RESEARCH ARTICLE

Does local government corruption inhibit entrepreneurship?

Emanuel Wittberg [ORCID] · **Gissur Ó. Erlingsson** [ORCID] ·
Karl Wennberg [ORCID]

Abstract The dominant 'sand in the wheels' view holds that entrepreneurship is strongly inhibited by corruption. Challenging this, the 'grease the wheels' view maintains that corruption might increase entrepreneurship in highly regulated economies. We extend the basic predictions of these theories by examining entrepreneurs' start-up decisions, as well as their location choices, in a seemingly low-corruption environment: Swedish municipalities. Combining a validated index of corruption perceptions in local government with population data on new entrepreneurs, nested logit models reveal that even in a low-corruption setting such as Sweden, perceptions of corruption can deter latent entrepreneurs. We also find that a minority of entrepreneurs relocate from their home municipalities to establish their start-ups elsewhere. Surprisingly and contrary to expectations, these relocating entrepreneurs often relocate from relatively low-corruption municipalities to others that are more corrupt. Implications for future research and public policy are discussed.

Plain English Summary The effect of corruption in local government is often overlooked in entrepreneurship research. This paper finds that even in one of the world's least corrupt countries—Sweden—local government corruption discourages the will to start new firms. Most scholars agree that corruption discourages people from starting new firms. However, a few studies have lately suggested that corruption—under specific circumstances—may actually increase entrepreneurship when bureaucracies are highly regulated and inflexible. This paper delves deeper into the salience of these contradictory views by studying municipalities in Sweden. This low-corruption country is highly regulated with an efficient but, at times, rigid bureaucracy. Using a combination of survey and business register data, we find that even in this low-corruption environment, corruption decreases the rate of entrepreneurship. Surprisingly, though, a minority of entrepreneurs relocate from their relatively low-corruption home municipalities to establish their start-ups in others that are more corrupt. An important implication of our findings is that even in the world's least corrupt countries, active anti-corruption strategies need to be upheld, and this is particularly pertinent at the local level.

E. Wittberg
Institute for Analytical Sociology (IAS), Centre for Local Government Studies, Linköping University, Linköping, Sweden
e-mail: emanuel.wittberg@liu.se

G. Ó. Erlingsson
Centre for Local Government Studies, Linköping University, Linköping, Sweden
e-mail: gissur.erlingssom@liu.se

K. Wennberg (✉)
House of Governance and Public Policy (GaPP), Stockholm School of Economics, Institute for Analytical Sociology (IAS), Linköping University, Linköping, Sweden
e-mail: karl.wennberg@hhs.se

1 Introduction

The dominant view of corruption and entrepreneurship holds that corruption inhibits entrepreneurship by increasing uncertainty and transaction costs (e.g. North, 1991; Tanzi & Davoodi, 1998). Consistent with this, a vast literature that has compared corruption across countries and regions has found that corruption tends to hamper entrepreneurship in the form of new start-ups (Aghion et al., 2016; Anokhin & Schulze, 2009; Audretsch et al., 2022a, 2022b, 2022c; Bologna & Ross, 2015; Dutta & Sobel, 2016) as well as being detrimental for overall economic development (Gründler & Potrafke, 2019; Mauro, 1995).

That said, an alternative view claims that corruption may reduce bureaucratic delay and red tape, suggesting that the effects of corruption on entrepreneurship may be more subtle and contextually dependent (e.g. Huntington, 1968; Leff, 1964). This view holds that corruption could work as a lubricant that 'greases the wheels' of business interactions, thereby legitimising minor bribery, encouraging public officials interpret and negotiate legislation more flexibly. For a long time, this view on corruption was considered debunked (e.g. Kaufmann & Wei, 1999). However, it has received renewed attention, and some support, in cross-country studies. Scholars have found that under some circumstances, corruption seems to reduce the negative effects of red tape for entrepreneurs (Belitski et al., 2016; Dreher & Gassebner, 2013; Jauregui et al., 2021; Mohamadi et al., 2017). That said, elucidating the conditions in which the mainstream or alternative theories of corruption and entrepreneurship hold true is complicated by both methodological and contextual factors.

Against this backdrop, our approach diverges from dominant ways of analysing corruption and entrepreneurship in two distinct ways. First, while most studies are aggregate analyses of countries, we focus on within-country variations in local government institutions. This is an important step to take since previous studies have found that local conditions are crucial for businesses to develop and flourish (Lidström,

2008; Wood & Valler, 2004), and that corruption may vary significantly within a single country (e.g. Beeri & Navot, 2013; Charron et al., 2014). Particularly in decentralised countries, the importance of local conditions is reinforced since many entrepreneurs need to interact with local government institutions on a regular basis (Fölster et al., 2016). Second, most extant corruption research has focused on developing economies where corruption is endemic, downplaying or overlooking the effects of corruption in low-corruption environments. However, public perceptions, exposed corruption scandals, and crime statistics indicate that corruption can be a problem even in low-corruption countries, not least in areas such as zoning and planning, inspections, granting of permits, and grants and subsidies, as well as in public procurement (e.g. Graaf & Huberts, 2008; Graycar & Villa, 2011; Hols Salén & Korsell, 2013; Masters & Graycar, 2016; Von Maravic, 2006). Hence, although seldom researched, corruption has the potential to have detrimental effects even in societies hailed as benchmarks for clean and honest government.

Against this backdrop, we examine the relationship between local government corruption and entrepreneurship in Sweden, a country regularly ranked as one of the world's least corrupt. We maintain that analysing local government corruption allows for a more nuanced, in-depth understanding of the causes and consequences of corruption. Specifically, we contend that the dominant macro view of corruption and entrepreneurship essentially collapses demand- and supply-side effects by modelling the net effects on entrepreneurship in the form of new firms. While on the country level, corruption should be associated with relatively fewer new firms as transaction costs increase, differences in macro-level entry rate may conceal considerable within-country variation in the local dynamics of new entrepreneurs and their location choices. Few entrepreneurs are likely to migrate abroad due to small or moderate levels of corruption. However, if latent entrepreneurs perceive that corruption in their municipality of residence is an impediment to their business endeavours, they can simply choose to relocate to a neighbouring municipality. This implies that what is observed on the macro level as a change in entrepreneurship could, on the local level, stem from both decreases in entry and relocation of entrepreneurship between municipalities. To better understand entrepreneurs' decisions about local

corruption contexts, we thus need to examine corruption in local government, and how latent entrepreneurs react to differences in corruption levels across municipalities—not just in terms of their decision on *whether* to enter entrepreneurship, but also their choice of *where* to do this.

Lacking access to exogenous variation in corruption level, we outline a novel research design to analyse the relationship between corruption for the start-up and location choices of entrepreneurs. This is done by combining detailed perception-based data on local government corruption with objective-matched employee-employer data on new entrepreneurs' start-ups and their locations. Hence, while the identified relationships are correlational rather than causal, we are able to construct uniform measures of corruption perceptions across the 290 Swedish municipalities and use detailed data. This allows us to present patterns of how local corruption may affect *both* entrepreneurial entry and entrepreneur's location choices. Drawing on studies of decentralisation in institutional economics and political science, we theorise on the local and individual-level links between corruption and entrepreneurship.

We model new entrepreneurs' start-up and location choices using a nested logit model. Our measures of corruption use perception-based data on variation in local corruption levels from a survey of 13,361 municipal councillors in all 290 Swedish municipalities in 2012 and 2013 with an overall response rate of 78 percent. This data is combined with matched employee-employer data on the complete population of new entrepreneurs as well as their location choices in 2014 together with rich data on local business conditions. This gives us the opportunity to simultaneously model start-up decisions *and* where start-ups are located geographically, and let this be conditional on local corruption levels. Since Swedish municipalities are responsible for, for instance, zoning and planning, inspections and granting of permits, and a broad range of public procurements, local authorities are essential for business owners (e.g. Acs et al., 2008b; Fölster et al., 2016). Employing local government corruption as the independent variable thus makes it possible to link the quality of local institutions with the decisions of latent entrepreneurs.

Nested logit models of new entrepreneurs' start-up and location choices reveal that even in a low-corruption context such as Sweden, perceptions of corruption are associated with lower levels of entrepreneurial entry. However, we find that close to a quarter of all entrepreneurs choose to start businesses outside their municipality of residence. That said, when they do, contrary to expectations, they tend to relocate to municipalities where corruption is relatively higher. In the concluding discussion, we speculate on these counter-intuitive patterns based on the observation that relocating entrepreneurs are more often younger males in the highest income quartile.

The paper contributes to the literature on corruption and entrepreneurship in three distinct ways. First, by departing from the dominant cross-country approach and focusing on within-country variation in local government corruption, we elucidate how such variations are associated with both the rate of new start-ups and whether latent entrepreneurs shun their home municipalities and locate businesses elsewhere. This is an important contribution given that the literature on local economic development has shown that local conditions are crucial for businesses to develop and flourish (e.g. Fritsch & Wyrwich, 2018; Wood & Valler, 2004). Second, we contribute by elucidating the micro-mechanisms underlying the well-established relationship between corruption and rates of entrepreneurship. This micro-level approach, which combines individual-level data with a focus on variations in perceived local government corruption, allows us to examine the extent to which differing levels of corruption within a single country—sharing legislature, institutions, and business conditions at large—lead to within-country redistribution of new start-ups between municipalities (Acs et al., 2008a). While we overall find results consistent with the mainstream theory of corruption-dampening entrepreneurship, we also find that a minority of entrepreneurs choose to locate their start-ups outside their home municipalities. These findings serve as one of the first attempts to reconcile the two predominant theories of corruption and entrepreneurship at the subnational level, with implications for research on the local and regional conditions for entrepreneurship (Acs et al., 2008b; Davidsson et al., 1994; Fritsch & Wyrwich, 2018) and theories of 'institutional competition' across regions (e.g. Boschma & Frenken, 2011; Bergh & Höijer, 2008). Third, by using detailed register data, our analyses of start-up and location choices are based on objective data on actual business start-ups. This high-quality operationalisation

of entrepreneurship thus has stronger internal validity than survey-based, self-reported data on nascent entrepreneurship, i.e. data that is based on individuals' intentions to start a business (McMullen et al., 2016).

Our findings that moderate levels of corruption may impact entrepreneurship even in low-corruption countries have important policy implications. Through simulations of estimated marginal effects, we show that if the corruption levels observed in 2014 would be one standard deviation lower in all municipalities, an average annual start-up decision of new entrepreneurs in the magnitude of 2.6 percent higher would be expected—corresponding to almost 500 new firms. We find that these effects are most pronounced in municipalities with relatively high corruption levels. Ultimately, the findings emphasise the importance of thoroughly examining local government corruption, even in societies traditionally viewed as spared from corruption problems.

2 Theory and hypotheses

A core tenet in institutional research on entrepreneurship is that the rate of entrepreneurship is shaped by institutional factors that may either provide an attractive environment for start-ups or impose barriers on them (Bosma et al., 2018; Urbano et al., 2019; Aidis et al, 2012). Corruption is thought to discourage entrepreneurial efforts by increasing the marginal costs of setting up a new firm due to unfair competition, institutional uncertainty, and a general reduction of trust. While heightened marginal costs may be rationally discounted if officially regulated and transparent, when such costs stem from corruption, they increase the risk premium for business investments since entrepreneurs and investors cannot ex ante assess whether they will be allowed to enter a market or how much this could cost, which leads to institutional uncertainty (Bylund & McCaffrey, 2017; Avnimelech et al., 2014; Baumol, 1990). Without stable business conditions and entrepreneurs being able to count on impartial case handling by public officials, individuals will be reluctant to invest their time and money in entrepreneurial endeavours that might fail due to arbitrary case handling (North, 1991).

The profound importance of a law-abiding society is highlighted by the fact that corruption explains much of the variation in economic growth between countries (Mauro, 1995). An important and regularly highlighted aspect of this association is corruption's deterrent effect on entrepreneurship (Acs et al., 2012; Bosma et al., 2018; Tanzi & Davoodi, 1998). For instance, Anokhin & Schulze's (2009) cross-national study of 64 countries between 1996 and 2002 found that corruption decreased both start-up rates and innovation. When Costa & Mainardes (2016) combined individual and country data in 53 countries, they found that corruption had a negative effect on both entrepreneurship and entrepreneurial intentions. Similar findings are reported by Dutta & Sobel (2016) and Avnimelech et al. (2014).

That said, a more limited strand of research suggests that corruption can actually *increase* entrepreneurship, particularly in highly corrupt and regulated economies. This contrasting view is underpinned by the 'grease the wheels' hypothesis, which suggests that minor or modest levels of corruption may ease the establishment of new businesses in settings with significant regulatory burdens by legitimising minor bribery and making rules and legislation 'negotiated' by public officials (Dreher & Gassebner, 2013; Mohamadi et al., 2017)—mechanisms not unlike the role that corruption allegedly played in economic development in the 1960s (e.g. Huntington, 1968; Leff, 1964).

While the bulk of country-comparative studies finds that corruption inhibits entrepreneurship, far less is known about this association at the subnational level. This is both empirically and theoretically consequential for theories of corruption and entrepreneurship because local authorities are often responsible for implementing business regulations, permits, and zoning laws, as well as business taxation. The few studies that examine local corruption rates and their association with the density of establishments or small businesses generally support the 'sand in the wheels' theory, showing that local corruption has a deterrent effect on new business creation in US states and counties (Aghion et al., 2016) as well as EU meso-regions (Nistotskaya et al., 2015). However, some studies, such as Bologna & Ross' (2015) study on corruption in municipal governments in Brazil, find that while higher corruption is associated with fewer establishments overall, this association

is non-significant or even positive in highly corrupt municipalities, lending some support to the 'grease the wheels' hypothesis.

Nonetheless, these studies exclusively examine the net rates of existing or new businesses rather than entrepreneurial entry decisions, and they do not account for the possibility that entrepreneurs may locate their businesses away from their home municipality to areas where they perceive business conditions to be more beneficial (McMullen et al., 2016). Hence, there remain important gaps in the literature when it comes to explaining how variations in local government corruption may affect entrepreneurship, especially regarding the spatial nature of entrepreneurship. To fill this gap, we next draw upon theories of decentralisation from political science and institutional economics to develop predictions about how local corruption in highly decentralised settings may affect both entrepreneurial entry and where entrepreneurs choose to locate their start-ups.

2.1 How local government corruption affects latent entrepreneurs

Decentralisation is generally thought to decrease corruption through increased transparency, and hence accountability, relative to centralised systems (e.g. Arikan, 2004; Fisman & Gatti, 2002). Classical economic theories on fiscal federalism assume that competition between municipalities, which decentralisation is supposed to encourage, forces local governments to carry out their operations more efficiently (e.g. Oates, 1972; Tiebout, 1956). However, the upshots of decentralisation have been debated. Empirical evidence on its benefits is inconclusive (Smoke, 2015; Treisman, 2007), and some argue that to reap the positive effects of decentralisation, the quality of subnational institutions must be high (e.g. Rodríguez-Pose & Muštra, 2022). In decentralised settings where institutions are weak, there may be ample opportunities for corrupt conduct in local government, for instance when mechanisms for oversight, scrutiny, and local accountability are lacking. Moreover, local elites may be subject to pressing demands from interest groups and/or intimate ties to friends and relatives (Prud'homme, 1995). Furthermore, the institutional competition assumed to follow from decentralisation may not always be positive from an anti-corruption perspective. It might give

rise to adverse effects, such as local authorities offering subsidies, tax cuts, or other forms of preferential treatment to sponsor existing firms or attract relocating plants (King et al., 1993).

Although competition may be desirable if it encourages efficiency, an alternative expectation is that it might be destructive for 'free competition' between incumbent and potential new entrants in circumstances where local decision-makers engage in preferential treatment of specific companies (Baumol, 2002). While favourable treatment increases uncertainty among new entrants, it could also have the unattractive feature to tempt such outsiders to attempt to bribe their way into local markets (Baron et al., 2018). Such acts of corruption could be easier to engage in locally compared to at the state level, since local officials oftentimes have more discretion than their national-level counterparts (Wang, 2020). Hence, scholars have highlighted decentralisation as potentially generating *more* corruption at local or regional levels, as opposed to the national one (e.g. Shleifer & Vishny, 1993).

Decentralised economies with a large public sector and voluminous public spending have been claimed to be particularly susceptible to corruption (Alesina & Angeletos, 2005; Bergh et al., 2016). In Sweden and other decentralised economies—such as the Nordic countries, Australia, Germany, the UK, or the USA—municipalities may be responsible for zoning and planning, inspections and granting permits, and grants and subsidies, in addition to handling much public procurement. These areas have been pinpointed as particular danger zones for corruption (Transparency International, 2020; Masters & Graycar, 2016; Von Maravic, 2006). Unsurprisingly then, looking at Sweden in particular, many of the exposed high-profile corruption scandals here have taken place in local government (e.g. Amnå et al., 2013). Moreover, again and again, survey data has indicated that Swedes believe that corruption is more prevalent in local government than at the state level (Erlingsson, 2022). In affluent developed economies, so-called need corruption related to extortive bribery is close to non-existent, but there are scandals related to 'greed' corruption—where bribes are offered to win contracts, buy public property below market value, or obtain permits illicitly (e.g. Bauhr, 2012). All in all, these examples underscore that in developed economies, decentralisation can result in significant

variations in institutional quality at the local level (e.g. Broms et al., 2019; Erlingsson & Lundåsen, 2021).

Following the view that decentralisation may open up opportunities for corruption in an otherwise low-corruption institutional setting, we expect that variations in institutional quality will affect entrepreneurship, given that (potential) entrepreneurs tend to form strategies suitable for the opportunities and limitations stemming from their institutional environment (Estrin et al., 2013). This notion has found some support from recent studies. For example, Sobel's (2008) cross-sectional study of US states finds that institutional quality increased 'productive' forms of entrepreneurship such as new patents (proxy for innovativeness), new capital investment, and new establishments, but decreased 'unproductive' entrepreneurship in the form of lobbying organisations and lawsuits. Similarly, a perceived lack of impartiality in local government institutions is expected to affect the incentive structures of latent entrepreneurs due to unfair competition from publicly owned enterprises (Bergh et al., 2021), lack of impartiality relating to zoning laws, questionable public procurements and irregularities in inspections, and granting of permits or licences (Graycar & Villa, 2011).

In line with the dominant 'sand in the wheels' view, and the view of deregulation as a cause for potential cross-municipality variation in corruption rates, we thus expect the presence of corruption in a given municipality to affect incentives for entrepreneurship by increasing uncertainty and entry costs. Following Bauhr's (2012) notion of 'greed corruption', we expect corruption to give an illicit advantage to a few connected firms that facilitates bribes at the expense of the majority of firms (see also Kalyuzhnova & Belitski, 2019). When corruption benefits a minority of firms at the expense of their competitors, this is expected to lower entrepreneurship. If entrepreneurship is believed to be influenced by corruption and not solely business viability, it is primarily a barrier to entry for latent entrepreneurs who seldom have the connections or resources needed to benefit from corruption. While established MNE:s and incumbents rarely have to resort to bribes to get favourable business conditions for new-plant locations (Devereux et al., 2007; Genschel & Schwarz, 2011), we mainly expect corruption to discourage latent entrepreneurs as it puts them at a disadvantage compared

with insiders who illicitly influence decision-makers for illicit gains (Audretsch et al., 2022a, 2022b), for instance to win procurement contracts (Locatelli et al., 2017; OECD, 2014). Based on this assumption, we test two hypotheses. The first concerns what we call the 'hometown effect':

> **H1**: local government corruption in latent entrepreneurs' home municipalities makes them avoid entrepreneurial entry in their municipalities of residence.

Since we focus on within-country variations in perceptions of corruption at the local level—as opposed to the aggregate national level—the presence of corruption in a given municipality might not deter entrepreneurs from starting businesses altogether. In institutional economics, a longstanding argument in favour of decentralisation is that it is expected to foster healthy 'institutional competition' between subunits, a healthy competition which could benefit municipalities associated with lower corruption. If latent entrepreneurs perceive the corruption-related costs and hurdles to setting up a new business in their municipality of residence—plausibly, their primary location choice—as being too high, they can either abandon their business idea altogether or choose to exploit it in a different locality where they expect corruption to be less prevalent. In this sense, the quality and transparency of local institutions provide nascent entrepreneurs with an 'option to exit' from the status quo of current business conditions in the local municipality (Hirschman, 1990).

Earlier studies probing such arguments have primarily relied on experimental methods and used self-reported intentions and perceptions. For example, in a behavioural discrete choice experiment, Malone et al. (2019) found that owner-managers responded adversely to institutional barriers such as mandatory licencing. In a vignette experiment, McMullen et al. (2016) asked 204 entrepreneurs and 125 corporate executives who were randomly selected across the USA to rank the attractiveness of specific geographic locations for their start-up, as well as their self-reported assessment of their likelihood of choosing each geographic location for their start-up as a function of regulations, amenities, business support services, costs of living, and relocation costs. They found that entrepreneurs were generally more favourable to

new locations than executives, but also more sensitive to relocation costs. These results strongly indicate that although nascent entrepreneurs may shun relocation costs, they are sensitive to the quality of local institutions compared to those in other localities.

Based on these arguments of perceived costs and hurdles for setting up a new business related to corruption locally versus elsewhere, we hypothesise that entrepreneurs in high-corruption municipalities should be more likely to locate their start-ups in municipalities that offer low-corruption conditions. A higher level of perceived corruption in any given municipality is thus expected to make new entrepreneurs more likely to establish their business in neighbouring municipalities characterised by fairer competition and impartial treatment by public officials. Our second hypothesis probes the presence of such a 'relocation effect':

H2: latent entrepreneurs relocate their entrepreneurial entry from home municipalities with higher perceptions of local government corruption to municipalities with lower perceived corruption.

3 Data and empirical strategy

3.1 Data

Data

Our objective is to examine the basis of entrepreneurial actions, here understood as moving from employment to entrepreneurship, in one's own municipality of residence or in a different one. We examine whether local government corruption, in an individual's home municipality as well as other municipalities, has an impact on either or both of these decisions. This is done by combining matched employee-employer register data on the full Swedish working population with a survey on local corruption perceptions. Our individual and firm-level data is gathered from anonymised registers provided by Statistics Sweden. Data on individuals and firms comes from the Longitudinal Integration Database for Health Insurance and Labour Market Studies (LISA). In addition, we use data from the geographical database 'Geografidatabasen' (GEO), the business database 'Företagsdatabasen' (FDB), and 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 is created from a survey sent to all local government councillors (described below under 'independent variables'). Data on municipal-level control variables are collected from Statistics Sweden and register data.

We examine new entrepreneurs' start-up and location choices in 2014 based on attributes of municipalities, sectors, and individuals in 2013. We focus on a population of individuals that had employment in 2013 but who were not business owners at this time. Since we want to examine if these individuals change labour market status from being employed in 2013 to becoming owner-managers the following year, we observe start-up and location choices in 2014. The choice to focus on a single year stems from the fact that the data underlying the corruption index we use was collected in 2012–2013. The drawback with a cross-sectional approach is that it estimates associations and thus puts limitations on claims to causal inference. A cross-sectional approach focusses on comparisons between units (here municipalities) and has an increased risk for omitted variable bias compared with a panel approach with fixed effect estimates. Nonetheless, a positive aspect, which decreases the risk for omitted variable bias in our case, is that Sweden is a unitary state with the same formal business regulations throughout the entire country. The unobserved heterogeneity between Swedish municipalities is therefore lower in comparison to the unobserved heterogeneity between countries. The type of variables that may cause omitted variable bias in our case are most likely related to differences in informal praxis of exercise of public authority, differences in local organisational cultures, and differences in informal entrepreneurial networks between municipalities. We mitigate problems of compositional effects and unobserved heterogeneity by including a wide range of control variables for both municipalities and individuals, including survey data on the communities' attitudes toward business and the municipal service toward businesses. The latter variables serve to control for variation in informal culture across municipalities, complementing structural variables such as population size and median income. We also estimate a range of robustness tests with alternative model specifications, presented in Appendix 3.

Another limitation of our approach is that our research design, like the bulk of studies on corruption and entrepreneurship, cannot rule out the risk for reversed causality. That said, based on theory and previous research, there is no strong reason to expect reverse causality between the start-up of businesses and corruption in the Swedish case. Nevertheless, one potential mechanism would be if a larger number of firms increase competition for municipal procurement contracts which in turn give increased incentives for firms to use bribery to win procurement contracts by illicit means. This scenario would mean that our estimates are biased *downward*, making our estimates more conservative. However, such reversed causality would mean that corruption levels in Sweden mostly are driven by firms' willingness to bribe rather than the public official's willingness to accept bribes—a scenario we find unlikely. Given that Sweden is a relatively low-corrupt country with strong anti-corruption norms within public administration, we expect variations in corruption levels to mainly be dependent on public officials' willingness to accept bribes.

A second scenario that could lead to reverse causality is if incumbents in municipalities with few competing firms are more resource strong and therefore are in a better position to influence politicians and public officials through bribes. This scenario would mean that market dominance facilitates corruption. However, we do not hold this mechanism as the most likely since the firms that already are incumbents would have small incentives to use bribery in situations with low competition.

The population studied is constrained to individuals aged 20–60 in 2014 who were employed in 2013, since individuals entering entrepreneurship from unemployment have been shown to have motivations often related to 'necessity' rather than 'opportunity' (Block et al., 2015; Folta et al., 2010). We also exclude individuals with missing information about either employment or workplace in 2013 or 2014 from the sample. The total population that met these criteria comprises 3,444,993 individuals, 17,631 of whom moved from employment to being full-time owner-manager(s) of a newly founded incorporated business in 2014. Next, we describe and motivate our modelling strategy, followed by an overview of the variables included. Detailed variable descriptions and

descriptive statistics are presented in Appendix 1 (Table 3 and Table 4).

3.2 Modelling strategy

To test our hypotheses, it is insufficient to solely examine whether individuals start a business, conditional on corruption levels in their home municipality. Such a design may overlook the possibility that individuals locate their businesses elsewhere. Hence, our main modelling strategy takes inspiration from the location choice literature in entrepreneurship (Carias et al., 2022; Dahl & Sorenson, 2009) to estimate a discrete choice model (McFadden, 1981). We thus simultaneously model individuals' start-up decision based on corruption levels in *both* their home municipality and other municipalities.

Discrete choice models are designed to model such situations when the outcome consists of choices between several non-quantifiable alternatives. The outcome in our model is the individual's decision whether to enter entrepreneurship as a full-time activity by starting a new independent firm in any of Sweden's 290 municipalities in 2014. A no-business option is also included in the choice set, meaning that the complete choice set consists of 291 options. We model that the individual faces two sequential decisions that are nested in each other, the first being the decision to enter entrepreneurship or not, and the second being the location choice alternative for those who start a new business (locating the start-up in any one of 290 municipalities, see Dahl & Sorenson, 2010). Since the alternatives involving starting a business at a specific location are more similar to each other compared with the decision not to start a business, this is likely to violate the Independence of Irrelevant Alternatives (IIA) assumption. We therefore apply a nested logit model (McFadden, 1981), which is appropriate for such nested choice situations that include a 'no-choice' alternative (Vermeulen et al., 2008). Our nested logit model has one degenerate 'nest' that includes the no-business option only and one other 'nest' that includes all 290 Swedish municipalities as a potential location for a new business. The IIA is only assumed to hold within the nest that includes start-up location choices but not between the 290 start-up alternatives and the no-business option.

The nested logit model relies on the assumption that decision-makers have a utility function for the

alternatives under study where the pros and cons of each alternative are decomposable to an additive set of characteristics—in our case, municipality-level characteristics. The independent variables represent characteristics of choice alternatives. Choice probabilities (and coefficients) are estimated based on relative differences in the values of the independent variables. The utility that an individual would receive from starting a business in municipality m can be expressed as:

$$U_m = BX_{mn} + \varepsilon_{mn} \tag{1}$$

where m indexes alternatives (municipalities) and n indexes nests. X_{mn} is a vector of attributes specific to each municipality, B denotes the weights assigned to each of the municipal-specific attributes, and ε_{mn} is a random disturbance term that represents uncertainty regarding the utility that each individual assigns to each alternative. The probability that alternative m is chosen from nest n is calculated as:

$$P(m,n) = P(m|n) * P(n) \tag{2}$$

where:

$$P(m|n) = \frac{e^{BX_{mn}}}{\sum_{i \in n_i} e^{B_n X_{mn}}}$$

is the probability of selecting alternative m within nest n, and

$$P(n) = \frac{e^{\lambda V_n}}{\sum_{i \in n_i} e^{\lambda V_n}}$$

is the probability of choosing nest n. λ is the dissimilarity coefficient and $V_n = \ln\left[e^{\sum_{m=1}^{M_n} X_{nm}\beta}\right]$ is the inclusive value for nest n. In line with common recommendations, the no-choice alternative of not starting a business is coded as a series of zeros for all municipal-specific attributes (Vermeulen et al., 2008). This means that the inclusive value V_n is zero for the 'not starting a business' choice option.

Nested logit models are computationally demanding. We therefore estimate our model on a choice-based sample comprising all 17,631 individuals who started a new incorporated firm together with 120,000 randomly drawn individuals who did not start a firm (Ben-Akiva & Lerman, 1985: 232–239; Wennberg et al., 2006). To compensate for the difference in sample size between these two groups and to produce

unbiased estimates, we estimate the model using the weighted exogenous sample maximum likelihood (WESML) function (Ben-Akiva & Lerman, 1985). WESML weighs up under-sampled alternatives and downweighs oversampled alternatives to yield consistent estimates of parameters (Manski & Lerman, 1977). This is achieved by using weights that are proportional to each observation's probability of being included in the sample.

3.3 Dependent variable: simultaneous start-up and location choice among entrepreneurs

We operationalise entrepreneurship at the individual level by identifying persons who transitioned from being employed in 2013 to becoming full-time owner-managers of a new incorporated business in 2014. All firms are not expected to be equally affected by policies and decisions from local government (e.g. Kalyuzhnova & Belitski, 2019; Kalyuzhnova et al., 2022). Incorporating a new firm involves larger investments and several employees, meaning that incorporations are also more likely to be dependent on municipalities' decisions regarding permits, procurement, zoning, and so forth. We thus only include incorporated businesses which are also argued to be more growth-oriented (Fairlie & Miranda, 2017; Levine & Rubinstein, 2017) while unincorporated firms are associated to a higher degree with less entrepreneurial forms of self-employment (Henrekson & Sanandaji, 2020).

We identified owner-managers of new businesses with the variable 'Arbetstalln' from the LISA database. Our operationalisation of new owner-managers included individuals who went from being employed in 2013 to being the owner-manager of an incorporated business in 2014. We identified 18,048 individuals as owner-managers for 15,374 new firms in total, indicating that a sizeable minority of start-ups are teams (Held et al., 2018). If a business was jointly founded and operated by two or more individuals, all identified owner-managers were included in our analysis as 'entrepreneurs' (Baptista et al., 2014). We excluded a minor number of start-ups for which more than five entrepreneurs were identified as owners of the same firm (417 individuals affiliated with 34 unique firms),[1] resulting in a sample of 17,631

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[1] Robustness tests including these start-ups with more than five founders show no substantial impact on the reported results.

owner-managers and 15,340 unique firms. To exclude lifestyle businesses and start-up decisions that may not be strongly affected by local institutions, we only focused on firms for which the owner-manager received their primary source of income from running that business. Hence, cases of so-called hybrid entrepreneurship were excluded (Burke et al., 2008; Folta et al., 2010).

3.4 Independent variable: 'local government corruption index'

Our main independent variable is an index that aims to gauge the occurrence of bribery in local government. The index aligns with the most widely used definition of corruption as 'abuse of public office for private gain' (Rose-Ackerman, 1978) and is, for all intents and purposes, comparable with the widely used corruption indices provided by the World Bank and Transparency International—i.e. indices that have been developed for the country level (cf. Lambsdorff, 2006). The index we employ was created by Dahlström & Sundell (2013). It is based on a survey sent to all 13,361 councillors represented in Sweden's 290 municipalities in 2012–2013. The overall response rate was 78 percent.

The index is based on questions asking whether the respondent believes that bribes had been offered during procurement processes, and whether a civil servant had been paid to perform duties they otherwise would not have.[2] Higher scores on the index imply relatively higher degrees of arbitrariness, implying higher uncertainty over starting a business in a given municipality. An upshot with the index is that by surveying the complete population of local councillors, the survey includes enough responses within each municipality to calculate mean values from respondents within every municipality in a meaningful way. Dahlström and Sundell (2013) analysed the validity of their index and found that it correlated with newspaper articles reporting about alleged bribery as well as judicial bribery charges. The index's major

strength is the large number of respondents from each municipality, combined with the fact that councillors are expected to have unique local knowledge, insights, and potentially also experiences of various types of irregularities. Based on the arguments above, we maintain that Dahlström and Sundell's index constitutes an appropriate proxy for municipal corruption given the purpose at hand. Since we expect it to be a valid proxy for actual corruption, we expect potential entrepreneurs to have information about, and react upon, the alleged corruption within their municipality of residence.

Figure 1 depicts the variation in corruption levels between Swedish municipalities, with darker shading denoting higher corruption levels. The figure shows that while corruption levels in Swedish municipalities are generally low, there is a non-negligible variation in corruption. The highest perceived corruption levels (above 3) are found in Solna, Norrköping, Falun, and Gothenburg—municipalities that all were subject to exposed irregularities in relation to building projects around the time when the survey was conducted.

3.5 Municipal-level control variables

We include a wide range of theoretically salient municipal-level control variables to control for municipality-level factors known to affect the likelihood of local start-ups:

(ln) Population size reflects local market size and demand for goods and services in the municipality (Davidsson et al., 1994; Larsson et al., 2017).
Population growth: identification of business opportunities tends to be higher in growing areas due to agglomeration of knowledge and likelihood of knowledge spillovers (Acs & Armington, 2004).
(ln) Income per capita: higher local levels of income increase the demand for goods and services, suggesting greater opportunities for new firms (Davidsson et al., 1994).
Proportion of service sector employees: in all countries, more businesses tend to be started in the private service sector. We therefore control for the relative size of this sector (in employees) among all employees in the municipality (Braunerhjelm & Borgman, 2004).
Proportion of public sector employees may affect entrepreneurship by decreasing demand for new

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[2] 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.'.
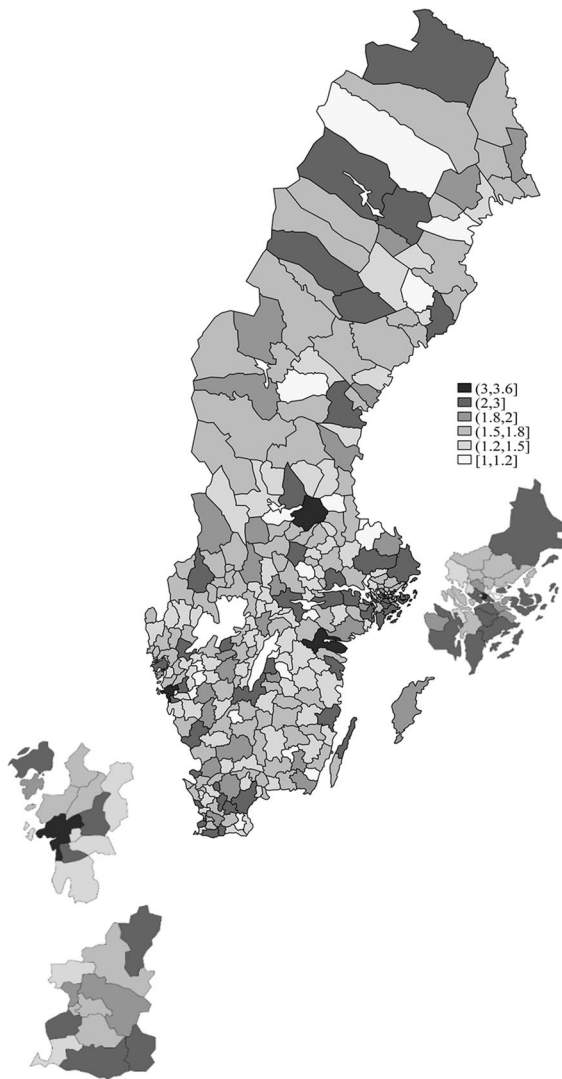
Fig. 1 Variation in the corruption index at the municipality level in Sweden. The observed values range from 1.05 to 3.55 points on a 7-point scale. Darker shades indicate higher levels of perceived corruption in the municipality. The three largest cities of Sweden and their surrounding municipalities are depicted in three enlarged maps (Stockholm to the right, Gothenburg upper-left, and Malmö bottom-left)

products and services (Aidis et al., 2012; Larsson et al., 2017). We control for the relative size of the public sector (in employees) among all employees in the municipality.

Community attitudes toward businesses: entrepreneurship is also affected by the degree of supportive community attitudes toward businesses (Bird & Wennberg, 2014; Westlund et al., 2014). We meas-

ure this using a unique attitude-based survey conducted annually by the Confederation of Swedish Enterprise (2014) based on surveys with 31,000 business managers. The question that is relevant for our purpose asks respondents: 'On a scale where 1 is "very negative" and 5 is "very positive", how do you consider the public's attitude toward small businesses in your municipality?'

Municipal service: red tape is also a potential obstacle to entrepreneurship (Ciccone & Papaioannou, 2007; Mohamadi et al., 2017). We measure this using a unique attitude-based survey conducted annually by the Confederation of Swedish Enterprise (2014) based on answers from 31,000 business managers. The question used to measure perceptions of red tape asks respondents: 'On a scale where 1 is "very negative" and 5 is "very positive", 'how do you consider the municipality's service to businesses in your municipality?'

Proportion of business owners (incorporated firms): occurrence of small firms is 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).

Rural municipality: rural municipalities offer a different kind of business environment compared to urban ones. On the one hand, urban areas provide economically more supportive environments than rural areas since resources are more easily accessible for new firms (Braunerhjelm & Borgman, 2004). On the other hand, rural municipalities offer favourable network opportunities for family firms with close connections to the local community (Bird & Wennberg, 2014). We classified municipalities as rural according to a variable provided by Statistics Sweden that comprises 10 categories of urbanisation, where 8 denotes a 'rural municipality'.

Tourism municipality: municipalities with a flourishing tourism industry offer many business opportunities in the service sector that are suitable for small businesses. We classified municipalities as tourism municipalities according to the Statistics Sweden urbanisation variable described above, where 6 denotes a 'tourism municipality'.

Start business dummy: our independent variables are coded as a series of zeros for the 'not start business' alternative. This may lead to biased estimates

unless we include a dummy that accounts for differences in baseline probabilities between the 'not start business' alternative and the other alternatives (Kamakura et al., 2001). We thus include a dummy variable taking the value 1 for all alternatives that involve the start of a business and 0 for the 'not start business' alternative.

3.6 Sector-level control variables

(ln) Competition: competition is an important factor for the future profit prospects of a firm. We account for this by including Glaeser et al.'s (1995) standardised measure of competition within an industry. The value is above 1 for municipalities where the industry is more competitive than the national average and below 1 for industries that are uncompetitive or dominated by a few large firms.[3] It is defined as follows:

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

(ln) Owner-manager 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 for the average income among owner-manager entrepreneurs in the sector where individuals were working in 2013 as a proxy for their expected income from a potential start-up decision in 2014.

Sector's share of the local economy: businesses are more likely to be started within established sectors, since exposure to existing organisations provides entrepreneurs with tacit knowledge, important connections, and self-confidence (Sorenson & Audia, 2000). For each municipality (alternative), we control for the relative size of the sector where owner-managers were working in 2013. This was calculated as the number of employees aged between 20 and 60 in the specific sector divided by the total

number of employees aged 20–60 in the entire municipality.

Dummy for sector in 2013: we include interactions between six dummies for the sectors where each individual was employed in 2013 and the 'start business dummy'. These interactions account for the fact that individuals in different sectors have different baseline probabilities of starting a business. The sector dummy variables take the value 1 for each individual's sector of work in 2013. The included sector dummies are Construction, Business Services, Retail, Manufacturing, Information and communication, and Other.

3.7 Municipal-individual interaction variables

County of birth: we include a dummy for municipalities within the county where individuals were born. It accounts for the fact that the proximity of family and friends may increase the likelihood of choosing a start-up location (Baltzopoulos & Broström, 2013).

(ln) Distance: we follow common practice for conditional choice models by including a measure of the Euclidian distance between the centre of each municipality and the individual's home address (Dahl & Sorenson, 2009). This variable accounts for social and economic costs stemming from starting a business elsewhere.

Not residence: previous research has found that individuals are embedded within their communities and value proximity to family and friends (Dahl & Sorenson, 2009). We control for individuals' attachment to their hometown by including a dummy that distinguishes the municipality of residence from other municipalities.

4 Results

Table 1 provides a descriptive overview of the location of new Swedish start-ups in 2014. It is obvious that, as a rule, entrepreneurs choose to start businesses in their home municipality. Only 25 percent of new start-ups in 2014 were located outside the municipality where the founders resided in 2013. The third row of Table 1 reveals that the subset of entrepreneurs who located their start-up outside their home municipality in 2014,

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[3] It was not possible to calculate a competition value for all markets in all municipalities. For example, some municipalities had no private businesses within those sectors that have traditionally been the domain of the public sector. In these cases, the competition value was set to 1.

Table 1 Number and location of entrepreneurs in new incorporated firms in Sweden, 2014

Entrepreneurs	17,631
Outside home municipality	4045 (23%)
Average relocation distance (km)	82
Median relocation distance (km)	29
Within county of birth	9104 (48%)

Note. Average and median relocation distances are only calculated for firms established outside the entrepreneur's home municipality

chose on average a location 82 km (51 miles) from their own municipality of residence in 2013, which is well within daily commuting distance. While the average relocation distance is longer than the typical distance between neighbouring municipalities in Sweden, it is inflated by outliers. The median relocation distance among entrepreneurs who establish their start-ups away from home is 29 km (18 miles), implying that the majority of relocators found their start-up in an adjacent municipality.

The figures in Table 1 are indicative of that entrepreneurs are 'geographically embedded' and tend to start businesses close to where they reside (Dahl & Sorenson, 2009). The bottom row of Table 1 also shows that about half of all entrepreneurs start their business in the county where they were born. Nevertheless, a non-negligible number of entrepreneurs do locate their start-up in municipalities other than their home municipality. This motivates our modelling strategy, which models entrepreneurship as a decision driven by conditions in both one's home municipality and in neighbouring municipalities.

4.1 Nested logit models of entrepreneurs' start-up and location choice decisions

We next report results from the nested logit model analyses of how corruption perceptions impact entrepreneurs' start-up decisions and location choices. As explained in the "3.2" section, the models are estimated on a choice-based sample comprising all 17,631 individuals who started a new incorporated firm together with 120,000 randomly drawn individuals who did not start a firm.

Table 2 shows results from the nested logit models. The dissimilarity coefficient at the bottom of Table 2

is in the interval [0–1] for all models, confirming that the models are consistent with the assumptions of random utility maximisation (RUM). All coefficients are displayed as log odds, meaning that values lower (higher) than 0 imply a lower (larger) probability of starting a business. The dependent variable in model 1 consists of 291 different location alternatives including each of Sweden's 290 municipalities, and the 'null' (baseline) choice of not starting a business. To test our hypotheses, we include an interaction between the 'corruption index' and the 'not residence' dummy since this allows us to separate between the role of corruption in the home municipality (the non-interacted coefficient) and other municipalities (the non-interacted coefficient + the interacted coefficient). Our first hypothesis (H1) predicted that higher corruption perceptions in an individual's home municipality are associated with their lower likelihood of entrepreneurial entry. The non-interacted corruption index variable has a log-odds coefficient of -0.106 ($p < 0.01$), supporting the 'hometown effect' (H1) where local corruption perceptions are negatively related to the individual's propensity to start a business in their home municipality. Hence, 'local entrepreneurs' are discouraged by corruption.

We next turn to examine H2, which predicts that corruption perceptions will be associated with entrepreneurs' location choices, drawing them away from higher corruption municipalities and toward those that are less corrupt. Since we found in model 1 of Table 2 that local corruption can deter latent entrepreneurs, it might be the case that entrepreneurs who are discouraged by corruption simply avoid dealing with officials in their municipality of residence by locating their start-ups in relatively less corrupt municipalities. To test this, we analyse the interaction between the corruption index and the dummy for 'not residence'. The interaction term between the corruption index and the dummy 'not residence' municipalities is 0.16, meaning that the log odds for starting a business outside the home municipality is 0.057 ($-0.106 + 0.163$). H2 is thus rejected: relocating entrepreneurs, who to start a business outside their own home municipality, are more likely to select municipalities with relatively higher levels of corruption. This is a somewhat surprising result. In the "5" section below, we elaborate on potential explanations for this heterogeneity.

Table 2 Nested logit models on new entrepreneurship in incorporated independent businesses

	Model 1 Full choice sample	Model 2 Own county + neigh- bouring municipalities
Hypothesised relationships		
H1: corruption index	−0.106** (0.040)	−0.121* (0.054)
H2: corruption index × not residence	0.163*** (0.053)	0.200*** (0.072)
Control variables		
(ln) Distance (home municipality)	−0.183** (0.039)	−0.153*** (0.031)
(ln) Population size	0.098*** (0.028)	0.111** (0.035)
(ln) Population growth	0.001 (0.022)	0.014 (0.034)
(ln) Income per capita	−0.281* (0.140)	−0.194 (0.194)
Proportion of public sector employees	−0.125 (0.182)	−0.137 (0.265)
Proportion of service sector employees	0.090 (0.139)	0.088 (0.205)
Community attitudes toward businesses	0.047 (0.070)	0.044 (0.103)
Municipal service	−0.033 (0.053)	−0.038 (0.077)
Proportion of business owners	−0.001 (0.009)	−0.000 (0.013)
Rural municipality	0.104 (0.102)	0.1687 (0.159)
Tourism municipality	0.055 (0.067)	0.061 (0.010)
Sector's share of the local economy	0.006* (0.003)	0.009* (0.004)
(ln) Owner-manager income in relevant sector	0.062** (0.019)	0.086*** (0.020)
(ln) Competition	−0.006 (0.020)	0.002 (0.027)
County of birth	0.187*** (0.042)	0.024 (0.072)
Not residence	−0.859*** (0.201)	−1.091*** (0.241)
Start business dummy (SB)	−4.451*** (0.677)	−5.101*** (0.929)
Sector dummies × SB	Yes	Yes
Dissimilarity parameter		
Start business alternatives	0.166*** (0.034)	0.215*** (0.037)
Log pseudolikelihood	−5335	−4752
Akaike information criterion	10,720	9554
Number of individuals	137,631	136,557
(Aver.) number of choices	291	25.3

Note. Coefficients in log odds. Standard errors in parentheses. Significance: *$P<0.05$; **$P<0.01$; *** $P<0.001$

Most control variables exhibit the expected effects. 'Distance' is negatively associated with the probability of establishing a start-up in a certain location and the coefficient for 'not residence' is negative, confirming that most individuals start a business in their home municipality. The effect of 'population size' suggests that larger markets increase a municipality's attractiveness, while 'population growth' and 'income per capita' do not. 'Sector's share of the local economy' is positive and significant, suggesting that individuals are more likely to start businesses in municipalities where the sector they previously worked in constitutes a large share of the local economy. The control variable for 'owner-manager income in relevant sector' is statistically significant and positive, indicating that economic incentives make a municipality more attractive. However, the 'competition' variable is not statistically significant, suggesting that 'owner-managers expected income in relevant sectors' may be a related and more direct measure of the profit that can be expected from different business locations.

Identifying the realistic choice set of potential locations for each individual is not straightforward regarding entrepreneurs' location choices. On the one hand, entrepreneurs have the theoretical possibility to start their business in any of Sweden's 290 municipalities, and long migration distances are, in fact, observed in the data. On the other hand, entrepreneurs tend to be embedded in their current social environment, as shown in Table 1. To avoid that our result is driven by model selection, model 2 estimates a model with a specification identical to that of model 1 except with a choice set restricted to the home municipality, neighbouring municipalities, municipalities in the same county, and the baseline choice of not starting a business.[4] The size of the choice set varies depending on individuals' residency, with each set consisting of 25 alternatives on average. Coefficient values for the corruption index in model 2 remain similar to model 1. Although the assumed choice set is more constrained in model 2, the main result of interest stays the same; while corruption in the home municipality

is associated with a lower propensity to start a business there, there is also a 'relocation effect' to other municipalities with relatively higher levels of corruption (in this case, only neighbouring municipalities and municipalities in the same county).

The results indicate heterogeneity between 'local entrepreneurs' (who chose to start a business in the home municipality) and 'relocating entrepreneurs' (who chose to start a business outside their home municipality). A comparison of individual characteristics among these two groups of entrepreneurs (see Table 5 in Appendix 1) reveals that relocating entrepreneurs to a greater extent are male (79 percent versus 74 percent) and more often from the highest income quartile (60 percent versus 54 percent). Relocating entrepreneurs are also younger one average: 62.3 percent of the relocating entrepreneurs are younger than 45 versus 55.2 percent for the local entrepreneurs. This indicates that the difference in responses to incentives observed for local and relocating entrepreneurs may be explained by the different individual characteristics between these two groups.

4.2 Regional effects of corruption on start-ups: counterfactual simulations of predicted effects

We next present results from simulations that illustrate the net impact that various levels of corruption have on entrepreneurship for each municipality and the population at large, based on the results from model 1. To do this, we conduct simulations of the expected number of new entrepreneurs based on counterfactual corruption levels. Details on the simulations are found in Appendix 7..

Figure 2 depicts how higher or lower corruption levels in all Swedish municipalities are associated with the total number of new entrepreneurs in the entire country. Each step on the *x*-axis in Fig. 2 corresponds to one standard deviation change in corruption for all municipalities compared to their original corruption level. The graph shows that the predicted level of new start-ups is higher when corruption levels are lower, suggesting that the suppressive 'hometown effect' is dominant compared to the 'relocation effect' found for relocating entrepreneurs. The simulated effect of lower corruption levels is slightly nonlinear and more pronounced for lower corruption values. Compared to the observed corruption levels, a one standard deviation lower level of corruption is

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[4] One thousand and seventy-four individuals who started a business outside this restricted range had to be excluded since their actual location choices were neither in neighbouring municipalities nor within their home county.

Fig. 2 The predicted number of new entrepreneurs in Sweden at different levels of corruption
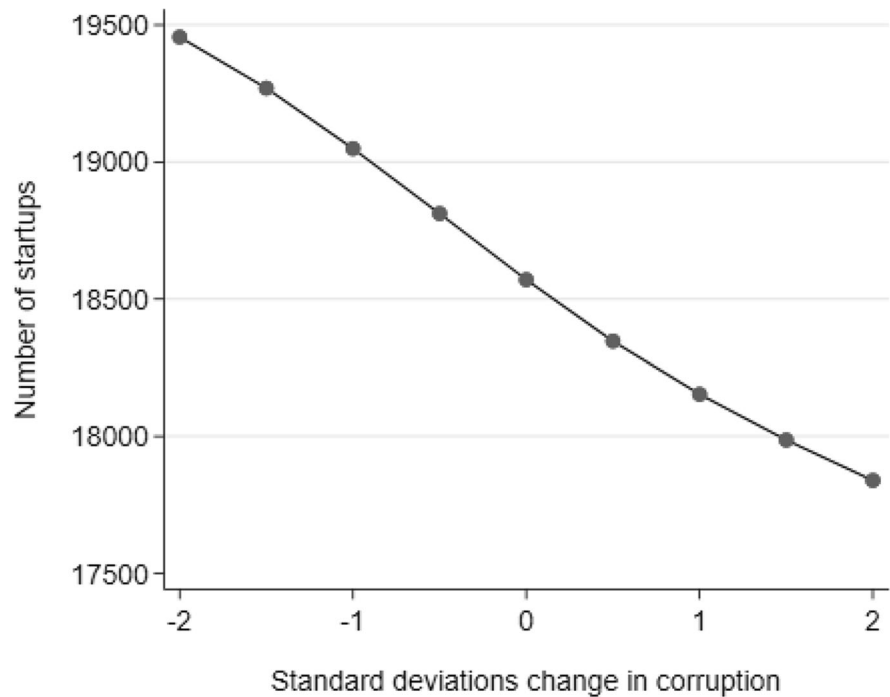

associated with a higher number of new entrepreneurs in a given year (from 18,571 to 19,049, 2.6 percent higher). While this aggregate relationship is quite moderate, one should bear in mind that from an international perspective, the baseline corruption among most Swedish municipalities is low. One could expect corruption-reducing policies to have a larger impact in contexts with higher corruption levels.

A local illustration of our findings' implications in a municipality with one of the highest corruption levels is provided in Fig. 3. The figure demonstrates the expected number of new entrepreneurs in Gothenburg for various counterfactual scenarios, with different corruption levels, in a given year. Gothenburg is Sweden's second-largest city and had the fourth-highest corruption level (3.26) in our data. The scale on the *x*-axis in Fig. 3 is based directly on the corruption index. The figure reveals a negative net impact of corruption on entrepreneurship in Gothenburg, further suggesting that the suppressive 'hometown effect' is dominant. If corruption levels in Gothenburg were identical to the average corruption level (1.66), the simulated estimates suggest that the entrepreneurship entry rate would be almost 11 percent higher (1522 instead of 1372) in a given year.

Figure 4 further distinguishes between the 'hometown' and 'relocation' effects for Gothenburg municipality. Figure 4A (on the left) shows how the number of new local entrepreneurs who start a business in their home municipality varies with different corruption levels. From the figure, it is clear that corruption is negatively related with local entrepreneurship. The curve resembles the one in Fig. 3, but the slope is steeper. Figure 4B illustrates the 'relocation effect' measuring the number of entrepreneurs who migrate to Gothenburg from other municipalities. As expected, the absolute number of relocating entrepreneurs is low compared to the number of instances where local inhabitants start firms. However, the predicted number of relocating entrepreneurs is expected to be higher at higher corruption levels. The number of entrepreneurs who relocate to Gothenburg is expected to be substantially fewer (202 rather than 328) if corruption levels would be on the country mean (1.66) rather than the observed value of 3.26. While this difference is large in percentage terms, it is rather small in absolute numbers, partly due to entrepreneurship entry being a 'rare event' in the overall population. On the whole, the 'hometown effect' thus dominates the 'relocation effect', even in municipalities with relatively higher corruption levels.

Fig. 3 The predicted number of new entrepreneurs in Gothenburg municipality at different levels of corruption. The first dot from the left depicts the predicted number of new entrepreneurs when the corruption index is equal to the average corruption level of 1.66. The last dot on the right depicts the predicted number of new entrepreneurs at the actual corruption level in Gothenburg (3.26)
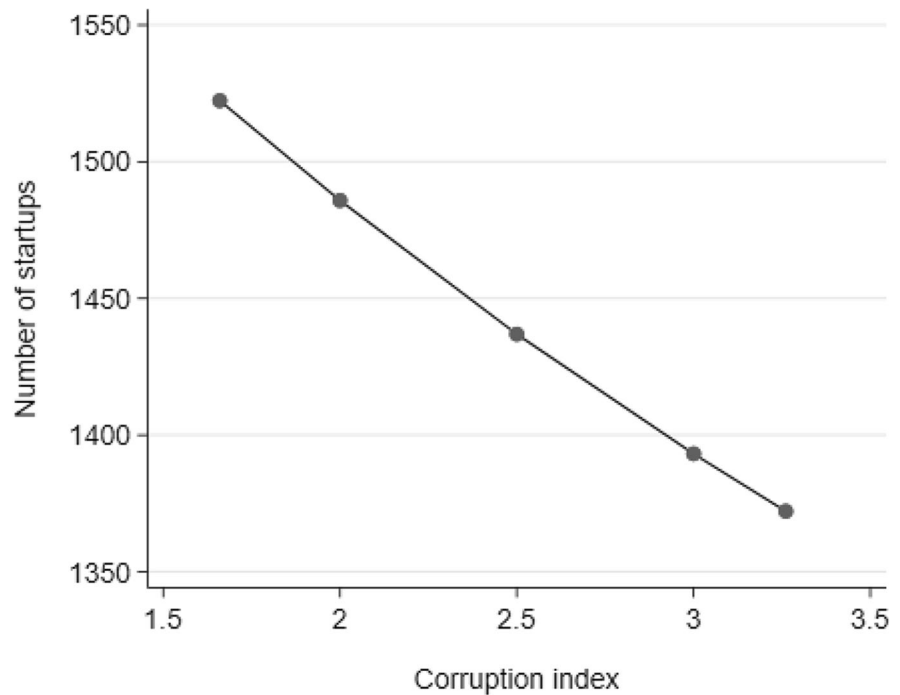
4.3 Robustness #1: multilevel logit model

To ensure our results are not affected by the specific model specification (nested logit), we conducted a robustness test by estimating multilevel logit models with standard errors clustered at the municipality level (details in Appendix 3, Table 6) using all 3,444,993 individual observations. The outcome in the logit models is individuals' probability of starting a business within their home municipality. The setup allows us to combine control variables at both the municipal and the individual levels. Given that this specification allows us to control for individual characteristics such as gender, age, income, and education (Parker, 2009), it also examines whether the main results are driven by compositional effects related to individuals' demographic profiles. Complete variable definitions are found in Table 3 in Appendix 1.
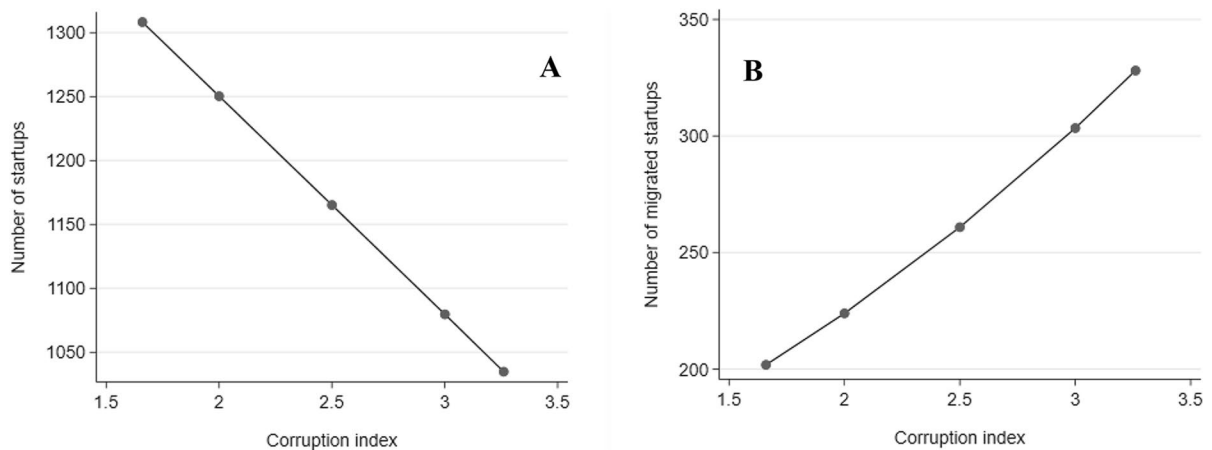

Fig. 4 Illustration of **A** the 'hometown effect' for Gothenburg municipality; **B** the 'relocation effect' for Gothenburg municipality

Table 6 in Appendix 3 includes two models: one with sector-specific dummies and one without. Our main test for H1 is the coefficient 'corruption index', which is negative and statistically significant in both models, indicating that local corruption perceptions are indeed negatively associated with individuals' likelihood of entering entrepreneurship within their home municipality.

In sum, the logit models of individuals' probability of starting a business in their home municipality support H1: corruption in a given municipality inhibits latent entrepreneurs from starting a business there. However, the logit model has a limitation given that it does not account for the possibility of a 'relocation effect' between municipalities. The next section provides another robustness check for our second hypothesis.

4.4 Robustness #2: conditional logit models with the individuals who did start a business

As a second robustness test, we estimated conditional logit models of the location choices of the 17,631 individuals who started a business in 2014. The setup of these models is similar to the nested logit models in our main analysis but includes only 290 alternatives: one for each municipality in Sweden. The 'not start business' alternative was, of course, excluded from these models. We estimated two models: one without weights and one where each individual was assigned a weight equal to their propensity to start a business. The weights in the latter model were calculated with propensity score matching, with the propensity to start a business as treatment. Both conditional logit models are presented in Table 7, Appendix 3. The results from these models are in line with our findings from the baseline nested logit models. In line with H1, corruption is estimated to be negatively related with entrepreneurship entry in the home municipality. However, relocating entrepreneurs who start their business outside the home municipality tend to relocate to municipalities with higher levels of corruption.

4.5 Robustness #3: industry heterogeneity

A key finding of our analysis is heterogeneity among entrepreneurs in their susceptibility to relocate their start-ups depending on perceived corruption levels.

We found that relatively young males, and those in the highest income quartile, are overrepresented among relocaters. However, it might be the case that entrepreneurs seeking to start their business in specific sectors are less able to relocate, for example based on unique resources or supply chains linked to a region, and hence continue suffering from corruption. To probe this potential source of heterogeneity, we have conducted a set of post hoc analysis comparing 'relocating entrepreneurs' with 'non-relocating entrepreneurs' in frequencies and ratios across different sectors (see Table 8, Appendix 4). Except from entrepreneurs active in industries where resources are strongly tied to the local land such as those active in 'Agriculture and forestry' (12% relocators) and 'Transportation and storage' (17% relocators), the ratio of relocating entrepreneurs across sector range is relatively uniformly distributed between 28% ('Hotels and Restaurants') and 20% ('Construction'). Hence, it does not seem to be the case that entrepreneurs seeking to start their business in specific sectors are significantly less able to relocate.

5 Discussion and conclusions

We set out to examine the relationship between local government corruption and entrepreneurship in the form of individuals' start-up decisions as well as their choices of business location. These patterns were examined in Sweden, a setting widely regarded as low-corrupt and permeated by rule of law. That said, Sweden is also one of the world's most decentralised countries (Ladner et al., 2021), with substantial local variations in business climate and economic-institutional factors (such as implementation of business legislation, zoning and building permits, inspections, granting of licences, and quality of public procurement). Exploiting a unique index of local government corruption, we found that corruption in local government deters latent entrepreneurs from founding start-ups in their home municipality, as hypothesised. However, contrary to our second hypothesis, we did *not* find that entrepreneurs chose to relocate from municipalities with high levels of corruption to environments with lower levels of corruption. Furthermore, and to our surprise, a minority of those

entrepreneurs locate their start-ups to municipalities with relatively high levels of corruption.

Among those relocaters, relatively young males, in the highest income quartile, were overrepresented. This might suggest that their more ample financial resources somehow 'insulate' them from the negative effects of corruption. Alternatively, if young male entrepreneurs are more risk-tolerant, they may not shun corruption to the same extent, and a few of them might even be drawn to rent-seeking opportunities found in relatively more corrupt municipalities. Further research on this specific minority of entrepreneurs, which chose to relocate to relatively more corrupt settings, is needed to parse out motivations and underlying mechanisms.

Our work contributes to the growing literature on corruption and entrepreneurship, as well as studies of local conditions for entrepreneurship. By departing from the predominant cross-country approach in corruption research, we theorised on the role of political decentralisation as a potential breeding ground for subnational variation in corruption. Empirically, we analysed how variations in corruption perceptions affect start-up decisions and if start-ups are relocated to municipalities with lower corruption perceptions. Since local variability in corruption is likely to be pronounced in decentralised countries—i.e. implying more heterogenous local institutional conditions (Beeri & Navot, 2013; Charron et al., 2014)—our results provide compelling evidence that it may be just as crucial to study within-country variation in corruption as corruption at the country level (e.g. Erlingsson & Lundåsen, 2021; Broms et al., 2019; Masters & Graycar, 2016).

Our focus on the consequences of local variations in corruption perceptions is also of broader relevance for research on local and regional conditions for entrepreneurship. While our overall results are consistent with the mainstream theory—that corruption dampens start-up rates—the dual focus on start-up decisions and start-up location choices means that we can simultaneously assess how high rates of corruption may deter entrepreneurs while also prodding business locations toward neighbouring municipalities, with implications for research on the local and regional conditions for entrepreneurship (Acs et al., 2008b; Davidsson et al., 1994; Fritsch & Wyrwich, 2018) and theories of 'institutional competition' across municipalities and regions

(Boschma & Frenken, 2011; Bergh & Höijer, 2008). Future research should account for the potential heterogenous effect of corruption on entrepreneurship, which, we argue, ought to be particularly salient in decentralised settings. Since corruption by its very definition is 'hidden', it remains a subtle but theoretically more salient institutional factor regulating the conditions for entrepreneurship. Further research using complementary indicators of corruption, such as irregular public procurement or unexplained variation in time and cost for business permits, may be fruitfully employed to develop research on the effects of 'greed' corruption in developed economies where 'need' corruption is rare—and, as a consequence, less attention has been paid to corruption at large and its economic implications. Our attention to political and administrative decentralisation as an underlying mechanism in the emergence of such types of corruption can also be extended and further probed for stronger causal claims in quasi-experimental settings such as when the power of local government to make decisions relevant to entrepreneurship is centralised or decentralised, and with what consequences.

Furthermore, our results extend the literature by moving beyond the effect of corruption on the rate of entrepreneurship to also examine how local variation in corruption perceptions shapes entrepreneurs' strategic decisions. Such decisions have previously been explored using experimental methods to probe entrepreneurs' location choice preferences (McMullen et al., 2016). By examining individuals' de facto start-up and location choices, our paper contributes to the growing literature examining how variation in corruption affects entrepreneurs' strategic decisions. Further work may seek to extend this line of work by examining not only entrepreneurs' reactions to corruption, but also what type of corruption may be particularly problematic. For example, observational or experimental studies may seek to examine what specific type of governmental decisions are most susceptible to local acts of corruption, including decisions related to zoning and planning, business inspections, granting of permits, or lucrative public procurement (Malone et al., 2019; Transparency International, 2020). Our study also provides opportunities for future research at the intersection of corruption and entrepreneurial ecosystems. While the general patterns unearthed in our study suggest entrepreneurs to on average shun away from corruption by not starting any new business when there is corruption in their home

municipality, it is possible that some entrepreneurs that are 'more mobile' may in fact be attracted to specific locations (ecosystems), regardless of these being more corrupt. Future research could seek to identify such groups of entrepreneurs and their strategic responses in terms of seeking to e.g. negotiating deal with authorities or incumbents (Artinger et al., 2015), engaging in lobbying or collective organising in terms of seeking to change current regulations (Meek et al., 2010), or contributing to crowding-in places most attractive in terms of market size and customers (Delgado et al., 2010), with the potential of such firms being or becoming willing to accept higher bribes to be in these locations. To the extent that any of these or other mechanisms serves to increase corruption in specific ecosystems, it would likely be more prevalent in developing countries, but could potentially exist also in developed countries, constituting important questions for future research at the intersection of corruption and entrepreneurial ecosystems.

Finally, the paper provides policy implications by highlighting the potentially detrimental effects of corruption in local government—even in so low-corruption mature democracies and developed economies. For instance, an analysis by The Swedish Agency for Public Management highlighted that corruption awareness is low among local decision-makers. The inquiry complained that integrity and anti-corruption efforts were only taken seriously *after* the fact a scandal had occurred (Statskontoret, 2012). This is disheartening. Since entrepreneurship is important for local economic development, local decision-makers in countries traditionally viewed as spared from corruption must also take the issue of controlling corruption seriously. This is particularly pertinent in highly decentralised settings, where local variations in institutional quality are likely to appear. Our study begs for theoretical generalisations also to other decentralised economies—such as the other Nordic countries, Australia, Germany, the UK, or the USA—where local authorities are responsible for zoning and planning and inspections and permits as well as much of public procurement. This highlights the potential for further research examining differences in the effects of variation in local corruption for entrepreneurs in decentralised economies, both when it comes to start-up and location choices, but also regarding entrepreneurs' decisions to expand or relocate their businesses (McMullen et al., 2016).

Our paper also comes with limitations, several of which offer important avenues for further research. As already highlighted, the first limitation is that the identified relationships are correlational rather than causal. The novelty in our research stems from the detailed measure of corruption perception across municipalities in an entire country and pairing this with detailed data on entrepreneurs' start-up and location choices that include a host of relevant background and control factors. While we cannot identify any strong a priori theoretical reason to expect reverse causality between the start-up of businesses and corruption in the setting of the study, further research that, for instance, exploits some source of exogenous variation in corruption on the local level would contribute further and stronger empirical evidence regarding the detrimental effect of corruption on local levels of entrepreneurship. Another limitation is that the analysis only focusses on how start-up decisions of potential entrepreneurs are associated with local corruption levels. Future research may complement our analysis here by examining to what extent corruption impacts the plant location choices of incumbents and multinational enterprises and compare those with results presented in the current research. Finally, our focus on latent entrepreneurs' heterogenous reaction to local corruption can be extended toward analysing how entrepreneurs strategically deal with corruption beyond their start-up and location choices. As we note in our analysis, the effect of corruption may be different, given heterogenous resources and influence of each entrepreneur (e.g. Audretsch et al., 2022a, 2022b).

While corruption in developed countries may not have the same blunt forms or visible consequences as the endemic and systematic corruption found in developing countries, it is still paramount to ensure that incentives for productive activities trump incentives for destructive activities. It is not least important to ensure that the potentially 'healthy' competition that may emerge between local governments in a decentralised setting is not transformed into 'unhealthy' competition where the minority of firms willing to sidestep regulations can earn an illicit advantage. Political scientists maintain that minimising corruption may be more important than universal suffrage and multipolar political parties for a democracy to function well (Rothstein, 2021). Hence keeping corruption at bay is vital both for economic prosperity and a free and healthy society.

Appendix 1

Table 3 Variables, definition, and sources

Dependent variable	Definition	Source
Business start-up decision	A discrete outcome variable for the individual's start-up decision in 2014. Potential outcomes are either that no business was started or that a new independent business was started as full-time activity in municipality 1–290. The variable is taking the value 1 for the chosen option and 0 for the 290 other alternatives	LISA
Main explanatory variable		
Corruption index	Municipal-level index created from survey data to local politicians	Dahlström & Sundell (2013)
Municipal-specific control variables		
Population size	Population in 2013 (1000 s inhabitants)	LISA
Population growth	Population growth in percent, 2013	LISA
Income per capita	Average gross income in 1000 s Swedish Krona	LISA
Proportion of public sector employees	Number of public sector employees aged 20–60 divided by total number of employed individuals aged 20–60, 2013	FDB
Proportion of private-sector employees	Number of private service sector employees aged 20–60 divided by total number of employed individuals aged 20–60, 2013	FDB
Community attitudes toward businesses	This variable measure the degree of supportive community attitudes toward businesses. It is based on a survey created by Confederation of Swedish Enterprise. The question is: 'On a scale where 1 is "very negative" and 5 is "very positive", how do you consider the public's attitude toward small businesses in your municipality?' The survey was sent to local entrepreneurs in each municipality	Confederation of Swedish Enterprise
Municipal service	This variable measure firm managers perceptions of red tape in each municipality. The question is: 'On a scale where 1 is "very negative" and 5 is "very positive", 'how do you consider the municipality's service and reception to businesses in your municipality?' The survey was sent to local entrepreneurs in each municipality	Confederation of Swedish Enterprise
Proportion of business owners	Proportion of the employed population owning an incorporated business in 2013	LISA

Table 3 (continued)

Dependent variable	Definition	Source
Rural municipality	Municipality classified as rural by a variable provided by Statistics Sweden. The main variable comprises ten categories that distinguish between different types of municipalities based on size, economic structure and geographical location etc. municipality in sparsely located region, tourism municipality, suburban municipality to metropolitan	Statistics Sweden
Tourism municipality	Municipality classified as tourism municipality by a variable provided by Statistics Sweden. The main variable comprises ten categories that distinguish between different types of municipalities based on size, economic structure and geographical location (etc. municipality in sparsely located region, tourism municipality, suburban municipality to metropolitan	Statistics Sweden
Start business dummy	A variable included in nested logit to account for the higher baseline probabilities of not starting a business. The dummy variable is set to 1 for all alternatives that involves starting a business and 0 for the 'not start business' alternative	LISA
Sector-specific control variables (only in the nested logit model)		
Sector's share of the local economy	Relative size of the sector an individual was working in during 2013. Calculated as number of employees aged 20–60 in the sector divided by the total number of employed aged 20–60 in the municipality	FDB
Owner-manager income in relevant sector	For each municipality (alternative): the average income for owner-managers in the sector where the individual was employed in 2013. Average income was calculated by adding up wages and distributed profit for all owner-managers. This value was averaged for each sector within each municipality	LISA
Competition	For each municipality (alternative): Glaeser et al.'s (1995) measure of competition for the sector where an individual in the sample was employed in 2013. The value is imputed to 1 if a municipality has zero firms in a given sector	FDB
Dummy for sector in 2013	Dummy variables taking the value 1 for each individual's sector of work in 2013. The included sector dummies are Construction, Business Services, Retail, Manufacturing, Information and communication, and Other	Statistics Sweden
Municipal-individual interactions (only in the nested logit model)		
Not residence	Dummy set to 1 for all non-residence municipalities	GEO
County of birth	Dummy variable set to 1 for municipalities in the county where the individual was born	LISA

Table 3 (continued)

Dependent variable	Definition	Source
Distance	The Euclidian distance between the individual's residence and the centre of the largest city in each municipality expressed in kilometres	GEO
Individual-specific covariates		
Age	Factor variable based on age in November 2013. Age intervals: 20–24, 25–34, 35–44, 45–54, 55 <	LISA register
Income	A four-level factor variable for disposable income in 2013. The levels are based on four income quartiles from the income in November 2013	LISA register
Education	Factor variable of highest educational degree by November 2013. The levels are as follows: elementary school, high school, university, postgraduate studies	LISA register
Sick leave	Set to 1 if an individual received sick benefits in 2013 or 2014	LISA register
Student courses	Set to 1 if an individual studied at university, adult education or similar in 2013, 0 otherwise	LISA register
Parental leave	1 if an individual received parental benefits in 2013, 0 otherwise	LISA register
Married	Set to 1 if the individual was married in 2013, 0 otherwise	LISA register
Born outside Sweden	1 if an individual was born outside Sweden, 0 otherwise	LISA register
Female	1 for female, 0 for male	LISA register

Note. *LISA* Longitudinal Integration Database for Health Insurance and Labour Market Studies, *GEO* geographical database ['Geografidatabasen'], *FDB* the Business database ['Företagsdatabasen'], *FAD* database on the dynamics of businesses and employment ['Företagens och anställningens Dynamik']

**Table 4** Descriptive statistics for municipal-level variables

	Mean	Std. dev	Min	Max
Corruption index	1.66	0.39	1.05	3.55
(ln) Population	2.92	0.96	0.89	6.80
Population growth	0.04	0.83	− 3.01	4.30
(ln) Income per capita	5.49	0.11	5.26	6.12
Proportion of public sector employees	0.27	0.07	0.12	0.49
Proportion of service sector employees	0.68	0.13	0.21	0.93
Community attitudes toward businesses	3.80	0.31	2.80	4.70
Municipal service	3.14	0.37	1.98	4.24
Proportion of business owners	4.56	1.53	1.04	11.66
Sector's share of the local economy	8.58	8.26	0	48.83
(ln) Owner-manager income in relevant sector	4.06	2.45	− 4.52	11.24
(ln) Competition	0.54	0.85	− 3.45	8.24
(ln) Distance	5.59	0.87	− 2.79	8.93
N (Municipalities)	290			

Note. Categorical variables excluded

Table 5 Post hoc test: characteristics of local and relocating entrepreneurs

	Local entrepreneurs	Relocating entrepreneurs	T-tests of differences
Male	0.739	0.781	***
Income Q4	0.536	0.602	***
Income Q3	0.216	0.185	***
Income Q2	0.162	0.134	***
Income Q1	0.087	0.079	
Age 20–24	0.027	0.031	
Age 25–34	0.227	0.263	***
Age 35–44	0.297	0.329	***
Age 45–54	0.323	0.277	***
Age 55 <	0.126	0.101	***
Elementary school	0.089	0.085	
High school	0.452	0.435	*
University	0.446	0.468	**
Postgraduate studies	0.013	0.012	
Born outside Sweden	0.133	0.148	**
Married	0.515	0.500	*
Individuals	13,586	4045	

Note. A comparison of local entrepreneurs who starts a business within their home municipality and relocating entrepreneurs who start a business outside their home municipality. Significance based on two-tailed t-tests: $*P < 0.05$; $**P < 0.01$; $***P < 0.001$

Fig. 5 Histogram of the corruption index
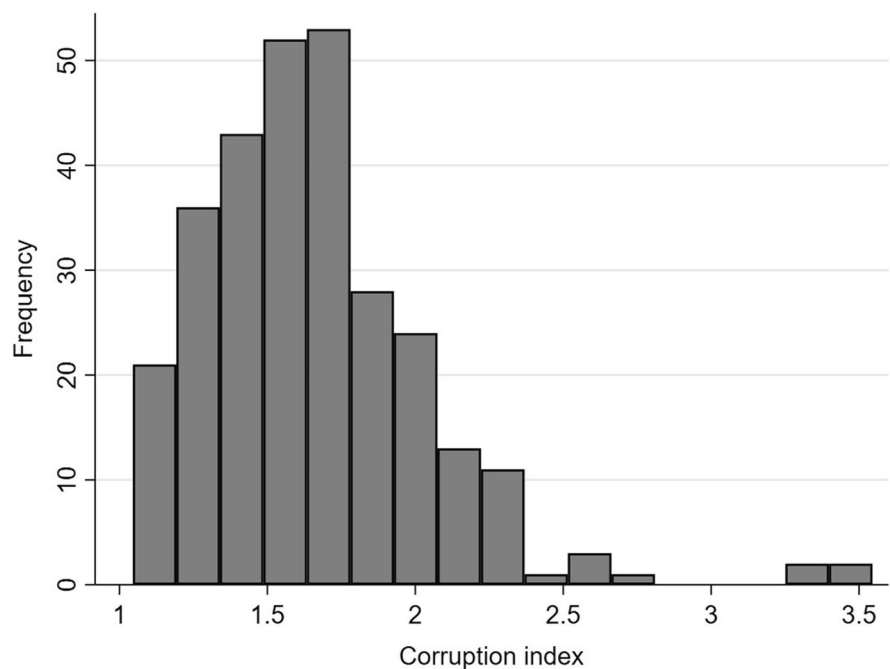
Appendix 2. Description of the simulations

Simulations were conducted by calculating average probabilities of firm entry by applying the coefficients from model 1 at different counterfactual corruption levels on a random sample of 100,000 individuals from the study population. The predictions were calculated by the following formula:

$$\overline{E_L} = P_L * N_L$$

where $\overline{E}$ is the predicted number of new entrepreneurs, P_L is the average probability of starting a business for a group of individuals, and N_L is the number of individuals that are included in the group.

To calculate predictions of the total number of new entrepreneurs in Gothenburg, we multiplied the average predicted probability of starting a business in Gothenburg by 3,444,993 to predict the total number of new entrepreneurs. To separate between the hometown and the relocation effect in Gothenburg (Fig. 4), we also calculated the average predicted probabilities of starting a business Gothenburg, separately for individuals who reside in Gothenburg municipality and those who reside outside Gothenburg municipality. The corresponding prediction for the entire country was calculated by multiplying the average probability of starting a business in any municipality (the sum of the probability of all alternatives except the no start business option) by 3,444,993.

Figure 2 illustrates the implication for entrepreneurship in the entire country if the actual corruption levels in each municipality would be one or two standard deviations higher or lower—a range chosen to ensure that the simulated changes are realistic in relation to the underlying data. We constrained the potential values of the corruption index to the values that were observed in our data {1.05, 3.55} since the models are calculated based on this range. Municipalities imputed with counterfactual corruption values below 1.05 or above 3.55 due to the manipulation rule thus had their minimum or maximum corruption values truncated to 1.05 or 3.55 for the counterfactual simulations to be in a realistic range of empirically observable values.

Appendix 3. Robustness tests

Table 6 Robustness test: multilevel logit model of new entrepreneurship in incorporated businesses

	Coefficient	Standard error	Coefficient	Standard error
Corruption index	−0.053*	(0.024)	−0.061*	(0.026)
(ln) Population size	0.184***	(0.019)	0.177***	(0.021)
(ln) Population growth	−0.134***	(0.029)	−0.163***	(0.030)
(ln) Income per capita	0.134	(0.232)	0.011	(0.240)
Proportion of public sector employees	−0.782**	(0.274)	−0.651*	(0.270)
Proportion of service sector employees	0.715**	(0.187)	0.493*	(0.199)
Community attitudes toward business	0.099	0.076	0.110	(0.080)
Municipal service	−0.013	0.041	−0.020	0.042
Proportion of business owners	0.053***	(0.015)	0.041**	(0.015)
Rural municipality	−0.194***	(0.092)	−0.236*	(0.096)
Tourism municipality	0.223***	(0.100)	0.224*	(0.103)
Income Q3	−0.649***	(0.053)	−0.726***	(0.052)
Income Q2	−0.894***	(0.051)	−0.986***	(0.048)
Income Q1	−0.253***	(0.053)	−0.445*	(0.047)
Age 25–34	1.223***	(0.084)	1.239***	(0.089)
Age 35–44	1.432***	(0.081)	1.564***	(0.083)
Age 45–54	1.434***	(0.081)	1.565***	(0.080)
Age 55 <	1.181***	(0.075)	1.370***	(0.073)
High school	−0.090**	(0.031)	−0.086***	(0.031)
University	−0.125*	(0.049)	−0.048	(0.041)
Postgraduate studies	−0.586***	(0.076)	−0.330***	(0.076)
Female	−0.930***	(0.022)	−0.778***	(0.022)
Born outside Sweden	−0.194***	(0.047)	−0.149**	(0.048)
Married	0.292***	(0.019)	0.298***	(0.019)
Student courses	−0.865***	(0.044)	−0.714***	(0.045)
Sick leave	−0.354***	(0.032)	−0.343***	(0.032)
Parental leave	−0.154***	(0.024)	−0.156***	(0.023)
Constant	−8.132***	(1.242)	−7.743***	(0.041)
Dummy for sector in 2013	No		Yes	
Pseudo R^2	0.046		0.064	
Akaike information criterion	167,536		170,841	
Number of individuals	3,444,993		3,444,993	

Notes. Coefficients in log odds. Clustered standard errors at the municipal level in parentheses

*$P<0.05$; **$P<0.01$; ***$P<0.001$

Table 7 Robustness test: conditional logit model of location choices among new entrepreneurs

	Not weighted	Weighted
Hypothesised effects		
H1: corruption index	−0.646***	−0.667***
	(0.045)	(0.011)
H2: corruption index × not residence	0.931***	0.942***
	(0.050)	(0.124)
Control variables		
(ln) Distance home municipality	−1.135***	−1.131***
	(0.012)	(0.031)
(ln) Population size	0.782***	0.795***
	(0.028)	(0.072)
(ln) Population growth	−0.020	−0.008
	(0.028)	(0.071)
(ln) Income per capita	−2.235***	−2.253***
	(0.168)	(0.424)
Proportion of public sector employees	−0.476*	−0.551
	(0.224)	(0.563)
Proportion of service sector employees	0.478**	0.387
	(0.175)	(0.438)
Community attitudes toward businesses	0.316	0.262
	(0.089)	(0.222)
Municipal service	−0.230**	−0.209
	(0.067)	(0.168)
Proportion of business owners	0.016	0.019
	(0.012)	(0.030)
Rural municipality	0.465***	0.512
	(0.131)	(0.330)
Tourism municipality	0.302***	0.324
	(0.085)	(0.215)
Sector's share of the local economy	0.035***	0.036***
	(0.003)	(0.008)
(ln) Owner-manager income in relevant sector	0.160***	0.162*
	(0.024)	(0.062)
(ln) Competition	−0.196***	−0.178***
	(0.026)	(0.066)
County of birth	0.144***	1.439***
	(0.047)	(0.116)
Not residence	−5.085***	−5.046***
	(0.103)	(0.256)
Log pseudolikelihood	−21,352	−3419
Akaike information criterion	42,739	6876
Number of individuals	17,631	17,631
Number of choices	290	290

Notes. Coefficients in log odds. Standard errors in parentheses. *$P<0.05$; **$P<0.01$; ***$P<0.001$

Appendix 4. Industry heterogeneity

Table 8 Number and ratio of entrepreneurs starting their business locally or outside the home municipality, by industry sector

Entrepreneurs	Non-relocating entrepreneurs	Relocating
All entrepreneurs	13,586 (77%)	4045 (23%)
Construction	1864 (80%)	479 (20%)
Retail	1806 (73%)	676 (27%)
Business services	3150 (77%)	957 (23%)
Energy sector	58 (76%)	18 (24%)
Public sector	84 (76%)	27 (24%)
Manufacturing	1021 (79%)	275 (21%)
Finance and insurance	236 (78%)	67 (22%)
Agriculture and forestry	238 (88%)	33 (12%)
Transportation and storage	620 (83%)	126 (17%)
Information and communication	1190 (74%)	422 (26%)
Real estate	329 (77%)	99 (23%)
Education	427 (77%)	124 (23%)
Health and social care	809 (79%)	209 (21%)
Cultural and personal services	514 (79%)	137 (21%)
Hotel and restaurant	604 (72%)	232 (28%)
Unknown sector	636 (80%)	164 (20%)

Declarations

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