

INFRASTRUCTURE QUALITY, FIRM CHARACTERISTICS AND CORRUPTION IN TANZANIA

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Abstract

The primary objective of this study was to examine what effect corruption has on firms' ability to access quality infrastructure in Tanzania, by examining firm heterogeneity and the incidence of graft in the firms' quest to conduct business operations, dependent on available infrastructure such as electricity and water. The results show that, regardless of firm age, size and ownership – all firms in Tanzania face the same challenges of intermittent power and water cuts, significant delays in the connection of power and water after submitting applications, and the need to pay bribes at every stage of the business lifecycle in order to get things done. Also, an examination of the pattern of FDI inflows to Tanzania over the last ten years revealed that, although the country has great foreign currency earning and FDI-harnessing potential, the business environment is not conducive enough to attract increased and significant levels of FDI. It is therefore recommended that the Government of Tanzania intervenes and puts policies in place to develop its local infrastructure so that it can further grow its economy, thereby increasing employment and trade opportunities, especially if it wishes to attract foreign investors.

Keywords: Firm Ownership, Infrastructure, Corruption, Graft, Tanzania

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1 Introduction

According to the UNCTAD (2006), foreign direct investment¹ (FDI) has the potential to generate employment, raise productivity, transfer skills and technology, enhance exports as well as contribute to the long-term economic growth of the world's developing nations. Although FDI is important in promoting growth and economic integration, the inflows of foreign direct investment into Africa have lagged far behind those of other developing regions in Asia and Latin America. According to the World Investment Report (2008), between 1980 and 2007, the average percentage share of global FDI received by the developed world was about 73.5%, with Asian countries receiving about 14.3% and a mere 2.3% flowing to Africa. This African share is four times less than that received by the Latin American countries during the same period 1980 to 2007. It also appears that the continent's annual share of global FDI of about 3% converged to the region's shares in world exports and world output (UNCTAD, 2007). The negligent levels of FDI inflows, particularly into the

manufacturing sector, are hence hindering the continent's efforts to foster economic growth and economic integration.

There are various factors which impact on an economy's ability to attract foreign investors. As a result, a great deal of research attention has been dedicated to identifying the key pull factors of cross-border investment, particularly those which pertain to the location choices of multinational corporations (MNCs). Most of these studies have sought to understand the nature of firm-specific, as well as location-specific variables which are deemed as important to MNCs. The following locational determinants have hence been identified in the literature: market size (Head and Mayer, 2004; Coughlin *et al.*, 1991); labour costs (Kinoshita and Campos, 2004; Cheng and Kwan, 2000); infrastructure (Moyo and Makoni, 2011; Khadaroo and Seetanah, 2008; Asiedu, 2002; Cheng and Kwan, 2000; Morisset, 2000; Loree and Guisinger, 1995; Wheeler and Mody, 1992); Government policies (Wu, 2000; Head and Ries, 1996); tariffs (Blonigen, 1997; Kogut and Chang, 1996; Grubert and Mutti, 1991) and institutions (Kirkpatrick *et al.*, 2006; Kinoshita and Campos, 2004; Stein and Daude, 2004; Wei, 2000a, 2000b; Wheeler and Mody, 1992).

Tanzania is located in East Africa, on the coast of the Indian Ocean, bordered by Kenya and Uganda

¹ According to the World Bank (2004), Foreign Direct Investment (FDI) is that foreign investment that establishes a lasting interest in or effective (active) management control over an enterprise, if the investor holds a minimum of 10% of the voting share.

to the north, Zambia, Malawi and Mozambique to the south, and Rwanda, Burundi and the DRC to the west. The Tanzanian economy is primarily dependent on agriculture, industry and tourism, with the agricultural sector accounting for 27% of the GDP, and 80% of employment (Heritage Foundation, 2014). According to George (2013), Tanzania in 2012 accounted for nearly 2% of the world's gold production, and was also the world's only known tanzanite producer; although more recently, large natural gas reserves were discovered. With a population of 49.25 million people, an unemployment rate of 10.70%, a GDP of US\$33.23 billion and a GDP growth rate of 7% in 2013, Tanzania remains a low-income country economically participating in the East African Community and SADC blocs (World Bank, 2013).

In terms of infrastructural development, Tanzania uses mainly gas and hydroelectric power as sources of electricity for both consumer and industrial usage, although the supply is erratic and unreliable as most power is lost during transmission because of poor infrastructure for that purpose. The 86,000km road network is in a very poor condition and this has the potential to increase business costs due to the need to pay higher freight insurance costs to guard against losses due to breakages. According to Heritage Foundation (2014), Tanzania attained an economic freedom score of 57.8 (out of 100, on a scale of 1 being least free and 100 being most free), making it the 106th freest economy globally, and was also ranked 15th out of 46 Sub-Saharan African countries in the 2014 Index. With regard to the rule of law, which comprises of both freedom from corruption and property rights, Tanzania scored 28.8 and 30, respectively, confirming that the country is still confronted by challenges within its institutional structures. Of the surveyed firms in Tanzania, access to electricity was ranked second out ten business obstacles encountered by firms conducting business in Tanzania by 43.9% (N=699) of the firms, while corruption (N=639; 49.4%) and transportation (N=653; 35.9%) were ranked eighth and tenth, respectively.

We therefore want to examine the impact of corruption on access to reliable infrastructure, as well as firm-specific characteristics such as firm size, firm age and ownership structure, using data sourced from the World Bank Enterprise Surveys. This is deemed important for the formulation of sound and appropriate investment policies such as ensuring reliable and consistent availability of basic infrastructure for all businesses, whether locally or foreign owned which can promote local economic growth thereby reducing unemployment and poverty in Tanzania. The rest of this paper is organised as follows: Section Two provides a brief literature review on foreign investment, infrastructure and corruption, followed by a description of the data and measurement variables. The descriptive statistics and results are analysed in

Section Four, while conclusions and recommendations thereof will be considered in Section Five of the study.

2 Literature review

The best-known theory of FDI is Dunning's 1977 Eclectic Paradigm in which he states that FDI occurs under different scenarios of ownership, locational and internalization advantages (OLI). Dunning (1980)'s original eclectic theory argued that the structure and intensity of MNCs foreign direct investment decisions are influenced by three factors: ownership-specific (O) advantages, internalisation (I) advantages and location-specific (L) advantages. Whilst Dunning's original eclectic theory emphasized on locational advantages, he did not explicitly emphasize the role that infrastructure in the host country could play to influence industrial location. It was only after the early 1990s when there was growing emphasis on the role of infrastructure in economic growth that FDI theorists began to incorporate the role of these supply side variables in explaining FDI (Gwenhamo, 2009). In particular, recent extensions to the ownership location and internalisation (OLI) framework have placed a vital role on infrastructural factors as determinants of FDI in developing countries. Thus Dunning and Lundan (2006) contributed towards fusing the traditional OLI framework with infrastructural factors. They argued that good infrastructure create location advantages that foreign firms seek before operating and investing in the host country.

In explaining the actual role that infrastructure plays in facilitating FDI and even trade, Kessides (1993), argued that the quality and availability of infrastructure facilities such as transport, water, telecommunication and electricity is important in enhancing the marginal productivity of factors of production like capital and labour. She went on to argue that infrastructure services are intermediate inputs and any reduction in their cost raises the profitability of production, thus resulting in higher levels of output, income and employment. By permitting the transition from manual to electrical machinery, reducing workers' commuting time, and improving information flows through electronic data exchanges, infrastructure services raise the productivity of factors of production like labour and capital and this improves the competitiveness or profitability of production and this may attract foreign investment (Kessides, 1993). Therefore, as a result of this spillover effect, infrastructure is often described as an "unpaid factor of production", since its availability and quality leads to higher returns obtainable for other factor inputs (Kessides, 1993).

Wheeler and Mody (1992), using a panel data model of 42 countries from 1982 to 1988, found that infrastructure quality (transport, communication and energy) is an important variable for developing countries seeking to attract FDI from the United States, but less important for developed countries that

already have high quality infrastructure. Kumar (2001) departed from using individual indicators of infrastructure and constructed a composite index which captured availability of transport, telecommunication, information and energy. He used data from 66 developed and developing countries across the world over the period 1982 to 1994 and employed principal component analysis. Using overseas affiliates of US and Japanese firms, Kumar (2001) found that infrastructure availability is important for outward-oriented FDI, thus concluding that by being efficiency-seeking, export-oriented FDI could be more sensitive to availability of quality infrastructure than overall FDI. Hong (2008) also departed from using country-level data and employed firm-level analysis. He developed a model which indicates that foreign firms' location choices are determined jointly by site (location) attributes and firm heterogeneity.

According to Khadaroo and Seenatah, (2008), the quality of developing countries' infrastructure and institutions play a critical role in attracting foreign investors, particularly resource-seeking FDI. They argue that this is mainly because MNCs are profit-oriented entities that seek to minimise the costs of doing business, and if moving to a developing economy to take advantage of lower labour costs means losing patent protection to imitators, making informal payments (bribes) to get things done, incur higher transport costs due to inadequate transportation and missed supply shipments due to communication problems, then they will opt not to do business there.

In the African context, Asiedu (2002) analysed 34 countries over the period 1980 to 2000 and used infrastructure indicators like the number of telephones per 1000 people while also controlling for classical FDI determinants (like market size, cost of labour and skills) concluded that countries that improved their infrastructure were rewarded with more investments. Using OLS, Asiedu (2002) found that a unitary increase in telephone density leads to a 1.12% increase in FDI/GDP. Another macro-level study that used African data was done by Khadaroo and Seetana (2008), who applied static and dynamic panel data models like GMM to study the role of transport and communication infrastructure on FDI in 33 Sub-Saharan African countries for the period 1984 to 2002. They controlled for non-infrastructure variables such as market size (measured using per capita GDP) and labour quality proxied by general secondary education enrolment. Their results showed that transport and communication infrastructure are important in attracting FDI, and the same holds true for market size, as well as quality of labour. Moyo and Makoni (2011) also conducted a study to analyse the role of infrastructure quality and firm heterogeneity, and their impact on FDI inflows into ten selected Sub-Saharan African (SSA) countries using firm level data from 2002 and 2005. By applying the maximum likelihood Probit and Tobit models in their data analysis, they

found that firm size and skilled labour had a positive and significant effect in attracting FDI inflows to countries, while firm age, unionisation and power outages had a negative and significant effect on FDI to these SSA countries.

Adding another dimension to the infrastructure and firm ownership debate, Sharma and Mitra (undated) affirmed that corruption plays a substantive role in economic activity functionality. Drury, Kriekhaus and Lusztig (2006) defined corruption as the abuse of public office for private gain. The private benefit concept was elaborated upon to encompass not only receiving money or valuable assets, but also receiving promises for future favours and benefits for/ from friends and relatives (nepotism and favouritism). Corrupt activities therefore include bribery, nepotism, theft, and other misappropriations of public resources (refer to Lambsdorff, 1999; Bardhan, 1997; Shleifer and Vishny, 1993; Nye, 1967). The leading view of corruption is that it is damaging to economic performance, as both a tax on productivity and a market distortion. However, it has also been demonstrated that corruption has a significant impact on growth, investment, capital flows, innovation and entrepreneurship. Gonzalez, Lopez-Cordova and Valladares (2007) using firm-level data, carried out a study on 33 African and Latin-American firms to examine the extent to which firms in developing countries are the targets of bribes. They found that, on average, African firms were three times more likely to be asked for bribes.

3 Data and variables measurement

In this study, we want to examine the interrelationship between location factors of infrastructure and firm characteristics, and how they are impacted on by corruption in Tanzania, using World Bank firm level data from across the services, manufacturing, transportation and construction sectors. We depart from the traditional approach that has been followed in the literature, particularly with regard to the measurement of infrastructure variables. We propose to use infrastructure indicators measured at firm level, as opposed to countrywide indicators commonly used in the empirical African literature (see Khadaroo and Seenatah, 2008; Asiedu, 2002; Schoeman *et al*, 2000; Morisset, 2000).

We control for infrastructure indicators by using the number of hours without electricity and water, whilst at the same time highlighting the importance of firm-specific factors, and the corruption encountered by firms in Tanzania trying to gain access to this basic infrastructure. Electricity and water are two critical inputs in most industrial sectors, hence their unavailability and/ or intermittent outages hinder normal business production and operations. Asiedu (2002) affirmed that a good measure of infrastructure quality should incorporate both infrastructure availability and reliability. The measures that we

employ here however, only capture reliability. This is because infrastructure is of little use if it is unreliable, hence we expect infrastructure reliability (frequency and duration of power and water outages) to be more important to foreign investors than availability.

The World Bank's 2013 Investment Climate Survey on Tanzanian firms in services, manufacturing, transport and construction is the main source of data for this study. Tanzania was selected as a country case study on the basis that it had the most recent available data, which covered all our infrastructure variables under examination, mainly water, power and transport. The quality of transport, water and electricity infrastructure was measured using variables such as average number of hours per day or days per month without power and water connection, as well as percentage of sales lost due to power outages. The assumption on these variables is that quality infrastructure is important in enhancing productivity, competitiveness and hence creates an environment attractive to foreign investors. Thus, a high number of days and many hours without infrastructural services as well as high percentage of output lost due to power outages indicate poor infrastructure quality, and are therefore expected to have a negative impact on FDI inflows, and domestic investment in general too.

Descriptive statistics on the sampled firms in this study show that very few firms (2.7%) in Tanzania have any form of foreign ownership in them.

Corporates in Tanzania are predominantly (95%) owned by locals, and using the number of permanent employees in the firm as a proxy for firm size, many of these firms, on average, employ 16 people. This may be attributed to the nature of economic activities in the country, and as a result – most employment is in fact temporary and cyclical in nature as 80% of the country's employment is in the agricultural sector. Another variable that we have also decided to include is firm age. Our argument is that the number of years that firms have been in existence enables them to have a better knowledge of the dynamics of local market conditions and survival strategies than younger firms. For example, older firms may know how to play the system in order to get ahead insofar as paying bribes to get things done.

4 Results and analysis

The objective of this study was to find out what effect corruption has on corporates in Tanzania insofar as access to reliable infrastructure has, dependent on firm age, size and ownership structure, in Tanzania.

A snapshot of Tanzania's infrastructure-related statistics for 2013 in relation to the aggregate Sub-Saharan region and other low income countries is captured in Table 1 below.

Table 1. Tanzania infrastructure-related statistics, 2013

	Tanzania	Region (Sub-Saharan Africa)	Low income countries
Number of electrical outages in a month	9.2	8.0	5.3
Duration of typical electrical outages (hours)	5.1	5.0	2.7
Average losses due to electrical outages (% of annual sales)	17.6	7.4	4.3
Percentage of firms owning a back-up generator	41.6	45.8	31.7
Number of days to obtain electrical connection (upon application)	50.8	34.8	33.5
Number of water insufficiencies in a typical month	2.2	2.2	1.3
Percentage of firms identifying electricity as a major constraint	43.9	45.2	33.5
Percentage of firms identifying transportation as a major constraint	35.9	29.5	20.4
Percentage of firms identifying labour regulations as a major constraint	33.1	12.2	11.4
Percentage of firms identifying an inadequately educated labour force as a major constraint	41.6	26.1	25.0
Percentage of firms identifying corruption as a major constraint	49.4	43.1	33.9
Firm age (years)	13.2	14.0	15.8
Firm size (average number of permanent employees)	15.8	27.6	33.8
Proportion of domestic ownership in a firm (%)	95.5	79.8	88.2
Proportion of 10% or more foreign ownership in a firm (%)	2.7	14.9	9.2

Source: World Bank Enterprise Surveys (<http://www.enterprisesurveys.org>), (2013)

From the table above, it can be assessed that in terms of firm characteristics, the average age of a firm in Tanzania is only 13.2 years. This compares well with other firms in the Sub-Saharan African region, as

well as low income countries, whose average firm ages are 14 and 15.8 years, respectively. With regard to firm size, as proxied by the number of permanent employees, Tanzanian firms are small, with only 16

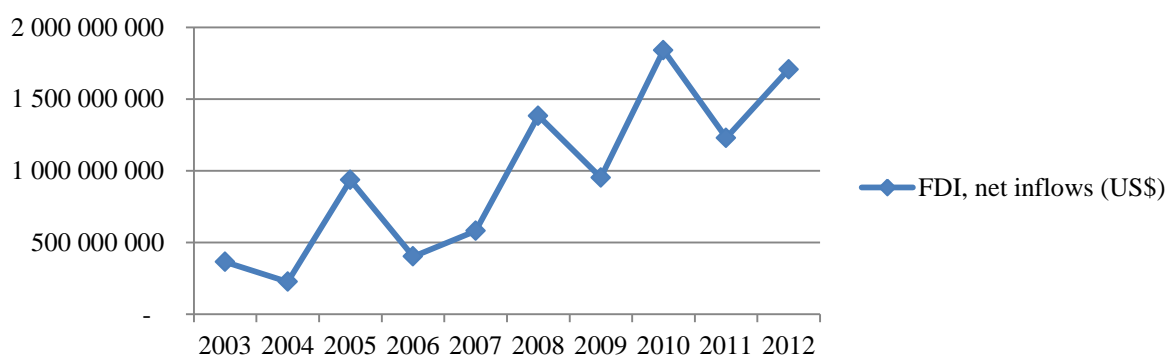
permanent workers on average, which is almost half of the SSA region average of 28 workers. Tanzania is a very domestic-oriented economy in terms of ownership. This is reflected in the almost insignificant existence of foreign investors in the country. Like the other countries in the region, Tanzania had a low level of FDI, in terms of the ownership structure of the surveyed firms. Of the surveyed firms, over 95% were domestic-owned. The average figure for SSA was slightly lower though at 79.8%. Foreign direct investment (FDI) in Tanzania has been very low due to its harsh economic environment which favours local businesses over foreign ownership of firms and assets in that country. Besides, Tanzania has very little incentives to offer foreign investors as its economy is primarily agriculture-based. Mining and industry which are the most targeted sectors for FDI are not very prominent investment-worthy for foreign investors due to the high unfavourable costs of doing business in Tanzania.

Looking at infrastructure - Tanzania, on average, had a slightly higher frequency of power outages at 9.2 vis-à-vis other Sub-Saharan African economies at 8.3. Electricity supply in SSA is generally unstable, with advanced nations such as even South Africa experiencing intermittent power outages, and sometimes forced load-shedding particularly during winter months when electricity demand is high. The power outages typically last for an average of 5 hours in both Tanzania and SSA. However, the resultant average losses in sales per annum are significantly higher for Tanzanian firms (17.6%) as compared to the SSA regional average of 7.4%. This unreliable supply of electricity has forced almost 42% of Tanzanian businesses to invest in back-up generators so as to minimise losses due to downtime, and hence 43.9% of local firms consider electricity a major obstacle to doing business in Tanzania. Water cuts are also experienced in Tanzania, although to a less extent to power cuts. On average, Tanzanian and other SSA firms experience two water cuts in a typical month, lasting 2.5 hours and 3.4 hours in duration, respectively. Although water plays a very important role in the production of various manufactured goods, results from this study however show that this variable

is statistically insignificant. This result may therefore mean that the quality of water infrastructure is a weak determinant of the probability to attract foreign investors. This may mean that water is not a major productive input and thus not important in attracting FDI. The other thing is FDI firms could be aware that they can easily minimise water related production problems by using boreholes.

In terms of infrastructure installation or connection, it takes Tanzanian firms 50.8 and 31.9 days between the time of applying for and having services connected for electricity and water, respectively. These two basic infrastructural provisions have to be in place before any form of business operations can commence, regardless of the size, location and industry the firm is in. As a result, 24.8% and 20.5% of firms resort to pay bribes to public officials in order to fast-track their electricity and water connections, respectively. Electricity and water are key inputs to all industrial sectors, and cannot be justified as requiring favours to be made to obtain the service. Tanzania is not a major exporter. Most of its products are consumed by its local population, hence most firms use road transport to reach various markets within the country. This is however an additional logistical, freight and insurance cost to them because the road network and infrastructure of over 86,000km in Tanzania is very poor, with 35.9% of firms reporting transportation as a major constraint in their business survival because they realise losses of up to 4% of their products due to breakage or spoilage en route to their domestic markets. In terms of labour, 41.6% of Tanzanian firms identified an inadequately educated labour force as a major constraint, compared to 26.1% for SSA, and 25% for other low income countries. In addition to this, 33.1% of firms found the labour regulations to be restrictive in Tanzania, more than double that of SSA (12.2%) and low-income countries (11.4%). These constraints alone, though predominantly face by domestic firms pose a major hindrance to Tanzania's ability to attract FDI. If the Tanzanian economy were more stable both politically and economically, this would have given the country a major economic boost, and attract higher volumes of much-needed FDI.

Figure 1. FDI Inflows to Tanzania, 2003-2012



Source: World Bank (2013)

Above in Figure 1 is a graph showing FDI inflows into Tanzania over a ten-year period. The country's peak FDI inflows of just over US\$1.8 billion were last experienced in 2010. Being a low-

income country, Tanzania needs to attract more foreign investment for development purposes.

Table 2. Corruption in Tanzania: A comparison with other selected African countries

Country	% of firms expected to give gifts to get an operating license	% of firms expected to give gifts to get a construction permit	% of firms expected to give gifts to get an electrical connection	% of firms expected to give gifts to get a Government contract
Tanzania	17.2	31.4	24.8	67.6
Zambia	7.7	13.6	14.8	27.4
Kenya	15.8	32.9	18.4	32.8
Dem. Republic of Congo	47.1	57.8	43.9	51.9
Sub-Saharan Africa	19.6	24.8	23.0	31.1
Low income countries	13.6	21.7	15.5	25.9

Source: World Bank Enterprise Surveys (<http://www.enterprisesurveys.org>), (2013)

The incidence of corruption in Tanzania is high. Corruption is found at every stage of the business lifecycle. 17.2% of Tanzanian firms are expected to pay a bribe in order to be granted an operating license, although this is slightly lower than the SSA regional average of 19.6%. In addition to this, 31.4% of firms need to pay a bribe to get a construction permit, 24.8% for an electrical connection and 67.6% to be awarded a Government contract or tender in Tanzania. When compared to other countries during the same 2013 period under review, it was found that only the Democratic Republic of Congo (DRC) surpassed Tanzania insofar as corruption was concerned. However, despite that being the case – the DRC enjoyed higher levels of FDI inflows as well as foreign currency earnings from the sale of its minerals. Foreign investors in the DRC have considered the costs and benefits of setting up MNCs in the DRC and as long as the benefits outweigh the costs, they will continue to be major participants in that economy. On the other hand, if these results are to be understood, in Tanzania you cannot start nor grow a business, regardless of the size or ownership, without having to “grease hands” in order to get things done. Corruption is a high “tax” on businesses, and has in some instances been known to render some businesses insolvent after paying bribes and still failing to access what they were bribing for.

For substantive inflows of FDI to be received, investors require political stability, respect for legal and property rights, sound corporate governance practices as well as adequate and reliable infrastructure to ensure their investments are secure. The continued disregard for property rights, high incidence of graft and corruption within the Government and business sectors, as well as the unreliability of infrastructure is keeping investors away from Tanzania.

5 Conclusions and policy recommendations

The primary objective of this paper was to study the role played by corruption on availability and access to reliable, quality infrastructure and firm heterogeneity in Tanzania. Results show that irrespective of firm size, age and ownership, all firms in Tanzania are faced with the same challenges of inadequate infrastructure, in terms of availability and reliability. In addition to this, firms are expected to pay bribes in order to get things done, including merely getting approval and connection of electricity and water. Tanzania being a low-income country needs to attract FDI in order to meet its economic and social development needs. This means that the Government must create an environment conducive for firm growth and invest more in infrastructure if it wants to attract FDI inflows into its economy. There is therefore a need for the Governments in Tanzania, where many domestic-owned firms complain about electricity as a major obstacle, to incorporate electricity infrastructure development in their domestic and foreign direct investment promotion programmes.

It is also recommended that the Government finds reliable alternatives to the current water and electricity infrastructure in order to not only guarantee survival of domestic firms, but also the attraction of foreign investment to Tanzania. Without this basic infrastructure, firms will remain uncompetitive and this will affect their trade involvement. Currently, only 13.9% of the surveyed firms are foreign-currency earners, yet almost 60% of them use imported inputs in their operations. This mismatch of foreign trade income affects the country's balance of payments negatively. With the discovery of large reserves of natural gas, Tanzania will need to attract foreign investment to the mining sector. To enjoy the benefits of FDI, basic infrastructure will be essential. Improving availability of reliable infrastructure for all

firms will provide a conducive environment that promotes employment creation, and therefore economic growth. It is imperative for the Government in Tanzania to come up with conducive policies that do not give rise to graft and corruption just to access infrastructure on the basis of firm age, firm size or firm ownership.

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