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Do corrupt local governments inhibit entrepreneurship?

A contextual analysis of start-ups in Swedish municipalities

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Abstract[2]

Does corruption affect the incentives for potential entrepreneurs to start businesses? The traditional view holds that entrepreneurship is inhibited. However, a few recent studies indicate the contrary, supporting a 'grease the wheels' perspective. In a novel approach to this question, we combine a local government corruption index and individual-level register data on start-ups in a low-corruption setting: Sweden. We disaggregate the analysis to individual entrepreneurs, focus on corruption in local institutions and hypothesize that local corruption deters potential entrepreneurs. Our findings are twofold. First, rejecting the 'grease the wheels' hypothesis, local corruption has a strong local deterring effect on potential entrepreneurs. Second, a minority of entrepreneurs relocate their start-ups from home municipalities to elsewhere. However, contrary to expectations, relocaters could embody 'non-productive' or 'destructive' entrepreneurship: they migrate from relatively low-corrupt to relatively high-corrupt municipalities. While migrating is uncommon, and the effect is weak, it nonetheless indicates that relocaters are attracted to conditions where rent-seeking opportunities are present.

Key words: Entrepreneurship, start-ups, corruption, local government, destructive entrepreneurship

JEL codes: D73, L26

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1 Introduction

While it is widely acknowledged that corruption hampers economic development (e.g. (Shao et al. 2007; Drury et al. 2006; Méon and Sekkat 2005; Mo 2001; Mauro 1995), the impact of corruption on entrepreneurship remains contested. The traditional view in institutional economics holds that corruption inhibits entrepreneurship, and does so by increasing uncertainty and transaction costs for investments and productive activities (e.g. Tanzi and Davoodi, 1998; North 1990). In line with this, several studies have confirmed that corruption has a negative impact on entrepreneurship (Aghion et al. 2016; Dutta and Sobel 2016; Bologna and Ross 2015; Avnimelech et al. 2014; Anokhin and Schulze 2009). However, recently, an alternative perspective has propagated that corruption in fact might *increase* entrepreneurship – particularly in highly regulated economies – by easing regulatory burdens associated with start-ups (e.g. Mohamadi et al. 2017; Dreher and Gassebner 2013). These findings lend support to the 'grease the wheels' hypothesis originally proposed by Leff (1964) and Huntington (1968).

In this paper, we outline a novel approach to the study of corruption's impact on entrepreneurship. We do this by highlighting the local and individual-level links between corruption and entrepreneurship, and focussing on an egalitarian, high-trust and low-corrupt democracy – Sweden. Taking inspiration from the occupational choice literature, we apply a conditional logit model based on high-quality individual-level register data which tracks the complete population of Swedish start-ups. This allows us to contextualize the start-up decision by simultaneously modelling the start-up decision and *where* the start-up is geographically situated, and letting this be conditional on local corruption levels. Since Swedish municipalities are arguably important for entrepreneurs (Fölster et al 2016; Lidström 2008), employing corruption in local government as the dependent variable enhances the possibility to link quality of local institutions with decisions of potential entrepreneurs. In

contrast to the lion's share of studies on corruption and entrepreneurship, we propose that this relationship is best modelled as an individual-level decision that must be firmly contextualized in local conditions.

Our contribution is twofold. First, the paper departs from the dominant way of analysing corruption and entrepreneurship – i.e. aggregate analyses using countries or meso-regions as the unit of analysis – by its focus on variations in local government institutions. It is widely acknowledged in the local economic development literature that local conditions are crucial for businesses to develop and flourish (Lidström 2008; Wood and Valler 2004). In the context of a decentralized welfare state, such as Sweden, entrepreneurs undoubtedly need to deal with local government institutions (Fölster et al. 2016). Local authorities are responsible for administering numerous public procurement processes, zoning and urban planning issues, licences and permits, as well as inspections. By moving from comparative country-level analyses, the paper thus complements and contributes to an evolving strand of literature which argues that it might be just as relevant to focus on subnational units in order to gain a more fine-tuned understanding of the causes and consequences of corruption (Charron et al. 2014), particularly in decentralized settings such as the Nordic welfare states (Erlingsson and Lundåsen 2019). Second, the paper is an attempt to move closer to the mechanisms underlying the association between corruption and entrepreneurship by analysing individual-level register data. The micro-level approach we propose, combined with a focus on variations in local government corruption, gives us the opportunity to study if differing levels of corruption within the one and same country lead to a redistribution of entrepreneurship between municipalities. Studying redistribution of start-ups due to varying local conditions is, almost by definition, impossible to gauge in aggregate country-level analyses.

2 Theory and hypotheses

Entrepreneurial activity is shaped by institutional factors that may either provide an appropriate environment for start-ups or impose barriers (Urbano 2018; Stenholm et al. 2013; Gnyawali and Fogel 1994). The argument that corruption discourages entrepreneurship is based on the assumption that corruption increases the marginal costs of entrepreneurship due to factors such as unfair competition, regulatory uncertainty and a general reduction of trust in the system. This, in turn, increases the risk premium of business investments which can be understood in terms of the broader concept of 'institutional uncertainty' (Bylund and Mcaffrey 2017; Avnimelich and Zemelka 2014; Baumol 1990). Without stable conditions, impartial handling of cases, and certainty about the future, it would not be rational for individuals to invest in a start-up that might be lost due to unpredictable and arbitrary case handling or sudden policy changes (e.g. North 1991). In addition, as underscored by Murphy et al. (1991) and Baumol (1990), corruption might spark off vicious circles that are economically detrimental. Not only are suboptimal reward structures expected to discourage potential entrepreneurs from starting productive businesses, these individuals could also be diverted to rent-seeking activities. Such concerns found support in Boudreaux et al.'s (2018) panel analysis of US counties, where it was observed that corruption shifted resources toward the construction businesses, away from productive sectors such as education, science and technical service industries. Similarly, Berdiev and Saunoris's (2018) panel study, including 60 countries between 2001 and 2010, suggested that corruption shifts entrepreneurship from formal to informal sectors.

The bulk of large-n corruption studies is cross-country. Through these, it has been shown that differences in corruption levels explain much of the variation in economic growth between developed and developing countries (Shao et al. 2007; Drury et al. 2006; Méon and Sekkat 2005; Mo 2001; Mauro 1995). The deterring effect of corruption on entrepreneurship

is often claimed to be an important underlying aspect of this association (Bosma et al. 2018; Acs et al. 2012; Tanzi and Davoodi 1998). The view that corruption has a deterring effect on entrepreneurship has found support in several studies. Anokhin and Schulze's (2009) cross-national panel study of 64 countries for the period 1996-2002 found that corruption decreases both entrepreneurship and investments. Similarly, Costa and Mainardes (2016) combined individual level and country data in 53 countries and found that corruption has a negative effect not only on entrepreneurship in general, but also on entrepreneurial intentions among risk-tolerant individuals. Two additional examples of studies with findings along these lines are Dutta and Sobel's (2016) panel study focusing on newly registered businesses in 130 countries, and a cross-sectional country study by Avnimelech et al (2014) focusing on nascent entrepreneurship in 176 countries. Results that support a negative relationship between corruption and start-ups have also been found in subnational panel studies using data from Brazilian municipalities (Bologna and Ross 2015) as well as in US states and counties (Aghion et al. 2016). And although not studying entrepreneurship per se, but the density of small and medium sized businesses in a sample of 172 meso-regions in the EU, Nistotskaya et al. (2015) employed a cross-sectional design and found a significant correlation between perceptions of government impartiality and such businesses.

However, contrary to the traditional view, an alternative perspective has made the claim that corruption may *increase* firm entry – particularly in corrupt or highly regulated economies. The so-called 'grease the wheels' hypothesis states that in either highly corrupt or highly regulated economies, corruption may *increase* firm entry (Huntington 1968; Leff 1964). The argument is that entrepreneurs may be drawn to corrupt practices in societies where they are tempted to 'grease the wheels', either in developing societies where bureaucratic processes are unreliable, slow and/or permeated by corruption, or in developed countries with rigid red-tape regimes. This hypothesis has found new life after Dreher and

Gassebner (2013) found that 'grease the wheels' assumptions were valid in highly regulated economies after conducting a cross-country panel study including 43 developed and developing countries covering the years 2003–2005. Similarly, Mohamadi et al. (2017) found that this hypothesis had support in both developing countries (with inefficient institutions) and in settings with 'efficient but extremely rigid red-tape regimes.' This was found in a cross-country panel study including 63 developed and developing countries over the period 2008–2015.

In sum, previous research confirms the assumption that corruption, as a rule, discourages entrepreneurship. However, the studies are inconclusive regarding the effect for developed countries in particular. Contrary to the 'traditional' view, some suggest that potential entrepreneurs – faced with corrupt government officials or extremely rigid red-tape regimes – may see corruption as an opportunity in itself and/or as a tool to 'grease the wheels' to lessen administrative burden.

One reason for the contradictory results could be that it is difficult to estimate the relationship between corruption and entrepreneurship, since the measures employed are highly aggregated. Aggregated approaches that focus on countries run the risk of overlooking the complexity of decisions at the micro level. For example, they do not tell us to what extent local variations in corruption may lead to the redistribution of start-ups from high-corrupt to low-corrupt municipalities. To address this gap, our paper offers what Ruef and Lounsbury (2007) call a 'contextual perspective' on corruption and entrepreneurship. In contrast to, for example, most econometric studies that focus on finding macro-level associations, this paper examines how some important structural conditions that potential entrepreneurs are embedded in may influence their decision to start a business or not. Such an 'embedded agency approach', that focuses on how local institutions (macro) affect individual decisions (micro),

contextualizes the decision of potential entrepreneurs in relation to local conditions (see also McMullen et al. 2016; Welter 2011).

The rationale behind our approach is that local government corruption – not least in decentralized settings where entrepreneurs must deal with municipal officials on a regular basis – is expected to have a very local impact on the decision of whether to start a firm or not. While the idea may seem commonsensical and uncontroversial, it has rarely been tested in previous research. As stated, cross-sectional studies using countries as levels of analysis give us few hints on the *actual* meaning of a statistical association between perceptions of corruption and entrepreneurship. Corruption indices that are constructed for the country level could either be viewed as an aggregated outcome of a collection of local effects or as capturing the quality of institutions, norms and interpersonal trust in a specific country more generally, hence these indices overlook the fact that, in some instances, within-country corruption variation may be considerably larger than those between countries (e.g. Charron et al 2014; Putnam et al 1993).

2.1 How is local government corruption expected to influence potential entrepreneurs?

Previous studies have found that in decentralized welfare states, danger zones for corruption are frequent and most pronounced in local government (Bergh et al. 2016; Erlingsson et al. 2009; Andersson 2002; see also Huberts et al. 2008). For potential entrepreneurs, the perceived impartiality of local government institutions is expected to affect their incentive structures. For example, unfair competition from publicly owned enterprises, lack of impartiality in the handling of issues relating to zoning as well as questionable public procurement processes, and irregularities when it comes to various inspections, issuing of permits and granting of licences are examples of unjust decisions that all are within the realms of local governments. In addition to being important for local businesses, all these areas have

been pinpointed as susceptible for corruption (Fazekas and Kocsis 2017; Andersson and Erlingsson 2012).

The individual-opportunity nexus on entrepreneurship holds business opportunities as something objective, and entrepreneurs as agents with capacities to discover and exploit these opportunities (Eckhardt and Shane 2003; Shane and Venkataraman 2000). Previous research supports that entrepreneurs are adaptive and form strategies suitable for the opportunities and limitations stemming from their institutional environment (Estrin et al. 2013; Boettke and Coyne 2009). For example, in a behavioural discrete choice experiment, Malone et al (2019) found that small business owners responded adversely to institutional barriers such as mandatory licensing. Against this backdrop, the presence of local government corruption is expected to alter the potential payoff from available alternatives. In line with previous research, we expect that if entrepreneurship can be expected to be influenced by personal relationships or partisan affiliations – rather than business viability – this will be a barrier to entry that discourages potential entrepreneurs. Previous research has, for instance, found political connections to be related to firm performance and entrepreneurial reinvestment (Palansky 2018; Amore and Bennedsen 2013; Zhou 2013). If established local business-owners are unjustly favoured by local governments, the incentives to enter the market decrease. If bids are rigged as to favour firms with pre-established connections with the municipalities, it would not be rational for potential entrepreneurs to start firms. Based on this, two hypotheses will be tested. First, a hypothesis about a 'hometown effect':

Hometown effect

H1: (Relatively high) local government corruption in one's home municipality decreases the propensity for starting a business in that particular municipality.

However, since our focus is on within-country variations in subnational institutions – and not the aggregate national level – the presence of corruption in a municipality might not deter

entrepreneurs from starting businesses altogether. Combining the concept 'institutional competition' (Bergh and Höijer 2008), with Hirschman's (1990) idea of 'exit', entrepreneurs in high-corrupt municipalities could choose to relocate the start-up to municipalities that offer more attractive conditions. Thus, the presence of corruption might lead entrepreneurs to establish their business in a neighbouring municipality, where competition is fairer and treatment by officials more impartial. Therefore, our focus on subnational government enables us to test the presence of a 'redistribution effect':

Redistribution effect

H2: (Relatively high) local government corruption increases the propensity for starting a business in another municipality than one's home municipality, that has (relatively low) levels of corruption.

3 Model, data and measurement

3.1 Conditional logit model

We take inspiration from the occupational choice literature (Baltzopoulos and Broström 2013; Dahl and Sorenson 2009, 2010) and apply a conditional logit model on individual level data to analyse start-ups in Sweden (MacFadden 1973).[3] The model's main feature is that the independent variables are characteristics of the alternatives, and that choice probabilities (and coefficients) are estimated based on relative differences in the values of the independent variables (Hoffman and Duncan 1988). The advantage of this approach is that it allows us to evaluate the impact of alternative specific characteristics that vary between alternatives. The main goal is to test whether potential entrepreneurs have a decreased risk of starting businesses in municipalities with higher levels of perceived corruption. The choice

[3] Conditional logit is sometimes referred to as a multinomial logit.

alternatives will be where to start a business, including the no-choice alternative of not starting a business.

The conditional logit model relies on the assumption that every individual has a utility function that determines the expected utility they would have from choosing each alternative. It is also assumed that the pros and cons of each alternative are decomposable to an additive set of municipality characteristics and that individuals choose the alternative that is expected to give them the highest utility. Inclusion of alternative specific dummies and interaction effects makes it possible to model an individual's decision in ways that mimic bounded rationality while accounting for heterogeneity and attachment to certain type of alternatives. However, the assumptions of the model make it crucial that the model specification is theoretically motivated and realistically mirrors the choice situation. Given the assumptions of the conditional logit model, the benefit that an individual *n* would receive from starting a business in municipality *i* can be expressed as:

$$U_{in} = B\, X_{in} + \delta\, Z_n\, X_{in} + \varepsilon_{in}$$

…where X_{in} is a vector of attributes specific for each municipality, *B* denotes the weights assigned to each of the municipal specific attributes and ε_{in} is a random disturbance term that represents uncertainty regarding the utility that each individual assigns to each alternative. Z_n is a vector of decision-maker characteristics that allows for variation in the weights that individuals assign to the municipal specific attributes, and δ is a vector of interaction coefficients that determine the size of this variation. Assuming that the errors arise from independent and identically distributed draws from an extreme value distribution (e.g. Ben-Akiva and Lerman 1985), the probability that an individual *n* chooses municipality *i* from the choice set C_n, can be expressed as:

$$P(i|C_n) = \frac{e^{B_c X_{in} + \delta\, Z_n\, X_{in}}}{\sum_{i \in C_n} e^{B_c X_{in} + \delta\, Z_n\, X_{in}}}$$

…which is commonly referred to as a conditional logit model. Some of our models will also include interactions with individual level covariates. This is indicated by adding the term $\delta\, Z_n\, X_{in}$ to the standard conditional logit model.

In the model, the decision is not only *where*, but also *whether to* start a business. It is hence important that the model includes the no-choice alternative, i.e. of *not* starting a business. Including the no-choice alternative is associated with a technical as well as a theoretical challenge. The first stems from the fact that the alternative specific variables, which in our case constitute municipal characteristics, are irrelevant for the decision to not start a business. A common procedure to model such no-choice options is to constrain the values of the independent variables to 0 for the no-choice alternative. However, these values will be treated as actual values in the model, which might bias the result. A related problem is that the standard conditional logit implies that there is no qualitative difference between starting a business and not starting a business. This is unrealistic, not least since starting a business is associated with starting costs and financial risks. We solve both problems by including an extra dummy constant (c_{nc}), which is set to 1 for the no-choice alternative and 0 for the other alternatives. Such a setup has been proven to be an efficient and relatively unbiased procedure for including the no-choice alternative in choice models (e.g. Kamakura et al. 2001).

A potential drawback with the conditional logit approach is that it relies on the Independence of Irrelevant Alternatives (IIA) assumption. Violation of the IIA property may result in non-efficient parameters and inappropriate standard errors, but the parameters are still unbiased and consistent (e.g. Fry and Harris 1994). Previous research has indicated that

well-specified conditional logit often gives similar results as more advanced models, such as nested logit or mixed logit, and that violations of IIA can be minimized with a well-specified model (Christiadi and Cushing 2007; Kamakura et al. 2001). In the present study, we attempt to handle the IIA problem by including 21 dummies for the county level. Such a specification only implies the IIA property within counties but not between counties, which is a more sensible assumption. We also include dummies that account for the fact that the current municipality of residence, as well as municipalities in the birth region, are qualitatively different and more likely to be selected compared to other alternatives.

3.2 Data

Our individual and firm-level data is anonymized register data from Statistic Sweden. Most of the data about individuals and enterprises comes from the Longitudinal Integration Database for Health Insurance and Labour Market Studies (LISA). Additionally, we employ data from the Geographical database 'Geografidatabasen' (GEO), the Business database 'Företagsdatabasen' (FDB), the database on the dynamics of businesses and employment 'Företagens och anställningens Dynamik' (FAD), as well as background data on the characteristics of individuals. The corruption index was created from a survey amongst local politicians (see below, in the independent variables-section). Data on municipality-level control variables were collected from Statistics Sweden and register data.

Our estimation focussed on start-ups in 2012 based on attributes of municipalities, sectors and individuals in 2011. The choice to focus on a single year stems from data-limitations, since data on corruption is only available for 2012. The drawback with a cross-sectional approach is that it estimates associations and thus puts limitations on the possibility of causal inference. On the other hand, as highlighted by Dahl and Sorenson (2010), using choice models focussed on a single year avoids the problem of unobserved heterogeneity

associated with regional and macroeconomic trends. We limit the problems of compositional effects and unobserved heterogeneity at the municipal level by including a wide range of control variables for municipalities as well as individuals. Our approach, then, is relatively well-suited to gauge micro-level patterns in the association between corruption and entrepreneurship.

We constrained the studied population to individuals who were aged 20–60 in 2012 and who were either employed or business owners in 2011. In contrast to many other studies on start-ups, we included businesses started by individuals who had previously been business owners. This decision was motivated by the fact that our main interest concerns start-ups, rather than the process of becoming an entrepreneur. Previous business owners are of interest because they are assumed to be among the most likely to start new firms. It is also possible that they are better informed about new business opportunities and have better chances of succeeding as entrepreneurs due to previous experience. We excluded individuals with missing information about either employment or workplace in 2011 or 2012 from the sample for two reasons. First, it provides a rough filtering of most likely individuals for entrepreneurship and thus helps to examine our research questions on corruption and entrepreneurship more clearly. And second, it dramatically improves data quality. It excludes several groups of individuals who were not available for the labour market for a wide range of reasons that would be hard to identify.

The total population meeting the above criteria consists of 3,880,872 individuals, including both males and females. A potential concern, from a modelling perspective, is that it is much more common not to start a business than to start a business, and modelling rare events may result in convergence problems. To ensure that our models converged, we used random samples of 60,000 individuals drawn from the group that did not start any business. We used proportional weights to obtain correct estimates despite this sampling.

We estimated our models on two samples: one that included all individuals who either were employed or businesses owners in 2011, and one that only included individuals from sectors dominated by private companies, also excluding insurance and financial companies. The idea behind this second sample is that we want to control for competition and average business income for the industry in which the individuals were employed in 2011. Such indicators are only meaningful for competitive industries within the private sector. Care and welfare, public administration or education sectors employ many individuals, but the majority of these organizations are in the public sector, and the number of private firms within these sectors are very few in most municipalities. The second sample also excluded firms in the financial and insurance sectors since, in the bulk of the municipalities, there are no such firms. The remaining part of this section will present an overview of the variables included in our model. Detailed variable descriptions and descriptive statistics are found in Appendix A and Appendix B.

3.3 Dependent variable

Our dependent variable is a discrete variable for the individual's decision on whether to start a firm in any of Sweden's 290 municipalities during 2012. A no-business option was also included in the choice set, meaning that the complete choice set consists of 291 options. We coded 1 for the chosen alternative and 0 for the other 290 alternatives.

To ensure high data quality, the business start-up data underwent an extensive filtering process that can be expected to remove noise in the form of low-quality businesses. The first step in this process was to only focus on incorporated businesses. Recent research has proven that it is problematic to use all types of business start-ups as proxies for so-called 'Schumpeterian' entrepreneurship (Schumpeter 1947), i.e. productive and a net bringer of wealth and jobs (Henrekson and Sanandaji 2014). Most businesses that are formed are of low

quality and lead to neither new jobs, innovation nor increased productivity (Shane 2009). In addition, a significant portion of all businesses are created for legal or tax reasons, or alternatively, as a form of self-employment that simply replaces regular employment. Previous research has shown that unincorporated firms to a higher degree are associated with replicate business ideas as well as non-entrepreneurial forms of self-employment (Åstebro and Tåg 2017; Henrekson and Sanandaji 2014), and that unincorporated firms have lower performance with regard to income and turnover (Andersson Joona and Wadensjö 2013). Aggregated measures of the number of start-ups have even been proven to have a negative association with high-quality entrepreneurship (Henrekson and Sanandaji 2014). In contrast, start-ups of incorporated firms have been shown to be a valid proxy for high-quality – i.e. Schumpeterian – entrepreneurship (Henrekson and Sanandaji 2019).

Next, as a fifth step, we had to identify the owner of these businesses. This was done in two steps. Firstly, we linked the new firms to individuals that work in these firm's by way of an anonymized organization number. Secondly, we identified the individuals that work as owners of these firm using the database 'Longitudinell integrationsdatabas för sjukförsäkrings och arbetsmarknadsstudier' (LISA). To simplify the research design, we only focussed on firms for which the business owner gets their primary source of income from running that business. Hence, we excluded cases of so-called 'hybrid entrepreneurship'. Admittedly, this decision could be viewed as controversial, since previous research has shown that many individuals start businesses alongside their employment and that these entrepreneurs, on average, have higher levels of human capital than 'ordinary' entrepreneurs (Burke et al. 2008; Folta et al. 2010). Nevertheless, the decision to exclude 'hybrid entrepreneurs' is based on the fact that it is a unique phenomenon that needs to be addressed separately (Solesvik 2017). Inclusion of hybrid entrepreneurs would significantly increase the complexity of this study, without adding any apparent benefit to our overarching endeavour.

The sixth step in the selection process was to filter out business owners who got their primary source of income from the same organization or workplace in 2011 or 2012. This procedure excludes a wide range of potential types of noisy data such as individuals that have started to work for their former employer as consultants, alternatively, wrongly classified takeovers. Apart from these intentional filtering steps, the number of studied businesses was reduced slightly, because we restricted the population of study to individuals that received the major part of their income either from employment or as a business owner in 2011.

These steps left us with 5,294 cases of newly registered firms that were started by a total of 5,933 individuals (Table 2). These firms constitute our first sample for the models that include individuals from all industries. The average number of employees in these firms was 2.01, and the average turnover was circa SEK 2.1 million.

Table 1 The number of start-ups that were filtered from each selection criteria

Criteria	**Number of remaining businesses**	**Number of filtered businesses based on selection criteria**
Total number of new businesses	78,896*	-
Incorporated	28,012	50,884
1-50 employees	21,762	6,250
Turnover > 0	20,478	1,280
No shell company	17,514	2,964
Owners' primary income comes from the business	7,032	10,482
New start-up in 2012	5,671	1,361
Entrepreneur was employed or a business owner in 2011	5,294	377
Workplace information was missing in 2011	4,560	734
Second sample excluding sectors dominated by public organizations	3,982	578

*Includes incorporated businesses, trading partnership and sole proprietorship

Table 2 Descriptive statistics for start-ups matching the selection criteria

	Sample 1	**Sample 2**
Number of businesses	4,560	4,099
Average turnover (SEK)[4]	2,109,000	2,167,615
Average number of employees	2.01	2.01
Total number of business owners	5,089	4,532
Average number of business owners per start-up	1.12	1.14
Total number of individuals in sample*	65,089	64,532

**** Including a sample of 60,000 individuals that did not start a new business.***

We also employed a complimentary analysis on a more restricted sample that only included individuals who worked in the private sector in 2011, the purpose being to control for competitiveness and average business income for different sectors at the municipality level. However, it was not feasible to construct such variables in sectors that have very few or no prior businesses in most municipalities. Thus, our second sample excluded businesses started by individuals employed in care and welfare, public administration, education sectors, finance and insurance industries in 2011 (in total 3,982 businesses started by 4 532 individuals, see Table 2).

It should be noted that the filtering process implies that our samples include a minority of all firms that started in 2012. However, start-ups are merely a non-perfect proxy for entrepreneurship (Henrekson and Sanandaji 2019). Hence, the advantage of a theoretically motivated filtering process to construct a measure of entrepreneurship also comes at the cost of lower generality. In this trade-off we have sought to use a measure that combines high precision while still being broad enough to be relevant for entrepreneurship as a general phenomenon.

[4] The conversation ratio from SEK to € were 0.094 in 2020-02-02.

3.4 Independent variable – 'local government corruption index'

As our independent variable, we employ an index that attempts to gauge the occurrence of bribes in local government. This index is compatible with the most widely used definition of corruption as 'abuse of public office for private gain' (see Rose-Ackerman 1978) and is conceptionally in line with the widely used corruption indices provided by the World Bank and Transparency International, which are designed for the country level. Despite the methodological novelty of our study, consistency with previously used definitions of corruption enables us to put the result in relation to the major strand of studies that have focussed on the effects of bribes at the country level. The corruption index we employ was created by Dahlström and Sundell (2013). The index is based on a survey that in 2012–2013 was sent to 13,361 councillors in all of Sweden's 290 municipalities. The response rate of 78 per cent must be regarded as high.[5] The index is based on questions regarding whether bribes had been offered during procurement processes or if a civil servant had been paid to perform duties (s)he otherwise would not have.[6] An attractive quality of the index is that by surveying all elected municipal politicians, the survey gathered enough respondents within each municipality to calculate mean values of all the respondents within that municipality in a meaningful way (for more information about the survey, see Dahlström and Sundell (2013) and Karlsson and Gilljam (2014)).The quality of perceptions as proxy for corruption is both dependent on the knowledge and honesty of respondents. According to the survey's creators, the index balances these requirements. The questions were focussed on the previous electoral period (2006–2010) and related to personal experiences and local knowledge of the respondents, however without targetting their own direct involvement in corruption. In

[5] The response rate was 50 percent or more in 288 of 290 municipalities.

[6] The corruption index was based on the following two questions: 'In your opinion, to what extent have the following occurred in your municipality during this mandate period?
1) A businessperson has offered a gift or service to a civil servant in connection with a public procurement.
2) A public employee has demanded payment for performing a service that is part of his or her duties.'

addition, Dahlström and Sundell (2013) carried out external validation which gave support to a correlation between their own index and newspaper articles about bribery as well as between the index measure and bribery charges. Based on this, the index's major strength is the large number of respondents from each municipality, combined with the fact that these respondents are councillors expected to have unique local knowledge, insights, and potentially also personal experience of various types of irregularities.

3.5 Municipal-level control variables

The following municipal-level control variables were employed:

- *Population size.* The size of the local markets as well as several other important characteristics of the municipality (Pennings 1982).
- *Population growth.* Like much previous research, we included population growth measured in percentual change in order to distinguish growing markets in dynamic regions (Davidsson et al. 1994; Reynolds 1994).
- *Unemployment.* Unemployment is theoretically relevant, but its net effect is unclear. It may either indicate few opportunities for entrepreneurship (and therefore deter potential entrepreneurs), but might also be associated with increased rates of necessity entrepreneurship among the unemployed (Bosma and Sternberg 2014).
- *Income per capita.* Higher incomes lead to increased demand for goods and services; we therefore control for income per capita (Bird and Wennberg 2014; Davidsson et al. 1994)
- *Service sectors proportion of the total economy.* Several studies have implied that more businesses tend to be started in the service sector and therefore this sector is included (Braunerhjelm and Borgman 2004).

- *Proportion of public sector employees*. Several studies have suggested that public sector size is negatively associated with business start-up rates (Aidis et al. 2012; Larsson et al. 2017).
- *Proportion of business owners.* Occurrence of small firms are an important determinant for business start-ups since it provides potential entrepreneurs with role models and relevant small firm experience (Bosma et al. 2012; Davidsson et al. 1994).
- *Not start business dummy.* As outlined in the methodological section, conditional logit models that include a no-choice alternative must include a dummy for this no-choice alternative in order to ensure unbiased estimates (Christiadi and Cushing 2007; Kamakura et al. 2001). We therefore include a dummy variable that is set to 1 for the option of not starting a business.

3.6 Sector-level control variables

Our ambition to contextualize the entrepreneurial decision on local conditions also calls for controls at the sector (industry) level. This is a non-trivial challenge given the large variety of industries that all have unique characteristics, which also vary between municipalities. Our solution is to focus only on the industry that the individuals were engaged in during 2011, assuming that individuals mainly consider starting businesses in their own industry. This simplification allows us to include several dimensions of industry-specific information with three additional sector level variables. We present these below.

- *Competition.* Competition is an important factor for the prospects of future profit of a firm. We account for this fact by including Glaeser et al.'s (1995) standardized measure of competition within an industry. The advantage of this competition measure is that it is a relative measure normalized by the national average and accounts for heterogeneity between sectors. The value is above 1 for municipalities where the industry is more

competitive than the national average and below 1 for industries which are uncompetitive or dominated by a few large firms. It is defined as follows:

$$Competition = \frac{Firms_{mun}/Workers_{mun}}{Firms_{total}/Workers_{total}}$$

- *Business owner income in relevant sector*. The potential income from running a business is typically an important factor for the start-up decision. For each municipality (alternative), we control the average income among business owners in the sector where individuals were working in 2011 as a control for individuals' start-up decision in 2012. Average income was calculated by adding up wages and distributed profit for all business owners and averaging this value within each sector and each municipality.
- *Sector's share of the local economy.* From an individual's perspective the relevant size of a local market is not only dependent on the size of a municipality but also on the relative size of different sectors. Businesses are more likely to be started within established sectors since exposure to existing organisations provide entrepreneurs tacit knowledge, important connections and self-confidence (Sorenson and Audia 2000). For each municipality (alternative), we control for the relative size of the sector where business owners were working in 2011. This was calculated as the number of employees between 20 and 60 in the specific sector divided by the total number of employed between 20 and 60 in the entire municipality.

3.7 Municipal-individual interaction variables

This paper is concerned with the economic aspects of entrepreneurship. Analyzing the social aspects of entrepreneurship, at least at a granular level, falls outside the scope of our ambitions. However, given the importance of social capital, we indirectly control for the presumptive impact of social networks in several ways, as explained below.

- *Region of birth.* We include a dummy for municipalities within the region where individuals were born (Michelacci and Silva 2007). It accounts for the fact that proximity of family and friends may increase the likelihood of the start-up location chosen (Baltzopoulos and Broström 2013).
- *Distance (from municipality of residence).* We follow common practice for conditional choice models and include a distance variable that measures the distance between the centre of each municipality and the individual's municipality of residence (Dahl and Sorenson 2009, 2010). An important reason for doing this is that it accounts for transaction costs stemming from starting a business elsewhere. This may be related to social costs (such as distance to family and friends), economical costs (relating to, for instance, commuting) and informational costs (assuming that one's information about market opportunities and smoothness of contacts with officials is greatest in one's municipality of residence).
- *Outside home municipality.* Previous research has found that individuals are embedded within their communities and value proximity to family and friends (Dahl and Sorenson 2009, 2010, 2012). We control for individual's attachment to their hometown by including a dummy which distinguishes the municipality of residence from other municipalities.

3.8 Individual level interaction variables

From previous research we expect the propensity to start a business to be heterogenous with respect to individual characteristics such as gender, age, income and education (Andersson Joona and Wadensjö 2013; Poschke 2013; Parker 2009). In contrast to binary choice models, such as the logit which focusses on individual characteristics, the conditional logit model employed here is used to model differences between available alternatives. In our case, we chiefly want to measure the effect of variations in quality of local government institutions, which makes conditional logit suitable. It is not possible to include individual level covariates as separate variables in a conditional logit model, but it is possible to include them in interaction with alternative specific variables.

To rule out the risk that our main results are driven by compositional effects at the individual level, we conduct robustness analysis by estimating models which include interactions between the choice of not starting a business and individual specific variables. These models also included control for life circumstances such as parental leave, university studies and sick leave. Complete variable definitions of all variables, including the individual level variables, can be found in Appendix A. Robustness analyses with models that include individual level interactions are found in Appendix C.

4 Results

Before our findings are presented, Table 3 provides a descriptive overview of the location of the start-ups in our two samples. The clearest result is that entrepreneurs generally start businesses in the municipality where they reside. Only 16 percent of the businesses started in 2012 were located outside the municipality where business owners resided in 2011. This can be understood in terms of a combination of emotional bounds to family and friends (Dahl and Sorenson 2009) as well as a wish to avoid various transaction costs (e.g. desire to

be near one´s social network, taking stock of one's information about the local market opportunities, avoiding time-consuming commuting). This pattern stresses the need to include a dummy for non-residence alternatives in our model which account for the tie individuals have to their home municipality. Another indication of individuals' preference to start businesses near their home is to look at the distance they are willing to re-locate in the minority of cases when they do start a business outside their home municipality. The third column of Table 3 reveals that the subset of entrepreneurs who started businesses outside their home municipality in 2012 on average located their business circa 60–70 kilometres from the centre of the municipality where they resided in 2011. While the average distance is longer than the typical distance between neighbouring municipalities in Sweden, it is clearly inflated by outliers. The median migration distance is only 26 kilometres, implying that the majority of re-locaters move their start-up to a neighbouring municipality. The data thus confirm previous findings – in general, entrepreneurs are neither willing to move to new municipalities nor to commute long distances for the sake of business opportunities. Apart from this, the bottom row of Table 3 shows us that about half of all entrepreneurs start their business in the county where they were born. This further underscores that entrepreneurs tend to value proximity to family and friends and avoid transaction costs.

Table 3 Start-up statistics

	Sample 1	**Sample 2**
Number of start-ups	5,089	4,532
Outside home municipality	812 (16.0%)	735 (16.2%)
Average migration distance (km)	66	61
Median migration distance (km)	26	26
Within birth region	2,518 (49.5%)	2,289 (50.5%)

Note: Average and median distance is expressed in kilometres. Migration distance is calculated for entrepreneurs who started businesses outside their home municipality.

Estimates of determinants for an individual's decision on whether and where to start a business are presented in Table 4. The dependent variable of these choice models consists of

291 different alternatives including each of Sweden's 290 municipality, and the choice to not start a business. The aim is to test whether bribes decrease or redistribute entrepreneurship at the municipal level. A corruption index measured at the municipality level is included as an independent variable. Our first hypothesis (H1) is that entrepreneurship is less frequent in municipalities associated with higher corruption levels. In line with this expectation, that corruption deters individuals from starting firms, our second hypothesis (H2) is that entrepreneurs migrate their businesses from (relatively) high-corrupt to (relatively) low-corrupt municipalities. To distinguish between inhibiting and redistribution, our models include the corruption index as a main effect which corresponds to the effect of corruption within the municipality of residence (to measure the *hometown effect*) and an interaction between the index and non-residential municipalities (to measure the *redistribution effect*). This allows us to determine if corruption has a different impact on the propensity for entrepreneurship in the local population compared to individuals from the outside. Coefficients are in odds ratios, meaning that values less than 1 imply a deterring effect and values greater than 1 increase the odds of starting a business. The *hometown effect* is set up as the baseline effect of corruption in the model. Odds ratios for the *redistributive effect* are given by multiplying the baseline effect with the interaction term *not home municipality X corruption index*. The results in Table 4 support H1 (about corruption's deterring effect in one's home municipality) but not H2 (about re-location of entrepreneurship from high-corrupt to low-corrupt municipalities). Model 1 is based on the first sample including individuals working in all sectors and includes 65,089 individuals. In line with H1, the *hometown effect*, corruption in local institutions has a negative effect on the propensity for start-ups in an individual's home municipality. The base coefficient for the corruption index is 0.78, corresponding to a statistically significant reduction of the odds for choosing to start a

business in the home municipality by circa 22 per cent for each unit increase in the corruption index.

A similar association between corruption and the propensity for start-ups in an individual's municipality of residence is found in Model 2 (which is based on our second sample that only includes private sectors). This sample is based on 64,532 individuals working in the private sector. The odds ratio estimate for the corruption index in Model 2 is 0.80, corresponding to a 20 per cent decrease in the odds ratio of starting a business in the municipality of residence. Hence, the two models are highly consistent with each other. We can therefore conclude that local government corruption in Sweden has a deterring effect on entrepreneurship among individuals that reside in a specific municipality, i.e. potential entrepreneurs who are assumed to be best informed about local conditions regarding market opportunities, corruption and lack of impartiality. This is an important finding, because the majority of entrepreneurs prefer to start their businesses in their municipality of residence.

Our next focus is whether corruption leads to redistribution of entrepreneurship in line with H2. Since corruption has a local deterring effect on potential entrepreneurs, it might be the case that entrepreneurs who are discouraged by corruption simply avoid dealing with officials in their municipality of residence and re-locate their start-ups to relatively less corrupt municipalities. To test this, we analyse the interaction between corruption and a dummy for non-residence municipalities. Before this interaction is elaborated upon, it should be noted that the single dummy 'not home municipality' has a coefficient value of circa 0.005 in Model 1 and Model 2. This means that individuals seldom start businesses outside their own municipalities. Again, this finding is to be expected, since individuals in general have sector knowledge and social capital tied to a geographically limited area.

Notwithstanding, we expect that those who, despite various transaction costs, choose to start businesses outside their municipality of residence are deterred by relatively high

corruption levels, ‘exit’ from their home municipality and locate their businesses to a more attractive environment, i.e. relatively less corrupt municipalities. However, the interaction term between the index and non-residence municipalities shows that H2 is rejected. Surprisingly, and counter-intuitively, the opposite pattern is found. A higher score on the corruption index is estimated to have a *positive* effect on individual’s propensity to locate start-ups outside his or her home municipality. The interaction is highly significant and has a high coefficient value. However, interpreting the implications from odds ratios is a tricky enterprise because effects are expressed in percentual change of odds ratios. A high percentual change from a low benchmark level may still have a modest impact in practice. For easier interpretation of these results, Figure 1 illustrates predicted probabilities at different counterfactual corruption levels for two pairs of adjacent municipalities. In both cases, the *hometown effect* dominates the *redistribution effect*, indicating that corruption mainly inhibits entrepreneurship.

In terms of controls, most variables have expected effects. Distance has a negative effect on the probability of establishing a start-up at a certain location, while a large population increases the attractiveness of a municipality. Furthermore, the current share of businesses in proportion to the total population also appears to be a strong predictor of the likelihood of a municipality being chosen as a start-up location. When it comes to sector-specific variables, both models confirm that individuals are more likely to start businesses in municipalities where the sector that they previously worked in constitutes a large share of the economy. In addition, both competition and average income – which only are included in Model 2 – are estimated to increase the propensity for start-ups. Competition is highly significant and is positively associated with start-ups, but average income is insignificant. Its wide confidence interval could indicate that the measure has a low precision at the sector level.

Table 4 Basic conditional logit models over the propensity to start a business.

	Model 1 – all sectors		Model 2 – private sectors	
Hypotheses				
Corruption index	0.779 ***	(0.036)	0.797***	(0.039)
Corruption index X Non residence	2.866***	(0.193)	2.972***	(0.214)
Control variables				
(ln) Population size	1.348***	(0.066)	1.370***	(0.054)
Population growth in per cent	0.568***	(0.021)	1.019**	(0.008)
Unemployment	1.001	(0.023)	1.003	(0.024)
Income per capita	1.001	(0.001)	1.001	(0.001)
Share public sector employees	0.261***	(0.022)	0.240***	(0.091)
Share service sector employees	0.654	(0.654)	0.547	(0.202)
Proportion of businesses in per cent	1.213***	(0.016)	1.110***	(0.017)
Sectors share of the local economy	1.020***	(0.003)	1.017***	(0.004)
Business owner income in relevant sector			1.342	(0.265)
(ln) Competition			1.142***	(0.043)
(ln) Distance	0.224***	(0.006)	0.215***	(0.006)
Not home municipality	0.005***	(0.001)	0.005***	(0.001)
Region of birth	1.057	(0.036)	1.046	(0.035)
Not start business (NB)	1831***	(337)	1793***	(730)
NB X Sector where individual worked in 2011				
NB X Construction	Base		Base	
NB X Energy and environmental	3.156***	(0.575)	3.071***	(0.672)
NB X Real estate	1.232*	(0.154)	1.248*	(0.155)
NB X Finance and insurance	2.844***	(0.355)		
NB X Business services	1.578***	(0.090)	1.970***	(0.129)
NB X Retail	2.400***	(0.138)	2.315***	(0.130)
NB X Hotel and restaurants	1.234**	(0.108)	1.243**	(0.108)
NB X Information and communication	1.006	(0.073)	1.168**	(0.088)
NB X Agriculture, forestry and fishery	1.129	(0.129)	1.518***	(0.179)
NB X Cultural and personal services	1.106	(0.092)	1.454***	(0.107)
NB X Public administration	6.848***	(1.111)		
NB X Manufacturing	3.070***	(0.203)	2.882***	(0.191)
NB X Transport and storage	1.942***	(0.163)	1.990***	(0.168)
NB X Education	5.784***	(0.612)		
NB X Care and welfare	8.100***	(0.752)		
NB X Unknown sector	0.453***	(0.073)		
Log pseudolikelihood	-44638		-36749	
Akaike information criterion	84096		74110	
Number of individuals	65089		64532	
Number of cases	18940899		18778812	

Note. All models include county level fixed effects. Coefficients are in odds ratios. Standard errors in parentheses. Significance: *P < 0.05, **P < 0.01; *** P < 0.001.

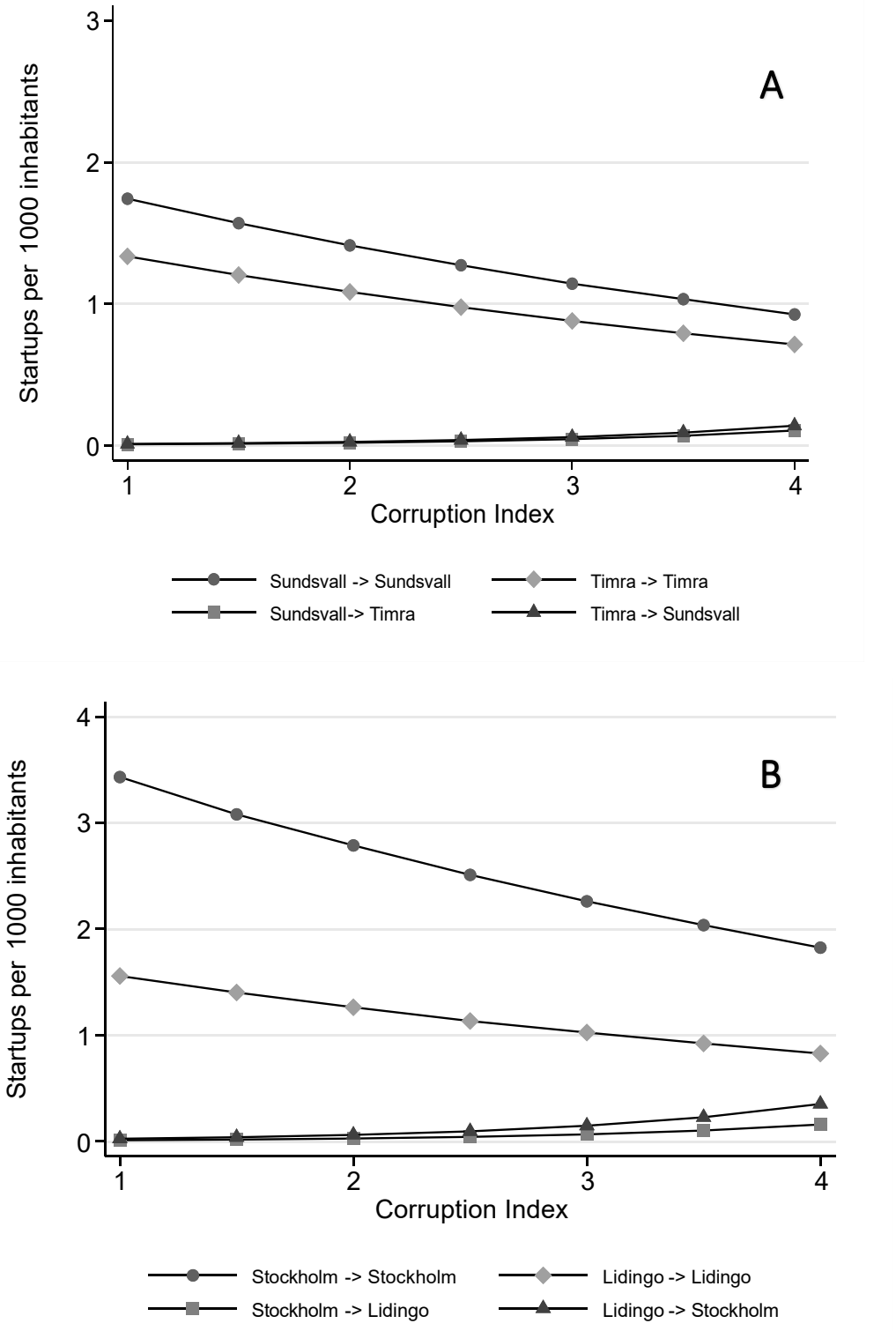

Figure 1 Illustration of hometown and redistribution effects at different levels of corruption. Y-axis denotes the predicted start-up rate per 1,000 citizens. Corruption levels on the x-axis is measured with respect to the municipality where businesses are predicted to be started. The graphs are based on Model 2.

To further control for compositional effects at the individual level, we estimated additional models where interactions between individual level characteristics – such as age, education and civil status – and the propensity for not starting a business were controlled for. While these interactions improved model fit and had effects consistent with theoretical expectations, their inclusion had little effect on the coefficients of interest. We therefore omit them from the main analysis (they are included in Appendix C).

In sum, we find support for H1. Corruption in a given municipality decreases the likelihood of individuals starting a business within their municipality of residence. This effect is strong and leads to a decrease in the general level of entrepreneurship. We can therefore conclude that our overall results confirm the traditional view, i.e. that corruption has a negative effect on entrepreneurship. In addition, the results indicate that there may be a modest redistribution effect. However, contrary to our theoretical expectations and rejecting H2, it seems as though some municipalities with relatively higher levels of corruption attract a subgroup of entrepreneurs. Although the interpretation of this finding is not straightforward, it might signal that our analysis picks up a redistribution of *destructive* entrepreneurship: a few entrepreneurs – for one reason or another – are drawn to the rent-seeking opportunities presented in municipalities where corruption and other violations of the norm of impartiality are more common.

5 Conclusions and discussion

There is a growing awareness that corruption in subnational institutions – within the one and same country – may be just as crucial to study as corruption at the country level (e.g. Broms et al 2019; Masters and Graycar 2016; Amore and Bennedsen 2013). With only few exceptions, the comparative literature on corruption's association with entrepreneurship has focussed primarily on the country level. Not only do such aggregated studies risk being

removed from everyday experiences of entrepreneurs – particularly in highly decentralized states where firms often rely on smooth and impartial interactions with local government – they also overlook effects of within-country variations in quality of local institutions. By contextualizing the analysis, focussing on how corruption in local government impacts the decision to start a business on the level of the individual entrepreneur, the paper contributes to both the evolving literature on subnational corruption as well as the literature on corruption's association with entrepreneurship.

Our focus has been on local government in Sweden, an egalitarian, high-trust and low-corruption setting. In the literature on local economic development it is often argued that that local conditions are crucial for businesses to develop (e.g. Lidström 2008; Wood and Valler 2005), and certainly in Sweden, firms are dependent on smooth, quick and impartial interactions with local government officials, for instance when it comes to public procurement, zoning issues, granting of licences and permits, and so forth (e.g. Fölster 2016). We applied a conditional logit model on register data to gauge whether individuals have a lower propensity to start businesses in municipalities with relatively high corruption levels. Employing a local government corruption index, designed to capture variation in corruption levels between the 290 Swedish municipalities, we found that corruption in local government institutions deters start-ups in a potential entrepreneur's home municipality. As a rule, the 'grease the wheels' hypothesis seems to be largely irrelevant in the Swedish context. This confirmation of H1 is highly relevant for policymakers. If we accept that entrepreneurship is important for local economic development, politicians should take the issue of controlling and decreasing corruption in local government seriously.

For the country as a whole, the local effect we have found need not discourage entrepreneurship on the aggregate, provided that entrepreneurs are willing to relocate start-ups to municipalities less associated with corruption. However, relocation of start-ups is rather

uncommon. Thus, it can somewhat comfortably be concluded that corruption in local government has a nationwide depressing effect on entrepreneurship. In addition, *when* entrepreneurs nonetheless relocate, they surprisingly tend to turn to municipalities where corruption is a relatively larger problem. This is contrary to our theoretical expectations and a rejection of H2. Although further research is called for, the finding indicates an intriguing heterogeneity within the group of entrepreneurs as suggested by, for instance, Collins et al (2016): productive entrepreneurship (which is discouraged by corruption) and 'non-productive' or 'destructive' entrepreneurship (which is attracted by illegal and/or rent-seeking opportunities). Thus a working hypothesis is that a few entrepreneurs – representing 'non-productive' or 'destructive' entrepreneurship – relocate start-ups because they are drawn to opportunities present in more corrupt municipalities.

In conclusion, the paper ultimately offers three main takeaways. First, our focus on Sweden further underscores the importance and relevance of studying corruption in 'low corruption' settings that traditionally have been overlooked in corruption studies. Obviously, corruption may have harmful consequences in societies hailed as benchmarks for clean and honest government. Second, the paper has highlighted the usefulness of disaggregating analyses of entrepreneurship from countries as units of analysis to focus on local governments, since they evidently can affect business climate with the local conditions they offer. Third, we have demonstrated the upsides of using individual-level register data, which provides opportunities to analyse entrepreneurship as an individual-level decision which, in this paper, facilitated the identification of a *redistribution effect* – i.e. to track if entrepreneurs simply re-locate their start-ups to better suited municipalities if they are not happy with the local conditions offered in their municipalities of residence.

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Appendix A

Table A.1 List of variables, definition and sources

Dependent variable	Definition	Source
Business start-up decision	A discrete variable. Potential outcomes are either that no business was started or that a business was started a specific municipality. Based on register data from 2012.	Statistics Sweden
Main explanatory variable		
Corruption index	A municipal-level index created from survey data to local politicians.	Dahlström and Sundell (2013)
Municipal specific control variables		
Population size	Population in 2012 in thousands of inhabitants.	Statistics Sweden
Population growth	Population growth in 2012 in thousands of inhabitants.	Statistics Sweden
Income per capita	Average gross income in SEK 1000 for individuals aged 16+.	Statistics Sweden
Unemployment	Municipal level unemployment rate in 2012 in per cent.	Statistics Sweden
Proportion of public sector employees	The number of public sector employees aged 20-60 divided by the total number of employed individuals aged 20-60.	Own construction based on data from Statistics Sweden
Proportion of private sector employees	The number of private sector employees aged 20-60 divided by the total number of employed individuals aged 20-60 in 2011.	Own construction based on data from Statistics Sweden
Proportion of business owners	Proportion of population owning an incorporated business in 2011.	Own construction based on data from Statistics Sweden
Dummies for counties	Binary dummy variables that identifies which of the 21 Swedish counties a municipality belong to.	Statistics Sweden
Not start business	A dummy variable set to 1 for the not start business alternative.	Own construction
Sector specific control variables		
Relative size of working sector	The relative size of the sector the individual was working in during 2011. Calculated as the number of employees between 20-60 in the specific sector divided by the total number of employed between 20-60 in the entire municipality.	Own construction based on data from Statistics Sweden
Average income for business owners within the most relevant sector	For each municipality (alternative): the average income for business owners in the sector where an individual in the sample where employed in 2011.	Own construction based on data from Statistics Sweden
Competition	For each municipality (alternative): Glaeser et al.'s (1995) measure of competition for the sector where an individual in the sample where employed in 2011.	Own construction based on data from Statistics Sweden
Municipal-individual interactions		

Birth region	Dummy variable set to 1 for municipalities in the county where the individual was born.	Statistics Sweden
Distance	Distance between the individual's residence and the centre of the largest city in each municipality expressed in 10 000 metres.	Own construction based on data from Statistics Sweden
Outside home municipality	Dummy set to 1 for all municipalities except from the home municipality.	Statistics Sweden

Individual specific covariates (only in Appendix C)

Age	Factor variable based on age in November 2011. Age intervals: 20-24, 25-34, 35-44, 45-54, 55 <	Statistics Sweden
Income	A four-level factor variable for disposable income in 2011.	Statistics Sweden
Education	Factor variable of highest educational degree by November 2011.	Statistics Sweden
Bus owner 2011	Set to 1 if the individual was owning a business 2011, 0 otherwise. Incorporated business, trading partnerships and sole proprietorships are counted.	Statistics Sweden
Sick leave	Set to 1 if an individual received sick benefits in 2012 or 2011	Statistics Sweden
Student courses	Set to 1 if an individual studied at university, adult education or similar in 2011, 0 otherwise.	Own construction based on data from Statistics Sweden
Married	Set to 1 if the individual was married in 2012, 0 otherwise.	Statistics Sweden
Parental leave 2012	Set to 1 if an individual received parental benefits in 2012, 0 otherwise.	Statistics Sweden
Children 0-3	Set to 1 if an individual had children in the age span 0-3 in 2012, 0 otherwise.	Statistics Sweden
Unemployed 2011	1 if an individual received any unemployment benefit in 2011. 0 otherwise.	Statistics Sweden
Born outside Sweden	1 if an individual was born outside Sweden, 0 otherwise.	Statistics Sweden
Male	1 for male, 0 for female.	Statistics Sweden

Appendix B

Table B.1 Descriptive statistics

	All sectors		Private sector	
	Mean	Std. Dev.	Mean	Std. Dev.
Corruption index	1.66	0.39	1.66	0.39
(ln) Population	2.91	0.97	2.91	0.97
Population growth in per cent	0.10	0.87	0.10	0.87
Unemployment	6.32	1.49	6.32	1.49
Income per capita	251.81	36.09	251.81	36.09
Share public sector employees	0.27	0.07	0.27	0.07
Share service sector employees	0.62	0.11	0.62	0.11
Proportion of businesses in per cent	4.57	1.56	4.57	1.56
Sectors share of the local economy	8.58	8.26	10.64	6.31
Average business owner income			0.01	0.02
(ln) Competition			0.53	0.65
(ln) Distance	3.28	0.88	3.27	0.87
N (Individuals)	65089		64532	
N (Municipalities)	290		290	

Note. Categorical variables are excluded.

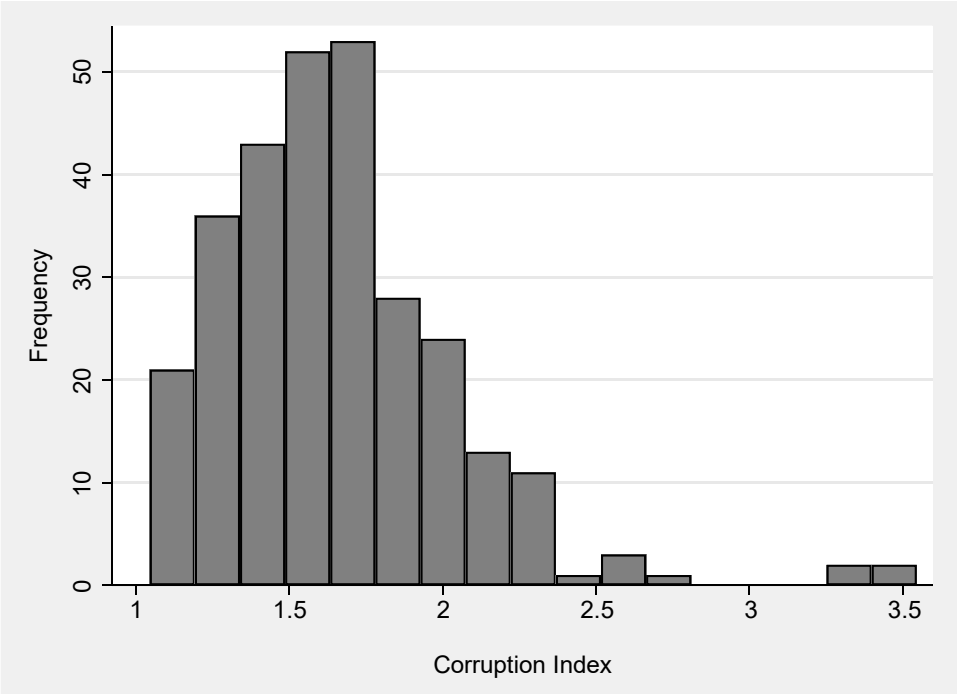

Figure B.1 Histogram for the corruption index.

Appendix C

Table C.1 Conditional logit models with individual level interactions.

	Model 3 – all sectors		Model 4 – private	
Hypotheses				
Corruption index	0.772***	(0.036)	0.801***	(0.039)
Corruption index X Not residence	2.862***	(0.194)	2.885***	(0.208)
Control variables				
(ln) Population size	1.341***	(0.050)	1.360***	(0.053)
Population growth in per cent	1.022***	(0.007)	1.020**	(0.008)
Unemployment	1.004	(0.023)	1.006	(0.024)
Income per capita	0.999	(0.001)	1.000	(0.001)
Share public sector employees	0.267***	(0.095)	0.250***	(0.095)
Share service sector employees	0.573	(0.201)	0.484*	(0.180)
Proportion of businesses in per cent	1.213***	(0.016)	1.109***	(0.018)
Sector's share of the local economy	1.019***	(0.003)	1.015***	(0.004)
Business owner income in relevant sector			1.116	(0.042)
(ln) Competition			1.332***	(0.267)
(ln) Distance	0.222***	(0.006)	0.214***	(0.006)
Region of birth	1.083**	(0.036)	1.065*	(0.039)
Not home municipality	0.005***	(0.001)	0.005***	(0.001)
Not start business (NB)	6843***	(3205)	10316***	(5319)
NB X Sector where individual worked in				
NB X Construction	Base level		Base Level	
NB X Energy and environmental	3.528***	(0.784)	3.487***	(0.768)
NB X Real estate	1.222	(0.145)	1.222	(0.154)
NB X Finance and insurance	2.930***	(0.405)		
NB X Business services	1.430***	(0.086)	1.475***	(0.094)
NB X Retail	1.943***	(0.116)	1.797***	(0.102)
NB X Hotel and restaurants	0.777***	(0.070)	0.807**	(0.074)
NB X Information and communication	1.180**	(0.091)	1.294**	(0.101)
NB X Agriculture, forestry and fishery	1.076	(0.127)	1.493**	(0.178)
NB X Cultural and personal services	1.846*	(0.076)	1.110	(0.087)
NB X Public administration	6.601***	(1.097)		
NB X Manufacturing	3.098***	(0.212)	3.066***	(0.210)

NB X Transport and storage	1.662***	(0.142)	1.767***	(0.151)
NB X Education	3.779***	(0.425)		
NB X Care and welfare	5.064***	(0.508)		
NB X Unknown sector	0.365***	(0.062)		
Not start business (NB) X individual				
NB X Income Quantile 1	0.930	(0.062)	0.898	(0.062)
NB X Income Quantile 2	1.771	(0.122)	1.651***	(0.117)
NB X Income Quantile 3	1.537	(0.103)	1.424***	(0.099)
NB X Income Quantile 4	Base level		Base level	
NB X Age 20-24	Base level		Base level	
NB X Age 25-34	0.400	(0.037)	0.432***	(0.040)
NB X Age 35-44	0.329	(0.031)	0.363***	(0.035)
NB X Age 45-54	0.404	(0.038)	0.434***	(0.042)
NB X Age 55-60	0.641	(0.066)	0.657***	(0.069)
NB X Elementary school	0.742	(0.191)	0.463***	(0.136)
NB X High school	0.627	(0.160)	0.408**	(0.118)
NB X University	0.536	(0.154)	0.353***	(0.117)
NB X Postgraduate	0.559	(0.143)	0.358**	(0.104)
NB X Education unknown	Base level		Base level	
NB X Bus owner 2011	0.923	(0.057)	0.934	(0.057)
NB X Sick leave	1.174**	(0.061)	1.194**	(0.065)
NB X Student courses	1.436***	(0.129)	1.680***	(0.177)
NB X Married	0.748***	(0.025)	0.783***	(0.027)
NB X Parental leave 2012	1.441***	(0.076)	1.438***	(0.077)
NB X Children 0-3	0.761***	(0.039)	0.740***	(0.039)
NB X Unemployed 2011	0.874*	(0.071)	0.904	(0.077)
NB X Born outside Sweden	1.226***	(0.066)	1.223***	(0.068)
NB X Male	0.527***	(0.020)	0.554***	(0.022)
Log pseudolikelihood	-44638		-36065	
Number of individuals	65089		64532	
Number of cases	18940899		18778812	

Note. All models include county level fixed effects. Coefficients are in odds ratios. Standard errors in parentheses. Significance: *P < 0.05, **P < 0.01; *** P < 0.001.