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Original Paper

Insurance and Non-Conforming Land Use (Note 1)

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Abstract

The purchase of a residential home carries the risk of adjacent properties being rezoned in a manner creating negative externalities reducing the value of nearby residential homes. In most municipalities, appeals against rezoning are a costly and time consuming activity both for appellants and the public administrative bureaucracy. In this paper we establish the framework to analyze the creation of a residential insurance arrangement that has the potential to reduce the costs associated with appeals to restrict rezoning.

Keywords

insurance, zoning, welfare economics, externalities

1. Introduction

An important part of land use planning in most urban communities in the industrial world is zoning; an ordinance setting out the consumption or production activities permitted on a specific parcel of land. Zoning ordinances are not fixed over time and the possibility of a change to the zoning designation for a parcel of land exists in most communities. It is a "possibility" because a change in the zoning designation of a parcel of land requires an application by the owner of the land (or prospective owner of the parcel of land) to a local government or its agency, to alter the zoning ordinance of the property. Local government councils may alter the zoning designation of a parcel of land exclusive of ownership to facilitate land use planning. In most instances, a proposal to rezone a parcel of land is made public with an opportunity for landowners adjacent to the parcel of land in question to comment on the proposed change in land use designation.

Zoning regulations or ordinances, particularly at the municipal level, are the most direct and effective way to impact the location of residential, commercial, agriculture and industrial activity. Numerous studies have examined the impact of zoning on the distribution of population, transportation routes,

988housing prices and private and social welfare. Much of the earlier literature is captured in a thorough and insightful analysis found in Fischel (1985). In their detailed review of the theory and empirical evidence on the welfare effects of zoning, Pogodzinski and Sass (1990) pay particular attention to the effects of zoning on population movement from both the supply and demand sides of the land market and the behavior of rent-seeking agents.

The application from a land owner or potential land owner to rezone a parcel of land is motivated by a desire on the part of the owner or potential owner to maximize her/his wealth. However, altering the legal use of a parcel of land may also increase or decrease the wealth of other land owners due to the creation of positive and/or negative externalities associated with the new activity on the rezoned parcel of land. The possibility of such externalities occurring generates interest on the part of those adjacent to the land in question to participate in support of or opposition to the proposal, the latter generating most of the activity.

The process leading to a decision to rezone or not rezone a parcel of land at the local government and higher-tier government in some instances is time-consuming and often delays land use change for months and even years. The costs are private and public, the former involving prolonged time commitments and lawyers' fees while the latter encompasses time costs on the part of local public administration staff and possibly appeals to higher levels of decision-making bodies. Landowners who believe a rezoning decision will reduce their wealth due to negative externalities will challenge zoning authorities and commit substantial resources to prevent rezoning.

Purchasing a residential home is a risky investment. Fire, theft, flooding and severe weather can quickly reduce a homeowner's wealth. In addition to risk mitigation, most homeowners can purchase insurance to offset the loss in wealth due to these factors. In a setting where zoning ordinances can change, creating negative externalities leading to a decline in property values, the purchase of a residential home is also risky. An alternative to the costly and often unpredictable outcome of zoning appeals and possible court actions is third party insurance against a decline in the value of residential real estate. The idea of insuring against the possibility of property devaluation has been examined by several authors over the past four decades. Marcus and Taussig (1970), Breton (1973), Auld (1982), Schiller (1995) and Fischel (2004). Marcus and Taussig argued that the United States should establish a Home Owners Insurance Corporation (HOIC), to offset the market imperfections and distributional considerations that arise when home prices decline due to unforeseen factors such as the "…decline in the overall demand for the area in which the property is located." In addition, "…sharp fluctuations in evaluation … range and quality of services provided by the local government," or "…unforeseen movement of a large industry out of a community." (p. 406). Market failure arises when local governments discontinue services or grant construction permits for commercial enterprises in residential areas. The authors also note that insuring home owners against a decline in home prices would provide stability in the real estate market and by extension, finance markets as well. Yarmolinski (1971) advanced a similar proposal for a home equity insurance plan. Fischel (2004) points out the

topic of externalities and zoning traditionally focussed on the price and welfare effects of zoning ordinances and how housing (largely) markets would operate in the absence of zoning laws. While zoning laws are not property rights, homeowners, he notes, view them as a contract between society and the individual homeowner. Moreover, while the power to establish or change zoning rests with local and state/provincial authorities through elected or appointed boards, they are ultimately responsible to those who possess the property right of private ownership.

None of these studies have explored the idea of insurance against rezoning in a framework that simultaneously considers applications for rezoning, rent seeking behavior, negotiation and third party real estate insurance. The focus of this paper is the response of landowners to the uncertainty of the regulations governing land use and how agents respond to the prospect of negative externalities that impact wealth, income and utility.

Our paper provides insight related into (a) the theoretical framework that identifies why there are no market or quasi-market solutions to the negative externality impact on non-conforming land use, (b) the simultaneous creation of negative and positive externalities in the presence of zoning non-conformity, (c) the challenge to design fair insurance and (d) quantification of the high cost of solving the equity and efficiency issues by way of third party intervention.

Section 2 of the paper provides a model to explore how agents, in this case homeowners, located in one space and in one state of zoning, may respond to a change in the initial state to one where a nearby property is rezoned for a non-conforming use leading to a decline in the value of at least one of the homeowners property (McDonald & McMillan, 2003). Political solutions, negotiation and third party solutions are explored in this setting. In section 3, we examine the issue of homeowner insurance in the context of expected utility theory and fair insurance, demonstrating that theoretically, insurance is a viable solution. Section 4 focuses on issues related to implementing zoning insurance. The final section provides a brief conclusion.

2. A Simple Model

Assume a community consists of a set of R properties $Ri = r1, r2, \ldots . rn$ in a given spatial setting regulated by zoning laws stipulating activities than are permitted in the space. Each property has an identical market value of \$ Vi.

Assume there is a proposal to rezone the $j\,th$ property permitting an activity that would generate both positive and negative externalities. For the subset of properties, $\hat{R}\{r1, r2, \ldots rj\}$ there is a positive externality leading to an increase in the market value of the property, ΔV, for each element in the set. For the remainder of the properties, $\ddot{R}\{rj + 1, \ldots \ldots rn\}$, there is a negative externality leading to a decline in property value, -ΔV* (Note 2). There are several possible scenarios in this situation. If the zoning is approved and

$$\sum_1^j \Delta V > \sum_{j+1}^n (-\Delta V *) \quad (1)$$

there is a net increase in the total value of property in the community. Whether or not the rezoning occurs depends on the rules governing changes in zoning.

2.1 Local Council Decision

Assume the agency charged with approving or rejecting an application for rezoning is fully-informed of the monetary value of the consequences for all property owners if a rezoning application is approved or rejected. Furthermore, the goal for the agency is to maximize the total value of property in the community. In such a (unlikely) situation, approval or rejection would be automatic. However, in the absence of a prescribed goal but with perfect information, consider the scenario where the application from the R̂ owners is reviewed by an elected council or board. The agency is aware of those whose property values would increase and those where the value would decline. The persuasiveness and representation of both sides will determine the outcome of the vote which could result in approval of the application for rezoning leading to a net increase in total property value or rejection of the rezoning application thus sustaining the status quo.

2.2 Referendum

In place of a council or board decision-making system, consider a referendum allowing all property owners to vote in favor or against a zoning change. Suppose the outcome of the proposed rezoning of the jth property would result in a *net decline* in total property value in the community.

$$\sum_1^j \Delta V < \sum_{j+1}^n (-\Delta V *) \quad (2)$$

If the subset of home owners who gain from the rezoning constitute the majority of homeowners, a referendum would result in an aggregate loss in property value. More formally,

$$\sum_{r=1}^j Y > \sum_{r=j+1}^n N \quad (3)$$

where Y is a yes vote and N is a no vote. If, however

$$\sum_{r=j+1}^n Y > \sum_{r=1}^j N, \quad (4)$$

the referendum will fail, “protecting” those who would lose but denying the opportunity for an increase total property value.

2.3 Negotiation

Assume the outcome described in equation 2 is negative: a net loss in total property value.

If the community has established a rule permitting Coase-type negotiations, those who stand to lose could offer a payment of $B to the potential “winners” where $B=>$ΔV and $B<-$ΔV*. Consider the following example where there is a set of five home owners, $r1, r2 \ldots . r5$ where each suffers a loss of $ 10K in property value if the rezoning is allowed for a total $ 50K loss for the group. The remainder of the population, a set of twenty five home owners, $r6, r7 \ldots . r30$ would each gain $ 1K as a result of the rezoning of the jth property for a total gain of $ 25K. The net loss to the community is $-25K if all participants voted on the rezoning of application of the jth property.

If there was no vote, the expected losers could negotiate a payment to each of the expected winners of $\Delta B\, i = \$\, 1.1K$ or in the aggregate, $\sum \Delta Bi = \$\, 27.5 > \Delta V$. Compared to the outcome where the rezoning is approved, the payment from the potential losers represents a net gain. The five losers have

lost $ 27.5K but that is less than the $ 50K they would lose if the rezoning was approved. Negotiations and bargaining leads to both groups being better off compared to the rezoning option. Such bargaining is fraught with difficulties, notably the intractability as the number of players increase. In addition, bargaining is not without significant transaction costs.

There are administrative limitations to the options above. It is unlikely that elected councils have perfect knowledge about the value of the gains and losses of a proposed zoning change. If this were to occur, the political fallout may persuade a council not to proceed with a zoning application. At the heart of the issue are the unexpected losses that occur when rezoning is approved in world where property owners *expect* the permanency of zoning. But value-enhancement rezoning may also trigger a decline in other property values due to negative externalities (Note 3).

The prospect of rezoning can be viewed in a simple state contingent model of uncertainty. A property owner faces two states, A_1 and A_2. A_1 is a state where a set of land use policies is constant. A_2 is a state where the use of at least one parcel of land, Rj, is altered by rezoning the use of that property, resulting in a reduction or increase in the value of a given property owner. If π is the probability that state 1 persists, ΔW represents a change in the value of the property, then the expected property value of any property owner is

$$E\Delta W^i = \pi \ \Delta W^i_{A_1} + (1-\pi\ )\Delta W^i_{A_2} \quad (5)$$

$0<\Delta W<0$ (Note 4)

Once a rezoning application has been announced, each individual home owner must consider her response. If the proposal is expected to lead to a decline in the value of property for one or more property owners, it is not uncommon for a concerted effort by those whose wealth will be impacted negatively to take action to prevent approval of the application for a zoning change. Acting alone or in concert with others whose wealth will be impacted negatively by the change this response is not without Costs (C) in terms of time and legal fees. In other words, expenditure to oppose a zoning change has the potential to change the probability the proposed change will be approved (Note 5).

3. Insurance

The purchase of land where there is a zoning plan which can be altered is similar to the purchase of land where there is no zoning with one exception. Where there is no zoning, there is no "advance warning" that land use may change: applications for re zoning are usually accompanied by notice of *intent* where land owners adjacent to the land considered for rezoning are invited to comment on the application. If a prospective homeowner is aware of the possibility an adjacent property could be rezoned to a non-conforming use generating negative externalities, she/he would take that into account when purchasing the property. In the case of re-zoning, there is always the chance that the application for a non-conforming use will be rejected. If, in the no-zoning case, the purchase of land for residential home ownership were followed by the sale of adjacent land for a non-conforming use, the distribution of income would be altered. However, it cannot be said *a priori* that this would result in a Pareto

improvement or the opposite. Similarly, in an area zoned Single Family Dwelling, (SFD), a successful application to change zoning that reduces the wealth of one or more existing homeowners may or may not improve overall welfare as we saw above. Is insurance against a loss in property value due to externalities a substitute for the existence of zoning (or rezoning where zoning exists)? Fair insurance should generate a premium that reflects the probability of the state where the loss may occur and the expected size of the loss (Note 6). The choice to buy insurance against a possible loss may have no impact on expected wealth but it does improve the level of utility enjoyed by the individual who elects to insure due to the existence of diminishing marginal utility associated with the assumption of risk aversion.

The issue of risk avoidance has been raised frequently in the literature addressing the history of zoning. Christine Boyer (1983) notes, "… zoning was intended instead to secure the interest of property owners by enhancing the economic stability of home ownership" (p. 153) and that if zoning was viewed as "... *insurance policy* that the single family homeowner's investment be protected in a stable neighborhood" (p. 148). An econometric analysis of Chicago land prices following the first 1923 zoning ordinance concluded, "… residential land owners valued the insurance that zoning provides against future intrusions of conflicting commercial land use." McMillen and McDonald (2002, p. 630).

It is reasonable however, to assume that homeowners have a strong desire for stable or rising property values. In an urban growth scenario, the pressure for higher population densities drives up residential land values creating, for some homeowners, the opportunity to reap a significant capital gain if their property can be rezoned from single family dwelling to high density residential. Those homeowners with a low preference for a "stable" neighborhood and high preference for wealth will accept the conversion of their property from single family dwelling to high density which in turn may reduce the property values of homeowners adjacent to the rezoned property. Zoning is therefore a form of insurance against such a non-conforming use at the expense of a capital gain for other homeowners in the neighborhood. If there is a social welfare function that favors high population density, zoning is an impediment to achieving welfare gains (Note 7). It is important to emphasize that property value insurance does not ensure there will be no change in wealth (Note 8).

4. Implementing Insurance

Insurance programs to protect homeowners' equity have been implemented in the past. None of them have focussed on the issue of insurance to protect homeowner equity in instances where non-conforming land use imposes a capital loss on the homeowner due to negative externalities associated with the non-conforming land use. As noted in the introduction, the idea of home equity insurance to address negative externalities associated with rezoning has been suggested by several researchers. In most cases, the complexities of implementation appear to outweigh the benefits. The major impediments are as follow.

1) Insurance against a decline in property value due to externalities arising from rezoning would have to address the potential problem of moral hazard where the homeowner, faced with a rezoning application for the construction of a non-conforming building, would encourage the rezoning knowing that she/he would be moving away.
2) In a similar vein, a developer of proposed high-rise student residences might pay some of the near-by single family residences to support the project at a rezoning hearing.
3) The selection of an appropriate "price index" to base the pay-out decision is difficult (Case, Shiller and Weiss, 1993).
4) Insurance may lead to the approval of rezoning application leading to development not in the best interests of the neighborhood in the long run but is unopposed because of third party insurance.
5) The cost of insurance against homeowner property devaluation due to rezoning would be expensive.
6) It is not possible to obtain a reasonable estimate of the probability a given homeowner would experience rezoning impacting the value of her/his property.

While there is merit to elements of these arguments, the insurance option should be afforded greater attention not only in terms of equity and fairness but also as a means to improve economic efficiency in two ways. First, the ability to rezone property may result in welfare gains for a community that would occur in the presence of insurance. Second, homeowner's insurance in the presence of negative externalities would greatly reduce the significant resources that are now marshalled against land use change. Insurance would clearly reduce the level of "NIMBY" activity on the part of homeowners who may be affected negatively from a rezoning proposal. Even in situations where it may be difficult to clearly identify negative externalities, home-owners, going back to the early part of the 20th century, have viewed zoning as their "guarantee" of conformity. To rezone a property for activity that may have negative effects on a neighborhood is to violate a covenant between the home owner and the local government.

There are no aggregate statistics on the cost of addressing a re-zoning application across the United States or Canada. However, one example will identify the breadth of the costs involved. In the Province of Ontario, Canada, rezoning applications not resolved at the local government level are often appealed to the Ontario Municipal Board (Ontario, 2014). In 2012-2013, the board reviewed close to 2000 appeals. The length of each appeal ranged from 1 day to more than 10 days. A weighted average of the number of days for each appeal is approximately 4 days. There are no statistics on the cost of appeals but given that approximately 8,000 appeal days occurred in 2012-2013 and if we assume there were 2 representatives for the plaintiff, the private cost alone would be in the order of $ 24 million.

The public cost, that is, the annual public administrative costs to operate the Ontario Municipal Board was $18 million (Note 9). To those figures, one would have to add the cost of hearing the application for rezoning which would likely be at least 2000 days (one day per application) with attending costs of

private counsel and local government legal counsel in addition to the time at the staff level of local government. A very rough and conservative estimate might be $ 10 M province wide. If similar costs prevailed across Canada and the United States, it is not inconceivable that the cost of addressing rezoning applications could cost more than $ 1 B annually. The point of this exercise is to underscore the inefficiency of the current system of dealing with rezoning.

The argument there is insufficient data to calculate the probability of rezoning one or more properties impacting the value of adjacent properties lacks merit. There are literally thousands of examples of rezoning every year in any major city. A sufficiently large number of statistical studies in various countries have been undertaken to provide a reasonable data base to provide both the qualitative link between homeowner property prices and non-conformities and the quantitative nature of these effects (Baranzini et al., 2008; Colwell, Gujral, & Coley, 1985; Kinard & Kickey, 1995, 2000).

5. Conclusion

Appeals against property rezoning are very costly and achieve little to address the real risk home-owners face when they purchase residential property: the risk a local government or higher-tiered government decision will depreciate their asset. While current studies on the actual impact of negative externalities on property value are limited, there are data bases in most municipalities yielding the statistics to make reasonable assumptions to develop a fair insurance system to protect homeowners from a loss in property value due to the decisions of local governments that would create negative externalities due to the creation of non-conforming land use policy.

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Notes

Note 1. The authors wish to thank Michael Hoy and Ray Rees for their insightful comments on an earlier draft of this paper.

Note 2. It is assumed that the satisfaction of the owner of each property increases when her/his property value increases and decreases when the value declines. There is no interpersonal comparison of utility.

Note 3. While a Pigou-type tax to address the negative externalities may be theoretically attractive, it would be difficult if not impossible to implement.

Note 4. It is assumed that this and other utility representations depict the usual properties of risk aversion and a preference for asset diversification.

Note 5. The probability of state 2 can be endogenous depending on the degree to which those challenging the proposal to rezone take action, at a cost, to stop the rezoning. A land owner is faced with two probabilities.

Note 6. Calculating the probability a state occurs where non-conforming externalities reduce the value of adjacent properties is one of the practical issues in the design of insurance. The issue is addressed subsequently.

Note 7. An example of this is the policy of the Government of the Province of Ontario to impose population density targets in cities that are deemed to be high growth centers.

Note 8. Fair market insurance requires the deduction of the premium in any calculation of the net change in wealth. The following hypothetical example underscores this point. Given risk aversion, an insurance premium and loss of value of $4 converts wealth uncertainty to one of wealth certainty.

Impact of Fair Market Insurance on Wealth of Potential Losers.

Assumptions: A1=200; A2=160; π=0.9

Value of Property : No Insurance		Fair Insurance Against State A_2	
A_1 occurs	A_2 occurs	A_1 occurs	A_2 occurs
200	160	200-4*=196	160+40-4=196

Note 9. In 2017, the Ontario government replaced the Ontario Municipal Board ("OMB") with a new Local Planning Appeal Tribunal ("LPAT"). The most important change is the elimination of the OMB's power to substitute its decision for decisions made by a municipality or its committees.