

Resourceful Cities

Berlin (Germany), 29-31 August 2013

Towards an Econometric Modelling of Agent Behaviour under the Uncertainties of Secure Land Tenure Elements

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Paper presented at the International RC21 Conference 2013

**Session: World of Cities, 'Planet of Slums'? Informal settlements
and public policies**

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Abstract

Land tenure security determines the degree of recognition of a claim to a benefit stream from land resource by an agent. This is in turn a necessary condition for providing incentives for access into the formal credit market and investment on land. An effective land policy making process towards the tenure security enhancement requires to identify the possible economics impacts of the land tenure conditions. However, the econometric models that used to explain the above impacts with respect to the tenure security have largely neglected the perceptual dynamics of agents towards the tenure security. As such, these models less competent in reflecting the grounded relation between agent's economic behaviour and tenure security.

The paper has integrated the established literatures on tenure security so as to facilitate the modelling of the impacts of land tenure security conditions on economical decision making of an agent. This has future use in predicting the impact of tenure security conditions on agent economic decisions making under a chosen policy measure.

Key Words: Land Tenure Security, Secure Tenure Elements, Perceptual Dynamics, Economic Impacts

Introduction

Urban land tenure insecurity has now become a global issue. Urban population expansion mainly driven by population growth and rural-urban migration has marginalized many people from the urban land market. Those who are marginalized by the land market mechanism may tend seek shelter in squatter settlements with less tenure security (Davis, 2006, pp. 1-19). According to UNHABITAT figures, in 2003 over 30% of the urban population lived in these squatter settlements. The figures provided by UNHABITAT have further highlighted that the trend of urban squatting may become much severe in the coming decades. According to these numbers, by 2050, two-thirds of the world humanity will live in cities and 90% of this growth will be due to the result of urban population growth in developing countries (UN-HABITAT, 2003, p. 25). This highlights the potential risk that most people who migrate to urban areas or poor people who live in urban areas will end-up in squatter settlements with less tenure securities.

Land tenure insecurity makes negative economic impacts. Tenure security defines the degree of perceptual certainty of an agent over the return from a benefit stream from a resource. This is mainly dependent on how others recognize the rights of an agent to enjoy the benefit stream (FAO, 2002, p. 18). The economic impact of tenure insecurity can be well explained using the neoclassical economic theories. According to these theories, population growth, technological development, and labour endowments enable people to engage in continuous exploitation the land. To accumulate the capital through this process and thus to continue the process, however, a market mechanism, where rights to resources can be exchanged, is needed (Soto, 2000, pp. 27-29). Tenure insecurity creates uncertainties to the bundle of rights and hence, uncertainties in returning the benefit. This inhibits the function of land market, and thus the accumulation of capital. Hence, lands with tenure insecurity become dead capital to a nation (Soto, 2000, p. 29). The uncertainties associated with property rights also make difficulties in accessing into the credit markets due to the reason that such rights provide little guarantee to the lenders to serve the property as a collateral. This inhibits the investment on land (Feder et al., 1988). All these factors result in insecure tenure lands being underutilized and less economically viable. A world wide study conducted by Soto (2000, pp. 30-32) indicates that tenure insecurity caused loss of \$74 billion in Peru, \$133 billion in the Philippines, and \$240 billion in Egypt.

Improving the land tenure conditions in squatter settlements is a very complex matter. It requires the determination of perceived subjective and objective uncertainties of returning the

benefit inherited within tenure security elements and their impacts on right holder's (agent's) economic decision making (Deininger, 2003, p. 36). This is not a perception on a single likelihood of returning the benefit from a certain right on resource, but rather likelihood of returning net benefit from a bundle of rights associated with a resource such as land. Hence, the true measure of tenure security involves outcomes from these rights to resources and their associated impact as well as individual perception (subjective & objective) on the probability of such outcomes (Sjaastad & Bromley, 2000, p. 9). Existing models that used to predict the economic impact of tenure security conditions on agent decision making, have largely neglected these perceptual dynamics of an agent agents towards uncertainties in returning the benefit from the rights to land. Hence, the policies directed by these models may not be effective in practice.

The purpose of this paper is to find a modelling approach that embraces the perceptual dynamics of an agent towards the returning benefit from a given tenure conditions so as to facilitate the formation of more grounded land policies. This requires a comprehensive literature review and careful integration of the theories into models to predict the effectiveness of policy measures under given scenarios.

The paper consists of four main sections and in this introductory section we have highlighted the importance and the relevance of the issue and our specific problem that we wish to deal with. In the next section, we will discuss the global debate on enhancing the tenure security. This will serve as a backdrop to section 3 dealing with the empirical determination of the economic impact of tenure security. Section 4 concludes the findings of the study and also highlights some reflections emerging from this work.

Global Debate on Tenure Security and Lesson to be Learned

Institutions and land rights are central to the land tenure discussions. Through the following literature review we will establish the role of these two components in enhancing the land tenure security. The core debate on the urban land tenure enhancement is mainly divided into two groups. One group argues that providing individual rights to squatter settlers would simply improve the land tenure security conditions and economical viability of land (Demsetz, 1967; Soto, 2001). The others are mainly concerned about the gradual enhancement of the land tenure continuum in order to avoid the unintended repercussions from tenure formalization (Durand-Lasserve & Selod, 2007; Jimenez, 1984; Payne, 2001;

UN-HABITAT, 2003). The following text will illustrate this debate so as to shed some light into our effort.

Let us first discuss the benefit of individual rights and its limits. According to Demsetz (1967, pp. 347-348), rights define the peoples' expectations towards a resource. The rights holder expects that the community prevents the others from interfering with his/her rights. Property rights define the things that are allowed and not allowed in enjoying a benefit stream from a resource, and they should ultimately internalize the externalities associated with the use of a certain resource. Demsetz (1967, p. 448) concludes that such internalization would be much easier if the right holder is provided with formal recognition or title to his rights. A study conducted by Soto (2000, pp. 29-31) in developing countries has highlighted that lack of formal recognition or difficulties in getting legal recognition of property rights to land make them less economically viable. These lands are invisible in the property market and hence, they are more like dead capital. As mentioned in the above section, this has caused loss of several billions of dollars for developing nations. Formal recognition of individual rights towards resources, like land, makes an individual to bear the benefits and costs associated with his decisions, and thus allow him to make rational decisions to economize the use of the resources, and hence, accumulation the wealth through market mechanism (Demsetz 1967, p. 355). This argument is based on the theoretical enlightenment given by Adam Smith (1776). In his famous article on the Wealth of Nation, Smith (1776) explains that how the market mechanism facilitates the accumulation of products and formation of the wealth (capital) of nations. This process of market mechanism can be analogue to conversion of the potential energy of a placid lake into electric energy by an engineer. Soto (2000, pp. 41-43) has suggested that, in the case of land, this conversion may result through the formalization of property rights that individuals enjoy. The formalization, according to Soto (2000, pp. 47-62) will provide six effects that enable the market mechanism to function, namely; facilitate the potential use of land through market forces, eliminate asymmetric information, force the people to rational choices through internalizing of externalities, enable the exploitation of the resource by a number of different individuals with different interests, allows people to connect with each others, and provide security against investments. Hence, according to Soto (2000, pp. 288-229) individual property rights motivate to unravel the potentials of individuals on resources and accumulate the wealth by facilitating the exchange of such rights through market mechanism.

In contrast to the above arguments, in his most popular works on capital, Karl Marx (1867-1894) has pointed out that individual property rights allow the concentration of the capital (wealth) into a few hands, and brings social unrest. Payne (2001, p. 9) has argued that If land policies focus on formalize the tenure security of one tenure categories, rather than land tenure continuum, then unintended repercussions may happen due to the reason that interests of the other tenure categories towards the newly enhanced tenure category, and thus make the tenure conditions even worse. The formalization will specially affect in customary holding lands as they overlook the institutions that locally evolved (Durand-Lasserre & Selod, 2007, p. 10). Hence, practical implementation of the individual titling on squatter settlements, as mainly argued by Soto (2000, pp. 41-43) and others, may therefore, adversely effects on urban squatter settlers in many ways. It may cause some dwellers to forced sell the land to others with high economic ability or leave the land due to the reason of lack of having the required documents. In some cases, the poor may not have enough money to pay the cost of formalization. Further, planning regulations imposed on them may in turn inhibit in investment.

Role of the institutions within a land tenure system further justifies the individual title is not the only means to eliminate the externalities as argued by Soto (2000, pp. 41-43). According to Bromley (1991, pp. 2-9) property rights only consist of rights and privileges. If an individual has certain rights, it naturally means that he has duties (institutions) over using such rights. If such duties do not exist, then such an individual has privilege over the others. Sanctions (institutions) on behaviour on using resources caused to emerge property rights. They define the boundaries of interest of individuals from which others are excluded. Unlike Soto, these boundaries (institutions) can be formal or informal. Depending on the penalty-reward structure of the property rights, the boundaries representing the interests of right holder can be broken and hence, brings tenure insecurity. Spill-over effects (or externalities) associated with rights can only be eliminated through introducing new boundaries which allows the emergence of new property rights. Incapability of the institutional setup (boundaries of interests) to recognize the new cost-benefit structure associated with property rights may lead to social unrest (Piyasena, 2009, p. 77). The degree of autonomy of such property rights will be determined by the extent to which actions and their outcomes remain within the boundaries defined by the property rights. If the persistence of autonomy does not enough to eliminate the externalities then additional boundaries need to be introduced (Sjaastad & Bromley, 2000, p. 16). Within this process, locally evolved institutions serve special purposes to preserve the boundaries that are there to meet specific social and

environmental objectives (Sjaastad & Bromley, 2000, p. 17). Providing individual titles by overlooking these will bring more harm than benefits. The western way of defining the individual rights through location is not enough to eliminate the externalities caused by the individuals as the attributes of a resource may have multiple layers with different physical and non-physical boundaries depending on location, resource categories, shares, and time (Sjaastad & Bromley, 2000, p. 15). In order to reduce the spill-over of using such resources, new boundaries (institutions) and congruencies between the boundaries need to be introduced at the interface between exercising of deferent rights over the same resource (Sjaastad & Bromley, 2000, p. 15-18).

Now we are in the position to clarify the role of rights and institutions in land tenure security. Land tenure security implies the perceived likelihood of returning the benefit from right to a resource (Sjaastad & Bromley, 2000, p. 9). The uncertainties associated with rights to a resource (land parcel) are determined by the characteristics of rights and enforcement institutions (Deininger, 2003, p. 23). Their central roles in this context are to eliminate the externalities and enhance the certainty of returning the benefit. An agent may have bundle of rights to a land parcel with different perceived likelihood of returning the benefit from each (Sjaastad & Bromley, 2000, p. 9). The uncertainty associated with returning the benefit from each of the rights has subjective and objective components (Deininger, 2003, p. 36). Integrating these perceptual uncertainties into a model which could predict the agent economic behaviour with given tenure security condition would be much beneficial for effective land policy making. This is the challenge of the next section

Towards the modelling of the impact of tenure insecurity

Tenure insecurity, as we pointed out above, can be defined as the perception of the likelihood of loosing specific rights to land (Sjaastad & Bromley, 2000, p. 7) and therefore, the associated benefits. Hence, any approach that intends to empirically determine the impact of tenure security needs to incorporate this perceptual dimension of tenure security. As highlighted in previous sections, this is quite complicated because land tenure may consist of a bundle of rights which reflect the various interests of an agent with different degree of perceived tenure security.

According to Deininger (2003, pp. 25-35), the above perceptual uncertainties are formed within five secure tenure elements; duration of rights, Identification of boundaries, subject of rights, properties of enforcement institutions, and evolution of rights in response to changing

relative scarcities. However, for the purpose this analysis, we have renamed some of the above elements to better interpret the cohesion among the elements. Accordingly the elements have been renamed as follows: element 01-duration of rights; element 02-boundary definitions by institutions; element 03-subject of rights; element 04-properties of the enforcing organizational setup; and, element 05-evolution of the institutional setup. Each secure tenure element, mentioned above, may attributed with subjective and/or objective perceived uncertainties which in turn affect the agent's economic decision towards his land (Deininger, 2003, p. 36). The next part of this section is focussing on empirical determination of the influence of these secure tenure elements.

Element 01(duration of rights) needs to be sufficiently long enough to reap the benefit from an investment. According to a study conducted by Brasselle, Gaspart, and Platteau (2002, p. 400) on land tenure security, perceived certainty in duration of rights has a positive correlation with investment. Similar studies carried out by Feder et al. (1988) and Galiani and Schargrodsky (2010, p. 21) have pointed out that the uncertainties associated with the duration of rights indeed have an effect on investment decisions by the right holder. However, such correlation is also affected by the ability to access the credit market and ability to transfer the rights through a land market (Besley, 1995, pp. 906-907). Increased investment on land also implies the higher income generation from land. According to IDB (1986), study in the Brazilian state of Maranhão it was found that legal ownership to squatters and undocumented occupiers have increased the income by 200 percent through land titling. A similar experience has been recorded in Ecuador (IDB, 1986, pp. 186-189). However there are other circumstances that may also lead to increased tenure security such as political interventions. According to Field (2005, p. 280) guarantee against forced eviction has been able to improve 68% of housing conditions in Peru (Field, 2005, p. 280). Hence, it is safe to assume that if the agent is provided with secure duration of rights with easy access to the credit market and enabling environment with transfer such rights, then the agent will most probably invest his/her land. On the contrary, lands with insecure duration of rights make it difficult to exchange the rights in land market and thus, inefficient land market (informal land market). This in turn adversely affects the land value and hence, the accumulation of wealth (Soto, 2000, pp. 228-229). Therefore, perceived uncertainty on duration of rights is negatively affecting investment in land and land values.

Element 3 (subject of rights) describes the attributes of the property regime, i.e. individual, informal or communal. According to Deininger (2003, pp. 28-32) the subject of rights is

determined by the surrounding circumstances. Individual rights may be more favourable under the circumstances where well-defined judicial process has been established and access to credit market is easy. In some circumstances, where high riskiness caused by remoteness, environmental hazards or other factors such as necessity of stand against the intervention of external parties, makes members to maintain communal property regimes (Deininger, 2003, p. 29). The choice of property regime is, therefore, dependent on the cost of establishing and enforcing individual rights and its ability to reduce the externalities against the benefit of such choice. The economic impact of this element is determined by the perceived uncertainties associated with elements 2, 4 and 5. Element 2 (boundary definition) describes the properties of the institutional setup to defines the boundaries that enables the internalizing of externalities and element 4 (properties of enforcing organizational setup) gives the degree of assurance to punish if boundaries are violated. The element 5 (evolution of institutional setup) gives an assurance to the right holder that his/her boundaries as defined by the institutional setup, will be adjusted according to the new cost and benefit situation.

Let us now focus on the impact caused by Element 2 (boundary definition) in detail. As we have identified above, the boundary definition is a necessary condition for eliminating the spill-over effect, and therefore internalizing the externalities. Within the western context, individual title with physical boundaries based on location is enough for eliminate the spill-over, and thus, internalize the externalities (Demsetz, 1967; Soto, 2000, pp. 231-233). However, as we have discussed above, in a more general context, such boundaries need to be developed by considering the (i) location, (ii) resource categories or attributes, (iii) shares, and (iv) time (Sjaastad & Bromley, 2000, pp. 15-16). The lack of precision of such boundaries makes high transaction cost in enforcement, and further reduce the security (Sjaastad & Bromley, 2000, p. 8). It is the challenge of the institutional arrangement to reduce the spill-over effect. Neither individual nor informal rights can deal with this unless the institutional arrangement takes necessary actions to build right boundaries to eliminate the externalities. Lack of proper boundary definitions on exhibiting the rights over land resource use, directly results in loss benefit (income) with a particular perceived likelihood of occurrence (Sjaastad & Bromley, 2000, p. 8). Further, unclerness of such boundary definitions makes high transaction cost in information search (especially with the physical boundaries). Depending on the surrounding circumstances of the market mechanism the demand for proper boundary definition can be vary. If the boundaries become uncertain, then this will affect the price of the land transaction (Feder et al., 1988, pp. 5-6) and hence the land

value. Therefore, we can conclude that perceived uncertainty associate with element 02 affects negatively on the income generation and the land value.

The properties of enforcing organizational setup (element 4) give an assurance that if the boundaries of rights (or duties associate with rights) are being violated, punishment is given. Thus it will depend manly on two components: monitoring and punishments. This includes the likelihood of detection and likelihood of enforcing a punishment (Sjaastad & Bromley, 2000, p. 8). Assurance of punishment for violating the boundaries makes lands more favourable for the investment, and thus income generation. However, there is hardly any literature that convincing the influence of this element on land demand and hence, land value. Therefore, we can conclude that element 4 has only a negatively effect on income generation from land.

The element 05 (evolution of institutional setup) ensures that institutions associated with rights to use the resources are updated when the cost-benefit structure or land value change. Optimal types of property rights, underpinning this process, are dependent on their ability to minimize the external effects through new boundaries (institutions). Once the resource values have increased, the net gain from formalizing the informal or customary rights is higher. Such formalization needs to be backed by the legitimate institutions. Sharp changes in increase the property value without institutional change creates more conflicts (Deininger, 2003, pp. 34-35). Such sharp changes make lands more vulnerable to land disputes such as land grabbing and land encroachment, which in turn affect the income generation from the land (Kemp, 1981, pp. 1-7).

The perceived uncertainties associated with the efficiencies of above elements in eliminating the externalities are not static; rather they are subjected to dynamics. These dynamics consist with perceived objective uncertainties and perceived subjective uncertainties, and can be derived through the way of formal and informal agent interact and the resultant behaviour. It can be argued that, a rational agent may take decisions such as leave the land, invest on it or move into conflicts with the outcome of this process. For example, if an agent discovers that some other tenure category with less or higher tenure security gives him/her a better economic impact then he/she will be more interested in acquiring such land. If the same true for several other agents in different tenure groups then it enhances the possibilities for conflicts. Upon determination of these possible behaviours of agents, it is the task of the policy makers to bring forth proper land policy measures that lead to better economic impacts.

Conclusion

Land tenure security mainly refers to the uncertainties in returning the benefits from bundle of rights attached with land resource. The economic impact of land tenure security is determined by characteristics of rights and institutions consist within a land tenure system. These characteristics are in turn emerging from five secure tenure elements: duration of rights; boundary definitions by institutions; subject of rights; properties of the enforcing organizational setup; and, evolution of the institutional setup. Perceived subjective and objective uncertainties associated with these elements will finally determine the economic impact of given tenure conditions. Once the uncertainties of the influence of these elements are modelled and the parameters are determined, it can be used to predict the economic impact of a given land tenure condition on an agent. This allows to formation of effective land policies that will enhance the economic viability of lands which are under insecure tenure.

Acknowledgement

We wish to convey our gratitude to Piyasiri Wikramasekara for his valuable comments on the article. We also would like extend our sincere gratitude to German Academic Exchange Service (DAAD) for its generous financial support.

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