

# What is Public Use?

## Eminent Domain and the Kelo Decision

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**This paper discusses the concept of public use following the Supreme Court decision in the eminent domain case of *Kelo v. City of New London*. The majority of the Court now equates public use to public purpose and approves of the Connecticut local economic development statute. The Kelo decision has generated considerable controversy. It is suggested that one approach to the resolution of the issue is the application of the economist's dual tests for the efficacy of public intervention in the private economy—existence of market failure and benefits that exceed costs.**

The decision of the U.S. Supreme Court in the case of *Kelo v. City of New London* (June 23, 2005) holds that municipalities may use the power of eminent domain to implement an economic development plan that is fully consistent with state statute. This ruling has induced a widespread backlash in the U.S. Congress and elsewhere that may ultimately produce legislation that would limit the use of eminent domain for economic development projects.

Several states—including Arkansas, California, Florida, Illinois, Kentucky, Massachusetts, Montana, and South Carolina—already limit the use of eminent domain for this purpose. For example, Illinois limits use of eminent domain to projects that would eliminate blight. It would seem that more states will follow suit. In Connecticut Governor Rell has endorsed a moratorium on eminent domain seizures even though the New London project had complied fully with Connecticut law.

The Kelo case has brought the issue of eminent domain back to prominence. The Takings Clause of the Fifth Amendment to the Constitution states "...nor shall private property be taken for public use without just compensation." This Clause raises two issues; what is public use, and what is just compensation? The purpose of this paper is to review the economics of public use. It is fair to say that the vast majority of the literature on eminent domain is devoted to the issue of just compensation, and takes the public use for granted.<sup>1</sup> However, the Kelo case hinges on the definition of public use

<sup>1</sup> Recent literature on just compensation includes Fischel (1995) and Innes (1997). Much of the recent literature explores the problem of just compensation when the developer of land knew that there was some chance that the property would be acquired through eminent domain at some point in the future, an issue first raised by Blume, et al. (1984). The empirical literature on the actual amounts paid in eminent domain

and raises the question, how broadly should this definition extend? The City of New London contended that the economic development plan would produce new jobs and increased tax revenue for the municipality.

Two fundamental and familiar economic principles are involved in the use of eminent domain for economic development purposes: market failure and economic efficiency. Eminent domain can be considered if the market fails to produce an efficient allocation of land to its alternative uses. The principles of cost-benefit analysis should be used to determine, as best one can, whether the benefits of the proposed development exceed its opportunity costs. The fact that someone has attempted to assemble land parcels (and failed) does not necessarily mean that benefits exceed costs for society. The test should not just be whether the proposed project has benefits.

Furthermore, it is argued that the benefits and costs that are relevant pertain to residents and property owners in the governmental unit that bears the cost of the project. In the case of the New London project the cost is borne by the State of Connecticut. An earlier version of this cost-benefit was applied to local land-use allocation decisions in McDonald (2001).

## Public Use

The various categories of public use can be enumerated and arranged into a rough hierarchy of “publicness”, as follows:

- Traditional public uses such as public schools, highways, parks, and so on.
- Use for common carriers, such as railroads, that are available to the public. Common carriers include telephone, telegraph, pipeline, and irrigation companies.
- Elimination of blight, where there are significant negative externalities in land use and important social costs that affect the residents, as discussed by Rothenberg (1967). For example the Court identified *Berman v. Parker* (1954) as a precedent to the Kelo case. In this case the Supreme Court decided that not all of the property in an urban renewal project must be blighted, but that non-blighted property could be included if necessary to the overall success of the project.
- Pursuit of other clear public purposes, such as the reduction in the concentration of land ownership in Hawaii (*Hawaii Housing Authority v. Midkiff* (1984)). The Court also relied on the Midkiff decision in the Kelo case.
- Economic development projects that produce new jobs and tax base for the community—a public purpose. Numerous examples can be cited. A prominent case is *Poletown Neighborhood Council v. City of Detroit*; a project that involved use of eminent domain for the acquisition of a large residential area to build a new General Motors plant. The 1981 decision of the Michigan Supreme Court permitted this project to go forward. However, the Michigan Supreme Court overruled the Poletown decision in 2004 in the case of *County of Wayne v. Hathcock* on the grounds of preserving both individual property rights and the role of the judicial branch as the expositor, not creator, of law. Critics of the original Poletown decision also have shown that the actual benefits of the project fell far short of the projections.

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acquisitions compared to market valuations consists of Munch (1976), Guidry and Do (1998), and Clairette, et al. (2004). These studies show that government appraisers pay more on average than the market price by 5 percent to 27 percent, perhaps to avoid costly litigation. Munch (1976) found that high-value properties receive more than market value and low-valued properties receive less than market value.

States have the authority to determine by statute the breadth of the definition of public use, and as Justice Stevens states in the Kelo decision, “The Court declines to second-guess the wisdom of the means the city has selected to effectuate its plan.”

While the Court declines to second-guess both the State and the city, if society is going to use eminent domain for such purpose, how should it proceed? It will be argued here that either the State or the city should impose strict market failure and cost-benefit tests to determine whether a proposed project rises to the level of public use.

## The Kelo Decision

In 2000 the City of New London adopted a development plan for its Fort Trumbull area that was expected to generate 718 to 1,362 permanent jobs, increase property tax and other revenues, and revitalize the downtown and waterfront areas of the city. A state agency had declared the city to be economically distressed in 1990. The precipitating event for the development plan was the closing of the Naval Undersea Warfare Center of the U.S. Navy in 1996, a facility that had employed 1,500 people. The New London Development Corporation (NLDC), a private, non-profit entity established by the city to assist in economic development efforts, was activated and received authorization from the State of Connecticut to issue bonds to support planning activities. In early 1998 Pfizer, Inc. announced plans to build a \$300 million research facility adjacent to the Fort Trumbull site. The NLDC planners welcomed this development as a possible anchor for their project. NLDC held a series of neighborhood meetings, and received approval from both the city and the state for a development plan for 90 acres of the Fort Trumbull area.

The Fort Trumbull area is located on a peninsula that contains the former naval facility and 115 privately owned properties. The development plan provided for a waterfront commercial area, a residential area, a facility for research and development enterprises (adjacent to the Pfizer property), a marina, office buildings, retail space, and parking. A portion of the former naval facility also has been converted to a state park. This plan was approved in January 2000 and the city authorized NLDC to purchase property or acquire property through eminent domain. NLDC proceeded to purchase most of the real estate in the 90-acre area. However, negotiations with some private owners broke down so NLDC initiated condemnation proceedings in November 2000.

Susette Kelo and other property owners brought action in the New London Superior Court in December 2000 on the grounds that the taking of their properties violated the public use clause of the Fifth Amendment. The Superior Court granted a permanent restraining order against taking of some of the parcels, but denied relief for the other parcels. The case was appealed to the Supreme Court of Connecticut, which ruled that all of the proposed takings were valid. The Court ruled that the takings were in accordance with the state’s economic development statute, and that economic development is a valid public use under both the Federal and State Constitutions.

Three dissenting justices would have imposed a higher standard for takings for economic development in that the city had failed to produce “clear and convincing evidence” that the economic benefits of the plan would actually be produced. These justices fell short of calling for a full cost-benefit analysis, but clearly they were moving in that direction. The US Supreme Court agreed to hear the case to determine whether economic development is public use under the Fifth Amendment. Justice Stevens wrote the

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opinion for the Court, and Justices Kennedy, Souter, Ginsburg, and Breyer concurred. Justice O'Connor filed a dissenting opinion, with which Justices Rehnquist, Scalia, and Thomas concurred. Justice Kennedy filed a concurring opinion, and Justice Thomas filed a dissenting opinion.

The majority opinion begins by noting that the Court long ago decided that public use is best interpreted as public purpose. In *Strickley v. Highland Bay Gold Mining Co.* in 1906, Justice Holmes wrote of "...the inadequacy of use by the general public as a universal test." The Court therefore examined whether the economic development plan serves a public purpose. The Court (*Kelo v. New London*, p. 12) states:

"For more than a century, our public use jurisprudence has wisely eschewed rigid formulas and intrusive scrutiny in favor of affording legislatures broad latitude in determining what public needs justify the use of the takings power."

A principal precedent is *Berman v. Parker* in 1954, in which the Court held that a redevelopment project in Washington, DC could use eminent domain to acquire property within the project area that was not blighted. The unanimous opinion of the Court in *Berman* was that the redevelopment area "...must be planned as a whole." In *Kelo* the Court cites the comprehensive nature of the New London economic development plan, the extensive review in accordance with State Statute, and the limited scope of their review to conclude that the public use requirement of the Fifth Amendment is satisfied.

The Petitioners in *Kelo* argued that economic development does not satisfy the public use requirement, however the Court rejected this contention based on several precedents including *Berman*. Petitioners also argued that takings for such purpose should require "reasonable certainty" of the expected benefits to the public. The Court rejected this argument by stating (*Kelo v. New London*, p. 17):

"When the legislature's purpose is legitimate and its means not irrational, our cases make clear that empirical debates over the wisdom of takings —no less than debates over the wisdom of other kinds of socioeconomic legislation—are not to be carried out in the federal courts."

The Court concluded by noting that use of the takings power for economic development purposes is a matter for legitimate public debate and that other states restrict the use of eminent domain. For example, California law states that the takings power for economic development projects can be used only in blighted areas. Nothing in the Court's ruling prohibits a State from placing restrictions on the takings power that go beyond the federal standard.

Justice O'Connor's strongly worded dissent has been widely cited. In her opinion the *Kelo* decision in effect sanctions the use of eminent domain to transfer property from one private owner to another. Her dissent is captured well in the following (*Kelo v. New London*, O'Connor, J., dissenting, p. 8):

"In moving away from our decisions sanctioning the condemnation of harmful property use, the Court today significantly expands the meaning of public use. It holds that the sovereign may take private property currently put to ordinary private use, and

give it over for new, ordinary private use, so long as the new use is predicted to generate some secondary benefit for the public—such as increased tax revenue, more jobs, maybe even aesthetic pleasure. But nearly any lawful use of real private property can be said to generate some incidental benefit to the public. Thus, if predicted (or even guaranteed) positive side-effects are enough to render transfer from one private party to another constitutional, then the words “for public use” do not realistically exclude any takings, and thus do not exert any constraint on the eminent domain power.”

**“In [Justice O’Connor’s] opinion the Kelo decision in effect sanctions the use of eminent domain to transfer property from one private owner to another.”**

Justice O’Connor further states that the Court abdicates its responsibility in calling for the States to place appropriate restrictions on economic development takings. She worries that the impact of the Court’s ruling will be to harm people with relatively few resources and benefit those with influence and power. In short, a taking for the purpose of transferring ordinary property from one private owner to other private owners for economic development purposes is unconstitutional. However, it is apparent that the use of the economist’s tests of market failure and benefits in excess of costs would indeed exclude many takings.

The reaction in Congress to the Kelo decision was swift. Bills were introduced in both the Senate and the House to limit the use of eminent domain for economic development purposes. The bill introduced in the Senate (S. 1313, June 27, 2005) cites the dissent by Justice O’Connor, and specifies that “...public use shall not be construed to include economic development.” The proposed Act would apply to all exercise of eminent domain power by the federal government and all exercises of eminent domain by state and local government through the use of federal funds. Two bills were introduced in the House. One bill (H.R. 3315, July 14, 2005) proposes an amendment to the Housing and Community Development Act of 1974 to prohibit the use of eminent domain by state or local government to obtain property for commercial development by private persons. The other bill (H.R. 3135, June 30, 2005) is similar to the bill introduced in the Senate by prohibiting use of eminent domain for economic development by the federal government, and would deny federal funds to state or local governments that use eminent domain for economic development. None of these three bills has been passed by both houses of Congress as of this writing.

## Economic Principles and Eminent Domain

Economists have much to contribute to the debate over eminent domain. In general economists believe that government intervention in the economy is justified if, and when, the market fails to produce an efficient allocation of resources and it can be shown that intervention will lead to an improvement in efficiency. As Milton Friedman and George Stigler argued for many years, the fact that the market outcome is inefficient does not necessarily mean that intervention by the public sector will improve the allocation of resources. The market failure test is similar to the “but for” test that is discussed in legal and planning literatures. Conservative and liberal economists differ in their views regarding how frequently the market fails and how likely government intervention will be beneficial, but most of them agree with the general idea.<sup>2</sup>

This section discusses basic economic models of the urban land market to determine the conditions under which these general standards are met. The models are based on earlier work by Munch (1976), Eckart (1985), Buchanan and Yoon (2000), and McDonald

(2001). But first it is worth noting that government intervention in the urban market is pervasive. With the exception of Houston, all major cities in the U.S. have zoning ordinances that specify in some detail the permissible use of every parcel of land. Zoning is based upon the police power of local government to protect the health and safety of the public and stems from the Supreme Court decision in 1926 in the case of *Euclid v. Ambler Realty*. In other words, the private market has produced an outcome that calls for regulation. Further, it is generally recognized that compensation is not required if a zoning ordinance causes a reduction in the value of an owner's land. It is also worth noting that most of the activities of local government involve the provision of public goods and services—goods and services that are publicly provided because the market would undersupply them. Those goods and services include education, hospitals and health care, transportation (streets and highways, public transportation), public safety (police, fire protection, public health), parks and recreation, community development (planning, water, sewerage, solid waste management), and other local infrastructure. In short, local government is largely in the business of addressing market failures and taking action that improves the allocation of resources.

The economic model of eminent domain is the subject of the seminal article by Munch (1976), who began by noting that, because of the just-compensation provision, eminent domain may be interpreted as a limitation on police power. Munch (1976, p. 475) stated that the economic efficiency argument for eminent domain stems from its advantage over the free market in assembling land under single ownership. While use of eminent domain is often not for the purpose of land assembly, the example in the Kelo case fits Munch's purpose precisely.

The Munch (1976) model is shown in Figure 1. Land parcels are assumed to be homogeneous, but the reservation price of the sellers in a locale varies because some sellers are not selling at the margin. The distribution of reservation prices is skewed to the right, with the current market price as the lowest reservation price. Neutze (1987) and Evans (1999) provide a more detailed analysis of this phenomenon. Consequently the supply curve of contiguous parcels of land for assembly is positively sloped, and is shown as  $MC_a$ . The supply curve of scattered parcels is perfectly elastic, and shown as  $MC_m$ . Supply curve  $MC_a$  is based on the assumption that the buyer will pay the reservation price to each seller, and no more. If the buyer cannot determine the reservation prices of the sellers, then  $MC_a$  is the average cost of land at each quantity, and the marginal cost of land is  $MC_b$ . The value of the marginal product of assembled land is assumed to be negatively sloped in the relevant range, and is shown as VMP. VMP is the long-run demand curve for land because the purpose of land assembly is to install new capital on the land.

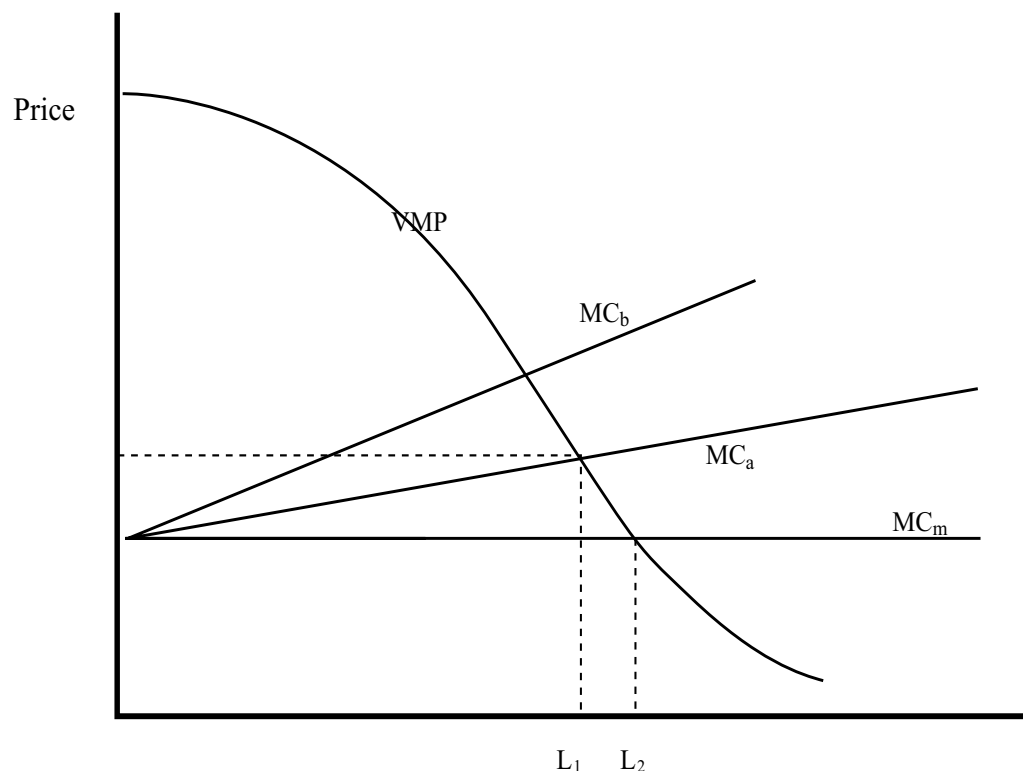
Munch (1976, p. 476) states that

"If the project has some minimum feasible size, the demand curve will be discon-

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<sup>2</sup> One prominent economist who disagreed with these ideas is F. A. Hayek, who thought that the "road to serfdom" involved social planners who try to maximize some concept of social welfare. Rather the purpose of government should be to supply public goods and to ensure personal freedom through a constitution of liberty and the rule of law rather than men. His proposal for "town planning" and use of eminent domain is interesting. He recognized that urban life is subject to market failure in the form of neighborhood effects – especially negative ones. His idea was to invest some portion of property ownership in a higher planning authority. This authority would be armed only with the power of eminent domain that he called expropria-

figure 1  
Quantity of Assembled Land.



tinuous at the corresponding number of parcels. If assembly of dispersed ownerships into one unit permits the internalization of externalities, there may be increasing returns to scale, implying an upward-sloping demand schedule over an initial range. The shape of the demand curve may affect the conclusion but not the method of analysis of the respective welfare costs of the free market and eminent domain.”

It is argued below that these considerations do indeed affect the conclusions.

The intersection of  $MC_a$  and VMP shows the efficient quantity of land assembly ( $L_1$ ), assuming that resources in the rest of the economy are allocated efficiently.<sup>3</sup> If there is competition among sellers on alternative sites, the market for land will produce the efficient outcome. However, if perfect substitutes for some parcels do not exist, then some sellers can capture monopoly rents. In addition, a holdout problem can exist if land is assembled sequentially (as is usually the case). If some parcels have already been acquired, then the owners of the contiguous parcels have a bargaining advantage

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tion at fair market value. Hayek (1960, pp. 350-1) put it as follows:

The main practical difficulties arise from the fact that most measures of town planning will enhance the value of some individual properties and reduce that of others. If they are to be beneficial, the sum of gains must exceed the sum of losses. If an effective offsetting is to be achieved, it is necessary that both gains and losses due to a measure accrue to the planning authority, who must be able to accept the responsibility of charging the individual owners for the increase in value of their property (even if measures causing it have been taken against the will of some of the owners) and of compensating those whose property has suffered. This can be achieved without conferring on authority arbitrary and uncontrollable powers by giving it only the right of expropriation at fair market value.

because of the high cost of the buyer's shifting to an alternative locale. If the net effect is to raise the supply curve above  $MC_a$ , then the market produces an inefficiently small assemblage of land. The holdout problem is a failure of the market to be efficient.

The private market may produce an inefficient outcome, but Munch (1976) argued that the use of eminent domain may not produce an efficient allocation either. If just compensation is taken to mean market value as established by actual market transactions, then  $MC_m$  will be seen as the supply curve. The buyer will opt for the quantity at which  $MC_m$  intersects VMP, producing an assemblage of land that is inefficiently large (L2). The welfare loss from this outcome may be larger than the welfare loss produced by the market failure. Munch (1976, p. 480) then points out that, under eminent domain, if the court awards an amount less than the seller's reservation price, the seller has an incentive to offer the buyer the amount  $MC_a$  minus  $MC_m$  to prevent the taking of the parcel. Then  $MC_a$  is the effective marginal cost of land to the buyer, and the efficient allocation is achieved. Munch (1976) reached the Coasian conclusion that, in the absence of transactions costs, the efficient allocation is achieved either with the free market or with eminent domain. However, in the presence of transactions costs, the relative efficiency of the free market and eminent domain is ambiguous.

As noted above, it shall be argued that the model shown in Figure 1 omits critical elements that represent the reasons for land assembly, namely economies of scale and agglomeration economies. The idea is that the output produced on the assembled land is greater than the sum of the outputs produced by the individual parcels, and that the value of the marginal product of land may rise in the relevant range. This notion has been explored in the context of land-use zoning by McMillen and McDonald (2002). Suppose that the supply curve of land is positively sloped, as Munch (1976) assumes. Land parcels in a particular locale are arrayed in Figure 2 in order of the reservation price. Given that the land parcels are arrayed in that order, the curve representing the value of the marginal product of each parcel (when added to the assemblage) can assume many shapes, including a jagged, discontinuous function. The shape of the VMP curve depends upon the nature of the development and the exact location of each parcel in the assembled development. Munch (1976), as shown in Figure 1, assumed that the VMP of the parcel was negatively related to its reservation price. In Figure 1 the first parcel assembled has a low reservation price and a high VMP, while the last parcel added has a high reservation price and a low VMP (equal to the reservation price). Under these assumptions the buyer can start to assemble land with the marginal cost less than the value of the marginal product. A profit is made even if the buyer is unable to assemble less than the efficient quantity of land. The critical feature of Figure 1 is that the VMP curve intersects the  $MC_a$  curve from above.

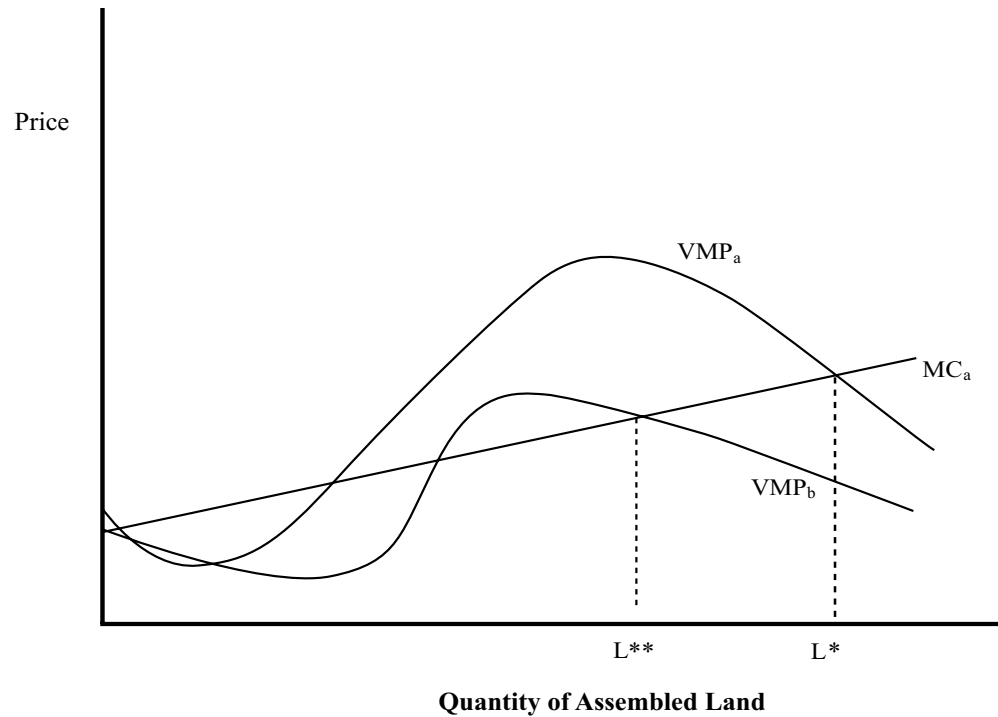
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In other words, the town planning authority would have no budget, just the power to purchase and sell property – including the use of eminent domain. Such an authority could undertake economic development projects in which property is purchased, sites prepared, and sold to developers. But only projects in which the authority at least breaks even would be undertaken. The authority would have no “higher” social goal than breaking even in its real estate transactions and other activities.

<sup>3</sup> The assumption of efficient allocation in all other markets is relaxed in the next section. It will be assumed that there is unemployment in the labor market and that local tax payers do not pay taxes equal to the cost of local public goods and services consumed.



figure 2  
Quantity of Assembled Land



One important case of the VMP curve is shown in Figure 2. In Figure 2 the value of the marginal product of assembled land starts at the  $MC_a$  level (equal to VMP in the current use), and rises slowly and then more sharply as more land is assembled. Two cases are shown. With curve  $VMP_a$  land assembly pays off once a sufficient quantity of land is assembled. The value of the total product of land exceeds the total cost of land when the area under the  $VMP_a$  curve exceeds the area under the  $MC_a$  curve. The efficient quantity of assembled land is found where  $VMP_a$  intersects  $MC_a$  from above ( $L^*$ ). However, with curve  $VMP_b$  land assembly does not pay enough, given its cost. The essential difference between land assembly in Figure 2 with  $VMP_a$ , compared to land assembly in Figure 1, is that assembling a portion of the efficient quantity will likely mean a loss for the buyer. The first parcels that are acquired cost more than the value of their marginal products, but these parcels are acquired because subsequent acquisitions will pay off with large VMP. In effect the buyer is faced with a risky “all or nothing” proposition. Given that many things can go wrong with the private market acquisition process, buyers and their financial backers may decide to forgo the opportunity represented in Figure 2. The market may fail because the risk is too great. But eminent domain can eliminate, or at least substantially reduce, the risk by guaranteeing that all of the required land can be acquired at a price that does not exceed the reservation prices of the individual parcels. As Munch (1976) has shown, land assembly under eminent domain should not go beyond the point at which the reservation price at the margin equals the value of the marginal product of land.

Therefore Figure 2 (with  $VMP_a$ ) depicts market failure and a case in which the benefits of land assembly exceed its cost. This is the case in which a little land assembly is not profitable, but a larger assemblage captures either economies of scale for an individual enterprise (e.g., a large production facility) or agglomeration economies that

benefit several enterprises (e.g., a shopping center). A useful test of market failure thus might include an examination of whether a little land assembly is not profitable, but a much larger assemblage is profitable. This test would be coupled with an examination of whether the buyer is having extreme difficulty assembling critical parcels in the private market. The argument for the use of eminent domain is considerably less compelling in the situation depicted in Figure 1. The buyer may not be able to achieve the efficient assemblage of land, but is not at risk of incurring a loss if the assembled land falls short of something close to the efficient quantity. Furthermore, the buyer is accumulating expected profits as land assembly continues, and therefore in principle has the means to continue with land acquisition. These suggestions amount to strict standards for the use of eminent domain for economic development purposes.

Eckart (1985) took the analysis of land assembly a step further by using game theory. Eckart assumes a situation in which land acquisition by the buyer is an “all or nothing” proposition and is clearly economically efficient. The buyer makes an offer to the land owners on an all-or-nothing basis, and the owners respond with counter offers. In Eckart’s model it is quite possible that the buyer rejects the counter offers and walks away from the project. One of Eckart’s results is that the counter offer will be lower if the owners collaborate on formulating that offer rather than engage in independent bargaining. A related result is that, with independent bargaining, the owner of the larger parcel of land makes a lower counter offer, because that owner has a larger impact on the price of the entire parcel. The owner of a small parcel makes a high counter offer because, as the owner sees it, this action will have little effect on the total purchase price. If all owners are small owners, the counter offers will likely be high, which will lead to a rejection by the buyer. Eckart’s approach is purely theoretical, but shows that market failure is a likely outcome provided that the project is subject to indivisibility (land of several owners must be acquired or there is no project), and if land acquisition becomes a bargaining game between the buyer and the multiple owners (especially owners of small parcels). Eckart (1985) did not discuss eminent domain, but his model clearly provides a rationale for use of the takings power. Strange (1995) extended Eckart’s model by adding a Bayesian model of the owners’ beliefs about the value of the project to the buyer.

Buchanan and Yoon (2000) take a somewhat different approach. Their analysis of the “anticommons” problem shows that, when several parties have the right to exclude someone from using a resource, that resource will be inefficiently utilized. Their model assumes that the user of the resource will have market power, and a Nash equilibrium is established.<sup>4</sup> Buchanan and Yoon (2000) used a Bertrand-type model where the parties with the right to exclude users, set the prices. A version of the Eckart-Buchanan-Yoon approach can be developed in reasonably simple form.

Following Eckart (1985), suppose that a potential buyer must acquire two adjacent parcels (i.e. the development is indivisible) and that he makes an offer of  $P^*$  for both parcels. Under economies of scale or agglomeration economies, the value of the two parcels to the buyer is  $\pi > P^*$ . The value of the parcels to the buyer is a random variable that is unknown to the owners. The two parcels are identical and each owner is offered  $P^*/2$ , an amount that is at least equal to the market value of each parcel if sold separately. Thus the allocation of the land to the buyer is clearly efficient. The parcel owners make independent counter offers. If the total of the counter offers is  $P^*$ , the buyer accepts with probability 1.0. If the total of the counter offers is greater than  $P^*$ , the probability that the

buyer will accept is less than 1.0, and if the total counter offer equals  $P$  the probability of acceptance is zero. While  $\pi$  is a random variable unknown to the owners, the owners are assumed to know that  $\pi$  cannot be greater than  $P$ .

Assume that the probability of acceptance by the buyer can be written as:

$$\theta = 1 - [(P_1 + P_2 - P^*)/(P - P^*)];$$

$$\text{Pr} = 1 \text{ if } (P_1 + P_2) = P^* \quad \text{Pr} = 0 \text{ if } (P_1 + P_2) = P$$

where  $P_1$  and  $P_2$  are the counter offers of owners 1 and 2.

Under Bertrand duopoly theory, each owner is assumed to formulate a counter offer by maximizing the expected value of the price received, which is written for owner 1 as:

$$\theta P_1 = P_1 - [(P_1 + P_2 - P^*)P_1]/(P - P^*).$$

Maximization with respect to  $P_1$  produces:

$$d(\theta P_1)/dP_1 = 1 - [(2P_1 + P_2 - P^*)]/(P - P^*) = 0,$$

so:

$$P_1 = (P - P_2)/2.$$

Owner 2 is identical to owner 1, so the counter offer from owner 2 is:

$$P_2 = (P - P_1)/2.$$

The Nash equilibrium solutions are:

$$P_1 = P_2 = P/3.$$

The sum of the counter offers is:

$$P_1 + P_2 = (2/3)P.$$

The sum of the counter offers must be equal to or greater than  $P^*$ . If the sum of the counter offers equals  $P^*$ , the buyer accepts. If the sum of the counter offers exceeds  $P^*$ , the probability that the offer is accepted by the buyer is:

$$\theta = (P/3)/(P - P^*) = 1/[3(1 - p)].$$

where  $0 < p < 1.0$  is  $P^*$  as a percentage of  $P$ . The probability of acceptance of the counter offers is 1.0 if  $p$  is greater than or equal to  $2/3$ , and falls to 0.33 as  $p$  falls to zero. The buyer can guarantee acceptable counter offers by making a high initial offer of  $P^* = 2P/3$ . Of course, a high initial offer requires that  $\pi$  (value to the buyer) be equal to or greater than  $P^*$ .

Following Buchanan and Yoon (2000) it can be shown readily that, with  $n$  identical owners, the sum of the counter offers (where  $i$  runs from 1 to  $n$ ) is:

$$\theta P_i = [n/(n+1)]P.$$

The case examined above has  $n = 2$ . As the number of identical owners increases, the sum of the counter offers gets larger, and the probability of acceptance by the buyer

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<sup>4</sup> The Nash equilibrium in the case of a common resource (many users with the right of no one to exclude them) results in over utilization of the resource.

falls. The equation shows that, as the number of owners becomes large, the sum of the counter offers will approach  $P$ , so the probability of acceptance by the buyer will approach zero. In particular:

$$\theta = 1/[(n+1)(1-p)].$$

This probability approaches zero as  $n$  get large provided that  $p < n/(n+1)$  (i.e., the initial offer by the buyer is small enough so that  $P^*/P$  is less than  $n/(n+1)$ ), which would appear to be a reasonable assumption. The probability that the buyer does not accept the counter offer is the probability that an inefficient allocation of resources occurs. Buchanan and Yoon (2000) refer to this outcome as the tragedy of the “anti-commons,” in which multiple parties each have the ability to exclude the buyer. Use of eminent domain can improve the allocation of resources in such cases.

## Benefits and Costs of Land Assembly

Now that the conditions for the existence of market failure have been discussed, the next task is to examine the costs and benefits of the proposed economic development project. This question has been addressed in McDonald (2001).<sup>5</sup> Assume that the economic development project involves acquisition of residential properties that will be replaced by commercial or industrial use. The potential benefits fall into three categories: land rent, local taxes in excess of the required spending on additional public services, and employment benefits. Local economic development policies have no net benefits if there is no unemployment, if users of local public goods pay taxes equal to the cost of those goods (as under the Tiebout hypothesis), and if land is already allocated to its highest and best use. In short, net benefits exist in a world with distorted markets. The annual net benefit for the community of allocating the land to industrial or commercial use in the presence of the local public sector is:

$$NB = (R_m - R_h) + T_m + fM(w+c-w^*)(N/L) - K.$$

The terms are defined as follows:

$R_m$  is the land rent for commercial/industrial use.

$R_h$  is the annual rent for the housing that is removed.

$T_m$  is the net contribution of the parcel in commercial/industrial use to the local public sector, respectively. Typically  $T_m$  is greater than zero (and the net contribution of housing is less than zero). The net (negative) tax contribution of the housing that is removed is not included because it is assumed that the people continue to reside in the community and pay taxes.

$N/L$  is the number of jobs created in the development project.

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<sup>5</sup> Rothenberg (1967) proposed a similar method for the evaluation of urban renewal projects, which did not include employment benefits because most projects involved building housing. The benefits in his formulation include the net change in land values plus the capitalized value of increased taxes generated. Weicher (1976) studied the fiscal profitability of urban renewal projects for municipalities and found that, as a whole, the 603 projects that had been completed as of 1973 were fiscally profitable because they were financed by federal matching grants of two-thirds of the project costs (75% for small cities). Weicher concluded that these projects as a whole were not economically efficient because, while the land value of the cleared land exceeded the acquisition cost by 29%, it took 7 years on average to complete the projects (a rate of return of 3.1%). Weicher (1976) provides a bibliography of urban renewal.

$f$  is the fraction of those jobs taken by original residents of the community.

$M$  is the local employment multiplier effect.

$w+c-w^*$  is the after-tax wage rate plus the reduction in income maintenance payments minus the after-tax reservation wage of workers who move into employment as a result of the project. (This factor plays a critical role in project evaluation, as is seen below.)

$K$  is the cost of the economic development program itself to the relevant unit of government.

This formula implies that a detailed cost/benefit study will be required. As noted above, some cost/benefit studies of the urban renewal program of the 1950s and 1960s were conducted, but no studies of the type contemplated here have been done.

## Preliminary Analysis of the Fort Trumbull Project

This paper concludes with a brief attempt to carry out its own instructions. This example is intended only to illustrate how the proposed method can be used. While some of the required data has been assembled, gaps in the available information exist. Arbitrary, but sensible assumptions have been applied to accommodate for these limitations.

Firstly, it is reasonable to conclude that the Fort Trumbull project is a case of market failure. The land assembly was undertaken by a public body that cannot operate in secret and required dealing with the owners of some 115 parcels. While the actions of the plaintiffs in the Kelo case (two residents and five non-resident owners) may, in part, have been a matter of (Hayekian) principle, the assessment which follows assumes that that eminent domain was an appropriate tool to use to implement the project, and that its application depends upon the estimated costs and benefits.

Data from the New London Development Corporation have been used to construct a rough cost-benefit analysis of the Fort Trumbull project. Since nearly all of the costs of the project are borne by the State of Connecticut, the State is the geographic area used for this analysis. The project was expected to generate 718 to 1362 jobs directly and 500 to 940 indirect jobs (a multiplier of 1.69). The reservation wage is assumed to be 84% of the wage rate in the area, based on an extensive review of the literature in McDonald (2001).<sup>6</sup> Alternative assumptions are employed for the percentage of jobs taken by residents of Connecticut. Bartik (1991) found that 23 percent of jobs created by economic development policies were taken by the residents of the metropolitan area in which the program is implemented. This measure is taken to be a low range estimate for the Fort Trumbull project and, as the relevant area in the Fort Trumbull case is a State, it is assumed that the upper range estimate is 46 percent (double the 23 percent found by Bartik (1991) for metropolitan areas). The average pay for employees in the New London metropolitan area for 2002 was \$36,450 (County Business Patterns). The project was also expected to generate 518 to 867 construction jobs (temporary employment estimated at one year in duration). Construction jobs in New London paid \$40,800 in 2002. It is assumed that any reduction in unemployment and welfare benefits is negligible. The average federal income tax rate was about 13 percent on incomes in this bracket in 2002 and the state income tax rate was 5 percent.

The project will generate additional income and sales tax revenue for the State. In addition to the income tax rate of 5 percent, Connecticut has a sale tax rate of 6 percent,

and it is assumed that 25 percent of after-tax income is spent on goods subject to the sales tax. It is not clear how much of this additional revenue will be needed to provide public services to the additional residents, but it is likely that much of the revenue is a windfall for the State. An assumption of a 50 percent windfall for the State from the income tax and sales tax is used for the sake of this example. No attempt is made to estimate the increase in corporate income tax revenue.

Annual property tax revenues were projected to increase by \$680,544 (from \$569,299 to \$1,249,843) but this figure appears to be much too low. However, as was pointed out in the previous section, the correct tax figure to use is the net contribution of the project to the local public fisc (taxes minus the cost of providing services to the area). The relevant local public fisc is the State of Connecticut and its municipality of New London. Total private investment in the Fort Trumbull project is estimated to be \$180 million, which would generate \$3.78 million annually in property taxes with a real property tax rate of 2.1 percent of value.<sup>7</sup> The estimated increase in property tax revenue is \$3.21 million.

What is the cost of providing public services to the Fort Trumbull project area? In New London 50.8 percent of total expenditures are for education. As it happens, inter-governmental revenue for New London from the State is 50.5 percent of total revenue, so in effect the State pays for the New London schools. Therefore, on average, local taxes in New London pay for the other local public services. As the marginal cost of these services are unknown, it is assumed that the marginal cost is equal to 50 percent of the average cost. This means that 50 percent of the additional \$3.21 million in local property taxes will be used to provide services to the Fort Trumbull area.

Given the data, a range of present value estimates of the benefits of the Fort Trumbull project to the State of Connecticut are shown in Table 1. A real risk-adjusted interest rate of 6 percent is assumed. Four alternatives are shown based on low and high values for jobs created, and two assumptions regarding the percentage of jobs taken by Connecticut residents (23 percent and 46 percent). In Table 1 the Low Estimate refers to the case of 718 permanent jobs and 518 temporary jobs and the High Estimate pertains to the case of 1362 permanent jobs and 867 temporary jobs.

The increase in land values is not known, but it is assumed that land is 20 percent of the value of property and that the property tax rate is 2.1 percent of value. An increase in property taxes of \$3.21 million per year means that \$642,000 of that increase comes from the increase in land value. This in turn means that the value of land has increased by \$30.57 million ( $\$642,000/0.021$ ).

A five year delay in the materialization of benefits after the expenditure (reducing the benefit/cost ratio) is assumed.

The total projected cost of the Fort Trumbull project was \$84 million. The State of Connecticut contribution was projected to be \$78 million, with the City of New London providing \$4 million, and the federal Economic Development Administration (EDA)

**“...it is reasonable to conclude that the Fort Trumbull project is a case of market failure.”**

<sup>6</sup> The reservation wage is the wage that an unemployed worker will accept rather than remaining unemployed. Empirical studies have shown that the reservation wage falls with the length of unemployment and the local unemployment rate. In short, the benefits of increasing employment may depend critically upon local labor market conditions and characteristics of the unemployed workers who are hired as a direct or indirect result of the project. More empirical studies of reservation wages are needed to facilitate the evaluation of local economic development projects.

table 1

Estimated Benefits and Costs  
of the Fort Trumbull Project  
(\$ million).

		Low Employment Estimate		High Employment Estimate	
Benefits	<i>Permanent Jobs</i>	718	718	1362	1362
	<i>Temporary Jobs</i>	518	518	867	867
	% of jobs retained in CT	23%	46%	23%	46%
	Employment	\$23.32	\$46.65	\$44.20	\$88.00
	Property Tax	\$26.57	\$26.57	\$26.57	\$26.57
	Sales Tax	\$4.75	\$4.75	\$8.97	\$8.97
	Income Tax	\$19.32	\$19.32	\$36.45	\$36.45
	Land Value	\$30.57	\$30.57	\$30.57	\$30.57
	Total	\$104.53	\$127.86	\$146.76	\$190.56
Costs	PV of Total	\$78.11	\$99.54	\$109.67	\$142.40
	Project Costs	\$84.00	\$84.00	\$84.00	\$84.00

adding \$2 million. From the perspective of the City of New London, the Fort Trumbull project is a great deal. However, the total cost for the State and the City is \$82 million, which falls below three of the four benefit estimates shown in Table 1.

The cost-benefit analysis is based on several critical factors. Firstly, employment increases are valued only at the actual wage rate minus the reservation wage. The real risk-adjusted interest rate is assumed to be 6 percent. The benefits are indeed risky, so 6% may be rather low. The costs of providing public services (both local and state) to the Fort Trumbull project area and the rest of the State are also unknown.

While the estimates provided by the New London Development Corporation produce rough benefit estimates that appear to be commensurate with the cost of the project, a failure of any of the major benefits to materialize will put the project in an unfavorable light. On the other hand, the New London Development Corporation hopes that the Fort Trumbull project will be the catalyst for the redevelopment of a major portion of the City of New London. No attempt has been made to account for this possibility.

## Conclusion

The decision in *Kelo v. City of New London* has generated controversy over the definition of public use (which the majority of the Court now equates to public purpose) and the use of eminent domain for local economic development projects. The use of the economist's dual tests for the efficacy of public intervention in the private economy—existence of market failure (similar to the “but for” test) and benefits to society in excess of costs—can be one approach to the resolution of the issue. Very rough and preliminary examination of the Fort Trumbull project in New London indicates that there was market failure, and that the benefits of the project to the State of Connecticut appear to be commensurate with the costs. Others are invited to join the debate and refine the analysis.

<sup>7</sup> The actual mill rate in New London was 35 per \$1000 of assessed value in 2002. The statutory assessment ratio in Connecticut is 70 percent, so the “equalized” mill rate would be 24.5 per \$1000, but the actual assessment ratio fell somewhat short of 70 percent, so the State of Connecticut reports an equalized mill rate of 21 for New London.

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