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Economic Transformation and Income Inequality in Urban China: Evidence from Panel Data[1]

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Using panel data of 4,730 urban residents drawn from 20 cities in China, this article examines changes in income determinants between the prereform and reform eras. To guide this empirical study, a conceptual model is developed that emphasizes the coevolution of politics and markets to synthesize theoretical ideas in the recent debate on the transformation of state socialist societies. The findings show significant changes in returns to education and in the rise of private/hybrid firms in the reform era. There is also strong evidence of institutional persistence in returns to positional power and in the organizational hierarchy. These findings reveal multifaceted processes of transformation that call for more sophisticated theoretical models and in-depth institutional analyses.

INTRODUCTION

An ongoing debate in recent studies of the transformation of state socialist societies centers on how to explain (and predict) the processes and mechanisms of large-scale social changes and their implications for the social stratification order in these societies (see Symposium on Market Transition in *American Journal of Sociology,* vol. 101, no. 4). On the one hand, Victor Nee's market transition theory (1989, 1991, 1996) emphasizes the role of emerging markets that compete with and undermine state socialist redistributive economy and alter the stratification order. On the other hand, other scholars emphasize various aspects of the political economy

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of transformation in which existing political and economic institutions mold emerging economic institutions.

The main issues under debate are closely related to long-standing sociological interests in explaining social changes and processes of social stratification. They also reflect sociologists' renewed interests in the role of social and political institutions in economic activities and how social institutions persist and change. It is not surprising that comparative sociologists have embraced the opportunity and that a large number of studies appeared in major sociological journals addressing these issues (Bian and Logan 1996; Gerber and Hout 1998; Guthrie 1997; Peng 1992; Róna-Tas 1994; Stark 1996; Walder 1995*a*, 1995*b*; Xie and Hannum 1996; Zhou, Tuma, and Moen 1997).

But empirical evidence is far from consistent and conclusive in adjudicating between competing theoretical hypotheses. The state of the field is partly dictated by the complexities and transitional characteristics of the transformation processes that evolve over time. From a researcher's point of view, however, these unsettling issues also reflect weaknesses in research design, data quality, and conceptual framework.

The accumulation of knowledge particularly suffers from a lack of consensus on the operationalization of key concepts. For instance, the "cadre" status has been used as an indicator of the key concept of "positional power" in state socialist redistribution. But it was measured differently in different studies, even in similar urban or rural settings. As Parish and Michelson (1996) showed, different operationalizations of the "cadre" status may lead to very different conclusions about the role of positional power, even when analyzing the same data set.

Although assessment of changes over time has been the main focus of research, almost all studies have used cross-sectional research designs. Such a design facilitates particular research purposes in comparing interregion or intergroup differences, but they are inadequate for studying changes *over time.* In addition, a cross-sectional research design is ill equipped to deal with unobserved individual attributes that may confound several key theoretical issues. For instance, the latent attributes of individual ability may affect an individual's educational level and occupational status, as well as his or her party membership.

Substantively, the debate in part stems from different emphases given to different processes of social changes. Like any large-scale social changes, the transformation of state socialism involves multifaceted processes, in which the expansion of markets is one, albeit a very important one, of many. Such transformations inevitably produce a variety of patterns of changes that defies a single theoretical logic. In this light, there is room for a theoretical synthesis (Szelényi and Kostello 1996).

In this study, I take a step to address these issues. I propose a conceptual

model that emphasizes the interplay between politics and markets as a coevolutionary process and advocates a focus on the *processes* of institutional change that provides a basis for a theoretical synthesis among competing arguments. My analytical focus is on a confirmatory study based on the multiple processes identified in the literature, reinterpreted in light of the proposed model. I report an analysis of changes in income determinants based on a panel data of 4,730 urban residents drawn from 20 Chinese cities, whose income information was collected retrospectively for selected years between 1955 and 1994. My focus on urban China, where China's redistributive economy has reached its most elaborate form, provides a more appropriate examination of the changes in state socialist redistribution. The use of panel data allows one to assess changes over time in a more satisfactory way and helps alleviate some potential problems in measurements of key concepts.

A caveat is in order. Income is but one indicator of economic benefits associated with positions. Recently, scholars (Oberschall 1996; Walder 1992; Zhou et al. 1997) called attention to the importance of latent and nonmonetary resources distributed through workplaces and other channels. I focus on income determinants for two reasons: First, income distribution is sensitive to changes in economic institutions, and a study of income determinants can detect the most salient changes in the transformation processes. Second, most empirical studies thus far have examined patterns of income inequality. My study addresses the same set of empirical questions and can be directly compared with previous studies in the literature.

EXPLAINING INSTITUTIONAL CHANGES IN CHINA: THEORETICAL ISSUES

The Theoretical Debate

Based on a series of studies of income inequality in rural China, Nee's market transition theory (1989, 1991, 1992, 1996) was one of the earliest attempts to theorize about sources of social changes in transitions from state socialism and their implications for changes in the social stratification order. Nee's bold theoretical statements and insistent defense of his positions have stimulated active research and debates on both alternative theoretical explanations and empirical assessments of the competing theoretical arguments.

Central to market transition theory is its emphasis on the importance of emerging market economies. In Nee's view, markets and state socialist redistribution represent two fundamentally different logics of resource allocation. The emergence of a market economy introduces new mechanisms of resource allocation that challenge and undermine state socialist

redistributive institutions. Nee's earlier arguments (1989, 1991) predicted two fundamental changes: First, the emergence of a market economy alters the opportunity structure shaped by a redistributive economy. Second, changes in mechanisms of resource allocation lead to changes in social stratification order.

On the other hand, other scholars have developed several alternative, competing explanations. These explanations consist of several streams of arguments emphasizing the increasing role of local governments (Walder 1995*b*), the persistence of political power (Bian and Logan 1996), the conversion of political power to economic resources (Róna-Tas 1994), changes in "political markets" (Parish and Michelson 1996), institutional reconfiguration (Stark 1996), and the institutional arrangements of work organizations (Zhou et al. 1997). Although they differ in emphases, these arguments share the main disposition that the ongoing transformation processes and emerging economic institutions are circumscribed by and intertwined with existing political, economic, and social institutions. Thus, an explanation of the sources and directions of the transformation must take seriously existing institutional arrangements and explain how they interact with and shape emerging new institutions.

A central issue in the debate is the role of institutions in theories of social changes. Nee's focus is on new market institutions whose advance forges new interests and relentlessly pushes aside, if not dismantles, "old" economic and political institutions. On this account, he criticized his critics as to "emphasize structural continuity with unreformed state socialism" and to focus "only on changing incentives for political actors in the state organizational hierarchy" (Nee 1996, pp. 914–15). Yet a similar critique can be made of market transition theory. Despite the claim to "incorporate the state as a potent causal force" (p. 916), Nee's work has made little effort to consider how the *interactions* between existing political and economic institutions and emerging institutions affect patterns of social stratification. For instance, Nee (1996) advocated an institutional analysis of market transition in China, but the path of change he emphasized is a process in which "power—control over resources—shifts progressively from political disposition to market institutions" (p. 910). Nee's arguments leave the impression that the entire outcomes of *institutional changes* can be explained by the advance of market economies, despite the resistance of "old" institutions.

The second major difference is related to the role of agency and interests. Nee emphasized the importance of new interests associated with emerging markets. As Nee (1996) argued: "Whereas opportunities for advancement were previously centered solely on decisions made by the redistributive bureaucracy and within the economy controlled by it, markets open up alternative avenues for mobility through emergent entrepreneur-

ship and labor markets." Along with these changes, "economic actors strive to institute new rules of competition and cooperation that serve their interests, both through informal arrangements and through formal institutional channels" (p. 910).

In contrast, the emphases on existing social and political institutions have led other scholars to recognize the importance of incumbents and vested interests in the transformation processes. The prevalence of political authority, bureaucratic bargaining, and governmental intervention in risk and benefit sharing has been noted in several studies and commentaries (Bian and Logan 1996; Naughton 1995; Oberschall 1996; Oi 1992; Parish and Michelson 1996; Shirk 1993; Walder 1995*b,* 1996). Thus, the incumbents may use their positional power and privileged access to decision-making processes to influence state policies and governmental regulations in favor of their interests. Or they may be in an advantageous position to capitalize on opportunities and economic benefits, relative to other social groups. Therefore, their positional power and advantage may persist even when the role of market institutions increases.[2]

Coevolution between Politics and Markets: Sketch of a Conceptual Model

As a basis for a theoretical synthesis, I propose a conceptual model that treats institutional changes as processes of coevolution between politics and markets. By "politics," I refer to patterns of interest articulation in the political arena associated with both current and emerging political and economic institutions. By "markets," I refer to the modes of resource allocation and economic transactions that take place through price systems and involve "autonomous" economic agents. The interplay between politics and markets has been emphasized by several scholars (see Bian and Logan 1996; Guthrie 1997; Parish and Michelson 1996; Róna-Tas 1994; Stark 1996; Walder 1996). I highlight some theoretical considerations along this line of reasoning.

Using the proposed model, I intend to portray an image of intrinsic

[2] Nee's work does recognize the role of the state, local corporatism, networks, and the persistence of political power (see also Nee and Lian 1994; Stark and Nee 1989). In my view, however, such a recognition has not altered his primary emphasis on the institutional logic of markets, as Nee put it: "According to market transition theory, the causes giving rise to a change in the mechanisms of stratification in reforming and postcommunist societies are linked inextricably to the expansion of market institutions" (Nee and Matthews 1996, p. 422). Indeed, if other alternative institutional logics were to be conceptualized to have a prominent role, Nee's market transition theory would have lost much of its flavor and would have become indistinguishable from other approaches.

interconnectedness between politics and emerging markets in the course of institutional changes in China, where state-initiated reforms and emerging markets have been two major sources of economic transformation. Both interest politics and markets coevolve in interactions with each other: in some areas, they compete with and constrain each other; in other areas, they mutually reinforce each other; in still others, they adapt to and transform each other in the process. The central idea in the imagery is that neither one can be understood without a careful and substantive understanding of the other.

The premise of the proposed model is based on an insight from institutional theories in sociology and economics that politics and markets are not antithetical and that the state plays a critical role in setting up institutional rules within which markets operate (Campbell, Hollingsworth, and Lindberg 1991; Esping-Andersen 1990; Evans, Rueschemeyer, and Skocpol 1985; Fligstein and Mara-Drita 1996; Wade 1990). Two findings in this literature are especially relevant for my discussion here. First, the expansion of markets is not a self-evolving process. Rather, economic activities are embedded in and constrained by the social context and historical path of change (Granovetter 1985; Hamilton and Biggart 1988). Second, in the coevolution of politics and markets, the state is an active actor, with its own interests and preferences. As a result, changes in economic institutions inevitably reflect a compromise between competing interests and institutions. I find myself in complete agreement with the view of new institutional economics that "the conception of economy is of an evolving, open system in historical time, subject to processes of cumulative causation—instead of approaches to theorizing that focus exclusively on mechanical equilibria" (Hodgson 1994, p. 69).

What are the mechanisms that govern this coevolutionary process? Nee's market transition theory best elaborated one such mechanism—the competition between existing and new economic institutions. The expansion of markets introduces new mechanisms of resource allocation and new ways of organizing economic activities. Redistributive economic institutions, in contrast, rely on the political authorities and favorable regulatory policies to hold on to their advantages in economic production and transactions. So long as market-induced economic activities outperform those of the current (redistributive) institutions, they tend to grow and increase their share in the national economy. In this sense, the emerging market economies compete with and undermine the state socialist redistributive economy.

An equally important mechanism is interest politics in the political arena. Social and economic institutions are associated with organized interests. The course of any institutional change ultimately depends on how various interests play out in the political arena. In comparison with the

new interests associated with emerging markets (Nee 1996), the vested interests in current political and economic institutions have considerable advantage (1) in their access to political authorities and to the processes of policy making and implementation and (2) in their organizing capacity (bureaucratic politics) in protecting and advancing their interests (Shirk 1993; Lieberthal and Lampton 1992). As Parish and Michelson (1996, p. 1043) pointed out: "The type of market compromises that will be arrived at depends as much on bargaining in more participatory political systems as it does on some underlying economic dynamic."

This leads us to consider another mechanism—the central role of the state—in this coevolutionary process. Economic activities, including markets, operate within the institutional rules set by political authorities. From the institutional logic of markets, it is conceivable that the competitive advantages of market-based institutions would force the state and state policies to evolve in favor of market institutions and the new interests associated with these institutions. So long as the state has its own interests in economic growth and national wealth, the comparative institutional advantages, according to this logic, would eventually give the "new interests" an upper hand in "capturing" the state.

However, the state may have its own interests that are not necessarily in congruence with the economic agents in the marketplace. As North and Thomas (1973, p. 8) noted, "the fiscal needs of government may induce the protection of certain property rights which hinder rather than promote growth; therefore we have no guarantee that productive institutional arrangements will emerge." Indeed, concerns about political stability, legitimation, and historical traditions have led to a variety of institutional rules that facilitate as well as constrain markets even in industrialized market economies. Given the historical role of the state in China, and the prevalence of vested interests associated with existing institutions, there is no reason to doubt that the remaking of institutional rules in China's economic transformations will be heavily influenced by the vested interests and the state's own interests.[3]

Consequently, both markets and politics coevolve in response to each other. Given the constraints of institutional rules and the prevalence of political authorities, market activities take unique forms in China: private enterprises are disguised as "collective" firms; all kinds of economic agents cultivate relations with political authorities and engage in rent-seeking behavior (Parish and Michelson 1996); and economic transactions, even

[3] Even the dismantling of the redistributive state would not lead to a break with the past, and vested interests and "old" institutions are likely to continue to exert their influence, as is evident in the experience of other former state socialist societies (Stark 1996; Róna-Tas 1994).

when they operate through the price system, are often brokered by political authorities (Boisot and Child 1996). These demands for and benefits from political authorities reinforce the latter's role in economic life and foster emerging interests that promote the roles of both politics and markets. In this sense, economic activities in the marketplace are molded by politics. On the other hand, the nonstate sector's increasing contribution to state revenue provides positive feedback for the state to adopt policies to encourage market expansion; governmental agencies are gradually changed from redistributors to regulators; and state-owned firms, though constrained by political authorities, are being pushed into market competition. In this process, both politics and markets have been transformed by each other.

I want to point out that the specific processes or mechanisms outlined here have been proposed and elaborated by various scholars in the literature. My intention is not to ignore the distinctive logics behind these theoretical models or to create a false compromise among these arguments that are motivated by different theoretical assumptions. The proposed conceptual model, I hope, serves the purpose to highlight the interconnectedness among these processes and to insist on understanding them in relation to one another.

How do we assess the outcomes of this coevolutionary process? An important implication of the proposed model (as well as other models that emphasize one or another particular process) is that there is a large area of model indeterminacy with respect to its power of empirical predictions. For instance, in the processes of institutional change, the recognition of the presence of a market institution (e.g., contract, labor market) does not necessarily lead to any predictive power without a substantive understanding of how it interacts with and is constrained by existing institutions. In this light, we can reduce model indeterminacy and improve the power of theory only by substantive institutional analyses of how these causal processes interact and exert their impacts in the specific institutional context, to which I now turn.

Implications for Income Inequality: Hypotheses

Empirically, the debate between market transition theory and those who emphasize the political economy of transformation has centered on the implications of their theoretical arguments for changes in the social stratification order. I now recast these theoretical arguments and their implications for income inequality. Although my discussion recognizes the lineage of these theoretical ideas, my emphasis is on the processes they identified and the ways these processes interact with each other. I take the market processes emphasized in Nee's market transition theory as my starting

point and then consider how other processes may constrain or intertwine with market processes, and their implications for patterns of income determinants.[4]

Inequality between redistributors and producers.—Building on Szelényi's (1978) argument that inequalities "are expressions of the basic conflict of state socialist societies, the conflict between the 'immediate producer' and the 'redistributor'" (p. 77), Nee predicts that market transitions produce fundamental changes in income inequality among social groups. As Nee put it (1996, p. 916), "the growth of market institutions (i.e., labor markets, subcontracting arrangements, capital markets, and business groups) causes a decline in the significance of socialist redistributive power even in the absence of fundamental change in the political order." The empirical implication is that *the advantage of "redistributors" in the acquisition of economic benefits declines relative to that of "producers" in the reform era, compared with the prereform era.*[5]

To the extent that the emergence of markets creates new opportunities outside the redistributive system and entails principles of resource allocation different from the redistributive economy, Nee's proposition is a plausible one. However, one's market position depends on access to opportunities and resources, which, in the Chinese context, is significantly affected by the existing institutional arrangements of redistribution. Those with positional power have advantages in access to both resources and the market-induced opportunities, relative to other social groups: previous "redistributors" may now profit from economic arena in the role of "regulators" in market transactions or as parties of economic transactions (Bian and Logan 1996; Walder 1996). Moreover, the weakening of government intervention into firm-level decisions may have strengthened local authority's power in gaining a larger share of the surplus in profit sharing on the shop floor. Thus, with the advance of markets, some "redistributors" may have lost their benefits, and some social groups may have gained their benefits. But, once we take into consideration these independent processes, it is likely that, *on average, the advantage of "redistributors" in the acquisition of economic benefits may not decline relative to that of "producers" in the reform era, compared with the prereform era.*

An important empirical issue is how to define "redistributors" and "pro-

[4] My emphasis here is less on adjudicating between competing theoretical arguments than on identifying competing processes and their interactions. Given the state of conceptual and empirical work in the literature, attempts to adjudicate between competing theoretical arguments are premature and may not be productive to advancing our knowledge of the field.

[5] Because my research design focuses on comparing changes over time, the empirical implications in this section are formulated in the form of a comparison between the prereform and the reform eras.

ducers." Nee recently advocated to define "administrative elites" as "redistributors" and defined "producers" to include, in addition to ordinary workers, "entrepreneurs, managers, and technicians" (1996, p. 916). In this study, I develop two alternative measures of cadre (administrator) status. The first one uses bureaucratic *ranks* of cadres promulgated by the central government. The second one distinguishes cadres in the public sector (government and public organizations) from those in the economic sector (in enterprises). The higher a cadre's bureaucratic rank, the closer he or she is to the redistributive authority than to market activities. Similarly, cadres in the public sector are closer to the political authority than cadres in the economic sector. Therefore, the former is closer to the concept of "redistributors" and the latter to that of "managers." I measure professionals in a similar way to detect the possibility that economic benefits vary with their positions (professional ranks) or their closeness to markets (public versus economic sectors).

Political versus human capital.—Institutional changes are reflected in changes in mechanisms of resource allocation. In a market economy where factors of production are allocated through competitive market transactions, it is argued that human capital plays an important role in determining one's economic rewards (Becker 1964). In contrast, it is often observed that the communist state rewards political loyalty more than competence. Following this logic, Nee (1989) argued that, as the political logic of redistribution is eroded by market mechanisms, *returns to political capital declines and returns to human capital increase in the reform era, compared with the prereform era.*[6]

Now consider other coexisting processes in allocating and rewarding political and human capital in the course of China's economic transformation. First, with regard to political capital, a direct implication can be drawn from the preceding discussion: so long as political authorities play a significant role in bureaucratic recruitment and promotions, persistent and significant returns to political status are logically plausible.

Second, with respect to returns to human capital, one needs to consider multiple and competing processes of allocating human resources in urban China. Nee's argument points to the rise of labor markets in allocating human capital as the source of increasing returns to education. But the state has been and is still actively involved in the allocation of human resources. Even in the reform era, a large proportion of individuals with high human capital (e.g., college education) entered the state sector, especially in government and public organizations (Zhou, Tuma, and Moen

[6] In the literature, it is conventional to use Communist Party membership as an indicator of political capital, and formal education and work experience as indicators of human capital.

1996, 1997). More importantly, since the early 1980s—before any substantive market reform took place in the urban areas—government policies have emphasized educational credential as one of the most important criteria in obtaining political and positional power (such as party membership and cadre promotion). In this light, *the importance of educational credential may increase, even in the absence of market allocation of human resources.*[7]

The institutional arrangements of work organizations.—In state socialist China, work organizations have been major institutions of redistribution. An important contribution by scholars who study social stratification processes in China is the recognition and theoretical arguments about the centrality of work organizations in the socialist redistributive system (Bian 1994; Lin and Bian 1991; Walder 1986, 1992; Whyte and Parish 1984; Zhou et al. 1996, 1997). These studies identified a hierarchical order among types of work organizations whose economic benefits vary systematically with state policies and their property rights relationships to the state. Work organizations in the state sector (government agencies, public organizations, and state-owned firms) benefit more from redistribution and state policies than those in the semistate and nonstate sectors (collective firms, hybrid, and private firms).

How would the expansion of markets affect the institutional arrangements of work organizations? According to the logic of market transition theory (Nee 1992), one would argue that firms that are closer to market transactions are more likely to experience major changes in patterns of income determinants, relative to those organizations in the state sector. Because political control varies significantly across types of work organizations, those who are less controlled by the state are more likely to break away from the redistribution system. Thus, with the advance of market processes, we expect that organizational hierarchies associated with the redistributive economy would change, so would the distribution of economic resources associated with types of work organizations. That is, *in the reform era, patterns of economic benefits associated with types of work organizations should favor those organizations (collective and hybrid/private firms) that are closer to market transactions and less controlled by the redistributive system.*

However, there are important competing processes that countervail the

[7] There is no intrinsic principle of state socialist redistribution that dictates low returns to education. As Konrad and Szelényi (1979) pointed out, socialist planning systems also value education and knowledge and incorporate intellectuals into political elites. A recent comparative study of redistributive patterns in the USSR and China reveals that returns to education were considerably higher in the USSR than in China (Zhou and Suhomlinova 1999).

market-induced processes identified above. Work organizations in the state sector serve legitimation for the political order and the interests of the central authority (Walder 1986). Relative to the new interests emerging from market expansion, the vested interests associated with existing institutions are better organized and have better access to political authorities. Institution-based bureaucratic bargaining often leads to those policies and regulations that protect the vested interests associated with the state sector (Oberschall 1996; Parish and Michelson 1996; Zhou et al. 1997). Hence, these considerations point to state intervention in regulation or resource transfer in favor of those in the state sector, producing institutional persistence. In this view, *the politics of vested interests embedded in existing institutions will lead to the persistence of income inequality based on existing organizational hierarchies in the reform era.*

DATA

The empirical analyses are based on life histories of a sample of 5,000 residents drawn from 20 cities in China, which interviewers collected in the summers of 1993 and 1994. We collected retrospective information on respondents' locations in type of work organizations, occupations, and residential locations, as well as their education and political status (party membership) over time.

We selected six provinces (Hebei, Heilongjiang, Gansu, Guangdong, Jiangsu, and Sichuan), each of which represents a conventional geographic region in China. In each province, we chose the capital city to represent large cities (population over 1 million). We also randomly selected a medium-sized city (population between 200,000 and 1 million) and a small city (population under 200,000) based on the 1990 *Yearbook of Chinese Cities* (SSB 1990*a*). The sample size in each city was proportional to the population in that size of city in that province. We also included Beijing, China's capital, and Shanghai, its largest industrial city. These 20 cities cover a variety of geographic locations and different types of urban economies.

We chose a stratified random sample of each city's residents. In China, a metropolitan city is composed of residential districts. Each district is composed of residential "streets," and each residential street is organized into residential blocks (*juweihui*). We selected residential blocks in each city using a systematic sampling scheme. That is, we selected every Nth residential block based on the official residential statistics. We used an analogous sampling scheme to select households in each residential block. Finally, we randomly selected a member of the household between ages 25 and 65 to be interviewed.

We collected income information for the following years: 1955, 1960, 1965, 1975, 1978, 1984, 1987, 1991, 1992, 1993, and 1994. Most of the selected years were associated with important historical events. For instance, 1960 was the year of a severe economic disaster, and 1965 was the year on the eve of the Cultural Revolution. We selected these years for several reasons. First, income distribution in years of historical significance helps us identify important characteristics of the redistributive system. Second, the salience of these years in one's life experience may assist the respondent to recall information more accurately.

The data yield an urban labor force sample whose composition varies over time. An individual enters my analyses when she enters the labor force and leaves the analyses when she exits from the labor force (e.g., retires). I also exclude the income records for those in the rural labor force in a particular year, because incomes in rural and urban areas are not comparable.

Recall errors are inevitable in retrospectively collected data, especially with respect to income. However, an advantage in collecting income information in China is that there were few wage changes in the prereform era. In the reform era, income changes were more frequent, but these events are more recent and easier to recall. To assess the quality of the income data, I conducted a comparison between the information collected in our sample and that based on official statistics over the years. Specifically, I compared the average income of our sample base on respondents' self reports in those selected years and the average income of our sample using official statistics of the average income in those provinces where the respondents were drawn.[8] Figure 1 displays the patterns between the two.

As figure 1 indicates, between 1955 and 1975, average income in our data is close to that based on official statistics. The differences between the two increased after 1978, with the average income in our sample being higher than the official statistics. But these differences are not substantial relative to the income level in these specific years. More importantly, the differences between the sample and official statistics show a relatively stable trend. I believe that the higher average income in our sample in recent years is mainly due to the fact that our sample has a larger proportion of residents from large cities (Beijing, Shanghai, and capital cities of the provinces). Average income levels in large cities are higher than other cities, especially in the reform era. The official statistic is based on the average income of the urban areas in an entire province, which should

[8] It is desirable to use more detailed information (e.g., age groups, city-level information) for such a comparison. Unfortunately, there is no systematic information over time in official statistics.

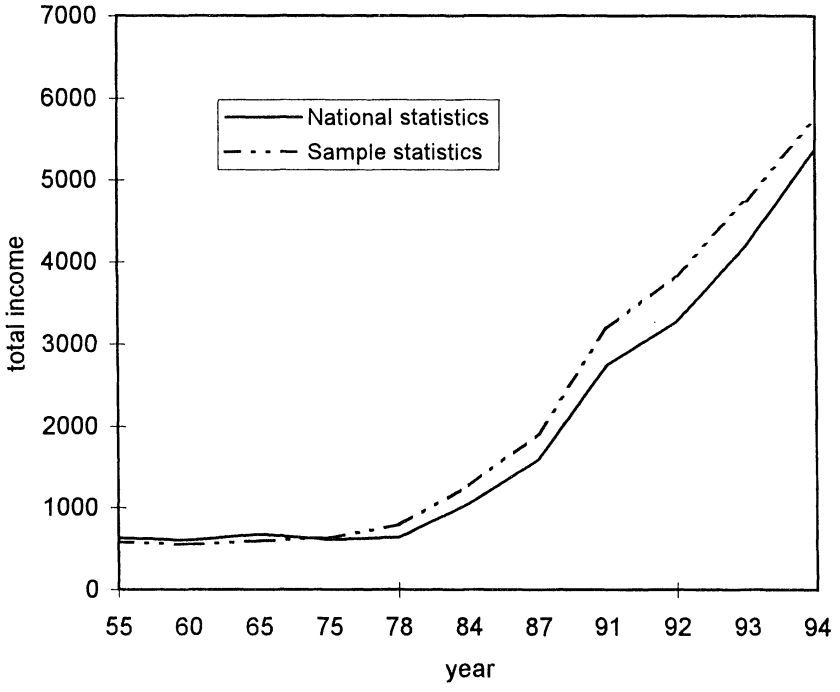

FIG. 1.—Comparison of national and sample statistics in income

have lower average income. Thus, the source of the observed discrepancies can be captured by modeling city locations in statistical analysis.

I conducted extensive data checking and deleted those records where the reported income was logically suspect. Cases with missing values in income or the covariates were excluded from the analyses. All in all, the number of deleted cases is relatively small (about 5%). The actual number of cases used in the analyses is 4,730.

VARIABLES

Dependent Variable

Personal income.—I use the logarithm of total personal income (Chinese yuan/month) as the dependent variable. We collected information on respondents' basic income, bonus, and income from other sources. Thus, total income reflects both rewards from the current job and other sources based on one's skill or position. Income is adjusted for inflation using provincial-level information (SSB 1990*b*).

Independent Variables

As I noted before, operationalization of key theoretical concepts is crucial to provide a common ground to compare research findings across studies. The principle I adopted is, wherever possible, to use generic categories whose meanings are widely shared to avoid artificial ambiguities in interpretation.

Gender.—I use a dummy variable (female = 1) to examine gender-based variations in the redistribution of economic rewards.

Age and age^2.—I use the first- and second-order effects of age to measure the effect of work experience or seniority, as part of human capital.

Education.—Formal education is a conventional measure of human capital. I distinguish the following educational levels: (1) illiterate or elementary (the reference category); (2) junior high; (3) senior high (including *Zhongzhuan*); and (4) college (including *Dazhuan*).

Party membership.—I use a dummy variable (party membership = 1) to indicate Communist Party membership as political capital.[9]

Occupation.—Occupational groups are closely related to positional power of social groups. For this reason, I develop two alternative measures of cadre status. In the first one, I distinguish the following occupational categories: high-rank cadre, low-rank cadre, high-rank professional, low-rank professional, clerk, service worker, skilled worker, and unskilled worker (the reference category). The Chinese bureaucratic hierarchy has mainly four levels: *bu* (ministry), *ju* (department), *chu* (division), and *ke* (section). I classify those holding ranks at or above *chu* level as high-rank cadres and those at or below *ke* level as low-rank cadres. In the Chinese professional system, there are senior engineer, engineer, assistant engineer, and technician levels (or equivalent levels in other professional occupations). I classify those at or above engineer level as high-rank professionals and those at or below assistant engineer level as low-rank professionals.

In the second specification, I distinguish cadres in government and public organizations (the public sector) from those in production/service organizations (the economic sector). Similarly, I distinguish professionals in public and economic sectors. Because of the small number of cases, I do not differentiate ranks among cadres and professionals in this specification. Other occupational categories remain the same.

Work organization.—I distinguish the following types of work organizations:

[9] Because samples from two provinces (Jiangsu and Guangdong) do not have information on party membership, I examine the effect of party membership in a separate analysis, excluding respondents from these provinces.

1. Governmental agencies include ministries, commissions, bureaus, and offices at various levels of the Communist Party and central and local governments.
2. Public organizations, in Chinese terminology, are nonprofit organizations in the public domain. They include educational and research institutions and organizations in the medical, publishing, broadcasting, and entertainment sectors. Although they are not the administrative organs of the state, most of these organizations are affiliated with the state or local governments through financial and organizational linkages.
3. Central government–owned firms. Among state-owned firms, I distinguish two categories: the central government–owned firms and local government–owned firms. Included in the first category are those work units in manufacturing, processing and other production firms, and those in service sectors that are directly owned by the central or the provincial government.
4. Local government–owned firms. I include firms that are state-owned but are managed by local (city or districts within cities) government in this category. These firms benefit from redistribution associated with the state sector but closer to local authorities.
5. Collective firms. Organizations in this category are not directly under the administration or financial support of the planning economy. Often they are sponsored by local governments (such as district/county government or residential offices). This type of organization has the least redistributive benefits but is closer to market transactions and less regulated by the government than state firms.
6. Private/hybrid firms. This type of firm includes private entrepreneurs, firms with mixed property rights, such as partly collective–owned and partly private–owned, or joint ventures between state-owned firms and foreign firms.

Control variables.—I include a set of dummy variables to indicate respondents' residential location (city) in all analyses to control for city-specific variations in income. Table 1 reports the attributes of the covariates in selected years.[10]

[10] The distribution of some categories in the earlier years (e.g., party membership and high-rank cadres in 1960) appears to be high for the particular age cohort (18–32) in our sample. Because of the lack of official statistics, I am unable to assess this issue accurately. There are several plausible explanations for the observed patterns. First, because the sample size in the earlier years is small, the distribution of certain attributes is likely to be sensitive to even random sampling variation. Second, our sample has a larger proportion of residents from large cities who had better access to party membership and promotion than the national average.

TABLE 1

DESCRIPTIVE STATISTICS OF THE COVARIATES, SELECTED YEARS

Covariates	1960	1965	1975	1978	1984	1987	1991	1993
Age[a]	25.3	28.3	32.7	33.7	35.5	36.5	38.2	39.3
Female	.47	.45	.48	.47	.44	.43	.41	.41
Party membership[b]	.19	.20	.20	.20	.21	.23	.23	.23
Education:								
Elementary or below	.50	.41	.30	.27	.20	.16	.13	.12
Junior high	.21	.24	.34	.35	.34	.34	.33	.33
Senior high	.17	.21	.23	.27	.34	.35	.36	.36
College	.08	.11	.10	.09	.11	.13	.17	.18
Occupation:								
High-rank cadre	.02	.02	.02	.02	.03	.03	.03	.03
Low-rank cadre	.11	.13	.12	.12	.12	.12	.13	.13
High-rank professional	.02	.04	.03	.04	.05	.06	.07	.08
Low-rank professional	.16	.19	.17	.15	.14	.13	.14	.14
Clerk	.04	.04	.04	.04	.05	.05	.06	.07
Service worker	.09	.09	.09	.10	.12	.12	.12	.12
Skilled worker	.32	.30	.32	.32	.30	.29	.27	.26
Unskilled worker	.22	.21	.21	.21	.19	.17	.15	.14
Private entrepreneurs	...	...	...	...	.01	.02	.03	.04
Cadre in public sector	.06	.07	.06	.06	.05	.06	.06	.07
Cadre in economic sector	.07	.07	.08	.08	.09	.09	.09	.09
Professional in public sector	.10	.12	.09	.09	.08	.09	.09	.10
Professional in economic sector	.08	.10	.11	.10	.10	.11	.12	.12
Type of workplace:								
Government agency	.11	.11	.09	.09	.08	.09	.10	.10
Public organization	.13	.14	.12	.11	.12	.12	.12	.13
Central government firm	.32	.30	.30	.29	.28	.28	.26	.26
Local government firm	.20	.19	.21	.22	.22	.22	.22	.21
Collective firm	.21	.24	.26	.26	.27	.25	.23	.22
Private/hybrid firms	.03	.02	.03	.03	.04	.05	.07	.09
N	805	1,164	2,174	2,705	3,379	3,605	3,699	3,678

[a] Age refers to the mean age in the sample. All other entries refer to proportions in that category.

[b] Samples from two provinces (about 20% of the total sample) have no information on party membership. The percentage reported here is calculated after excluding these samples.

MODELS AND METHODS

Multivariate Regression Model for Cross-Sectional Data Analysis

As a preliminary analysis, I use the conventional multivariate regression model to examine income determinants in selected years. This set of analyses aims at detecting variations in income determinants over different historical contexts.

The analysis of cross-sectional data is limited in addressing some important theoretical issues. For instance, "Communist Party" membership is often used as an indicator of political capital. But, the Communist Party may selectively recruit those who had more ability into the party. If this is indeed so, party membership may reflect the compound effects of both political loyalty and ability. However, in a cross-sectional research design, it is impossible to distinguish the two effects.

A Mixed Model for Panel Data Analysis

My main analytic focus is to model the panel data for the analysis of changes in income determinants in two historical periods: the prereform era and the reform era. Using multiple observations for each subject over time, models based on panel data can effectively control for unobserved individual attributes such as "ability" (Hsiao 1986; Judge et al. 1985). This set of analyses aims at examining income determinants of theoretical importance after controlling for important but latent individual attributes as well as random fluctuations across cities and years.

As I noted before, interpretation of empirical results is often contentious because of disagreement over the operationalization of theoretical concepts. One advantage of the panel data analysis in this study is that, by comparing changes across periods using the same measurements of key concepts, the consistency of the measures over time partly alleviates potential impreciseness in measurements. The estimated pattern of stratification in the prereform era also allows an empirical assessment as to whether the operationalization of the concepts and model specification have captured the redistributive patterns discussed in the literature.

An important issue in panel data analysis is to model correlations among repeated measures within a subject. Since panel data analysis makes use of information on a series of observations for each subject (e.g., income in several years for a respondent), observations within a subject are "clustered" and their error terms are correlated.

In our data, there is a second source of clustering. Our data are drawn from 20 cities, and there is considerable heterogeneity across cities. Individuals from the same city are influenced by similar economic conditions (inflation, industrial structures, economic development, etc.). Also, respon-

dents' income in a particular year may be affected by broader economic conditions or political events in that year. Therefore subjects in a specific year may also be "clustered." The sources of both within- and cross-subject "clustering" violate the independently and identically distributed (i.i.d.) assumption in the OLS estimation, and one needs to explicitly model the covariance structures that deal with these sources. For this purpose, I propose a mixed model for the panel data analysis of income. The general form of a mixed model can be expressed as follows:

$$Y = X\beta + Z\gamma + \epsilon, \tag{1}$$

where X is a set of covariates treated as having fixed effects, Z the set of covariates having random effects. The variance of Y, var(Y), is

$$\text{var}(Y) = ZGZ' + R. \tag{2}$$

The first source of clustering, repeated measures within a subject, is mainly related to modeling the R vector in equation (2). Conventionally, it is sensible to consider some kind of time-series covariance structure. However, in our data, the observation points within a subject (the selected years of income) are not equally spaced. As a result, conventional time-series covariance structures (e.g., autoregressive error process [AR] 1) are inappropriate because of their equal-spacing assumption.

As Littell et al. (1996, p. 127) pointed out, many spatial covariance structures can be generalized to model covariance structures in which the correlations decline as a function of time. The spatial power function is a direct generalization of the AR(1) structure but allows unequal spacing among observations within a subject. It models the covariance between two measurements at times T_1 and T_2 as

$$\text{cov}(y_{t1}, y_{t2}) = \sigma^2 \rho^{|t1-t2|}, \tag{3}$$

where ρ is an autoregressive parameter assumed to satisfy $|\rho| < 1$ and σ^2 is an overall variance.

In addition, it is likely that the observations have measurement errors. One can model the measurement errors by allowing an additional variance parameter in R to capture measurement errors across subjects. I further specify $\text{Var}(\epsilon_i) = \sigma^2 + \tau^2$, where τ^2 captures measurement errors in a subject. Thus, the R vector is specified as

$$R = \tau^2 I + \sigma^2 \rho^{|t1-t2|}. \tag{4}$$

For the second source of clustering—correlations among subjects within city localities and in historical years—I propose to model city localities and years as having random effects. That is, I allow the effects of city localities and the selected years to vary randomly to account for city- and year-specific factors that are not included in the model. To accomplish

this, I include a set of indicator variables in the Z vector. The corresponding G variance/covariance structure is specified as variance-component structure, with each city (year) having its own variance parameter but uncorrelated across cities (years). My primary interest is related to the fixed effects of the covariates in X, after controlling for the effects of city- and year-specific factors.

To assess changes in the social stratification order over time, I estimate the interaction effects between the sets of covariates in X and a dummy variable indicating the reform era in urban China. In this formulation, the main effect of a covariate indicates its overall effect on income in urban China. A *statistically significant* effect of the interaction term for that covariate indicates a "statistically discernible" change in the effect of that covariate *in the reform era.* The direction and magnitude of such a change can be interpreted based on the parameter estimates of that interaction term.

To sum up, I specify a mixed model as follows:

$$\ln(Y) = \alpha + X_{it}\beta + X_{itp}\lambda_p + Z_{\text{city}}\gamma + Z_{\text{year}}\delta + \epsilon_{it}, \quad (5)$$

where X_{it} refers to the covariates of theoretical interest that vary over time and across individuals. In my model specification, I treat this set of covariates as having fixed effects. β are the corresponding parameter estimates. The λ vector is the set of the estimates of the interaction between X and the period indicator, p. Z vector contains the set of indicator variables for city localities and the selected years for which income information was collected, and γ and δ the corresponding estimates of their respective random effects. In addition, equation (5) also estimates ν_{city} and μ_{year}, the covariance components associated with city localities and the selected years respectively. R follows the specification in equation (4), and ϵ_{it} is the structure of the error terms for the specific observations. It is assumed that ϵ_{it} follows an i.i.d. distribution, after controlling for the variance/covariance structures specified above. The appendix provides a detailed discussion of model specification in this study.

Because of the unequal-spaced observation points and potential missing information involved in the panel data, maximum likelihood estimation produces biased estimates of the random parameters. The restricted maximum likelihood (REML) procedure can deal with this problem and is adopted in the model estimation in this study.

RESULTS

Determinants of Income: A Cross-Sectional Data Analysis

I first examine patterns of income determinants in selected years using a multivariate regression model. My purpose is twofold: First, the results

in this set of analyses help detect patterns of change in income determinants over time. Second, my analyses establish a basis for comparison with results in previous studies and in the panel data analysis in later sections.

Table 2 reports the parameter estimates of the covariates in selected years. The estimated models also included a set of indicator variables for respondents' city localities. My interest is in patterns of resource allocation among social groups, while controlling for cross-city variations in overall income levels.

As indicated at the bottom of table 2, sample sizes vary across these selected years, reflecting changing compositions of the sample over time. The R^2 indicates that the model specified for these selected years has a reasonably good explanatory power. This model accounts for 24%–44% of the income variation in various years.[11]

We can detect roughly two income regimes over time and a transitional period in between. The first income regime is associated with the Mao era, 1949–77. During this period, there was a general trend of equalization in income. Across the three years under this regime (1960, 1965, and 1975), there was a trend of decreasing gender inequality; differences in occupational status (e.g., returns to cadre and professional status) were also narrowing. There was some reduction of income differences among types of work organizations, but the patterns were less systematic.[12]

Patterns of income determinants in 1978 and 1984 reflected a transitional period between the prereform and reform eras. By 1978, the new leadership consolidated its power. But little institutional change was introduced in urban areas. As a rectification of the radical policies of the Cultural Revolution, the government adopted a series of wage increases, which were reflected in increases in returns to cadre and professional status in 1978 (see table 2). In some aspects, patterns of income determinants in 1978 resembled a return to the pre–Cultural Revolution period.

In the early 1980s, the central government experimented with decentralization in allocation of resources in state-owned firms. The most immediate effects of these policies on income were that managers in firms had the discretion to decide bonuses outside the state-set wage system. These

[11] The high R^2 is partly due to the inclusion of the city indicator variables, which captures substantial variations in income across cities.

[12] Because of the retrospective nature of the sample, variations in income determinants across the years partly reflect the evolving composition of the sample. The patterns in the earlier years may reflect a younger population. I replicated the analyses (and those reported in table 3 below) using only 35% of the sample (those who entered the labor force before 1966). The patterns in the replication study are similar to those reported in table 2, indicating that the reported patterns are robust to variations in sample composition over time.

TABLE 2

OLS ESTIMATES OF THE DETERMINANTS OF INCOME, SELECTED YEARS

Covariates	1960	1965	1975	1978	1984	1987	1991	1993
Intercept	1.97***	2.28***	2.32***	2.43***	3.80***	3.75***	3.34***	3.33***
Female	−.29***	−.24***	−.18***	−.16***	−.14***	−.19***	−.18***	−.18***
Age	.09*	.07**	.06***	.06***	.01†	.02***	.04***	.04***
$Age^2/100$	−.11	−.07†	−.06***	−.07***	−.01	−.02**	−.04***	−.04***
Education:								
Junior high	.04	.04	.06**	.04	.05†	.07**	.09**	.11***
Senior high	.11*	.06†	.05†	.03	.02	.10***	.16***	.18***
College	.18**	.13**	.15***	.07†	.03	.16***	.16***	.17***
Occupation:								
High-rank cadre	.42***	.35***	.29***	.40***	.28***	.21***	.21***	.34***
Low-rank cadre	.16**	.07	.08*	.16***	.09*	.06†	.10**	.21***
High-rank professional	.24*	.25***	.13*	.18**	.12*	.14**	.13**	.20***
Low-rank professional	.20***	.15***	.05	.06†	.02	.03	.07*	.15***
Clerk	.04	.08	−.02	−.03	.02	−.01	.01	.07†
Service worker	.00	.03	.01	.05	.04	.06†	.05†	.07*
Skilled worker	.07	.07*	.02	.06*	.00	−.01	−.01	.03
Workplace:								
Government agency	.19**	.14**	.09*	.08*	.07†	.07†	.10**	.17***
Public organization	.21***	.11**	.10**	.09**	.05	.08*	.13***	.16***
Central government firm	.21***	.12***	.15***	.16***	.12***	.11***	.11***	.17***
Local government firm	.16***	.11**	.12***	.11***	.07**	.10***	.10***	.11***
Private/hybrid forms	.18*	.07	.09†	.21***	.30***	.54***	.57***	.56***
R^2	.42	.40	.36	.30	.24	.29	.40	.44
N	779	1,132	2,134	2,624	3,255	3,478	3,587	3,623

NOTE.—"Elementary school education or below" is the reference category for education, "unskilled workers" for "occupation," and "collective firm" for "type of work organization." The models estimated above also included 19 dummy variables for each city included in the analysis.

† $P < .10$.

* $P < .05$.

** $P < .01$.

*** $P < .001$.

changes were reflected in the patterns of income determinants in 1984, where employees in government and public organizations, on average, had no advantages, other things being equal.

Patterns of income determinants in 1987, 1991, and 1993 showed evidence of a new income regime. Overall, the effects of the covariates showed a consistent trend during this period. In particular, we observed increasing returns to education, as well as to cadre and professional positions. Types of work organizations remained important during this period, and their effects appeared to be increasing.

To sum up, the results reported here are broadly consistent with both documented historical changes of the redistributive economy in urban China (Whyte and Parish 1984) and findings in other studies. The general patterns of income variations reflect two distinctive regimes. In the Mao era, 1949–77, variations in income showed a decreasing trend, with the declining importance of education and occupation, among others. This was clearly attributable to the "destratification" state policies promulgated during this period (Parish 1984). However, in the era of urban reform, we observe a trend of increasing inequality, as indicated by the increasing importance of education, occupation, and work organizations.

Changes in the transitional period between 1978 and 1984 were largely induced by state policies rather than by the reform of the redistributive institutional arrangements (with the exception of the growth of the hybrid and private firms).[13] During this period, the government experimented with a series of reform measures within the framework of existing institutions, especially in the area of wage policies. These changes did not reflect the traditional logic of redistribution or that of markets (Walder 1987). For the purpose of examining institutional changes in urban China, in my view, these two years were closer to the prereform era than to the reform era.

Explaining Variations in Income: A Mixed Model for Panel Data

I now turn to panel data analysis. Based on the findings in the previous analyses, I used the year 1985 to divide the prereform and reform eras in urban China.[14] Given the specific years for which we collected income

[13] In all analyses reported in this study, I combined "private entrepreneurs" and "those working in private and hybrid firms" into a single group (labeled "hybrid firm" in the tables) because of the considerable overlap between the two categories. My exploratory analysis shows that including both categories in the model does not lead to significant changes in the results.

[14] 1985 marked the official beginning of the urban reform and of the second income regime. It also witnessed a state-initiated wage reform that was based on principles (positions and ranks) substantially different from earlier wage systems. However, it could be argued that there were initial reform efforts in urban areas since the early

information, 1955–84 and 1987–94 were the time spans of the two eras covered in our data. To test the hypotheses about patterns of change across the two eras, I compare the "main effects" of the covariates and the "interaction effects" between these covariates and the period dummy variable, p ($p = 1$ if year > 1985; $p = 0$, otherwise).

Table 3 reports the parameter estimates of two models, using the two alternative specifications of cadre/professional status.[15] In model 1, cadres and professionals were specified into "high-rank" and "low-rank" groups respectively. In model 2, cadres and professionals were differentiated between those in the public sector (government and public organizations) and those in the economic sector (enterprises).

Columns 1 and 2 of table 3 show the main effects and interaction effects of the covariates in model 1. The intercept and the associated interaction effect indicate the "overall" income level and changes in the overall income level in the reform era. The positive and significant effect of the interaction term shows that there were statistically significant and substantial increase (exp[0.83]–1 = 129%) in the overall income in the reform era. However, my interest is in changes associated with specific positions and groups across the two periods.

Gender.—In the prereform era, a female employee earned 84% (exp[-.173] = .84) that of a male employee's income. In the reform era, there was a negative "female" effect, indicating that female employees' earning decreased during this period relative to male employees. But, this interaction effect was not statistically significant. That is, we cannot reject the null hypothesis that the observed difference in gender effects across the two periods is due to sampling variations.

Work experience and education.—In the literature, it is conventional to use work experience and formal education to measure human capital. Work experience, as measured by the first- and second-order effects of

1980s. Given the transitional characteristics of income determinants in 1978 and 1984, it is desirable to analyze these two years separately. But due to the small number of data points in this short time span, a separate panel analysis is not feasible. In my preliminary analyses, I explored two alternative specifications of the two eras. The first one was to divide the periods between 1955–78 and 1984–94. The results based on this specification showed *less significant changes* in parameter estimates across the two eras than those reported in the text. In the second specification, I omitted information in 1984 and divided the periods between 1955–78 and 1987–94 on the ground that income determinants in 1984 appeared to be an anomaly. The results showed similar patterns as those reported in the text.

[15] The models also estimated coefficients for the random effects of city and year indicator variables. Because of space limitations and because my interests are in the fixed effects of the theoretically related covariates, I do not report this set of parameter estimates.

TABLE 3

PARAMETER ESTIMATES OF THE COVARIATES IN THE FULL MIXED MODEL

COVARIATES	MODEL 1		MODEL 2	
	Main Effects	Interaction Effects[a]	Main Effects	Interaction Effects[a]
Intercept	3.037***	.830***	3.019***	.812***
Female	−.173***	−.020	−.174***	−.021
Age	.064***	−.023***	.063***	−.023***
$Age^2/100$	−.070***	.027***	−.069***	.027***
Education:				
Junior high	.036*	.049*	.039*	.053**
Senior high	.073***	.085***	.077***	.091***
College	.104***	.106***	.114***	.118***
Occupation:				
High-rank cadre	.239***	.005	...	...
Low-rank cadre	.116***	.002	...	...
High-rank professional	.110***	.050	...	...
Low-rank professional	.056**	.028	...	...
Cadre in public sector	...	...	.193***	−.046
Cadre in economic sector	...	...	.103***	.018
Professional in public sector	...	...	.088**	.028
Professional in economic sector	...	...	.055**	.033
Clerk	.026	.011	.034	.005
Service worker	.021	.014	.023	.013
Skilled worker	.019	−.016	.018	−.016
Work organizations:				
Government agency	.099***	.027	.063*	.054†
Public organization	.086***	.040†	.058*	.054†
Central government firm	.142***	.006	.141***	.006
Local government firm	.075***	.023	.075***	.023
Private/hybrid firms	.230***	.232***	.230***	.233***
G-covariance structure:				
v_{city}	.043**	.017**	.043**	.017**
μ_{year}	.016*	...	.016*	...
R-covariance structure:				
σ	.210***	...	.211***	...
ρ	−.00007***	...	.00006***	...
ϵ	.024***	...	.023***	...
N	4,730		4,730	
$N \times T$	27,392		27,392	

NOTE.—"Elementary school education or below" is the reference category for education, "unskilled workers" for "occupation," and "collective firm" for "type of work organization." Both models also estimated a set of coefficients for the random effects of cities and the selected years.

[a] The interaction effects indicate changes in the effects of the particular covariates in the 1987–94 period.

† $P < .10$.
* $P < .05$.
** $P < .01$.
*** $P < .001$.

age showed significant and varying effects across the two periods. In the prereform era, the effect of work experience showed a familiar inverted-U shape. In the second period, however, we observed changes in both the first-order and the second-order effects of age. This implies that there was a sharp decline in returns to work experience in the reform era. Because the sample evolved over time, the age effects may be sensitive to variations in sample composition. For this reason, I will not give substantive interpretation of age effects in this study.

With regard to formal education, there were significant returns to all educational levels in the prereform era, and these returns increased in the reform era. As the main effects indicated, in the prereform era, a college education increased one's income by 11%, and a senior high education by 8%, compared with those who had elementary or no education (the reference category). The estimates of the interaction effects show that there were significant increases in returns to these educational levels in the reform era. A college degree in the reform era had 23% higher income (exp[.104 + .106] = 23%), and a senior high school graduate had 17% higher income, compared with those who had elementary or no education. As noted before, this finding may reflect confounded effects of market forces and state policies.[16]

Occupation.—The main issues of contention in the debate are related to the role of positional power in the transformation processes. The parameter estimates for occupational groups show returns to various occupational statuses. The "main effects" indicated that, in the prereform era, high-rank cadres had the highest income—27% higher than unskilled workers (the reference category), other things being equal. Professionals (both high-rank and low-rank) and low-rank cadres also had significantly higher income, but the magnitudes appeared to be substantively smaller than that for high-rank cadres. There were no statistically discernible differences among other occupational groups (clerks, service workers, and skilled workers), as compared with unskilled workers.

Market transition theory predicts that returns to the cadre status decline relative to that of producers in the marketization processes. The interaction effects for occupational groups show that there were no statistically discernible changes for these occupational groups in the reform era. The magnitudes for the professionals appeared to be larger than others. But we cannot reject the null hypothesis that these differences are due to statistical variability rather than substantive changes.

[16] As Mincer (1974) showed, the estimates of educational effects (school years) may be biased downward when age is included in a typical wage model. Thus we need to be cautious in interpreting the magnitudes of returns to education in this analysis. Because of the use of panel data in this study, the comparison of *changes* in returns to education between the two eras is less likely to be affected by this problem.

Type of work organization.—Organizational hierarchy was the center of the redistributive economy in urban China. As the results of the "main effects" show, in the prereform era, such an organizational hierarchy was indeed present. Compared with the reference category of collective firms, employees in central government-owned firms enjoyed the highest income, other things being equal. Those in governmental agencies and public organizations, as well as those in local government-owned firms, also had advantages. This pattern is consistent with the organizational hierarchy of the redistributive economy and prevalent state policies documented in the literature. The main exception is the significant and higher income for employees in the private/hybrid firms. This resulted from the rise of a private sector in urban economies since 1978, as our cross-sectional analyses (see table 2) indicated.

To what extent has this organizational hierarchy changed in the reform era? According to the results from the "interaction effects," not much. Except for the significant and positive effect for private/hybrid firms, the economic benefits associated with types of work organizations have not shown statistically discernible changes. Moreover, collective firms had not benefited from market activities, relative to other types of work organizations, despite the fact that they were closer to market activities than those workplaces in the state sector. In other words, there is no strong evidence that the institutional arrangements of work organizations and the associated patterns of income distribution in urban China have changed significantly.

Party membership.—In a separate analysis similar to that reported in table 3 but excluding samples with no information on party membership (samples from Guangdong and Jiangsu Provinces), I estimated that the net return to party membership is about 6% ($\beta = .058$, $P < .001$), and there is no significant change in the reform era, other things being equal. That is, there is no evidence of "declining in significance" of political capital across the two periods. I note that because a large proportion of employees in the urban labor force are party members (over 20% on the national average), this political status is widely diffused, raising questions about whether it is still a useful indicator of "political capital" in urban areas.

Findings based on the second measure of cadre status.—Given the critical role of cadre/professional status in the theoretical debate, model 2 adopted alternative measures that distinguish cadre and professionals in two sectors. According to the logic of market transition theory, managers and professionals in economic sectors would benefit more from market transactions relative to those in the public sector who were more regulated by state policies.

As the parameter estimates in model 2 show, in the prereform era, cad-

res in the public sector had the highest income, cadres in the economic sector and professionals in both public and economic sectors also had significant and higher income than unskilled workers (the reference category), but their advantages were less salient. However, there were no statistically discernible changes in these patterns in the reform era, as indicated by their corresponding interaction effects. The interaction effect did point to a decrease in income for cadres in the public sector. However, this coefficient was neither substantial (in magnitude) nor statistically significant to warrant a different conclusion.

The effects of government and public organizations were smaller in model 2 than in model 1. This was because the specifications of cadres and professionals were based on their locations in types of work organizations. Clearly, a large proportion of cadres and professionals were concentrated in government and public organizations. In the reform era, government and public organizations had marginally significant ($P < .10$) and higher income than before. Other types of work organizations had no significant changes, except for income increase for employees in hybrid/private firms.

Variance components.—Parameter estimates of variance components in the G-vector show significant "clustering" effects associated with city localities and the selected years. The estimates of the parameters in the R vector also show evidence of autoregressive correlation among repeated measures within a subject.

Summary.—The main evidence for the impacts of market expansion, as consistent with market transition theory, is the significant and higher returns to those working in private and hybrid firms, whose economic activities were more governed by market transactions than by the redistributive economy. The increasing returns to education are also consistent with market transition arguments.

On the other hand, there is no evidence of "decline in significance" in returns to positional power, as measured by cadre/professional status in two alternative specifications. Besides the significant role of private/hybrid firms, there is no evidence of substantial changes in the organizational hierarchy in urban economies.[17]

[17] I also conducted statistical analyses that compared changes in income determinants over time among the inland region (Gansu, Heilongjiang, Sichuan, Hebei), coastal regions (Jiangsu, Guangdong), Shanghai, and Beijing. There were noticeable regional variations in the effects of the covariates in this set of analyses. But these results are largely consistent with the overall patterns reported in table 3. Because of the smaller number of cases in each region, the statistical power is relatively weak. I did not report this set of analyses due to space limitations.

Changes in Income Determinants in the 1990s: An Alternative Baseline

In the 1990s, economic reform in urban China has accelerated. Therefore, to detect more recent changes in the processes of marketization, one may use an alternative baseline to compare changes in patterns of income determinants between 1955–87 and 1991–94.[18] I estimated the changes in income determinants in the 1990s, using this alternative baseline. Table 4 reports the parameter estimates from this set of analyses.

Returns to education.—As table 4 shows, in both models 1 and 2, changes in returns to education in the 1990s are significant for all educational levels, but the magnitudes of increases for senior high and college are smaller in the 1990s, as compared with findings in table 3. These results seem to suggest, after more rapid changes in the 1980s, increases in returns to education slowed down in the 1990–94 period.

Returns to cadre and professional status.—In model 1, low-rank cadres and professionals had more significant improvement in their income in the 1990s than before. This finding suggests that the advancement of markets led to improved economic benefits for those cadres and professionals who were more distant from the redistributive center. But the advantages of the high-rank cadres have not changed relative to the large segments of "producers"—skilled and unskilled workers.

Findings in model 2 show that cadres and professionals in both public and economic sectors gained in income in the 1990s compared with the earlier period. Cadres in the public sector gained most, and professionals in the economic sector had the second largest gain. These results reflected confounding processes that reward both those closer to the political authority and those closer to market transactions.

Returns to work organizations.—In model 1, both government agencies and public organizations had the most significant gains in the 1990s, compared with collective firms. Hybrid firms had the largest gain, among all types of work organizations. However, their magnitude was smaller than those reported in table 3. In model 2, there were no significant changes in the hierarchical order of work organizations between the two periods.

Overall, more dramatic changes in the 1990s, with both the expansion of markets and the weakening of the central government, did not lead to a significant alteration of the patterns of income determinants as compared with the findings in table 3. These findings reinforce the view that institutional changes involve multifaceted processes that produce institutional changes in some areas but institutional persistence in others.

[18] A reviewer suggested this alternative baseline.

TABLE 4

PARAMETER ESTIMATES OF THE COVARIATES IN THE FULL MIXED MODEL, AN ALTERNATIVE PERIODIZATION, 1949–89 AND 1990–94

COVARIATES	MODEL 1		MODEL 2	
	Main Effects	Interaction Effects[a]	Main Effects	Interaction Effects[a]
Intercept	2.858***	.537**	2.854***	.529*
Female	−.185***	−.001	−.188***	.000
Age	.062***	−.013**	.061***	−.013**
$Age^2/100$	−.071***	.018**	−.068***	.017**
Education:				
Junior high	.031†	.056**	.035*	.055*
Senior high	.077***	.086***	.083***	.085***
College	.136***	.059*	.153***	.054†
Occupation:				
High-rank cadre	.220***	.059	...	...
Low-rank cadre	.097***	.058*	...	...
High-rank professional	.133***	.033	...	...
Low-rank professional	.045*	.070**	...	...
Cadre in public sector	...	...	.141***	.080*
Cadre in economic sector	...	...	.096***	.052†
Professional in public sector	...	...	.082**	.070†
Professional in economic sector	...	...	.049*	.068**
Clerk	.013	.049	.019	.053†
Service worker	.032†	−.003	.032†	−.003
Skilled worker	.008	.003	.008	.002
Work organizations:				
Government agency	.091***	.053*	.074**	.041
Public organization	.085***	.051*	.065*	.046
Central government firm	.136***	.020	.136***	.020
Local government firm	.084***	.008	.085***	.008
Private/hybrid firms	.324***	.135***	.323***	.136***
G-covariance structure:				
ν_{city}	.044**	.021**	.044**	.021**
μ_{year}	.034*	...	.033*	...
R-covariance structure:				
σ	.209***	...	.209***	...
ρ	−.00006***	...	−.00009***	...
ϵ	.024***	...	.025***	...
N	4,730		4,730	
$N \times T$	27,392		27,392	

NOTE.—"Elementary school education or below" is the reference category for education, "unskilled workers" for "occupation," and "collective firm" for "type of work organization."

[a] The interaction effects indicate changes in the effects of the particular covariates in the 1990–94 period.

† $P < .10$.
* $P < .05$.
** $P < .01$.
*** $P < .001$.

Comparison with the OLS Results and Other Studies

Comparing the parameter estimates based on cross-sectional and panel data (tables 2 and 3), we find that the directions of effects for key covariates are largely consistent in these two sets of analyses. This is comforting evidence that findings based on cross-sectional data analysis in previous studies parallel those based on the panel data analysis. The findings based on the panel data analysis are also similar to other published studies in the urban setting. For instance, although model specifications and data vary across these studies, the estimated returns to party membership and positional power in this study are similar to those reported in Bian and Logan (1996), Xie and Hannum (1996), and Walder (1995*a*). The effects of organizational hierarchy in table 3 are also consistent with the findings on "work-unit characteristic" in Bian and Logan (1996). The estimated returns to education in the reform era (in table 3) appear to be higher than those reported in other studies. This may be due to several reasons: the panel data analysis may be better able to assess changes over time and to untangle the covariation between education, occupation, and work organizations; also, our data captured more recent changes in the course of economic transformation.[19]

As indicated in table 2, there are considerable variations in the effects of the covariates across years. These variations may reflect the confounding effects of substantive changes in the reform, temporal changes in response to shifts in state policies, and sample variability. As we see in table 2, choices of different years may lead to different conclusions about changes and stability over time. In contrast, panel data and the mixed model specified here have advantages in addressing the theoretical issues while controlling for random fluctuations and unmeasurable individual attributes over time.

DISCUSSION

Building on theoretical ideas in previous studies, I proposed to conceptualize institutional changes as processes of coevolution between politics and markets and to focus on the interaction between the multiple processes to understand changes in patterns of income determinants in China's economic transformation. My analytical focus on urban China provided a more appropriate setting to assess institutional changes in the transforma-

[19] I do not compare my findings with those reported in the studies of rural China because the institutional arrangements and redistributive channels between rural and urban China are considerably different to allow for a meaningful comparison.

tion of state socialism because the redistributive economy has been more entrenched in urban areas than in rural areas. The use of panel data analyses and the operationalization of key theoretical variables also have improved over the research designs in the previous studies.

It is worth pointing out that the estimated patterns of income determinants for key theoretical variables (returns to positional power and returns to type of organizations) in the prereform era were consistent with the main theoretical arguments of the state socialist stratification order in the literature. This is important evidence that the operationalization of key concepts in this study is consistent with the theoretical specifications, and that the empirical findings (the main effects) establish a baseline for comparing changes in the effects of these covariates across the periods.

The empirical evidence revealed some noticeable changes between the prereform era and the reform era. The strongest evidence consistent with market transition theory is the significant role of private/hybrid firms in the new income regime. These new organizational forms reflect institutional changes that break away from the traditional redistributive economy. Given that this type of work organization is most closely associated with market transactions, I infer that marketization processes have indeed altered channels of resource distribution in urban China. Also, increasing returns to education may be partly attributed to emerging labor markets that better realize values of human capital than before.

On the other hand, the evidence also showed strong institutional persistence. First, regarding returns to political capital and positional power, there is no evidence that returns to party membership or cadre status (in both measures) "decline in significance." That is, we did not observe significant changes in returns to the "redistributors" (high-rank cadres) relative to "producers" (skilled and unskilled workers).[20] Second, except for the salient benefits of employees in private/hybrid firms, there were no significant changes in the organizational hierarchy across the two periods. Employees in collective firms, which were closer to market activities than those in the state sector, had not improved their income relative to those in the state sector.

[20] A reviewer commented that the findings that, in the reform era, there is no change in returns to the cadre status and that there is a significant increase in returns to education may be interpreted as "the relative decline" of the cadre status. But in the formulation of statistical estimation and tests, the effects of the cadre status should be compared only with the corresponding reference category (unskilled workers). Whether cadres gain (or lose) *disproportionately* with respect to "returns to education" remains to be examined. My exploratory analysis does not show any conclusive evidence on this issue.

To put these findings in a broader context, I note that changes in income determinants were most sensitive to changes in economic activities and captured the most salient aspects of economic transformation in urban China. Furthermore, our data contains information up to 1994, with much more recent evidence than that used in previous studies. In addition, our sampling scheme has a larger proportion of urban residents in large cities, which tend to change more rapidly than other types of cities in China's economic reform. All these factors should help us capture more recent and more dramatic changes due to the expansion of markets and, in this sense, they should favor hypotheses derived from market transition theory.

These findings and my interpretations by no means imply that there were no significant changes in urban China in the last two decades. Quite the opposite. Changes have been both fundamental and widespread. However, these changes were multifaceted, as were the processes that generated them. For instance, increasing returns to education in the reform era clearly reflect the increasing importance of human capital in market transactions. But it is also consistent with state policies in personnel management in the reform era. Similarly, even when we observe similar benefits associated with governmental agencies and positional power of cadres, the sources of these benefits may be partly related to market transactions, as seldom does any work organization or individual in the public sector nowadays solely depend on redistribution from the state. In this sense, although the observed patterns of income determinants may appear to have not changed in significance across the two periods, the processes that generate the apparent continuity may have changed substantively.

These observations raise questions about the usefulness of a focus on discrete institutional forms in understanding institutional changes in China. In the processes of coevolution between markets and the state (and local governments), both are transformed by each other to such an extent that, at an empirical level, conventional concepts may no longer be meaningful to guide our interpretation. Consider the notion of "redistributors." As the state monopoly of resources declines significantly, the political power of the cadres becomes increasingly derived from either the role of "regulators" (as in governmental agencies) or the role of "agents" of the state who manage the production processes (as in state-owned firms). These administrators may still profit from their positional power, which is derived from in part by their association with the political authorities and in part through their involvement in economic transactions in the marketplace. Similarly, although human capital plays an increasingly important role in obtaining economic benefits, the processes of obtaining human capital in the reform era, as Zhou, Moen, and Tuma (1998) shows,

are strongly tilted in favor of the children of those with political or cultural capital rather than ordinary "producers."

These considerations point to a set of challenges in understanding institutional changes in China and other former state socialist societies. First, we need to take a fresh look at both "old" and "new" institutional forms. We need to go beyond labels and ask to what extent the observed economic transactions or "new" institutional phenomena (e.g., business groups, subcontracting) are governed by market or political principles and in what ways they erode, reinforce, or transform markets and politics? In this regard, we need to have a better understanding of how institutional rules are made in the political arena and, in particular, *the specific ways* in which the "old" and "new" interests exert their influence in the rule-making processes. Such analyses would allow us to better understand the sources of advantages and disadvantages among different social groups on a substantive ground.

Second, the persistent and even increasing income inequality revealed in this study is closely related to the critical role of work organizations. Along with the diminishing role of central government in directly managing production, the distribution of economic resources is increasingly determined by one's work organizations. These work organizations are being transformed into new institutional forms whose governance is not necessarily consistent with the principles of either redistribution or markets. Thus it is unlikely that organization-based income inequality can be lessened, let alone eradicated, by the presence of labor markets. Without a good understanding of the new institutional mechanisms of distribution and authority relationships in the workplaces, it is unlikely that we can arrive at a satisfactory answer to sources of income inequality and social stratification in China's transitional economy.

More importantly, the retreat of the redistributive state does not necessarily imply an advance of markets. The emergence of new institutions often takes the form of a recombination of existing routines, authority relationships, and available solutions—such as networks, local corporatism, clientele relationship—within the current institutional arrangements (Bian 1997; Boisot and Child 1996; Lin 1995; Oi 1992; Stark 1996). We need to consider the rise of alternative institutional forms that transcend both redistribution and markets and their implications for the emerging stratification order. Substantive institutional analyses, in my view, require an approach that is historically informed and sensitive to specific institutional contexts, without losing sight of the broad (and competing) causal processes underlying the ongoing economic transformation. Only on this basis can we provide more satisfactory explanations of the observed patterns of income determinants and of institutional changes.

APPENDIX

Technical Report on Model Specification

My main theoretical interest is in examining the effects of the covariates specified in the fixed effects vector, X, in the mixed model (eqq. [1] and [2] in the text)

$$Y = X\beta + Z\gamma + \epsilon, \tag{A1}$$

with

$$\text{var}(Y) = ZGZ' + R, \tag{A2}$$

where Z is the random effects vector, G is the variance/covariance structure associated with Z, and R the variance/covariance structure for time-series correlations among repeated measures within a subject.

Parameter estimates of the fixed effects are sensitive to model specifications in other parts of the model, especially the specification of variance/covariance structures in G and R. In this appendix, I describe and discuss my decision in the model specification of equation (5) in the text. My discussion is concerned mainly with specification of covariates in the X or Z vectors, and the variance/covariance structures of G and R.

Random Effects or Fixed Effects?

The modeling strategy in specifying a mixed model allows one to treat the effects of the covariates as either fixed or random. That is, we need to make a decision about whether a covariate should be put in the X vector or in the Z vector.

Statistically, the choice of treating the effect of a covariate as fixed or random depends on whether one makes inferences conditional on the individual characteristics or makes unconditional inferences on the population characteristics (Hsiao 1986, p. 42; Judge et al. 1985, chap. 13). In general, an effect can be treated as *fixed* if the levels in the sample represent all possible levels of the covariate or at least all levels about which inference is to be made. Conversely, if the levels of the covariate that are used in the study represent only a random sample of a larger set of potential levels, it is appropriate to treat their effects as *random.* Since the main covariates of theoretical interest—age, education, occupation groups, and type of workplaces—are well established in the literature and the main levels in each covariate are measured in the sample as specified in the research design (see the section on variables), I treat these covariates as having fixed effects and include them in the X vector.

I specify the set of indicator variables for respondents' city localities and the selected years in which income data were collected as having

random effects. That is, I assume that the effects of city localities and the selected years are drawn from a larger population of effects associated with city localities and years. Given that both the selected years and cities in the data are only a sample of the populations and that I use years and city localities to control for variations in urban economies over time, this decision is appropriate.

Specification of the R-*Covariance Structure*

In equation (A2), R refers to the covariance structure associated with the serial correlations among the repeated measures within a subject. Intuitively, we expect the presence of serial correlations among repeated measures within a subject in panel data. Therefore, we need to model the covariance structure of R.

It is common to assume that the effects of the repeated measures decline over time. In this scenario, the conventional autoregressive covariance structure (e.g., AR[1]) is an obvious choice. But, the repeated measures in the data are unequally spaced and vary in the number of years measured depending on the respondents' duration in the labor force. The AR(1) error structure and other time-series covariance structures are inappropriate because they assume equal spacing among repeated measures. I model the serial errors using spatial covariance structures, which are free of the equal-spacing assumption. Moreover, they can be used as a generalization of covariance structures for the one-dimensional time-series error correlations. In particular, the spatial power structure is a direct generalization of the AR(1) structure for unequally spaced repeated measures, and it is intuitively appealing.

I tested the specification of the covariance structures using likelihood ratio tests. I began with a baseline model with independent errors (model 1 in table A1). This model assumes that the errors associated with ϵ_i are i.i.d. with no cross-sectional or serial correlations.

Model 2 introduced the specification of an autoregressive time-series variance/covariance structure (the spatial power specification), which greatly improves the model fit, with two *df*.

It is likely that there are measurement errors across subjects. One way to model measurement errors is to specify an additional variance term for each subject, which is estimated together with the ϵ_i term in R (Diggle, Liang, and Zeger 1994, p. 87). Model 3 shows that the inclusion of the measurement error term significantly improves the model fit, with 1 *df*.

Specification of the G-*Covariance Structure*

In equation (A2), G refers to the covariance structure associated with the covariates in the random-effect vector. In the model specification, I as-

TABLE A1

TESTS OF MODEL SPECIFICATION FOR THE FULL MIXED MODEL

Model Specification[a]	REML Log-likelihood Statistic	χ^2	*df*
1. Baseline model: $Z = 0$; $R = \sigma I_n$	−22,667.4	...	...
Specification of the R structure:			
2. Adding spatial power autoregressive error structure: $R = \sigma^2\rho^{\lvert t1-t2\rvert}$; $Z = 0$	−12,892.6	19,549.6	2
3. Adding a measurement error parameter: $R = \tau^2 I + \sigma^2\rho^{\lvert t1-t2\rvert}$; $Z = 0$	−12,451.4	882.4	1
Specification of the Z sector:[b]			
4. Adding only year indicator variables in Z[c]: $R = \tau^2 I + \sigma^2\rho^{\lvert t1-t2\rvert}$; $Z = Z_{\text{year}}$, $G = \sigma_{\text{year}} I$	−11,736.1	1,430.6	10
5. Adding only city indicator variables in Z[c]: $R = \tau^2 I + \sigma^2\rho^{\lvert t1-t2\rvert}$; $Z = Z_{\text{city}}$, $G = \sigma_{\text{city}} I$	−11,701.6	1,499.6	39
6. Adding both city and year indicator variables in Z: $R = \tau^2 I + \sigma^2\rho^{\lvert t1-t2\rvert}$; $Z = (Z_{\text{year}}, Z_{\text{city}})$; $G = [\sigma_{\text{city}} I, \sigma_{\text{year}} I]$	−10,872.6	1,658.0	10

[a] Refer to eqq. (1) and (2) and the appendix for information on model specifications.

[b] Degrees of freedom refer to the previous model as the baseline model, except that in both models 4 and 5, degrees of freedom refer to model 3 as the baseline model.

[c] Z_{city} refers to the set of indicator variables for city localities; Z_{year} refers to the set of indicator variables for selected years.

sume that G follows a variance-component structure. That is, I specify each of the 20 cities and each of the selected years in the sample to have a distinct variance component to account for heterogeneous urban economic conditions across cities and over the selected years. The variance-component structure also assumes that the variations among these cities or across the selected years are independent of each other.

Models 4 and 5 in table A1 included the random effects of "city localities" and "years" separately with their respective variance-component structures. The likelihood ratio tests show that, in both models, the inclusion of Z and G significantly improves the model fit over the previous model (model 3).

Model 6 included both city localities and years into the random effect vector, and it shows a significant improvement in model fit over model 5. These considerations lead to the full model, model 6, as specified in equation (5) in the text.

REFERENCES

Becker, Gary S. 1964. *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education.* New York: Columbia University Press.

Bian, Yanjie. 1994. *Work and Inequality in Urban China.* Albany: State University of New York Press.
———. 1997. "Bringing Strong Ties Back In: Indirect Connection, Bridges, and Job Search in China." *American Sociological Review* 62:266–85.
Bian, Yanjie, and John W. Logan. 1996. "Market Transition and the Persistence of Power: The Changing Stratification System in Urban China." *American Sociological Review* 61:739–58.
Boisot, Max, and John Child. 1996. "From Fiefs to Clans and Network Capitalism: Explaining China's Emerging Economic Order." *Administrative Science Quarterly* 41:600–628.
Campbell, John L., J. Rogers Hollingsworth, and Leon N. Lindberg. 1991. *Governance of the American Economy.* Cambridge: Cambridge University Press.
Diggle, Peter J., Kung-Yee Liang, and Scott L. Zeger. 1994. *Analysis of Longitudinal Data.* Oxford: Clarendon Press.
Esping-Andersen, Gøsta. 1990. *The Three Worlds of Welfare Capitalism.* Princeton, N.J.: Princeton University Press.
Evans, Peter B., Dietrich Rueschemeyer, and Theda Skocpol. 1985. *Bringing the States Back In.* Cambridge: Cambridge University Press.
Fligstein, Neil, and Iona Mara-Drita. 1996. "How to Make a Market." *American Journal of Sociology* 102:1–33.
Gerber, Theodore P., and Michael Hout. 1998. "More Shock than Therapy: Market Transition, Employment, and Income in Russia, 1991–1995." *American Journal of Sociology* 104:1–50.
Granovetter, Mark. 1985. "Economic Action and Social Structure: The Problems of Embeddedness." *American Journal of Sociology* 91:481–510.
Guthrie, Douglas. 1997. "Between Markets and Politics: Organizational Response to Reform in China." *American Journal of Sociology* 102:1258–304.
Hamilton, Gary G., and Nicole Woolsey Biggart. 1988. "Market, Culture, and Authority: A Comparative Analysis of Management and Organization in the Far East." *American Journal of Sociology* 94:S52–S94.
Hodgson, Geoffrey M. 1994. "The Return of Institutional Economics." Pp. 58–76 in *The Handbook of Economic Sociology,* edited by N. J. Smelser and R. Swedberg. Princeton, N.J.: Princeton University Press.
Hsiao, Cheng. 1986. *Analysis of Panel Data.* New York: Cambridge University Press.
Judge, George G., W. E. Griffiths, R. Carter Hill, Helmut Lutkepohl, and Tsoung-Chao Lee. 1985. *The Theory and Practice of Econometrics.* New York: Wiley.
Konrad, G., and Iván Szelényi. 1979. *Intellectuals on the Road to Class Power.* New York: Harcourt Brace Jovanovich.
Lieberthal, Kenneth G., and David M. Lampton. 1992. *Bureaucracy, Politics, and Decision Making in Post-Mao China.* Berkeley and Los Angeles: University of California Press.
Lin, Nan. 1995. "Local Market Socialism: Local Corporatism in Action in Rural China." *Theory and Society* 24:301–54.
Lin, Nan, and Yanjie Bian. 1991. "Getting Ahead in Urban China." *American Journal of Sociology* 97:657–88.
Littell, Ramon C., George A. Milliken, Walter W. Stroup, and Russell D. Wolfinger. 1996. *SAS System for Mixed Models.* Cary, N.C.: SAS Institute.
Mincer, Jacob. 1974. *Schooling, Experience and Earnings.* New York: Columbia University Press.
Naughton, Barry. 1995. *Growing Out of the Plan: Chinese Economic Reform, 1978–1993.* New York: Oxford University Press.
Nee, Victor. 1989. "A Theory of Market Transition: From Redistribution to Markets in State Socialism." *American Sociological Review* 54:663–81.

———. 1991. "Social Inequalities in Reforming State Socialism: Between Redistribution and Markets in State Socialism." *American Sociological Review* 56:267–82.
———. 1992. "Organizational Dynamics of Market Transition: Hybrid Forms, Property Rights, and Mixed Economy in China." *Administrative Science Quarterly* 37: 1–27.
———. 1996. "The Emergence of a Market Society: Changing Mechanisms of Stratification in China." *American Journal of Sociology* 101:908–49.
Nee, Victor, and Peng Lian. 1994. "Sleeping with the Enemy: A Dynamic Model of Declining Political Commitment in State Socialism." *Theory and Society* 23:253–96.
Nee, Victor, and Rebecca Matthews. 1996. "Market Transition and Societal Transformation in Reforming State Socialism." *Annual Review of Sociology* 22:401–35.
North, Douglass, and Robert Thomas. 1973. *The Rise of the Western World.* Cambridge: Cambridge University Press.
Oberschall, Anthony. 1996. "The Great Transition: China, Hungary, and Sociology Exit Socialism into the Market." *American Journal of Sociology* 101:1028–41.
Oi, Jean. 1992. "Fiscal Reform and the Economic Foundations of Local State Corporatism in China." *World Politics* 45:99–126.
Parish, William L. 1984. "Destratification in China." Pp. 84–120 in *Class and Social Stratification in Post-Revolution China,* edited by J. Watson. New York: Cambridge University Press.
Parish, William L., and Ethan Michelson. 1996. "Politics and Markets: Dual Transformations." *American Journal of Sociology* 101:1042–59.
Peng, Yusheng. 1992. "Wage Determination in Rural and Urban Industrial China." *American Sociological Review* 57:198–213.
Róna-Tas, Ákos. 1994. "'The First Shall Be Last?' Entrepreneurship and Communist Cadres in the Transition from Socialism." *American Journal of Sociology* 100:40–69.
Shirk, Susan. 1993. *The Political Logic of Economic Reform in China.* Berkeley and Los Angeles: University of California Press.
SSB (State Statistical Bureau, People's Republic of China). 1990*a*. *Yearbook of Chinese Cities.* Beijing: China Statistical Publishing House.
———. 1990*b*. *Historical Statistics of Provinces, Autonomous Regions, and Municipalities, 1949–1989.* Beijing: China Statistical Publishing House.
Stark, David. 1996. "Recombinant Property in East European Capitalism." *American Journal of Sociology* 101:993–1027.
Stark, David, and Victor Nee. 1989. "Towards an Institutional Analysis of State Socialism." Pp. 1–31 in *Remaking the Economic Institutions of Socialism,* edited by V. Nee and D. Stark. Stanford, Calif.: Stanford University Press.
Szelényi, Iván. 1978. "Social Inequalities in State Socialist Redistributive Economies." *International Journal of Comparative Sociology* 16:63–87.
Szelényi, Iván, and Eric Kostello. 1996. "The Market Transition Debate: Toward a Synthesis?" *American Journal of Sociology* 101:1082–96.
Wade, Robert. 1990. *Governing the Market: Economic Theory and the Role of Government in East Asian Industrialization.* Princeton, N.J.: Princeton University Press.
Walder, Andrew G. 1986. *Communist Neo-Traditionalism: Work and Authority in Chinese Industry.* Berkeley and Los Angeles: University of California Press.
———. 1987. "Wage Reform and the Web of Factory Interests." *China Quarterly* 109: 22–41.
———. 1992. "Property Rights and Stratification in Socialist Redistributive Economies." *American Sociological Review* 57:524–39.
———. 1995*a*. "Career Mobility and the Communist Political Order." *American Sociological Review* 60:309–28.

———. 1995*b*. "Local Governments as Industrial Firms." *American Journal of Sociology* 101:263–301.
———. 1996. "Markets and Inequality in Transitional Economies: Toward Testable Theories." *American Journal of Sociology* 101:1060–73.
Whyte, Martin King, and William L. Parish. 1984. *Urban Life in Contemporary China.* Chicago: University of Chicago Press.
Xie, Yu, and Emily Hannum. 1996. "Regional Variation in Earnings Inequality in Reform-Era Urban China." *American Journal of Sociology* 101:950–92.
Zhou, Xueguang, Phyllis Moen, and Nancy Brandon Tuma. 1998. "Educational Stratification in Urban China: 1949–1994." *Sociology of Education* 71:199–222.
Zhou, Xueguang, and Olga Suhomlinova. 1999. "Redistribution under State Socialism: A USSR and PRC Comparison." *Research in Social Stratification and Mobility.* In press.
Zhou, Xueguang, Nancy Brandon Tuma, and Phyllis Moen. 1996. "Stratification Dynamics under State Socialism: The Case of Urban China, 1949–1993." *Social Forces* 74:759–96.
———. 1997. "Institutional Change and Job-Shift Patterns in Urban China, 1949–1994." *American Sociological Review* 62:339–65.