Economic Value or Fair Market Value: What Form of Takings Compensation Is Efficient?

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The scholarly literature on takings compensation emphasizes incentives for condemnors and condemnees. The widely accepted prediction that full compensation leads to overinvestment by condemnees, however, is not based on the correct understanding of the takings law in the United States. Condemnors are often assumed to be social wealth maximizers or to suffer from fiscal illusion, both theories lacking empirical support. In addition, costs and accuracy of assessing property value for takings compensation purposes

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are important, yet have never been systematically analyzed. I argue that owners will generally invest efficiently if either economic value or fair market value (assessed under current U.S. law) is adopted as the takings compensation standard. Government officials seek to maximize their own political interests, not their agency's or society's interests, when making decisions on condemnations. If only condemnors' and condemnees' incentives are considered, economic value compensation is the most efficient; fair market value compensation will be suboptimal. After taking into account assessment costs and assessment accuracy, I further argue that fair market value plus a schedule of proportional bonuses should be given to homeowners. Nonresidential property owners, because their economic value approximates fair market value, are entitled only to fair market value compensation without bonuses.

I. INTRODUCTION

What compensation should the government pay when it physically condemns property?[1] The law and economics literature debates the efficiency of compensating "fair market value"[2] versus that of compensating "economic value,"[3] which is fair market value plus

[1] This Article addresses physical takings. Regulatory takings are excluded. In the following text, "takings" mean "physical takings."

[2] Fair market value is "the amount a willing buyer would pay a willing seller of the property, taking into account all possible uses to which the property might be put other than the use contemplated by the taker." David A. Dana and Thomas W. Merrill, *Property: Takings* 169–70 (Foundation 2002).

Judge Posner defined market value as "not the value that every owner of property attaches to his property but merely the value that the marginal owner attaches to *his* property." *Coniston Corp v Village of Hoffman Estates*, 844 F2d 461, 464 (7th Cir 1988) (emphasis original).

I use fair market value and market value as synonyms. "The term 'fair' hardly adds anything to the phrase 'market value,' which denotes what 'it fairly may be believed that a purchaser in fair market conditions would have given,' or, more concisely, 'market value fairly determined.'" *United States v Miller*, 317 US 369, 374 (1943) (citation omitted).

[3] The proponents of economic value compensation include Richard A. Epstein, *Takings: Private Property and The Power of Eminent Domain* 183 (Harvard 1985); Richard A. Epstein, *Bargaining with the State* 182 (Princeton 1993) ("Ideally, the state should be required to pay not the market value, but the subjective value that the individual attaches to the property."); Abraham Bell and Gideon Parchomovsky, *Taking Compensation Private*, 59 Stan L Rev 871, 873 (2007); Michael Heller and Rick Hills, *Land Assembly District*, 121 Harv L Rev 1465, 1474–75 (2008); Steven J Eagle,

"(unique) subjective value."[4] For real estate investors, subjective value is close to zero. For homeowners, subjective value, derived from, say, the memory of growing up in the family houses, is usually positive and sometimes quite large.[5] Thus, economic value is higher than or equal to fair market value.[6] Most people would agree that at least the fair market value should be compensated when the government physically condemns a property. Nevertheless, should subjective value be part of the compensation package?

The question how much compensation should be paid when condemnation occurs poses a well-documented dilemma.[7] When full compensation (that is, economic value compensation[8]) is paid, government officials who condemn properties (the condemnors) are perceived to have incentives to take the social costs of condemnation into account. Unfortunately, compensation, especially full compensation, is said to create a moral hazard problem. Owners of condemned property (the condemnees) ignore the possibility of physical

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Privatizing Urban Land Use Regulation: The Problem of Consent, 7 Geo Mason L Rev 905, 915 (1999).

The proponents of fair market value compensation include *United States v 564.54 Acres of Land*, 441 US 506, 511 (1979) (Justice Marshall, in the majority opinion, arguing that market value is a useful compromise standard for assessing takings compensation required by the Constitution); Thomas J. Miceli and Kathleen Segerson, *Takings*, in Boudewijn Bouckaert and Gerrit de Geest, eds, 4 *Encyclopedia of Law and Economics: The Economics of Public and Tax Law* 328, 332 (Elgar 2000) (arguing that, all things considered, market value compensation may be the best choice); William A. Fischel, *Regulatory Takings: Law, Economics, and Politics* 211 (Harvard 1995) (same); Ed Nosal, *The Taking of Land: Market Value Compensation Should Be Paid*, 82 J Pub Econ 431, 434 (2001) (arguing that market value compensation is optimal).

[4] See Lawrence Blume and Daniel L. Rubinfeld, *Compensation for Takings: An Economic Analysis*, 72 Cal L Rev 569, 619 (1984); Lee Anne Fennell, *Taking Eminent Domain Apart*, 2004 Mich St L Rev 957, 963–65 (2004); Thomas J. Miceli and Kathleen Segerson, *The Economics of Eminent Domain: Private Property, Public Use, and Just Compensation* 20 (Now 2007).

Subjective value is sometimes called the "consumer's surplus." See James E. Krier and Christopher Serkin, *Public Ruses*, 2004 Mich St L Rev 859, 866 (2004). Merrill and Smith use "subjective premium" instead of subjective value. See Thomas W. Merrill and Henry E. Smith, *Property* 249 (Oxford 2010).

[5] See Heller and Hills, 121 Harv L Rev at 1475 (cited in note 3).

[6] See Abraham Bell and Gideon Parchomovsky, *The Hidden Function of Takings Compensation*, 96 Va L Rev 1673, 1683 (2010).

[7] See, for example, Thomas J Miceli and Kathleen Segerson, *Compensation for Regulatory Takings: An Economic Analysis with Applications* 7 (JAI 1996).

[8] In this Article, I use "full compensation" and "economic value compensation" interchangeably. Note that in the prior literature, full compensation is sometimes used to connote full compensation of the current value of the condemned properties.

takings and overinvest.[9] On the other hand, if zero compensation were paid, although condemnees would have the right investment incentives, condemnors would ignore the social costs of physical takings and condemn too many properties.[10]

The problem here is similar to one faced in tort law when balancing the incentives of tortfeasors and victims.[11] Full compensation for the injury creates moral hazard for the victims (not taking enough care), whereas zero compensation induces potential tortfeasors to be reckless. The negligence rule, giving both sides incentives to act optimally, is the most prominent solution to the problem.[12] There is nothing similar to negligence in takings law, although some scholars propose a partial compensation rule that it is thought might serve an analogous function.[13]

In this Article, I will argue that this dilemma actually only exists if we fail to recognize what the actual takings laws require and how it works, and if certain unwarranted assumptions about the incentives of condemnors and condemnees are made. In fact, the economic value compensation standard and the fair market value compensation standard will both induce owners to invest efficiently. Furthermore, the government as an expropriator does not follow the behavioral model accepted by most takings theorists. I argue that, as far as condemnors' and condemnees' incentives are concerned, economic

[9] See Blume and Rubinfeld, 72 Cal L Rev at 618 (cited in note 4); Lawrence Blume, Daniel L. Rubinfeld, and Perry Shapiro, *The Taking of Land: When Should Compensation Be Paid*, 99 Q J Econ 71, 71–72, 81 (1984).

[10] See Thomas J Miceli and Kathleen Segerson, *Regulatory Takings: When Should Compensation Be Paid?*, 23 J Legal Stud 749, 754 (1994).

[11] See Louis Kaplow, *Transition Policy: A Conceptual Framework*, 13 J Contemp Legal Issues 161, 193 (2003).

[12] See Robert Cooter and Thomas Ulen, *Law and Economics* 341–44 (Pearson 5th ed 2008).

[13] See Blume and Rubinfeld, 72 Cal L Rev at 620 (cited in note 4); William A. Fischel and Perry Shapiro, *A Constitutional Choice Model of Compensation for Takings*, 9 Intl Rev L Econ 115 (1989). Compare Dana and Merrill, *Property: Takings* at 178 (cited in note 2) (arguing that "[i]ncomplete compensation . . . works something like a rule of comparative negligence in tort"); Louis Kaplow, *An Economic Analysis of Legal Transitions*, 99 Harv L Rev 509, 603 (1986) (analogizing partial compensation to partial insurance).Robert Cooter proposes a "second-best theory of takings" in which "one party will have efficient incentives and the other party will have distorted incentives." See Robert D. Cooter, *The Strategic Constitution* 295 (Princeton 2000).

Michael Heller and James Krier's proposal to detach "payments by the government" from "compensation to the condemnees" is another, more radical proposed solution. See Michael A. Heller and James E. Krier, Commentary, *Deterrence and Distribution in the Law of Takings*, 112 Harv L Rev 997 (1999).

value is the most efficient compensation standard, whereas the fair market value standard falls short.

The administrative costs of assessing takings compensation (assessment costs) and the accuracy of the appraised property value (assessment accuracy), however, also have to be taken into account in determining which form of compensation is the most efficient. There is a trade-off: assessment of fair market value can be fairly accurate and low-cost, especially when econometric models of appraising property value can be used. The fair market value standard, however, undercompensates owners because their subjective value is not compensated. By contrast, the economic value standard aims to award full compensation, and a straightforward self-assessment of economic value regime can be administered with low costs, at the expense of extreme overassessment. Law-and-economists have proposed a different mechanism to induce owners to reveal their true economic value while increasing the accuracy and cost at the same time.

Taking into account all four factors necessary for efficiency[14]—condemnees' incentives, condemnors' incentives, assessment accuracy, and assessment costs—I argue that what I call the "ex post assessment by non-landowner method" appears to be better than other assessment methods at approximating real economic value. This method can accurately assess the fair market value of condemned properties at low costs. The assessed value should then be complemented with bonus compensation, so that total compensation is more likely to attain full economic value compensation. The bonus compensation rate, however, should not be flat, as has been advocated in the past.[15] Rather, a schedule that, for example, gives long-term owner-occupants higher bonus rates is more likely to reflect the amount of their subjective value. As for owners of nonresidential or investment residential properties, fair market value compensation should be the norm, because those properties hold low, if any, subjective value for their owners.

This Article thus contributes to the literature in several ways. First, I find that although the well-accepted thesis that condemnees will overinvest when awarded full compensation is theoretically

[14] The efficiency standard I use in this Article is the Kaldor-Hicks efficiency, under which a legal policy is more efficient than the status quo or another policy choice if those made better off under the legal policy in question could in theory compensate those made worse off. In other words, the new legal policy creates net benefits. See, for example, Richard A. Posner, *Economic Analysis of Law* 13–14 (Aspen 7th ed 2007).

[15] See the discussion and literature cited in Katrina Miriam Wyman, *The Measure of Just Compensation*, 41 UC Davis L Rev 239, 256–57 (2007).

sound, it does not accurately describe condemnees' incentives under current U.S. law. Second, I point out that the behavioral assumptions regarding condemnors relied on in most of the literature are not realistic and have therefore led to policy proposals that will award inefficiently low compensation. Third, I systematically analyze assessment costs and assessment accuracy by proposing a framework of assessing property value for takings compensation purposes. In particular, I demonstrate that self-assessment of economic value can be accurate if random condemnation of private properties is allowed, which is extremely costly and arguably unconstitutional, and if the government knows the true economic value to every owner, which begs the question. Moreover, I show that although the recent literature on the new land assembly mechanism has made some progress, no one assessment method is practical, low cost, and accurate at the same time. Fourth, this Article is the first systematically to consider the four efficiency-related factors together[16] and look comprehensively into the pros and cons of choosing between economic value and fair market value by the measure of these four factors. Finally, I distinguish between residential homeowners and nonresidential property owners and tailor takings compensation standards to each category: fair market value plus a schedule of bonuses for the former and fair market value only for the latter.

The structure of this Article is as follows: Section II reexamines the current theses regarding the effects of compensation on condemnees' incentives, and Section III does the same with condemnors' incentives. Section IV systematically analyzes assessment costs and assessment accuracy, including a proposal for a framework of understanding them and examining in detail the merits and demerits of the four prototypes. Section V coherently analyzes the four factors and proposes the most efficient takings compensation standard. Section VI concludes.

II. CONDEMNEES' INCENTIVES

Four theories can be found in the literature regarding how the amount of takings compensation affects condemnees' incentives. The literature mostly fails to distinguish between fair market value compen-

[16] The importance of at least three factors (excluding assessment accuracy) has long been noticed (see, for example, at least since Blume and Rubinfeld (72 Cal L Rev at 582–83 (cited in note 4)), though no comprehensive analysis of assessment costs and assessment accuracy to my knowledge has appeared.

sation and current value compensation and sometimes mixes full compensation with current value compensation.

Theory 1 supports a case for lower, even zero, compensation. On this view, compensation, especially full compensation, induces owners to "overinvest"[17] in their properties because compensation protects them from bearing the risk of condemnations. This is often called the moral hazard problem.[18]

The other three theories support a case for more, preferably full, compensation. According to the theory 2, less than full compensation will motivate some owners to overinvest in their properties to increase their value, because condemnors usually condemn low-value properties. That is, owners overinvest to avoid takings.[19] According to theory 3, less than full compensation may also induce owners to "underinvest"[20] to reduce losses if takings ultimately happen.[21] Last, in theory 4, owners will take political actions to prevent takings if they (expect to) receive less than full compensation.[22] Below I discuss whether and to what extent the four possible forms of takings compensation induce overinvestment, underinvestment, and

[17] "[T]he socially appropriate investment would take into account the fact that capital is lost when the land is taken." Blume, Rubinfeld, and Shapiro, 99 Q J Econ at 72 (cited in note 9). That is, overinvestment means investing more than the socially appropriate (or optimal) level.

[18] See Kaplow, 99 Harv L Rev at 537–41 (cited in note 13).

[19] See Miceli and Segerson, *Economics of Eminent Domain* at 28 (cited in note 4); Thomas J. Miceli, 147 J Institutional & Theoretical Econ 354, 358 (1991). To be exact, Miceli's mathematical model demonstrates that, under certain assumptions (particularly the probability of takings being a function of owners' investment and the benevolent government assumption discussed below), owners will overinvest to increase property value to avoid takings, if owners are not fully compensated with a lump-sum payment that equals to the value of property when investments are made at a socially optimal level. Note that, as a result, "full" compensation in Miceli's framework has a different meaning than I will use it in this Article. According to Miceli, if property value at the date of condemnation is higher than the property value if only optimally invested, and the government only awards condemnees with the latter, it is still considered full compensation.

For arguments that investment can increase the current value and thus reduce the probability of takings, as condemnors tend to condemn low-value, less-developed properties, see also Robert Innes, *Takings, Compensation, and Equal Treatment for Owners of Developed and Undeveloped Property*, 40 J L & Econ 403, 429 (1997)

[20] Underinvestment means investing less than the socially optimal level.

[21] See William A. Fischel and Perry Shapiro, *Takings, Insurance, and Michelman: Comments on Economic Interpretations of "Just Compensation" Law*, 17 J Legal Stud 269, 269 (1988) (arguing that with the zero compensation standard, "too little capital will be invested in productive enterprises").

[22] See Ulen, *Public Use* at 170 (cited in note 21).

rent-seeking activities. These four forms of takings compensation are compensation of economic value (that is, full compensation; one extreme), zero/no compensation (the other extreme), compensation of current value, and compensation of fair market value (the current United States law). The literature mostly fails to distinguish between fair market value compensation and current value compensation and sometimes mixes full compensation with current value compensation.

One major contribution of this section is to demonstrate that while the current value compensation standard induces overinvestment, the fair market value compensation standard adopted in the United States and the economic value compensation standard generally induce efficient investment decisions. In conclusion, because a less than full compensation standard will stimulate rent-seeking, the economic value compensation standard is the most efficient as far as condemnees' incentives are concerned. In the following, first I argue that it is misleading to label the overinvestment problem in the takings context as a moral hazard problem and then I address the four forms of takings compensation and four theories in turn.

A. Inaccurate Analogy of Insurance and Moral Hazard

Scholars frequently analogize takings compensation to insurance,[23] and overinvestment by potential condemnees owing to guaranteed compensation payments is labeled a "moral hazard"[24] problem.[25] I will argue that while the insurance analogy has deepened our understanding of problems involving takings compensation, the insurance/moral hazard analogy deters us from fully comprehending the distinctive nature of the takings compensation/overinvestment problems.[26]

According to the overinvestment thesis, to attain efficiency, owners should take into account the probability of condemnation when deciding how much to invest in their properties. With (let us assume) guaranteed full compensation, however, owners will invest as if the probability of condemnation were zero, even though they know it

[23] See, for example, Blume, Rubinfeld, and Shapiro, 99 Q J Econ 71 (cited in note 9); Kaplow, 99 Harv L Rev at 603 (cited in note 13).

[24] Moral hazard is the tendency of a person who is imperfectly monitored to expend less effort protecting those goods that are insured against damage. See Moore McDowell, et al, *Principles of Economics* 367 (McGraw 2d ed 2009); N. Gregory Mankiw, *Principles of Microeconomics* 484 (Thompson 5th ed 2009).

[25] See, for example, Fischel and Shapiro, 17 J Legal Stud at 272 (cited in note 21).

[26] For other criticisms of the insurance theory, See Daniel A. Farber, *Economic Analysis and Just Compensation*, 12 Intl Rev L & Econ 125, 127–29 (1992).

is not. As a result, property owners overinvest, which is inefficient. Even if compensation is not full, higher compensation will tend to lead to more overinvestment.

The nature of the moral hazard problem in, say, fire insurance[27] is different from the overinvestment problem in the takings context in the following ways: First, fire is always wealth-reducing, whereas condemnation can be efficient. Moral hazard is undesirable because we want to minimize the number of fires and owners' caution is critical in attaining this goal. By contrast, physical takings are not necessarily a social loss.[28] We do not want to minimize the number of condemnations.[29] Hence, it is in fact undesirable if owners try their best to obstruct every condemnation.

Second, although every insured owner can take certain precautionary measures against fires originating around the house,[30] most condemnees lack the political clout or legal knowledge to fight condemnation. Thus, even if one for some reason thinks every condemnee should try to stop condemnation, condemnees are mostly unable to do anything politically meaningful.

Third, while condemnees *theoretically* could invest in their properties before condemnation to acquire more compensation and, as a side effect, create more social loss, the insured usually could not

[27] Granted, fire insurance is not the only type of insurance. Nevertheless, other types of insurance, such as health insurance or liability insurance, seem to be more distant to takings compensation than fire insurance.

[28] For instance, the condemnation and revitalization of properties in Lincoln Center and Times Square in New York City arguably create more social benefits than social costs. Many other condemnations are also efficient. For discussions of social costs and benefits of the condemnation in New York City's Time Square Project, see, for example, Michael Heller, *The Gridlock Economy: How Too Much Ownership Wrecks Markets, Stops Innovation, and Costs Lives* 108 (Basic 2008); Eric R. Claeys, *Exclusion and Exclusivity in* Gridlock, 53 Ariz L Rev 9, 45–47 (2011).

[29] It is desirable to minimize the number of *inefficient* condemnations. Nevertheless, it is unrealistic to expect that condemnees can tell efficient from inefficient condemnations, and condemnees have no incentives only to stop the latter. Condemnees only care about their own compensation. Given full compensation, they rest and wait for condemnations to come, even inefficient ones. Given undercompensation, they fight even if the condemnation is for the common good.

[30] See Blume and Rubinfeld, 72 Cal L Rev at 593 (cited in note 4) ("Moral hazard occurs when the party to be insured can affect the *probability* or the magnitude of the event that triggers payment.") (emphasis added). If owners cannot take any precautionary action against fire, there is no moral hazard, since owners do not become *less* careful. Thus, not all types of insurance incur moral hazard, only those that change relevant parties' behaviors.. For instance, insurance against, say, a meteor strike does not create moral hazard, because homeowners can do nothing to change the probability or magnitude of damages caused by a meteor strike (other than probably *under*investing—for example, reducing (or not expanding) the size of the house to avoid a meteor strike).

invest to acquire more insurance payments because the value of the properties often have been specified in the insurance contract.[31]

Fourth, owners do not pay anything similar to an insurance premium in order to enjoy takings compensation.

In summary, the analogy of insurance and moral hazard may be helpful for initial analysis but it soon becomes misleading. I am not denying that overinvestment *could* exist, or claiming that the concept of moral hazard is totally inapplicable in the takings context. Rather, my argument in this section is that the term moral hazard as understood in the insurance context does not exactly connote the nature of the overinvestment problem in the takings context. I will hereinafter avoid the term moral hazard and instead use the term "overinvestment problem" in the takings context.

B. Current Value Standard

I will use one hypothetical example to bring to light the distinctions between the current value standard and the fair market value standard. In this example, Phil has owned for fifty years a large, urban, vacant land parcel, zoned for multifamily residences (such as condominiums). The only fixture on the land is a water tank that has not been used for two decades. Phil is, so to speak, a *homo economicus,* responding to the incentives given by the legal regime.

1. Overinvestment Due to Ignoring the Chance of Takings. Under the current value standard, the land, the water tank, and whatever fixtures exist at the time of the title vesting date[32] will be compensated. As a result, Phil is likely to overinvest, because he can ignore the possibility of takings in making investment decisions. For instance, if the probability of takings is 10 percent, the marginal benefit of investment is $100, and the marginal cost of investment is $95, Phil will still invest, since the investment will increase the value of current use and thus takings compensation by $100 – $95 = $5. Nevertheless, from a social standpoint, Phil should not invest, as the marginal social cost ($95) is larger than the expected marginal

[31] In this sense, the moral hazard problem in the condemnation context is more serious, because condemnees can better affect the magnitude of the event that triggers payment. See id. Nevertheless, as the next section will show, in reality condemnees can hardly affect that magnitude of losses.

[32] For discussions of *US v Miller*, 317 US 369 (1943), regarding the temporal reference point for evaluating the value of condemned properties, see Thomas W. Merrill and Henry E. Smith, *Property: Principles and Policy* 1266 (Foundation 2d ed. 2012).

social benefit ($90).[33] The extent of overinvestment positively correlates with the probability of takings.[34] The extent of overinvestment by owners whose plots are unlikely to be condemned,[35] the extent of their overinvestment is small.

2. Overinvestment to Avoid Takings. The current value standard does not award full compensation, as it does not compensate Phil's subjective value derived from his childhood memory of playing in that vacant plot with his friends and family. Phil thus has incentives to prevent condemnation of his property. According to Thomas Miceli's model, whether an owner like Phil will avoid takings by "overinvesting" depends on whether probability of takings is a function of (compensable) property value (and thus a function of investment).[36] If the condemnor is benevolent (as Miceli assumes[37]) or suffers from fiscal illusion (more on this in Section III), owners would have incentives to overinvest if compensation is less than a lump-sum payment of the property value when the property is optimally invested.

It is unclear, however, to what extent Miceli's model can be extended if the condemnors maximize political interests, which I argue below is a better model. Although condemnors are always subject to budgetary constraints and thus can only condemn less if compensation is higher, compensable value will not be the major concern for political-interest-minded condemnors. Then, whether the probability of takings is a decreasing function of investment and property value is in doubt, as the probability of takings is more likely to be a decreasing function of owners' political clout, or at least owners' political influence should be one variable in the model as well. Besides, consider the condemnation of the entire blighted neighborhood for urban renewal: for any given owner in the neighborhood,

[33] [$100*(1 – 10%) + $0(10%)] = $90.

I assume throughout this Article that condemned properties will be razed rather than used by the condemnor in their original form. In the latter scenario, investments by the original owner should not be considered as total wastes (and priced as $0 in the above formula). Nevertheless, the latter scenario should be rare enough to be assumed away in this Article to simplify the calculation. The basic insight remains intact if the possibility of the latter scenario is taken into account.

[34] For example, if the possibility of takings is 50 percent, the owner overinvests by $45 in the above example.

[35] Takings is generally a low-probability event; see Kaplow, 99 Harv L Rev at 548 (cited in note 13); Miceli and Segerson, *Takings* at 334 (cited in note 3).

[36] See Miceli and Segerson, *Economics of Eminent Domain* at 26–28 (cited in note 4); Miceli, 147 J Institutional & Theoretical Econ at 358 (cited in note 19).

[37] See Miceli, 147 J Institutional & Theoretical Econ at 355–56 (cited in note 19).

investing more to increase his property value is unlikely to decrease the probability of takings, unless most of his neighbors invest around the same time to revitalize the neighborhood before condemnation. Otherwise, investments and improvements in a few houses alone will not change the blight of the neighborhood and reduce the probability of takings, and the improved properties will still be expropriated together with other run-down properties.

Accordingly, if we assume that the probability of takings is thus independent of the property value, it is not difficult to demonstrate that owners will not overinvest in order to avoid takings. Supposing that Phil somehow believes that the zero compensation standard has been adopted, he now will take the probability of takings into account. Nevertheless, will Phil overinvest to reduce the chance of takings? When a $90 investment can lead to a $1000 increase in value, it is privately and socially efficient to make this investment, even though there is a 10 percent chance of condemnation. When a $90 investment can only produce $10 in value, Phil will not invest, and his decision is socially efficient as well. Because Phil believes that in one-tenth of the time, he will lose his investment, he will invest $90 only if the investment creates $100 in value (expected MR = expected MC). This is also socially efficient. Put differently, investment is not free. It makes no economic sense for owners to invest beyond of point of MR = MC merely to increase the compensable property value. When compensation payment is insufficient to cover the investment cost, owners will not invest. In sum, under the above assumption and the current value standard, owners will overinvest, but this inefficient decision is not driven by the idea of overinvesting to reduce the chance of condemnation; rather, it is due to the current value compensation standard that induces owners to ignore the possibility of takings.

We now instead assume that the government is benevolent and the probability of takings is a decreasing function of investment and property value, both being critical assumptions in Miceli's model. Nevertheless, following Miceli's model, it is unclear whether the current value standard will induce overinvestment to avoid takings. Miceli's model takes lump-sum compensation as given and concludes that owners may overinvest. The current value standard, however, does not award lump-sum compensation. Thus, although my intuition is that owners will overinvest to avoid takings, more modeling is required to analyze owners' investment decisions under this scenario. As I will argue that the current value standard is not among the top two choices, I will leave this issue here, to make room for discussions of more critical issues.

3. Underinvestment to Reduce Losses. I doubt that, overall, owners will underinvest to reduce losses incurred by condemnation. Owners underinvest if they stop investing when the marginal social benefit is still larger than the marginal social cost. Risk-neutral owners, however, will not even underinvest to reduce losses if the zero compensation standard replaces the current value compensation standard. From the social perspective, following the example of Phil, a $90 investment that creates at least $100 in wealth is efficient. For Phil to be labeled an underinvestor, he must stop investing his $90 when it can create more than $100, but there is no reason that a rational and risk-neutral Phil will do so, since the probability of takings is only 10 percent. Because the social and private welfare functions converge, Phil's investment decision will be socially optimal. Note that owners indeed *invest less* than they would have if they were fully or partially compensated.[38] Nevertheless, investing less is not underinvesting, and investing less is a rational and efficient response to the given legal rules and probability of takings.

If risk-neutral Phil will not underinvest to reduce losses under the zero compensation standard, he will not underinvest under the current value standard. For example, if Phil's current value will only be 80 percent compensated, a $45 investment by Phil that would otherwise have produced a $49 benefit now produces an expected private benefit of $48,[39] while the expected social benefit is $44.1.[40] Therefore, in fact, Phil will still overinvest, not underinvest.

Owners could underinvest if they are risk-averse and expect to receive very low compensation. For example, risk-averse Phil may be unwilling to spend $89 if $100 can be created and the probability of takings is 10 percent and the zero compensation standard applies. This is underinvestment. If owners are partially compensated, they will also have incentives to overinvest. Thus, depending on the extent of owners' risk-averseness and the compensation standard, some owners could, as a whole, overinvest and some underinvest. Under the current value standard, owners probably overinvest.

[38] See Kaplow, 99 Harv L Rev at 561 (cited in note 13) ("actors will in fact invest less if there is some probability of an uncompensated taking"). See also Thomas S. Ulen, *The Public Use of Private Property: A Dual-Constraint Theory of Efficient Government Takings,* in Nicholas Mercuro, ed, *Taking Property and Just Compensation* 170 (Kluwer 1992) (arguing that owners will avoid "physical and emotional investments in one's property that would give it a subjective value that would be lost in the event of a taking").

[39] $49*90% + $49*10%*80% = $48.02.

[40] $49*90% + $49*10%*0% = $44.1.

4. Rent-Seeking. Property owners under the current value standard will not just silently accept undercompensation, as their subjective value is not compensated. They may take political actions to request more compensation or avoid condemnation. Some scholars have argued that condemnees will be successful,[41] while others have cast doubt on condemnees' political clout.[42] I have argued elsewhere that whether condemnees will take actions and whether they will succeed depend on the political environment, especially the existence of other special interest groups fighting for the same pool of resources.[43] Nevertheless, because all such rent-seeking actions do is transfer wealth (money changes hands between condemnors and condemnees), political actions, be it successful or unsuccessful, are inefficient.

C. Fair Market Value Standard

It is well accepted in the literature that if compensation payment is lump-sum, owners have no incentive to overinvest; indeed, owners will invest efficiently.[44] In other words, if takings compensation is determined independent of the level of investment, owners do not have incentives to overinvest. The critical question is thus whether

[41] See Farber, 12 Intl Rev L & Econ at 130–31 (cited in note 26); Daryl J Levinson, *Making Government Pay: Markets, Politics, and the Allocation of Constitutional Costs*, 67 U Chi L Rev 345, 375–77 (2000).

[42] See Saul Levmore, *Just Compensation and Just Politics*, 22 Conn L Rev 285, 306–07 (1990).

[43] See Yun-chien Chang, *Empire Building and Fiscal Illusion? An Empirical Study of Government Official Behaviors in Takings*, 6 J Empirical Legal Stud 541, 566–74 (2009).

[44] For a technical definition of lump-sum compensation payment and the proof of the lump-sum theory, see Blume, Rubinfeld, and Shapiro, 99 Q J Econ at 78 (cited in note 9); Miceli and Segerson, *Economics of Eminent Domain* at 27 (cited in note 4). But compare Robert Innes, *The Economics of Takings and Compensation When Land and Its Public Use Value Are in Private Hands*, 76 Land Econ 195, 207 (2000) (demonstrating that when owners' investment will worsen the public use value after takings, lump-sum full compensation still prompts overinvestment and efficient investment choices can be achieved with more than full lump-sum compensation). In this Article, I will stick with the tradition of Blume, Rubinfeld, and Shapiro (often called BRS in the literature), as generally speaking, private investment will not reduce the public use value of the land in the future. For example, building a house on a vacant plot does not reduce the land value as a part of the highway if the government condemns this plot. Granted, Innes's example—using the land as habitat for endangered species—is plausible. But note that the difference between BRS and Innes here is full versus more than full compensation, rather than lump-sum or not. Hence, the lump-sum nature of the two compensation standards I identify below, fair market value and economic value, is still critical.

the fair market value standard under current U.S. law awards lump-sum payment to condemnees, and I will argue that it generally does.

1. Fair Market Value Compensation Is Generally Lump-Sum. Fair market value in the U.S. takings law refers to the value of a property in its future "highest and best use,"[45] rather than its "current use," which is discussed above. It is important not to conflate these two standards; otherwise, one would mistakenly fault the fair market value standard with inducing overinvestment. Moreover, the court has emphasized repeatedly that the highest and best use is to be assessed *regardless of the current, actual use*.[46] In Phil's case, since the vacant land's highest and best use is a condominium, Phil will receive the value of such a condominium as takings compensation—regardless of whether the plot remains vacant or Phil rushes to build a one-family house before condemnation (note that I do *not* argue that the amount of compensation Phil would receive under the two scenarios will be exactly the same). Current use is not assumed the highest and best use,[47] and investing on improving the current use of the property generally will not increase the value of the highest and best use. Therefore, if owners have incentives to overinvest at all, they will only overinvest on increasing the value of the highest and best use (that is, owners invest on elevating the highest and best use as if the probability of takings were zero).

The value of the highest and best use (the fair market value), however, is unlikely to be affected by owners' investment. Put differently, compensation payment under the fair market value standard

[45] At least in New York State, the term "highest and best use" means that a condemned property must be valued on its most valuable, reasonably probable future use regardless of actual use. The highest and best use, however, is not boundless. For example, a future highest and best use may result from rezoning, special use permit, or zoning variance. Condemnees must "establish that there existed, on the title vesting date, a reasonable probability that the asserted highest and best use could or would have been made of the subject property in the reasonably near future and the use was economically feasible." Edward Flower, *Highest and Best Use Defined and Applied*, in Jon N. Santemma, ed, *Condemnation Law and Procedures in New York* 173, 176–77 (NYS Bar 2005). See also Michael Rikon, *"What's It Worth—Who Wants to Know?"—The Valuation of Real Property in Litigation*, in Santemma, ed, *Condemnation Law and Procedures in New York* 161, 164; Christopher Serkin, *The Meaning of Value: Assessing Just Compensation for Regulatory Takings*, 99 Nw U L Rev 677, 689 (2005) ("It is black letter law that fair market value is based on . . . its highest and best use."); Heller and Hills, 121 Harv L Rev at 1474 (cited in note 3).

[46] See Flower, *Highest and Best Use* at 176–77 (cited in note 45); Rikon, *Valuation of Real Property in Litigation* at 164 (cited in note 45).

[47] See Walt Huber, Levin P. Messick, and William Pivar, *Real Estate Appraisal: Principles and Procedures* 182 (Educational Textbook 3d ed 2006) (using a formula to determine whether existing, current use is the highest and best use).

can be considered lump-sum. To demonstrate this key point, let us examine how fair market value is assessed in practice. In assessing the value of the highest and best use of the condemned property, real estate appraisers most often use the "comparable sale" approach,[48] under which "comparable properties" recently sold in the open market at arm's length are chosen and their sale prices adjusted to reflect the differences between the sold properties and the condemned property. The final assessed value is usually derived from the average or median of the adjusted sale prices.

The key in ascertaining that compensation payment is lump-sum lies in how appraisers pick comparable properties and adjusting their sale prices. First, owners' investment should hardly be able to influence the hedonic characteristics and sale prices of the *comparable* properties. Moreover, owner's investment is unlikely to affect which comparable properties appraisers choose and how appraisers adjust sale prices. Appraisers' handbooks contain a long list of factors that appraisers should pay attention to in choosing comparable sales and particularly adjusting sale prices. Nevertheless, the most critical factors are mostly *immovable* traits of properties such as (lot or building) size, location, timing, and so on, in addition to transaction details such as property rights conveyed, financing terms, conditions of sales.[49] It should be worth noting that in the court-of-first-instance takings cases that I have read, appraisers in eminent domain procedures in New York State mainly use a few immovable traits to adjust the sale prices of comparable properties.[50] It makes

[48] The comparable sale approach is widely recognized as "by far the most reliable . . . method of valuing land." See id at 184.

When comparable sale approach is not applicable, the "rent/income capitalization method" or the "replacement cost method" will be used. The rent/income capitalization method relies on the rent stipulated in the lease for the condemned properties or comparable properties. Owners would overinvest if their investments increased the rental value (and thus rent) of their properties. The replacement cost method could lead to overinvestment if, in assessing replacement costs, the improvements recently made by owners are taken into account. Nevertheless, unless the current use is the highest and best use, it makes little sense to employ the replacement cost method in takings compensation appraisals. Moreover, economically speaking, costs do not equal values. The "values" derived from the replacement cost approach is thus problematic.

[49] Dates of sale, location, physical features, terms and conditions of sales have been listed as the most important factors in determining the magnitude of adjustment. William L. Ventolo, Jr and Martha R. Williams, *The Art of Real Estate Appraisal: The Complete Guide for Homeowners and Real Estate Professionals* 118 (Kaplan 2d ed 2008). See also Mary Elizabeth Geraci, *The Appraisal of Real Estate* 443 (Appraisal Institute 12th ed 2002).

[50] See, for instance, the detailed accounts of how appraisers assess the compensable value of two condemned properties in two cases in New York City: *In the Matter of the Application of the City of New York to acquiring title in fee simple and other*

economic sense for appraisers to focus on immovable features, since they contribute to most of the property value. There is a practical necessity as well. By the time appraisers investigate comparable properties, their movable traits may have been changed since the last sales and a comparison of changed movable traits renders the price adjustment inaccurate. Given that the value of the highest and best use is determined mainly based on comparisons of immovable traits in the compared properties and the condemned properties, takings compensation assessed under the fair market value standard will largely be independent of owners' investments.

Granted, it is still possible for owners/condemnees' investment to influence the fair market value.[51] Owners can improve movable traits, such as repainting the façade, lobbying for rezoning, or building a condominium on a vacant lot. Owners overinvest when their investments will be at least partially compensated in the eminent domain procedure. It all depends on whether and to what extent the appraisers will consider these traits in picking comparable properties and adjusting prices. The repainted façade, for example, may be ignored or given very little weight, particularly because the takings law emphasizes that compensation should be assessed regardless of the current use. The few movable traits that can have substantial impact on compensable value, such as zoning and structure (or lack thereof), are likely be taken into account, but to what extent will probably be unclear to most landowners. Nevertheless, as long as investments in certain types of traits could increase the value of the highest and best use, owners would overinvest in these traits, though the extent of overinvestment should not be exaggerated. The extent of overinvestment is positively correlated with the probability of takings, the ratio of compensation to investment, and the certainty of this ratio. Only certain types of investments—those that will be taken into account by appraisers as a plus—will influence

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interests in certain real property not heretofore acquired for Powell's Cove Environmental Waterfront Park Queens (Index No. 14010/00) (also available at http://law.justia.com/cases/new-york/other-courts/2007/2007-50267.html; visited on Jan 6, 2012); and *In the Matter of the Application of the City of New York, relative to acquiring title in fee simple absolute to certain real property where not heretofore acquired for the same purpose, required as the site for the Newton Creek Water Pollution Control Plant Upgrade (Second Taking)* (Index No. 30021/97) (also available at http://www.courts.state.ny.us/Reporter/3dseries/2008/2008_50124.htm; visited on Jan 6, 2012).

[51] Indeed, sometimes investments by owners can *decrease* the compensable value. Assuming that Phil adds five more water tanks on his land. Then, among other adjustments, appraisals have to make download adjustment of the prices to deduct the demolition costs of the useless water tanks on the condemned property (see this at work in the *Newton Creek* case cited in note 50). That is, Phil's investments backfire!

compensation.[52] These investments generally affect only a small part of property value, limiting the extent of the overinvestment. The uncertain, probably less than one, ratio of compensation to investment will further cap the magnitude of overinvestment. Finally, it is costly to change the traits that can have substantial impact on compensable value. Lobbying for rezoning and building a condominium on a vacant parcel are two cases in point. Owners' risk aversion or loss aversion may reduce their level of (over-) investing.

In sum, I argue that owners' investments are largely independent of the compensable value of their property under the fair market value compensation standard. Immovable traits of the properties determine most of the compensable value, and they cannot be altered through investments. Because there is some leeway for owners to influence the compensable value of their properties, they have incentives to overinvest. Overall speaking, however, in practice the leeway should be fairly limited, so that owners' level of investment should be very close to optimality. Granted, ultimately the magnitude of overinvestment under the fair market value standard is an empirical question. However, the contribution of this Article is to point out that the current value standard and the fair market value standard are different, and that overinvestment under the latter is much more unlikely.

My claim that fair market value compensation payment is generally lump-sum will remain intact if hedonic regression models,[53] developed by real estate economists, are used to assess fair market value of properties. Hedonic regression models are an enlarged and more scientific version of the comparable sale approach, as the former considers many more properties and many more property characteristics than the latter. The property characteristics considered in hedonic regression models, such as building class, corner location, lot shape, and so forth, are also mostly immovable.[54] Thus,

[52] Other types of investments will be made efficiently, because the ratio is zero (or put differently, the payment is lump-sum).

[53] "At its simplest, a hedonic equation is a regression of expenditures (rents or values) on housing characteristics. The independent variables represent the individual characteristics of the dwelling, and the regression coefficients may be transferred into estimates of the implicit prices of these characteristics" Stephen Malpezzi, *Hedonic Pricing Models: A Selected and Applied Review*, in Anthony O'Sullivan and Kenneth Gibb, eds, *Housing Economics and Public Policy* 67, 68 (Blackwell 2002).

[54] See, for example, Michael H. Schill, Ioan Voicu, and Jonathan Miller, *The Condominium versus Cooperative Puzzle: An Empirical Analysis of Housing in New York City*, 36 J Legal Stud 275 (2007); Vicki Been and Ioan Voicu, *The Effect of Community Gardens on Neighboring Property Values,* 36 Real Estate Econ 241 (2008); Ingrid Gould Ellen, et al, *The Impact of Business Improvement Districts on Property Values: Evidence from New York City*, in Gary Burtless and Janet Rothenberg Pack,

the above analysis of the comparable sale approach can generally be applied to the hedonic regression models as well.[55]

The anonymous referee of this journal suggests that fair market value is measured by "the property's highest and best use, minus the costs of developing it into its highest and best use." Indeed, development costs are factored into the assessment of fair market value. But note that appraisals are generally not a two-stage process of assessment and then deduction.[56] Again, I use the hypothetical story about Phil as an example. Phil's land is vacant and zoned for condominium use. The appraisers are likely to choose as comparable properties vacant parcels that are zoned for, and after sales developed into, condominiums. The sale price of the comparable vacant parcels will reflect their undeveloped nature, and through lack of adjustment in this respect, the compensation awarded to Phil will reflect that the condemned property is currently a vacant parcel but could be developed into a condominium. The development costs are thus taken into consideration indirectly.

2. Overinvestment to Avoid Takings? Assuming that the probability of takings is a function of investments, and fair market value compensation is perfectly lump-sum, according to Miceli's model, owners will overinvest to avoid takings if the amount of compensation they receive is less than "the property value if the property has been optimally invested." Miceli recognizes that it is a demanding task for the court to ascertain this value,[57] which is determined by a number of factors, including the initial probability of takings.

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ed, *Brookings Wharton Papers on Urban Affairs* 1 (2007); Yun-chien Chang, *An Empirical Study of Compensation Paid in Eminent Domain Settlements: New York City 1990–2002*, 39 J Legal Stud 201 (2010); Yun-chien Chang, *An Empirical Study of Court-Adjudicated Takings Compensation in New York City: 1990–2003*, 8 J Empirical Legal Stud 384 (2011).

[55] Note that if the coefficients of the hedonic regression models are known to owners, they will know whether and to what extent their investments will change the compensable value. This will not happen in the comparable sale approach used by appraisers, which is often considered more art than science.

[56] The literature cited in note 45 and the court cases cited in note 50 do not present the fair market value this way. Nor do the appraisal textbooks and handbooks I have consulted (cited in notes 47 and 49) formulate fair market value as a two-stage process. *Nichols on Eminent Domain* contains comprehensive collections of state laws and federal laws on takings issues. Although it does detail how a condemned property is appraised in practice, I at least cannot find any cited cases or statutes that formulate fair market value in the way the referee has put it. See Julius L. Sackman, 4 *Nichol's on Eminent Domain* §12-50–§12-72 (Matthew Bender 3d ed 2009).

[57] See Miceli, 147 J Institutional & Theoretical Econ at 359 (cited in note 19).

I would propose that the fair market value, particularly when assessed by hedonic regression models, is a good proxy for this optimal property value. For most properties, the probability of condemnation is close to zero. Thus, owners of sold properties who regard the probability of takings as zero and make their investment decisions accordingly will be investing at an approximately efficient level.[58] Hedonic regression models (and, to a lesser extent, comparable sale methods) use many of these approximately optimally invested properties and their sale prices to assess the value of the condemned properties. The estimated value, therefore, probably also approximate "the value of the condemned property if it has been optimally invested." At least, owners have no reasons to expect that their property value estimated by hedonic regression models will be lower than this optimal property value. Consequently, owners will not have incentives to overinvest to avoid takings.[59]

Owners may even have incentives to *under*invest to *invite* takings. If the initial probabilities of takings for the eventually condemned properties are higher than those for sold properties, the optimal investment level should be lower in the former, leading to lower property value. That is, the fair market value of the condemned properties estimated by hedonic regression models would tend to be higher than the value of the condemned property if it has been optimally invested. In Miceli's model, this leads to underinvesting to invite takings.[60] Nevertheless, Miceli implicitly assumes that subjective value is zero. When subjective value is positive, owners will underinvest to invite takings only if the subjective value is lower than "the estimated property value minus the property value at its social optimum." It is unclear how often this will be the case.

3. Underinvestment to Reduce Losses. Based on the discussions in Section II.B.3, risk-neutral owners will not underinvest to reduce losses. Given that subjective value will not be changed by pecuni-

[58] Their tiny incentives to overinvest will be capped by the fact that their investment can hardly influence compensable value under the fair market value compensation standard.

[59] Owners' subjective value will not be compensated under the fair market value standard. Nevertheless, as long as subjective value cannot, or need not, increase because of owner's investment, owners will not have incentives to (over-)invest in creating subjective value. Moreover, if condemnors are not benevolent (or benevolent but without information about subjective value), they will not take into account the magnitude of subjective value in making condemnation decisions. Owners then have no reason to manipulate the amount of subjective value, because it is independent of the probability of takings.

[60] See Miceli, 147 J Institutional & Theoretical Econ at 358 (cited in note 19).

ary investments, risk-averse owners will hardly underinvest under the fair market value standard, because even if their properties are condemned, owners receive approximately "full" compensation for their nonsubjective value. With little risk, owners will hardly be deterred from investing.

4. Rent-Seeking. The fair market value standard does not compensate owners' subjective value. Thus, when eminent domain is imminent, owners could still take political actions to prevent condemnation from happening. This possibility is the major inefficient aspect of the fair market value standard.

D. Economic Value Standard

Under the economic value compensation standard, owners are likely to invest efficiently. As I discuss below, under most, if not all, schemes, economic value compensation would require self-reporting by property owners. If owners report economic value ex ante,[61] subsequent investment will not alter the reported value. If they report ex post,[62] they can name the same (or higher) price with or without the strategic investment. Put differently, owners do not have to inflate (deflate) their economic value by actually overinvesting (underinvesting). Investments are independent of the takings compensation awarded, and thus independent of the probability of takings. Accordingly, if economic value is self-reported,[63] owners neither overinvest to avoid takings nor underinvest to reduce losses,[64] and owners take into account the probability of takings when making investments. Moreover, because the economic value standard fully compensates condemnees, owners have very few incentives to take political actions. They will do so only if the cost of political actions is lower than the increased compensation. Effective political actions are often costly, and under economic-value-assessing mechanisms, owners can often inexpensively acquire more compensation through inflating their economic value. Hence, rent-seeking political actions are usually the secondary, unused option.

[61] See Section IV.C.

[62] See Section IV.D.

[63] If the economic value is calculated by adding bonuses to the assessed fair market value, compensation is still largely affected by owners' investment, because fair market value is essentially a lump-sum payment.

[64] Miceli's model is not applicable to the economic value standard, because the property value here is not a function of investment, which is one of the basic setups in Miceli's model. See Miceli, 147 J Institutional & Theoretical Econ at 355 (cited in note 19).

E. Zero Compensation Standard

As elaborated above, under the zero compensation standard, owners will not overinvest because they ignore the chance of takings[65] and will not underinvest to reduce losses in takings unless owners are risk-averse. If the probability of takings is a function of investments by owners, because zero compensation is lump-sum and zero is certainly below the property value if the property has been efficiently invested, owners will overinvest to avoid takings.[66] Moreover, the resource that owners put in political actions will be the most among the four forms of compensation, because owners stand to lose the whole value of their properties in condemnation.

In sum, the most important contribution in this section is pointing out that under current United States law, owners will invest approximately at the efficient level. This makes the fair market value standard superior to the current value standard. There are more socially wasteful rent-seeking political actions under the zero compensation standard than under the fair market value standard, as owners suffer greater losses under the former. Compared with economic value compensation, which induces few, if any, rent-seeking political actions and induces owners to invest efficiently, fair market value compensation still incurs more social costs in rent-seeking. It is therefore obvious that, as far as condemnees' incentives are concerned, economic value compensation is the most efficient. We cannot, however, simply conclude that economic value compensation is most efficient, all things considered. Three other factors must also be examined: condemnors' incentives, assessment costs, and assessment accuracy. The next section starts with condemnors' incentives. To make my analysis more focused, I discuss below only the two forms of compensation that come out ahead after the analysis in this section: economic value compensation and fair market value compensation.

III. CONDEMNORS' INCENTIVES

Condemnors are usually assumed to be government officials. The literature proposes three widely different theories about these officials' incentives: the benevolent theory, the fiscal illusion theory, and the political interest theory. After examining each of these, however, I conclude that the key to determining the effects of a compensation standard on condemnors lies in the behavior of developers. Developers will have clear incentives to lobby government officials

[65] See Blume, Rubinfeld, and Shapiro, 99 Q J Econ at 71 (cited in note 9).
[66] See Miceli, 147 J Institutional & Theoretical Econ at 354 (cited in note 19).

to condemn properties if less than full compensation is required. Thus, full compensation will be most efficient.

A. Benevolent Theory

The benevolent theory assumes that government officials aim to maximize social welfare.[67] In Fischel and Shapiro's phrase, this theory suggests a "Pigovian model of government" that has been relied on by several important articles.[68] According to this theory, we do not have to worry about how the choice of takings compensation standard affects government officials' behaviors. No matter how much compensation is mandated, government officials will always take into account all relevant social benefits and costs, including the value of the condemned properties, when making condemnation decisions. This theory, therefore, focuses on the effects of compensation standard on condemnees.

The obvious problem for the benevolent theory is that we do not live in an ideal world in which government officials are omniscient saints. There is no reason to believe that while condemnees are all self-interested, condemnors are all public-spirited. This theory perhaps is an interesting starting point for discussion, but it is important to proceed to more realistic models of government official behavior.

B. Fiscal Illusion Theory

Another popular model[69] of government official behavior is the fiscal illusion theory. The fiscal illusion theory posits that government

[67] See Fischel and Shapiro, 17 J Legal Stud at 276 (cited in note 21); Fischel and Shapiro, 9 Intl Rev L & Econ at 120 (cited in note 13); Benjamin E. Hermalin, *An Economic Analysis of Takings*, 11 J L Econ & Org 64, 69 (1995).

[68] See Fischel and Shapiro, 17 J Legal Stud at 285 (cited in note 21) (observing that Blume, Rubinfeld, and Shapiro; Blume and Rubinfeld; Kaplow; and others have adopted this position). But compare Fischel and Shapiro, 9 Intl Rev L & Econ at 121 (cited in note 13) (arguing that the assumption of Blume, Rubinfeld, and Shapiro is not a Pigovian government; instead, they assume an "inexorable government").

[69] See William A. Fischel, *Takings and Public Choice: The Persuasion of Price,* in Charles Rowley, ed, 2 *The Encyclopedia of Public Choice* 549 (2002) (using *Lucas v South Carolina Coastal Council* to support this theory); Hanoch Dagan, *Just Compensation, Incentives, and Social Meanings*, 99 Mich L Rev 134, 138 (2000) (endorsing the theory); Serkin, *Meaning of Value* at 705–08 (cited in note 45) (endorsing the theory but arguing that takings jurisprudence has goals other than cost internalization); Dana and Merrill, *Property: Takings* at 41–46 (cited in note 2) (arguing that the fiscal illusion theory is "almost certainly correct"); Thomas W. Merrill, *Incomplete Compensation for Takings*, 11 NYU Envtl L J 110, 131–32 (2002); Paul Niemann and Perry Shapiro, *Compensation for Taking When Both Equity and Efficiency Matter,* in Bruce L. Benson, ed, *Property Rights: Eminent Domain and Regulatory Takings Re-examined* 55, 58 (Palgrave 2010) (using this theory as the assumption their model).

officials are trying to minimize takings compensation.[70] The choice of takings compensation standard is critical to the efficiency of the takings system, because the required amount of compensation is the only money that the condemnor will award; that is, it is the only social costs that the condemnor will internalize. Hence, as far as condemnors' incentives are concerned, full compensation is the most efficient, because full compensation forces condemnors to take into account all social costs of the takings. In contrast, less than full compensation forces condemnors to internalize only part of the social costs.

The fiscal illusion theory has the advantage of being easy to model mathematically because condemnors and condemnees make decisions using the same measure—the monetary value of condemned properties. Nevertheless, I doubt that the fiscal illusion theory is the best characterization of government officials' behavior. The theory itself has been heavily criticized for making incorrect assumptions on what government officials maximize,[71] and a previous paper of mine has shown that the theory is not borne out by empirical evidence.[72] Life would be much easier if government officials were so single-minded in minimizing takings compensation, but I believe that the next theory is more accurate.

C. Political Interest Theory

The political interest theory argues that government officials make decisions according to their own calculus of personal political costs

[70] See the interpretation of this theory in Chang, 6 J Empirical Legal Stud at 562–63 (cited in note 43).

[71] See, for example, Vicki L. Been, *Lucas v The Green Machine: Using the Takings Clause to Promote More Efficient Regulation?*, in Gerald Korngold and Andrew P. Morris, eds, *Property Stories* 221, 248–49 (Foundation 2004) (arguing that the assumption of governments' maximizing monetary profits is unlikely to be accurate); Vicki Been and Joel C. Beauvais, *The Global Fifth Amendment? NAFTA's Investment Projections and the Misguided Quest for an International "Regulatory Takings" Doctrine*, 78 NYU L Rev 30, 88–100 (2003); Kaplow, 99 Harv L Rev at 567–70 (cited in note 13); Carol M. Rose, *What Federalism Tells Us about Takings Jurisprudence*, 54 UCLA L Rev 1681, 1690–92 (2006) (linking the discussions of federalism with the demerits of fiscal illusion theory); Farber, 12 Intl Rev L & Econ at 130 (cited in note 26); Note, *Taking Back Takings: A Coasean Approach to Regulation*, 106 Harv L Rev 914, 923–25 (1992) (arguing that takings compensation is not the only way to force cost internalization in a Coasean world where marketable police power servitude is sold); Daryl J Levinson, *Empire-Building Government in Constitutional Law*, 118 Harv L Rev 915, 916, 969 (2005).

[72] See Chang, 6 J Empirical Legal Stud at 541, 563–65 (cited in note 43).

and benefits.[73] While fiscal illusion theorists believe that full compensation can induce government officials to condemn efficiently, political interest theorists are far less optimistic. According to this theory, government officials think in political, not monetary, terms. In addition, because government officials do not internalize the monetary costs of paying compensation, requiring full compensation will not necessarily induce efficient condemnation decisions.[74] Under a full compensation regime, few if any owners will protest the condemnation of their own properties. Government officials will therefore be free to condemn properties efficiently or inefficiently to maximize their own political capital.[75] For instance, if the amount of full compensation for a property is $900 and the social benefit is $750, government officials will still decide to condemn if doing so best increases their political capital.[76]

For the political interest theory, therefore, a takings compensation standard is a blunt and imperfect tool if the aim is to induce government officials to condemn efficiently. Political calculus seldom overlaps with efficiency calculus. A better approach, in theory, would be to require government officials to perform cost-benefit analyses before they propose condemnations, only allowing takings when benefits surpass costs. This regulatory overview approach further demonstrates the uselessness of compensation standards in producing the right takings incentives for government officials.

That being said, full compensation is still superior. Some government officials may be able to utilize their takings power corruptly; that is, threating to condemn properties owned by people without political clout, in order to garner their bribery. Economic value compensation reduces this perverse incentive to the minimum.[77]

[73] See Levinson, *Empire-Building Government* at 915 (cited in note 71); Levinson, *Making Government Pay* at 345 (cited in note 41); Nicholas Bagley and Richard L. Revesz, *Centralized Oversight of the Regulatory State*, 106 Colum L Rev 1260, 1293–94 (2006).

[74] See Wyman, *Measure of Just Compensation* at 259 (cited in note15). Compare Susan Rose-Ackerman, *Against Ad Hocery: A Comment on Michelman*, 88 Colum L Rev 1697, 1706 (1988) (arguing that compensation requirement may have little impact on government officials).

[75] Kaplow has suggested that requiring compensation leads to more condemnation. See Kaplow, *Transition Policy* at 194 (cited in note 11).

[76] Note that the political capital does not have to surpass $900 or $150 (= $900 – $750). What government officials care about is "political opportunity costs"—simply put, whether using the $900 budget elsewhere can earn government officials more political interest.

[77] See Bell and Parchomovsky, 96 Va L Rev at 1693 (cited in note 6).

Government officials are not the only parties involved on the condemnors' side. As *Kelo v City of New London*[78] and *Poletown Neighborhood Council v City of Detroit*[79] show, private developers or private corporations are often important partners in takings,[80] especially when economic (re)development projects are at issue.[81] Often the government first condemns the properties, compensates the condemnees, and then resells the properties to the developers. Because there is no necessary connection between the amount of takings compensation that the government pays and what the government charges to developers,[82] no takings compensation standard can guarantee efficient takings.

Nevertheless, awarding economic value as compensation, as compared to giving fair market value as compensation, is more likely to reduce inefficient takings. There are many examples of governments selling condemned properties to developers for large discounts as an inducement to develop (and probably a quid pro quo for past and future political contribution). Large discounts, combined with a requirement that mandates less than full compensation, insulate developers from condemnation's social costs, giving developers strongest incentives to bypass voluntary transactions and ask that the government condemn properties instead.[83] Requiring full, rather than incomplete, compensation could lead to one of two possible outcomes, either of which would reduce inefficient takings. First, assuming that the discount that the government can offer developers is stable, full compensation narrows the gap between developers' private costs (the amount they pay the government) and social costs. Second, even if the discount rate is flexible, it will be politically capped to some extent. It is reasonable to surmise that as the discount rate offered to developers rises, politicians will stand a greater chance of being accused of corruption by their opponents

[78] 545 US 469 (2005).

[79] 304 NW2d 455 (Mich 1981).

[80] On the other hand, developers are much less frequently involved when the government condemns properties for constructing roads, municipal buildings, and the like.

[81] About rent-seeking activities by interest groups in economic development takings, see Ilya Somin, *Controlling the Grasping Hand: Economic Development Takings after Kelo*, 15 S Ct Econ Rev 183, 201–03 (2007).

[82] I thank Chris Serkin for pointing this out.

[83] This phenomenon is similar to what Thomas Merrill called "secondary rent-seeking." Merrill used this term to describe developers' incentives to acquire the legislative grant of the eminent domain power when the surplus of eminent domain power is not awarded to condemnees. See Thomas W. Merrill, *The Economics of Public Use*, 72 Cornell L Rev 61, 85–88 (1986). Heller and Hills expands the use of the term to describe the rent-seeking activities when landowners' "true loss" is not compensated. See Heller and Hills, 121 Harv L Rev at 1482 (cited in note 3).

or the press. And the discount rate for the same charge to developers is inversely related to the amount of required compensation.[84] Full compensation, rather than less than full compensation, in this scenario will be better able to expose nepotism or corruption and reduce the number of inefficient condemnation. In sum, economic value compensation, as compared to fair market value compensation, is less likely to induce inefficient takings initiated by developers,[85] and thus should be preferred.

So far, I have examined the effects of physical takings compensation on condemnors' and condemnees' incentives. Both parts of the analysis lead to the conclusion that economic value compensation is more efficient than less than economic value compensation. It would be hasty, however, to dub economic value compensation as the most efficient standard before examining assessment costs and assessment accuracy, two considerations that have been alluded to from time to time but never analyzed systematically in the literature.

IV. ASSESSMENT COSTS AND ASSESSMENT ACCURACY

So far, economic value compensation is the leading candidate for the most efficient compensation standard, but it still has to pass two more tests: assessment accuracy and assessment costs. The first section provides the basic ideas of these two concepts. The second section proposes a new framework of assessment methods for systematically analyzing assessment costs and assessment accuracy. The ensuing four sections first investigate whether economic value can be assessed accurately and inexpensively, and then examine whether fair market value, another candidate for the most efficient takings compensation standard, can be assessed accurately and inexpensively.

A. Definition, Importance, Relation

Assessment accuracy is defined as how close the assessed compensation is to the compensation standard.[86] Most previous articles

[84] For example, if the government plans to charge a developer $80 for the condemned land, then compensating condemnees $100 for fair market value means a 20 percent discount for the developer, while compensating condemnees an economic value of $160 represents a 50 percent discount for the developer.

[85] Note that the developers' expenses of lobbying toward inefficient takings are themselves a deadweight loss.

[86] For a general discussion of the desirability of accuracy in legal adjudication, See Louis Kaplow, *The Value of Accuracy in Adjudication: An Economic Analysis*, 23 J Legal Stud 307 (1994). Richard Epstein also argues, "[s]etting cash compensation correctly, moreover, is critical to the sound functioning of our condemnation system."

focused on the effects of the compensation standard itself on the incentives of condemnors and condemnees, on the implicit assumption that assessments of property value are always accurate.[87] Under the rubric of assessment accuracy, I discuss the incentives of condemnors and condemnees when assessments are inaccurate (that is, actual compensations deviate from the compensation standard).[88] Simply put, inaccurately low compensation creates or aggravates the incentives for developers and owners that an accurate less than full compensation standard would have produced. Furthermore, inaccurate assessments create a new problem that has not been discussed so far—overcompensation. When assessed property value is higher than economic value, it is arguably overcompensation.[89] Expecting overcompensation, owners will welcome takings, even lobby for them.[90] Their political efforts are wasted from a social standpoint. Moreover, overcompensation could even affect incentives of third parties. Unduly high compensations will eventually incur higher taxes (than accurate compensation will do) to defray

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Richard Epstein, *Supreme Neglect: How to Revive Constitutional Protection for Private Property* 89 (Oxford 2008).

[87] Some commentators have noted the inaccuracy in assessing takings compensation, but they do not analyze this issue systematically. See, for example, Daniel B. Kelly, *Acquiring Land through Eminent Domain: Justifications, Limitations, and Alternatives*, in K. Ayotte and H.E. Smith, eds, *Research Handbook on the Economics of Property Law* 344, 353 (Elgar 2011); Guido Calabresi and A. Douglas Melamed, *Property Rules, Liability Rules, and Inalienability: One View of the Cathedral*, 85 Harv L Rev 1089, 1108 (1972); Wyman, *Measure of Just Compensation* at 265–66 (cited in note15); Blume and Rubinfeld, 72 Cal L Rev at 619–20 (cited in note 4); Merrill, *Economics of Public Use* at 84 (cited in note 83).

[88] Thus, one can argue that there are just *three* major concerns in determining an efficient compensation standard, with assessment accuracy as a particular concern with respect to property owners' or government officials' incentives. This is a fair point. I highlight the effects of assessment accuracy for two reasons. First, conceptually the incentives incurred by the compensation standard itself and by the variance of compensation assessment are distinguishable. Second, the accuracy of takings compensation assessment has not gained the attention due, and thus it should be stressed in the analysis, at least for now.

[89] Some scholars have proposed sharing with condemnees the social benefits of the project that requires the condemnation. See, for example, Krier and Serkin, 2004 Mich St L Rev at 871 (cited in note 4). For discussions of this alternative, See also Dana and Merrill, *Property: Takings* at 172–73 (cited in note 2). To the extent that such "gain-based compensation" surpasses the owners' economic value, it is "overcompensation" in the sense that owners then may have incentives to lobby for condemnation, instead of feeling indifferent to, or disliking, condemnation.

[90] See Bell and Parchomovsky, 96 Va L Rev at 1706 (cited in note 6).

the compensation expenses—and such taxes would distort people's incentives to work.[91]

Assessment costs,[92] the resources expended in calculating the amount of takings compensation, include costs of employing professional appraisers to assess properties, costs of processing the self-assessments of landowners, and costs of maintaining and monitoring the government employees in charge of property value assessment. Assessment costs are critical for a fairly obvious reason: resources are limited. Money saved from assessing property value (an activity in ascertaining elusive, man-made information) can be used more productively elsewhere (such as producing more or better food for the poor). Economic value is subjective; verifying it could consume a lot of resources. Therefore, if economic value is difficult to appraise accurately or assess in cheaply enough, some other types of compensation standard, based on a more objective criterion such as fair market value, could be more desirable.

Assessment accuracy positively correlates with assessment costs.[93] Given an assessment method, only by spending more on assessments can more accurate assessments be produced.[94] Nevertheless, some assessment methods can achieve higher accuracy with lower costs

[91] See N. Gregory Mankiw, *Principles of Microeconomics* 168–69, 250–51 (Thompson 2001); Miceli and Segerson, *Compensation for Regulatory Takings* at 218 (cited in note 7). Raising funds through taxation also incurs a positive social cost. Steven Shavell, *Eminent Domain versus Government Purchase of Land Given Imperfect Information about Owners' Valuations*, 53 J Law & Econ 1, 2 (2010).

[92] Some papers discuss assessment costs, but only in passing. See, for example, Douglas Ayer, *Allocating the Costs of Determining "Just Compensation,"* 21 Stan L Rev 693, 698 (1969) (discussing the issue of assessment costs; calling such costs "determination costs"); Frank Michelman, *Property, Utility, and Fairness: Comments on the Ethical Foundation of "Just Compensation" Law*, 80 Harv L Rev 1165, 1214–18 (1969) (discussing "settlement costs"); Blume and Rubinfeld, 72 Cal L Rev at 582–83 (cited in note 4); Kaplow, 99 Harv L Rev at 545–48, 560 (cited in note 13); Heller and Hills, 121 Harv L Rev at 1479 (cited in note 3); Richard A. Epstein, *The Supreme Court, 1987 Term—Foreword: Unconstitutional Conditions, State Power, and the Limits of Consent*, 102 Harv L Rev 4, 62 n167 (1988); Daniel B. Kelly, *The "Public Use" Requirement in Eminent Domain Law: A Rationale Based on Secret Purchases and Private Influence*, 92 Cornell L Rev 1, 25–26 (2006).

[93] Daniel B. Kelly, *Acquiring Land through Eminent Domain* at 353 (cited in note 87).

The relationship between assessment costs and assessment accuracy should not be linear. The marginal increase in accuracy is large when resources start to be spent on assessment. The marginal returns of assessment costs will eventually decrease sharply.

[94] In his seminal paper on accuracy in adjudication, Kaplow assumes that "more accuracy can be obtained only at a higher cost." Kaplow, *Value of Accuracy* at 307 (cited in note 86). See also Bell and Parchomovsky, 59 Stan L Rev at 874 (cited in note 3).

than others can. Because assessment accuracy and assessment costs are both necessary factors in determining the most efficient form of compensation, higher accuracy is not always more preferable to lower accuracy, if the cost of achieving the former is substantially higher than that of achieving the latter. In other words, 100 percent accuracy, even if attainable, is not necessarily the optimal level of accuracy.

B. Assessment Methods: A New Framework[95]

The choice of assessment methods influences assessment accuracy and assessment costs. An assessment method is the set of procedures governing how a property value is assigned for takings compensation purposes. Most articles on takings implicitly assume that the government should perform the assessment.[96] A few papers dispute the standard assumption, arguing that condemnees should assess property value for their takings compensation.[97] Nevertheless, the government-condemnee dichotomy neglects another layer of this issue—*when* property value should be assessed for takings compensation. I thus propose a new framework of four prototypical assessment methods based on who assesses property value for takings compensation purposes and at what time.

1. Landowners versus Non-landowners. Assessments can be done either by landowners or by non-landowners such as a condemnor agency, a professional appraiser, a court, or a jury. Assessments by landowners and non-landowners are different in two important ways. First, landowners and non-landowners have different information. Economic value is subjective and only landowners have direct information about it.[98] On the other hand, fair market value is relatively objective, and usually non-landowners have better knowledge and economy of scale in assessing it. For this practical reason, below I assume that only ex post and ex ante the two methods of assessment by landowner will be used to assess economic value, and only ex post and ex ante the two methods of assessment by non-landowner will be used to assess fair market value. Nevertheless, readers should be aware that theoretically all assessment methods could be used to as-

[95] For a detailed account of the framework, See Yun-chien Chang, *Takings Compensation: Theoretical Framework and Empirical Studies* (Elgar 2013).

[96] See, for example, Miceli and Segerson, *Takings* at 328 (cited in note 3).

[97] See Saul Levmore, *Self-Assessed Valuation Systems for Tort and Other Law*, 68 Va L Rev 771 (1982); Bell and Parchomovsky, 59 Stan L Rev at 871 (cited in note 3).

[98] See Heller and Hills, 121 Harv L Rev at 1471 (cited in note 3).

sess economic value or fair market value. I omit some possibilities because they are intuitively costly and inaccurate.

Second, landowners and non-landowners have different incentives. Landowners' self-interest will cause them to exaggerate their assessments for compensation as much as possible.[99] By contrast, non-landowners do not necessarily underassess or overassess.[100] Part of the reason is that non-landowners are not homogenous. Non-landowners could be a condemnor agency, the finance department (in charge of local property tax assessments), a professional appraiser, a court, or a jury. A judge and a jury (member) may very well have different incentives. Furthermore, some non-landowners, for instance a condemnor agency, are not homogenous entities, either. The career-service government employees and the politically appointed agency head may have different goals in mind. All non-landowners, however, do have one thing in common—they determine the amount of compensation but they do not pay it personally.

2. Ex Ante versus Ex Post. Whoever assesses either can perform the assessment ex ante or ex post; that is, before or after the decisions to condemn properties are made. Ex ante assessments and ex post assessments should be distinguished for two major reasons. First, ex post assessments could be more accurate because there is more information. Compensation laws usually indemnify landowners for the property value at the time of condemnation. Market value fluctuates from time to time, so the nearer the assessment date is to the condemnation date, all other things being equal, the more accurate the assessment is. Because ex post assessments are typically closer to the date of condemnation, they tend to be more accurate. Moreover, after the date of condemnation (ex post assessments could be done after properties are condemned[101]), assessing a market value of a land parcel is no longer predicting future market value but verifying past market value—the latter is more accurate.[102]

Economic value also changes over time; therefore, the analysis above also applies—the nearer the assessment date is to the condemnation date, the more accurate the estimation of future economic

[99] See Kelly, *"Public Use" Requirement* at 26 (cited in note 92).

[100] In this Article, under- or overassessment means below or above market value (when the government assesses) or economic value (when owners assess).

[101] Indeed, ex post assessments are frequently done after land parcels are condemned. In New York City, for example, takings compensations are usually determined in post-condemnation settlements or court proceedings. See a detailed account of New York City condemnation laws in Chang, 39 J Legal Stud at 210–12 (cited in note 54).

[102] Note that accurate assessments are not necessarily lower or higher than inaccurate ones.

value becomes. When ex post assessments are conducted after the time of condemnation, an appraisal of property value is verification of a past economic value, which is more accurate than an ex ante forecast of future economic value.

Second, assessors' incentives are different. Ex ante assessments could be more disinterested than ex post assessments owing to different incentives provided by legal mechanisms. Ex ante assessments are made when condemnation plans are not certain, or when there is no specific condemnation plan at all,[103] whereas ex post assessments are done after specific land parcels are targeted to be condemned or have been condemned.

Many legal mechanisms are available ex ante to make assessors more disinterested or to make them assess more accurately. Ex ante assessments could be audited or used to tax self-assessors, to name two. However, there is hardly any effective incentive scheme to affect ex post assessments, for ex post assessors are rather sure about the costs and benefits of overassessment and underassessment, because they are soon to either condemn the land or have their land condemned.

3. Proponents and Implementing Jurisdictions. The four prototypes of assessment methods are ex ante assessment by landowners, ex ante assessment by non-landowners, ex post assessment by landowners, and ex post assessment by non-landowners. Table 1 exhibits the typology and lists in the cells scholars that have proposed the method and jurisdictions that have implemented it.

Most (if not all) American states adopt ex post assessment by non-landowners. When a government plans to condemn specific properties, it commissions professional appraisers to assess them. Contemporary Taiwanese laws adopt ex ante assessment by non-landowners. Every year, local governments in Taiwan assign each land parcel an official assessment of its value. That land value is then used both to tax the land and to establish the compensations due for condemnations.

Saul Levmore proposed the ex ante assessment by landowner method, under which landowners periodically report their assessments on their land and are both taxed and (if condemnation occurs) compensated accordingly. Abraham Bell and Gideon Parchomovsky advocated a revised method of ex post assessment by landowners. [104]

[103] I do *not* claim that assessors know nothing about the possible condemnation or that assessors assume the probability of condemnation to be zero.

[104] See Levmore, *Self-Assessed Valuation* at 778–79 (cited in note 97); Bell and Parchomovsky, 59 Stan L Rev at 875 (cited in note 3).

Table 1. Typology of Assessment Method and Its Proponents and Adopters

Timing of Assessment	Identity of Assessor: Landowners	Identity of Assessor: Non-landowners (Government or other)
Ex ante	Harberger (1965); Tideman (1969); Levmore (1982); Niou and Tan (1994); Bell and Parchomovsky (2005); Plassmann and Tideman (2008). New York City 1658; New Zealand 1891–96; Taiwan 1954–77; Columbia 1954, 1963	Taiwan 1977 to date
Ex post	Lehavi and Licht (2007); Heller and Hills (2008); Plassmann and Tideman (2011); Grossman, Pincus, and Shapiro (2012); Bell and Parchomovsky (2007)	U.S.; Levmore (1982); Tideman (1990).

In their design, when the government needs land, it asks landowners to report assessments and then decides whether to condemn the land or to leave the titles in landowners' hands and tax them according to the self-reported value.

In the following sections, I evaluate the assessment costs and assessment accuracy of these four prototypical assessment methods. Since economic value is the leading candidate for the most efficient compensation standard, I look into the methods that can be used to assess economic value first; namely, the two assessment-by-landowner methods. Because I find that none can simultaneously be practical and attaining 100 percent accurate assessments at low costs (contrary to the claims by scholars), I further examine the other two methods that are better suited to assess fair market value. I find that, however, they cannot live up to the expectation, either. In the next section, I will sum up all the analyses and propose the most efficient compensation standards.

C. Ex Ante Assessment by Landowners

Ex ante assessment by landowners is not a brand new proposal. It has been implemented in New York City in 1658 (then called New Amsterdam, governed by the Dutch),[105] New Zealand between 1891

[105] In addition to New York City, Plassmann and Tideman also asserts that India, Korea, and Spain have implemented such a method, but they do not provide any

and 1896,[106] Taiwan between 1954 and 1977,[107] and Colombia in 1954 and 1963.[108] In the modern United States, the idea seems to have originated with a University of Chicago economist, Arnold C. Harberger, in a conference in Chile in 1962.[109] Niou and Tan's economic models formalize and then revise the "self-assessment"[110] mechanism proposed by Dr. Sun Yat-sen in the 1920s.[111] Economist T. Nicolaus Tideman has contributed to the discussions of self-assessments through papers published in 1969,[112] 1990,[113] and 2008.[114] In legal academia, Saul Levmore first proposed it in a seminal article in 1982,[115] and that paper has attracted discussions and refinements in recent years.[116] Elsewhere, I have provided a detailed account of why these aforementioned self-assessment models are not always able to produce accurate assessment of property value for takings compensation purposes and why these models are more costly than their proponents have claimed.[117]

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citation to the source. See Florenz Plassmann and T. Nicolaus Tideman, *Accurate Valuation in the Absence of Markets*, 36 Pub Fin Rev 334, 355 n1 (2008). Posner lists Ancient Greeks as adopting this method in his law and economics textbook. See Richard A. Posner, *Economic Analysis of Law* 64–65 (Aspen 5th ed 1998).

[106] See Richard Bird, *Put Up or ShutUp: Self-assessment and Asymmetric Information*, 3 J Pol Analysis Mgmt 618, 619 (1986); Peter F. Colwell, *Privatization of Assessment, Zoning, and Eminent Domain*, 4 ORER Letter 1, 2 (1990), available at http://www.business.uiuc.edu/orer/V4–2–1.pdf.

[107] See Yun-chien Chang, *Self-Assessment of Takings Compensation: An Empirical Study*, 28 J L Econ & Org 265 (2012). Note that other papers have documented Taiwan's regime incorrectly.

[108] See Bird, 3 J Pol Analysis Mgmt at 619 (cited in note 106).

[109] See Arnold C. Harberger, *Issues of Tax Reform for Latin America*, in *Fiscal Policy for Economic Growth in Latin America* 119–20 (Johns Hopkins 1965).

[110] I use "assessment by landowners" and "self-assessment" interchangeably.

[111] Dr. Sun Yat-sen, the National Father of Taiwan, is also widely respected in China because he led the revolution against the Qing Dynasty in the beginning of the twentieth century. For a brief introduction of Dr. Sun's proposal, see Emerson M.S. Niou and Guofu Tan, *An Analysis of Dr. Sun Yat-sen's Self-Assessment Scheme for Land Taxation*, 78 Pub Choice 103, 104–05 (1994).

[112] See T. Nicolaus Tideman, *Three Approaches to Improving Urban Land Use* (May 22, 1969) (unpublished Ph.D. dissertation, University of Chicago) (on file with author).

[113] See T. Nicolaus Tideman, *Integrating Land-Value Taxation with the Internalization of Spatial Externalities*, 66 Land Econ 341 (1990).

[114] See Plassmann and Tideman, 36 Pub Fin Rev 334 (cited in note 105).

[115] See Levmore, 68 Va L Rev at 771(cited in note 97).

[116] See Lee Anne Fennell, *Revealing Options*, 118 Harv L Rev 1399 (2005); Bell and Parchomovsky, 59 Stan L Rev at 891–92 (cited in note 3). For general criticism of the self-assessment models, see Amnon Lehavi and Amir N. Licht, *Eminent Domain, Inc.*, 107 Colum L Rev 1704, 1730 (2007).

[117] See Chang, *Takings Compensation* (cited in note 95).

Sections IV.C.1 and IV.C.2 use a mathematical model of an ideal type of self-assessment method to demonstrate why theoretically and practically this method cannot induce owners to disclose their true economic value. Given the imperfection of such self-assessment methods, Section IV.C.3 discusses the possible results of implementing them in the real world.

1. Mathematical Model of an Ideal Type. In the ideal-type self-assessment method, a risk-neutral owner's economic value of her property is W. She periodically reports a self-assessment, X = W + Q. Q is the amount of over- or underassessment, or the deviation from true economic value. In each period, the owner pays property taxes, tX, once (t is the property tax rate); there is a probability, p, that the property will be condemned. Assume that condemnation probability p is determined regardless of self-assessments X. The wealth of the property owner is:[118]

$$
\begin{aligned}
f(X) &= (1 - p)(W - tX) + p(W - W + X - tX) \\
&= W - tX - pW + tpX + pX - ptX \\
&\text{[Substituting } X = W + Q\text{]} \\
&= W - pW - t(W+Q) + tp(W + Q) + p(W + Q) - pt(W + Q) \\
&= W - pW - tW - tQ + tpW + tpQ + pW + pQ - ptW - ptQ \\
&= W(1 - p - t + tp + p - tp) + Q (p + pt - t - pt) \\
&= W(1 - t) + Q(p - t)
\end{aligned}
$$

We can ignore W(1 – t) because as long as the property tax rate is not larger than 100 percent—a very fair assumption—W(1 – t) will be positive. If p > t, (p – t) > 0. The owner can increase wealth, f(X), by making Q > 0. Because X = W + Q, Q > 0 means X > W. That is, the self-assessment is higher than the economic value. Similarly, if p < t, (p – t)< 0. The owner can increase wealth, f(X), by making Q < 0, which means that the self-assessment is lower than the economic value. If p = t (I call it the parity condition), the owner cannot

[118] Mathematically, my model and Plassmann and Tideman's model are modeling similar things, though Plassmann and Tideman use calculus, and I do not. Besides, Plassmann and Tideman do not discuss the scenario when probability p is determined regardless of self-assessments X. In addition, tX in my model represents property taxes; in their model it is a specially designed tax (property taxes will be levied using the revealed economic value). The most important distinction between us is that the same mathematical results are hailed in their model as a strong reason to adopt self-assessment regimes, whereas I am pessimistic about the model's practicability. See their model in Plassmann and Tideman, 36 Pub Fin Rev at 345–47 (cited in note 105) and my critique of their model specifications and interpretations in Chang, *Takings Compensation* (cited in note 95).

increase wealth by over- or underassessing. That, however, does not imply that the owner will necessarily report Q = 0 (self-assessing accurately), because that does not do her any good either. The owner will be indifferent to the amount of Q.

Now I relax the assumption that X does not affect p, because self-assessed property value usually does influence condemnation probability. X and p negatively correlate. If honestly reporting W would get p > t, owners will report a positive Q, but not as high as possible. Higher Q means higher X meaning lower p. When Q is high to a certain point, p becomes smaller than t, which reduces wealth. Similarly, if honestly reporting W would get p < t, owners will report a negative Q, but not as low as possible,[119] because when X is too low, p becomes larger than t.

Most important, when X and p negatively correlate and honestly reporting W would get p = t (I call it the inverse condition[120]), the owner will then have incentives to report Q = 0. The reason is: if the owner reports Q > 0, p will reduce to become smaller than t. Consequently, Q(p – t) will be negative, meaning the total wealth of the owner dwindles. Similarly, if the owner reports Q < 0, p will increase and ultimately Q(p – t) will still be negative. Therefore, the owner will honestly disclose her economic value, because doing so maximizes her wealth.

Now I assume that owners are *risk-averse*.[121] If condemnation probability is independent of reported property value and p = t, risk-averse owners will have incentives to disclose honestly, because given the same expected wealth, reporting Q = 0 minimizes the risk (that is, the payoff with or without condemnation is the same, W – Wt). If the inverse condition holds, risk-averse owners still disclose honestly, because reporting Q = 0 not only minimizes risk but also maximizes expected wealth.

In sum, under the ideal type, when owners are risk-neutral, if condemnation probability is independent of reported property value, owners will not always be induced to disclose economic value honestly. If the inverse condition holds, owners will disclose economic

[119] In any case, Q cannot be lower than –W, because reported value, X, cannot be 0 or negative, since the real economic value, W, is unlikely to be nonpositive.

[120] Therefore, the inverse condition contains the parity condition, with the additional requirements that (a) condemnation probability negatively correlates with reported property value; and (b) the parity condition can hold only when owners honestly report economic value; that is, $p \neq t$ when owners do not reveal their real economic value.

[121] Risk-averse owners will "[always prefer] the least risky among baskets with the same expected value." Steven E. Landsburg, *Price Theory and Applications* 619 (South Western 4th ed 1999).

value honestly. When owners are risk-averse, owners will honestly disclose economic value as long as the parity condition holds.

2. Impossibility of Fulfilling Parity Condition and Inverse Condition. Though the conditions for accurate self-assessments are clear, they are impossible to achieve in the real world. First, the parity condition can only hold in a world where only stochastic condemnation is allowed (that is, condemnation for public use as we know it has to be banned). Second, the inverse condition can only hold if policymakers actually know each property owner's economic value; this obviously begs the question.[122] I explain them in turn.

Let me elucidate the first point with a hypothetical example. Suppose there are only two types of owners, Rich and Poor. Rich, Poor, and the government all know the given tax rate. The government wants to make Rich and Poor believe that their condemnation probabilities equal the tax rate, so that they will reveal their genuine economic value. Nevertheless, Rich knows that the probability of condemning her house for public use is fairly low, though it is difficult to estimate the exact probability, since condemnation for public use depends on a lot of uncertain factors, such as whether the city council will approve of the budget for condemnation in a certain year. The government knows it as well. Even if the government can somehow manage to persuade Rich that the probability of condemning for public use is actually, say, 0.5 percent, the government must randomly condemn properties owned by Rich to make up for the shortfalls between the 0.5 percent condemnation probability and the, say, 4 percent property tax rate. Moreover, if the government cannot persuade Rich of its 0.5 percent estimate, the government has to give up the practice of nonstochastic condemnation. Otherwise, Rich's "perceived condemnation probability" will not equal the property tax rate.[123]

On the other hand, Poor knows that there are urban renewal projects ongoing in her blighted neighborhood. Even though she is not mathematically sure about the condemnation probability, she is quite convinced that the probability is well above 4 percent. Thus, unless the government raises Poor's tax rate substantially, randomly gives back properties from Poor, or stops condemning nonstochastically,

[122] For a similar argument, see Paul Niemann and Perry Shapiro, *Efficiency and Fairness: Compensation for Takings*, 28 Intl Rev L & Econ 157, 158 (2008).

[123] Rich's "perceived condemnation probability" equals the probability of stochastic condemnation plus the probability of condemnation for public use. When the latter is uncertain, Rich may perceive the total condemnation probability to be higher or lower than the property tax rate.

there is no way that Poor will think that her p equals t. That is why parity conditions can hold only in a world whether properties are only condemned stochastically, with the probability set at exactly the property tax rate. However, this is impossible to achieve, not only because of the extremely high costs, but also because of the constitutional validity of stochastic condemnation.

To understand my second point, first bear in mind that the higher Q is, the higher reported value is, and the lower condemnation probability is. We know that the economic value of a representative owner, John, is 100. The government only knows that his fair market value is 85, but guesses that the economic value is 95. The schedule of condemnation probability is set and announced accordingly. That is, John knows that if he reports 95, p will equal t. If he reports > 95 (< 95), p < t (p > t). Will John report honestly? Remember that the expected wealth of John is [W (1 – t) + Q (p – t)]. If John reports 95 or 100, his expected wealth is both W(1 – t).[124] But if John reports anything between 95 and 100, his expected wealth is larger than W(1 – t) because Q (p – t)>0.[125] Therefore, a risk-neutral John will certainly underassess to maximize his expected wealth. If John is risk-averse, he does not necessarily report honestly, either. The expected wealth of reporting between 95 and 100 is higher than reporting at 95 or 100, so a not-so-risk-averse John may be willing to trade it for higher risk. The same thing happens when the government overestimates John's economic value. Therefore, to ensure that John will honestly report his economic value, the government has to set p = t at John's economic value. Nevertheless, if the government already knows John's economic value, why do we need self-assessment methods in the first place?

3. Implementing as Another Imperfect Substitute. If policymakers do not manipulate condemnation probability or property tax rate, the self-assessment method can work as an inaccurate but low-cost[126] option. We can expect that the self-assessment method will produce underassessment[127] of economic value because, as the model above

[124] If John reports 95, p = t. If John reports 100, Q = 0. In either case, Q (p – t) = 0.

[125] Q is negative because John underassesses. P < t (because X > 95), so (p – t) < 0.

[126] The assessment costs of implementing such a method are generally low. All we need to do is record the self-assessments in a database. In addition, the same self-assessed property value can be used for levying property taxes and providing takings compensation. In addition, since the owners themselves report the property value after recognizing its implications, the number of legal disputes could be reduced. Nevertheless, because the compensation is below economic value, owners still have incentives to lobby government officials not to condemn their properties.

[127] Owners will underassess only to a certain extent, because in the real world, condemnation probability is indeed in reverse relationship with the compensable property value. This is the Law of Demand.

suggests, if property tax rate is higher than condemnation probability, owners would report Q < 0 to increase expected wealth. And probably in most jurisdictions, condemnation probability is much lower than the property tax rate. Take Taiwan, where a self-assessment regime was employed between 1954 and 1977, as a real world example. The property tax rate in Taiwan was at least 1.5 percent, while the condemnation probability was on average 0.04 percent, much lower than the tax rate.[128] Take New York City as another example. Between 1990 and 2002, the property tax rate for most residential properties of up to three units was around 0.6 percent, while that for other properties was around 4.5 percent.[129] During the same period, although there were around one million properties in the city, on average only thirty-five condemnees either settled with condemnors or received court-adjudicated compensation awards.[130] This number[131] is far less than the 6,000 necessary to fulfill the parity condition.[132]

In sum, implementing a self-assessment method in the real world will probably give us underassessment of economic value, which is imperfect. Below I examine whether other methods of assessing economic value can do a better job.

D. Ex Post Assessment by Landowners

The ex post assessment by landowner method requires that condemnors pay the price landowners demand after the condemnation decision has been made. Lee Fennell has argued in passing that this

[128] Evidence shows that, just as my model predicts, owners in Taiwan underassessed. See Chang, 28 J L Econ & Org (cited in note 107).

[129] The nominal property tax rates were between 10 percent and 19 percent. Property Tax Rates and Charges, http://home2.nyc.gov/html/dof/html/property/property_rates_rates.shtml (last visited Jan 4, 2012). The assessment ratio, which equals tax assessment divided by estimated market value, is 6 percent for most residential properties of up to 3 units and 45 percent for other types of properties. Determining the Annual Assessment, http://www.nyc.gov/html/dof/html/property/property_val_assessment.shtml (last visited Jan 4, 2012). The tax assessment evaluates the current use, so it will be lower than the fair market value (which takes into account highest and best use) and the economic value. Thus, the real property tax rate is even lower than what the tax schedules show.

[130] Of the thirty-five condemnees, thirty-three condemnees settled. Data are from Chang, 39 J Legal Stud at 221–26 (cited in note 54). Two condemnees got court awards. Data are from Chang, 8 J Empirical Legal Stud at 388–90 (cited in note 54).

[131] Granted, some condemnation cases end without legal disputes from condemnees. But I doubt there are 6,000 such cases annually in New York City.

[132] 1,000,000 * 0.006 = 6,000. 1,000,000 is the number of properties in New York City; 0.006 is the property tax rate.

mechanism will fail.[133] No country seems to adopt this method.[134] Its unpopularity can be attributed to the fact that landowners have stronger incentives to exaggerate than non-landowners do and that the legal tools available ex post to counter the incentives to exaggerate are fewer than those available ex ante.[135]

1. Revised Form: Options for Government. The pure form of the ex post method is impracticable, but it could be revised to grant the government an option to give up condemning the property and to tax the property according to the landowner's reported valuation thereafter. Bell and Parchomovsky first advance this idea.[136] Elsewhere, I have elaborated why their model cannot achieve their goal of producing accurate assessments:[137] *First*, their special property tax regime neither increases the accuracy of assessments nor decreases the assessment costs; rather, it induces rent-seeking activities. *Second*, their governmental back-off option sometimes induces owners to over-assess and sometimes induces owners to underassess. *Third*, their lifetime sale restraint cannot prevent owners from underassessing. Below I discuss the general merits and demerits of the revised form of the ex post method ("revised method") in assessing economic value.

It is obvious that the revised method produces more accurate assessments than the pure ex post method does, because the possibility of using self-assessments to tax is zero under the latter, while it is usually positive (zero if the government never reneges[138]) under

[133] See Fennell, 118 Harv L Rev at 1419 (cited in note 116).

[134] Prof. A.J. van der Walt, in his comparative analysis of constitutional property clauses, looked into the stipulations in Australia, Austria, Canada, Germany, Guyana, India, Ireland, Jamaica, Japan, Malaysia, Mauritius, Namibia, South Africa, Switzerland, Trinidad and Tobago, the United States, and Zimbabwe. In my reading, none of them seems to adopt ex post assessment by landowners. In fact, because most of them specifically use market value as a benchmark for compensation (some countries do not have a clear benchmark), my guess is they adopt assessment by non-landowners. However, a few of them, like Zimbabwe, Jamaica, and Ireland, authorize laws to stipulate how to compensate landowners; Prof. van der Walt does not look into those detailed stipulations. See A.J. van der Walt, *Constitutional Property Clauses: A Comparative Analysis* 58–60, 81–82, 92, 114–16, 150–51, 183, 219–21, 240–41, 253–54, 262–63, 273, 304–05, 315–16, 343–48, 372–73, 394–95, 440–41, 489–92 (Juta 1999).

[135] Taxing is ineffective, because owners can still name the price they want. Auditing cannot be effective, because the government cannot verify the true economic value.

[136] See Bell and Parchomovsky, 59 Stan L Rev at 871 (cited in note 3).

[137] See Chang, *Takings Compensation* (cited in note 95). See other critiques in Wyman, *Measure of Just Compensation* at 266 (cited in note 15).

[138] The government may never renege because the law strictly limits its back-off discretion or because landowners have complete information about the government's

the former. It is, however, unclear whether the revised method produces more accurate self-assessments than the pure ex ante method does. On the one hand, in terms of incentives, as long as governments cannot propose condemnations at will (in order to increase tax revenue),[139] the probability of continuing to condemn a specific land parcel (under the revised method) will be higher than the probability of deciding to condemn a specific land parcel (under the pure ex ante method). Thus, landowners under the revised method would be induced to assess property value higher than what they would do under the pure ex ante method.

On the other hand, if the self-assessments under the revised method are so high that governments decide not to condemn, the high self-assessments will probably be the property tax basis for the rest of landowners' lives, while in the pure ex ante method landowners could adjust assessments periodically. The expected costs of overassessing are higher under the revised method. On net, it is unclear which method incentivizes owners to report higher self-assessments. In addition, theoretically, one cannot be sure whether a higher self-assessment is less accurate.

The information perspective, however, can tip the balance against the revised method. Under the revised method, landowners could gather information about the reservation price of the condemnor by accessing and analyzing condemnor agencies' budgets and environmental impact statements, cost-benefit analysis of condemnation projects, and administrative guidelines that limit government officials' discretion to renege on condemning. By contrast, this kind of information may not exist, or may be harder to acquire, under

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decision-making concerns and take advantage of it—for example, landowners can exaggerate to the extent that the self-assessed value is still within the government's willingness to pay.

[139] Bell and Parchomovsky proposes this restraint, which prevents willful condemnation proposals from boosting property tax revenue. The status quo is that property owners pay property taxes according to the government-assessed value, which is usually lower than fair market value, not to mention economic value. When the government notifies a property owner of a possible condemnation, the owner, taking into account the probability that the governments may back off, is likely to report a property value that is higher than her tax assessment, in order to get higher takings compensation in case the condemnation plan continues. The government, if reneging on the condemnation plan, can levy higher taxes on the property because its owner has increased its value. See Bell and Parchomovsky, 59 Stan L Rev at 900–901 (cited in note 3).

Of course, if the government often bluffs, owners will not fall into the trap of reporting a much higher property value only to be taxed. However, if the government uses this trick infrequently, it could increase property taxes due on some properties that it has no intention to condemn at all.

the pure ex ante method. Such information, acquired from ex post wasteful rent-seeking activities, enables landowners to have a better grasp of condemnors' reservation prices and manipulate their self-assessments accordingly. And landowner's over-assessment could deter efficient public projects. Hence, the revised method will produce usually inaccurately high self-assessments, because landowners take advantage of the information regarding the reservation prices to report their economic value strategically.

In terms of accuracy, the pure ex ante method in practice usually produces underassessment, while the revised ex post method produces overassessment. Neither is necessarily better. Nevertheless, as far as assessment costs are concerned, the revised ex post method is more expensive than the pure ex ante method. First, given that property taxes have to be assessed some way, under the ex ante method, every land parcel is assessed only once in a tax period at most, while the revised ex post method has an additional procedure for potential targets of condemnation.[140] Second, as mentioned above, without manipulation of the parity condition, under the ex ante method, the administrative costs are mostly recording self-assessments. Legal disputes could be few because landowners determine the property value themselves. By contrast, under the revised ex post method, there could be many legal disputes about why the government does or does not back off condemning some properties.

2. Land Assembly Mechanisms. In the aftermath of *Kelo v City of New London*, 545 US 469 (2005), the leading takings case, which involved controversial land assembly for economic development, a new strand of literature has proposed innovative land assembly mechanisms that draw on a majority vote, the "Clarke tax,"[141] and the auction theory. These mechanisms promise to make progress in reducing holdouts and award compensation that is more complete. They are categorized as ex post assessment by landowners, because the total sale price is determined collectively by owners (in some mechanisms owners can even name their own compensation)

[140] Compare Kaplow, 99 Harv L Rev at 603 (cited in note 13) (pointing out that most localities need to assess properties for tax purposes anyway).

[141] In a Clarke mechanism, voters (in our case, landowners) are motivated to reveal his preference honestly. The key is that those whose votes are decisive or pivotal will have to pay the Clarke tax. The Clarke tax and the voting rule will induce accurate self-assessment, because overassessment may lead to a higher amount of Clarke taxes, whereas under-assessment may lead to the adoption of a less preferred outcome (such as condemnation or no condemnation). For the calculation of Clarke taxes and other model designs, see T. Nicolaus Tideman and Gordon Tullock, *A New and Superior Process for Making Social Choices*, 84 J Pol Econ 1145, 1147–50 (1976); Edward Clarke, *Multipart Pricing of Public Goods*, 11 Pub Choice 17 (1971).

after a takings/assembly project has been initiated. Below I briefly describe the several new mechanisms and point out their limitations.[142]

Two pairs of legal scholars ignited the debate. Heller and Hills proposed the "land assembly district," in which owners in one neighborhood determine by a majority vote whether to sell the whole district to a developer or a municipality at the quoted price.[143] The land assembly district is agnostic as to how the sale price is distributed among owners, as long as they are set in statutes by an ascertainable measure.[144] That is, owners' subjective value is not taken into account in the proceeds distribution rule. Heller and Hills recognize that their proposal thus does not guarantee that each landowner is fully compensated.[145] Heller and Hills also lean toward assigning the voting power according to a similar, ascertainable measure that reflects owners' share of property within the land assembly district.[146] A majority vote rule that does not assign voting power according to economic value, however, is unlikely to ensure that every approved land assembly is efficient.[147]

Lehavi and Licht's mechanism separates takings from compensation.[148] Basically, the condemnor exercises its eminent domain power to take properties and grant certain rights to a special purpose development corporation. Property owners are entitled to receive fair market value compensation or receive stocks of the corporation. If the latter route is followed, these former landowners receive certain proportion of proceeds from sales or auctions as their compensation. Nevertheless, even though this proposal may well be an improvement over the current regime in giving owners fair market value compensation, it still does not always lead to efficient land assembly and do not guarantee full compensation, because subjective value is not considered in the mechanism.[149]

[142] I do not review all proposed models here. For a comprehensive critique of the mechanisms that have been raised so far. See Florenz Plassmann and T. Nicolaus Tideman, *Marginal Cost Pricing and Eminent Domain*, 7 Found & Trends in Microecon 1, 61–98 (2011).

[143] See Heller and Hills, 121 Harv L Rev at 1469–70 (cited in note 3).

[144] See id at 1501.

[145] See id at 1495, 1498–99. See also Plassmann and Tideman, 7 Found & Trend in Microecon at 81 (cited in note 142).

[146] See Heller and Hills, 121 Harv L Rev at 1503 (cited in note 3).

[147] See Plassmann and Tideman, 7 Found & Trend in Microecon at 82 (cited in note 142). Heller and Hills seem to disagree. See Heller and Hills, 121 Harv L Rev at 1495 (cited in note 3).

[148] See Lehavi and Licht, 107 Colum L Rev at 1734–35 (cited in note 116).

[149] See Plassmann and Tideman, 7 Found & Trend in Microecon at 81–83 (cited in note 142).

Two groups of economists follow suit. Grossman, Pincus, and Shapiro, in a recent working paper,[150] propose an auction mechanism that they claim will always induce honest self-assessments and compensate every owner's economic value. Their model, however, is still imperfect, as the authors themselves recognize that it is too conservative in granting land assembly.[151] In addition, this model awards most condemnees more than their economic value, and an overcompensation regime will induce inefficiency, as discussed in Section IV.A. Finally, for the auction mechanism to work effectively there must be multiple serious bidders. When applied in eminent domain context, however, the government could be the only possible bidder. A second-price auction cannot work at all if there is only one bidder.

Plassmann and Tideman propose a new model[152] that applies the Clarke tax.[153] Their model is claimed to induce honest revelations of each owner's economic value in a land assembly project. Nevertheless, this new model is not perfect, either, as owners will receive less than economic value if the benchmark value assigned to them before they report self-assessments is lower than the economic value. In addition, the so-called pivotal owners must pay Clarke taxes and thus suffer a loss simply because the government or a developer proposes a land assembly.

Moreover, the four land-assembly mechanisms discussed in this subsection is not universally applicable in takings problem, as not all condemnation projects involve land assembly. When it comes to acquisition of unique sites, neither mechanism can be used.[154] As Plassmann and Tideman's comprehensive and critical comparison of all the major proposed land assembly mechanism also shows,[155] no mechanism can, with reasonable assumptions, always give land-

[150] This working paper seems to be based on an older working paper by Shapiro and Pincus. The major difference seems to be that the previous working paper employs first-price auction whereas the recent working paper uses second-price auction.

[151] See Zachary Grossman, Jonathan Pincus, and Perry Shapiro, *Second-Best Mechanism for Land Assembly* (Working Paper, University of California, Santa Barbara, Aug 17, 2010); Plassmann and Tideman, 7 Found & Trend in Microecon at 79 (cited in note 142).

[152] In this new 2011 article, Plassmann and Tideman also discuss their 2008 model, discussed in Section IV.C.1.

[153] See Plassmann and Tideman, 7 Found & Trend in Microecon at 68–73 (cited in note 142).

[154] Heller and Hills acknowledge this limitation of their model. See Heller and Hills, 121 Harv L Rev at 1470 (cited in note 3).

[155] Plassmann and Tideman, 7 Found & Trend in Microecon at 81–83 (cited in note 142).

owners exactly economic value compensation and approve land assembly projects whenever they are efficient.

In sum, no method of assessment by landowner is perfect. Although comparison and evaluation of any self-assessment mechanism that has not been implemented in the real world have to be tentative, my sense is that a simple tax-compensation combination used ex ante is superior to other self-assessment designs, assessment cost and accuracy both considered. As demonstrated above, self-assessment mechanisms that induce revelation of economic value are administratively costly and often requires information that is hard to collect, and many of them in fact will not induce honest self-assessment. The ex ante tax-compensation combination regime, by contrast, can be implemented without the undesirable features of governmental manipulation of tax rates and condemnation probabilities, and this regime can be used to levy property taxes. It has the known drawback of probably underassessing economic value. But at least policymakers know the value is underassessed. Finally, owners should be less disappointed at takings or taxing because they name their own prices.

Because assessment of economic value cannot be perfect and at low cost, to determine properly which form of compensation is the most efficient we need to know how accurately fair market value can be assessed and at what cost. Below I discuss the two prototypes of assessment methods that can be used to appraise fair market value.

E. Ex Ante Assessment by Non-landowners

Ex ante assessment by non-landowners is not implausible. In fact, this is the method employed under contemporary Taiwan law. In a previous paper, I have empirically evaluated the Taiwanese system.[156] Here, I use a stylized example to demonstrate that a "tax-compensation combination" design used in this type of method will still fail to attain the goal of accurate assessments.

In a "tax-compensation combination" regime, property value predetermined by the government is employed not only to levy property taxes but also to determine takings compensation. Raising property value increases not only tax revenues but also potential takings compensation payments. This design is intended to curb the official assessors' inclination to underassess land value—official assessors are more likely to underassess if their assessments are only used to

[156] See Chang, 6 J Empirical Legal Stud at 551–61 (cited in note 43) (finding that between 2000 and 2007, governmental assessments in Taiwan under this regime are inaccurate).

determine takings compensation. All these assume that the government (officials) suffers from fiscal illusion. While I believe that the political interest theory is more persuasive than the fiscal illusion theory, in the following model, first I follow the presumptions of the latter, and then I discuss the model under the assumptions of the former.

Following the fiscal illusion theory, I assume that the government aims to minimize takings compensations and prefers to have more budgetary inflow;[157] assessors fully and only internalize the costs of compensations and the benefits of tax revenue in monetary terms. In such a model, assessors face:

$$\text{Costs} = \text{Condemnation compensation} = \{\Sigma p_i * A_i\}$$

$$\text{Benefits} = \text{Tax revenue} = \{\Sigma(1 - p_i) * A_i * t\}$$

where p_i represents the probability of condemnation of land i; A_i represents the assessed value of land i; t is the tax rate. The Σ sums up the costs and benefits of all land parcels.

An assessor, call her Joan, who internalizes the monetary costs and benefits, naturally aims to maximize net benefits (tax revenue minus takings compensation payments):

$$f(A_i) = \Sigma[(1 - p_i) * A_i * t - p_i * A_i]$$

If $p_i < t/(t + 1)$, $f(A_i)$ is always larger than 0; in this case, Joan maximizes $f(A_i)$ by increasing A_i as much as possible.[158] If $p_i > t/(t + 1)$, $f(A_i)$ is always smaller than zero. Hence, Joan assesses land as low as possible to reduce losses. If $p_i = t/(t + 1)$, $f(A_i) = 0$. Joan is indifferent to any amount of assessment. Because p_i varies, Joan may over-assess some land parcels while underassessing others.[159]

The tax rate (t) is known, while the probability of condemnation (p_i) is usually uncertain. Sometimes Joan perceives p_i as obviously larger or smaller than $t/(t + 1)$ and overassess or underassess accord-

[157] I have argued that the fiscal illusion theory implicitly adopts this assumption. See id at 562–63.

[158] Higher A_i usually leads to lower p_i and lower expected p_i induces Joan to assess A_i higher. Therefore, the model itself, when $p_i \neq t/(t + 1)$, actually incentivizes inaccurate assessments. This shows the danger of putting the decision-making powers of assessing value and condemning in the same party's hands. This result contrasts with the analysis of the ideal type of ex ante assessment by landowners, under which the inverse relationship between p_i and A_i keeps the self-assessments in check.

[159] The basic logic of this model is the same as that of the model in Section IV.C.1, but the incentives of the assessors are just the opposite.

ingly. Sometimes Joan is not sure about the relationship between p_i and $t/(t + 1)$. In this case, the rule of thumb for her may be assuming that $p_i = t/(t + 1)$. Then, as I just argued above, she is indifferent and still does not have incentives to assess accurately.

Some would contend that when Joan has nothing to maximize, she would simply assess accurately. Nevertheless, assessing accurately is more time-consuming than assessing inaccurately. Jane has no incentive to work harder for nothing— accurate or not, the expected net benefit for the government, $f(A_i)$, is zero. Furthermore, to equate p_i with $t/(t + 1)$ in the first place, or to make assessors unsure which one is larger, the law has to adjust either the tax rate or the probability of condemnation (for every land parcel!). It is administratively very costly and politically unfeasible to adjust them only for the sake of getting accurate assessments.

Loosening the assumptions made above by the fiscal illusion theory and dealing with the complexities in reality, I argue that accurate assessments are even more difficult to arrive at. First, assessors may not internalize the monetary costs of paying compensations and the monetary benefits of receiving tax revenue. Because assessors do not personally pay compensation or receive tax revenue, neither of the costs or benefits above may affect their assessing decisions.[160] Their personal concerns, like reducing accuracy to alleviate workload,[161] may be more decisive.

Granted, assessors may partially internalize the above costs and benefits (because, say, insufficient tax revenue affects their bonus), but this does not ensure accurate assessments.[162] Furthermore, assessors may also internalize other types of costs and benefits (such as those brought by the public use of the condemned land), which only make accurate assessment more unlikely.

More fundamentally, as the political interest theory argues, assessors may perceive costs and benefits not in monetary units but in *political units*.[163] If the correlation coefficient of "political costs versus

[160] Even assuming that the government as a whole does internalize costs if compensations are paid, assessors are not the government incarnate. They do not necessarily assess for the net benefits of the government as a whole.

[161] See Steven Shavell, *Foundations of Economic Analysis of Law* 129–30 (Harvard 2004); Michael S. Johnson, *Assessor Behavior in the Presence of Regulatory Constraints*, 55 S Econ J 880, 881 (1989).

[162] Kaplow argues, "*to the extent that* both discounted in roughly the same proportions, no bias should result" (emphasis added). See Kaplow, 99 Harv L Rev at 568 (cited in note 13).

[163] Assessors usually are not politicians, who perceive costs and benefits in political units, but politicians oversee assessors, so assessors may be required to perceive costs and benefits in political units.

monetary costs" and the correlation coefficient of "political benefits versus monetary benefits" do not approximate each other, using tax-compensation combination cannot achieve its goal of inducing accurate assessments.[164]

In sum, the tax-compensation combination, the major design in the ex ante assessment by non-landowners method, appealing as it seems, can hardly provide the correct incentives that will induce non-landowners/assessors to make accurate assessments of fair market value, whether the government maximizes "monetary costs and benefits" or "political costs and benefits." In the next section, I will examine whether another assessment method can do a better job in assessing fair market value.

F. Ex Post Assessment by Non-landowners

Ex post assessment by non-landowners is the method employed by most (if not all) American states. Take New York State as an example:[165] when the government needs a specific property but cannot reach a voluntary deal with its owner, it condemns the property and asks a professional appraiser to assess the value of the property. Then the government offers the highest approved appraised value as compensation to the property owner. If the owner does not accept the offer as payment in full, the government negotiates a settlement with the owner. If negotiations fail, the court adjudicates the amount of compensation due.[166]

An ex post assessment by non-landowners model tends to be simpler than models designed according to three other types of assessment methods, as shown by the simplicity of the New York State regime. The simplicity is due to unavailability of ordinary incentive schemes. For example, the tax-compensation combination (imperfect as it is when employed ex ante) is not useful ex post, because the probability of condemnation is 100 percent—there is nothing uncertain to balance the government assessors' incentives. Further-

[164] For example, if political costs equal monetary costs while political benefits only translate into monetary benefits 50 percent of the time, assessors take too few monetary benefits into account and do not produce the accurate assessments as tax-compensation combination theorists expect.

[165] See NY Em Dom Proc Law (McKinney 1977). For detailed descriptions of the New York regime, See Chang, 39 J Legal Stud at 210–12 (cited in note 54).

[166] One could argue that the New York regime is not an entirely pure type of ex post assessment by non-landowners, because when the compensation is determined in a settlement, property owners' ex post assessments could have influenced the amount of compensation. Nevertheless, if a judge determines the amount of compensation, or the condemnee accepts the offer as payment in full, it is arguably a pure type.

more, it will be absurd to grant the government a back-off option, since the amount of compensation is determined by the government itself.[167]

The costs of the ex post assessment by non-landowner method tend to be higher than those of the ex ante methods. Under the ex post models, all properties must be assessed once in a tax period and additional assessments are necessary for condemned properties, whereas condemned properties under the ex ante models using the tax-compensation combination design need not be assessed again. Note, however, that the number of condemned properties each year is small; thus, the difference in assessment costs in this respect is slight.

Which method is more accurate is more difficult to ascertain. Assessors such as government officials maximize political interests, which could lead to overcompensation or undercompensation. Assessors such as real estate appraisers could have all kinds of incentives not to assess accurately.[168] Nevertheless, fair market value is an objective measure of property value, thus ascertainable by extrapolating from the sale prices of comparable properties. The incentive problem under non-landowner assessment methods is not that assessors are not honest about "their own" value, but that it could be in their (political) interests to manipulate the objective assessed value. In addition, assessors may not have incentives to work hard enough to ascertain a fair market value. Therefore, the assessment method that can appraise market value without counting on assessors' incentives to work hard and prevent assessors from distorting

[167] Even if the government is required to commission independent appraisers to assess property value, as New York State is, the government can certainly ascertain property value before deciding whether to condemn. A back-off option neither enhances assessment accuracy nor induces responsible governance.

[168] They may sacrifice some accuracy of assessment to save workload. See literature cited in note 161.

They may deliberately inflate assessments to reduce the chance that condemnees challenge the assessments in court, where they will face cross-examination. See Curtis J. Berger and Patrick J. Rohan, *The Nassau County Study: An Empirical Look Into the Practices of Condemnation*, 67 Colum L Rev 430, 443 (1967) (arguing that in the case of Nassau county, the deliberate inflation thesis does not hold).

Competition for appraisal commissions from the government may induce appraisers to try to deliver what they think are the government's preferred assessments. See S. Alan Aycock and Roy Black, *Special Master Bias in Eminent Domain Cases*, 33 Real Estate Issues 53, 53–54 (2008); Wallace Kaufman, *How Fair Is Market Value? An Appraiser's Report of Temptation, Deficiencies, and Distortions in the Condemnation Process,* in Bruce L. Benson, ed, *Property Rights: Eminent Domain and Regulatory Takings Re-examined* 77, 83 (Palgrave 2010).

Appraisers may assess conservatively in difficult cases, as they do not want to lose their designations or reputations because of extreme assessments.

assessments for personal interests is more likely to produce accurate assessment of market value. Hedonic regression analyses are a case in point, because hedonic regressions have generally accepted methodologies and the regression results (the estimated market value) can easily be replicated.

Hedonic regression analyses can be used ex ante or ex post to assess property value for tax purposes or compensation purposes. Nevertheless, because the benchmark compensable value is the property value at the time of condemnation, ex post assessment will be more accurate. And if hedonic regression models are used in both taxing and compensating, the marginal costs of appraising property value are negligible; thus, the assessment costs of the ex post method and those of the ex ante method can be considered equally low. Hence, in jurisdictions where a hedonic regression model is applicable, the ex post method should be better.[169]

V. FAIR MARKET VALUE PLUS A SCHEDULE OF BONUSES

So far, I find that, in terms of condemnees' and condemnors' incentives, economic value compensation is optimal, and fair market value is suboptimal. Accurate assessment of economic value in practice, however, is impossible. Two options emerge from the above discussions: the first is implementing the ex ante self-assessment method without manipulating the parity condition; the second is implementing the ex post assessment by non-landowner method. The first aims at verifying economic value but can only get underassessed economic value. The second aims at appraising fair market value. Thus, we are choosing between two underassessed values. For the following four reasons, I argue that we should side with fair market value standard assessed ex post by non-landowners.

Fair market value should be preferred first because it does not always deviate from the actual economic value. Residential property owners usually have positive subjective value, while owners of nonresidential properties (including those in commercial districts and industrial zones), and owners of investment residential properties do not attach much subjective value to the properties. Awarding fair market value could get the compensation roughly right when the government takes the latter types of properties. By contrast,

[169] In some jurisdictions, hedonic regression analyses may not be applicable, because there are not enough sales. When traditional appraisal mechanisms are used, it is unclear whether the ex ante method or the ex post method is superior.

under the self-assessment method, nonresidential property owners and residential property owners alike underassess.

In addition, the fair market value standard is easier to improve upon. Some scholars have proposed adding a bonus to the estimated fair market value in order to make up for the loss of subjective value,[170] and a few states in the United States, in the aftermath of the *Kelo* case, under certain circumstances, award a flat bonus of 25 percent or 50 percent of the fair market value to condemnees.[171] A bonus could also be added to the underassessed economic value to fill in the shortfall. Nevertheless, bonuses work better with fair market value. Suppose that the bonus is proportional to the compensable value.[172] Under the ex ante self-assessment method, the bonus changes owners' expected value function and gives them even more incentives to underassess. Eventually owners pay lower taxes and may still receive undercompensation. Under the ex post assessment by non-landowner method, the proportional bonus does not affect the estimates by hedonic regression models (though it may influence the value appraised by appraisers or government officials). Therefore, sticking with a fair market value standard and adding a bonus has a better chance of not awarding undercompensation.

Moreover, although hedonic regression analyses of fair market value cannot yet be used in every neighborhood, with the advent of ever more powerful computers and an increasing amount of data, the applicability of hedonic regression analyses can only increase. At the very least, knowledge gained from employing it can increase the accuracy of traditionally appraised property values.[173] By contrast, there seems to be no practical way to improve the accuracy of assessed economic value. At the same time, advances in computer technology will continuously reduce the fixed and marginal costs of using hedonic regression models to estimate fair market value.

Finally, fair market value and the ex post assessment by non-landowner method has the advantage of being the incumbent compensation standard. Switching track to another compensation regime incurs administrative costs and thus requires good evidence of efficiency improvement. However, the self-assessment regime and the

[170] For such a proposal, see, for example, Epstein, *Supreme Neglect* at 91 (cited in note 86). For discussion and criticism, see Ilya Somin, Controlling the Grasping Hand: Economic Development Takings after *Kelo*, 15 S Ct Econ Rev 183, 215–18.

[171] See Wyman, *Measure of Just Compensation* at 257 & n61 (cited in note15); Merrill and Smith, *Property: Principles and Policy* at 1267 (cited in note 32).

[172] Suppose that the bonus is constant— the same for every condemnee. It is equally likely to be inaccurate in our two options.

[173] See evidence in Chang, 8 J Empirical Legal Stud at 405–07 (cited in note 54).

underassessed economic value are not obviously better. In sum, I believe that fair market value and the ex post assessment by nonlandowner method should be chosen over economic value and other assessment methods.

Improvements can still be made on the fair market value standard. The proportional bonus discussed above is not the ideal way of approximating the real economic value.[174] A schedule of bonus rates,[175] I believe, works better than a flat (rate) bonus. Ideally, the schedule should be designed to reflect the various factors that affect subjective value. In reality, some factors (idiosyncratic preference, for one) are hard to verify and thus unlikely to be considered in the bonus schedule. Nevertheless, few would object to the notion that the length of tenure positively correlates with the magnitude of subjective value[176]—a homeowner who just moved into the house has lower subjective value than does a homeowner whose family has lived in the house for three generations. Other factors could be important and manageable, but these factors, as well as the details of the bonus schedule, have to be examined or worked out, respectively, based on future empirical studies and cannot be discussed here. The schedule of bonus rates will not be perfect, but should be better than the flat bonus rate and is the second-best choice when direct assessment of economic value is unlikely to be accurate.

[174] Proponents of flat-rate bonus recognize that the bonus will not be perfect but argue that as long as the bonus compensation regime does not systematically over- or undercompensate condemnees, it will be better than the fair-market-value-only compensation regime, which systematically undercompensates condemnees. See Epstein, *Takings* at 184 (cited in note 3). See other criticism of the bonus compensation regime in Ulen, *Public Use of Private Property* at 181 (cited in note 21); Fennell, 2004 Mich St L Rev at 993–94 (cited in note 4); Heller and Hills, 121 Harv L Rev at 1483–84 (cited in note 3).

[175] Other scholars have also proposed this kind of regime. See Robert C. Ellickson, *Alternatives to Zoning: Covenants, Nuisance Rules, and Fines as Land Use Controls*, 40 U Chi L Rev 681, 736–37 (1973); Testimony of Thomas W. Merrill, Charles Keller Beekman Professor of Law, Columbia University, The *Kelo* Decision: Investigating Takings of Homes and Other Private Properties: Hearings before the Senate Committee on the Judiciary, 109th Cong 106, 106 (2005) (available at http://www.judiciary.senate.gov/hearings/testimony.cfm?id=e655f9e2809e5476862f735da10a78d5&wit_id=e655f9e2809e5476862f735da10a78d5-2-5); John Fee, *Eminent Domain and the Sanctity of Home*, 81 Notre Dame L Rev 783, 818 (2006) (proposing a 2 percent bonus for each additional year of home ownership, up to thirty years).

[176] Ellickson's and Merrill's designs are based on this factor. See Ellickson, 40 U Chi L Rev 681(cited in note 175); Testimony of Thomas W. Merrill, *Kelo* Hearings (cited in note 175). Jeff Stake also argues that longer possession should trigger greater compensation. See Jeffrey Evans Stake, *Just (and Efficient?) Compensation for Government Expropriations,* in Michael Freeman and Oliver R. Goodenough, eds, *Law, Mind and Brain* 299, 316 (Farnham 2009).

Two caveats, however, are in order. First, the extent of inaccurate assessment, the total costs incurred by the mechanisms, and the social costs of rent-seeking and bribery-seeking activities are ultimately empirical questions. In four previous empirical studies, I have examined the accuracy of assessments under four different assessment methods: ex ante assessment by landowners (Taiwan, 1954–77),[177] ex ante assessment by non-landowners (Taiwan, 2000–2007),[178] ex post assessment by non-landowners (New York City, 1990–2003),[179] and ex post joint assessment by landowners and non-landowners (New York City, 1990–2002).[180] The economic value and the fair market value in these regimes were all inaccurately assessed. Because of limitations of the data, the magnitude of inaccuracy is not readily comparable. Even if it were, the amount of assessment costs and rent-seeking costs are yet to be studied. My recommendation of the fair market value plus a schedule of bonus is thus tentative and based on my intuitive evaluation of the magnitude of the costs and benefits. Others can reasonably disagree with my assessment.

Second, I criticize others' proposed mechanisms for not ensuring accurate assessment of economic value at reasonable costs. Admittedly, my proposal has a similar sin, because no one has yet to work out an empirically grounded formula to calculate the schedule of bonuses. My sense is that, even without the schedule of bonus, compensation of fair market value appraised by hedonic regression models is still better than other alternatives when assessment costs and assessment accuracy are both taken into account. I will leave for future empirical studies to verify or refute this claim.

VI. CONCLUSION

The major findings and contributions of this Article are as follows: The fair market value standard under current law and the economic value standard generally induce condemnees to invest efficiently. Condemnees will, however, be induced to take rent-seeking activities if takings compensation is expected to be higher or lower than economic value. In addition, it is difficult to design the compensation regime so as to induce government officials to condemn properties efficiently, because they pursue their own political interests. Nevertheless, if less than full compensation is required, government

[177] See Chang, 28 J L Econ & Org (cited in note 107).
[178] See Chang, 6 J Empirical Legal Stud 541 (cited in note 43).
[179] See Chang, 8 J Empirical Legal Stud 384 (cited in note 54).
[180] See Chang, 39 J Legal Stud 201 (cited in note 54).

officials may have incentives to threat condemnation to garner bribery, and developers are more likely to lobby government officials for condemning land. Therefore, as far as condemnors' and condemnees' incentives are concerned, economic value is the most efficient form of compensation. Nevertheless, assessment costs are often not negligible and assessment of property value is not always accurate. They need to be taken into account to determine the most efficient form of takings compensation.

On the basis of the analytical framework and theoretical inferences outlined above, I propose that fair market value (appraised by hedonic regression models) plus a schedule of bonuses appear to be the most efficient takings compensation standard. Owner-occupants of residential properties who live in the properties for a long time should receive the maximum amount of bonus, whereas owners of nonresidential properties or owners of investment residential properties should receive a minimum bonus, if any, to reflect the differences in magnitude of their subjective values.