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WORKING PAPER SERIES

WORKING PAPER NO. W03-003

THE EFFECTS OF PREVAILING WAGE REQUIREMENTS ON THE COST OF LOW-INCOME HOUSING

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September 2003

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September 2003

Abstract

Recent legislation expands the coverage of prevailing wage regulations in California. This paper estimates the effects of these regulations on the costs of subsidized housing constructed for occupancy by low-income households. Econometric evidence based upon new construction projects in California, subsidized by tax credits in the late 1990s, demonstrates that housing costs are substantially higher under prevailing wage regulation. Moreover, we demonstrate that these cost increases do *not* arise because projects paying prevailing wages tend to be located, for other reasons, in higher cost housing markets.

Estimates of the additional construction costs attributable to prevailing wages vary between 9 and 32 percent under the most credible statistical models, which take into account geographical location as well as project attributes, financing, and developer characteristics.

We estimate the effect of uniform imposition of these regulations on the number of new dwellings for low-income households produced under the tax credit program. Under reasonable conditions, our mid-range estimate of the prospective decrease in dwellings subsidized by the tax credit program alone exceeds 2,600 per year.

For discussion and criticism only. Comments welcome.

JEL Codes: D24, H23, J51
Keywords: Prevailing wages, housing costs

This research is supported by a grant from the U. S. Department of Housing and Urban Development and by the Berkeley Program on Housing and Urban Policy.

I. Introduction

In October 2001, following heated political debate, the California legislature voted to expand the application of the state's "prevailing wage" laws to many development projects previously not covered, including housing subsidized with public funds and even some private residential construction projects. The passage of Senate Bill 975 (SB 975) amended the California Labor Code[1] by redefining "public funds" more broadly, and it brought to the forefront of the policy debate a consideration of the costs and benefits of prevailing wage laws, specifically in the context of subsidized housing for low-income households. Since prevailing wage rates are almost invariably higher than market wages, the new law may significantly increase construction costs in affected projects, perhaps to the point that they will no longer be financially feasible for their developers. Although SB 975 included short-term exemptions for housing projects planned before its passage,[2] in the longer term, the legislation may affect more and more residential development in California, including many housing projects targeted towards low- and moderate-income families.

While this specific piece of legislation applies only to California, the impact of prevailing wage policy is of national importance, specifically in relation to the Davis-Bacon and Related Acts. Several studies have estimated the impact of the provisions of

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[1] SB 975 amended Section 1720 of the California Labor Code, which defines guidelines for the application of prevailing wages on publicly funded projects.

[2] In addition to the temporary exemptions for subsidized housing projects planned prior to the new legislation, other exemptions were granted subsequently (e.g., excluding self-help housing and some transitional housing projects from prevailing wage requirements). In addition, certain types of public funding do not necessarily require prevailing wages (for example, tax credits). Most low-income housing projects rely upon multiple funding sources, however, and those including nonexempt public funds may face a new obligation to pay construction workers prevailing wages as a result of SB 975.

the Davis-Bacon Act on the cost of government contracts, but there is no hard evidence on the impact of prevailing wage policy on housing or residential construction costs.

While some supporters argue that Davis-Bacon and other prevailing wage laws increase the efficiency or stability of the construction labor markets, these claims remain unsubstantiated. Rather, redistribution of income appears to be the ultimate goal of these laws (Allen, *et al.*, 1983, Goldfarb and Morrall, 1981).

This paper presents new evidence on some of these issues. It estimates the effect of prevailing wage requirements on the cost of construction of state subsidized low-income housing in California. The evidence is based upon micro data on newly constructed units funded in part by the Low-Income Housing Tax Credit Program (LIHTC) from 1997 to 2002.

The results indicate that the prevailing wage regulations in place increased the costs of these projects by at least 9 percent and by perhaps as much as 32 percent. The most credible estimates suggest cost increases of 10 to 20 percent. These effects are precisely measured, as a statistical matter, and the estimates are quite robust to variations in the statistical models that form the basis for analysis. The results are robust across a variety of cost measures, and an analysis of potential sample selectivity increases our confidence in the numerical results. There can be little doubt that prevailing wage requirements in California substantially increase the cost and decrease the supply of dwellings available to low and moderate income households.

Section II below provides a brief review of the legislation that requires some contractors pay "prevailing wages" to employees on specified projects. Section III reviews the rather scanty literature on the economic effects of these regulations. Section

IV describes the original research that forms the contribution of this paper. Section V is a brief conclusion.

II. History of Prevailing Wage Legislation

The Davis-Bacon Act (the "Act") was intended to preserve jobs and wages for local construction workers. Traditionally, the federal government awarded construction contracts to the lowest bidder. The Act sought to limit a monopsony contractor's ability to lower wages for its workers in order to win contracts, or else to discourage non-local firms from competing for government contracts and driving down wage rates.

The Act was passed in 1931, at the nadir of the Great Depression, when Congress was facing mounting pressure to preserve jobs and wages. Competition from an influx of new workers, especially from blacks and recent immigrants, threatened local construction workers. Labor unions called upon Congress to intervene. The Davis-Bacon Act went into effect just prior to the implementation of the Works Progress Administration (WPA), which soon thereafter accounted for more than half of all public spending for construction in the U.S.

The Act is administered by the Department of Labor (DOL), which defines prevailing wage rates by job classification as those paid to the "majority" of similarly situated workers in an affected project's geographic area. In the event that there is not a majority paid the same wage rate, the prevailing wage is the rate paid to the "greatest number" of laborers, provided the greatest number constitutes thirty percent of those employed. In the event that less than thirty percent of those employed receive the same wage rate, the average wage becomes the regulated rate.

This definition (and the fact that the DOL considers wage rate variations down to the penny) ensures that the "prevailing wage rate" is almost invariably the wage reflected in union collective bargaining agreements. In practice, prevailing wages *are* union wage rates.

After passage of the federal law, many states (and even some localities) adopted "little Davis-Bacon Acts," which required prevailing wages to be paid on state or locally funded construction projects.[3] Most of the state legislative activity surrounding prevailing wage laws occurred within the first decade or so following passage of the Davis-Bacon Act, and 27 states had passed prevailing wage laws by 1945. This number slowly rose to a maximum of 41 states in 1973. In the late 1970s and early 1980s, following national debate about Davis-Bacon (and a critical study by the General Accounting Office), several states repealed prevailing wage laws.

California's prevailing wage law was passed in 1931, the same year as the federal act, and a 1995 study of state prevailing wage laws found it to be one of the most stringent in the nation (Thieblot, 1995). It extends to areas beyond the federal law, such as demolition work, site and sewer construction, and some janitorial and hauling work. The administration of the California statute falls under the jurisdiction of the state's Department of Industrial Relations (DIR). Determination of the regulated wage rates is left to the discretion of the director of the DIR.

California's determination of "prevailing wages" is similar to the federal standard, in that it effectively employs the modal wage rate. This usually results in the selection of a

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[3] Seven states enacted prevailing wage laws prior to passage of the federal law, though the original character of these state laws was weaker than the federal Davis-Bacon Act.

negotiated wage rate (under a union collective bargaining agreement) since free market wages are unlikely to be identical to the penny.

Local prerogative on construction wage regulation varies within the state. By 1995, two California localities had found court approved ways to pass laws that freed them from paying prevailing wages on local construction projects, while a handful of others imposed requirements that private contractors pay prevailing wages on some industrial construction projects even if such projects were not financed by any level of government.

Since passage of the Davis-Bacon Act, construction of low-income housing sponsored directly by the U. S. Department of Housing and Urban Development (HUD), such as Public Housing projects and most Section 8 New Construction and Substantial Rehabilitation projects, has necessitated payment of "prevailing wages."[4] There is some ambiguity about coverage of housing projects subsidized indirectly through federal grants to lower levels of government. The 2001 California law resolves this ambiguity. It extends this coverage to subsidized housing construction utilizing federal, state, and local public funding sources such as those under the Community Development Block Grant Program and most built under the LIHTC program.

III. Prior Work

A large literature has developed on the efficiency and distributional effects of minimum wage laws generally (see Card and Krueger, 1995 for a review), and of the implications of Davis-Bacon legislation. Goldfarb and Morrall (1981) reviewed a

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[4] The application of the Davis-Bacon Act to HUD-sponsored construction is subject to a variety of detailed regulations, and HUD has provided wage surveys to assist the DOL in its determination of wage rates. (See Department of Housing and Urban Development, 1981 for details).

number of empirical studies of the costs of Davis-Bacon, concluding that the legislation could hardly be attractive on efficiency grounds. The same authors (Goldfarb and Morrall, 1978) examined construction wage data to estimate the large cost savings achievable by utilizing mean wages (rather than modes) as the regulatory benchmark for defining prevailing wages. Metzger and Goldfarb (1983) developed an economic model to evaluate claims that output quality improves under a prevailing wage regime, concluding that quality may easily decrease as a consequence of the increased costs imposed by regulation.

Estimates of increased project costs under Davis-Bacon vary considerably. To establish a control group for comparing costs, some researchers studied projects proposed before and after the suspension or repeal of wage regulation. Others analyzed differences among jurisdictions that had adopted prevailing wages compared with those that had not. Still others simulated the effects of regulations on typical projects using published wage surveys of the construction industry (e.g., the surveys conducted by F.W. Dodge, Inc.). A one-month suspension of the Act in 1971 forced contractors to rebid for projects in the pre-award phase. Thieblot (1975) found an increase of about one-half percent on prevailing-wage projects. By accounting more fully for institutional factors and inflation, Gould and Bittlingmayer (1980) estimated the increase to be between 4 and 7 percent. Using contractor surveys to compile a sample of affected and unaffected projects in rural areas, Fraundorf, *et al.* (1984) concluded that the Act increased costs by an average of more than 26 percent.

A series of simulations and empirical studies fueled by the proposed repeal of Utah's prevailing wage law (e.g., Philips, *et al*, 1995; Philips, *et al.*, 1995; Prus, 1996) found that decreased construction earnings and associated losses in tax revenue might exceed savings in public construction costs. Prus (1996) compared the costs of government construction projects across states, finding a differential averaging 18 percent between prevailing wage and non-prevailing wage states. Thieblot (1996) questioned all of these studies on methodological grounds.

Several papers analyzed public school construction projects (Prus, 1999; Philips, 1999; Azari, *et al.*, 2002; Bilginsoy and Philips, 2000; Philips, 2001), finding inconsistent effects of prevailing wage regulation upon construction costs, using before and after comparisons or interstate comparisons. It is difficult to know whether conditions have been controlled for adequately in these unpublished studies, and in several cases, statistical results are reported in an unconventional manner.

One paper prepared for the President's Commission on Housing relates housing construction costs to prevailing wage legislation (US Department of Housing and Urban Development, 1981), but that document is merely a compendium of assertions. There is apparently no other evidence on the link between prevailing wage regulations and housing costs.

IV. Empirical Analysis

A. The Data

We analyze the structure of costs for newly constructed dwellings for California Low-Income Housing Tax Credit (LIHTC) housing projects whose applications for funding were filed after January 1, 1997 and which were placed in service before May 1, 2002. All projects were selected to receive federal (and some state) tax credits by the California Tax Credit Allocation Committee (TCAC), the administrator of the federal LIHTC program in California.[5]

In accordance with program regulations, only rental housing projects are eligible for credits. The allocation process is competitive, so that projects that best fulfill housing needs and public policy objectives (as determined by TCAC) have priority. For newly constructed units to be eligible for tax credits, they must meet both rent and income requirements. The rents charged may not exceed thirty percent of the imputed income for the unit.[6] At initial occupancy, the income of a resident household may not exceed fifty or sixty percent of the area median income (AMI). Developers choose between a "20/50" or "40/60" minimum set aside, meaning that at least 20 (or 40) percent of the units must be "affordable" to families with incomes at 50 (or 60) percent of the median income.

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[5] The federal LIHTC program, authorized by Congress in 1986 and administered nationally by the Internal Revenue Service, enables developers of qualifying rental housing to raise project equity through the sale of federal tax credits to investors. TCAC allocates additional state tax credits to those projects which are selected to receive federal credits. TCAC may also authorize tax credits for rehabilitation of low-income housing. Due to their heterogeneity, housing rehabilitation projects are excluded from this analysis.

[6] The income is imputed based on an assumption of 1.5 persons per bedroom, and the area median income for a family of that size. The rent charged must not exceed 30 percent of this imputed income.

Only "affordable" units are eligible for tax credits. To increase attractiveness of projects in the competition for credits, most applicants designate a greater proportion than the minimum set aside as "affordable," and many target occupants with incomes lower than the 50/60 percent AMI threshold. Units receiving federal tax credits are required to remain "affordable" according to the above definition for 15 years.[7]

A number of criteria are considered in the allocation process. Federal guidelines require that preference go to projects which serve the lowest income tenants and which maintain affordability for the longest period. Other selection criteria include project location and the housing needs of that location (including consideration of target populations with special needs and public housing waiting lists), project characteristics, and projects intended for eventual tenant ownership. In California, the demand for credits usually exceeds their availability by about four to one, and an elaborate set of regulatory guidelines has been established.[8]

There are a total of 454 projects in the TCAC electronic database from application years 1997-2002, which were placed in service before May 1, 2002. Of these 454

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[7] Units benefiting from California state tax credits are generally required to maintain "affordability" for 55 years.

[8] For example, both state and federal law require that ten percent of annual credit be awarded to projects that involve non-profit developers. In addition, the state law requires that at least twenty percent of the credits be used for projects located in rural areas, and at least two percent be set aside for small projects (consisting of twenty or fewer units). California also has guidelines to maintain geographic distribution of the tax credits, awarding a certain percentage of annual credits to each of twelve geographic regions across the state. Preference for credit allocation is also given to projects which promote certain public policies such as smart growth, energy efficiency, and community revitalization efforts.

projects, 216 were identified as New Construction Projects.[9] Of these 216 projects, we were able to gather complete data (described below) on 205 projects,[10] including *ex post* cost data on each project, reflecting certification by TCAC and by external auditors. Other data about these projects were assembled from the Committee's electronic database, from paper files of TCAC, and from telephone interviews. For each project, we assembled information about project characteristics and costs and about whether the project paid labor at "prevailing wages."

Three measures of project costs were compiled, representing differing definitions of allowable expenditures in constructing housing. The broadest definition is *Residential Project Cost* which includes all costs associated with the residential component of the project (some projects have a commercial component as well). These costs include land acquisition and development, construction (labor, materials, contractor profit and overhead), survey and engineering costs, financing, legal fees, developer fees and other expenses. *Residential Construction Cost* includes only the expenses associated with site work and structures, general requirements, contractor overhead and contractor profit. Land and project "soft costs" (other than those included in contractor overhead and profit) are not included. Finally, *Site and Structure Cost* includes only the site preparation and building portion of the residential construction costs (i.e., excluding

[9] From the paper files, there were a total of 162 projects classified as Acquisition or Rehabilitation projects, and 76 project files were not available at the time of data collection during the fall of 2002. (This typically meant that the files were in use by TCAC staff or other state officials at the time data were assembled.)

[10] The *Residential Construction Cost* variable was only available for 203 projects.

contractor overhead and profit and general requirements). This measure of cost is most directly linked to the labor and materials cost of the housing project.

Figure 1 presents the distribution of these three cost measures. As shown in the histograms, the distributions are highly skewed and are roughly lognormal. For example, the median *Residential Project Cost* is $8.4 million while the mean is almost $9.4 million. The mean *Residential Project Cost* per unit is about $124,000, and the median is about $117,000. The mean *Residential Construction Cost* is about $77,000 and the median is about $73,000. The mean *Site and Structure Cost* is about $69,000 per unit and the median is about $66,000.

Figure 2 presents scatter diagrams relating these three measures of cost. A straight line through the origin fits these scatter diagrams quite well.[11] On average, *Residential Construction Cost* is 62 percent of *Residential Project Cost* and *Site and Structure Cost* is about 56 percent of *Residential Project Cost*.

We gathered measures of the targeting of these projects (to senior citizens, special needs populations, etc.), the affordability of the dwellings, and the minimum setaside chosen by the applicant ("20/50" or "40/60"). All these indicia are reflected in the criteria for allocating tax credits. In addition, we gathered information on:

- *Project location*, such as whether the project is located in a HUD-designated high cost area, on an island, in an urban area, on an inner city infill site, as well as the geographical region in which the project is located;

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[11] In simple linear regressions, the intercept terms are insignificantly different from zero, implying a proportional relationship among the three cost measures.

- *Special facilities and features*, including the presence of an elevator, underground parking, childcare facilities, and special needs facilities;
- *Structure and construction*, including the type of structure, density of the development, number of stories and bedrooms, and whether construction required substantial environmental mitigation;
- *Applicant and developer*, including whether the applicants and developers are non-profits, for-profit firms or joint ventures; and,
- *Financing*, including the percent of funding from public sources, number of funding sources and whether the project is a TCAC-designated tax-exempt bond project.

Finally, we identified those projects constructed while paying prevailing wages according to interpretations of the regulations governing prevailing wages in force in California at the time of construction.[12]

Table 1 presents summary information on the housing projects approved by TCAC during the past six years and completed prior to May 1, 2002. As the table indicates, approximately 95 percent of the units constructed met affordability guidelines (the other five percent of dwellings in approved projects received no allocation of tax credits). Ninety-seven percent of the projects used the "40/60" set aside rule.

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[12] Beginning in 1999, applicants for LIHTC funding were asked to identify "projects where use of federal, state or local subsidies requires that higher than normal wages must be paid." To avoid any ambiguity in the classification of projects subject to prevailing wage regulations, we contacted developers by telephone to verify the payment of prevailing wages for each project. This information was supplied for 175 of the 205 projects. The remaining 30 were unknown because the developer was unreachable, or because the developer no longer had the information (this arose with a few of the oldest projects). In the analysis below, the variable indicating prevailing wages has a value of one if it is *known* that prevailing wages were paid, and zero otherwise.

Figure 1. Cost Distributions for LIHTC Projects 1997-2002

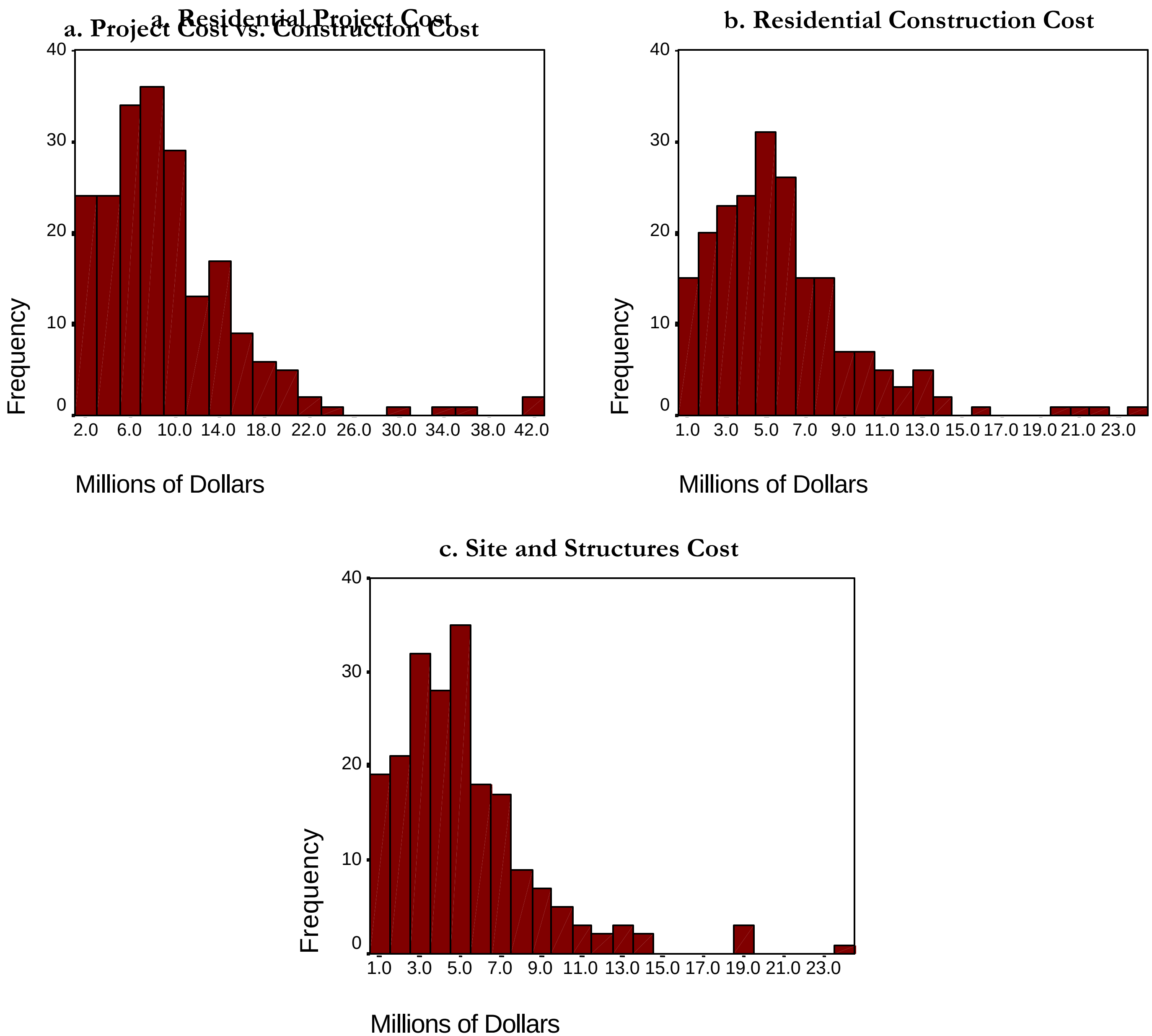
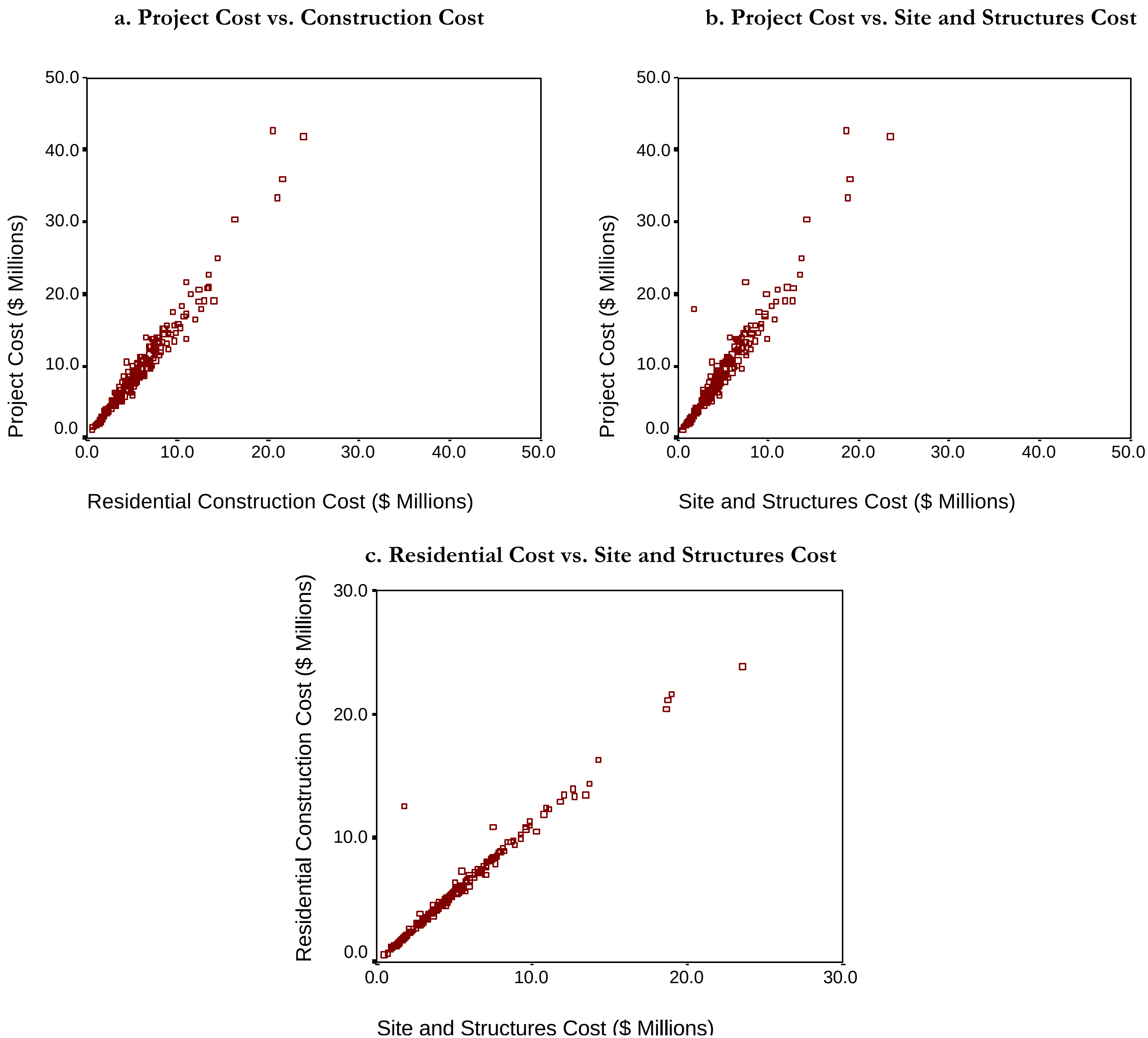


Figure 2. Relationships Among Cost Measures



Most projects were targeted to large families or to senior citizens. More than two-thirds of the applicants were limited partnerships, and forty-one percent of the developers were nonprofit organizations. A quarter of the projects were located in the San Francisco Bay Area, and a third were located in the greater Los Angeles area.

B. The Basic Statistical Models

Appendix Table A1 presents ordinary least squares (OLS) regression models relating construction costs to the descriptors reported in Table 1 – including 33 descriptors of projects and their facilities, their applicants, and financing, and 14 geographical identifiers. Regressions are presented for each of the three cost measures (*Site and Structure Cost, Residential Construction Cost, and Residential Project Cost)* and for each of two specifications. In the first specification (columns 1 through 3), the dependent variable is the logarithm of cost, and the logarithm of the number of units is included as a regressor. In the second specification (columns 4 through 6), we impose constant returns to scale; the logarithm of cost per unit is the dependent variable.

Table 2 presents somewhat more parsimonious statistical models, where those project descriptors which are clearly insignificant in Table A1 are eliminated from the regressions. The latter models include 22 project descriptors as well as the 14 geographical identifiers. As reported in Table 2, project costs vary by type of project, by type of developer, and by type of structure. There is also some evidence that projects with larger fractions of "affordable" units have lower total costs and lower costs per unit. Projects completed more recently tend to be more expensive, and those providing beneath-structure parking have higher costs. Projects with larger dwellings are more costly as are those constructed on urban infill sites. There are some differences in costs by location, and projects located in San Francisco, Sacramento, and Los Angeles have higher costs.

The cost relationships reported in Table 2 are generally consistent for both specifications and across all three definitions of cost. In columns 1, 2, and 3, the estimated coefficient for the logarithm of the number of units is significantly less than one, suggesting that there are modest economies of scale in projects containing more dwellings. Despite this, models using the logarithm of cost per unit as the dependent variable (thereby constraining the model to reflect constant returns to scale) are quite similar; the magnitudes and statistical significance of the coefficients are similar. In particular, the coefficient indicates that, holding other factors constant, projects paying prevailing wages are 9 to 11 percent more costly than are otherwise identical projects not subject to these regulations. All these results are consistent with those reported in Appendix Table A1.

Table 3 presents the same statistical models without distinguishing the geographical location of housing projects. The explained variance in these models is slightly lower than in the more elaborate specification. The magnitude of the other coefficients and their statistical significance is quite comparable however. The estimated coefficients for the prevailing wage variable are substantially larger, suggesting cost increases of 16 to 18 percent for those projects paying prevailing wages as compared to projects for which this requirement has not been imposed.

Table 1
Variable Definitions and Descriptive Statistics

Variable	Definition	Mean	Standard Deviation
Prevailing Wages	One if prevailing wages were paid as a result of federal, state or local requirements, zero otherwise	0.200	0.40
Affordability	Fraction of units in project that meet affordability guidelines	0.947	0.14
Targeting			
Non targeted	One if units are not targeted to a specific population, zero otherwise	0.088	0.28
Senior	One if units are targeted to seniors, zero otherwise	0.278	0.45
SRO	One if units are single room occupancy, zero otherwise	0.024	0.15
Needs	One if units are targeted to special needs populations, zero otherwise	0.044	0.21
Family	One if units are targeted to large families, zero otherwise	0.566	0.50
Set Aside	One if at least 20 percent of units are affordable to applicants with incomes at one half of area median income (AMI); zero if at least 40 percent of units are affordable to applicants with incomes at 60 percent of AMI	0.034	0.18
High Cost	One if project is in a HUD High Cost Designation Area, zero otherwise	0.520	0.50
Elevator	One if project contains at least one elevator, zero otherwise	0.340	0.48
Density	Number of units per acre	31.97	38.96
Time	Occupancy date. Elapsed time in days from July 19, 1995	1700	376
Three Stories	One if project contains buildings with three or more stories, zero otherwise	0.120	0.32
Child Care	One if project contains childcare facilities on site, zero otherwise	0.044	0.21
Parking	One if project contains parking beneath the structure, zero otherwise	0.170	0.37
Three Bedrooms	One if 50 percent or more units have 3 or more bedrooms, zero otherwise	0.310	0.46
Island	One if project is on an island, zero otherwise	0.005	0.07
Special Facilites	One if project contains special needs facilities, zero otherwise	0.034	0.18
Mitigation	One if project required substantial environmental mitigation, zero otherwise	0.054	0.23
Urban	Fraction of housing units classified as urban in census place	0.984	0.12
Applicant			
CORP	One if applicant is a corporation, zero otherwise	0.063	0.24
LP	One if applicant is a limited partnership, zero otherwise	0.690	0.46
SP	One if applicant is a sole proprietorship, zero otherwise	0.010	0.10
JV	One if applicant is a joint venture, zero otherwise	0.010	0.10
Non Profit	One if applicant is a non-profit organization, zero otherwise	0.220	0.42
Developer			
JV	One if developer is a joint venture, zero otherwise	0.361	0.48
For Profit	One if developer is a for-profit organization, zero otherwise	0.220	0.42
Non Profit	One if developer is a non-profit organization, zero otherwise	0.410	0.49
Funding	Fraction of project funding from public sources	0.187	0.21
Sources	Number of different funding sources	3.630	1.45
Bonds	One if project is eligible for tax-exempt bond finance	0.400	0.49

Table 1
Variable Definitions and Descriptive Statistics
(continued)

Variable	Definition	Mean	Standard Deviation
Structure			
Townhouse	One if project is a townhouse, zero otherwise	0.180	0.39
Cooperative	One if project is a cooperative, zero otherwise	0.005	0.07
Two Stories	One if project has two or more stories, zero otherwise	0.500	0.50
Single Family	One if project is single family detached, zero otherwise	0.010	0.10
Garden Apartment	One if project is garden apartments, zero otherwise	0.310	0.46
Infill	One if development is an inner city infill site, zero otherwise	0.150	0.35
Location			
San Francisco	One if development is in San Francisco, Oakland, San Jose CMSA	0.250	0.43
Sacramento	One if development is in Sacramento MSA	0.088	0.28
Fresno	One if development is in Fresno MSA	0.039	0.19
Bakersfield	One if development is in Bakersfield MSA	0.034	0.18
Los Angeles	One if development is in Los Angeles, Riverside, Orange County CMSA	0.340	0.47
Merced	One if development is in Merced MSA	0.020	0.14
Salinas	One if development is in Salinas, Seaside, Monterrey MSA	0.024	0.15
San Diego	One if development is in San Diego MSA	0.078	0.27
San Luis Obispo	One if development is in San Luis Obispo, Atascadero, Paso Robles MSA	0.024	0.15
Santa Barbara	One if development is in Santa Barbara, Santa Maria-Lompoc MSA	0.020	0.14
Redding	One if development is in Redding MSA	0.010	0.10
Modesto	One if development is in Modesto MSA	0.010	0.10
Yuba City	One if development is in Yuba City MSA	0.005	0.07
Visalia	One if development is in Visalia, Tulare, Porterville MSA	0.020	0.14
Other	Other locations	0.044	0.21
Residential Project Cost	Millions of Dollars	9.390	6.54
Construction Cost	Millions of Dollars	5.766	3.86
Site and Structure Cost	Millions of Dollars	5.145	3.50
Units	Number of units in project	82.790	56.41

Table 2
Models of Construction Costs
Ordinary Least Squares Models
Dependent Variables in Logarithms

	Total Cost			Cost Per Unit		
Variable	Site and Structure Cost	Residential Construction Cost	Project Cost	Site and Structure Cost	Residential Construction Cost	Project Cost
Prevailing Wage	0.103	0.108	0.097	0.097	0.105	0.091
	(2.41)	(2.87)	(2.82)	(2.22)	(2.73)	(2.56)
Log Units	0.913	0.926	0.917	-	-	-
	(33.39)	(38.15)	(41.67)	-	-	-
Affordability	-0.352	-0.223	-0.144	-0.303	-0.176	-0.097
	(2.91)	(2.08)	(1.49)	(2.47)	(1.61)	(0.97)
Targeting						
Non targeted	-0.150	-0.079	-0.065	-0.138	-0.071	-0.053
	(2.56)	(1.52)	(1.39)	(2.30)	(1.34)	(1.10)
Senior	-0.168	-0.202	-0.200	-0.184	-0.219	-0.215
	(4.06)	(5.52)	(5.99)	(4.37)	(5.89)	(6.27)
SRO	-0.541	-0.541	-0.641	-0.577	-0.572	-0.675
	(5.62)	(6.44)	(8.28)	(5.88)	(6.68)	(8.46)
Needs	-0.011	-0.140	-0.093	-0.009	-0.138	-0.091
	(0.13)	(1.94)	(1.40)	(0.11)	(1.86)	(1.32)
Time	4.878	7.093	6.561	4.597	6.893	6.290
	(3.04)	(5.05)	(5.08)	(2.79)	(4.79)	(4.70)
Parking	0.173	0.167	0.155	0.201	0.190	0.182
	(3.35)	(3.69)	(3.73)	(3.87)	(4.15)	(4.30)
Three Bedrooms	0.144	0.109	0.082	0.156	0.120	0.094
	(3.86)	(3.33)	(2.74)	(4.11)	(3.60)	(3.04)
Island	0.625	0.625	0.379	0.625	0.625	0.379
	(2.94)	(3.37)	(2.22)	(2.87)	(3.28)	(2.14)
Special Facilities	-0.223	0.080	0.035	-0.257	0.051	0.002
	(2.19)	(0.90)	(0.42)	(2.47)	(0.56)	(0.02)
Mitigation	-0.061	0.098	0.053	-0.073	0.089	0.041
	(0.84)	(1.54)	(0.90)	(0.98)	(1.37)	(0.68)
Applicant						
Non Profit	-0.005	0.076	0.029	-0.008	0.071	0.026
	(0.10)	(1.86)	(0.78)	(0.16)	(1.71)	(0.68)
Developer						
Non Profit	0.115	0.070	0.052	0.147	0.097	0.083
	(2.69)	(1.87)	(1.53)	(3.46)	(2.62)	(2.40)
Funding	-0.118	0.020	0.142	-0.015	0.106	0.241
	(1.25)	(0.24)	(1.87)	(0.17)	(1.33)	(3.26)
Sources	0.016	0.003	0.005	0.014	0.001	0.003
	(1.39)	(0.33)	(0.54)	(1.18)	(0.13)	(0.31)
Bonds	-0.065	-0.043	-0.035	-0.098	-0.070	-0.067
	(1.59)	(1.22)	(1.08)	(2.43)	(1.98)	(2.05)

Table 2
Models of Construction Costs
Ordinary Least Squares Models
Dependent Variables in Logarithms
(continued)

	Total Cost			Cost Per Unit		
Variable	Site and Structure Cost	Residential Construction Cost	Project Cost	Site and Structure Cost	Residential Construction Cost	Project Cost
Structure						
Townhouse	0.155	0.155	0.134	0.168	0.166	0.146
	(3.17)	(3.60)	(3.39)	(3.35)	(3.79)	(3.57)
Cooperative	0.697	0.598	0.459	0.874	0.751	0.629
	(2.81)	(2.75)	(2.30)	(3.51)	(3.46)	(3.11)
Two Stories	0.102	0.085	0.061	0.106	0.090	0.065
	(2.65)	(2.51)	(1.96)	(2.69)	(2.61)	(2.01)
Single Family	0.371	0.333	0.243	0.399	0.360	0.271
	(2.43)	(2.49)	(1.98)	(2.55)	(2.63)	(2.13)
Infill	0.161	0.124	0.073	0.179	0.137	0.091
	(3.15)	(2.74)	(1.77)	(3.44)	(2.99)	(2.14)
Location						
San Francisco	0.302	0.297	0.403	0.280	0.275	0.381
	(4.08)	(4.57)	(6.77)	(3.69)	(4.15)	(6.18)
Sacramento	0.194	0.172	0.206	0.188	0.167	0.200
	(2.35)	(2.40)	(3.11)	(2.22)	(2.26)	(2.91)
Fresno	0.014	0.019	-0.033	0.030	0.034	-0.018
	(0.15)	(0.22)	(0.42)	(0.30)	(0.38)	(0.22)
Bakersfield	-0.076	-0.114	-0.076	-0.085	-0.122	-0.085
	(0.72)	(1.23)	(0.89)	(0.78)	(1.28)	(0.96)
Los Angeles	0.173	0.161	0.202	0.162	0.151	0.191
	(2.35)	(2.50)	(3.42)	(2.15)	(2.30)	(3.11)
Merced	-0.026	-0.041	-0.015	-0.017	-0.033	-0.006
	(0.22)	(0.39)	(0.15)	(0.14)	(0.31)	(0.06)
Salinas	0.183	0.098	0.202	0.185	0.098	0.204
	(1.45)	(0.88)	(1.99)	(1.43)	(0.87)	(1.93)
San Diego	0.088	0.058	0.195	0.070	0.041	0.178
	(1.04)	(0.77)	(2.87)	(0.81)	(0.54)	(2.53)

Table 2
Models of Construction Costs
Ordinary Least Squares Models
Dependent Variables in Logarithms
(continued)

Variable	Total Cost: Site and Structure Cost	Total Cost: Residential Construction Cost	Total Cost: Project Cost	Cost Per Unit: Site and Structure Cost	Cost Per Unit: Residential Construction Cost	Cost Per Unit: Project Cost
San Luis Obispo	0.066	0.060	0.179	0.150	0.134	0.260
	(0.55)	(0.57)	(1.85)	(1.24)	(1.27)	(2.64)
Santa Barbara	-0.132	-0.245	-0.025	-0.116	-0.232	-0.009
	(0.95)	(2.01)	(0.22)	(0.81)	(1.85)	(0.08)
Redding	0.247	0.184	0.177	0.235	0.173	0.166
	(1.60)	(1.36)	(1.43)	(1.48)	(1.25)	(1.29)
Modesto	0.149	0.107	0.073	0.140	0.097	0.065
	(0.93)	(0.76)	(0.57)	(0.86)	(0.68)	(0.49)
Yuba City	0.047	-0.075	-0.050	-0.012	-0.126	-0.107
	(0.22)	(0.40)	(0.29)	(0.06)	(0.66)	(0.61)
Visalia	0.080	-0.003	-0.103	0.073	-0.009	-0.110
	(0.66)	(0.02)	(1.06)	(0.59)	(0.08)	(1.09)
Constant	6.313	3.983	4.951	6.190	3.829	4.831
	(3.80)	(2.74)	(3.70)	(3.63)	(2.57)	(3.48)
R^2	0.932	0.948	0.955	0.732	0.788	0.802

Note: t-ratios in parentheses

Table 3
Ordinary Least Squares Models of Construction Costs
Excluding Geographical Identifiers
Dependent Variables in Logarithms

	Total Cost			Cost Per Unit		
Variable	Site and Structure Cost	Residential Construction Cost	Project Cost	Site and Structure Cost	Residential Construction Cost	Project Cost
Prevailing Wage	0.167	0.182	0.172	0.158	0.176	0.164
	(3.80)	(4.44)	(4.14)	(3.58)	(4.29)	(3.94)
Log Units	0.944	0.958	0.952	-	-	-
	(33.83)	(36.78)	(36.14)	-	-	-
Affordability	-0.341	-0.206	-0.154	-0.319	-0.187	-0.135
	(2.74)	(1.75)	(1.31)	(2.55)	(1.59)	(1.14)
Targeting						
Non targeted	-0.176	-0.104	-0.083	-0.167	-0.099	-0.076
	(2.85)	(1.79)	(1.42)	(2.70)	(1.69)	(1.30)
Senior	-0.148	-0.181	-0.158	-0.157	-0.189	-0.166
	(3.45)	(4.51)	(3.91)	(3.67)	(4.74)	(4.12)
SRO	-0.469	-0.467	-0.532	-0.494	-0.485	-0.554
	(4.53)	(4.86)	(5.44)	(4.77)	(5.07)	(5.67)
Needs	-0.015	-0.142	-0.093	-0.013	-0.140	-0.091
	(0.17)	(1.72)	(1.11)	(0.14)	(1.69)	(1.08)
Time	4.393	6.526	5.454	4.329	6.496	5.400
	(2.64)	(4.22)	(3.47)	(2.58)	(4.19)	(3.42)
Parking	0.189	0.192	0.170	0.207	0.205	0.185
	(3.63)	(3.97)	(3.46)	(4.00)	(4.28)	(3.80)
Three Bedrooms	0.155	0.115	0.101	0.164	0.121	0.108
	(4.03)	(3.21)	(2.77)	(4.23)	(3.39)	(2.97)
Island	0.648	0.649	0.365	0.638	0.642	0.356
	(2.85)	(3.07)	(1.70)	(2.78)	(3.03)	(1.65)
Special Facilities	-0.260	0.033	0.000	-0.277	0.020	-0.015
	(2.40)	(0.32)	(0.00)	(2.55)	(0.20)	(0.15)
Mitigation	-0.014	0.135	0.106	-0.027	0.126	0.096
	(0.20)	(1.96)	(1.52)	(0.36)	(1.83)	(1.36)
Applicant						
Non Profit	-0.047	0.027	0.001	-0.046	0.027	0.001
	(0.98)	(0.61)	(0.01)	(0.96)	(0.60)	(0.03)
Developer						
Non Profit	0.129	0.079	0.055	0.150	0.095	0.073
	(2.89)	(1.92)	(1.31)	(3.46)	(2.37)	(1.80)
Funding	-0.083	0.068	0.209	-0.015	0.117	0.268
	(0.83)	(0.74)	(2.24)	(0.16)	(1.35)	(3.03)
Sources	0.025	0.012	0.024	0.023	0.011	0.023
	(2.11)	(1.13)	(2.16)	(1.95)	(0.99)	(2.01)

Table 3
Ordinary Least Squares Models of Construction Costs
Excluding Geographical Identifiers
Dependent Variables in Logarithms
(continued)

	Total Cost			Cost Per Unit		
Variable	Site and Structure Cost	Residential Construction Cost	Project Cost	Site and Structure Cost	Residential Construction Cost	Project Cost
Bonds	-0.055	-0.032	-0.036	-0.077	-0.048	-0.055
	(1.30)	(0.81)	(0.89)	(1.87)	(1.25)	(1.40)
Structure						
Townhouse	0.184	0.185	0.206	0.197	0.195	0.217
	(3.74)	(4.04)	(4.43)	(4.02)	(4.29)	(4.69)
Cooperative	0.521	0.335	0.351	0.647	0.429	0.459
	(2.08)	(1.44)	(1.48)	(2.64)	(1.90)	(1.99)
Two Stories	0.129	0.112	0.109	0.129	0.112	0.109
	(3.25)	(3.01)	(2.91)	(3.21)	(3.01)	(2.88)
Single Family	0.380	0.347	0.270	0.391	0.357	0.280
	(2.37)	(2.34)	(1.79)	(2.42)	(2.39)	(1.84)
Infill	0.126	0.089	0.036	0.139	0.099	0.047
	(2.31)	(1.75)	(0.69)	(2.55)	(1.94)	(0.92)
Constant	6.770	4.490	6.034	6.572	4.322	5.862
	(3.89)	(2.77)	(3.67)	(3.75)	(2.66)	(3.55)
R^2	0.911	0.924	0.920	0.665	0.703	0.668

Note: t-ratios in parentheses

C. Instrumental Variables Estimates

It is possible that the requirement to pay prevailing wages imposed on some of these construction projects is not exogenous to the other factors determining project costs. For example, if projects located in higher cost areas (for example, in highly urbanized areas) were more likely to be required to pay prevailing wages (for example, because unions are able to exercise more political influence in these regions), then simple ordinary least squares regression models would falsely attribute these higher costs to the payment of prevailing wages.

Estimation of the models by the method of instrumental variables (IV) eliminates this source of bias and yields consistent estimates of the effect of prevailing wage requirement on construction costs. Appropriate instruments are variables which are correlated with the regulatory classification of projects – i.e., identifying those paying prevailing wages as opposed to those paying market wages – and which do not themselves affect construction costs.

From computerized voting information, we obtained the election results on ten statewide California propositions for the city in which each of the 205 sample projects was located. We also measured the party registration of voters in each jurisdiction, and the percent working in highly unionized industries and occupations by census place.[13] We also measured the homeownership rate and the age distribution of the population in

[13] Highly unionized industries and occupations are defined based on Current Population Survey data analyzed by Barry T. Hirsch and David A. Macpherson (2003). Highly unionized industries are those in which national union membership was 18 percent or higher, and highly unionized occupations were those in which membership was 20 percent or higher. US census data on employment by industry and occupation for employed persons 16 years and older in each census place were used to compute the variables "highly unionized industries" and "highly unionized occupations" associated with each of the 205 housing projects.

each jurisdiction, as well as union membership in the relevant geographical location, as a fraction of total wage and salary employment.

Arguably, these demographic and political variables affect the propensities of local government and regional officials to require payment of prevailing wages. Clearly, these demographic and political variables have no causal relationship to construction costs.

Table 4 summarizes these measures of political and demographic variations across the sample of construction projects. The table reports the mean and standard deviation of these variables in the sample of housing projects.

The table also reports the results of the first stage regressions of the instrumental variables procedure. In this first stage, the dependent variable is the requirement that prevailing wages be paid (one for yes; zero otherwise). The results for two models are presented. Model 1 is the regression model that includes all the other variables reported in columns 1, 2, and 3 of Appendix Table A1. Model 2 includes all the other variables reported in columns 4, 5, and 6 of Appendix Table A2. As indicated in the table, a number of the instruments are statistically significant at about the 0.10 level. An F-test for the joint significance of the set of instruments is presented in the table. When no other regressors are included in the first stage estimation, the set of instruments is highly significant in distinguishing prevailing wage projects from other projects. (The F-ratio, 2.981, is significant at the 0.0001 level.) When all the other variables describing the characteristics of the individual projects are also included, the coefficients of the instruments are significantly different from zero at the 0.11 level (F=1.492).

Table 5 presents instrumental variables estimates of the same models reported in Table 2. The pattern of magnitudes and significance of the coefficients in Table 5 is the same as that previously reported. The coefficient on the logarithm of the number of units is close to one, but it is significantly below one, suggesting modest scale economies when producing more units in a given project. When the coefficient is constrained to one representing constant returns to scale – columns 4, 5, and 6 – the substantive results are unchanged.

Note that when the model is estimated using instrumental variables, the coefficient on the prevailing wage variable is larger in magnitude and is more precisely measured than in the ordinary least squares regression. The results in Table 5 imply that – for otherwise identical low-income projects – prevailing wage construction is between 18 and 25 percent more costly. Importantly, the finding that prevailing wage legislation increases housing costs does *not* arise because prevailing wages are more likely to be required in high cost housing markets.

Appendix Table A2 presents the same IV models, excluding the 18 geographical identifiers. These models imply even larger cost increases for prevailing wage projects.

Table 4
First Stage Instruments in Two Stage Least Squares Models
Dependent Variable: Prevailing Wage
(t-ratios in parentheses)

Variable	Mean (Standard deviation)	First Stage Coefficent* Model 1[a]	Model 2[b]
Number of Adjacent Jurisdictions	7.440	0.002	0.002
	(9.49)	(0.49)	(0.40)
Fraction Yes Vote on Prop 199	0.386	-0.013	0.057
Low-income Rental Assistance, 1996	(0.08)	(0.02)	(0.10)
Fraction Yes Vote on Prop 107	0.533	1.090	1.084
Housing and Homeless Bonds; 1990	(0.09)	(1.24)	(1.23)
Fraction Yes Vote on Prop 168	0.422	-1.283	-1.306
Low Rent Housing Projects, 1993	(0.10)	(1.56)	(1.59)
Fraction Yes Vote on Prop 155	0.496	-0.877	-0.973
School Facilities Bonds, 1992	(0.12)	(0.93)	(1.03)
Fraction Yes Vote on Prop 156	0.483	0.723	0.757
Passenger Rail and Clean Air Bonds, 1992	(0.09)	(0.82)	(0.86)
Fraction Yes Vote on Prop 157	0.330	-0.275	-0.427
Toll Roads and Highways, 1992	(0.13)	(0.26)	(0.41)
Fraction Yes Vote on Prop 160	0.503	1.734	1.762
Project Tax Exemptions, 1992	(0.07)	(1.74)	(1.77)
Fraction Yes Vote on Prop 164	0.575	-0.617	-0.776
Term Limits, 1992	(0.12)	(0.72)	(0.89)
Fraction Yes Vote on Prop 167	0.413	-1.730	-1.724
State Taxes, 1992	(0.07)	(1.65)	(1.64)
Fraction Yes Vote on Prop 210	0.649	1.769	1.770
Mimimum Wage Increase, 1996	(0.09)	(1.47)	(1.47)
Percent of voters registered as Democrats	0.597	-1.136	-1.102
	(0.13)	(1.35)	(1.31)
Percent of population over 40 years old	0.341	-0.209	-0.117
	(0.06)	(0.34)	(0.19)

Table 4
First Stage Instruments in Two Stage Least Squares Models
Dependent Variable: Prevailing Wage
(t-ratios in parentheses)
(continued)

Variable	Mean (Standard deviation)	First Stage Coefficent* Model 1[a]	Model 2[b]
Percent of housing units owner-occupied	0.554	-0.682	-0.717
	(0.13)	(1.60)	(1.68)
Percent working in highly unionized industries	0.339	0.841	0.836
	(0.07)	(1.31)	(1.31)
Percent working in highly unionized occupations	0.265	-1.065	-1.093
	(0.07)	(1.57)	(1.61)
Percent Unionized	0.166	1.446	1.667
	(0.06)	(1.13)	(1.28)
F-ratio[c]		1.492	1.492
[p value]		[0.11]	[0.11]
F-ratio[d]		2.981	2.981
[p value]		[0.00]	[0.00]

Notes:

*t-ratios in parentheses

[a]Coefficients and t-ratios are from the regression equation which also includes all other variables reported in Appendix Table A1.

[b]Coefficients and t-ratios are from the regression equation which also includes all other variables reported in Appendix Table A2.

[c]F-test for the joint significance of the instruments.

[d]F-test for the joint significance of the instruments in a regression equation which includes no other covariates.

Table 5
Instrumental Variables Estimates of Cosntruction Costs
Dependent Variables in Logarithms

Variable	Total Cost: Site and Structure Cost	Total Cost: Residential Construction	Total Cost: Project Cost	Cost Per Unit: Site and Structure Cost	Cost Per Unit: Residential Construction	Cost Per Unit: Project Cost
Prevailing Wage	0.225	0.233	0.177	0.248	0.250	0.196
	(2.58)	(3.04)	(2.50)	(2.76)	(3.17)	(2.67)
Log Units	0.910	0.922	0.914	-	-	-
	(33.26)	(38.04)	(41.25)	-	-	-
Affordability	-0.363	-0.238	-0.152	-0.315	-0.191	-0.105
	(3.01)	(2.22)	(1.55)	(2.58)	(1.76)	(1.05)
Targeting						
Non targeted	-0.187	-0.115	-0.089	-0.182	-0.112	-0.084
	(2.98)	(2.09)	(1.76)	(2.85)	(2.00)	(1.62)
Senior	-0.161	-0.194	-0.195	-0.176	-0.210	-0.210
	(3.87)	(5.30)	(5.78)	(4.18)	(5.68)	(6.08)
SRO	-0.554	-0.555	-0.649	-0.595	-0.589	-0.688
	(5.75)	(6.59)	(8.32)	(6.08)	(6.90)	(8.59)
Needs	-0.047	-0.177	-0.117	-0.053	-0.180	-0.122
	(0.55)	(2.36)	(1.68)	(0.61)	(2.36)	(1.70)
Time	4.327	6.528	6.200	3.900	6.225	5.806
	(2.64)	(4.56)	(4.67)	(2.33)	(4.26)	(4.24)
Parking	0.169	0.164	0.152	0.198	0.187	0.180
	(3.28)	(3.63)	(3.65)	(3.83)	(4.13)	(4.25)
Three Bedrooms	0.147	0.111	0.084	0.161	0.124	0.097
	(3.94)	(3.42)	(2.79)	(4.24)	(3.74)	(3.13)
Island	0.677	0.678	0.413	0.689	0.686	0.424
	(3.16)	(3.62)	(2.38)	(3.15)	(3.59)	(2.36)
Special Facilities	-0.236	0.067	0.026	-0.275	0.034	-0.011
	(2.32)	(0.75)	(0.31)	(2.66)	(0.38)	(0.13)
Mitigation	-0.041	0.118	0.066	-0.049	0.112	0.058
	(0.56)	(1.83)	(1.11)	(0.66)	(1.71)	(0.94)
Applicant						
Non Profit	-0.022	0.058	0.018	-0.029	0.050	0.011
	(0.46)	(1.38)	(0.46)	(0.61)	(1.18)	(0.28)
Developer						
Non Profit	0.105	0.059	0.046	0.136	0.087	0.076
	(2.45)	(1.58)	(1.32)	(3.22)	(2.33)	(2.18)
Funding	-0.172	-0.036	0.106	-0.078	0.046	0.197
	(1.73)	(0.41)	(1.31)	(0.81)	(0.56)	(2.52)
Sources	0.015	0.002	0.004	0.013	0.000	0.002
	(1.32)	(0.24)	(0.49)	(1.10)	(0.02)	(0.24)
Bonds	-0.073	-0.051	-0.041	-0.110	-0.081	-0.075
	(1.78)	(1.43)	(1.23)	(2.70)	(2.27)	(2.27)

Table 5
Instrumental Variables Estimates of Cosntruction Costs
Dependent Variables in Logarithms
(continued)

	Total Cost			Cost Per Unit		
Variable	Site and Structure Cost	Residential Construction	Project Cost	Site and Structure Cost	Residential Construction	Project Cost
Structure						
Townhouse	0.148	0.148	0.129	0.160	0.159	0.140
	(3.02)	(3.44)	(3.24)	(3.20)	(3.64)	(3.43)
Cooperative	0.725	0.626	0.477	0.916	0.791	0.659
	(2.92)	(2.88)	(2.37)	(3.70)	(3.66)	(3.25)
Two Stories	0.090	0.073	0.053	0.092	0.077	0.055
	(2.32)	(2.14)	(1.69)	(2.32)	(2.21)	(1.69)
Single Family	0.418	0.382	0.274	0.459	0.418	0.312
	(2.70)	(2.81)	(2.18)	(2.90)	(3.02)	(2.41)
Infill	0.159	0.123	0.072	0.179	0.138	0.090
	(3.13)	(2.75)	(1.74)	(3.46)	(3.03)	(2.13)
Location						
San Francisco	0.285	0.279	0.392	0.257	0.253	0.365
	(3.82)	(4.25)	(6.47)	(3.38)	(3.79)	(5.86)
Sacramento	0.194	0.172	0.206	0.188	0.167	0.200
	(2.36)	(2.40)	(3.10)	(2.24)	(2.28)	(2.92)
Fresno	0.033	0.037	-0.021	0.054	0.055	-0.001
	(0.33)	(0.44)	(0.27)	(0.54)	(0.63)	(0.02)
Bakersfield	-0.078	-0.116	-0.077	-0.088	-0.124	-0.087
	(0.73)	(1.26)	(0.90)	(0.81)	(1.32)	(0.98)
Los Angeles	0.166	0.153	0.198	0.153	0.142	0.185
	(2.26)	(2.38)	(3.32)	(2.04)	(2.17)	(3.01)
Merced	-0.017	-0.030	-0.008	-0.005	-0.021	0.003
	(0.14)	(0.29)	(0.09)	(0.04)	(0.19)	(0.03)
Salinas	0.184	0.099	0.202	0.186	0.099	0.205
	(1.46)	(0.90)	(1.98)	(1.45)	(0.88)	(1.95)
San Diego	0.114	0.086	0.212	0.102	0.073	0.200
	(1.32)	(1.14)	(3.05)	(1.16)	(0.95)	(2.79)
San Luis Obispo	0.097	0.092	0.199	0.192	0.174	0.289
	(0.79)	(0.86)	(2.02)	(1.57)	(1.64)	(2.90)
Santa Barbara	-0.102	-0.215	-0.005	-0.078	-0.196	0.017
	(0.73)	(1.75)	(0.04)	(0.54)	(1.56)	(0.15)
Redding	0.253	0.191	0.182	0.243	0.181	0.171
	(1.64)	(1.42)	(1.45)	(1.54)	(1.32)	(1.33)

Table 5
Instrumental Variables Estimates of Cosntruction Costs
Dependent Variables in Logarithms
(continued)

	Total Cost			Cost Per Unit		
Variable	Site and Structure Cost	Residential Construction	Project Cost	Site and Structure Cost	Residential Construction	Project Cost
Location						
Modesto	0.112	0.069	0.049	0.094	0.053	0.033
	(0.70)	(0.49)	(0.38)	(0.58)	(0.37)	(0.25)
Yuba City	0.079	-0.042	-0.030	0.024	-0.091	-0.082
	(0.37)	(0.23)	(0.17)	(0.11)	(0.48)	(0.46)
Visalia	0.110	0.028	-0.084	0.109	0.026	-0.084
	(0.90)	(0.26)	(0.85)	(0.88)	(0.24)	(0.83)
Constant	6.926	4.614	5.352	6.943	4.555	5.354
	(4.07)	(3.10)	(3.88)	(4.00)	(3.00)	(3.76)
R^2	0.932	0.948	0.955	0.736	0.791	0.802

Note: t-ratios in parentheses

V. Conclusions

This paper presents the first systematic evidence on the effects of prevailing wage requirements on the costs of constructing low-income housing. A sample of 205 low-income housing projects approved for subsidy by the California Tax Credit Allocation Commission after January 1, 1997 and placed in service by May 2002 forms the basis for the empirical analysis. Statistical models are estimated using three definitions of cost certified by the Commission and by an independent auditor. We estimate models in two specifications – allowing for scale economies in construction and imposing constant returns to scale. Finally, we estimate models by ordinary least squares regression and by instrumental variables techniques.

The statistical models explain about 90 percent of the variations in construction costs across a broad sample of low-income housing projects, and about 80 percent of the variation in cost per unit built. The results confirm that costs vary by type of project. Single room occupancy projects are considerably less expensive,[14] and projects targeted to large families are more expensive. Projects including underground parking are more expensive, as are those with more three-bedroom units.

Construction costs also vary by type of applicant and type of developer. Cooperatives and single-family dwellings also appear more costly to build. Some differences in construction costs are apparent by geographical region. In particular, newly constructed units in San Francisco are more than 20 percent more expensive than elsewhere.

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[14] Single Room Occupancy projects are less expensive on a per-unit basis because bathrooms, kitchens and common areas are not included in each unit. Estimates of the impact of prevailing wage were also produced using dependent variables of cost per square foot, but the results did not differ substantially from the cost per unit analyses, and thus are not included in this paper.

There is also clear evidence of economies of scale in multifamily housing construction.

Table 6 provides a summary of the results of this econometric analysis as they pertain to prevailing wages. It presents estimates of the percentage increase in construction costs arising from the imposition of prevailing wage regulation, holding other things constant – characteristics of the project, its sponsorship, its financing and its geographical location.

Using the most realistic specifications of costs, the ordinary least squares models imply that prevailing wage requirements increase the cost of low-income housing by 9 to 11 percent. The instrumental variables models imply that the increased costs arising from prevailing wage requirements are higher – between 18 and 32 percent for the most realistic specifications. When location is not controlled for, the estimates are 16 to 18 percent higher for prevailing wage projects using OLS methods, and up to 42 percent higher using IV methods.

Some indirect evidence on the plausibility of these estimates is available. In Appendix B, we present evidence (from the single family housing market) suggesting that labor costs are roughly 46.9 percent of housing construction costs in San Francisco (exclusive of land). We also show the wage differential (mean hourly wage versus state prevailing wage determination) for selected construction occupations in San Francisco is about 66.7 percent. Together, these numbers imply that, without any substitution, the increase in *Residential Construction Cost* for a project would be 31.3 percent if a builder were required to pay prevailing wages. However, input substitution (e.g., an increased reliance on prefabricated components to reduce on-site labor costs) and increased administrative costs (due to more complex reporting requirements) would have some

Table 6
Estimates of Cost Increases for Low-Income Housing in California
Arising from the Imposition of Prevailing Wage Legislation
(in percent)

Statistical Model	Scale Economies Assumed	Site and Structure Cost	Residential Construction Cost	Project Cost
A. Ordinary Least Squares Estimation				
Extended	YES	9.9 %	10.3 %	10.4 %
	NO	8.9	9.7	9.5
Basic	YES	10.3	10.8	9.7
	NO	9.7	10.5	9.1
Excluding location	YES	16.7	18.2	17.2
	NO	15.8	17.6	16.4
B. Instrumental Variables Estimation				
Extended	YES	29.9	30.2	29.2
	NO	31.6	31.0	30.7
Basic	YES	22.5	23.3	17.7
	NO	24.8	25.0	19.6
Excluding location	YES	38.6	42.1	38.5
	NO	38.2	41.5	38.3

Note: "Extended" includes all the independent variables listed in Appendix Tables A1 and A2.
"Basic" includes all the independent variables listed in Tables 2 and 3.
"Excluding location" includes all the independent variables listed in Tables 4 and 5.

further impact on cost.[15] It is also possible that increased wage payments required by the regulations would attract workers who are more productive. Presumably, the combined effects of these factors upon construction costs underlie the estimates reported in Table 6 – the impact of prevailing wages may be as low as 9.1 percent, or as high as 31.6 percent (excluding the estimates without location variables).

These increases in cost surely lead to reductions in the number of newly constructed low-income housing units produced through public subsidy. Consider, for example, new dwellings completed under the LIHTC. The federal allocation of tax credits provided financing for an average of 19,129 low-income housing units per year from 2000 to 2002 (including both new construction and rehabilitation).[16] On the basis of our dataset it appears that approximately 18% of these units, or about 3,443 annually, were governed by prevailing wage prior to the adoption of SB975. We can project the supply effect of applying new prevailing wage requirements to the share of annual production (about 15,686 units annually) not regulated in that fashion previously. If costs were increased by just 9.1 percent as a result of prevailing wage legislation (the smallest increase predicted by any of our statistical models), 1,308 fewer subsidized dwellings would have been built. A cost increase of 20 percent, the middle of the range of estimates presented in Table 6, would have resulted in 2,614 fewer low-income housing units. And at a cost increase of 31.6 percent – our upper bound estimate, excluding models ignoring

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[15] It may be that developers will use prevailing-wage-triggering subsidy streams on land only – outside the "construction" project - in an effort to avoid the requirement altogether.

[16] http://lihtc.huduser.org/state_reports/CA.pdf. The total credits reported combine those issued at the 9% and 4% levels, the latter being applied to projects having other federal subsidies or tax-exempt fund sources. The two categories are subject to different rules concerning the state's total credit-issuing authority.

geographical differences – the imposition of prevailing wage legislation would have effectively stopped 3,767 low-income housing units from being developed. In this way, state regulation of construction wages will substantially impede the federal goal of increasing access to new housing opportunities for California's neediest families.

These estimates are illustrative rather than definitive. But they do imply that the imposition of prevailing wages would substantially reduce the quantity of low-income housing added by the expanded LIHTC program in California. Of course, the LIHTC is not the only program providing low-income housing in California. In November 2002, California voters approved Proposition 46, a $2.1 billion bond measure dedicated toward affordable housing development and related programs. About half these funds are directed toward new multifamily construction. If prevailing wage requirements apply to dwellings built using these bond proceeds and those from other existing programs – the HOME program, the Community Development Block Grant Program, for example – the effect upon low-income housing production could be even larger.

When considering the benefits of expanding prevailing wage coverage, which are distributed largely to skilled, middle-income workers, it is important to recognize that they come at the expense of housing production targeted to the lowest-income segment of the population.

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Appendix Table A1
Extended Cost Models
Ordinary Least Squares
Dependent Variables in Logarithms

Variable	Total Cost: Site and Structure Cost	Total Cost: Residential Construction Cost	Total Cost: Project Cost	Cost Per Unit: Site and Structure Cost	Cost Per Unit: Residential Construction Cost	Cost Per Unit: Project Cost
Prevailing Wage	0.099	0.103	0.104	0.089	0.097	0.095
	(2.23)	(2.68)	(2.91)	(1.92)	(2.43)	(2.51)
Log Units	0.895	0.912	0.901	-	-	-
	(32.40)	(37.68)	(40.59)	-	-	-
Affordability	-0.397	-0.299	-0.224	-0.329	-0.235	-0.160
	(3.00)	(2.54)	(2.11)	(2.40)	(1.94)	(1.43)
Targeting						
Non targeted	-0.168	-0.086	-0.078	-0.148	-1.342	-0.060
	(2.80)	(1.65)	(1.62)	(2.38)	(0.07)	(1.19)
Senior	-0.211	-0.212	-0.210	-0.224	-0.226	-0.222
	(4.52)	(5.18)	(5.59)	(4.61)	(5.34)	(5.61)
SRO	-0.670	-0.600	-0.629	-0.703	-0.630	-0.661
	(5.78)	(5.96)	(6.75)	(5.84)	(6.06)	(6.72)
Needs	-0.040	-0.135	-0.086	-0.032	-0.130	-0.079
	(0.46)	(1.79)	(1.23)	(0.36)	(1.66)	(1.07)
Set Aside	0.010	-0.037	-0.034	0.010	-0.032	-0.033
	(0.10)	(0.45)	(0.45)	(0.10)	(0.39)	(0.42)
High Cost	-0.042	-0.018	-0.020	-0.027	-0.008	-0.005
	(1.13)	(0.54)	(0.65)	(0.70)	(0.22)	(0.17)
Elevator	0.046	0.014	0.006	0.042	0.010	0.002
	(0.94)	(0.31)	(0.16)	(0.81)	(0.23)	(0.05)
Density	0.001	0.001	0.000	0.001	0.000	0.000
	(1.27)	(0.93)	(0.12)	(1.13)	(0.86)	(0.22)
Time	5.008	6.819	6.128	4.653	6.579	5.796
	(3.09)	(4.85)	(4.70)	(2.76)	(4.51)	(4.21)
Three Stories	0.033	-0.021	0.003	0.020	-0.033	-0.009
	(0.49)	(0.35)	(0.06)	(0.29)	(0.54)	(0.15)
Child Care	0.078	0.198	0.153	0.061	0.186	0.137
	(0.96)	(2.81)	(2.33)	(0.72)	(2.54)	(1.98)
Parking	0.117	0.150	0.138	0.162	0.186	0.180
	(1.92)	(2.84)	(2.82)	(2.60)	(3.45)	(3.55)
Three Bedrooms	0.125	0.096	0.065	0.142	0.111	0.081
	(3.25)	(2.88)	(2.11)	(3.58)	(3.24)	(2.51)
Island	0.678	0.668	0.433	0.661	0.654	0.417
	(3.18)	(3.62)	(2.52)	(2.97)	(3.41)	(2.30)
Special Facilities	-0.274	-0.033	-0.023	-0.312	-0.066	-0.059
	(2.35)	(0.33)	(0.25)	(2.57)	(0.63)	(0.59)
Mitigation	-0.046	0.134	0.080	-0.061	0.123	0.067
	(0.61)	(2.02)	(1.30)	(0.77)	(1.79)	(1.03)

Appendix Table A1
Extended Cost Models
Ordinary Least Squares
Dependent Variables in Logarithms
(continued)

Variable	Total Cost: Site and Structure Cost	Total Cost: Residential Construction Cost	Total Cost: Project Cost	Cost Per Unit: Site and Structure Cost	Cost Per Unit: Residential Construction Cost	Cost Per Unit: Project Cost
Urban	0.001	0.001	0.000	0.000	0.000	0.000
	(0.48)	(0.53)	(0.47)	(0.22)	(0.27)	(0.17)
Applicant						
CORP	0.114	0.034	0.020	0.107	0.030	0.013
	(1.50)	(0.52)	(0.32)	(1.36)	(0.44)	(0.20)
LP	0.005	-0.075	-0.020	0.004	-0.073	-0.020
	(0.10)	(1.83)	-0.53	(0.09)	(1.73)	(0.51)
SP	0.375	0.194	0.351	0.274	0.114	0.256
	(2.15)	(1.29)	(2.50)	(1.52)	(0.74)	(1.75)
JV	0.130	0.018	-0.015	0.151	0.038	0.004
	(0.80)	(0.13)	(0.11)	(0.89)	(0.26)	(0.03)
Developer						
JV	-0.121	-0.066	-0.051	-0.153	-0.092	-0.081
	(2.59)	(1.62)	(1.37)	(3.19)	(2.22)	(2.07)
For Profit	-0.164	-0.109	-0.085	-0.200	-0.139	-0.118
	(3.18)	(2.42)	(2.04)	(3.78)	(3.04)	(2.74)
Funding	-0.203	-0.055	0.043	-0.060	0.062	0.176
	(1.99)	(0.62)	(0.52)	(0.61)	(0.72)	(2.18)
Sources	0.015	0.001	0.002	0.012	-0.001	0.000
	(1.26)	(0.12)	(0.23)	(1.03)	(0.08)	(0.02)
Bonds	-0.044	-0.029	-0.032	-0.082	-0.059	-0.068
	(1.04)	(0.79)	(0.96)	(1.94)	(1.62)	(1.98)
Structure						
Townhouse	0.154	0.170	0.135	0.168	0.183	0.149
	(3.02)	(3.84)	(3.30)	(3.19)	(4.00)	(3.45)
Cooperative	0.736	0.676	0.487	0.941	0.851	0.679
	(2.95)	(3.12)	(2.43)	(3.71)	(3.88)	(3.27)
Two Stories	0.075	0.080	0.055	0.082	0.088	0.062
	(1.70)	(2.08)	(1.56)	(1.78)	(2.20)	(1.65)
Single Family	0.356	0.348	0.255	0.393	0.381	0.289
	(2.35)	(2.64)	(2.09)	(2.49)	(2.79)	(2.24)
Infill	0.150	0.129	0.090	0.174	0.145	0.112
	(2.65)	(2.61)	(1.98)	(2.96)	(2.85)	(2.35)

Appendix Table A1
Extended Cost Models
Ordinary Least Squares
Dependent Variables in Logarithms
(continued)

	Total Cost			Cost Per Unit		
Variable	Site and Structure Cost	Residential Construction Cost	Project Cost	Site and Structure Cost	Residential Construction Cost	Project Cost
Location						
San Francisco	0.251	0.247	0.371	0.233	0.228	0.354
	(3.17)	(3.57)	(5.81)	(2.82)	(3.18)	(5.25)
Sacramento	0.135	0.125	0.157	0.141	0.127	0.163
	(1.44)	(1.54)	(2.09)	(1.45)	(1.51)	(2.05)
Fresno	-0.022	-0.002	-0.060	0.011	0.025	-0.029
	(0.22)	(0.02)	(0.74)	(0.11)	(0.28)	(0.34)
Bakersfield	-0.112	-0.144	-0.110	-0.114	-0.147	-0.113
	(1.02)	(1.52)	(1.26)	(1.00)	(1.50)	(1.21)
Los Angeles	0.126	0.114	0.165	0.122	0.110	0.161
	(1.61)	(1.68)	(2.62)	(1.49)	(1.56)	(2.41)
Merced	-0.078	-0.082	-0.057	-0.058	-0.066	-0.038
	(0.63)	(0.77)	(0.57)	(0.45)	(0.60)	(0.36)
Salinas	0.148	0.038	0.150	0.159	0.046	0.160
	(1.14)	(0.34)	(1.43)	(1.17)	(0.39)	(1.44)
San Diego	0.030	-0.002	0.152	0.022	-0.012	0.145
	(0.32)	(0.02)	(2.03)	(0.23)	(0.14)	(1.83)
San Luis Obispo	0.012	0.016	0.143	0.121	0.108	0.246
	(0.10)	(0.15)	(1.45)	(0.98)	(1.01)	(2.42)
Santa Barbara	-0.140	-0.251	-0.034	-0.124	-0.238	-0.018
	(0.98)	(2.03)	(0.29)	(0.83)	(1.85)	(0.15)
Redding	0.207	0.166	0.146	0.214	0.168	0.153
	(1.31)	(1.21)	(1.15)	(1.29)	(1.18)	(1.13)
Modesto	0.119	0.112	0.072	0.125	0.112	0.078
	(0.73)	(0.79)	(0.55)	(0.74)	(0.76)	(0.56)
Yuba City	-0.006	-0.113	-0.096	-0.059	-0.159	-0.145
	(0.03)	(0.61)	(0.55)	(0.26)	(0.83)	(0.80)
Visalia	0.008	-0.052	-0.139	0.013	-0.050	-0.133
	(0.06)	(0.48)	(1.38)	(0.10)	(0.44)	(1.25)
Constant	6.434	4.540	5.650	6.333	4.390	-0.133
	(3.78)	(3.07)	(4.12)	(3.57)	(2.86)	(1.25)
R^2	0.938	0.954	0.960	0.750	0.807	0.814

Note: t-ratios in parentheses

Appendix Table A2
Instrumental Variables Estimates of Construction Costs
Excluding Geographical Identifiers
Dependent Variables in Logarithms

	Total Cost			Cost Per Unit		
Variable	Site and Structure Cost	Residential Construction	Project Cost	Site and Structure Cost	Residential Construction	Project Cost
Prevailing Wage	0.386	0.421	0.385	0.382	0.415	0.383
	(5.10)	(6.07)	(5.40)	(5.08)	(6.04)	(5.41)
Log Units	0.929	0.941	0.937	-	-	-
	(33.85)	(37.19)	(36.20)	-	-	-
Affordability	-0.375	-0.245	-0.188	-0.348	-0.220	-0.163
	(3.09)	(2.16)	(1.64)	(2.87)	(1.94)	(1.43)
Targeting						
Non targeted	-0.231	-0.164	-0.137	-0.222	-0.157	-0.130
	(3.73)	(2.85)	(2.34)	(3.59)	(2.73)	(2.22)
Senior	-0.141	-0.173	-0.151	-0.153	-0.184	-0.162
	(3.39)	(4.49)	(3.86)	(3.69)	(4.82)	(4.16)
SRO	-0.511	-0.512	-0.573	-0.544	-0.539	-0.603
	(5.04)	(5.52)	(5.99)	(5.38)	(5.83)	(6.33)
Needs	-0.085	-0.219	-0.162	-0.085	-0.217	-0.162
	(0.96)	(2.70)	(1.93)	(0.95)	(2.67)	(1.93)
Time	3.475	5.506	4.558	3.358	5.441	4.450
	(2.12)	(3.67)	(2.95)	(2.04)	(3.61)	(2.87)
Parking	0.175	0.176	0.156	0.197	0.194	0.175
	(3.45)	(3.79)	(3.26)	(3.93)	(4.24)	(3.72)
Three Bedrooms	0.156	0.115	0.102	0.167	0.124	0.111
	(4.16)	(3.36)	(2.87)	(4.45)	(3.63)	(3.15)
Island	0.728	0.737	0.443	0.718	0.727	0.435
	(3.27)	(3.61)	(2.11)	(3.21)	(3.57)	(2.07)
Special Facilities	-0.285	0.006	-0.024	-0.308	-0.013	-0.045
	(2.70)	0.06	(0.24)	(2.91)	(0.13)	(0.45)
Mitigation	0.015	0.167	0.135	0.000	0.155	0.122
	0.21	2.51	1.98	(0.01)	(2.34)	(1.79)
Applicant						
Non Profit	-0.068	0.004	-0.020	-0.068	0.004	-0.020
	(1.46)	0.09	(0.46)	(1.45)	(0.09)	(0.46)
Developer						
Non Profit	0.108	0.056	0.034	0.135	0.078	0.058
	2.47	1.40	0.83	(3.18)	(2.03)	(1.46)
Funding	-0.196	-0.056	0.099	-0.113	0.012	0.171
	(1.93)	(0.61)	1.03	(1.19)	(0.14)	(1.92)
Sources	0.024	0.012	0.023	0.022	0.010	0.021
	(2.11)	(1.11)	(2.16)	(1.90)	(0.91)	(1.97)

Appendix Table A2
Instrumental Variables Estimates of Construction Costs
Excluding Geographical Identifiers
Dependent Variables in Logarithms

Variable	Total Cost			Cost Per Unit		
	Site and Structure Cost	Residential Construction	Project Cost	Site and Structure Cost	Residential Construction	Project Cost
Bonds	-0.076	-0.055	-0.055	-0.105	-0.077	-0.081
	(1.81)	(1.43)	(1.41)	(2.56)	(2.07)	(2.12)
Structure						
Townhouse	0.168	0.167	0.190	0.184	0.181	0.204
	(3.49)	(3.78)	(4.19)	(3.86)	(4.14)	(4.56)
Cooperative	0.609	0.430	0.436	0.773	0.564	0.582
	(2.48)	(1.91)	(1.89)	(3.22)	(2.57)	(2.58)
Two Stories	0.103	0.083	0.084	0.101	0.082	0.082
	(2.61)	(2.28)	(2.26)	(2.56)	(2.27)	(2.21)
Single Family	0.439	0.411	0.327	0.455	0.425	0.342
	(2.80)	(2.87)	(2.22)	(2.90)	(2.96)	(2.31)
Infill	0.128	0.092	0.038	0.145	0.105	0.053
	(2.42)	(1.88)	(0.76)	(2.75)	(2.17)	(1.07)
Constant	7.852	5.693	7.091	7.640	5.482	6.907
	(4.57)	(3.61)	(4.37)	(4.44)	(3.48)	(4.26)
R^2	0.916	0.930	0.925	0.686	0.728	0.690

Note: t-ratios in parentheses

Appendix B

For comparison purposes, we used a cost estimation service and actual wage data to calculate the impact of increased labor cost from prevailing wage legislation on residential construction cost. This rough estimate is based on two calculations – the percent of construction cost that labor represents (obtained from cost estimation) and the percent increase in labor cost resulting from payment of prevailing wages (obtained from actual wage data and state prevailing wage determinations).

To estimate the percent of construction represented by labor, we used a construction cost estimator. Specifications for an average single-family home in San Francisco were used to estimate the proportions of total cost that materials, labor and equipment represent. These proportions are presented in Appendix Table B1. As illustrated in this example, labor represents 46.9 percent of total construction cost for an average San Francisco single-family home.

An estimate of the increase in labor cost resulting from payment of prevailing wages is obtained by comparing actual wage data for selected San Francisco construction occupations with prevailing wage determinations. Five construction occupations applicable to residential construction were listed in the prevailing wage determinations published by the state – Carpenters, Drywall Installers, Electricians, Plasterers and Stucco Masons, and Roofers.[17] Mean wage data was obtained from the California Employment

[17] Since DIR only publishes non-residential rates, these were the wage rate determinations used in this analysis. Technically, the DIR can produce a "special residential determination" upon request of the developer, but in practice, these rates do not usually differ substantially from the non-residential rates. The regulations governing the timing of such requests make it difficult for developers to seek special rate determinations, and often DIR will use the non-residential rates in the residential wage determination anyway. The federal Department of Labor produces residential rates, but, similar to DIR's determinations, these rates are often the same for

Development Department (EDD), and prevailing wage determinations from the California Department of Industrial Relations (DIR). Although these occupations do not represent equal proportions of the labor cost, for simplicity, the five wage differentials are averaged. The resulting average wage differential – 66.7 percent – is used to represent the increase in labor cost resulting from prevailing wages.

The impact of prevailing wages on construction cost is then calculated as follows:

*TotInc = 1- (Lab% * LabInc + Other%)*

Where *TotInc* represents the total increase in construction cost; *Lab%* represents labor's original share of total cost; *LabInc* represents the increase in labor cost resulting from prevailing wages; and *Other%* represents the original non-labor share of total costs.

Using the labor share obtained from the cost estimator and the wage differential from EDD and DIR data, the estimated increase in construction cost resulting from prevailing wages is 31.3 percent.

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residential and non-residential workers. For example, the rate for a residential carpenter in San Francisco is $29.75 per hour, and for a non-residential carpenter it is the same.

Appendix Table B1
Labor's Share of Total Construction Costs

Item Name	Material	Labor	Equipment	Total
Excavation	0.0%	1.1%	0.2%	1.3%
Foundation, Piers, Flatwork	2.0%	3.6%	0.5%	6.1%
Rough Hardware	0.2%	0.4%	0.0%	0.6%
Masonry Frame	6.7%	10.5%	0.5%	17.7%
Insulation	1.2%	0.9%	0.0%	2.2%
Exterior Finish	3.7%	2.5%	0.3%	6.5%
Exterior Trim	0.2%	0.4%	0.1%	0.7%
Doors	0.6%	0.6%	0.0%	1.2%
Windows	1.0%	0.8%	0.0%	1.8%
Finish Hardware	0.1%	0.1%	0.0%	0.2%
Garage Door	0.0%	0.0%	0.0%	0.0%
Roofing, Flashing, Fascia	2.7%	2.6%	0.0%	5.3%
Finish Carpentry	0.4%	2.1%	0.0%	2.4%
Interior Wall Finish	1.7%	3.0%	0.0%	4.8%
Painting	1.0%	2.8%	0.0%	3.8%
Wiring	1.0%	2.3%	0.0%	3.3%
Lighting Fixtures	0.8%	0.3%	0.0%	1.1%
Flooring	0.8%	1.3%	0.0%	2.0%
Carpeting	1.5%	0.6%	0.0%	2.2%
Bath Accessories	0.4%	0.3%	0.0%	0.6%
Shower & Tub Enclosure	0.2%	0.2%	0.0%	0.5%
Countertops	0.7%	0.7%	0.0%	1.4%
Cabinets	2.4%	0.9%	0.0%	3.3%
Built In Appliances	1.2%	0.2%	0.0%	1.4%
Plumbing Rough-in and Connection	1.1%	3.1%	0.2%	4.3%
Plumbing Fixtures	2.2%	0.8%	0.0%	3.0%
Heating and Cooling Systems	3.1%	4.7%	0.0%	7.8%
Unit Heating and Cooling	0.0%	0.0%	0.0%	0.0%
Fireplace and Chimney	0.0%	0.0%	0.0%	0.0%
Subtotal Direct Job Costs	**37.0%**	**46.6%**	**1.7%**	**85.3%**
Final Cleanup	0.0%	0.3%	0.0%	0.3%
Insurance	2.3%	0.0%	0.0%	2.3%
Permits & Utilities	1.4%	0.0%	0.0%	1.4%
Plans & Specs	0.3%	0.0%	0.0%	0.3%
Subtotal Indirect Job Costs	**4.0%**	**0.3%**	**0.0%**	**4.4%**
Contractor Markup	10.3%	0.0%	0.0%	10.3%
Total Cost	**51.4%**	**46.9%**	**1.7%**	**100.0%**

Note: This is an estimate for a single-family residence built under competitive conditions in Zip area **941 San Francisco, California** in **July, 2003**. This estimate includes a foundation as required for normal soil conditions, excavation for foundation and piers on a prepared building pad, floor, wall, interior and exterior finishes, roof cover, interior partitions, doors, windows, trim, electric wiring and fixtures, rough and finish plumbing, built-in appliances, supervision, design fees, permits, utility hook-ups, the contractors' contingency, overhead and profit. Highly decorative, starkly original or exceptionally well-appointed residences will cost more.

Source: Cost estimation website: http://www.building-cost.net/

Appendix Table B2
Comparison of Mean Wages and Prevailing Wages - San Francisco

Geographical Location	Occupational Title	Mean Hourly Wage (1)	Prevailing Wage (2)	% Diff (Mean vs. Prev)
San Francisco MSA	Carpenters	$25.83	$40.49	56.74%
San Francisco MSA	Drywall and Ceiling Tile Installers	$26.67	$40.93	53.45%
San Francisco County	Electricians	$29.01	$56.07	93.26%
San Francisco County	Plasterers and Stucco Masons	$23.68	$37.91	60.09%
San Francisco County	Roofers	$20.10	$34.14	69.85%
Average Mean Wage-Prevailing Wage Differential				**66.68%**

(1) Actual wage data is accurate for the MSA level only for all occupations. The source of the data is the Occupational Employment Statistics Survey done by the California Employment Development Department.
(2) Prevailing wage determinations are available at the county level for electricians, plasterers and stucco masons, and roofers, and at the MSA level only for carpenters and drywall installers. These are from the superseded 2001 determinations from the Department of Industrial Relations. 2002 determinations are available, but for comparison purposes with actual wage data, 2001 determinations were used.