

The Economics of a Linkage Tax

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Abstract

Linkage is a term sometimes applied to municipal programs that place a special assessment on office development and use the revenues collected to finance additions to the local stock of low income housing. The microeconomic effects of a linkage assessment on new construction, on the value of previously built structures, and on the municipality's revenue generation are analyzed. The reasons why Boston and San Francisco might have chosen to use linkage as a special assessment on relocating businesses while other cities choose to subsidize new businesses are examined.

Introduction

Linkage is a term sometimes applied to municipal programs that place a special assessment on office development and then use the revenues collected to finance additions to the local stock of low income housing. Proponents of linkage programs claim impressive accomplishments: San Francisco collected \$21 million and helped finance construction of 3,000 public housing units in three years; by 1985, Boston had signed contracts valued at \$29 million with developers who would pay the linkage assessment. Other cities (i.e., Chicago and Hartford, Conn.) have been studying the idea of linkage. In theory, a linkage program generates a cross subsidy from office development to development of, and thus an increased local supply of, low and middle income housing. Analysis, however, suggests that the impressive gains in public housing construction and its financing cited by Boston and San Francisco are only the most obvious effects of linkage.

This paper studies the effects of a linkage assessment on property tax revenues.¹ Although the subsidization of public housing is a vitally important concern of many economists, that is not the focus of this paper. The focus is revenue generation. Analysis suggests that a linkage assessment, depending on demand and supply elasticities, increases property taxes collected from linkage-

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¹Sales tax receipts for a given jurisdiction also may decline as a result of induced business relocation.

type structures, including those that are only good substitutes for structures actually assessed the linkage tax. Furthermore, depending on the stock of linkage-type and nonlinkage structures and their demand elasticities, the total property taxes in the municipality may increase.

Linkage Programs

Boston and San Francisco respectively administer linkage through the Boston Redevelopment Authority and the Mayor's (San Francisco) Office of Housing and Community Development. Linkage technically is not a tax; instead it is an assessment imposed in conjunction with zoning regulations.²

Linkage is intended and claimed by its advocates to assure that developers of new office buildings, as employment generators, share in the responsibility for increasing and preserving a city's housing stock, particularly its affordable housing. The claim made is that local office development creates new low paying jobs, leading to a special need for low income housing to which the local market fails to respond.³ Linkage is an effort to internalize to the employer (developer) the housing externality. In Boston [10], analysis of employment profiles indicates that 55 percent of office workers are paid at salary levels that constitute a low or moderate income household; for retail businesses, 80 percent of office workers are paid at the low or moderate income levels; and the percentages for hotel and institutional employment are respectively 59 percent and 77 percent. In San Francisco, the Board of Supervisors [3, p. 9] claims in defense of linkage that

there is a causal connection between such developments and the need for additional housing in the City, particularly housing affordable to households of low- and moderate-income.⁴

²To the economist, this distinction between an assessment and a tax seems an insignificant nuance; but that nuance legally may be significant; for example, in California Proposition 13 mandates no new *ad valorem* taxes but does not affect new assessments.

author does not necessarily accept this claim of a special employer responsibility as justified; however, this issue and related equity concerns are not the focus and thus not addressed in this paper.

⁴This claim is interesting, given San Francisco's exclusion of retail business from its linkage tax and assuming that retail business there, as in Boston, has a workforce of which 80 percent is paid at the low or moderate income level.

Linkage requires commercial developers either to pay a sum of money or to provide additional low or moderate income housing units in proportion to the size of planned new development or to provide substantially rehabilitated housing. In Boston, linkage is collected from any development project in excess of 100,000 square feet that requires a discretionary zoning action, e.g., variance, nonconforming use, or planned development area designation. Office, retail business and service, institutional and educational, and hotel and motel (but not including apartment hotel) are types of development subject to linkage. Development that is wholly owned by a public agency is not subject to linkage. In San Francisco, linkage assesses development of office use space that includes professional, banking, insurance, management, consulting, technical, sales, and design or the office functions of manufacturing and warehousing businesses, but excludes retail uses, repair, any business characterized by the physical transfer of tangible goods to customers on the premises, whole shipping, receiving and storage, and design showcases or any other space intended and primarily suitable for display of goods.

Boston's plan mandates either a payment exaction equal to \$5 per square foot of floor area in excess of 100,000 square feet or the creation of housing units for occupancy exclusively by low and moderate income residents of the city. The number of housing units that must be built is proportional to the payment exaction. The payment exaction is made in 12 equal annual installments, with the first installment due upon issuance of the project's certificate of occupancy or two years after the building permit is obtained. San Francisco's program is formula based. The developer complies with linkage through formulas that set the required fee to be paid, the housing units to be developed, or a combination thereof. The formulas are:

Net Addition Gross Sq. Ft. Off. Space X \$5.34 = Fee

Net Addition Gross Sq. Ft. Off. Space X .000386 = Units

Should a developer plan to comply through a combination of housing units and the fee, the exchange rate is \$13,834.20 per unit.⁵ An effort is made (or so it is claimed) to ensure that housing units used to comply with the linkage exaction are net additions to or substantial rehabilitations of the local housing stock.

⁵For a business already operating in San Francisco, the calculation of net addition of gross square feet of office space is based on the formula: (Net Addition Gross Sq. Ft. Office Space) - (No. of Employees Working in City X 268 sq. ft.) = Total Net Gross Sq. Ft. Office Space.

Revenue Implications

In Boston (after the first 100,000 square feet of floor space) and San Francisco linkage revenues are proportional to the size of the linkage-type development. Effectively, the linkage assessment raises the marginal cost per square foot of development.⁶ But linkage also affects property tax revenues. This is the case regardless of whether the linkage assessment is paid as a fee or as an obligation to create additional low income housing units because both forms of payment vary positively with structure size.

To understand the effect running from a linkage assessment to property taxes, consider that property taxes are a positive function of the market value of property (land plus structure). This statement holds as long as property assessments track a parcel's market value. For any constant millage rate, property tax revenues vary proportionately with changes in market value.

Furthermore, consider a flow model for newly developed office space that distinguishes between two structural categories. One structural category includes all newly developed structures subject to the linkage assessment; these are termed *linkage structures*. A second category includes all other newly developed structures not subject to linkage, hereafter termed *nonlinkage structures*. Additionally, the model distinguishes between developers and contractors; developers demand structure supplied by contractors. Figure 1 disaggregates total market demand for new structures, D_T , into demand for linkage structures, D_L , and demand for new structures not subject to linkage, D_{NL} .⁷ D_T equals D_L plus D_{NL} . Price along D_L represents the cost paid by developers to contractors for structure. Given a supply of structures, S , and the prelinkage demand, D_T ,

⁶Marginal costs are unaltered only if additional housing units would have been built by the developer in quantity and characteristics as to comply fully with linkage. In this case, linkage has no direct impact on housing construction.

⁷The reader will realize that in another section the paper distinguishes between structure demanders operating in the local market and those operating in the national market. This latter group would have a more elastic demand for structure, possibly even perfectly elastic, than would demanders selling in the local market. But it is this author's belief that for a typical city, the structure demanders operating in the local market make up a significantly larger portion of the structures market than those in the national market. The author believes, therefore, that the issue of some demanders having a possibly infinitely elastic demand is not particularly significant. As noted later, this statement may not describe Boston, San Francisco, or New York well.

the initial equilibrium price is P . At price P , Q_L and Q_{NL} units respectively of linkage structure and nonlinkage structure are developed.

Upon enactment of linkage, D_L shifts to D'_L . For the same office space, a developer now pays the contractor an amount less the cost (value) of linkage per unit. Postlinkage demand therefore shifts to D'_T , the summation of D'_L and D_{NL} .⁸ The price along D'_L is the direct cost of structure and does not include the linkage assessment. This distinction is necessary, given the interpretation of S as the contractors' flow of new structures. The vertical distance between D_L and D'_L equals the value of the linkage assessment per square foot. There emerges a new equilibrium with both lower construction cost, P' , and quantity of floor space. Linkage structures now have the net cost P'' per square foot which equals the cost of construction, P' , plus the linkage assessment. The price of nonlinkage construction falls to P' but without any other cost factor such as the linkage assessment. This lower price with D_{NL} unchanged increases development of nonlinkage structure to Q'_{NL} .

This conclusion that the value per square foot of nonlinkage structure declines is dependent on the assumption of no cross effects between linkage and nonlinkage structures. Cross effects may increase the market value of those nonlinkage structures that are substitutable for linkage structures. For the Boston case at least, there is the strong possibility of substitution between linkage and nonlinkage property even for new structures. The Boston program applies only to structures over 100,000 square feet; it seems likely that developers would be able to substitute structures under 100,000 square feet in some cases. In terms of Figure 1, a shift outward in demand for new nonlinkage structures would accompany the shift downward in demand for new linkage structures. If this occurred, total demand for new structures would decline by less than shown in the figure. As a result, the equilibrium contractor price for both types of structures per square foot would fall less. Such substitution among new structures seems less likely in San Francisco, where linkage property is distinguished from nonlinkage property by prospective use. Any net additional residential construction induced by linkage would have a similar effect on D_{NL} and the new equilibrium.

⁸The paper ignores cross effects, treating instead the two demands as independent. Moreover, the paper makes the robust assumption that no net new residential housing is produced as a result of linkage. Hence, D_{NL} does not shift. Were linkage to induce new development of nonlinkage structures, D_{NL} would shift to the right, serving to shift D'_T toward D_T . Alternatively, residential structures may be excluded from Figure 1 on the basis that they are not likely to be part of the contractor supply curve with the same price per square foot as commercial and industrial construction.

To this point, the analysis has omitted the possibility that an existing structure or location in a nearby municipality that does not impose a linkage assessment is a good substitute for a linkage structure in the central city.⁹

Existing structures (linkage-type structures), if substitutable for newly constructed linkage structures, would have a market value of P'' (Figure 1). Should a firm desire a new location within a linkage assessing municipality, a linkage-type structure becomes an alternative to new construction. New construction costs P'' in total per square foot and sets the opportunity cost per square foot of existing substitutes. Provided the market is competitive, P'' becomes the market value per square foot of linkage and nonlinkage structures. The municipal government now collects the linkage assessment from new linkage structures and collects an increased property tax from linkage-type property. Note that a linkage structure becomes a linkage-type structure in future tax periods, and that the linkage type property tax effect occurs only gradually as these properties are periodically reassessed.

The market value ($P'' \times Q'_L$) of linkage development is greater than, less than, or equal to its prelinkage equivalent ($P \times Q_L$) depending on the demand elasticity. That linkage development, however, sets the opportunity cost of linkage-type structures. The stock of these linkage-type structures almost certainly will dominate new construction. This phenomenon becomes particularly relevant. Even if property taxes collected from the linkage structures are smaller than they would be in the absence of linkage, total property taxes should increase because the total assessed value for linkage-type structures increases. Therefore, property taxes from it rise by the factor $[(P''-P)/P]$.

What happens to property tax receipts from nonlinkage property? Property taxes assessed, at a constant millage rate, on the stock of nonlinkage property fall due to its lowered value (assessed value based on market decline from P to P'). Of course, the increased flow of this property, $Q'_{NL} - Q_{NL}$, contributes additional revenues. But again, the stock should dominate the flow. Hence, the tax revenue reduction from the stock likely exceeds the gain from the increased flow, resulting in a net decline in property taxes from nonlinkage structures relative to the level before linkage. This decrease, however, is mitigated by reappraisal lags.

The net effect of linkage on property tax revenues is uncertain because net property taxes likely increase from new and existing linkage structures and likely decrease from nonlinkage structures, assuming no interdependencies and no

⁹The author is thinking of the suburbs surrounding a major city such as Boston or San Francisco that are separate political municipalities. For expositional simplicity, the assumption is maintained that it is the central city only that imposes linkage.

possibility of conversion. If the value of new and existing linkage property is substantially greater than the value of new and existing nonlinkage property (seems likely in major cities such as Boston, San Francisco or New York City that are dominated by businesses producing for national markets), total property tax receipts would increase. Certainly static revenue projections based on continuation of prelinkage trends underestimate net tax receipts from new and existing linkage property while overestimating receipts from nonlinkage property.

Linkage becomes attractive to a municipal government should it perceive the above suggested induced changes in revenue flows and believe that net property tax revenues will increase. The government then could approve linkage legislation, take credit for helping the poor via the linkage subsidy to low income housing, and collect increased property taxes without raising assessment or property tax rates.

Critical to these conclusions are the assumptions that the supply of linkage-type structures is fixed, and that suppliers of construction only switch between construction of linkage and nonlinkage structures within the linkage imposing jurisdiction. Realistically, construction resources should be highly mobile between the central city and its suburbs. Moreover, suppose that structures in the suburbs are substitutes for central city linkage structures. If there exists a high degree of substitutability between linkage and linkage-type structures in the central city and the suburbs, then the value of linkage and linkage-type structures may rise very little following imposition of the linkage assessment. A business desiring additional or new linkage property can avoid linkage by relocating to the suburbs. As a result, structure prices in the central city will rise minimally; instead, linkage structures will migrate to the suburbs, resulting in increased structure prices in the suburbs. The more substitutable and readily available is the suburban supply of alternatives, the smaller will be the premium paid in the central city for linkage-type property. A high elasticity of supply and a highly competitive market implies that no linkage structures will be built in the central city because businesses have an alternative and, therefore, will refuse to pay a linkage premium. Due to reduced development, the center city's collection of linkage assessments then declines, and property tax revenues decline over time from what they would have been. The migration reallocates certain business to the suburbs. This, in turn, should increase suburban property tax revenues. This is a significantly more pessimistic prediction for central city revenues under linkage than that in the initial analysis.

Again, the conclusion depends upon the locational substitutability. Although substitutability likely is substantial for many urban areas, for others it may not be substantial. Should the central city enjoy some unique locational advantage over its suburbs, locational substitutability may be low. Also,

locational substitutability likely varies among businesses. Where locational substitutability remains particularly low, the initial analysis applies effectively only with linkage, nonlinkage, and linkage-type property existing. This is likely the situation for Boston, San Francisco, and other major and geographically large central cities.¹⁰ Such cities, should they also suffer severe low and lower income housing shortages that may influence a businesses' willingness to remain or to relocate to them, may find linkage particularly attractive.

The degree of substitutability reference linkage structures varies between extremes depending upon many factors, the alternative results can be viewed best as polar cases with a continuum existing between the extremes.

The reader should recognize that, as shown in Figure 1, developers do not bear the full incidence of the linkage assessment. Instead, the market shifts a portion of the assessment backward to contractors and forward to consumers, depending on the elasticities of demand and supply in the respective markets. Forward shifting of linkage (P' plus the linkage assessment) raises the price of output produced from linkage-type structure. On the other hand, forward shifting of any price decrease benefits consumers of products using nonlinkage structures.

Taxation Versus Subsidization of New Business

Why do some cities such as Boston and San Francisco impose a linkage assessment on new business while other cities subsidize new business?

One explanation with special application to Boston (but likely also applicable to other cities, especially where business relocation to the suburbs is unlikely) is that linkage changes the relative tax receipts between linkage and nonlinkage sources. The change occurs through the relative increase in value of linkage-type structures as assessment practices and millage rates are maintained. Due to the linkage effect on property value, property tax collections from linkage-type structures increase while collections from nonlinkage structures decrease. For given assessment and millage rates, the tax on linkage-type structures increases as the tax on nonlinkage structures decreases (due to the decline in market price). The change in market value resulting from linkage is particularly relevant to Boston because of a 1978 court mandate that all Massachusetts municipalities equalize assessment rates on all classes of property. The mandate imposed a major shift of the property tax burden from commercial and industrial property to residential property. Effectively, the court

¹⁰Electronic communications may be changing the relevance of geographical proximity.

ordered that taxes on nonresidential property be lowered. By enacting linkage, which raises the market value on all linkage-type property, however, Boston officials could equalize assessment and millage practices on all property while partially circumventing the court's mandate.¹¹

Another explanation applies to linkage in Boston and especially to San Francisco. Linkage in San Francisco excludes retail and repair businesses. These businesses predominantly serve the local populace. (In Boston, linkage includes retail establishments.) Should businesses typically occupying linkage structures be less sensitive than average to changed tax rates in location and building decisions, then a linkage strategy increases the municipality's linkage and property tax revenues. This seems to describe firms apt to occupy linkage-type structures--large financial and commercial firms serving a regional or national market. Other cities, especially those nearby but not assessing linkage, may be poor alternatives, given relocation costs. Moreover, linkage firms, by virtue of their national competition, are unlikely to be able to shift the linkage cost forward in the form of higher prices. As a result, local buyers of these firms' products would not bear the linkage burden through higher costs. But for firms in primarily local competition, cost shifting likely would occur.

A version of the above explanation related to the effective tax concept involves the assumption that property taxes are proportional to market value. Many U.S. municipalities likely maintain reasonable proportionality over several year intervals; however, long-run proportionality in San Francisco and other California cities was overturned by that state's passage of Proposition 13 in 1978. Afterward, the expectation was that assessment rates would lag market value without offsetting millage rate adjustments if real estate inflation exceeded 2.0 percent per year.¹²

Proposition 13 lowered California's average property tax from 2.5 percent (or .5 percent above the national average) to 1.0 percent of market value. As a result, San Francisco changed from a high property tax to a low property tax

¹¹The court allowed Boston, once it went to full value assessment, to classify property and levy higher tax rates on business than on residential property.

In San Francisco, one also might point to constraints on local tax revenues produced by so-called Gann limits; the linkage assessment may circumvent these limits. Likewise, certain downtown businesses, most notably banks and insurance companies, escape the city's payroll tax because of restrictions on local taxing powers in the state's constitution. The linkage assessments may be seen as compensation for this anomaly.

¹²Specifically, assessed values were limited to 1.0 percent of a property's value in 1975-76 or of its market value at the time of transfer for property exchanged after 1976.

municipality. In addition to this static effect, there was a dynamic effect; Proposition 13 eliminated proportionality during any periods in which nominal property values increased more than 2.0 percent per year regardless of cause by limiting assessment increases to 2.0 percent per year except when property changes hands. Since 1978 effective property taxes on San Francisco property necessarily fall whenever property values rise annually by more than 2.0 percent (provided ownership is unchanged). For several years before Proposition 13, residential property values in San Francisco rose much faster than did commercial property values. This shifted more of the property tax burden to residential owners and away from commercial property owners. One interpretation of Proposition 13 is that it reversed this trend. Of course, if residential property is transferred more frequently on average than is commercial and industrial property, then the revision of assessed value at transfer may cause the former values to continue to rise relatively faster than the latter.

With real property taxes lowered below the national average and expected to decline further due to inflation, a development boom began in San Francisco. Proposition 13 enhanced San Francisco's and California's general desirability as a business location. The lower property taxes raised the net return on capital relative to that outside California. As a result, the market relocated capital to San Francisco (as well as other California cities). Although some benefits from Proposition 13 passed to local residents, a large share of these benefits were retained by the owners of capital, especially in the case of nationally oriented businesses. Moreover, because property owners tend to be upper income individuals, the benefits from Proposition 13 tended to be distributed regressively.

In reality, the regressivity depends upon the tax-shifting effects. For San Francisco businesses competing only within California, tax shifting likely shifts a portion of Proposition 13's benefits forward to consumers through lower prices. Shifting backward to labor and capital inputs also may occur. California firms in competition with non-California firms, however, do not need to lower prices so that none of the benefits from reduced local taxation accrue to consumers--even local consumers. The owners of local firms, when selling in national markets, capture the benefits with the exception of benefits shifted backward to inputs through increased demand and higher prices and wages. Businesses competing locally are likely to be retail and, therefore, in San Francisco not subject to linkage. Businesses competing in national markets are apt to be wholesale or service-oriented when located in San Francisco and subject to the linkage assessment.

The effect of Proposition 13 in San Francisco and the similar effect in Boston, where property taxes do not track market values, likely explains each city's imposition of linkage. The linkage assessment on a particular type of new

business structure returns to the municipal government, from owners of these and substitute structures, a portion (but not all) of the benefits from the reduced or declining real property taxes. That is, the net gain from property tax reduction exceeds the linkage tax. Developers and owners of capital continue to be attracted to the location. Moreover, if new construction is a small fraction of the existing stock, the linkage assessment serves to enhance the value of existing structures. Thus, the rise in market price of all linkage-type structures creates a wealth effect for owners that is taxed only at about 1.0 percent (effective property tax rate).

Conclusion

Linkage impacts not only new structures on which it is collected, but serves to raise the value of existing linkage structures while lowering the value of nonlinkage structures. The linkage assessment seems designed to impact primarily local firms that produce for nonlocal markets and for which the suburbs or another city are not particularly good substitutes. Linkage exempts those local firms serving mainly the local market and for which the suburbs may be a good substitute location. Such a distinction is reflected by the Boston and San Francisco linkage statutes. Boston excludes from linkage assessment businesses with less than 100,000 square feet of floor space, and San Francisco excludes from linkage retail and repair businesses and businesses that transfer tangible goods to customers on the premises. Thus, linkage becomes a means for municipal government to alter property tax shares among businesses. Moreover, the burden of linkage likely offsets some of the advantages accruing from Proposition 13 and similar mandates, especially during real estate booms.

Municipal governments in cities particularly attractive to regional and national businesses should find the linkage assessment attractive--Chicago and Hartford are considering linkage. To justify the linkage assessment, government claims compassion for the poor via a subsidy to low income housing; the general voter perceives the subsidy as provided at someone else's expense; meanwhile, government is acting indirectly to raise property tax revenues from all linkage property and possibly from all property. This latter effect makes linkage especially attractive to government as a means of offsetting property tax rollbacks.¹³

¹³Proposition 2-1/2 in Massachusetts limits not only the effective property tax rate, but also the amount by which a city's property tax revenues can grow each year, excluding new development.

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Figure 1



