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China's Urban Housing Development in the Shift from Redistribution to Decentralization*

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This paper examines the influence of economic and housing reforms on urban housing development in China during the early transition from central state redistribution to administrative and fiscal decentralization. In socialist redistributive economies, the central state historically favored production investment at the expense of housing investment, monopolized the limited urban housing investment through administrative planning, and allocated urban housing as a heavily subsidized redistributive good. These policies contributed to serious urban housing shortages as an entrenched social problem in China. Panel regression analysis is used to model determinants of urban housing development in an early phase of economic and housing reform. The findings suggest the effects of continuing state redistribution and accelerated decentralization on urban housing development. Theoretical and policy implications are discussed.

The problem of housing illustrates the nature of social problems in general, and from its analysis students of social life can learn a great deal concerning the role of norms, the complexity of the factors and the method of analysis of social problems in general.

Louis Wirth (1947:142)

The statement, "housing is the most urgent problem of our society," is generally accepted by countries of different political and economic systems (Szelényi 1983:19). In any society, the housing sector is an integral part of the economic and social system. The availability and quality of housing are major indicators of a society's standard of living and level of economic and social development. In market economies, a housing purchase by the average individual or family is the largest investment and transaction. Mortgage payments or rental fees are generally the largest monthly household expenditure. Residential capital investment accounts for a substantial share of the national reproducible physical wealth (Renaud 1991). Research on housing provision and consumption provides a major avenue to understanding the interaction between the political, economic, and social forces which create and distribute wealth in a society.

Comparing Housing Systems

There are important distinctions between the housing systems of centrally planned and market-based economies. In planned economies, where housing is considered a *redistributive* good, the state's administrative allocation of housing construction funds constitutes the *first distribution*, while the allocation of completed housing units to state workers and employees as

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a welfare service for consumption becomes the *second distribution* or *redistribution* (Cai 1991). In a market economy, however, housing is a *private* good, which households acquire directly on the market according to income and choice; providing the same amount or standard of housing to everybody is not a social goal (see Renaud 1991:6-8). The two housing systems also differ considerably in definition of housing needs, determinants of housing investment, tenure and ownership, pricing of housing, and financing of housing construction and consumption.

In addition to the major differences between the two housing systems, there is considerable diversity among the countries within each system. In the late 1980s, public ownership of the urban housing stock in reforming socialist economies ranged from a high of 68 percent in China to a low of only 25 percent in Hungary. Public housing in market economies varied from 2 percent of the total housing stock in the United States to 38 percent in Sweden (Renaud 1991:38). The mixture of government intervention and market coordination tends to blur the boundary that separates centrally planned housing systems from market-based ones.

Given the tremendous importance of housing to the overall economic and social well-being of a country and the close interconnections between economic and urban housing reforms, economists at the World Bank (Hamer 1992; Renaud 1991) recently argued that China's overall economic reform will fail if urban housing reform is not successful. Our paper first discusses China's urban housing conditions before the economic and housing reforms that began in 1978, and then examines the effects of these reforms on urban housing development during China's early transition from a centrally planned to a market-oriented economy.

Research on China's Housing Reform

The literature on urban housing reform in China falls into three categories. Studies published in Western scholarly sources (Carlson 1987; Chu and Kwok 1990; Kirkby 1990; Lee 1988) provide broad historical overviews of China's urban housing policies and conditions through the mid-1980s, and acknowledge that housing shortages were ameliorated by the recent construction boom. A major conclusion of these studies is that reform has not resolved such critical problems as housing affordability and inequity. Although these studies are informative, they tend to be descriptive and atheoretical. The second type of research features published reports by analysts currently or formerly affiliated with the United Nations or the World Bank (Carlson 1986; Hamer 1992; Tolley 1991). Although they provide solid economic analyses of the advantages and disadvantages of urban housing reforms with regard to housing finance, property rights, rent calculation, tenure choice, and real estate development, these studies have a relatively narrow economic focus and advocate more rational and comprehensive reform policies. The third category of research, including numerous articles published in Chinese language journals such as *China Reconstructs*, *Chengshi Jingji* (Urban Economics), *Chengshi Guihua* (City Planning Review), and *Chengxiang Jianshe* (Urban and Rural Construction), examine housing reform policies and programs either at the national level or in specific cities (see Lin 1987), but they lack a theoretical focus.

Our study makes a unique contribution to the existing knowledge of urban housing reform and development in socialist economies, especially in China. First, unlike previous studies, which relied on scattered, ad hoc, and somewhat dated information, we use a set of coherent and interrelated indicators to chart the most up-to-date urban housing development trends during China's reform period. Second, while previous studies tended to focus on the characteristics of housing reform and development in individual cities, we develop and test several hypotheses about the determinants of housing development in China's cities as a system during 1984 to 1987. The determinants examined include demographic, economic, political, and policy variables which measure reform effects on urban housing development. This

analysis allows us to show how the redistributive role of the state in resource allocation and the mechanisms unleashed by reform affect urban housing development. Third, from the statistical findings, our study draws out the theoretical and policy implications of further urban housing reform and development in China as the transition toward a market economy continues.

Pre- and Post-Reform Urban Housing Development

From the middle 1950s to the late 1970s, the Chinese state played a primary role in urban housing investment, construction, and allocation.¹ But the state failed to eliminate serious urban housing shortages, which had several causes. First and foremost, urban housing construction was financed almost exclusively by basic construction investment from the central government. Housing construction funds from the central state budget supplied over 90 percent of the total urban housing investment (Gu 1990:54). Given the state's monopoly on housing finance, housing investment was always vulnerable to changes in centrally defined economic goals and the fiscal conditions of the state. The socialist development strategy that favored production, especially in heavy industries, over consumption kept housing investment very low in proportion to total capital construction investment. During China's first four "Five-Year" plans (1953-1965, 1958-1962, 1966-1970, 1971-1975), the proportion of housing construction investment remained well below 10 percent of the total capital investment (SSB 1990a:164). In comparison, housing investment during 1958-1974 in the United States, Japan, and the Soviet Union accounted for an annual average of 23, 18, and 18 percent of their respective total capital construction investments (Cai 1991:7).

Second, the state heavily subsidized housing by excluding housing costs from wages and by keeping rents artificially low. In China's cities, rents accounted for only an average of 2 percent of a household's monthly expenditure, compared with figures that range from 10 percent for countries with the lowest incomes to 25 percent in middle to high-income countries (Renaud 1991:39). In some of China's cities, residents paid an average of 13 Chinese *fen* (100 *fen* = 1 *yuan* = 18¢ U.S.) per square meter of living space; commercial rent would have been 200 *fen* (SCHRLGO 1991). The low rent made urban residents depend almost exclusively on the state for housing. The more housing units the state built, the more housing it had to subsidize. In addition, the low-rent, high-subsidy housing system prevented the state from recouping construction costs, and thus limited new housing investment.

Third, the continued rapid growth of the absolute size of the urban population since the mid-1950s further burdened the housing system. As a result, the average resident in China's cities had only 3.6 square meters of living space² in 1977, the year before housing reform began. There were 3.23 million households in China's cities lacking sufficient living space,³ accounting for 17 percent of the total number of households (Li 1990:66).

China's housing shortages have been distributed unequally between sectors, across localities, and within the political-administrative hierarchy. Compared to collectively owned enterprises, state-owned enterprises are generally larger and have production activities more closely coordinated with the national economic plan. As a result, they receive more resources

1. State dominance in the housing sector has been confined to the urban areas. In rural areas, while land is owned by local governments and collectives, housing has been built, financed, and owned by individual households.

2. In China, the term living floor space excludes kitchen, bathroom, balcony, stairways, corridor, etc. These, on average, make up approximately half of the total floor space in a housing unit (Carlson 1987:51).

3. These are broken down into three categories. The first category of households, numbering 1.04 million, includes couples who could not live together and those living in classrooms, workshops, warehouses, and offices. The second category numbered approximately 1.3 million households, which included two or three generations or grown-up children (aged 12 and above) and their parents sharing the same room. The third category included 0.89 million households in which per capital living space was below 2 square meters (Li 1990:66).

through state allocation and employee housing (Whyte and Parish 1984). Generally speaking, more developed and wealthier coastal cities and those with higher political status in the administrative hierarchy have had more housing investment (see Chen and Gao forthcoming).

China's urban housing reform began in 1978 as a major component of the overall economic reform introducing some decentralization and market mechanisms into the centrally planned system. The housing reform involved several different strategies and programs at the national and local levels. Initially, the state considerably increased nationwide housing investment as a proportion of gross national product (GNP) from an average of 1.5 percent during 1949-1987 to around 7 percent through most of the 1980s. China's housing investment-GNP ratio exceeded the ratios of many countries, such as Japan, West Germany, France, the United States, and Hong Kong (SCHRLGO 1991). In 1988, China's urban housing investment alone accounted for 3.3 percent of the GNP (Hamer 1992:5). Of the 200 billion *yuan* in state urban housing investment during 1949-1987, 110 billion *yuan* (55 percent) were invested between 1978 and 1987; of the 1.4 billion square meters of living space completed in the same period, 1 billion square meters (71 percent) were completed from 1978 to 1987 (SCHRLGO 1991:12). The surge in housing investment and completed living space per urban resident would even have been greater, had it not been for the rapid growth of the urban population (the denominator in the calculation of the two indicators in Figure 1), which averaged 4.5 percent annually during 1978-1991 (SSB 1992:15). Nevertheless, living space per capita in China's cities improved steadily in the 1980s. The near doubling of the indicator from 1978 to 1990 reflects the fueling effect of the housing construction boom after a long period of neglect, from 1949 to the late 1970s, that reduced living space per capita (see Figure 2).

The urban housing investment and construction boom indicates a reorientation of the state from production toward housing construction. The more significant aspect of the reform, however, involved the shift of the housing investment system from one based almost exclusively on central state redistribution to one featuring joint responsibilities of the central state, local governments, business enterprises, and individual households. Local governments and enterprises became more active and autonomous in financing urban housing construction. In 1979, over 90 percent of all housing investment was financed by central and local government budgets. By 1988, the central government's share was reduced to 16 percent, while local government budgets financed an additional 6 percent (Hamer 1992:6). By 1990, the central and local government budgets accounted for only 23 percent of the total urban housing investment, enterprises financed 60 percent, with 17 percent coming from individual households (SCHRLGO 1991:24).

Before the reform, urban housing construction was planned and approved by central authorities and then implemented through the vertical bureaucracy at the local level. The reform streamlined and decentralized this planning-approval process to the local (city or municipal) level. Decentralization prompted some local governments to begin commercializing the urban housing sector through the sale of public housing stocks and rent increases. Four cities started the experimental sale of state-owned housing in 1982. An individual would pay one-third of a residential unit's price, which was set below market cost, with the municipal government and the buyer's work unit each contributing one-third of the remaining balance. During the first two years, the four cities sold a total of 2,140 new housing units. In 1984, this trial scheme was officially extended to about 110 cities and towns, with an additional 50 cities starting in 1985. By 1986, 48 million square meters of housing were sold, though this amounted to only 3 percent of the annual production (Hamer 1992:26).

Finally, local housing reform involved increasing the very low rents. The city of Yantai (Shandong province), for example, raised monthly rent from 0.15 *yuan* per square meter to 1.17 *yuan*, and issued "housing subsidy coupons" worth 23.5 percent of a tenant's monthly wage to help pay the higher rent; these changes made housing commercially viable (Mou

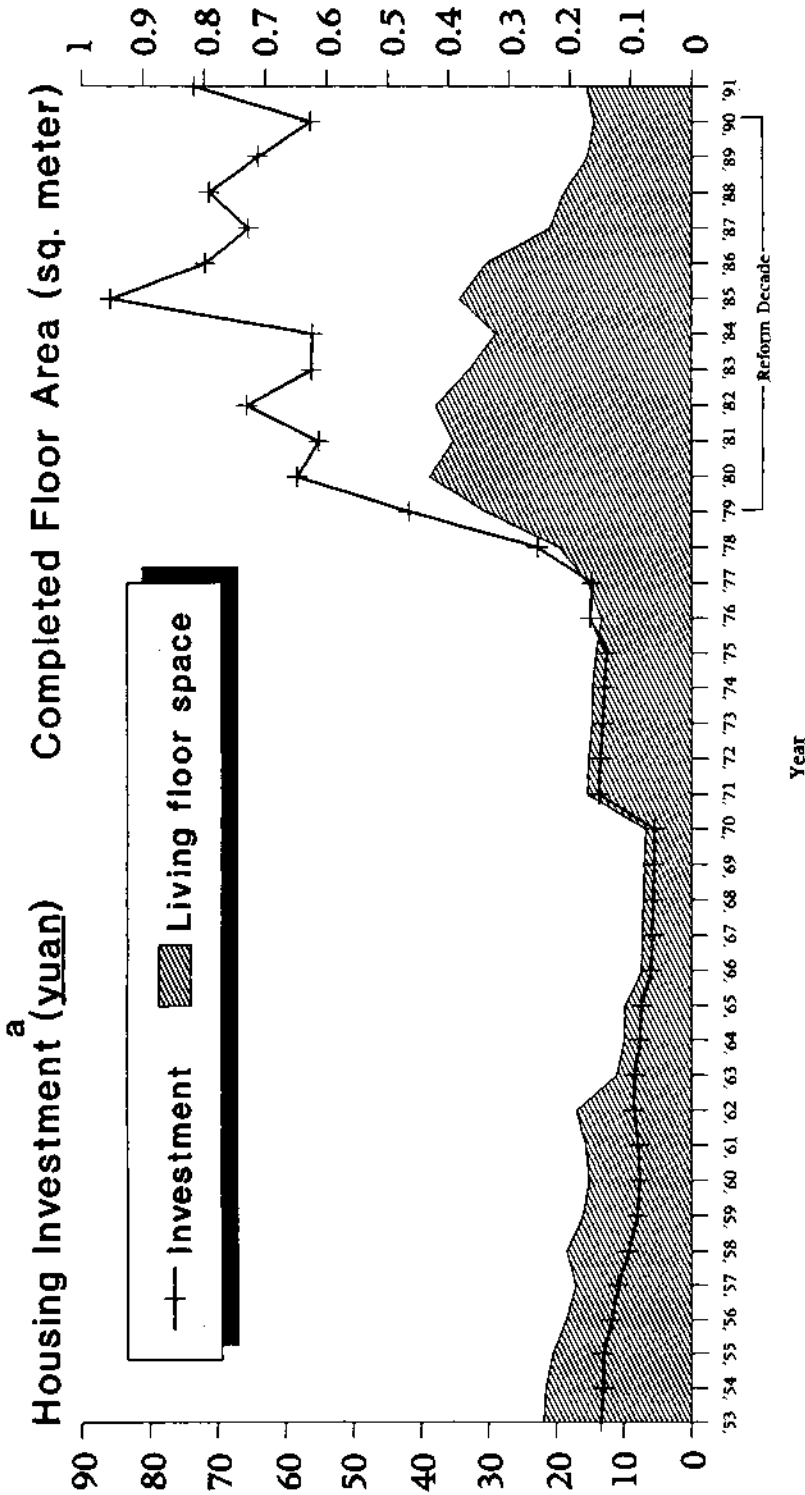


Figure 1 • State Housing Investment and Completed Living Floor Space per Capita in Urban China, 1953-1991

Notes:

a. Investment in current price (1 yuan = U.S. 10¢).

Source:

CSA (1990:60); Kirby (1990:299); SSB (1990a: 81, 153; 1991:22; 1992:15, 23, 27).

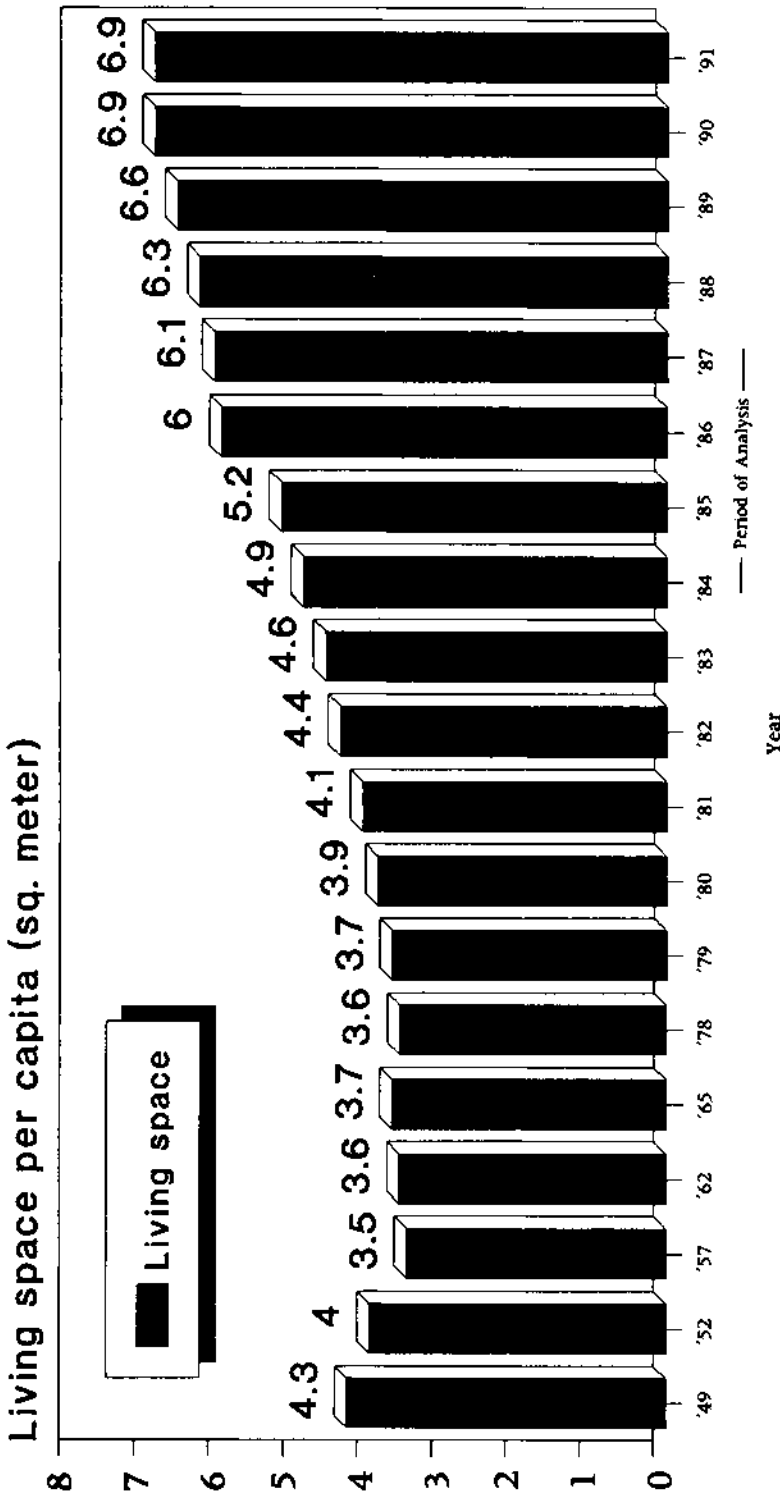


Figure 2 • Living Space per Capita in China's Cities, 1949-1991 (Selected Years)

Note:

Data on 1949-65 are for 74 cities, while 1978-91 data are for all cities.

Source:

Cai (1991:10); SSB (1990b:324).

1989). A number of other cities also increased average monthly rents to over 1 *yuan*, which approximated 70 percent of the true rental cost (Zhang 1990).

Theoretical Framework and Hypotheses

Economic reforms in China, Eastern Europe, and the Soviet Union in the past decade or so have led to new theoretical developments in the study of state socialism. The new institutional analysis of state socialism (see Stark and Nee 1989:30) suggests that theories explaining its processes and outcomes must focus on institutional arrangements specific to state socialism. Recent theoretical and empirical studies of state socialism have focused on the problem of the transition from bureaucratic redistribution to market coordination. The theory of market transition (see Nee 1989) suggests that the shift from state redistribution to market coordination creates new *power*, *incentive*, and *opportunity* structures that benefit direct producers (e.g., peasant households). The institutional bargaining perspective (Burawoy and Krotov 1992) suggests that in prereform socialist economies, enterprises were capable of bargaining with the central state to minimize what the state appropriated and to maximize what it redistributed. Although reform has paralyzed the central state, enterprises continue to bargain with regional and local authorities to obtain scarce resources.

Our study focuses on urban housing development in a period (1984-1987) during which reforms introduced very few market mechanisms. Reform only shifted the locus of redistribution from the central state to local governments and enterprises. This administrative and fiscal decentralization, although not creating market transactions directly, brought greater powers, incentives, and opportunities to local governments and enterprises. The local government has become the primary tax assessor and collector in the country. It determines the volume of resources that remain locally as revenues and as after-tax net earnings of enterprises, and what is turned over as taxes to provincial and central governments (Hamer 1992:17-18). The combination of more resources and greater leeway in using these resources provides local governments and enterprises with incentives and opportunities to invest in housing construction. Greater autonomy for local governments and enterprises also strengthens their hand in bargaining with higher authorities to keep even more of the surplus, which further facilitates housing construction. While our theoretical focus is on how changes *within* the redistributive system affect urban housing development, it is appropriate for us to draw on the underlying assumptions of market transition and institutional bargaining models which highlight the enhanced authority and opportunities of local governments due to decentralization.

Using this modified theoretical framework, our statistical analysis focuses on the period from 1984 to 1987 (see Figure 2) because 1984 marked the beginning of general urban economic reform and increasing decentralization in housing finance and construction. The period is also distinctive because in January of 1988, the state announced a bolder and more comprehensive reform program, which emphasized home ownership (Hamer 1992). This new phase of reform was to be extended from the experimental cities to the majority of cities in the early 1990s. The temporal focus of our analysis calls for two types of hypotheses and statistical models. First, we evaluate determinants of living conditions at the beginning of the urban economic reform in 1984, using cross-sectional regression analysis. Second, and more significantly, in a theoretical sense, we test hypotheses dynamically with panel regression models, which allow us to examine the reform's effect on housing development between 1984 and 1987, taking housing conditions in 1984 into account.

Hypotheses

Earlier studies (Chen 1988; Howe 1968; Wu 1988) report worse housing shortages in China's larger and more crowded cities. Under the prereform redistributive economy, it took more state investment to improve housing conditions in larger and more densely populated cities. Despite the reform, the worse housing conditions in larger and more crowded cities were unlikely to be ameliorated during the short study period (1984-1987).

Hypothesis 1: City size and density had a negative effect on living conditions in 1984 and on housing development from 1984 to 1987.

Prior to the reform, fiscal resources flowed upward, as profits from enterprises were handed over to the central state by local governments. With administrative and fiscal decentralization, more resources have been kept at the local level. Cities and enterprises can retain surpluses to build residential housing. More industrialized cities have a larger revenue base and more funds for housing investment. More profitable enterprises tend to exert greater bargaining pressure on local governments to build additional housing to better satisfy their employees' housing needs.

Hypothesis 2: Industrialization had no effect on living conditions in 1984, but contributed to housing development during 1984-1987.

Under the state redistributive economy, resource allocation is influenced by the administratively and financially stratified vertical system. Walder (1992:530) suggests that administrative position in the government hierarchy is a determinant of revenue extraction by the state (i.e., the higher the position in the government hierarchy, the larger the budget and the more numerous and lucrative the sources of revenue). But this advantage may be weakened by decentralization, which has strengthened the autonomy and flexibility of localities further down the administrative hierarchy and farther away from the political power centers.

Hypothesis 3: Cities higher in the political-administrative system⁴ had more spacious living conditions in 1984, but cities with lower political status achieved greater housing development between 1984 and 1987 as reform deepened.

China's economic and housing reforms have involved spatially targeted and location-specific favorable policies, which may reinforce prior spatial socioeconomic disparities. Historically, China's industrialization proceeded from the coastal region to the inland regions. In the 1980s, the coastal region was favored by more open and extensive reform policies (Chen 1991). The market transition argument (Nee 1989) points to net gains for the coastal provinces, which contributed their surplus resources through state redistribution prior to the reform, in comparison to the less reformed inland provinces, which benefited from redistribution previously. During 1984-1987, the central state officially designated 14 cities as "housing reform cities," but a number of other cities implemented various locally initiated housing reform programs.

Hypothesis 4: Cities in the coastal provinces⁵ and housing reform cities⁶ had better living

4. China's cities are ranked according to an administrative hierarchy which determines political and economic autonomy. Beijing, the nation's capital, is equivalent to a province for administrative purposes and reports directly to the central government. Shanghai and Tianjin also are province-level cities. There are 26 cities that are capitals of provinces and minority autonomous regions. Below them are prefecture-level cities which report directly to provincial governments. As the bottom of the hierarchy are county-level cities that report to prefectures.

5. China's coastal region includes the three central government municipalities of Beijing, Shanghai, Tianjin, as well as Fujian, Guangdong, Guangxi, Hebei, Jiangsu, Liaoning, Shandong, and Zhejiang provinces, while China's inland region encompasses 18 provinces and minority autonomous regions.

6. The 14 officially designated housing reform cities are Shijiazhuang, Tangshan, Xingtai (Hebei province); Jinzhou (Liaoning province); Changzhou, Zhenjiang (Jiangsu province); Bengbu (Anhui province); Nanping (Fujian province); Yantai (Shandong province); Wuhan (Hubei province); Fuoshan, Jiangmen (Guangdong province); Chongqing (Sichuan province); and Lanzhou (Gansu province). We also included in the dummy variable 11 other cities which experimented with various local housing reform measures through 1987, including the four cities that began housing sales in 1982.

conditions than other cities in 1984 and more housing development than other cities during 1984-1987.

The previous section has documented that greater housing investment contributed to a major improvement in living space per capita at the national level (see Figures 1 and 2). Cities that are more capable of investing funds in housing construction will have more spacious living conditions over time. Second, cities with better living conditions at the outset of the reform are better able to take advantage of greater local autonomy in committing more resources to housing construction.

Hypothesis 5: Housing investment had a positive effect on living conditions in 1984 and housing development between 1984 to 1987; cities with larger living spaces in 1984 achieved more housing development than other cities from 1984 to 1987.

Before the reform, the Chinese state emphasized production at the expense of consumption, and kept wages low and disconnected from rents. Although economic and housing reforms promoted and strengthened the household as the central consumption unit and led to wage increases and housing sales, the continuing role of the state in determining basic wages, coupled with the high price of commodity housing and lack of housing choices, prevents housing from becoming an affordable consumer product whose value is commensurate with the low and relatively fixed household income.

Hypothesis 6: Household income had a weak positive effect on urban housing development through 1987.

Data, Variables, and Measurement

The data for testing the above hypotheses are derived from China's urban statistical yearbooks for 1984 (SSB 1985) and 1987 (SSB 1988). The former contains demographic, economic and social indicators on all 295 cities in China for 1984,⁷ and the latter has the same indicators on all 382 cities for 1987.⁸ The use of panel regression requires our unit of analysis to be the 295 cities with data for both years.

The dependent variable—housing development—is measured by living space per city resident in 1984 and 1987 (the indicator in Figure 2). To construct this measure, we divided the total amount of residential living space in each city by its nonagricultural population,⁹ because the agricultural population in China's cities is not entitled to urban housing. Average living floor space may not be best measure of urban housing conditions in China, as it does not distinguish between those who share dwelling units with family or friends and those who have their own flats, crowded as the latter may be. In developing nations, residential crowding is sometimes measured by the number of households to a housing unit. In Western nations, the indicator is usually the number of persons to a room in the housing unit (Baer 1976). But living space per capita is the only officially reported and consistently used indicator in China, and its validity has been shown by studies linking it to stress (e.g., Ekblad et al. 1991). The current preference of most urban residents for more spacious living also justifies using it as a measure of housing conditions.

7. China had 300 officially designated cities (municipalities) in 1984. Five cities were not included in SSB (1985) due to nonreporting.

8. In 1987, the total number of cities in China increased to 382, a net gain of 82 from 1984. Almost all of these "newly designated" cities were previously counties (see Chen 1991).

9. According to China's Ministry of Construction (1991:86), urban residential floor space (the numerator in the dependent variable) includes all housing stocks built by state and collective units and nonagricultural residents within the boundary of cities and towns. Excluded in the measure are housing units in the urban areas built by agricultural residents who are not entitled to the allocation of public housing.

The independent variables include city size, density, industrialization, political-administrative status, region, housing reform policy, housing investment, household income, and the lagged dependent variable. For some variables, logarithmic transformations normalize skewed distributions. We use the nonagricultural population (logged) in China's cities in 1984 to measure city size. Density is the number of people in 1984 per square kilometer (logged). The measure of industrialization is the gross industrial output value in 1984 (in Chinese yuan) divided by the nonagricultural population of the city (logged). To measure the political-administrative status of China's cities, we code the three central government municipalities (Beijing, Shanghai, Tianjin) and the 26 provincial or minority autonomous region capitals as the omitted category, whereas prefecture-level cities are coded 1 (0 otherwise), and the same coding is used for county-level cities. To measure the regional effect of economic development and reform intensity, we code cities in China's coastal region 1, while cities in the interior region are coded 0. We use a dichotomous dummy variable to measure the potential effect of housing reform policy by assigning 1 to the housing reform cities and 0 to all other cities. Housing investment is measured by the sum of the housing construction funds (in Chinese yuan) spent by state and collective units in 1984 (logged). Omitting private housing investment, for which city-level data are not available, may slightly underestimate the total amount of urban housing investment. Household income is measured by the total income (in Chinese yuan) for regular expenditures per average member in an urban household in 1985 (SSB 1986). In addition to basic wages, this measure includes bonuses, subsidies, and other sources of monetary income. Thus, income per household member is a more realistic and accurate measure of consumption and living standard than wages.

Results and Discussion

Table 1 compares four regression models. In estimating them, we relied on statistical diagnostics to ensure that multicollinearity was not a problem.¹⁰ The relatively small number of observations also cautioned us to check for the disproportionate effects of influential cases on the parameter estimates.¹¹ To maximize the number of cases for analysis, we used a statistical procedure to retrieve the observations that would otherwise be lost due to missing values.¹²

10. To detect multicollinearity, we used two diagnostic tools, VIF (variance inflation indicator) and COLLINOINT, which are options available in the SAS regression procedure. The variance inflation indicator is defined as $1/(1 - R_i^2)$ where R_i^2 is the coefficient of determination for the "regression" of the i th independent variable on all other independent variables. The VIF statistics show how multicollinearity has increased the instability of the coefficient estimates. COLLINOINT generates the condition number that provides a single statistic for indicating the severity of multicollinearity. Using the generally accepted criteria of VIF = 10 and condition number = 30 (see Freund and Littell 1991:97-98), we found no evidence of collinearity among the independent variables.

11. We used two regression diagnostics in Belsley, Kuh, and Welsch (1980) to detect potential outliers. The first diagnostic tool is the *studentized residual*, computed as the observed residual divided by its estimated standard deviation. If the *studentized residual* associated with a case exceeds two, it indicates that the case may influence regression results. The other diagnostic procedure—DFFITs (differentiation)—provides a means for examining the sensitivity of the regression coefficients to a slight change in the weight given to the i th observation. The DFFITs cutoff for identifying an outlier is two. Applying the two diagnostics, we detected no city in the first three equations to be outliers. In the last equation (Model 3), two cities whose *studentized residual* and DFFITs exceeded two were excluded from the analysis.

12. Fifty-five cities had missing values on housing investment by collective units. Given our relatively small number, excluding the cities meant a loss of 18.6 percent of all observations. Assuming that the missing data are conditional on some other variables (see Little and Rubin 1987:3-20), we decided to use the procedure of regression imputation to fill in the missing values. The BMDPAM (analysis of missing) routine based on the method of maximum likelihood is considered among the best statistical softwares for this purpose (see Dixon 1988:813-28). Using this procedure, we regressed collective housing investment on city size, percent labor force in collective units, collective enterprise industrial output and average wage of collective units' employees. Imputing the missing values allows us to include all cities with repeated measures for 1984 and 1987 in the first three equations in Table 1.

Table 1 • Unstandardized and Standardized Regression Coefficients for Models Predicting Housing Development in 295 of China's Cities in the period 1984-1987

Independent Variables ^a		1984	1984-1987 Model 1	1984-1987 Model 2	1984-1987 Model 3 ^b
City size (logged)	<i>b</i>	-.485***	-.610***	-.490***	-.573***
	β	-.398	-.472	-.379	-.584
	(SE)	(.111)	(.119)	(.120)	(.164)
Density (logged)	<i>b</i>	.145*	.213**	.176**	.246**
	β	.160	.221	.183	.294
	(SE)	(.062)	(.066)	(.065)	(.099)
Industrialization (logged)	<i>b</i>	.025	.290*	.283*	.186
	β	.013	.140	.138	.103
	(SE)	(.139)	(.148)	(.145)	(.240)
Prefecture-level city	<i>b</i>	-.771**	-.994**	-.799**	-.879**
	β	-.305	-.369	-.297	-.453
	(SE)	(.297)	(.318)	(.314)	(.313)
County-level city	<i>b</i>	-1.237***	-1.175**	-.860*	-.980*
	β	-.496	-.443	-.324	-.426
	(SE)	(.378)	(.408)	(.405)	(.313)
Coastal city	<i>b</i>	.186	.136	.087	-.164
	β	.071	.049	.031	-.082
	(SE)	(.150)	(.161)	(.158)	(.213)
Housing reform city	<i>b</i>	— ^c	-.233	-.193	-.133
	β		-.049	-.041	-.048
	(SE)		(.269)	(.262)	(.247)
Housing investment per capita (logged)	<i>b</i>	.537***	.384**	.251*	.054
	β	.288	.194	.127	.029
	(SE)	(.116)	(.124)	(.125)	(.199)
Lagged living space per capita (1984)	<i>b</i>	—	—	.248***	.279**
	β			.234	.270
	(SE)			(.061)	(.107)
Household income (1985)	<i>b</i>	—	—	—	.005
	β				.045
	(SE)				(.012)
Intercept		8.185	10.437	8.396	9.931
Adjusted R ²		.164	.156	.199	.272

Notes:

a. See text for definition of variables.

b. Based on 103 cities for which data on household income are available.

c. Not included because some housing reform cities did not introduce reform measures until after 1984.

* Significant at $p \leq .05$; ** significant at $p \leq .01$; *** significant at $p \leq .001$.

Column 1 in Table 1 shows the cross-sectional equation in which living space per capita in 1984 is the dependent variable. Larger cities have less spacious housing, as expected. An unexpected finding is the weak positive effect of density. Industrialization and region have no effect, while city status and housing investment show the expected strong effects. Although these cross-sectional results are not our central interest, they reflect prereform conditions, which can then be compared with the results from panel regression analysis.

Model 1 (column 2 in Table 1), strictly speaking, is not a change model, as it does not control for the lagged dependent variable. However, the model specifies a clearer causal sequence than the cross-sectional model above, in that living space per capita in 1987 is taken as a function of the predictors measured in 1984. The statistically significant variables represent reform effects on housing development during 1984-1987. The results show that larger cities

had less housing development, whereas more densely populated cities had more housing development. The major difference between the cross-sectional model and Model 1 is that industrialization did not affect housing conditions in 1984 but had a positive effect on housing development between 1984 and 1987.

Model 2 (column 3 in Table 1) is based on a panel regression equation in which living space per capita in 1987 (t) is estimated as a function of initial living space in 1984 (t -lag) and the same set of independent variables initially measured.¹³ The obvious advantage of panel regression is that it controls for initial differences on the dependent variable in predicting change in the dependent variable between time 1 and time 2 (Markus 1979). In our case, the positive correlation of 0.35 between living space per capita in 1984 and 1987 (see Appendix A) indicates some stability over time in that cities with better initial living conditions had even more favorable subsequent living conditions, without considering other factors. That living space per capita in 1984 and 1987 do not correlate at unity allows us to evaluate the effects of other factors on change in living space per capita between the two time points. The results from Model 2 suggest this to be the case. When controlling for the lagged dependent variable (the stability factor), all variables that are significant in Model 1, maintain their effects, except that the coefficients are attenuated.

The first three models provide partial supporting evidence for *hypothesis 1*. The negative effect of city size at the outset of the reform in 1984 sustained itself through 1987. Decentralization did not alleviate the burden of the local governments in larger cities to improve living conditions. The constraint of city size on housing conditions reflects not only China-specific conditions but those in the large urban centers of many Third World countries (Brennan 1993; Rondinelli 1990). Contrary to *hypothesis 1*, density had a weak positive effect in 1984 and a stronger positive effect on housing development during 1984-1987. Given this fine distinction between the static and dynamic effects, we suggest that in cities of higher population density, governments were more responsive and aggressive in housing construction to relieve the greater pressure on housing demand. Since the early 1980s, many cities in China, especially the highly crowded ones like Shanghai, have erected increasing numbers of high-rise apartment buildings, which mitigate the potential constraints of high density on housing development.

The positive effect of industrialization on urban housing development between 1984 and 1987 supports *hypothesis 2*. Under the unreformed redistributive socialist economy, profits from enterprises were handed over to higher authorities through and by local governments. If even some surplus was kept at the local level, the local governments had severely limited authority in using the surplus for such nonproduction projects as housing development. As a result, industrialization had nothing to do with living conditions in 1984. With decentralization of allocative power to local governments and enterprises and their authority to retain after-tax profits, more industrialized cities or those with more productive and profitable enterprises could invest more of the surplus in housing construction, thus leading to more rapid housing development through 1987 (see Chen and Gao forthcoming). The process of channeling the surplus into housing construction at the city level has been reinforced by the bargaining pressure from profitable enterprises to better meet their employees' housing needs.

The effect of city status confirms the static aspect of *hypothesis 3*, but contradicts its dynamic version. The prereform redistributive system favored provincial capitals at the expense

13. The lag model is written as:

$$\text{Living Space}_{(87)} = \alpha + b_1 \text{Living Space}_{(84)} + b_2 \text{City Size}_{(84)} + \dots + \epsilon_t \quad (1)$$

When the lag model is rewritten into an explicit change model, it becomes:

$$\text{Living Space}_{(87)} - \text{Living Space}_{(84)} = \alpha + b_1 \text{Living Space}_{(84)} + b_2 \text{City Size} + \dots + \epsilon_t \quad (2)$$

In (1), the effect of living space₍₈₄₎ on living space₍₈₇₎ is expressed in terms of the deviation of the coefficient of living space₍₈₄₎ from the coefficient of 1.0 (representing stability). The other coefficients in the equation represent the effect of the independent variables on change in living space₍₈₇₎ as in: $\text{Living Space}_{(87)} = \alpha + (1 + b_1) \text{Living Space}_{(84)} + b_2 \text{City Size} + \dots + \epsilon_t$.

of prefecture- and county-level cities, as shown by the cross-sectional model. Models 1 and 2 indicate that provincial capitals had greater housing development than either prefecture- or county-level cities from 1984 to 1987, although the disparity between prefecture- and county-level cities in living conditions narrowed slightly over time. Administrative and fiscal decentralization was not sufficient to improve the less favorable positions of lower-tiered cities with regard to the distribution and use of financial resources for housing development. Under the partially reformed redistributive economy, the privileged and powerful position of provincial capitals at the top of the administrative hierarchy helped them obtain and control more resources. Decentralization benefited provincial capitals more by allowing them to use resources more freely for housing development. However, further decentralization for a longer period of time is likely to weaken the privilege of cities of the highest political status, and favor cities with lower political status.

Region and location-specific housing reform turn out to have no effects, leaving *hypothesis 4* unsupported. Although the positive coefficient of region indicates slightly better initial housing conditions and more housing development in coastal cities during 1984-1987, the difference is not sufficient to produce a statistical effect. This suggests that whatever positive influence there was from faster economic development, deeper reform, and greater decentralization in coastal cities, they did not affect housing development, measured in the improvement of the average living space from 1984 to 1987. Its unexpected sign aside, the housing reform city dummy variable suggests that if there was a positive effect from reform programs in the officially designated housing reform cities or those with various local experiments, it did not lead to improved living space per capita over time. Whether this is due to the limited and piecemeal reform measures or the short period of study calls for in-depth case studies of these cities over a longer time span.

The three models thus far are clearly consistent with *hypothesis 5*. It is obvious that relative to the growth of urban residents, more housing investment improved the average living space by contributing more new housing units to the existing stocks either before or after the reform. In Model 2, the unstandardized coefficient of housing investment is interpreted as an increment of .251 square meters of living space per person in 1987 for a 1 percent increase in housing investment in 1984. The strong positive effect of living space per capita in 1984 (Model 2) suggests that, irrespective of the relative effects of some independent variables, cities that had more spacious living conditions in 1984 did better in improving living conditions through 1987. The "housing rich cities" got even richer because they had more resources for housing construction at the beginning of the reform. This reinforced the advantage of those cities and provided them with more latitude in using the resources to better local housing further. This outcome is logically consistent with the shift from redistribution to decentralization, which tends to widen existing socioeconomic disparities at the local level, at least initially.

Model 3 (Column 4 in Table 1) includes household income as an additional predictor of urban housing development. Although the model is based on only 103 cities, they are fairly representative of all China's cities in terms of geographic coverage, size category, and level of economic development.¹⁴ That household income has no effect fails to support *hypothesis 6*. Since an average person in a household received only 60.4 *yuan* a month for regular expenditures in 1985 (see Appendix A), a flat of 50 square meters, even set at the below market price

14. The 1985 urban household survey, which provided the household income variable, was conducted in 106 cities originally. Lhasa, the capital of Tibet, was missing for all the 1984 variables, and thus was excluded (see Appendix A). Shenzhen and Wenzhou were left out because they were influential cases (see Note 11 above). The remaining 103 cities were located in all of China's provinces and minority autonomous regions (except Tibet), from all four officially defined city size categories (20 cities with 1,000,000 and plus nonagricultural population, 22 cities with 500,000-999,999 people, 34 cities with 200,000-499,999 people, and 27 cities with less than 200,000 people), and represented various levels of development. The survey covered a total of 17,143 randomly selected households in the 106 cities; the household data were then aggregated to the city level.

of 12,500 *yuan* (SCHRLGO 1991), was far beyond the financial capacity of the average household. Household income, nonsignificant as it is, reveals the limitations of the economic and housing reforms during 1984-1987. There was a lack of market mechanisms (e.g., mortgages) to induce the rapidly growing disposable income, which had been rising 6.4 annually since 1978 (Huang, Shen, and Jin 1991), into financing housing construction. The inclusion of household income does not change the other variables in the model, except for industrialization and housing investment, which are no longer statistically significant. Given the relatively high correlations between household income and industrialization and housing investment (see Appendix A), we entered them separately in the model and found that none was statistically significant. The disappearance of the effects of industrialization and housing investment reflects the use of a nonrandom sample of 103 cities for which the household income variable is available.

Theoretical and Policy Implications

This paper has combined a historical overview of the extent and sources of serious housing shortages as a social problem in urban China through the 1970s and a focused examination of urban housing development trends in the 1980s. Against the historical dominance of the central state over urban housing and the earlier economic and housing reforms emphasizing decentralization, we have advanced and tested, through both cross-sectional and panel regression analyses, several hypotheses about the reform's effects on urban housing development during 1984-1987. In spite of the short time period under study, enough change in the cities' average living conditions occurred that it could be explained by some antecedent demographic, economic, and political factors during the reform, while controlling for the initial living conditions.

Before the reform period 1949-1978, the central state monopolized the urban housing sector. From 1979 on, the housing system was gradually replaced by one based on local governments and, even more often, enterprises, which accounted for 60 to 70 percent of the total urban housing investment throughout the 1980s (Huang, Shen, and Jin 1991:11). The decentralization and diversification of housing finance led to a housing construction boom in the 1980s (also see Chen and Gao forthcoming). The completion of new housing space averaged 125 million square meters annually during 1979 to 1988, compared with an average of only 18 million square meters from 1950 to 1978 (SCHRLGO 1991).

Despite this achievement, severe urban housing shortages and inequalities have not been eliminated. In 1985, a total of 10.5 million urban households, 26.5 percent of all urban households, were classified as lacking sufficient living space (see Footnote 3), with 730,000 of these "hardship" cases averaging less than 2 square meters of per capita living space. In 1988, there were still 8 million urban households with insufficient living space, and 500,000 of them had a per capita living space of less than 2 square meters (Huang, Shen, and Jin 1991:4). Looking ahead, to achieve the recently announced state goal of 8 square meters of living space per urbanite by the year 2000, requires the completion of 150 million square meters of living floor space during the period 1991 to 1995 and 180 million square meters during 1996 to 2000. The projected annual investment ranges between 45 and 54 billion *yuan*, far exceeding the average annual investment of approximately 20 billion *yuan* during 1979-1988 (SCHRLGO 1991).

Continuing housing shortages are inevitably connected with the partially reformed system based on local governments and enterprises. Based on theory, the shift from central redistribution to local autonomy corrects the economic and social problems in state socialist societies resulting from rigid central planning and control. The Chinese experience reveals the advantages and limitations of the partially reformed housing system, which remains *redistributive* in nature even though the locus of housing redistribution has shifted from the central

state to the local state and enterprises. Increasing housing demand strains local government budgets and enterprises' balance sheets, and largely accounts for the decline of housing investment and construction after 1985 (Figure 1) and the lost momentum in the improvement of living space per capita in 1990-1991 (Figure 2). Moreover, given the considerable local variations in economic development and enterprise productivity and profitability, the redistributive housing system will continue to produce and maintain housing inequality between and within cities of different sizes and regions.

Our statistical analysis allows us to arrive at the final, albeit tentative, conclusion that the shift from a centrally controlled housing finance system to one based on local government and enterprise autonomy has brought about rapid housing development during the reform decade. Having achieved earlier success, this partially reformed system has already begun to stall as a victim of its own essentially unaltered redistributive logic. The new but diminishing housing investment will have decreasing economic returns, if it is not recovered through more extensive privatization of housing ownership and complete commercialization of housing sales and rents. To transform urban housing from a redistributive welfare service to a marketized wage good, the reform must move the housing system from one anchored in local governments and enterprises to one oriented toward the housing market and individual consumers. This next phase of reform will be much more complex and protracted than the initial shift, for it involves gradually removing the redistributive role of local governments and enterprises in housing provision, factoring the full housing costs into wages, and establishing a real and fully functioning housing market. Urban housing reform in China, as in other socialist countries, will experience many obstacles as the transition from a state-redistributive to a market-coordinated economy continues.

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Appendix A • Correlation Matrix, Means and Standard Deviations for the Variables

Variable	Correlations ^a											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
1. Living space (1987)	1.00											
2. City size ^b	-.09	1.00										
3. Density ^b	.15	.49	1.00									
4. Industrialization ^b	.20	.40	.50	1.00								
5. Prefecture-level city	-.02	.34	.25	.40	1.00							
6. County-level city	-.03	-.68	-.38	-.47	-.83	1.00						
7. Coastal city	.10	.19	.29	.35	.19	-.20	1.00					
8. Housing reform city	-.01	.22	.20	.19	.19	-.27	.18	1.00				
9. Housing investment ^b	.25	.23	.08	.38	.17	-.34	.09	.10	1.00			
10. Lagged living space (1984)	.35	-.00	.12	.18	.08	-.15	.12	.03	.34	1.00		
11. Household income (1985)	.50	.20	.18	.39	.04	-.24	.46	.07	.58	.52	1.00	
N	295	295	295	295	295	295	295	295	295	295	295	105
Means	5.94	12.21	6.26	7.99	0.41	0.49	0.35	0.35	0.08	4.63	60.4	
S.D.	1.33	1.03	1.38	0.64	0.49	0.50	0.48	0.48	0.28	1.25	12.8	

Notes:

a. Correlations of $\pm .15$ are statistically significant at $p \leq .01$

b. Variables in logged form. The original (untransformed) variables have means and s.d. of 373.314 and 662.299 for city size, 1.037 and 1.497 for density, 3.573 and 2.333 for industrialization, 87 and 156 for housing investment.