official.
- **Hypothesis 5b**. Access to technology in the local social neighbourhood decreases individual probability of bribing an official.
- **Hypothesis 5a.** Individual level access to technology decreases individual probability of bribing courts.
- **Hypothesis 5b.** Access to technology in the local social neighbourhood decreases individual probability of bribing courts.

Data and Methodology

- We utilize data from the European Bank for Reconstruction and Development survey 'Life in Transition'. The sample covers over 26,000 of individuals in 35 European countries in 2010.
- We use a multilevel Heckman selection probit model to account for hierarchical structure of the data and to address a selection bias problem.
  - Failure to account for a nested structure of data (dependence of observations due to clustering of data) will lead to biased results, especially for coefficients of predictors that are measured at the group level (Rabe-Hesketh *et al*. 2005).
  - Individuals within a psu-country sample are more alike than a random sample of individuals. This is the 'clustering' effect of psu-country groups.
  - Selection issue relates to use of courts and contact with officials.

Description of dependent variables

Variable	LiTS question
Use of officials	Q6.02: During the past 12 months have you or any member of your household used these services? b) Request official documents (e.g. passport, visa, birth or marriage certificate, land register, etc.?) from authorities?
Corruption of officials	Q6.04: During the past 12 months have you or any member make an unofficial payment or gift when using these services over the past 12 months?
Use of courts	Q6.02: During the past 12 months have you or any member of your household used these services? c) Go to courts for a civil matter
Corruption of courts	Q6.04: During the past 12 months have you or any member make an unofficial payment or gift when using these services over the past 12 months?

Description of key independent variables

Technological access	**Q2.25: Do you or anyone in your household own any of the following?** **f) mobile phone** **g) a computer** **h) access to internet at home** **A scale of all three questions is constructed**
Technological access (PSU average)	Averaged at psu level
Medium city	Population based on data in Wikipedia
Large city	Population based on data in Wikipedia
Capital city	
Institutional trust (PSU average)	Q3.03: To what extent do you trust the following institutions… (a) The Presidency ; (b) The Government/cabinet ministers (c) Regional government; (d) Local government (e) The parliament ; (f) Courts (g) Political parties; (h) Armed Forces (i) The Police A scale of all three questions is constructed (alpha is equal to 0.91), and the variable is aggregated to a psu-level
Inbound trust (PSU average)	Q3.04: To what extent do you trust… (d) friends and acquaintances

Note: PSU – primary survey unit, defined as Census Enumeration Areas with population or No of households used as a size

Other variables & controls: both individual and psu levels

- Occupational choice:
  - Business owner
  - Self-employed
  - Employee

- Controls:
  - Consumption (proxy for income)
  - Gender
  - Age
  - Higher education

  - Distance from capital city (as used in literature)

Table 1: Empirical results (Hypotheses 1-2, 5)

	Model 1				Model 2			
	Level 2: Country-PSU				Level 2: Country-PSU			
	Level 1: Individual				Level 1: Individual			
VARIABLES	Coef	St Err	Coef	St Err	Coef	St Err	Coef	St Err
	Official corruption		Officials use		Court corruption		Court use	
Employed for wages			-0.00576	(0.0442)			-0.0313	(0.0504)
Employed for wages (PSU avg)			-0.453	(0.343)			-0.705*	(0.418)
Self-employed			0.0475	(0.0988)			0.0695	(0.108)
Self-employed (PSU average)			1.012	(0.760)			-2.479**	(1.012)
Business owner			0.183*	(0.104)			0.269***	(0.104)
Business owner (PSU average)			-0.654	(0.950)			-0.628	(1.110)
Technological access	-0.697***	(0.162)	0.457***	(0.0629)	-0.896***	(0.240)	0.285***	(0.0707)
Technological access (PSU average)	-2.752***	(0.738)	-0.295	(0.307)	-2.041*	(1.169)	0.214	(0.367)
Medium city	0.140	(0.129)	0.0272	(0.0475)	-0.00917	(0.185)	-0.0143	(0.0540)
Large city	0.498***	(0.153)	-0.220***	(0.0576)	0.0543	(0.218)	0.0232	(0.0634)
Capital	-0.446**	(0.198)	0.236***	(0.0709)	-0.584*	(0.306)	-0.0627	(0.0807)

Table 2: Empirical results (Interaction,Hypotheses 3-4)

Variables	Model 3				Model 4				Model 5			
	Level 2: Country-PSU Level 1: Individual				Level 2: Country-PSU Level 1: Individual				Level 2: Country-PSU Level 1: Individual			
	Official Corr		Official Use		Official Corr		Official Use		Official Corr		Official Use	
Technological access	-0.77***	(.147)	.458***	(.062)	-0.75***	(.143)	.458***	(.062)	-0.721***	(.144)	.460***	(.062)
Tech. access (PSU avg)	-2.68***	(.773)	-.323	(.306)	-2.23***	(.748)	-.416	(.322)	-1.84**	(.765)	-.425	(.327)
Medium city	0.114	(.122)	.031	(.047)	0.150	(.115)	.028	(.048)	0.312**	(.129)	.029	(.048)
Large city	0.511***	(.161)	-.193***	(.054)	0.414***	(.146)	-.195***	(.054)	0.550***	(.152)	-.193***	(.055)
Capital	-.619***	(.200)	.225***	(.068)	-.485***	(.170)	.229***	(.068)	-0.463***	(.175)	.244***	(.070)
Instit. Trust (PSU avg)	1.19*	(.630)	-.001	(.224)	-	-	-	-	1.83**	(.802)	.063	(.242)
Inbound Trust (PSU)	-	-	-	-	.597	(1.68)	.213	(.612)	-2.91	(2.13)	.283	(.637)
Medium city x Institutional Trust	-1.522*	(.873)	.112	(.308)	-	-	-	-	-1.32	(1.01)	.009	(.335)
Large city x Institutional Trust	-1.828	(1.12)	-.136	(.343)	-	-	-	-	-1.85	(1.26)	-.236	(.402)
Capital city x Institutional Trust	-.296	(1.356)	-.140	(.452)	-	-	-	-	-.687	(1.37)	.218	(.525)
Medium city x Inbound Trust	-	-	-	-	-3.20	(2.25)	.663	(.764)	-.796	(2.57)	.561	(.787)
Large city x Inbound Trust	-	-	-	-	-4.56*	(2.13)	.203	(.841)	-1.05	(2.52)	.231	(.878)
Capital city x Inbound Trust	-	-	-	-	4.19	(3.02)	-.314	(1.24)	3.85	(3.36)	-.040	(1.25)
Institutional Trust x Inbound Trust	-	-	-	-	-	-	-	-	12.26	(8.13)	-1.41	(2.40)
Medium city x Institutional Trust x Inbound Trust	-	-	-	-	-	-	-	-	-24.56**	(10.49)	1.38	(3.05)
Large city x Institutional Trust x Inbound Trust	-	-	-	-	-	-	-	-	-16.94	(12.86)	1.54	(3.78)
Capital city x Institutional Trust x Inbound Trust	-	-	-	-	-	-	-	-	-1.43	(18.86)	-8.03	(5.24)

Figure 1

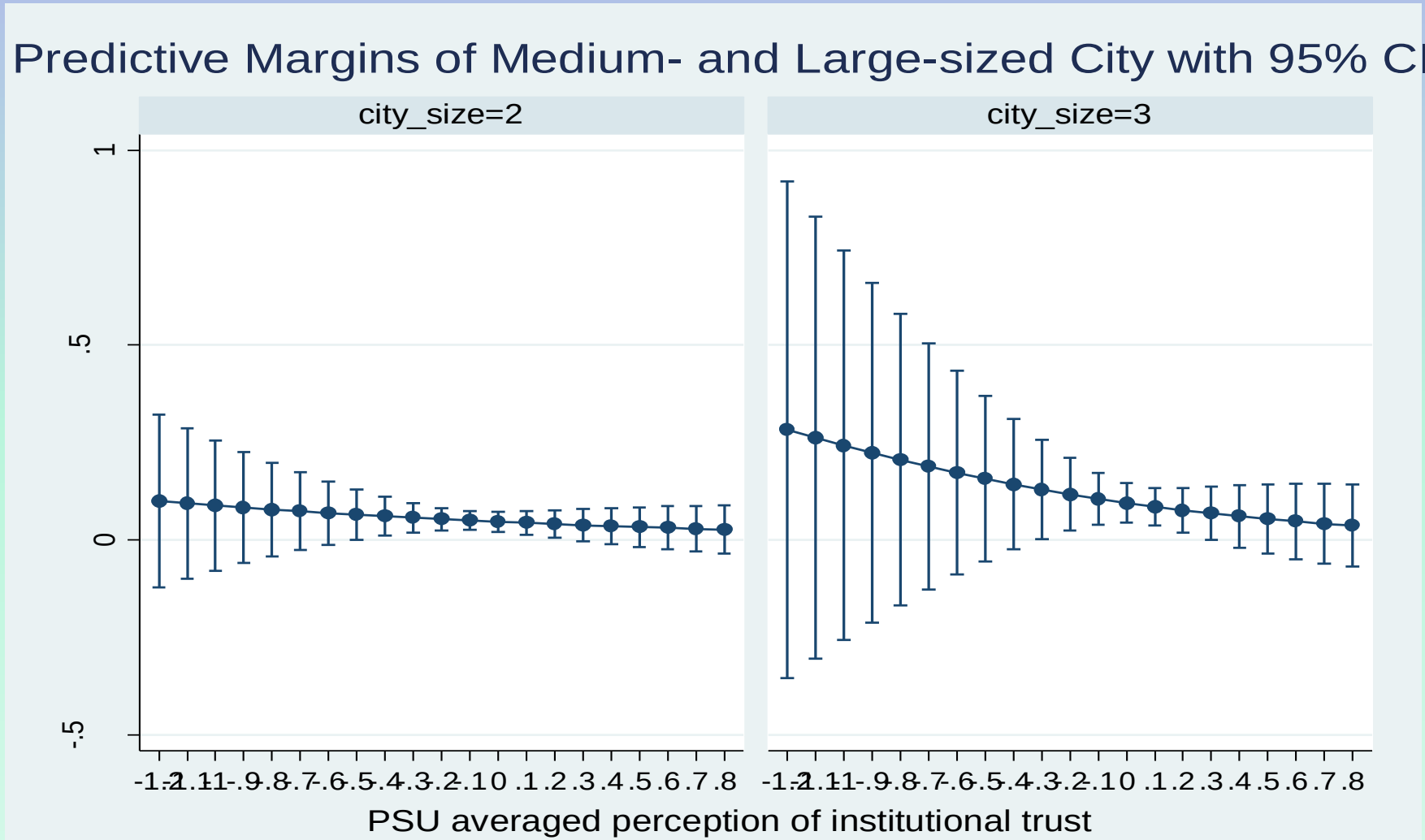
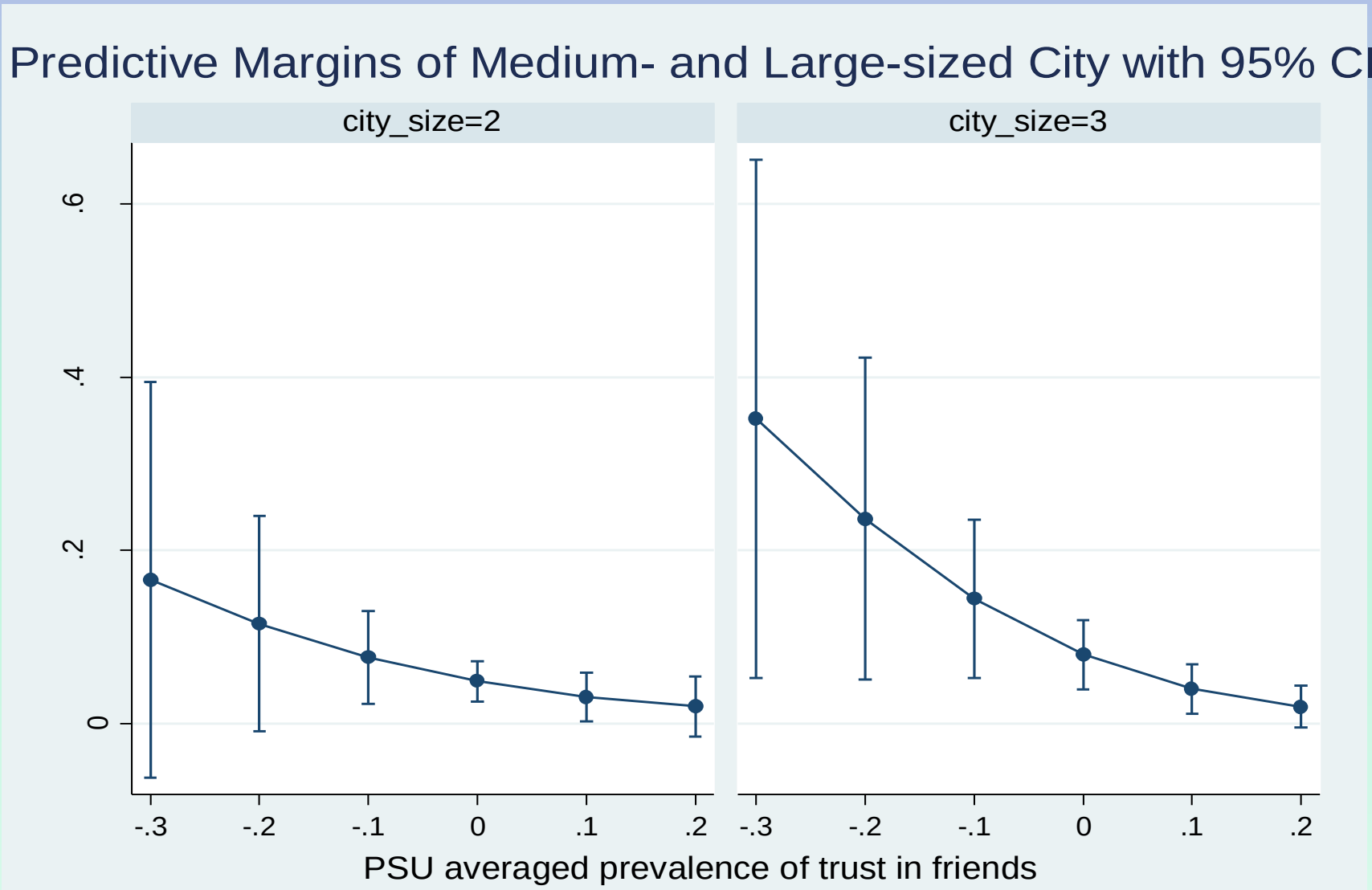

Predictive Margins of Medium- and Large-sized City with 95% CIs
city_size=2
city_size=3
1
.5
0
-.5
-1.2 -1.1 -1 -.9 -.8 -.7 -.6 -.5 -.4 -.3 -.2 -.1 0 .1 .2 .3 .4 .5 .6 .7 .8
PSU averaged perception of institutional trust

Figure 2


Predictive Margins of Medium- and Large-sized City with 95% CIs
city_size=2
city_size=3
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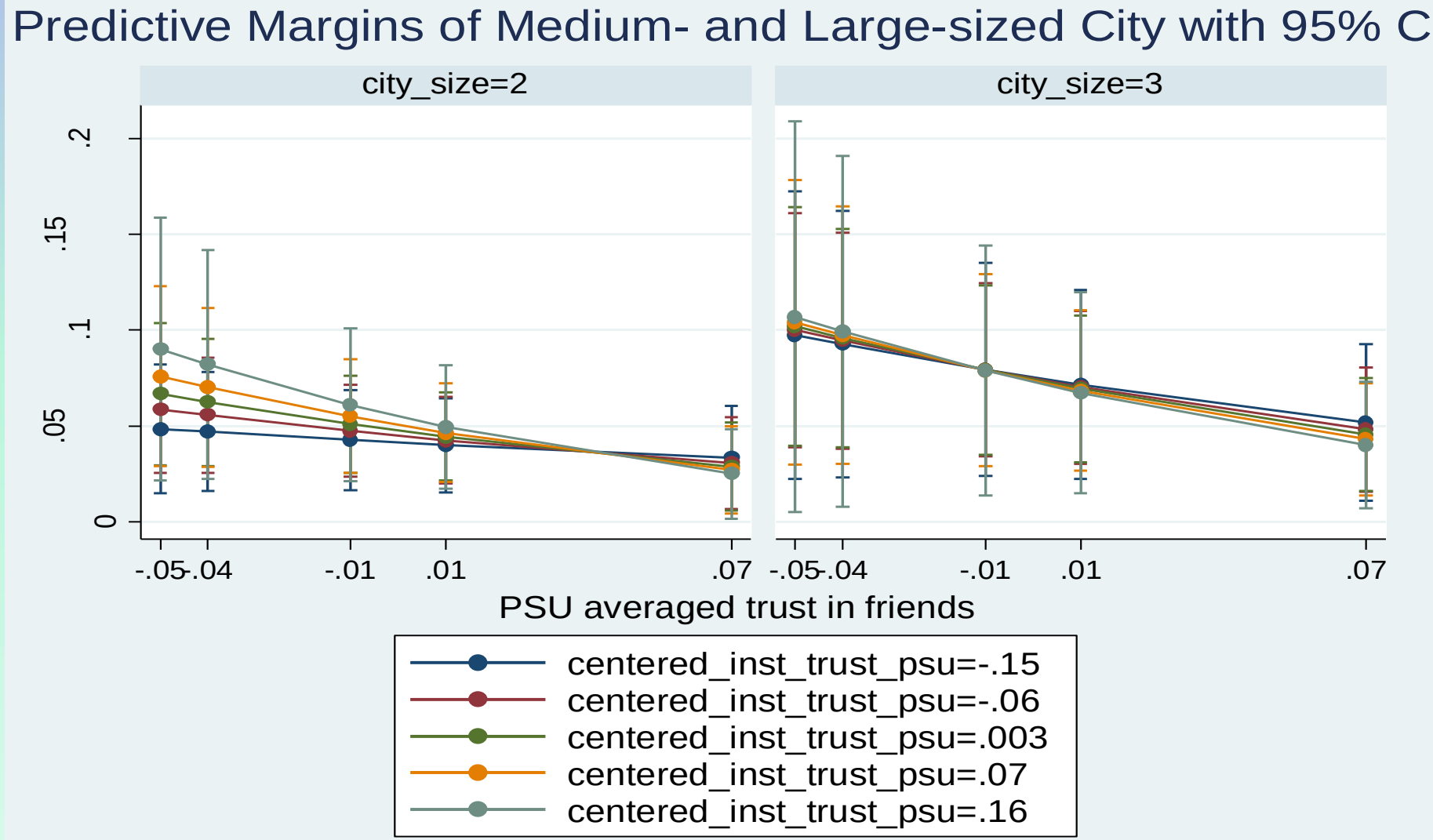
.2
.4
.6
-.3
-.2
-.1
0
.1
.2
PSU averaged prevalence of trust in friends

Figure 3


Predictive Margins of Medium- and Large-sized City with 95% CIs
city_size=2
city_size=3
0
.05
.1
.15
.2
-.05
-.04
-.01
.01
.07
PSU averaged trust in friends
centered_inst_trust_psu=-.15
centered_inst_trust_psu=-.06
centered_inst_trust_psu=.003
centered_inst_trust_psu=.07
centered_inst_trust_psu=.16

Findings

- The meso-level (local neighbourhood) institutional environment plays a role in determining the incidence of corruptive practices.
- Larger cities are more prone to officials' corruption than medium and small ones.
- Capital cities are different from other large cities in that they seem to exhibit lower corruption levels for both, courts and officials. We interpret the latter association as related to the structure of social and political connections.
- The effect of the size of the city on corruption is mitigated by higher level of local institutional trust (**bridging**), and inbound trust proxied by trust in friends and acquaintances (**bonding**); the effect of the former is weaker compared to the effect of the latter
- Where bonding and bridging are both present, this reinforces their moderating effect on the impact of city size on corruption, consistent with Storper (2013)
- In the neighbourhoods where on average individuals have higher access to elements of information and communication technology, corruption of both, officials and courts, is significantly lower.

Conclusions

- Much of the institutional discussion is in terms of alternative advantages of bonding (community) versus bridging (society). We follow Storper (2013) and first argue why it is a combination of these two that matters for institutional quality, and second confirm that result empirically.
- As urbanization process continues relentlessly, all this is of critical importance, as we also find that higher urbanization is associated with more corruption.
- Apart from institutional setup, it is also ICT (technology) however that may also play a positive role limiting corruption.