

Abandonment of Homeownership is Costly for Owners in a Shrinking Society: A Hidden Vacant Housing Problem

Masatomo Suzuki^{a*}

^a School of Data Science, Yokohama City University, Kanagawa, Japan

*Correspondence: 22-2, Seto, Kanazawa-ku, Yokohama, Kanagawa, 236-0027, Japan;

E-mail: suzuki.mas.ke@yokohama-cu.ac.jp

This paper conceptualizes how the difficulty for owners in abandoning their property ownership affects housing market structure and short/long-term consequences of the shrinking society. Using Japan as a case study, we develop a framework of market for existing houses facing low demand. The framework shows that the property prices can be negative from the burden for owners to keep the unused assets. Since market transaction is possible only with positive prices, the resale market disappears, which leave the properties vacant without changes of ownership. The implications are: (i) in the short-term, a need for volunteer maintenance becomes a heavy burden for absent owners, while it retains the quality of neighbourhood environment; and (ii) in the long-term, failure of property transaction does not update registration information, which diverges ownership of the neighbourhood's lands or leads their true ownership unknown, hindering future conversion of the assets to other profitable purposes such as farmland and greenery. We argue that such problems arising from the difficulty for owners in abandoning their property ownership are more pronounced in Japan, but are common in shrinking society.

Keywords: vacant housing; housing abandonment; shrinking society; conceptual framework; Japan

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Introduction

One of the major concerns of a shrinking society is the increase in vacant and abandoned houses (see for example Accordino and Johnson, 2000; Haase et al., 2016; Kubo and Yui, 2020). The US context has been widely investigated so far: properties

get foreclosed through tax delinquency or mortgage default, and the abandoned properties exhibit negative externalities to society. That is, the absence of an owner means poor maintenance of the property and neighbourhood insecurity, leading to a significant drop in nearby house prices (Gerardi et al., 2015; Hartley, 2014). In declining US cities, the abandoned properties are often put on auction even at around ‘one dollar’ (non-negative price just above zero) by local authorities or land banks, since keeping the properties involves a maintenance cost for them (The New York Times, 2013).

However, as Morckel (2014) pointed out, the term ‘abandonment’ in the US declining cities has no agreed-upon definition. As vacant and abandoned houses are widely observed worldwide in different contexts (Caramaschi and Chiodelli, 2022), we need to distinguish between a case involving ownership abandonment (a part of foreclosure cases through tax delinquency or mortgage default) and a case without ownership abandonment (physical neglect and unused vacancy) (Suzuki and Asami, 2019; Suzuki et al., 2022).

We shed light on the more general housing problem in shrinking societies where vacant housing problems arise not only through foreclosure-related contexts. The vacant housing problem has often been investigated in the context of low-demand in the housing market (Bramley and Pawson, 2002; Buitelaar et al., 2021; Keenan et al., 1999; Molloy, 2016; Moroni et al., 2020). While the foreclosure-related abandonment of housing often involves a transfer of the ownership rights, the ownership does not change merely by becoming vacant (Couch and Cocks, 2013; Keenan et al., 1999). In declining European cities, such as Sicilian villages in Italy, housing transactions around zero price (i.e., one euro) are also documented (CNN, 2021; The Guardian, 2019). The sellers of the vacant properties are individual owners (not land banks or other public

sectors), who wish to escape from continued maintenance burden. Owners of vacant properties can escape from the burden only upon transactions of the properties.

However, the successful transactions may be limited to special properties with hidden potential for buyers (e.g., properties in historical villages).

We argue that the problem is that majority of vacant properties cannot achieve positive equilibrium price and can no longer be transacted in the resale market. As an example of a mature country, where home ownership has been promoted for achieving property(asset)-based welfare (Doling and Ronald, 2010; Ronald and Doling, 2012; Searle and McCollum, 2014), we first document housing policy debates in the context of a shrinking society in Japan. The Japanese case demonstrates negative outcomes of the unsuccessful property transactions: inescapable owners' burden of maintaining the vacant property in the short term, and the fact that their true ownership will gradually become unknown in the long term because registration information is no longer updated without transactions in housing market (Yoshihara, 2021).

We then develop a conceptual framework of the housing market that allows negative pricing, which means that houses can become durable 'bads' under excess supply. The term 'bads' indicates that the commodities cause disutility to consumers, as opposed to the 'goods' (Hara, 2005); the term is used mainly in the waste disposal and environmental recycling context (Hosoda, 2015). The framework shows that in housing market where owners cannot abandon ownership unless they succeed in selling the asset to someone else, equilibrium prices can be negative from the cost of keeping and maintaining the asset for potential buyers. Thus, the resale market disappears, and properties remain vacant without changes in their ownership. The implications are: (i) in the short-term, a need for volunteer maintenance becomes a heavy burden for absent owners, while it retains the quality of neighbourhood environment; and (ii) in the long-

term, failure of property transaction does not update registration information, which diverges ownership of the neighbourhood's lands or leads their true ownership unknown, hindering future conversion of the assets to other profitable purposes such as farmland and greenery.

Based on the conceptual framework, we also compare the market in which ownership abandonment is costly for owners with a market allowing free disposal, and then discuss policies to allow transactions of vacant properties under the former system. The framework provides a view that, although allowing abandonment destroys the neighbourhood environment in the short term, the transfer of ownership contributes to a land use transition in the long-term. Demolition of vacant properties, introduction of abandonment cost, or mitigation of the financial burden for owners are required to allow transaction of vacant properties. We argue that such problems arising from the difficulty for owners in abandoning their property ownership are more pronounced in Japan, but are common in shrinking society.

The remainder of this paper is organised as follows. The next section describes the contexts of the vacant housing problem in Japan. The third section develops a conceptual framework on the housing market structure, discussing the short/long-term consequences of costly abandonment of homeownership for owners. The fourth section compares with the housing market structure that allows free disposal. The fifth section discusses the policies to promote transaction of vacant housing. The final section concludes the paper.

The Japanese Vacant Housing Problem

Background for Emergence of Vacant Houses

Based on the Housing and Land Survey (Statistics Bureau of Japan), Table 1 documents the emergence of vacant houses over time across Japan. The number of vacant houses increased by 3.2 times from 1978 to 2018. The vacancy rate, which is the ratio of all vacant houses (i.e., properties currently without any residents) to the total housing stock (i.e., vacant and occupied houses), was 13.6% in 2018; the figure is significantly higher than that in 1978 (7.6%). This suggests that significant numbers of vacant houses emerge, some of which remain vacant over the long term. Moreover, the withdrawal rate, which is defined as the ratio of the ‘other’ vacant houses that are not utilized in any way nor put on the market (i.e., not in use as second dwellings, for rent, nor for sale; thus, properties whose ownership is abandoned are included here), to all vacant houses, has been around 30–40%, and the rate recently increased to 41.1% in 2018. The vacant properties cannot always be transacted in the market.

[Table 1 about here]

Most of the vacant houses that are becoming a problem in Japanese society are already without a mortgage balance (Hirayama, 2010) and are not necessarily related to foreclosure events. They have emerged and have been left unoccupied under the structural backgrounds that forces small demand and large potential supply (Uto et al., 2023). This nature is common in shrinking society to some extent, although the context of shrinking society vary across countries and regions (Mallach et al., 2017).

First is the Japan’s situation as a super-aging society with fewer children, which is also a common background for vacant houses in the other East Asian countries (Jeon

and Kim, 2020). The share of aged adults in Japan's total population is 29.1% in 2021, the highest among countries and regions across the world, and the rate is rapidly increasing. Moreover, the country suffers from a decreasing population and a proportionally small young generation. Typically, after parents who have lived in houses for long periods of time have passed away or moved out to elderly care facilities, their houses are inherited by their heirs and left vacant. This is because the heirs currently live in different cities, so they do not utilize the houses themselves. In fact, around 55% of vacant houses were acquired due to inheritance, based on a nationwide survey on owners of vacant houses by the Ministry of Land, Infrastructure, Transport and Tourism (2020a).¹

Second, the existing home sales market has not matured and skewed to new houses in Japan. The share of resale housing transactions in all housing transactions (i.e., the sum of resale houses and newly built houses) in Japan was only 14.5% in 2018, far smaller than in the United States (79.8% in 2020) (Ministry of Land, Infrastructure, Transport and Tourism, 2021). This is caused by the lack of reliability in the evaluation, the information asymmetry (Iwata and Yamaga, 2007, 2008), or the inadequate evaluation custom especially for aged wooden detached homes (Suzuki and Asami, 2022). Further, selling (or renting out) vacant properties requires cleaning and renovation. Even if they are successfully sold, the net benefit (subtracting the margins for brokers, costs of surveying the lot, and sales taxes, etc.) tends to be small. Thus, vacant houses are likely to be left unoccupied even if they are still usable as residence.

Third is the infrequent demolition. As property tax for a residential lot is discounted to 1/6 if the lot has a building on it (even if the building is vacant), owners hesitate to demolish vacant houses to turn them into vacant lots. This system was originally created to encourage the development of vacant land during a time of

increasing urbanization and continues to this day. The demolition of vacant properties by the public is a very rare event, basically restricted for cases with apparent dangers to neighbourhoods such as a nearby vacant property collapsing.

Owner's Burden on Keeping Vacant Houses

In Japan, ownership abandonment of a property is not common even when its owner does not wish to or cannot continue to own and utilise it. If owners wish to abandon a property at the time of inheritance, they also have to abandon *all* their financial assets besides their properties (that is, abandonment of single asset is not allowed). This is a formal legal procedure upon inheritance of any type of assets. Moreover, at other opportunities, it is not necessarily easy for a national or local government to accept ownership abandonment of properties due to its cost in maintenance and legal problems, such as a boundary demarcation or its attached liens. In other words, the cost of meeting these conditions for the donation to the government becomes high for owners, making it difficult to abandon properties.

In the short term, owner cannot simply cease to take any responsibility for the property because of the personal penalties in case they fail to do so. If an accident (for example a fire) occurs at the vacant house, the owner needs to compensate any victims. Moreover, to cease to take responsibility is seen as socially or cultural irresponsible; strong social norms from neighbourhood communities exist for owners to maintain property in good condition even if not currently occupied. Indeed, a survey on owners of vacant properties (Ministry of Land, Infrastructure, Transport and Tourism, 2020a: p.89) reported that only 3.2–6.9% of vacant houses are not maintained by anyone (the survey excludes properties whose owners are unknown; such a case is a long-term problem as we describe later). The remaining vacant houses are maintained, mostly by their owners or their families/relatives (accounting for 88.1% of the maintained vacant

houses). Some owners even use a professional maintenance service to try to reduce the negative externality to the neighbourhood.

These time and money costs are an ongoing burden to owners of vacant properties. Table 2 shows the list of problems on maintaining vacant properties: 69.8% of owners of vacant houses have some problems (only 30.2% of owners have ‘no problem’ on maintenance). Specifically, 29.8% pointed out ‘hard maintenance work’ and 21.6% reported ‘heavy burden on the money costs’.

[Table 2 about here]

As we have discussed, the donation of a vacant property is currently a really difficult option. Table 3 documents the willingness to pay if donation of a vacant property is accepted. Samples are owners who clearly indicate that they wish to donate their vacant properties and are searching for recipients (such owners account for only 1.3% of all owners with vacant properties, and thus the sample size is small). In reality, more owners with vacant properties not in use potentially have a willingness for donation. Some owners (44%) wish to pay some money to donate their vacant properties. Specifically, if owners can donate their vacant properties, 4% of them wish to pay demolition costs of the building, and 12% of them wish to pay 10 years of property tax and maintenance costs. This implies that, at least for some owners, keeping the vacant properties becomes durable ‘bads’ that yield negative value. This may be a background for transactions taking place at around zero price in Japan (CNN, 2019).

[Table 3 about here]

Unregistered Inheritance and Emergence of Owner-Unknown Properties

Without an opportunity of transaction in the market, ownership becomes often ambiguous: being poorly documented or split among multiple descendants of the original owners. Its long-term consequence is a difficulty in converting the property for an alternative use.

In general, it is optional for owners to register their land titles in a society with infrequent transactions, and the land titles are often left without being updated (Archer, 1974; Feder and Nishio, 1998; Miceli et al., 2000, 2011). This applies to Japan, in which registration is not mandatory and requires a certain amount of cost (Nakagawa, 2021). In most cases, the registration information is updated only upon property transactions in the market; the registration information for vacant properties not in use are rarely updated.

Table 4 documents the registration status upon obtaining vacant property. For 19.6% of vacant houses not in use, the registration information was not updated upon the acquisition of the vacant house (typically through inheritance from parents, not through transactions in the market). The figure is much higher than vacant properties for sale, for rent, or for second home. The reasons for not updating registration information is: ‘no need to register or change names’ (49.6% of owners) as the most common reason, followed by ‘complicated procedures’ at 16.0% and ‘large cost expense’ at 9.5% (Ministry of Land, Infrastructure, Transport and Tourism, 2020a: p.56).

[Table 4 about here]

Inheritance typically takes place upon the death of the owner. Property ownership is inherited equally by all relatives, including the offspring of the property

owner. Although the actual distribution depends on the owner's will, the fact of failing to update registration information means that, at least for the public, the property ownership is inherited equally by all relatives. This means that a sufficient amount of time had already passed from the last transaction or the last registration update. If the siblings subsequently pass the ownership rights to their children, the number of potential owners of the property continues to increase cumulatively. This leads to 'owner-unknown' properties, whose true owners are not known to the public (Yoshihara, 2021).

In such a status, no one takes responsibility for the maintenance of these properties. The property cannot be converted to other profitable uses in the future, since it is almost difficult to clarify a 'true' owner by getting an agreement from all the potential owners. As of 2016, the owner-unknown land is 4.1 million hectares, which accounts for 10.8% of the Japanese territory. If the situation does not change, by 2040, the owner-unknown land is expected to increase to approximately 7.2 million hectares, which accounts for 19.0% of the Japanese territory (Abandoned and unclaimed land issues research group, 2017).² Transaction of vacant houses is in need to solve this long-term problem.

Conceptual Framework of Housing Market where Abandonment of Homeownership is Costly for Owners

Market for Existing Houses Facing Low Demand

Glaeser and Gyourko (2005) contrast cities or metropolitan areas where the price level of properties is above construction cost with those where the price is below the construction cost to illustrate the different demand-supply structure in each situation.

For the latter type of cities or metropolitan areas, new constructions do not take place, so they consider that the supply is fixed (i.e., supply is inelastic to price) for market for existing houses.

Here we focus on the latter type of market, especially a submarket for *existing houses facing sufficiently low demand*. In the Japanese context, market for existing houses is separate from the market for newly built houses, and there is also segmentation with the market for existing houses. We assume that cost for putting on the market is zero; thus, the supply curve represents the physical stock of vacant houses, which are automatically supplied to the market by owners. In reality, there are many vacant houses that are not offered for sale for the non-economic reasons (that is, despite whatever the market price for the unit may be) and for a need of repair costs that exceeds the current property value. Our analysis focuses on properties without these backgrounds for being vacant.

Abandonment of Homeownership is Costly for Owners

Housing has been widely accepted as durable ‘goods’ that exhibit a positive price. However, to ensure that the equilibrium price is positive, the amount of supply in the transaction market should be maintained at a certain level. Once there is excess supply, houses can become durable ‘bads’ that exhibit a negative valuation. That is, unused durable houses impose a maintenance burden on the owner if ownership abandonment is not allowed. This can be captured by incorporating the positive abandonment cost, c (> 0), which is the cumulative burden of future maintenance of an unused property.

Demand-Supply Curve

The specific feature of the housing market is that transactions with negative prices are not allowed. This requirement is because of the use of real estate brokers who receive a

constant rate of the (positive) property price as a margin. In areas with sufficiently low property price, direct sales from seller to buyer without a broker may occur; in some cases, sellers of properties at around zero price bear costs for renovation, etc., so that the real transaction price can be considered as negative to some extent. Still, transactions do not occur for properties whose net value is substantially negative.

Figure 1 shows the demand-supply curve for the market for existing houses facing low demand. The supply is basically expected to remain constant regardless of the price of existing housing, because they become vacant from the move out of original occupants for exogenous reasons. This is expressed as a vertical supply curve as in Glaeser and Gyourko (2005).

[Figure 1 about here]

For rental housing market, Goodman (2013) proposed a framework that properties are withdrawn from the market after the housing rent falls to the level of the average variable costs to keep the property operation. At this rent level, ‘ceasing’ or ‘keeping’ the property operation becomes indifferent for owners. This is modelled as a vertical supply curve as in Glaeser and Gyourko (2005) is kinked to horizontal direction at the level of the average variable costs. Following this framework, we assume that the supply curve here also has a kink when the price level is $-c$ (< 0), the cumulative level of the future maintenance burden. Below this price level, owners choose to keep their properties by their own and keep maintenance burden.

The demand curve is downward sloping (as usual) but now expands into a negative price region. This reflects the fact that the price can be negative due to the maintenance burden on owners. Once the potential supply exceeds the threshold q_0 , the

property valuation becomes negative, which means that properties are no longer transacted in the market (thus, we show this region using a dashed line).

We consider two cases for existing houses facing low demand. Figure 1(a) shows the case of a moderate level of supply. If the level of supply is at $q_A (< q_0)$, that is, when the supply curve is S_A , the equilibrium price becomes positive at intersection point A: $p_A > 0$. Because of the positive equilibrium price, properties are transacted for those who have a higher willingness to pay. The cost of property ownership abandonment does not exhibit any critical influences. In case enough demand exists relative to supply (in a market that deals only with well-selected existing houses), not all existing homes become the ‘bads’; the supply and demand will balance at a positive price and trade in the market as ‘goods’. In other words, what will result in ‘bads’ is when there is not enough demand relative to supply.

Figure 1(b) shows the case of excess supply. If the supply is at $q_B \geq q_0$, that is, when the supply curve is S_B , the equilibrium valuation becomes negative at intersection point B: $p_B < 0$. If it ‘dares’ to become an object of market transactions, it is given a negative price, representing costs to dispose of (i.e., remove its existence). Economic theory posits that at equilibrium, demand equals supply, and negative pricing occurs when there is excess supply. The supply of vacant properties is exogenous at least in the short-term, and it also holds in the long-term, under the assumption that owners always wish to dispose of their vacant properties to escape from the maintenance cost and that enough demolition does not occur.

Since the price for transaction must be non-negative, all the houses are no longer transacted in the market and are left vacant because of the negative valuation. Owners finally maintain the properties with the burden $-c$; the negative value does not become lower than this level even if they cannot be transacted in the market.

Short- and Long-Term Consequences of the Housing Market Structure in a Shrinking Society

In the case described in Figure 1(b), property value for existing houses becomes negative, and thus, the transactions do not take place. In the short-term, this means that the owners of vacant properties have the responsibility to keep an eye on them since they still hold their ownership rights. The public burden for maintaining the neighbourhood security remains at a minimum level during the process of population shrinkage.

The long-term consequence is difficulty in utilizing the currently vacant properties. Since property transactions do not take place at a negative value, the majority of vacant and unused properties are owned by the absent individual owners. As periods without market transactions become longer, registration information becomes obsolete, especially in the Japanese context. Thus, the properties face a high risk of acquiring the owner unknown status. Since eminent domain of vacant properties is difficult to enact in Japan, even in cases of the owner unknown status, the potential for regeneration will be severely restricted. Social cost of assembling land becomes too high to find the actual owner from large numbers of relatives.

Comparison to the Housing Market with Free Disposal

We contrast the housing market where abandonment of homeownership is costly for owners – a system with short-term maintenance but long-term ‘freezing’ of the market – to the housing market with free disposal – a system with short-term lack of maintenance but long-term market viability. Figure 2 shows the demand-supply curve in a housing market in which free disposal is allowed. As in Figure 1, the durability of housing leads to a vertical supply curve for the potential level of supply. It now has a kink at the price

level of zero because of an option for free disposal. That is, owners choose to abandon their properties at no cost rather than keeping them, which has otherwise a negative valuation, $-c$. As in Figure 1, the demand curve is downward sloping, that is, the property valuation decreases as the quantity increases.

[Figure 2 about here]

We consider two cases for existing houses facing low demand. Figure 2(a) shows the case of a moderate level of supply. If the level of supply is at $q_A (< q_0)$, that is, when the supply curve is S_A , the equilibrium price becomes positive at intersection point A: $p_A > 0$. The positive price allows all properties to be transacted in the market. This is a typical description of a simple demand-supply curve analysis and has no significant differences to that of Figure 1(a).

Figure 2(b) shows the case of excess supply. If the supply is at $q_B (\geq q_0)$, that is, when the supply curve is S_B , the equilibrium price is zero at intersection point B. In this context, q_0 of houses are transacted in the market at price 0 (that is, houses are taken away by demanders for free of charge), and the remaining $q_B - q_0$ of houses are abandoned at no cost (free disposal). Owners are indifferent between the two options. Since owners have the right to abandon their properties freely (that is, excess existing housing can be thrown away for free), the market price does not become negative.

Note that the property value no longer drops below zero *for the owner* and *for potential buyers*; the value in the market reflects an option to displace the costs to the public sector. It is indeed often for this reason that public agencies are reluctant to take title to properties where they have the legal right to do so. Even if a public agency

conveys a vacant property to a new private owner, those costs do not disappear from the society; the public agency can only remove the costs through public subsidy.

In the short term, property abandonment occurs as described in Figure 2(b). The absence of the owner results in poor maintenance of the property (Hanlon, 2008; Lambie-Hanson, 2015), leading to a further drop in nearby property prices through a negative externality channel (Gerardi et al., 2015; Hartley, 2014).³ The public sector, such as the land bank, needs to (temporarily) maintain the abandoned properties to reduce the negative externality. Since the abandoned properties will be transacted through auctions with very low prices almost around zero (Hodge et al., 2017), they also negatively affect nearby property prices through an oversupply channel (Campbell et al., 2011).

Once property ownership is abandoned, ownership rights are transferred to the public sector. In the long term, the positive aspect of this is that the public sector can transfer ownership to a new owner who will use the properties for socially desirable and most profitable land use at that time. Even if an abandoned house is unsuitable for utilisation, combining multiple vacant lots will be useful for green and agricultural use (Paredes and Skidmore, 2017; Schilling and Logan, 2008). The aggregation of ownership rights via land banks is the key factor in managing these drastic conversions.

In the US foreclosure context, owners at least partly have the option to abandon their property rights through strategic default and/or tax delinquency.⁴ That is, if the value of a property is expected to decline, it may be optimal for its owner to stop paying property taxes and maintenance, and have the property ownership transferred to the public (Goodman, 2013; Hillier et al., 2003; Margulis, 1998; Morckel, 2013; O'Flaherty, 1993; Scafidi et al., 1998; Silverman et al., 2013; White, 1986; Wilson et al., 1994). The argument here is that the massive and well-documented externalities and contagions of

unmaintained vacant properties in the US may be placed as a temporal phenomenon that realizes long-term market viability.

Policy to Promote Transaction of Vacant Housing

In the case of excess supply, each housing market structure—costly homeownership abandonment for owners or free disposal—leads to different short- and long-term consequences. These consequences are a trade-off and the optimal policy depends on how we predict the future, and how we discount future consequences relative to the current situation. For housing markets where abandonment of homeownership is costly for owners, we discuss the potential policy changes that can liquidate some of the vacant properties.

Given the demand curve fixed, there are several policies to make changes to the supply curve. First is a demolition of vacant properties to reduce supply: shift of the supply curve S_B in Figure 1(b) to left (as to the supply curve S_A in Figure 1(a)). In Japan, the Vacant Houses Special Measures Act provides measures to prevent certain unoccupied houses from being denied the property tax reduction, in case the vacant house has been declared dangerous or dilapidated by the local authority as a “specially designated vacant house” and the owners ignore the advice and guidance to take adequate maintenance by the local authority. However, the designation has not been so common so far to widely result in demolition of vacant houses. According to Ministry of Land, Infrastructure, Transport and Tourism (2020c), only 19,029 specially designated vacant houses received advice and guidance during 2015–2019, which is just 0.54% of the number of ‘other’ vacant houses in 2018 (3,487 thousand units; this can also be calculated as 8,489 thousand units (number of vacant houses) times 41.1% (withdrawal rate), using the figures in Table 1). If it is more widely applied, it will

generate incentive for individual owners to demolish their vacant properties. Besides the demolition of vacant properties by the public for limited cases with apparent dangers to neighbourhoods, such as a nearby vacant property collapsing, subsidy for demolition or other public policies to promote demolition may be worth considering. The benefit of preventing the owner unknown status in the long run may outweigh its temporary costs, even for the public sector.

Second is to allow current owners to abandon or to transact vacant properties by paying some costs. The Japanese government is now investigating the possibility of allowing spontaneous abandonment if the owner pays a 10-years' property tax and maintenance cost in advance (Ministry of Land, Infrastructure, Transport and Tourism, 2020b). In our framework, we can consider that the cost for an individual owner becomes γc , where $0 < \gamma < 1$. The payment allows sellers to compensate buyers for a part of the future maintenance costs and other costs associated with the transaction of the property. The supply curve is now kinked at $-\gamma c$ (not at $-c$), and the transaction takes place at price level $-\gamma c$ (at the intersection with the demand curve, D), along with the abandonment by the payment γc . The cost of maintenance is now shared between individual owners and the public sector; in other words, it reduces the burden on individual owners.

Third is a reduction of maintenance burden for potential buyers. One way is to establish a previous payment system of the maintenance cost, in order to reduce the maintenance burden of the potential buyers. In the current housing market, final owners must pay *all* future maintenance costs; property transactions involve the transfer of maintenance costs, and thus, the equilibrium valuation will be negative. The idea is that the future maintenance burden can be charged based on the period of use in advance. For instance, we can consider the following framework: all the maintenance burden, c ,

has already been collected from owners who lived in the house during the initial 30 years of property life (the amount for each owner is calculated based on the duration of their ownership). In this case, the new owner who purchases the 30-years-old property receives the reserved maintenance fee from the previous owners. In this example, the new owner of an old property no longer has a heavy burden of maintenance costs: the demand curve shifts to that of Figure 2(b). Because the property can be abandoned at no cost (using the reserve), the property will be sold at a positive price even at the end of the property lifecycle. Note that the creation of the fund may need to be implemented through the public policy; that is, such a requirement can become mandatory on purchasing new houses, as we see in the deposit requirement for some home appliances.

Conclusion

This paper conceptualizes the structure of the market for existing houses facing low demand, using Japan as a case study. In a case of a moderate level of supply, properties are quickly transacted for those who are willing to pay, and thus, whether property ownership abandonment is allowed or not does not exhibit any critical difference. However, in a case of excess supply, no one wishes to use or own properties they no longer need, while the properties have to be maintained by someone (at least for a while). The property value can essentially be negative in equilibrium due to the cost of maintenance of the property.

Thus, whether property ownership abandonment is possible or not clearly affects the structure of the housing market. Allowing free disposal mitigates the maintenance burden, and the property will be transacted in the market at a non-negative price. The transaction volume in the housing market determines the following two factors: (i) the short-term maintenance burden (who has the responsibility for maintenance) and (ii) the

long-term possibility of utilizing the property again in the future. Such problems arising from the difficulty for owners in abandoning their property ownership are more pronounced in Japan, but are potentially common in shrinking society. The international comparison of the institutional settings on the possibility of property ownership abandonment will provide a basis for future policy debates on the vacant and abandoned housing problem.

These problems can also be placed as disutility and inequality aspects of homeownership under the property(asset)-based welfare system in a shrinking society. At the individual level, descendants who inherit unnecessary vacant properties in the era of population shrinkage are forced to take the maintenance burden. This is in contrast to the previous generations who have financially gained from owning properties, serving as an inequality across generations. At the national level, accumulation of vacant and abandoned properties that cannot be converted to other profitable purposes also serves as an inequality across generations.

Notes

1. This is sampled from houses that were first detected as vacant in the Housing and Land Survey (Statistics Bureau of Japan) in 2018. Number of owners of vacant houses is 3,912.
2. The research group was founded by former Minister of Internal Affairs and Communications Hiroya Masuda and others.
3. The decline in property values may also trigger more abandonment until a tipping point is reached (Bond and Coulson, 1989).
4. Even in the US foreclosure cases, owners may not always be allowed to explicitly relinquish title to the property (Huber, 2020). The tax foreclosure of vacant, abandoned properties does not lead to transfer of title. While a lien for the unpaid taxes is created, the decision by the lienholder (whether public or private) to force transfer of title through a

legal proceeding is optional, not mandatory. Since public agencies are concerned about the cost of maintenance as well, in most jurisdictions neither public or private lienholders exercise their right to foreclose. A similar problem exists with mortgage foreclosures, where lenders frequently refuse to take title to properties that have potential negative value (Weber, 2015; Weiss, 2015).

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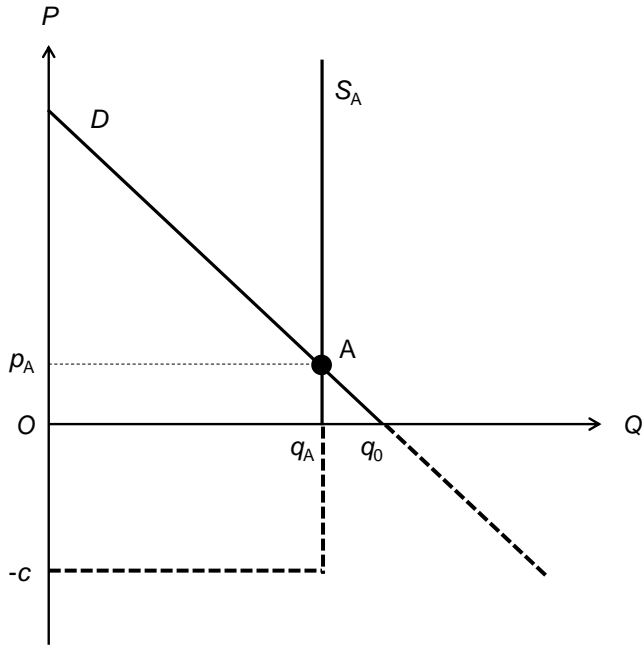
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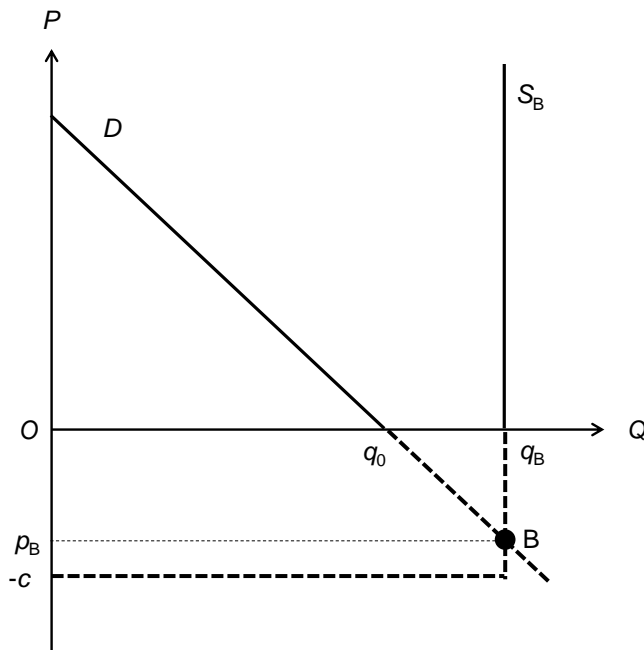
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(a) Case of moderate supply

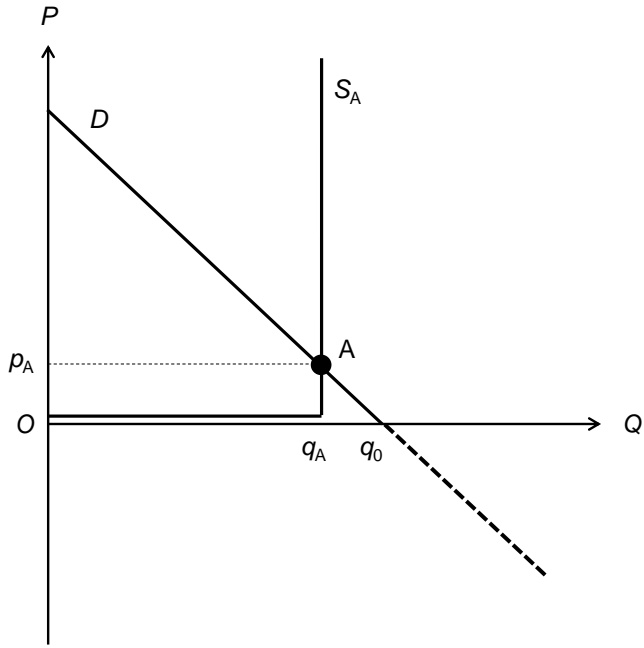


(b) Case of excess supply

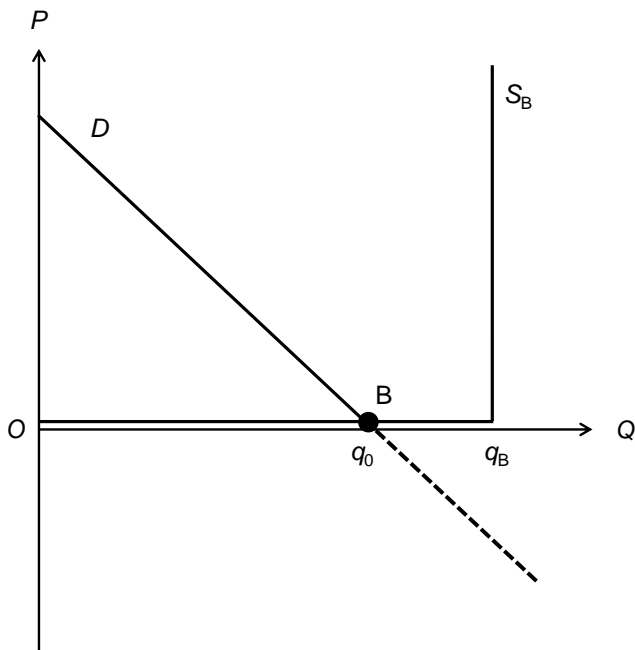
Figure 1. Demand-supply curve in housing market where abandonment of homeownership is costly for owners.

Notes: The horizontal axis is the quantity (number of houses) and the vertical axis is the price level. The intersection of demand curve, D , and either of the vertical and kinked

supply curve, S_A or S_B , shows the equilibrium. In panel (a), all the properties are transacted at point A (quantity q_A at price p_A). In panel (b), all the properties are valued negatively at point B (quantity q_B at price p_B); thus, all of them are left vacant without transactions.



(a) Case of moderate supply



(b) Case of excess supply

Figure 2. Demand-supply curve in housing market with free disposal.

Notes: The horizontal axis is the quantity (number of houses) and the vertical axis is the price level. The intersection of demand curve, D , and either of the vertical and kinked supply curve, S_A or S_B shows the equilibrium. In panel (a), all the properties are

transacted at point A (quantity q_A at price p_A). In panel (b), q_0 of the properties are transacted in the market at price 0 and the remaining $q_B - q_0$ of properties are abandoned at zero cost (point B).

Table 1. Increasing vacant housing problem in Japan.

Year	Number of vacant houses [thousand units]	Vacancy rate [%]	Withdrawal rate [%]
1978	2,679	7.6	36.5
1983	3,302	8.6	37.9
1988	3,940	9.4	33.2
1993	4,476	9.8	33.2
1998	5,764	11.5	31.7
2003	6,593	12.2	32.1
2008	7,568	13.1	35.4
2013	8,196	13.5	38.8
2018	8,489	13.6	41.1

Notes: The vacancy rate is the ratio of entire vacant houses (shown in the table) to the total housing stock. The withdrawal rate is the ratio of the ‘other’ vacant houses that are not utilised in any way nor put on the market to the entire vacant houses. Note that the ‘other’ vacant houses are included in the entire vacant houses. Source: Housing and Land Survey (Statistics Bureau of Japan)

Table 2. Problem on maintaining vacant property.

Problem on maintaining vacant property	Percentage with the problem
Difficult to maintain the house because of living far away	21.0
Hard to do the maintenance work	29.8
Heavy burden on the money costs	21.6
Not having a reliable person or company to ask for the maintenance work	4.4
Wasteful to maintain because of not having a plan to use the house	26.0
No problem	30.2
Number of observations	3912

Notes: The table shows the percentage of owners of vacant houses with each problem on maintaining their properties (multiple answers allowed). Source: Survey on owners of vacant houses (Ministry of Land, Infrastructure, Transport and Tourism) in 2019.

Table 3. Willingness to pay for donating a vacant property.

Willingness to pay for donating a vacant property	Percentage
1 year of property tax and maintenance cost	22.0
5 years of property tax and maintenance cost	6.0
10 years of property tax and maintenance cost	12.0
Demolition cost of the building	4.0
Unwilling to donate if cost is required	42.0
Other/Unknown	14.0
Number of observations	50

Notes: The table shows the distribution of willingness to pay for donating a vacant property. Samples are owners who wish to donate their vacant properties and are searching the recipients. Source: Survey on owners of vacant houses (Ministry of Land, Infrastructure, Transport and Tourism) in 2019.

Table 4. Registration status upon obtaining vacant property.

Vacancy type	Number of observations	Registration status upon obtaining vacant property [%]			
		Updated owner name	Newly registered	No update	Unknown
Entire sample	3786	55.6	21.1	15.3	7.9
For sale	485	62.5	22.3	9.1	6.2
For rent	173	53.8	24.9	8.7	12.7
For second home	983	53.4	29.1	11.2	6.3
Not in use	2002	55.6	16.7	19.6	8.1

Notes: The table shows the number of owners and percentage of owners with each registration status upon obtaining vacant property. For the ‘entire sample’, we include samples whose vacancy type is unknown. Source: Survey on owners of vacant houses (Ministry of Land, Infrastructure, Transport and Tourism) in 2019.