

Titling and beyond: Evidence from Dar es Salaam, Tanzania

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ABSTRACT

Land titling has been a policy priority for developing country cities for decades. In Sub-Saharan Africa and across the world, tenure formalization has been promoted as a tool to improve the quality and value of urban housing. The track record of these projects, however, has generally been disappointing. Why is this? In this paper, we argue that project design has paid too little attention to contextual features of land markets in estimating the benefits of formalization to individual households. We draw on evidence from a case study city – Dar es Salaam, Tanzania – to show that in cities where broader property rights institutions are incomplete and informal sources of tenure security are strong, formal property rights may not be valued by households. This raises questions about the households' willingness to pay for regularisation and suggests that complementary strategies to build trust in government and consolidate public benefits of titling will be needed to ensure that projects have a beneficial impact.

1. Introduction

Titling has been a policy priority since the mid-1990s at least (Buckley and Kalarickal, 2005; Payne and Durand-Lasserve, 2012). Since this time, property formalisation initiatives have been a continuous feature of the portfolios of bilateral aid agencies and international organizations. Projects to provide titles to informal households have been implemented all over the world, including in many countries across Africa.

What do policy makers expect titling can do? The case for titling was perhaps most famously made by Hernando de Soto, who linked property formalization to access to credit. In much of Sub-Saharan Africa, however, credit markets are underdeveloped. In these contexts, there may be a vicious cycle and expectations that titling alone can result in improved access to credit are muted (Buckley and Kalarickal, 2006; Payne and Durand-Lasserve, 2012). Instead, as we outline below, proponents of titling link formalization to improved housing quality and poverty reduction objectives through two key channels: increased tenure security and reduced property transaction risks.

Informally owned property is generally expected to be less secure than property where ownership can be upheld by legal documentation. This higher insecurity, in turn, is logically linked to lower quality housing, as security is a precondition for investment in housing construction and improvements (Payne and Durand-Lasserve, 2012, p.46).

Many therefore expect that the provision of title deeds to informal owners can stimulate a process of investment and improvement in housing.

Informal property is also thought to be more difficult to transact than formal property. Lack of legal documentation will make the process of buying and selling property opaque and riskier than for formal property. This can be understood as higher transaction costs, which dampen the value of the assets (UN-HABITAT, 2013; Becker and Morrison, 1999; Collier, 2017). As such, informal property is expected to trade at a discount relative to formal property. Formalization is therefore anticipated to increase the value of the assets held by the poor, and the impact of titling projects is often measured in property price appreciation (Field and Kremer, 2006).

In addition to these potential benefits for informal households, titling projects may also have wider social benefits. Formal rights are often seen as a precondition for the development of land cadastres that are linked with property tax registries. Property tax can be an important source of funds for public goods in urban areas, and an accurate cadastre can save costs in public infrastructure planning and implementation. Land cadastres are also essential for wider sustainable land management systems, including planning expansion of infrastructure and service provision and to adapt to climate change-related challenges as well as to shape effective development controls to prevent urban expansion into hazard areas.

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The track record of urban land titling initiatives to date has, however, been ambiguous. Numerous studies have highlighted that these projects are often marred by implementation challenges and/or unanticipated consequences. These range from spiralling costs and poorly timed interventions to issues such as rising conflict, asset inequality, and political tension (Benjaminsen et al., 2009; DFID, 2002). Indeed, in Sub-Saharan Africa, most projects have failed to make it beyond pilot stage (Ali et al., 2014).

What about the anticipated benefits of these projects to households that receive titles? The evidence base is mixed. On the one hand, there are a number of well-known cases in which positive outcomes have been documented. For example, Erica Field's research in Peru finds that titling resulted in increased investment in housing, as well as other indicators of improved tenure security such as increased participation in work outside of the house (Field, 2003, 2005, 2007).¹ On the other hand, there are counter-examples of projects that fail to achieve expected improvements and in some cases, have even been associated with increased tenure insecurity (Durand-Lasserve and Selod, 2009; Payne and Rakodi, 2009; DFID, 2002). Since long-term evaluations are often lacking, the question remains as to whether these inconclusive results reflect issues with the underlying expectations of the projects or evaluation challenges: long-term outcomes – such as capitalization driven by increased tenure security – may not be observable in the short-term.

In this paper, we shed new light on this debate by exploring how the broader context of land and housing markets may matter for achieving expected outcomes of titling projects. One such contextual feature is the cost of title, as demand for title is likely a function of the price, which includes both the cost of the title itself as well as other costs, such as requirements to survey land, adjust land uses, and/or pay fees or taxes (Kironde, 2019; Monkkonen, 2012). As such, there is a growing literature which explores how costs of formally registering or transferring property may undermine participation in regularisation programs and may even result in re-informalisation of titled property over time (Galiani and Schargrodsky, 2016; Gutierrez and Molina, 2020).

Yet the broader institutional context will also matter for the *benefits* of titling, which is the focus of this paper. Specifically, the benefit of titles will be a product of both the effectiveness of formal property rights and the strength of any alternative avenues to assert ownership claims that may exist in practice. With respect to the effectiveness of formal property claims, this will depend on more than access to documentation – it will depend on the state of the wider institutional framework for property rights, such as existence of the complementary legal institutions (Koroso and Lengoiboni, 2019). This includes the need for accessible public records to overcome information failures and effective court systems to uphold contracts. Although the impact of these arrangements on the value of title to households has been understudied to date, it is reasonable to expect that formal documents of property ownership will not hold the same value in contexts where these are weak – for example, because of widespread corruption and lack of confidence in administrative records – as they would in places where there is high trust in formal institutions (Platteau, 2000, 145–47).

With respect to the strength of alternative arrangements, existing research highlights that informal ownership is often underpinned by informal institutional arrangements to secure tenure and support property transactions (Payne and Durand-Lasserve, 2012). When these arrangements are sufficiently strong that individuals do not fear loss of their assets and can even engage in transactions with confidence, the risks associated with informal transactions are likely to be perceived, and may in fact be, lower than theory would anticipate. Although to date there has been limited empirical exploration of the size of this effect, one notable exception is in Mexico where Monkkonen proposes that variation in these informal arrangements explains differences in the value of

formal titles in both within and between cities in Mexico (Monkkonen, 2016).

In addition to this, context-specific institutional arrangements may further impact the anticipated benefit of titles through two other channels. Specifically, informality is often associated with increased risk of expropriation by government and greater uncertainty around access to public goods such as water and sanitation. Yet, as He et al. point out in their analysis of informal property in China, these uncertainties are actually a product of specific institutional arrangements (He et al., 2019). As such, we can anticipate that they will differ from one context to another. Thus, the degree to which formality reduces risks of expropriation by government will depend on both legal frameworks and the political context in which they are applied. Similarly, whether informality increases uncertainty in access to public services will reflect the legal context – in Colombia, for example, utilities are mandated to operate regardless of tenure – and realities of service delivery.

In this paper, we examine the case of Dar es Salaam, Tanzania. Like in many Sub-Saharan African cities, Dar es Salaam is marked by widespread informality of tenure and the absence of foundational property rights institutions such as accurate and accessible public records on land ownership. In addition to this, informal property rights arrangements are thought to be strong, public service deficits are widespread, and the government has extensive powers of expropriation for formal and informal property alike. We ask: is it reasonable to expect that in this context a formal title will be associated with higher quality housing and a real estate premium? Ultimately, will households support a national or local program of property formalization and most importantly, will they be willing to pay to acquire the rights to the property they live in?

In order to answer these questions, we analyse differences in the formal and informal stock of housing in the city and measure the value that households place on formal documentation using a hedonic price model. The findings show that there are few observable differences in levels of perceived tenure insecurity and housing quality across formal and informal households and indicate that there is no market premium for holding formal tenure documentation. This likely reflects the influence of local institutional frameworks for land and housing markets, and suggest that design of potential project benefits of titling need to pay much more attention to the specific environment in which the intervention is being applied as well as to complementary measures that can be taken to complement the intervention.

2. Materials and methods

This paper explores the case study of Dar es Salaam, which is the largest and most economically important city in Tanzania (Todd et al., 2019). According to the 2012 census, the city is home to a population of 4.4 million over a landmass of 1393 square kilometres. It is one of the fastest growing cities in Sub-Saharan Africa, and current estimates put the population at over 5 million (Jones et al., 2016). As with many other cities in the region, Dar es Salaam is marked by tenure informality, which has been identified as a policy priority at both local and national levels (USAID, 2010). Indeed, existing research highlights that urban policy is dominated by a “binary conceptualisation extralegal and legal, formal and informal and an understanding that extralegal must become legal and emerge from the ‘shadows’ in order to achieve development” (Campbell, 2013 p498).

In targeting tenure informality, local and national authorities in Dar es Salaam have drawn on support from international development organizations including bilateral agencies, the World Bank, and Hernando de Soto's Institute for Liberty and Democracy. To date, initiatives have been limited to pilot programmes in small-project areas of cities (USAID, 2010; Kusiluka and Chiwambo, 2018). As with many titling projects across the world, failure to scale these projects to the city level may be attributed to implementation challenges. Yet project evaluations also indicate that demand for title is weak among informal households. Using data from a Randomized Control Trial (RCT), Ali et al. (2014) estimate

¹ There are challenges in identification of effects in natural experiments. For a discussion including a focus on political economy issues see Mitchell (2009).

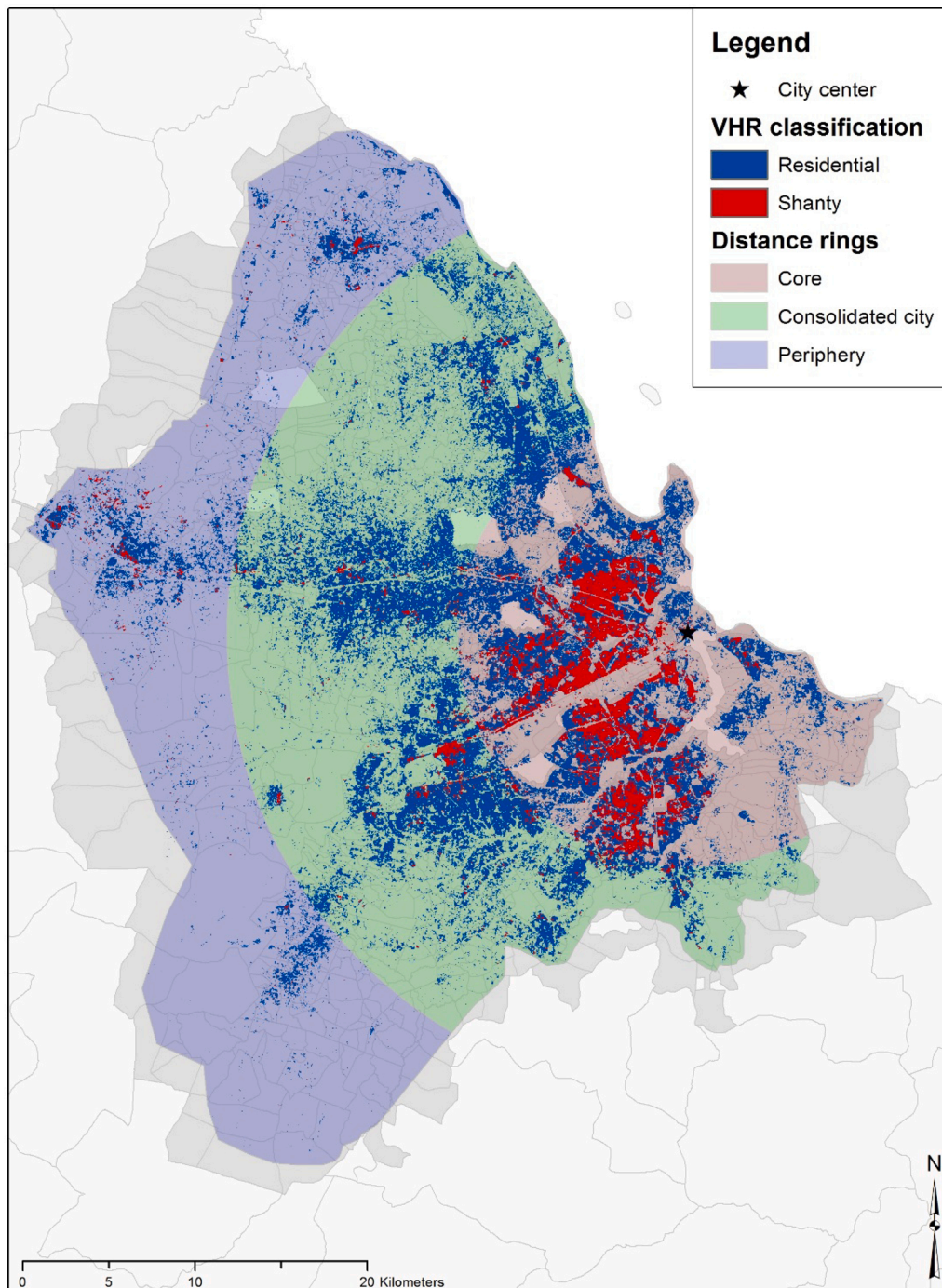


Fig. 1. Sampling stratification by distance to city center and location of irregular or 'shanty' areas according to satellite classification, Source World Bank, 2016.

that even if the price were reduced to 20% of the cost of issuing a title deed, less than fifty percent of eligible households would purchase it – a finding that is further remarkable as it is not very sensitive to income. This raises questions about whether uptake is limited by low perceptions of the benefits of titles in the city; a question also raised by a previous titling project evaluation by the Norwegian Agency for Development Cooperation (USAID, 2010).

As discussed above, the benefits of title are often understood in terms of access to credit, improved tenure security and housing quality, and improved transferability of property. The mortgage market in Dar es Salaam is limited, and recent evaluations of titling projects have noted limited impact of formalization on access to credit (Collin and Zeitlin, 2015; Parsa et al., 2011; Kusiluka and Chiwambo, 2019). These results

are in keeping with established theoretical expectations about the impact of formalization in contexts where credit markets are incomplete (e.g. Dasgupta and Lall, 2006). What about the anticipated benefits of improved security of tenure and transferability of property? How sound is the case that titling will lead to improvements in quality of housing and its benefit capitalized in property values?

In practice, the relative benefit of title depends on both the functioning of formal and informal property rights systems. As in many Sub-Saharan African cities, ownership claims certified by formal documents in Dar es Salaam are not beyond dispute (Collier and Venables, 2017). Processes to resolve land disputes are time consuming and costly (Kironde, 2000; Pedersen, 2013). Formal land records are thought to be out of date and are not publicly accessible. Corruption may be widespread:

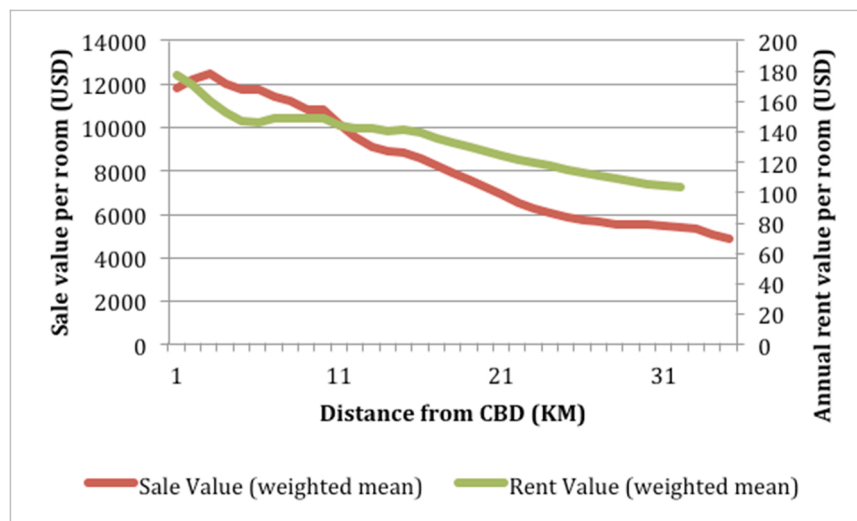


Fig. 2. Weighted Average of Estimated Sale and Rental Prices by Distance to City Centre, NB Prices have been converted into USD using an average of the official exchange rate over the time of the survey (1USD:0.000455TSH).

data on perceptions of corruption collected through the Afrobarometer survey in 2014 show that 35% agreed with the statement that most/all judges are corrupt, while 50% agreed with a similar statement about the police, and 25% for government officials.²

At the same time, there is reason to believe that informal institutions to support informal property transactions and resolve property rights violations exist (Panman, 2021). Informal property is generally purchased through informal channels, rather than acquired by invasion or squatting (Kironde, 2000, 2006; Kombe, 2005). These transactions are often witnessed by influential local figures and authorities such as the locally elected Subward chairperson, who also takes on the role of adjudication in the event of disputes (for a detailed discussion of these figures and their role in the land market, see Kombe, 1994; Kombe and Kreibich, 2001; Kombe, 2005; Panman, 2021). Unlike in rural villages, these authority figures do not have any official capacity to administer land transactions (for recent research on rural practices see Biddulph and Hillbom, 2020; Kabigi et al., 2021). Nonetheless, qualitative research indicates that informal owners express high levels of security in their tenure (Kironde, 2000; Kombe and Kreibich, 2001; Moyo, 2006).

In this paper we therefore explore whether there are indeed observable relationships between property formality, security, and values. To this end, we draw on data from the Dar es Salaam Measuring Living Standards in Cities (MLSC) survey. The MLSC survey is a new instrument designed to enhance understanding of cities in Africa and support evidence-based policy design. The instrument was developed under the World Bank's Spatial Development of African Cities Program. It was piloted in Dar es Salaam between November 2014 and February 2015. The data is available **online** through the World Bank's data catalogue.

A number of innovations in both the sampling strategy and questionnaire design were introduced in order to explore questions relevant to understanding living standards in urban areas, including the relationship between informality of tenure and housing values and quality.

It is widely anticipated that location within cities is important for access to a range of amenities and opportunities. The MLSC survey was thus designed in order to be able to explore locational attributes. It is geo-referenced and provides information on urban living standards at an unprecedented level of granularity. The survey is representative for the city of the whole, and, because the survey sample was stratified to be

representative for four different areas in the city, it is also representative for four different geographic areas within the city. Specifically, the city was divided into concentric circles to facilitate comparison between the city center, the 'consolidated core', and the periphery of the city. For full details of the sampling strategy and weights please see the MLSC report (also online).

In addition to this, satellite imagery was used to differentiate across different patterns of settlement in the city. Using a semi-automated algorithm, the team was able to classify enumeration areas (EAs) as either having a regular, planned layout or irregular 'shanty' characteristics based on their textual and structural composition (for further details on the methodology, see Antos et al., 2016). This design aims to capture differences between 'planned' and 'unplanned' areas of the city, and to be able to explore the relationship between these neighbourhood-level features and formality of tenure. As indicated in Fig. 1, most of the irregular EAs were located in the center of the city. As such, the central stratum was then further divided into 'regular' and 'irregular' areas in the sampling, in order to allow for comparison across the two.

In total, close to 2000 households were interviewed. In this paper we focus our analysis on owner-occupier households, who account for about one third of this sample. Renters are not included in the analysis, as land titling policy and research is almost entirely silent on the topic of rental housing. This is an important omission in the literature, as it is likely that renters make up a significant portion of residents in developing country cities (Marx and Suri, 2013; Gulyani and Talukdar, 2008; Baker and Schuler, 2004). The renting is also a likely driver of irregular housing expansion in central areas, as most rental accommodation takes the form of rooms in owner-occupied properties (Panman, 2021). We therefore explore the important topic of the rental market in depth in an accompanying paper (Panman and Lozano Gracia 2021).

The survey questionnaire was carefully phrased and tested to capture sensitive data on housing values and formality of property ownership. Household survey data has long been used to analyse housing values in contexts where official data on housing transactions does not exist. There are, however, challenges in ensuring the accuracy of these data. For example, surveys often ask homeowners to estimate the rental value of their property. Yet this assumes knowledge of rental markets and may arouse suspicion about the motivation of the question (anecdotal evidence suggests respondents may interpret it as interest in renting the property). After careful testing, the MLSC questionnaire was therefore modified to ask: "If a friend of yours wanted to buy a property like this in the same neighborhood, how much would he/she have to pay?". This phrasing was also designed to minimize any endowment effect in responses, as

² 2017 data shows an improvement on these scores. The 2014 results are reported as they coincide with the timing of the MLSC survey.

Table 1
List of Documents Households say they Possess.

Document type	%
Certificate of Right of Occupancy	4%
Title deed	13%
Inheritance letter	5%
Traditional Right of Occupancy	1%
Settlement permit	15%
Letter of allocation	10%
Total at least one formal ^a	40%

^a households can possess more than one document.

insight from behavioural economics indicates that people often ascribe more value to things merely because they own them.

The data must nonetheless still be used with caution. Challenges to accurate valuation remain, particularly as some households may simply lack knowledge of housing values in their area – in Dar es Salaam, as across the region, it is more common to purchase land to build a house incrementally than to buy a finished house – a factor often attributed to preferences as well as affordability issues (CPCS, 2015; World Bank, 2015). As indicated by the summary statistics in Table 2, the housing value estimates provided range widely. Yet it is notable that in keeping with theoretical expectations, prices decline with distance from the city centre, as depicted in Fig. 2. This graph also shows rental values paid by renters, as a point of comparison, which are more straightforward to collect as it is a value that renters pay with some regularity.

Collecting data on the formality and security of property ownership also requires careful design. Informality is an umbrella term that covers a wide range of ideas, categories, and sub-categories of tenure, but it has become standard practice in the titling literature and in policy research to classify households as ‘informal’ if they lack legal tenure to prove ownership claims. This reflects the theoretical dichotomy between formal, ‘legal’ market transactions and those that are instead framed by social norms and occurs outside of ‘legal’ exchange (UN-HABITAT, 2013).

Tanzanians often describe themselves as ‘owning’ their property if they have inherited or paid for it. Legally, however, the President is the custodian of all the land, which is legally designated as either ‘general’, ‘reserved’ or ‘village’ land. In urban areas, citizens are granted legal recognition of the right to occupy general land for residential use through a Certificate of Right of Occupancy (CRO), which last for a set number of years, often between 33 and 99 years (although shorter versions also exist). In order to qualify for a CRO, land must have been surveyed and be located in an area allocated for residential use in a town planning drawing (Moldrop Wolff et al., 2018). As indicated in Table 1, only 4% of households that define themselves as owning their property say that they have a ‘Certificate of Right of Occupancy’ (CRO).

CROs are not, however, the only form of legal recognition for property. Existing qualitative research suggests that it is not uncommon that households fail to complete or renew the paper work required have a CRO, despite being eligible for them. This may in part reflect the lengthy delays that were associated with processing these forms in the past (Kironde, 2006).³ These households may nonetheless possess other documents that can be taken as an indication of *eligibility* for CRO and may thus have implications for both households perceptions of the formality of their property and their capacity to assert their claims in court.

³ World Bank doing business indicators suggest that the costs and time to process formal documents have been reduced in recent years. Yet it is likely many eligible households still do not have the full legal documentation. Indeed, it is notable that in February 2017, adverts for mortgage finance from the FNB bank were visible in various locations in Dar es Salaam claiming that applicants can secure a loan within three days, and that “we’ll even get you the title deed” (in Swahili and English).

As such, following consultation with land office officials as well as trials of the survey instrument, the MLSC survey asked households to identify if they had any of the six forms of documentation of property ownership set out in Table 1.⁴ As indicated in this table, we find that forty percent of households have at least one form of these documents. We therefore classify 60% of owner-occupied households as ‘informal’, on the basis that they do not have any formal documents of tenure in the analysis that follows. Where relevant, we also present results comparing the findings if formality is defined on the more restrictive category of possessing full CRO or title deed.

Formality of tenure is linked to improved housing outcomes through anticipated effects on security of tenure. In order to test this relationship, however, we must also capture a measure of tenure security directly. There is no single authoritative way of doing this. The most commonly used metric is households’ self-assessed risk of property being taken away without their consent. This is arguably the most useful measure because household investment decisions are shaped by *perceptions* of security. As Lanjouw and Levy stress, even “if perceived security differs systematically from actual security, it is perceptions that give us the better variable for understanding utility” (Lanjouw and Levy, 2002, 999).

In the MLSC survey households were therefore asked to state whether they felt concerned about having their property taken away from them without their consent. Household categorized themselves as either ‘not concerned’, ‘a little concerned’, or ‘very / extremely concerned’. One fifth of respondents express some degree of concern, and we classify these households as ‘insecure’.

The survey further captures key features of housing characteristics and amenities (Table 2). These variables help us to build a picture of the quality of housing in the city, but also to disaggregate features that influence housing values. Thus, we are able to distinguish between properties based on the type of building, its age, and size (measured both in terms of the number of rooms and an estimate of roof area based on

⁴ The forms of documentation included were developed from a list of indicated by officials and tested in the pilot phase of the MLSC survey questionnaire development and enumerator training. There is some ambiguity over the categories, for example, ‘letter of allocation’ was known as a ‘letter offer’ until 2012. Similarly, the Traditional Right of Occupancy aims to capture any land allocation by village officials (such as the Certificate of Customary Right of Occupancy or CCRO) which may pre-date urban expansion – although these do not have formal standing within urban areas, respondents may nonetheless believe that they do. Both ‘title deed’ and CRO were included as a reflection of different ways of talking about the most complete forms of tenure documentation, and general catch-all terms such as ‘settlement permits’ were also included. As such, the analysis below includes both more expansive and restrictive definitions of what formality of tenure may mean to avoid that the results are driven by errors in the survey phrasing (rather than a reflection of lack of clarity over documentation that exists in the city, which, as discussed above, may reflect weaknesses in the reach of the formal system). MLSC also asked households if they had a ‘Sales Agreement’. This category was not included in the final list of formal documents of tenure however. This is because – although a notarized Sale Agreement is a formal document required for the transaction of property with other forms of documentation – the questionnaire was ambiguous in its wording that it referred to an official contract, given that many people in Dar es Salaam record informal sales with an informal agreement between the interested parties. Since households with a formal, notarized Sale Agreement are also likely to have another form of documentation, households that indicated they *only* have a Sale Agreement were classified as informal. It should also be noted that the list of formal documents did not include temporary residential licenses (valid for 2–5 years), which were introduced as a pilot scheme in 43 wards in 2005. Just over 200,000 households that were made eligible for the licenses in the first phase of this scheme, but less than half (44.5%) had taken them up by 2012, and the second phase has yet to be rolled out (Sheuya and Burra, 2016). Assessments of tenure security to date suggest that there is little reason to expect that these temporary licenses impact tenure security (Collin et al., 2015; Moyo, 2006).

Table 2
Definition of Variables.

Variable	Definition	Obs.	Mean	SD	Min	Max
In_sale	Dependent variable, log of estimated sale value of house (TSH).	799	16.85	2.11	9.21	21.42
Tenure variables						
Formal	Dummy variable that takes on the value of 1 if the household has any of 6 legally recognised documents of ownership	811	0.40	0.49	0	1
Title	Dummy variable that takes on the value of 1 if the household has either title deed or CRO	811	0.16	0.36	0	1
Insecure	Dummy variables that takes the value of 1 if the household expresses any degree of concern that their property may be taken away from them without consent	811	0.22	0.41	0	1
Housing characteristics and amenity variables						
House	Dummy that takes on value of 1 if the property is a detached house (rather than a semi-detached house or flat)	811	0.84	0.37	0	1
Prop_age	Number of years since the property was first built. For missing values (111 observations), the median property age for the strata was imputed.	811	12.69	10.21	1	65
Prop_age2	Prop_age squared, to account for possible 'vintage effect' of property	811	265.32	459.36	1	4225
Mains	Dummy variable that takes the value of 1 if household is connected to either piped water or sewage system	811	0.36	0.48	0	1
Electricity	Dummy that takes the value of 1 if household is supplied electricity by the utility company	811	0.57	0.49	0	1
Garbage	Dummy that takes the value of 1 if household garbage is collected by the municipality	811	0.44	0.50	0	1
Concrete	Number of roof, floor, and/or roof that is made of concrete.	811	1.95	0.42	0	3
Rooms	The number of rooms the household occupies	811	3.64	1.61	1	15
Sublet	The number of rooms that the household sublets to tenants	811	1.12	2.37	0	22
Roof_area	The estimated roof area (calculated from satellite imagery)	798	112.02	86.55	4	1044
Locational attribute variables						
KM_cbd	Measure of distance from the city center, rounded to 0.5 kilometers.	798	15.50	8.53	0	35
Irregular	Dummy that takes the value of 1 if the house is located in an 'irregular' EA, as identified by satellite imagery	811	0.21	0.41	0	1

Table 3
Formal and Informal Owner-Occupied Housing Compared (means).

	Informal	Formal	
Insecure	24.4%	18.2%	**
Connected to mains	33.5%	40.1%	**
Connected to Electricity	52.0%	65.7%	***
Has garbage collection	41.3%	48.1%	**
Located in irregular EA	16.6%	26.9%	***
Is a freestanding house	87.3%	78.7%	***
Pays property tax	24.2%	58.6%	***
Has concrete walls	96.1%	96.6%	
Has concrete roof	3.1%	2.5%	
Has durable floor	93.4%	95.7%	
Number of rooms	3.51	3.85	***
Rooms sublet	0.91	1.43	***
Roof size	109.00	116.48	
Property age	11.10	14.93	***
Distance from city centre	16.16	14.51	***

NB in the table above, means are compared for continuous variables, and proportions for dummy variables.

*Difference in means/proportions significant at the 10% level

** Difference in means/proportions significant at the 5% level

*** Difference in means/proportions significant at the 1% level

satellite imagery). We can also identify whether the house has amenities such as access to electricity from the utility company, connection to water or sewage mains, and whether the property is serviced by public garbage removal services. We use these variables to 'unbundle' the value of properties in hedonic price analysis, allowing us to explore not only price premiums associated with each of these amenities but also to test whether there is a price premium for formality of tenure.

3. Results and discussion (I): How do formal and informal houses compare?

In this section we explore broad trends in the quality of housing across formal and informal properties with descriptive statistics. We test the hypothesis that formal property owners face greater security of their assets and live in higher quality housing than informal households, as

Table 4
Hedonic Estimates for Sale Price of Housing (log).

	Column 1	Column 2
Formal	0.0600615 (0.0819881)	
Title		0.0411778 (0.0878603)
Insecure	- 0.5114768*** (0.0974709)	- 0.5115314*** (0.0976775)
House	-0.103271 (0.1176632)	-0.1100553 (0.1173343)
Prop_age	0.0209549* (0.0118724)	0.0213482* (0.0118578)
Prop_age2	-0.0002136 (0.0002454)	-0.0002143 (0.0002453)
Mains	0.2840554*** (0.0879394)	0.2805397*** (0.0883849)
Electricity	0.2947525*** (0.0909353)	0.2941781*** (0.0914266)
Garbage	0.6094121*** (0.0908452)	0.6069732*** (0.0907679)
Concrete		
1	-0.1103336 (0.3253643)	-0.1132428 (0.3253656)
2	0.2474106 (0.2850787)	0.2440264 (0.285182)
3	0.2342222 (0.3371701)	0.2268999 (0.3379083)
Rooms	0.1015281*** (0.0268235)	0.1039747*** (0.0267762)
Sublet	0.0496233*** (0.0192307)	0.049599*** (0.019228)
Roof_area	0.0010619** (0.000469)	0.0010597** (0.0004688)
KM_cbd	- 0.0224876*** (0.0057033)	- 0.022666*** (0.0057151)
Irregular	- 0.3022623*** (0.1189494)	- 0.2996378*** (0.1187649)
_cons	16.45721*** (0.3583518)	16.47024*** (0.3572082)
Observations	786	786
R2	0.18094586	0.18104797

Notes: Robust Standard Errors are in Parenthesis. Given that the regression employs a log-linear equation, the coefficients can be interpreted as the percentage increase in rent for a one unit change in the variable of interest, controlling for all other variables in the equation. For a dummy variable, the estimates reflect the percentage increase in rent associated with having that amenity, all other things being equal.

* Significance at the 10% level.

** Significance at the 5% level.

*** Significance at the 1% level.

theory would predict. The results are summarised in Table 3, which shows that although there is some observable difference in terms of location and age of the housing stock, the differences in security of tenure, quality of building materials, and access to services are surprisingly small.

As discussed above, in Dar es Salaam, one fifth of households surveyed express some degree of concern that their property may be taken away from them without their consent. Notably, the proportion of informal households that feel insecure regarding their property rights is less than 5% points greater than formal households.

Why is this? Insecurity of tenure in Dar es Salaam is largely driven by concerns over expropriation from the state. The vast majority of insecure respondents (170) stated that they worried about government expropriation.⁵ That fear of expropriation is not strongly tied to tenure formality is likely the outcome of provisions for expropriation under Tanzanian law, which do not distinguish between houses on the basis of

⁵ It is worth noting that the fear of expropriation may not align with actual risk of expropriation, yet for understanding insecurity perception of risk is key.

formal tenure. Indeed, the Land Acquisition Act (1967) and Land Act (1999) maintain the President's role as custodian of all land landowners are compensated, regardless of formal tenure status: "it does not matter whether they are registered or not provided they are recognized locally as the owners" (Kironde, 2009, 14).

Although high levels of concern over expropriation are to be expected, economic theory would lead us to anticipate that people would also be concerned about conflicts with other citizens. This is not the case. Only ten survey respondents expressed worry that they might lose their property to a relative, and one spoke of fear of a money lender/ bank. These findings are at odds with theoretical expectations, but they align with insights from existing research in the city, which highlights that informal households do not express high levels of tenure insecurity as there are strong informal institutional arrangements to secure tenure even in the absence of titles (Moyo, 2006; Kombe, 2005; Kombe and Kreibich, 2001; Panman, 2021).

Perhaps the strongest indicator that there is little variation in the levels of insecurity among formal and informal households is that there is little observable variation in the quality of building materials across these residences. As indicated in Table 3, formal houses are larger in terms of number of rooms but the difference in the mean roof size, which is used as a proxy for property size in squared meters, is not significant. Furthermore, we do not see a clear pattern between formality of tenure and building height, as is often anticipated: of the 533 owner-occupied properties in the survey for which we have building height information, most (97%) are one storey high, yet only approximately half of those that are two storeys or more (13 properties) have formal documentation of tenure.

Informality is often also tied to lower access to public services. Overall, service deficits are high in Dar es Salaam. Indeed, it has been well documented that water and service delivery is marked by technical challenges such as fragmented planning, poor management of services, deteriorating infrastructure, and simply inadequate levels of ground water supply to meet current levels of demand (Pastore, 2015; Jones et al., 2016; de Waal and Cooksey, 2008). Existing qualitative research in the city suggests that households with informal tenure face similar challenges in accessibility as those with formal tenure (Andreasen and Moller-Jensen, 2016; Burra, 2004). The MLSC survey shows that the difference in the proportion of formal and informal households with access to mains water and sanitation is less than 7% across the two groups.

Informality is commonly associated with irregularity of settlement patterns across the world. Indeed, in Dar es Salaam, the terms 'informal settlements' and 'unplanned areas' are used interchangeably. It is thus notable that a larger portion of formal households in Dar es Salaam live in areas identified as 'irregular' than informal households – as shown in Table 3. This indicates that we must be cautious in attributing irregularity of neighbourhood development to the absence of legal land ownership rights. Instead, Panman (2021) argues that differences in the informal institutional frameworks for land use management – and, in particular, the role of local leaders in helping to coordinate land use agreements amongst neighbours – play a pertinent role in driving these differences across areas, with important knock-on effects for housing quality.

We further test the links between formality of tenure and housing quality characteristics using a logistic regression (for detailed results see Appendix A), with the aim of disentangling the conditional relationship between these individual variables and formality of tenure. It is notable that we fail to find any significant relationship between formality of tenure and security of tenure, housing quality, access to services, or even locational attributes of housing. The only correlations that appear significant are those with the property age and taxation. This aligns with existing qualitative research which highlights that some residents in Dar es Salaam associate formal documentation with a number of costs and obligations, including the requirement to pay tax (Kironde, 2019). The link with property age, however, could also support the hypothesis that

government capacity to issue titles and register land for taxation has come under increased strain over time, although the results are likely characterized by endogeneity problems.

4. Results and discussion (II): Is there a price premium for formal title in Dar es Salaam?

In the following section we use hedonic price analysis to explore the value of formal documents of ownership, as a way to explore the expectation that underpins titling projects that informal households would be willing to pay to formalise their property. The hedonic method allows us to uncover implicit prices for different features that make up the price of composite goods like housing. The method has been applied to estimate the size of the price premium for formal title in a number of developing country cities, including Manila, Philippines; Bogota and Cali, Colombia; Jakarta, Indonesia; and Ho Chi Min City, Vietnam (Friedman et al., 1988; Dowall and Leaf, 1991; Kim, 2004). To the best of our knowledge, the hedonic method has only been applied in Sub-Saharan Africa to measure the value of formal property documentation for undeveloped plots in Bamako, Mali (Durand-Lasserve et al., 2013; Selod and Tobin, 2013).⁶

We estimate a log-linear form of the hedonic regression model:

$$\ln(P) = \beta_0 + \beta_1(T) + \beta_2(H) + \beta_3(L) + \varepsilon \quad (1)$$

Where P is self-reported housing values; (T) includes tenure variables; (H) refers to house characteristics and amenity variables; and (L) are locational attributes.

As discussed above, the housing value estimates range widely. As such, we take a cautious approach to using the data and employ a robust regression, which weights observations based on the size of their residuals through a process of iterative re-weighting.⁷

Tenure variables refer to formality and security of tenure, housing characteristics include the property size and services it has, while location attributes refer to distance from the city centre, and a variable that indicates if the house is located in a visibly irregular neighbourhood. A full definition of these variables is provided in Table 2 and discussed above.

The results are presented in Table 4 below. As would be expected, the results indicate that the value of housing reflects both housing and neighbourhood amenities. A larger house – measured in number of rooms and square meters – is associated with higher estimated sales value, all other things being equal. There is a positive and statistically significant effect for access to all services measured, *ceteris paribus*. For example, access to mains water/sanitation and electricity are both associated with a 30% price premium. The effect is negative for distance from the city centre. Furthermore, as theory would predict, households that feel insecure in their tenure also estimate the value of their house 51% lower than those who feel secure, all other things being equal.

In contrast, the results do not indicate that formal documents of property ownership are associated with a property price premium. Households with formal documents of tenure value their property only fractionally higher than informal households, and the effect is not statistically significant (column 1). Given that some forms of property

⁶ There are a handful of papers that employ hedonic methods in the region, but these do not measure the value of titles (Arimah, 1992; Megbolugbe, 1989; Lozano-Gracia and Young, 2014).

⁷ Values that are clear outliers – i.e. observations that are unusual given the value of predictor variables – are weighted 0 and thus effectively excluded from the analysis. In the analysis below 56 observations are weighted 0. There are no clear patterns in the characteristics of households that suggest that the estimates are biased for a specific reason. The proportion of informal, insecure, and migrant household heads differs by no more than 5% of all owner-occupiers. They do not differ in age (mean age is 46), or proportion with secondary education or higher.

documentation such as a traditional right of occupancy may not be highly transferable, the analysis is repeated in column 2 using a restricted definition of formal. This restricted definition includes only title deeds and/or Rights of Occupancy. Once again, the results fail to indicate that there is a price premium associated with title. In Appendix B we conduct further robustness tests, including interviewer and enumeration area fixed effects. In all specifications, the effect associated with title is small and insignificant.

It is worth noting that neighbourhood quality appears to be a very important factor in the value of housing. Houses located in irregular areas are valued 30% lower than those in regular areas, all other things being equal. In addition to this, garbage collection commands a considerable premium of 60% – which likely reflects the value of being located close to a passable road, since this is one of the main obstacles to garbage trucks servicing houses. This is interesting because irregularity of settlement and lack of roads are neighbourhood characteristics often associated with tenure informality; indeed, it is worth noting that one of the seminal pieces of literature on the value of housing formalisation by Friedman et al. (1988), housing is categorized by these types of locational attributes rather than data on whether the housing is formal or not (i.e. housing is considered formal unless it is located in a ‘squatter’ area). Yet, as discussed above, in Dar es Salaam there is no clear connection between legal documents of ownership and regularity of neighbourhood in, and thus the irregularity of the settlement pattern in these areas cannot simply be attributed to lack of formal property documentation (indeed, a larger portion of households with legal documents of ownership are found in these areas than those without, as shown in Table 3).

5. Conclusions

The case for land titling is often made in terms of the benefits that would accrue to titled households, given the expectation that formal property is more secure and less costly to transact than informal property. In this paper, we have argued that this is too simplistic to usefully describe the situation in contexts where formal land market institutions are incomplete and informal markets are widespread, such as in many Sub-Saharan African cities. We demonstrate this by drawing on data from Dar es Salaam, which shows that formal and informal property is remarkably similar, and households with formal property rights do not value their houses higher than those without, all other things being equal.

The findings point to the need to better account for local institutional context in the design and assessment of titling projects. Specifically, in contexts such as Dar es Salaam where the individual benefits of titles are low, it is unlikely that formalization would result in property value appreciation and hence that households would be willing to pay for titling efforts. As such, it may not be reasonable to anticipate that households will voluntarily engage in titling projects or willingly pay for formal property documents without further efforts to consolidate and communicate the potential value of title to them.

Yet it is important to note that the results presented in this paper do not mean that there are no benefits to formalisation: titling projects have public as well as individual benefits, and property registration may be a key step in consolidating the land market in cities like Dar es Salaam. As discussed above, formalization is vital for the development of an accurate cadastre, which in turn is associated with a wide range of benefits such as improved public land management, infrastructure planning, the collection of property tax, and urban disaster risk management. These benefits, however, do not accrue directly to titled households. As such, financial buy-in from informal households is unlikely to provide a sustainable means to support the costs of the projects.

As such, drawing on the findings from this paper, we suggest three potential complementary policy initiatives could serve to encourage participation in formalization initiatives in Dar es Salaam and in other cities where informal rights are widespread and confidence in formal

processes is weak.

First, the findings suggest that in cases where informal institutions are strong, governments may want to consider ways to build from these strengths as the basis for formalisation. Careful consideration of the impacts of such an approach would be needed to ensure that the most vulnerable are protected, however, as legal recognition of property rights always involves some form of transformation of the rights, creating winners and losers (Boone, 2019). Gradual implementation with continuous evaluation of results would allow for assessment of impacts and leave space for course-correction when needed.

Second, there is a need to explore alternative financing measures for titling initiatives. Since land registration systems have public good characteristics and can yield important benefits for the city as a whole, it may be appropriate to finance projects from city-wide funds rather than user fees. In this case, policy design should also consider costs that households may face over time – such fees that may need to be paid to maintain records if ownership changes hands or leases expire – to avoid re-informalisation. Moreover, careful evaluation of how to prioritise and sequence reforms, including the relative benefits of continuing the project-based approach versus city-wide reforms on households' perceptions of the value of title, would be beneficial.

Third, complementary measures to strengthen the benefits of titling for individuals could improve individual willingness to participate in formalization. Reforming institutions is a long-term challenge, but measures to improve and build confidence in the formal systems would likely increase demand for titles over time. In Dar es Salaam, this could include efforts to reduce costs of property registration, eliminate double allocation of plots, strengthen dispute resolution processes, and build confidence in eminent domain procedures. The creation of a reliable and publicly accessible record of property transactions could also yield significant benefits to individual owners. The Government of Tanzania has already started working in this direction with support from the World Bank. Efforts to strengthen the land administration systems include actions to upgrade and upscale the country's Integrated Land Management Information System in urban areas, build capacity in land management and dispute resolution systems, and explore new approaches to reduce tenure regularisation costs for households.

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entirely those of the authors. They do not necessarily represent the views of the International Bank for Reconstruction and Development/World Bank and its affiliated organizations, or those of the Executive Directors of the World Bank or the governments they represent.

Appendix A. Logistic regression – probability of being formal

In the following appendix we explore the probability that a house will be classified as formal using a logistic regression. The objective is to further describe the differences between formal and informal housing, following Friedman et al. (1988) and Kim (2004). In addition to the tenure, housing, and locational variables described above, the regression also includes characteristics of the household, as detailed in Table A1. Property ages are also grouped by quartiles, for ease of interpretation.

The results are displayed in Table A2. Overall, they fail to show a conditional relationship between insecurity of tenure and formality of property documentation. They further fail to show that there is a relationship between access to services or the location of property. We also do not find a significant relationship between affluence or education of the household head and likelihood of formality of tenure – these are two characteristics often thought to influence demand for titles, although it is likely highly dependent on context, and the causality has been theorised to run in both directions (for a discussion of this literature, see Monkkonen, 2012, 2016). It is worth noting that our results align with Ali et al.'s finding that socioeconomic variables do not have a significant effect on take-up of titles in Dar es Salaam (Ali et al., 2014).

In contrast, age matters: we divided the housing stock into quartiles, and the odds of the oldest properties (17–65 years old) having formal titles are 2.3 times those of the newest properties (built within the last 6 years). Most notably, the odds of having formal documents of tenure are almost four times higher for households that pay property tax than those who do not.

Table A1
Definition of Variables.

Variable	Definition	Obs.	Mean	S.D.	Min.	Max.
tax	Dummy that takes the value of 1 if the household pays property tax	811	0.38	0.49	0	1
hhh_age	Age of the household head	809	47.75	13.11	18	97
hhh_educ	Categorical variable indicating highest level of educational attainment for the household head 0. Illiterate; 1. Kinder; 2. Secondary; 3. University/other tertiary)	796	1.41	0.69	0	3
migrant	Dummy that takes the value of 1 if the household head was not born in Dar es Salaam	760	0.73	0.45	0	1
poor	Dummy variable that takes on the value of 1 if household is in the bottom 40% of consumption for Dar es Salaam	808	0.45	0.50	0	1

Table A2

Logistic Regression Exploring probability of having formal documents of tenure.

	Odds Ratio
insecure	0.9047079 (0.2134156)
house	0.8402039 (0.2107545)
prop_age 7–10 yrs	0.8527564 (0.236657)
11–17 yrs	1.219941 (0.3334772)
17–65	2.334952** (0.8120265)
mains	1.105552 (0.2309919)
elec_utility	0.9446373 (0.2308578)
garbage	0.9748929 (0.1998531)
concrete 1	0.2517176 (0.2321272)
2	0.4197382 (0.3514119)
3	0.365176 (0.3482937)
s5_norooms	0.9662757 (0.0631292)
sublet	1.012638 (0.0473973)
roof_area	0.9996634 (0.0009476)
km_cbd	1.008497 (0.0155273)
irregular	1.031658 (0.2849169)
tax	3.911661*** (0.8316452)
hhh_age	0.9962331 (0.0085525)
hhh_educ Kinder/primary	1.861398 (0.8908429)
Secondary	1.888239 (0.9875846)
Uni	1.662546 (0.9826468)
migrant	1.059565 (0.2351793)
poor	0.8126094 (0.1722616)
_cons	0.6423398 (0.7426409)
Prob > chi2	0.000

Notes: Robust Standard Errors are in Parenthesis

*Significance at the 10% level.

** Significance at the 5% level.

*** Significance at the 1% level.

Appendix B. Robustness checks

Hedonic price regressions can suffer from issues of multicollinearity. The choice of variables included in the hedonic model is guided by the hedonic price literature; the age of a property, its size, and location are all central tenets of housing values across the world, and thus important to include in the analysis. Yet covariance amongst these variables will affect both the size and significance of the coefficients, and thus complicate interpretation of the results.

Table B1 presents the variance inflation factor (VIF) amongst the independent variables included in the model. The VIF provides an indicator of how much the standard error is inflated by multicollinearity. The VIF of 1.07 for the formal tenure variable thus indicates that the standard error is only 7% larger a result of multicollinearity. Indeed, as a general rule of thumb, a VIF of less than 5 is considered moderate and inconsequential to the interpretation of the results (Xiao, 2017).

The VIF may also reflect multicollinearity within a given variable, as is likely the case of ‘concrete’, which is a categorical variable with four categories. Equally, the high VIF for the two property age variables is a reflection of their close collinearity with each other.

In Table B2 we present a number of additional specifications of the hedonic price regression presented in the main body of this chapter. Column one reports the results of the robust hedonic price regression with only the physical characteristics of the property and its location. Columns 2 and 3 then show the results when formality of tenure and insecurity of tenure are included, respectively. The specification in column 4 is our preferred specification, which is reported in the main body of the text. The table shows that contrary to what we may anticipate from the theoretical link between title and tenure security, yet in keeping with the observation that informal households in Dar es Salaam report high levels of tenure security, the inclusion of tenure security in the model has only a very small effect on the size of the coefficient for

Table B1
Variance Inflation Factors.

Variable	VIF
Formal	1.07
Insecure	1.06
House	1.23
Prop_age	9.7
Prop_age2	8.43
Mains	1.18
Electric	1.33
Garbage	1.34
Concrete	
1	3.44
2	5.58
3	3.27
Rooms	1.15
Sublet	1.31
Roof_area	1.09
km_cbd	1.55
Slum_area	1.54
Mean VIF	2.77

Table B2
Additional Specifications of the Hedonic Price Regression.

	1 (Ln) Value	2 (Ln) Value	3 (Ln) Value	4 (Ln) Value	5 (Ln) Value	6 (Ln) Value
Formal		0.0854519		0.0600615	-0.0317766	0.0249744
Insecure		0.0827306	- 0.51427***	0.0819881	0.0902065	0.1510966
House	-0.0753319	-0.0670055	0.0972559	0.0974709	0.1047922	0.2171694
Prop age	0.1184344	0.118818	-0.1088084	-0.103271	-0.1441975	-0.3023965
Prop age ²	0.0233109	0.022915*	0.1172755	0.1176632	0.1451695	0.2146344
Mains	0.0119601	0.0119835	0.0211561*	0.0209549*	0.0026683	-0.0076431
Electricity	0.0002567	-0.0002607	0.0118507	0.0118724	0.0113528	0.0207717
Garbage	0.0002474	0.0002477	-0.0002096	-0.0002136	0.0001351	0.0003445
Concrete	0.3221835***	0.322883***	0.0002451	0.0002454	0.0002278	0.0004239
1	0.0881716	0.0883628	0.2825035***	0.2840554***	0.0825368	0.1051832
2	0.334108***	0.3292001***	0.0877735	0.0879394	0.1090811	0.1776864
3	0.0912784	0.0915777	0.2977629***	0.2947525***	0.1485314	0.5178767***
Rooms	0.6234907***	0.6242275***	0.0906659	0.0909353	0.0903573	0.1643735
Sublet	0.0915959	0.0917217	0.6081144***	0.6094121***	-0.0959197	0.1658914
Roof area	0.004007	-0.0029684	0.090719	0.0908452	0.140652	0.1945221
KM_CBD	0.3283197	0.3287079	-0.1056874	-0.1103336	-0.2553994	0.379316
Irregular	0.3563165	0.3492479	0.3249878	0.3253643	0.1852113	0.5542427
_cons	0.2876964	0.2879978	0.2520029	0.2474106	-0.1170945	0.5149418
Obs	0.3649486	0.3581858	0.2847873	0.2850787	0.1795566	0.4897001
R2	0.3401838	0.340636	0.2386314	0.2342222	0.0212489	0.7441722
EA FE	0.104612***	0.1002141***	0.3367303	0.3371701	0.3276574	0.5825883
Inter-viewer FE	0.0270231	0.0270968	0.1059721***	0.1015281***	0.0884429**	0.0746507
	0.0532538***	0.0518199***	0.0267526	0.0268235	0.0367827	0.0500432
	0.0193944	0.0194167	0.0507768***	0.0496233***	0.0381313	0.0184469
	0.0012762***	0.0012816***	0.0192096	0.0192307	0.0285678	0.0330923
	0.0004717	0.0004723	0.001061*	0.0010619**	-0.0000539	0.0006778
	- 0.0187403***	- 0.0189456***	0.0004686	0.000469	0.0005464	0.0008429
	0.005724	0.0057299	- 0.0224235***	- 0.0224876***	- 0.1095859**	-0.0065983
	- 0.2413942**	- 0.2446353**	0.0056977	0.0057033	0.0497816	0.0114796
	0.1195095	0.1197881	- 0.3008489***	- 0.3022623***		0.0473414
	16.06778***	16.06205***	0.1187007	0.1189494		0.2215942
	0.3558972	0.3570588	16.46074***	16.45721***	18.62395***	15.92023***
	786	786	0.3570145	0.3583518	0.6677822	0.6368074
	0.16443601	0.16525301	0.18133491	0.18094586	786	786
	no	no	no	no	yes	no
	no	no	no	no	no	yes

Notes: Robust Standard Errors are in Parenthesis.

* Significance at the 10% level.

** Significance at the 5% level.

*** Significance at the 1% level.

formal documents of tenure. Moreover, the effect associated with formality of tenure is not significant in either specification.

Columns 5 and 6 report two fixed effects models which look at variation within geographical locations. Column 5 can be interpreted as reporting the variation observed within enumeration areas, while column 6 reports variation grouped by the identity of the enumerator that collected the survey data. The coefficient for the value of formal title is small and insignificant in both specifications. In the Enumeration Area FE model (column 5), the coefficient is negative; yet in further analysis which treats irregular enumeration areas as a submarket (not shown), the coefficient for formal documents also remains small, positive, and insignificant.

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