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Does Country Level Social Trust Predict the Size of the Sharing Economy?

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Abstract

The sharing economy (peer-to-peer based sharing or renting activities coordinated through community-based online services) is typically assumed to be closely related to social trust. The two sharing economy companies Airbnb and Flipkey exist in over 100 countries, allowing us to construct a measure of sharing economy penetration to test against social trust and other potential explanations. Results indicate that sharing economy penetration is promoted by ICT-infrastructure and economic openness, whereas the correlation with social trust is negative and often statistically significant. Our conclusion is that sharing economy services do not require high levels of social trust to succeed. Rather, they provide institutions that facilitate trust-intensive economic activities also where social trust is low.

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1 Introduction

The sharing economy (peer-to-peer based sharing or renting activities coordinated through community based online services) is typically assumed to be closely related to trust. But in what way? In Botsman and Rogers (2010), the founders of Airbnb.com describe how they saw a gap between regular hotels and rental listings that seemed unoccupied by both hotels and by non-monetary exchanges. They attribute the existence of this gap to a lack of trust. In contrast, some authors have suggested that the sharing economy can only thrive where the trust level is sufficiently high. For example, Finley (2013) argues that "[t]he continued growth of the sharing economy is contingent upon one crucial factor: trust. Trust is the enabling factor inherent within all sharing-sector activities." Similarly, Olson and Connor (2013) argue that "trust and reputation" are "building blocks for a strong sharing economy".

The importance of trust for market transactions is well-known, and Arrow (1972) famously noted that every commercial transaction has within itself an element of trust. It is worth thinking twice about exactly how trust matters for the sharing economy. The description in Botsman and Rogers (2010) suggests that the founders of Airbnb.com view their service as providing the institutions and infrastructure necessary for the sufficient level of trust to emerge. The market space they identified was there because of a lack of trust, suggesting that (ceteris paribus) the potential market share for a service such as Airbnb.com is larger where trust is lower.

As noted by for example Jøsang, et al. (2007) and Dakhlia, et al. (2016) trust and reputation systems represent a significant trend in decision support for Internet-mediated service provision, because they help to reduce informational asymmetries and opportunistic behavior. They do so by letting transacting parties rate each other after the completion of a transaction, and by using aggregated ratings about a given party to derive a trust or reputation score. The presence of such rating systems provides an incentive for honesty and therefore positively affects market quality. The ability to choose freely among suppliers based on their reputation can be understood as a mechanism to induce cooperative outcomes in strategic interactions, much in the manner described by Tullock (1985). As a result, the technologies used by sharing economy firms allow transaction to take place where they otherwise would not have taken place due to a lack of trust.

1.1 Related literature

The sharing economy as defined above is a relatively new phenomenon. Hamari, et al. (2015) equates the sharing economy with collaborative consumption and defines it as "Peer-to-peer-based activity of obtaining, giving, or sharing the access to goods and services, coordinated through community-based online services" (p. 3). The scientific literature on the sharing economy is small but rapidly growing. Horton and Zeckhauser (2016) provide a mainly theoretical discussion of short and long run economic consequences of the sharing economy.

Some studies concern economic consequences. For example, Zervas, et al. (2015) use a difference-

in-differences strategy to estimate how Airbnb impacts hotel revenue. They conclude that affected hotels have responded by reducing prices. They also find that Airbnb's impact is non-uniformly distributed, with lower-priced hotels, and hotels that were not catering to business travel, being the most affected segments.

Other studies deal with definitions and classifications. Departing from the portal collaborative-consumption.org, Hamari, et al. (2015) mapped 254 platforms for collaborative consumption and noted that activities can be separated into two types of exchange: access over ownership and transfer of ownership. Access over ownership, the most common type, means that users offer and share their goods and services to/with other users for a limited time through peer-to-peer sharing activities, such as renting and lending. Out of the 254 platforms, 191 platforms were identified as facilitating access over ownership while 139 provided the transfer of ownership. 76 platforms had an overlap between the categories.

A few studies examine personal traits and norms of sharing economy users. In an empirical analysis of Airbnb's data, Ert, et al. (2015) find that sellers that appear to be more trustworthy (based on the website photo) have higher listing prices and are booked with higher probability. Forno and Garibaldi (2015) study the case of home-swapping in Italy, which they describe as an alternative form of tourism which requires trust, open-mindedness, inventiveness, enthusiasm, and flexibility. They note that 52 percent of home-swappers agree that most people are trustworthy, compared to the Italian population average of 22%. On the other hand, Lamberton and Rose (2012), find that trust in other users is a non-significant (but still positive) predictor of participation in a bicycle-sharing system.

To our knowledge, no study has (so far) examined country level determinants of sharing economy penetration.

2 Data

2.1 Sharing economy penetration

We create a country level measure of sharing economy penetration by examining the global presence of six widely used home-sharing services: Airbnb, Flipkey, HomeExchange, HomeAway, Roomorama and 9flats. Among these, only Airbnb and Flipkey result in a sufficiently large sample to allow for a cross-country analysis. Data from Airbnb and Flipkey were collected from their websites (`http://www.flipkey.com/` and `http://www.airbnb.com/`). For each country's capital, we queried both Airbnb and Flipkey and saved the number of hits per city. In the case of Airbnb, some challenges had to be handled. The listings at Airbnb are capped at 1000 hits per query such that queries with more than a thousand hits will only return "1000+ Rentals" . To get variation over the full sample, we narrowed the searches by adding criteria. Acceptable room types were set to either "Private room" or "Shared room", acceptable property types to "Apartment", "House", "Villa", "Condominium" or "Townhouse", and with a minimum of three beds.

Airbnb			Flipkey	
		Top 5		
Lisbon	34		Lisbon	316
Copenhagen	20		Copenhagen	212
Amsterdam	16		Paris	173
Rome	13		Rome	157
Paris	11		Amsterdam	155
		Bottom 5		
Algiers	0.07		Doha	0.07
Yaoundé	0.06		Havana	0.05
Tashkent	0.05		Kinshasa	0.05
Dhaka	0.03		Damascus	0.03
Riyadh	0.02		Riyadh	0.02

Table 1: Sharing economy penetration (hits per 100 000 inhabitants)

Another challenge is that the Airbnb search query is "smart" in that it is not strictly geographically constrained, but will include a larger area than the capital's for small capitals, or where there are few renters in the city, but many in relatively proximity. This is a major problem for some of the geographically small cities, such as San Marino. To minimize the problem, we exclude capitals with less than 500,000 inhabitants from all datasets and examine the consequences of different cutoffs as a robustness test.

The resulting measure of sharing economy penetration is simply the number of hits divided by city population. As shown in Table 1, Lisbon and Copenhagen are in top for both services.

2.2 Trust and other control variables

To explain cross-country differences in sharing economy penetration, we use a number of control variables. We employ what has become the standard measure of social trust in the literature: the share of respondents agreeing with the proposition that "most people can be trusted", as measured by the World Values Survey and a number of similar surveys, taken from Berggren and Bjørnskov (2011). Although the trust question has been criticized for being conceptually vague, Knack and Keefer (1997) tested its validity by noting that return rates in wallet-drop experiments around the world correlate strongly with survey measured social trust. The measure has also been linked to a number of characteristics of countries around, including a claimed causal relationship with economic growth (Algan and Cahuc 2010) and welfare state size (Bergh and Bjørnskov 2011). Importantly, country level trust is typically very stable over time. For further information on social trust, see the survey by Nannestad (2008).

It is likely that the people in countries with higher incomes, better education and better access to information and communication infrastructure are more prone to using sharing economy services. In order to compare countries worldwide, we control for GDP per capita (PPP US dollars), the average years of schooling for the population aged 25 and above, (from Barro & Lee's Educational Attainment

Dataset), and the number of high-speed broadband users per capita (defined as downstream speeds at least 256 kbit/s from the World bank's World Development Indicators). We also control for economic globalization as measured in the KOF-index of globalization (Dreher 2006). As an additional proxy for the demand for housing services, we control for registered air carrier departures per capita (also from WDI). Descriptive statistics are shown in Table 2.

Table 2: Summary statistics

Statistic	N	Mean	St. Dev.	Min	Max
Airbnb hits	158	44.076	97.915	1	941
Flipkey hits	157	198.038	534.780	1	4,496
Logged Airbnb hits per capita	158	−10.516	2.221	−15.400	−1.946
Logged Flipkey hits per capita	157	−9.282	2.765	−15.400	−0.420
Trust	144	24.772	13.243	5.419	68.076
Broadband users	191	8.316	11.498	0.000	42.220
GDP per capita	177	8,379.349	15,436.730	350.567	84,763.730
KOF Economic Globalization	150	62.103	16.382	25.693	97.644
Avg years of education	143	8.350	2.905	1.203	13.270

3 Results

We examine the country-level determinants of sharing economy penetration by running an ordinary least squares regression of the number of hits per capita (in logs) for Airbnb and Flipkey respectively on a constant, country level social trust and a vector of other potentially relevant control variables. The results are presented in Table 3 for Flipkey and in Table 4 for Airbnb. For both services, the main result is illustrated by comparing column 1 and 2: The raw correlation between social trust and sharing economy penetration is indeed significantly positive, as assumed in the management literature cited above, but once the number of broadband users per capita is introduced as a control variable, social trust is significantly negatively correlated with sharing economy penetration, whereas broadband users are positively so. These effects appear for both Airbnb and Flipkey, and do not change much when controlling GDP per capita (which, perhaps surprisingly, has a negative sign), air carriers per capita and economic globalization (both of which have the expected positive coefficient) and education (which has the expected positive sign, though significant only for Flipkey).

3.1 Robustness tests

We have subjected our results to robustness tests, the results of which are available from the authors. Below we summarize what was done and how results are affected.

First, we verified robustness with respect to the measurement of ICT. Using secure internet servers per 1 million people (i.e. servers using encryption technology in transactions) instead of

Table 3: Explaining penetration: flipkey

	Dependent variable:			
	Log hits per capita			
	(1)	(2)	(3)	(4)
Social trust	0.033**	−0.037**	−0.063***	−0.062***
	(0.015)	(0.015)	(0.016)	(0.016)
Broadband users		0.152***	0.140***	0.101***
		(0.019)	(0.030)	(0.031)
GDP per capita			−0.001	−0.474*
			(0.237)	(0.277)
KOF Economic globalization				0.038**
				(0.017)
Avg years of education				0.214**
				(0.099)
Air departurse per capita			1.267***	1.377***
			(0.361)	(0.350)
Constant	−10.655***	−10.493***	−10.086***	−9.583***
	(0.417)	(0.337)	(2.005)	(2.019)
Observations	113	105	94	86
R^2	0.044	0.417	0.492	0.561
Adjusted R^2	0.035	0.405	0.469	0.527
Residual Std. Error	2.161 (df = 111)	1.688 (df = 102)	1.527 (df = 89)	1.468 (df = 79)
F Statistic	5.055** (df = 1; 111)	36.418*** (df = 2; 102)	21.541*** (df = 4; 89)	16.810*** (df = 6; 79)
Note:				*p<0.1; **p<0.05; ***p<0.01

Table 4: Explaining penetration: airbnb

	Dependent variable:			
	Log hits per capita			
	(1)	(2)	(3)	(4)
Social trust	0.037***	−0.024	−0.049***	−0.049***
	(0.013)	(0.015)	(0.014)	(0.014)
Broadband users		0.121***	0.122***	0.107***
		(0.018)	(0.025)	(0.027)
GDP per capita			−0.212	−0.455*
			(0.222)	(0.264)
KOF Economic globalization				0.014
				(0.015)
Avg years of education				0.109
				(0.086)
Air departurse per capita			1.365***	1.375***
			(0.311)	(0.305)
Constant	−11.914***	−11.705***	−9.491***	−8.873***
	(0.372)	(0.331)	(1.907)	(1.987)
Observations	117	108	94	86
R^2	0.063	0.351	0.478	0.508
Adjusted R^2	0.055	0.339	0.454	0.471
Residual Std. Error	1.913 (df = 115)	1.627 (df = 105)	1.322 (df = 89)	1.285 (df = 79)
F Statistic	7.770*** (df = 1; 115)	28.390*** (df = 2; 105)	20.341*** (df = 4; 89)	13.606*** (df = 6; 79)
Note:				*p<0.1; **p<0.05; ***p<0.01

broadband users do not change the main results. Including both measures at the same time, broadband users are significant while internet servers are not. Also, interacting trust with broadband users reveals no further insights.

Second, we tried lowering the cutoff for how small cities are included to both 100 000 and zero inhabitants. The main results remain.

Third, some cities might be more attractive travel destinations, due to weather or other reasons. Assuming that cities can be either too cold or too warm, we add average temperature (from Mitchell et al. 2004) and its square to the specification. The results provide some support for a non-linear effect of temperature (with an implied optimal average temperature at 14 degrees Celsius for Airbnb. For Flipkey, the quadratic term is not significant), but do not change the main result.

Fourth, the negative sign on GDP per capita is perhaps a bit surprising. Adding a quadratic income term (i.e., including both GDP per capita and its square) does not add explanatory value and does not change the main results. Using GDP per capita without logging also leaves main results unaffected.

As a fifth robustness test, we note that demographic profile may be related to both internet usage and possibly also to trust. Controlling for the share aged 15 to 64 (from WDI) does not change the main results, and the share of working age is negatively related to sharing economy penetration, significantly so for Flipkey. A possible explanation that a higher number of working age means relatively fewer seniors with excess capacity in housing.

Next, we test the idea that corruption affects results by decreasing trust and possibly also affecting the demand or supply of sharing economy services. It turns out that less corrupt countries have lower sharing economy penetration, in line with our claim that sharing economy services provide institutions that act as a substitute for legal institutions and trust. The negative coefficient on trust remains, as does the positive coefficient on broadband users.

As a seventh and final robustness test, we include the burden of government regulation from World Economic Forum's global competitiveness index (item 1.09). It is highly correlated with CPI and also leaves main results unchanged.

4 Concluding discussion

Our empirical analysis suggests that the sharing economy services Airbnb and Flipkey are more common in countries that have lower GDP per capita, are economically more open and have many travelers (proxied using air carriers). Unsurprisingly, they are also more common in countries with better-developed internet infrastructure. The partial correlation with country level social trust is negative and typically statistically significant once ICT-infrastructure is controlled for.

Our finding that the market for sharing economy services is larger in countries with lower social trust does not support the popular notion that the sharing economy depends on high levels of social trust. On the contrary, the results suggest that a major contribution of the companies in the sharing

economy is that they have found ways to facilitate trust-intensive transactions also where social trust is low. The relative value of reputation and ranking systems, and a third party providing rules and contracts is higher in countries where most people are reluctant to trust anonymous strangers. In the words of Botsman and Rogers (2010), the rise of the sharing economy services means that we have "returned to a time when if you do something wrong or embarrassing, the whole community will know". If the reputation mechanism is indeed a relevant explanation of our empirical results, the implication is that sharing economy penetration may have a positive, though likely small, effect on trust: When people are more likely to care about their reputation, they are less likely to behave opportunistically. The mechanism is similar to the one suggested by Berggren and Jordahl (2006) for why integrity of the legal system is conducive to trust. Another interpretation is that companies in the sharing economy transform the need for generalized trust to a need for particularized trust: Users do no not need to trust people in general, they need to trust the specific and named users of the sharing economy services and the owners of these services. In any case, examining the consequences for trust from participation in the sharing economy may prove to be a fruitful area for further research, though a clever research design is needed to disentangle self-selection effects from causal effects. We leave this as a suggestion for future research.

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