TAXING URBAN LAND IN CHINA

by Roy Bahl and Jun Zhang

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DISCUSSION PAPER

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DISCUSSION PAPER
EXECUTIVE SUMMARY

i. The proposed urban land tax. Urban land in China is not priced, it is owned by the state and assigned to enterprises and households free of charge. This practice has resulted in major efficiency and equity problems in allocating land resource. In order to improve the land allocation process, the government and the Chinese Congress have decided (i) to impose a tax for the use of land in urban areas; and (ii) to allow the transfer of land use rights between occupants. To facilitate these changes, the relevant laws and regulations have been passed; moreover, the articles in Constitution relating to land were revised in 1988.

ii. This move raises many questions in China: How can a land tax be implemented while all land is state owned and there is no formal market for the exchange of properties? Is it reasonable to believe that the tax rate can be high enough to both raise municipal revenue and affect the land use choice of enterprises? Who will bear the burden of this tax? How will enterprises react to the tax, in terms of their production, factor rewards and investments? Do Chinese local governments have the administrative capacity to implement the tax? And last but not the least, how can tax rates be determined? These are the issues this study wishes to address. Due to the complicated and complex situation concerning price and subsidies, the household sector is not touched in the study.

iii. Property rights. According to the Chinese Constitution, land in urban areas is owned by the state, and in rural areas is by peasants collectively, or by the state in the case of mines, forestry, etc. The ownership of structures, however, is clearly identified: a building can be owned by the government, a state-owned or collective enterprise, or an individual. A strong set of property rights is attached to the buildings. As far as enterprise location is concerned, the enterprise is allowed to play a role in choosing its initial location, but the outcome has to be determined by a lengthy administrative procedure. When enterprise relocation occurs, compensation costs can run very high, although the location value is not formally taken into calculation. As a result, there is abundant evidence suggesting that Chinese enterprises seldom adjust land input in their production, either in terms of land acreage or location.

iv. Experiments. Many of the issues raised are generally of the problem of implementation. In fact, however, over 100 Chinese cities are already experimenting with some sort of land tax or charge. Some common traits of the experiments are summarized in the paper. Because land value information is not available, many cities tend to use a method that uses proxies for location values (e.g., the variations of profit per square meter of land in different locations of a city) by zones rather than by individual properties. The rates suggested are excessively low since the enterprises, ability to afford the tax is a major concern in the design. Fushun, a city of northeast China, is the only case where the imposition of a land tax is legally authorized by the Ministry of Finance. It is reported that the levy has been successful in the sense that urban land expansion is curbed and the government revenue has been greatly enhanced.
Land value estimation. Since there is no land market to reveal land prices, a theoretical model to estimate land rents and rent gradients is derived in the paper. To test the model, a survey covering two cities, Yantai and Jinan of Shangdong Province, was carried out, and both time-series and cross-section data of 300 firms in Yantai and 600 firms in Jinan were collected. The estimates of land rents and rent gradients were obtained from a two-stage least-square econometric model. It was discovered that the model was relatively successful in estimating land values of commercial establishments, but yielded little light on industrial firms in past because these enterprises were subject to more severe price controls.

Tax burden estimation. Based on the parameters estimated for the commercial establishments, a simulation model was developed to evaluate the profit situation of firms and financial position of the municipality under different scenarios of land taxation. It was found that if the government intends to tax away the full amount of the location rent, then a large number of enterprises, between 40 to 60% of the total sample, will become unprofitable. Thus in the initial stage the tax rates have to be set at levels much lower than the full amount of location rent. The government may also have to consider making the land tax deductible in the estimation of the profit tax.

Policy recommendations. Although there is still much to learn, this report recommends that the land tax rate should be set at a relatively high level, and gradually be raised to cover the full amount of real location value. If a low rate is imposed, which is the standard practice in the experimenting cities, little impact on enterprise choice of input mix will be induced. Furthermore, the costs of administering the tax may more than offset the revenues gained from the tax. The empirical findings from the two study cities suggest a centrally determined, uniformly applied urban land tax is not appropriate in China, due to the large variations of the estimated location values from one city to the next. Thus, it is more appropriate to make this a local tax, allowing the local authorities to determine the tax rates and structures.
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INTRODUCTION

1.01 The Land Administration Law of 1986 authorizes imposition of a charge for the use of land in urban areas. The law is silent on the particulars of this levy, e.g., whether it will be a charge (rent) or a tax, who will set the rate and how high the rate will be, what will be the base, etc. As a result, feasibility and impact studies are underway in MURCEP, in the Ministry of Finance and in some of the larger cities, and over 100 cities and 110 counties are already levying some form of land charge on an "experimental" basis.

1.02 The basic rationale for a land charge is that land has value as a productive factor. So long as the state assigns it, without charge, to enterprises and individuals, the general government sector will be providing an unintended subsidy to the enterprise sector. The most often-cited consequences of not charging for land are (i) that there will be too little incentive for enterprises to use land in an efficient way, e.g., it is known that enterprises hoard land; (ii) those enterprises that are assigned "better" locations will have a competitive advantage; and (iii) the government will sacrifice revenues that might otherwise finance infrastructure improvements.

1.03 It is difficult to take issue with the economic justification of this proposal to charge for the use of land. The implementation of a land charge in China, however, does raise many questions.

- How can a land charge or tax be implemented when all land is state owned and there is no formal market for the exchange of properties?
- Is it reasonable to expect that it can be levied at a high enough rate to both raise significant amounts of revenue and to affect the land use choices of enterprises?
- Who will bear the burden i.e., consumers or workers? This goes directly to the question of how will enterprise react to the charge in terms of production, factor rewards, investment and methods of doing business?
- Do Chinese local governments have the administrative capability to implement a land use charge or tax?
- How should the rate and base be determined?

1/ At the time of this writing, no implementing regulations had been issued.
2/ Ministry of Urban and Rural Construction and Environmental Protection.
3/ Shanghai, Beijing, Guangzhou and Wuhan.
1.04 The objective of this research is to address these questions. In the next section we consider the issue of property rights and the method of assigning and reassigning land uses in China. We turn then to a description of the alternative proposals for the land use tax or charge, and to a brief survey of the experiments presently underway. The prospects for developing a general model of land value determination in China are then evaluated. Case studies are presented for two cities in Shandong Province, Jinan and Yantai. The approach in these case studies is essentially empirical and is based on site visits and questionnaire surveys of 307 enterprises in Yantai and 613 enterprises in Jinan. We use these data to estimate the base value and location rent of urban properties and to simulate the impacts of a land tax. The final section of this study is an evaluation of these results and a discussion of the implications for government policy.
CHAPTER II

LAND OWNERSHIP AND PROPERTY RIGHTS

2.01 A major question to raise in evaluating the potential success of a land use tax is whether enterprises and individuals will be able (and willing) to respond to the tax by adjusting their use of land and/or by seeking a more appropriate location. To the extent these adjustments are made, the tax can have the desirable effects on the allocation of land use that the government is hoping for. To the extent there are legal and practical constraints that prohibit firms from making such responses, the tax will more likely act as a lump sum reduction in retained profits. The question of legal and practical constraints to such response by enterprises and persons is addressed here with a review of the current status of property rights in land and buildings and of the current methods of compensation and assignment of land.

2.02 In describing the current practice, it is not enough to look only at the laws and regulations. China today is a country whose economic system is in transition and there are experiments everywhere. Moreover, China always has been a country where the official regulations left room for ad hoc negotiation in the implementation of policy. This description of the Chinese "land market" and the nature of the property rights in land considers not only the laws that govern land use and exchange, but also the experiments, some specific examples and even anecdotal evidence.

A. Ownership and Use Rights

2.03 Land is owned collectively or by the State in rural areas and by the State in urban areas. Land located outside the urban planning area is mostly owned by farming collectives and there are few restrictions on its use. Within the urban planning area the use of land is prescribed by the State and the construction of all permanent structures must be approved according to the usual urban planning procedures.

2.04 Property rights in land are limited by the denial of private ownership, the restrictions on its use in urban areas, and limitations on the transfer of user rights. Yet with respect to tenure and compensation, there are formal property rights and varying degrees of protection for land users. These rights are specified in a kind of lease document, a "use permit." The protection this document offers depends on the type of land use.

2.05 The situation as regards the ownership of structures is different. There are four classes of ownership. Most structures are state-owned. The construction funds were provided either by the general government (through the Housing Bureau) or by the state-owned enterprises. Second, structures may be owned by collective enterprises who have used their own funds for construction. Third, individual private ownership of structures is permitted, and this accounts for about 17 percent of the urban housing stock nationwide. Finally, joint ventures may construct and own structures, but this accounts for a relatively small percentage of the total amount of floor space.

4/ Parts of this section draw from a background paper for this project, Steen Lau Jorgensen, "Property Rights and Land Taxation in Capitalist and Socialist Societies": (Washington, DC: The World Bank, April 1987), mimeo.
Residential Properties

2.06 By law, tenants cannot be evicted. When a tenant is given an apartment, he/she can transfer it and it even can be passed on as inheritance. If an individual changes his company of employment (which itself is rare), he may keep his housing even if it was built and is operated by his old employer. If the government decides to demolish housing, it has an obligation to supply each tenant the same amount of space "preferably at the same location." The property rights thus include a right to an amount of housing space ("a number of rooms") for an indefinite period of time, but no absolute right is given to location even though old tenants are said to have first priority in the event of redevelopment.

2.07 The rights of those individuals who own their structure are as strong. If dispossessed, they are usually compensated for the value of their building, but no compensation is given for the location value of the land they have been assigned. There are three methods used to work out the compensation. The first is that monetary compensation is awarded for the privately-owned structure, and the individual is provided (rented) comparable housing in a state-owned apartment. In effect, he sells his structure and becomes a tenant. The second method is that no compensation is paid for the structure but the government gives the owner a comparable apartment. In this case, the individual is awarded ownership of the new apartment. The third possibility is that the private owner is dispossessed and no compensation is paid.

2.08 The property rights for owners of structures does not appear to be any weaker than that for tenants, but it is still true that no individual right to location value is recognized. This state of affairs certainly offers no stimulus to home ownership. Since an important element of the housing reform is to encourage individual investment in housing, a stronger set of property rights for owners is almost certainly in the offing.

Enterprises

2.09 The use permit for state-owned enterprises (SOE) and cooperatives specifies the activity on a specific plot of land, e.g., industry or commercial. Enterprises cannot transfer their usage right freely, so it seems to be close to a perfect case of a stewardship right, assigned and held conditionally. In the special case of a foreign investor or a joint venture, the permit seems to be much like a standard lease. It states the duration of the lease, the use, and the land rent.5/

2.10 In general, the enterprise property right situation is rather uncertain and imprecise. Technically, they are assigned a location, but seem to have some limited say about the choice of a location and about the amount of land area assigned. Before the 1988 Constitutional revision, enterprises could not transfer even part of their land. Any unused land was to revert back to the State. The April 1988 amendment states that the user right may be transferred "according to the law." However, the conditions under which such transfers can

5/ In Shanghai, for example, the lease rent is determined by both the type of use and the location.
take place are not at all clear. Officials interviewed about this issue reported the following: (i) enterprises cannot transfer land for compensation, unless there is a special arrangement with the Central Government, as for example in an experimental program, (ii) state-owned enterprises can lease building space, but with approval of the Central Government, and (iii) private enterprises and collectives can lease building space without approval and are free to set the lease price.

2.11 In fact, it does not appear that the regulations are strictly obeyed. It was reported that in Shanghai, and probably in every major Chinese city, a problem of "illegal" leasing of land exists: enterprises that are assigned too much land rent out space to small private enterprises.

B. Land Assignment and Transfer

2.12 Property rights are most limited with respect to selection of locations and freedom to exchange. Technically, the State assigns land to users and there is no market role. In fact, the land assignment process may not be so one-sided as one might expect, and enterprises can exert some influence. Likewise there is no formal mechanism for exchanging properties. The emerging land "market"-sales, resales, and exchange-is controlled by the State and users do not have a formal authorization to transfer their right. Still, there are some limited, informal or "conventional" rights to exchange properties and these rights have been extended considerably under a number of experimental practices.

Initial Assignment of Land

2.13 The assignment of land involves an extensive bureaucratic process. Several municipal agencies are involved: the Land Acquisition Department is responsible for approving the application, the Urban Planning Bureau is responsible for land allocation and for the issuance of building permits, and the Agricultural Bureau is involved when questions of compensation for agricultural land arise. The assignment process is time-consuming, imposes what appears to be substantial administrative costs, and may be more sensitive to inter-Ministerial politics than government planners would like.

2.14 The rules for land assignment seem most precise in the case of land that is being converted from agricultural to urban use. There are nine steps in the assignment of such land to enterprises:

6/ A good example is the financing of a new sports stadium complex and attendant infrastructure in Guangzhou. The state awarded the land to a land development corporation in return for construction of the entire set of facilities. The land development corporation then leased the land to 17 enterprises to cover the cost of the project. It was reported that both the general contractor and the 17 enterprises made a "good" profit on the activity.

7/ This procedure was recorded during an interview with the Urban Planning Bureau in Changzhou in September, 1987.
Step 1: The enterprise sends a memo to the Urban Planning Bureau requesting a location; the Urban Planning Bureau makes a decision.

Step 2: If a favorable decision is made, the report is sent to the Planning Commission for determination of the scale of the land allocation.

Step 3: The Urban Planning Bureau works with the enterprise to determine the exact location, design the land use plan, and the plan for the necessary facilities (roads, utilities, etc.).

Step 4: The enterprise submits a detailed final plan to the Urban Planning Bureau.

Step 5: The Urban Planning Bureau holds a conference involving the Economic Commission, the subcity governments, the Vegetable Office, the Urban Renewal Office, and any other agency concerned. Any objections are noted and appropriate action is taken.

Step 6: If Steps 1-5 have been passed, the Urban Planning Bureau will draw the boundaries of the land to be taken.

Step 7: The Urban Renewal Office (or Land Acquisition Office) will negotiate with the sellers on the price of the land. They will prevent collusion among the sellers and control the price.

Step 8: The Urban Planning Bureau will issue a land acquisition permit and will authorize the construction of extra facilities such as roads, etc.

Step 9: The Urban Planning Bureau will issue a land occupation permit for the total amount of land to be assigned. The difference between the last two steps is that often the enterprise will be required to take more land than it initially needs because of allowing for necessary rights-of-way, etc.

2.15 In Changzhou it was reported the whole process previously took months but now it takes much longer: especially steps 2, 5, and 7 can take a substantial amount of time. Moreover, while municipal governments can give approval for less than 10 mu of land (0.67 ha), approval of the Provincial government is required for larger tracts; hence, another step (or series of steps) is involved. Does all of this create problems in allocating land, or does it only involve a time delay? The answer in Changzhou is that "eventually they almost always get their land." In 1986, 272 firms applied and 159 received

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8/ 1 mu = 666.7 square meters or 1 square meter = 0.0015 mu.
In total, 1192 mu (79 ha) of land were acquired. There were a few rejections, but this was mostly because there was an unclear construction plan or financial plan, or because the applying enterprises still had some vacant land. Moreover, some applications are still in process. There has been substantial land acquisition in recent years. Between 1980 and 1987 there was an average of 1845 mu (123 ha) acquired and in 1985 the amount was 3019 mu (211 ha). Mostly, this is due to expansion of enterprises to multiple locations rather than to the formation of new enterprises.

Relocation of Enterprises

2.16 The initiator of a relocation of an enterprise is either the Urban Planning Bureau (UPB) or the enterprise itself. Many relocations are initiated by the Government, e.g., the movement of smokestack industries or relocation of firms to make way for a new public facility. In Shanghai, voluntary movements were called "a rare occurrence." Why is this the case? The answer is that government policy and financial constraints are formidable barriers to locational mobility. The main obstacles are that enterprises cannot freely "sell" their land use for a price that makes the purchase of an alternative site feasible, and, that the employees of the enterprise often resist movement away from the central area of the city.

2.17 Consider the case of an enterprise that would like to relocate to the suburban area where more space is available. To compensate the present land users in the suburban area and build a new structure, the enterprise may draw on three sets of resources: retained earnings, bank loans, and compensation for the sale of its present building and land use rights. In fact, however, the land use right can bring no compensation. The firm will receive nothing for its location value because the land is owned by the State and was freely granted to the enterprise in the first place. Compensation, then, is limited to what can be received for the structure. If the enterprise in question is a state-owned enterprise, then the government will build a new structure of comparable size at the new location. If it is a collective or a privately-owned enterprise, then the enterprise which will move onto the land pays a negotiated compensation to the original land user for the value of the structure.

2.18 On the buying end, the compensation paid for new land on the urban fringe (agricultural land) is closer to a market price. In addition to paying for the user right on the new property, the relocating enterprise must rehouse all displaced inhabitants of the area and give present users enough compensation to continue production elsewhere. The relocating enterprise may also face an infrastructure fee, based on the amount of new land to be developed. Finally,

9/ About 45 percent of these were applications for industrial land use.

10/ These do not appear to be unusual amounts. In Jinan, a larger city, the amounts acquired in 1985 and 1986 respectively were 4080 mu and 4256 mu. About 25 percent of this was used for industry purposes.

11/ This is determined by a combination of State regulations and negotiation. However, if the structure is state-owned, no compensation is due to the enterprise.
there may be some direct negotiation with the displaced farmers that leads to additional side payments. The result is a financing gap that relatively few enterprises can accommodate. This becomes a powerful incentive to "stay put."

2.19 Add to this the problems of relocating workers. One issue is that workers are loath to leave the central area of the city where amenities are better. Those interviewed in various cities repeated the following reasons:

- Shopping is convenient in the downtown area.
- The downtown is the center of education and culture, and the children have better educational opportunities.
- For some families, both the husband and the wife work, but not in the same enterprises. If the husband or the wife were to be relocated to a suburb location, family life would become very difficult.
- Transportation services are inadequate—the busses are crowded, there is no private car, and bicycle commuting to the suburbs is not feasible.

2.20 Even if the workers are willing to leave, there is the problem of providing them with comparable housing. This is costly to the enterprise, and there are other problems. Enterprises often pool their resources to create housing for employees and this complicates the relocation plan, e.g., what compensation can be paid to the relocating enterprise for its share of the housing.

2.21 While the cards are clearly stacked against the movement of enterprises, there are some voluntary relocations, and in these cases the local government's role is mainly as an arbitrator between the parties and as a notary approving the contract. In the case of two Yantai enterprises, the company could choose between expanding at its present city center location or outside the city. Both chose to expand outside the city and one moved all of its operations out. Despite their ultimate decision, both enterprises mentioned the high compensation costs as a disincentive to expanding but both cases were rather special: one company already had the use right to land outside the urban area and the other was "encouraged" to move because of pollution problems.\footnote{12}{The provision of government subsidies may be a major reason why enterprises move out of the built-up city area.}

2.22 The situation is different in the case of involuntary relocation. When enterprises are forced to move, they are supplied with an equal amount of land and floor space plus space for necessary expansion. Workers are given the
option to move when the enterprise moves but, as noted above, they cannot be
forced to move because of the strong tenants' rights.13

Housing Assignment and Transfers

2.23 The process for assigning residential housing depends on whether the
structure is "owned" by the local government or by an enterprise. Houses in
China can be classified into three categories of ownership:
   o Privately owned
   o Enterprise owned (include agency, school, military, etc.)
   o Housing Bureau owned and managed.

2.24 Private houses are limited in China, and in large or medium-sized
cities and especially new developed cities, housing is dominated by categories
(2) and (3). Most urban residents live in enterprise owned houses. They must
apply to the enterprise for the privilege to live in those houses. Enterprises
may assign housing units to their workers according to their own priorities.
Priorities are given to the applicants according to their age, seniority, rank,
responsibilities, family size or marital status, and present living conditions.
In general, higher priority is given to those who are elderly, have job
seniority, higher rank, a larger family or a poorer present living condition.
Those who do not qualify for the enterprise owned houses, such as the self-
employed or unemployed persons and primary school teachers, can apply for houses
from the local housing bureaus. The housing bureaus lease available houses
according to needs and present living conditions. Irrespective of who makes the
assignment, the new resident receives a housing permit which is taken to the
administration of the housing complex. Here a contract is signed establishing
the tenants' duty to pay rent and the administrators' duty to do the upkeep.

2.25 To what extent is the
assignment of housing an enterprise
issue? A comparison of Shanghai and
Yantai may be instructive. In
Shanghai, nearly all housing was built
by the Urban Construction Bureau (UCB)
whereas enterprises played a larger
role in Yantai. Even in Shanghai, 53
percent of funds for new construction
(since 1980) came from enterprises
which were then given a share of the
finished buildings according to their
share of funding. Most enterprises in
Shanghai preferred to return the

| TABLE 1 |
| OWNERSHIP OF HOUSING: 1986 |
| Percent | Shanghai | Yantai |
| Housing Bureau | 67.0 | 24.1 |
| Enterprises | 8.5 | 72.3 |
| Private | 24.5 | 3.6 |

SOURCE: Data supplied by Shanghai and Yantai local government officials.

13/ This situation has changed in recent years. In the past, even though
some employees objected to relocation they were forced to move because at that
time employees were not allowed to quit their jobs and find another. The
situation has now changed some, because it is possible for a worker to move to
another enterprise when a relocation takes place.
buildings to the Municipal Housing Bureau after having put their employees into the apartments because it is a "lossmaking business" to operate a housing enterprise: the rent they can recover from the renters is set at the level far below the maintenance cost. This practice was also common for smaller (but not larger) enterprises in Yantai. The distribution of ownership in the two cities in 1986 is shown in Table 1.

2.26 The difference in the distribution of housing ownership reflects the disparity in the historical background and growth pattern of the two cities. Yantai is a fast growing city with housing construction mostly in the downtown area where private housing has been demolished. In Shanghai, most of the pre-liberation private housing in the downtown area still exists and most of the new construction takes place in the new satellite cities around Shanghai proper.

2.27 There are no national statistics that enable a good estimate of the amount of residential housing exchanged, but the general opinion seems to be that there is very little intraurban residential housing mobility. The problem is not that the exchange of housing is prohibited or even badly organized. In fact, most cities have "housing exchange fairs" once or more a year where exchanges take place (see Box 1). In Yantai and Shanghai, between .5 and 1 percent of properties are exchanged every year. This suggests very little mobility, perhaps because workers are not mobile in their employment and perhaps because (relative to the central city area) there are few locations that offer an adequate range of public service amenities. In both Shanghai and Yantai, it was reported that there was a decided preference to live in the city center close to commerce and where the schools, transportation and other public services were better. In Yantai, some apartment complexes on the outskirts were only one-fifth full and in Shanghai a local saying goes "rather a bed downtown than a house in the suburbs." The low transfer percentage is also helped by the fact that rents are not graded according to location. It should be noted, however, that many enterprises decrease the cost of commuting by giving transport subsidies.

C. Compensation for Property

2.28 The law is much more clear in the case of compensation for farmland to be converted to urban use than it is in the case of compensation for urban land in the event of a transfer between users. The approach is more in the vein of paying the seller an estimated cost of replacing the land in its current use, than it is an attempt to establish market value. In some of the newer experiments, however, various forms of bidding have been introduced.\footnote{For example, in Shenzhen and Fuzhou.}

Farmland

2.29 The Land Administration Law of August 1986 specifies the principles of compensation for rural land to be converted to urban purposes. The Law provides regulations on the amounts of four components of compensation:
In recent years, housing exchange fairs have been sponsored in many cities by the housing bureau and other sanctioned organizations. Beijing holds two fairs per year and in some cities there is a permanent market. In the fair, people register and provide a description of their present house and that of the house they want (location, size, condition, rent, public facilities, etc.). Matches can be made between the interested parties, and the deal becomes effective with the approval from the administration office.

There are some special problems with this practice, mostly growing out of the ownership pattern for land and housing in China.

1. Housing exchange does not usually involve the ownership of the house, and does not carry the right to change the use of the property. One rule adopted is that the stock of housing ownership of an enterprise should not be reduced through exchange. This places another constraint on the trading process.

2. Exchanges often involve more than two parties in the exchange, e.g., A wants the house lived in by C, C wants the house lived in by B and B wants the house lived in by A. In practice, situations are often more complicated.

3. The house exchange may involve a side payment. When there exist differences between qualities or sizes of the houses, compensations are sometimes paid to the enterprises who suffer a loss in the exchange. The housing fair administration is involved in this process, and charges a service fee. Amongst private owners and collectives, extra compensation is permitted.

- Land acquisition
- Unharvested crops
- Relocation of labor
- Improvements

The central government specifies only the general items to be considered in determining compensation. The exact amounts are determined by each municipal government. This is because the amount and productivity of farmland varies from city to city.

The experience in Changzhou in 1987 gives a good example of the application of the regulations. The land acquisition price, unharvested and crop compensation and labor retraining cost all are based on the estimated average annual yield per mu, which was (in 1986) 400 yuan for vegetable land and 240 yuan for grain land. There is an additional premium for vegetable land. This differentially higher price is set because of the importance of replacing the acreage in this use, and perhaps because vegetable land tends to be closer in to the urban area. In Changzhou, the following formula applied to vegetable land:
a. Land acquisition fee (400Y x 5 years)  Y 2,000/mu
b. Labor training and reemployment  Y 4,000/mu
c. If per capita land is less than 0.2 mu  Y 1,200/mu
d. Compensation for unharvested crops  Y 180/mu
e. New vegetable development  Y10,000/mu
f. Irrigation facility fee  Y 400/mu
g. Land occupation tax  Y 6,000/mu

Total  Y23,780/mu
(Y 36/sq. meter)

For grain land, the formula was:

a. Land acquisition fee (240Y x 5 years)  Y 1,200/mu
b. Labor training and reemployment  Y 2,400/mu
c. If per capita land is less than 0.2 mu  Y 1,200/mu
d. Compensation for unharvested crops  Y 120/mu
e. Compensation for "price" difference of grain vs. oil and coal  Y 350/mu
f. Irrigation facility fee  Y 400/mu
g. Land occupation fee  Y 5,500/mu

Total  Y11,170/mu
(Y 17/sq. meter)

2.32 In addition, compensation must be paid for improvements, e.g., wells, irrigation channels, brigade roads, etc. The amounts are calculated as the total labor cost and capital investment embodied in the improvements. Over and above this, there is a compensation for buildings. The values are assessed (proposed) by the farmers' brigade but are verified and, if necessary, adjusted by the Agricultural Bureau.

2.33 In Changzhou, land acquisition is about 10 percent of total price in the case of grain land and vegetable land. These percents may vary because the base yield value of the crops may vary and because the local governments may alter the compensation formulae. By comparison, evidence from Yantai suggests that the distribution of this compensation is about 30 percent for land, 50 percent for relocation, and 10 percent each for unharvested crops and improvements. The clear implication is that the opportunity cost of land is not the key determinant of land prices. Local officials stated that the average (per mu) level of compensation around Yantai is about 10,000 yuan (15 yuan/sq. meter) for grain land, 20,000 yuan (30 yuan/sq. meter) for fruit land and 30,000 yuan (45 yuan/meter) for vegetable land. These are slightly higher than the amounts observed for Changzhou.

2.34 After the official compensation is determined by this formula, there may be a direct bargaining process between the builder and the owners (farmers). The contract finally signed will specify total compensation, installment payments and various nonprice compensations. There may also be unauthorized side payments to the farmers.

2.35 In the official document there is a vague statement about the builders' obligation to help reestablish the production level of the brigade. This compensation might take the form of the builder buying a truck, building
materials, diesel fuel, etc., at state prices for the brigade. At times the builder will contract some of the construction of the new facility to the brigade or even help establish a rural enterprise, or the farmers may be hired directly. When a local clock factory in Yantai expanded on agricultural land, it gave "technical assistance" to the previous owners to make a workshop that manufactures casings for the clocks. A supplier contract was signed with a special clause obligating the enterprise to buy a certain number of casings for a set number of years. It was stressed that the farmers' brigade is the owner of the land, and apparently has to be satisfied for the contract to clear. Whether the brigade has veto power is unclear. In any case, when the land is sold for urban use, it becomes State-owned property, even though the enterprise that receives the land use right may pay the compensation. Land rarely reverts back to collective ownership.

2.36 The compensation level for land around Yantai has been increasing, according to local officials. One extreme example was a piece of waterfront property which was claimed to have risen from 7.5 yuan/meter to 75 yuan per meter in a couple of years. According to some officials, high land prices inhibit movements of enterprises to the outskirts of the city.

Urban Land

2.37 Of course there are no such rules for the compensation of urban land because urban land is owned by the State. As noted above, if an enterprise gives up the use of a parcel of land, it receives compensation for neither the land nor the locational advantage. The position on this is that if there is a location rent attached to the land, the profit from its transfer to another user ought to accrue to the government and not to the enterprise. After all, most of the locational advantage is due to government investment in buses, roads, utilities, etc.

2.38 There is, however, some compensation paid to those who give up their land use rights in a particular location. Similar to the case of farmland, compensation is paid for buildings, usually on a basis of depreciated cost. Moreover, the current occupants of the land must also be compensated by the government with new floor space for a factory or a shop, and the current tenants must be given comparable housing.

2.39 Those who are assigned the user rights for prime urban land, then, benefit by not having to pay for location value. Depending on the compensation they must pay to the dispossessed, they may receive a subsidy equivalent to the capitalized value of the location rent. No wonder there is an excess demand for urban land. The seller of an urban user right fares less well. He is not compensated for what may be a very profitable location advantage and he may have to pay a substantial sum to purchase the user right to farmland on the urban fringe. That there is relatively little voluntary relocation away from urban areas is no great surprise.
CHAPTER III

LAND USE TAX: THE ISSUES AND THE PRACTICE

3.01 It seems clear that China will soon begin charging for land use. The Land Administration Law of 1986 makes provision for such a charge and the issue is under study at the Central and Local government levels. There is a debate over the structure of the charge, among Ministries who see their missions differently, but there also are some fundamental inconsistencies between the State's objectives for the tax and the first attempts at design.

3.02 There also are ideological issues. The consensus seems to be that there is no inconsistency between the basic socialist philosophy and taxing or charging for urban land, though there are different opinions on what is the theoretical basis for such a charge. One justification is the straightforward proposition that tenants should pay a rent for the use of land. The amount of rent, according to some proponents of this view, should reflect past government investments in the land. Others argue that enterprises already pay some (indirect) compensation for land in the form of profit taxes, profit remittances, and sales taxes. This makes for an unclear relationship between land owner (the State) and land user (the enterprise) that might be cleared up by a land use charge.

3.03 The government rhetoric is to use the land charge to raise revenue, to tax away location rents that may give one firm a competitive advantage over another, and to improve the efficiency of urban land use by forcing firms to pay for their space. But there are serious legal, economic, political and administrative constraints to achieving these objectives, and these issues have entered into the debate over how to structure the land tax. One argument is that enterprises cannot afford the land tax because their profits are too low. This leads to proposals to adopt a low, almost nominal tax rate; but this would be contradictory to the objectives of raising revenues and providing a tax penalty that would stimulate enterprises to make better use of land. There is also debate about how the revenues will be shared among levels of government, hence about whether the land tax will really be a significant new source of revenue for local governments. Even if these issues were to be resolved in the direction of creating a local government tax with a high enough rate to penalize suboptimal use of urban land, there is the issue of giving enterprises enough mobility to respond to the land use tax.

3.04 Other questions are only now being addressed, e.g., who will bear the burden of the tax, what will be its expected yield and revenue-income elasticity, and what is the capability of local governments to effectively administer the tax? The answers to these questions will be important in shaping the rate and base structure of the new land tax.

A. A Local Government Tax?

3.05 A question that could properly be raised is "why all the furor over a tax whose revenue yield is likely to be very small?" The answers are that,
depending on the rate, the revenue yield may not be small, and even if rates are low, this tax could set important precedents. The land use charge may be a way to directly raise the question of fiscal decentralization, i.e., how much taxing and spending discretion should be given to local governments? A truly local government land tax would require that local governments be given some autonomy in setting the tax rate and that they retain all of the revenues collected. It would fit the spirit of the Chinese economic reform to give more autonomy to local governments, in hopes that increased responsibility for public service financing would bring an improved efficiency of operations and an increased accountability on the part of local officials. Fiscal decentralization would be a step away from the fiscal uniformity that now characterizes the country and would give local governments the opportunity to shape part of their budget to match local preferences. It could also generate an increased rate of revenue mobilization—a greater willingness to pay—because local residents and enterprises could more closely identify the tax payment with the provision of local government services. This would be a welcome benefit because local governments are strapped for infrastructure finance.

3.06 Fiscal decentralization also has drawbacks, and these are consequential enough to cause some to propose that the land use tax be a completely centralized levy. One problem is that fiscal disparities could occur because more prosperous local governments could raise more revenue or charge lower land tax rates than could poorer communities. Moreover, the central government would be giving up control over a revenue source at a time when it is facing a revenue problem. Perhaps the biggest obstacle of all is the "shock effect," i.e., that this would be a dramatic departure from the present nationally uniform system where local governments have no freedom to set tax rates.

3.07 In fact, the traditional centralized option is one possibility under study by the Ministry of Finance. Under this version, the Ministry would set a single rate for each taxing zone in the more than 300 cities that would be eligible. This rate would be fixed for several years, hence would avoid conflicts over choosing a new rate and the administrative cost associated with revamping the rate structure every year. The more decentralized option under study is a compromise between the present centralized system and the more typically Western systems where local governments may both define tax bases and set rates. This would involve a central definition of the tax base, and even of the administrative regulations, but local government options in setting the tax rate. The Ministry of Finance is also considering a proposal along these lines. Under this approach the Ministry would set an upper and lower limit to the land use tax depending on city size. The city would then determine the exact tax rates as well as the boundaries of the different taxing zones within the urban area. This approach has the advantage of giving local government some power in setting its tax rate. Apparently, Ministry of Finance thinking on this issue has progressed. The following proposal for a range of average rates has been suggested:
<table>
<thead>
<tr>
<th>Size of City</th>
<th>Maximum and Minimum Rate (in yuan per square meter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extra Large</td>
<td>10 - 5</td>
</tr>
<tr>
<td>Large</td>
<td>8 - 4</td>
</tr>
<tr>
<td>Medium</td>
<td>6 - 3</td>
</tr>
<tr>
<td>Small</td>
<td>4 - 2</td>
</tr>
<tr>
<td>Towns</td>
<td>2 - 1</td>
</tr>
</tbody>
</table>

B. Earmarking

3.08 Related to the question of local autonomy in rate setting is the question of whether the tax should be earmarked for urban construction. The argument could be made that such an arrangement would be fair on a benefits received basis, i.e., higher location rents and therefore higher taxes can be attributed to properties that enjoy a higher level of public infrastructure services. Moreover, local government infrastructure finances are considered a major bottleneck to urban economic development and another revenue source would be welcome.

3.09 The opposing view is that earmarking restricts local autonomy, and the whole idea behind this program is to give local governments more control over fiscal resources. This would lead to the recommendation to collect the land use tax as a general levy and to permit local governments to allocate the revenues according to their own priorities.

C. Revenue Sharing and Deductibility

3.10 Another issue, and perhaps the most complicated to deal with, is whether the revenues from this tax should be shared among central, provincial and local governments or fully retained by the local government. As a land use charge, or simply a rent, the local government could retain all of the revenues. As a land use tax, the Central government would share in the proceeds.\(^{16/}\) One proposal under consideration by the Ministry of Finance is a 50 percent sharing rate. In fact, this is the sharing rate in Fushun, the only city authorized to levy a land use tax.

3.11 Should the land use tax be shared? A major problem with a shared tax is that it could dampen local government enthusiasm for assessment and collection. Does it make sense to give the municipal government authority to choose a higher tax rate, if it can only retain half of what is collected? The larger the share of higher level governments, the less the incentive for the local government to mobilize resources through the land tax and the less it approximates a benefit charge for local infrastructure. The problem is even more complicated. If the local government is not required to share the revenue proceeds, there must be some guarantee that the provincial government will not

\(^{16/}\) However, it is the sharing arrangement, and not the distinction between "charge" and "tax" that is important in this regard. The urban maintenance and construction tax is not shared.
reduce the local government tax sharing rate on the profit and sales taxes by a compensating amount.

3.12 Another dimension to the land use charge or tax is its status as regards deductibility from the enterprise profit tax. If the land use tax is treated as a deductible cost, then its revenues will be raised at the expense of some reduction in profit tax revenues. Certainly the net revenue gain from the land use tax will be less than the gross revenues raised, from the point of view of the local government. The difference between the total collections and the amount of net revenue increase will depend upon the sharing rates imposed on the land use tax and the profits tax.17/ From the point of view of the enterprise that earns profits, deductibility will significantly lower the burden of the land use tax.

3.13 One alternative to deductibility of the land use tax is simply to disallow it as a cost of doing business. This would deny the status of the tax as a price for land use and would therefore treat land and labor in a different way. This method would reduce retained profits by the amount of the tax, hence would tax profitable firms and increase the relative subsidy to those currently making losses. In the latter case, it would not be seen by the enterprise as a land price. Another possibility is to give a credit against profits tax liability for the land tax. This approach would also give an advantage to firms making losses, but it would give all profit making firms comparable relief from land taxation (under the present deduction system, firms in a higher tax rate bracket can offset a greater percentage of their costs); and the tax price on land could be set much higher without as much concern for the extent to which enterprises could bear the burden. The biggest drawbacks to the credit approach are the revenue loss implied and the fact that profitable enterprises are able to disregard the land tax by writing it off against profits.18/

D. The Tax Base

3.14 The base of the property tax in most countries is the assessed value of land or land and buildings, with assessment typically made on a basis of comparative sales data. Property values cannot serve as the tax base in China however, because there is no formal market where properties are bought and sold. It seems to have been generally agree that the base of the land use tax in China will be the area of the land assigned to each user. Technically, it will be a specific rather than an ad valorem tax.

3.15 Building space will not be subject to tax. This is good policy if the goal is to generate a more intensive use of land in prime urban areas. Those who hold excessive vacant land for storage or make poor use of their space will pay the same tax rate per unit of land as those who build multistory buildings, move their space-intensive activities to the suburbs or lease their excess land. The taxation of land and not building space, however, does raise a special set

17/ This issue is dealt with in some detail in Roy Bahl, Local government finance in Zhejiang Province (Washington, DC: The World Bank, 1987), mimeo.

18/ This problem could be lessened by allowing a partial credit for land tax paid.
of implementation considerations. For example, if a parcel of land is occupied
by more than one user, as in a multistory building, then the total taxable land
area will have to be prorated amongst the occupants. This may raise difficult
administrative problems and at a minimum will require detailed recordkeeping.
Another problem is how to treat land in "nonproductive" uses, e.g., enterprise
land used for a nursery school, a clinic, or simply open space.

3.16 What types of land use will be either given preferential treatment or
be made exempt from the tax? To the extent that some land uses are not taxed,
their location rents will be protected and there will be no tax incentive for
more effective use of the land. This is a difficult problem in all countries
and it will be a difficult problem in China. It is tempting to give nonprofit
organizations the benefit of exemption from land tax, but exemption does not
stimulate such organizations to make the best social choices as regards land use.
Many officials interviewed suggested that sentiment was in the direction of
reduced rates of tax for culture, education and health activities and for
housing, and exemption for government properties and for other nonprofit
activities. Of course, there is far from consensus about the particulars of
exemption policy.

3.17 Jinan has begun preparations for a land use tax. Based on some very
general guidelines, they are proceeding on the assumption that the base of the
tax will be land. In cases where a building has several floors and there is
multiple occupancy, a proration will be done and the entire bill will be sent
to ground floor tenants. The exemptions will be:

- Government and military.
- Social organizations and undertakings that generate no revenue, for example, schools and research institutes.
- Religious buildings and parks.
- Infrastructure and green space.
- Railroads, airlines (except the terminal), port warehouses.
- Agricultural land (which is subject to different taxes already).
- Mines and oil fields.
- Wasteland and reclaimed land (exempt for 5-10 years).

A special exemption issue arises in the case of general government buildings.
Should Provincial and Central government land use be subject to the land tax?
The arguments against exemption are good ones:

- if a price is not charged, the general government can hoard
and can assign itself prime location properties irrespective
of its needs and without consideration of the economic
consequence;
if the central or provincial government occupies prime urban land, profitable enterprise uses may be squeezed out with a corresponding revenue cost to the municipal government; and

central and provincial buildings benefit from municipal services in the same way as do enterprise buildings and they ought to contribute to the financing of these services.

Such arguments have led to legislation in many countries that requires higher level governments to pay "tax in lieu of property tax" to the municipal government. However, many countries—including the United States—completely exempt such property, usually on grounds that different levels of government cannot legally tax one another.

E. Tax Rates

3.18 A uniform rate tax on land area cannot capture location effects, i.e., the tax liability for a 100 square meter property in the suburbs and a 100 square meter property in the central business district would be exactly the same. The practice in the experimental cities and discussions in both MURCEP and the Ministry of Finance indicate that the government proposes to divide cities into taxing zones and to tax the "preferred" zones at a higher rate per square meter. Since the higher taxed zones are meant to be those where enterprises are more profitable, ceteris paribus, this approach roughly simulates taxing location values. But the differential tax treatment depends on both the boundaries of the tax zones and the tax rates chosen for each zone. Unfortunately, neither the zones, the tax rates, or the tax rate differentials between zones are likely to be set on a basis of estimated location value differences. More likely, they will reflect political concerns and ad hoc judgment. Officials in Jinan reported that they began with instructions for three zones, a prescribed average rate of 2.4 yuan per square meter, and a revenue target of 200 million yuan. They adjusted the rate differentials and moved the zone boundaries until they satisfied all three conditions.

3.19 If the tax is to somehow reflect the relative value of land in different urban locations, it is very important that the local government be able to set the rate structure. This is because rent gradients will be quite different from city to city. If the rates for each zone (or even the differentials) are centrally prescribed and nationally uniform, the land use tax structure will not approximate a charge for location rents. The pattern of true land values will differ widely from city to city, and the local government would control only the definition of the taxing zones.

3.20 Within a given zone, the proposed structure does not capture differential location rents since all occupants pay the same tax per square meter of land use. Nor does a strictly defined land area tax recognize other important differences, e.g., location on a major street or busline, or better water and heating services. The larger the taxing zones, the greater will be these horizontal inequities and the less successful will be the land use charge in truly capturing location rents. Even though this is a problem, it is not so different from that which occurs under common property tax practice in most countries. Assessments can be arbitrary and general neighborhood values are
often used to establish assessment values for all parcels of land within the neighborhood.

3.21 Chinese cities that are planning a land tax or are experimenting with one have reacted differently to this potential horizontal inequity within zones. Shanghai has not proposed an adjustment. Jinan has defined three zones in the same judgmental way as have other cities, but with the following modification. Zone 1 (prime location) enterprises are located on designated main streets within the primary zone. Any enterprise located in Zone 1, but not bordering on the main streets, was given a Zone 2 classification. The test was whether the street address was on the main street. This does improve the horizontal equity within a taxing zone, but it also introduces a new level of complexity in administration.

3.22 What should be the level of the tax rate? It isn't possible to declare an "optimum tax rate" for the land use tax. One view is that this is a land rent and ought to reflect the price of land. This is a hard position to support because the price of other inputs is partly controlled by the State. A market rent for land, even if it could be determined, would not necessarily be good policy because it could distort relative prices in a way inconsistent with government objectives.

3.23 More likely the rate will be "set" on a judgmental basis and constrained by "affordability," i.e., whether the enterprises will be able to carry anything but a very nominal rate of tax without seriously compromising financial condition. It is not at all clear that affordability is as much of a constraint on the land use tax rate as many officials make it out to be. The system reform gives increased autonomy to the enterprise sector and there has been a noticeable transfer of resources to that sector. An important part of this transfer is the phasing out of the adjustment tax, which could range up to 30 percent of gross profits.

3.24 To be sure there is great variation in profitability among enterprises, and some (public utility companies) are intentionally held to negative profits while consumer or producer prices are subsidized. Others may have a narrow profit margin simply because they are inefficient. But this would not seem a good reason for low rates of land tax for all firms. If enterprises that realize planned losses are to be subsidized, surely there is a better way to do it than by providing free land.

3.25 The evidence would seem to suggest that the great majority of firms do earn a profit. A survey of enterprises in Yantai and Jinan showed relatively few firms to have suffered losses during the 1984-86 period.

3.26 This leaves open the question of what rate per square meter of land to charge those firms that do make profits. The standard suggested by local researchers as affordable in Shanghai and Beijing was an amount equivalent to 2 or 3 percent of gross profits. This would imply a very low tax rate (about 3 to 4 yuan per square meter on average in Shanghai) and some of this could be
offset (via deductibility) by a reduced level of profits taxation. Herein lies the biggest problem to be faced in designing the tax. If the rate is set low to accommodate the affordability concern, then the revenue raising power of the tax will be limited, the tax incentive for more efficient land use will be limited, and the competitive advantages due to location rents will not be considerably narrowed.

3.27 There is yet another question on rate structure: should all types of enterprise within one zone pay the same rate? The issue is, again, affordability. Some firms are inappropriately in the "high rent" district and are very land intensive, e.g., a warehouse or a factory located in a commercial shopping area. The tax on such firms could be onerous, hence some propose lower rents for such activities. But this would defeat the allocative objectives of the land use tax in that the tax penalty would be lessened for exactly those firms who may be the most inefficient users of land. The classification of the land use charge within a zone, according to type of enterprise, would also compromise revenue raising objectives, heighten administrative costs and introduce horizontal inequities. For example, two occupants of the same building, using the same amount of floor space, could pay different amounts of tax.

3.28 Nevertheless, some cities are considering differential rates by industry class. The Shanghai study considered five different rates in each zone to account for different industrial land uses. Jinan officials also lean toward a classified rate within each zone, "...highest for shops, next highest for industries and lowest for housing."

F. Revenue Potential and Buoyancy

3.29 One important goal mentioned for the land use tax is to raise revenue for the general government sector. The tax structure under most proposals and experiments, however, will not result in large amounts of revenue. The rates are simply too low. For example, the target amount in Shanghai is equivalent to less than 1 percent of total taxes collected.

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19/ By comparison with the value of land, these tax rates seem very low. For example, in a recent auction, the 50 year lease rights to a suburban plot were purchased by the Japanese for 8070 yuan per square meter.

20/ It would seem inconsistent with the trend of current Chinese tax policy to adopt such a classification scheme. Previously, the sales tax rate structure was complicated to change relative commodity prices but now the strategy is to move toward uniformity in sales tax rates and to let market forces determine the relative prices for most commodities. Similarly, the adjustment tax, which was a measure designed to tax away the excess profits of firms with a competitive advantage, is being phased out and there is discussion of unifying the five profits taxes into a simpler system. A classified land use tax, designed to soften the burden on firms with lower profits rates, would seem to be out of step with the current reform of the tax system.
Revenue buoyancy, the natural growth in land use tax—is also a problem. One would want the revenues from the land tax to increase naturally with the growth in the local economy—which implies the growth of land value. But since the tax will be levied on a basis of square meters of land area, it cannot show any revenue response to an increase in local industrial output or gross sales. Tax revenue can only rise if the tax rates per square meter are increased by discretionary government action, or if the zone boundaries are changed. The latter implies administrative costs, increased complexity in the system, and the introduction of even more subjective judgment in the determination of tax liability. Possibly the solution to the buoyancy problem is to index the tax rate to gross local output.

G. Incidence and Economic Effects

The question of who will finally pay the land use charge or tax is a difficult one to answer. The nominal payment will be made by enterprises; but, of course, the burden must somehow be borne by individuals, in the form of higher product prices or lower wages and benefits. The final incidence will depend on the kinds of adjustments made by enterprise in response to the tax. Enterprises in China are constrained in the kinds of price and output adjustments they can make, but a number of possibilities are open.

- Commercial and small industrial enterprises may by able to adjust product prices to compensate for a small increase in land prices. This might be done inside the range of their local price guidelines. For some fixed price goods, the government might authorize an increase as it has in response to increased factor costs in the past. To the extent prices increase, the tax will fall on consumers. Those firms facing the highest rates will also bear some loss in profits, hence worker benefits will probably fall.

- Profit taxes will fall because the land use charge is deductible. This will reduce Central and Provincial government revenues and hence government service levels. This burden will be borne (Province-wide and nationally) by those who would have from the services.

- The enterprise may reduce its tax by substituting labor or capital for land, or by moving to a zone where the tax rate is lower. The former can happen if the enterprise leases its excess land or brings it into production. The latter can happen if the enterprise moves the more space intensive part of its operations to a workshop in a lower tax zone.

- If none of these adjustments are possible, the enterprise will realize lower profits, i.e., the land use tax will act like a lump sum profits tax. What tax burden is implied here? Lower retained profits would be reflected in: (i) less reinvestment in technical reform, which could be reflected in lower future earning and benefits of workers in the enterprise or higher future product prices for all consumers; (ii) lower employee benefits in areas such as schools or clinics, and (iii) lower
wage bonus. If the enterprise is already in a loss position, the tax will lead to an increased subsidy from the municipal government and, ceteris paribus, a reduction in other services available.

The upshot of this discussion is that the land use tax will be paid by some combination of enterprise labor and consumers. There are a few avenues open to enterprises to avoid the tax through price and production adjustments, and to the extent these adjustments take place, the entire urban economy will operate at a higher level of efficiency.

3.32 One way to look at the land use charge is as another step in the economic reform. It makes a needed correction in the amount of resource transfer from general government to enterprises. The increased operational autonomy and the switch from a remittance to a profits tax system has led to a shift in resources toward the enterprise sector. The land tax moves things back a step. The winners will be those who benefit most from the increased levels of government services which the land tax revenues will buy. The losers will be the consumers of enterprise products and those enterprise workers who benefited most from the distribution of retained earnings to wage bonus and to employee benefits.

H. Administration

3.33 Property taxes in all countries pose great administrative difficulties, mostly because of the inherent arbitrariness in the tax. The tax is not levied on an actual exchange but on a notional value, hence assessments are somewhat arbitrary, e.g., the assessor must use evidence from properties that did sell to answer the question "what would be the value of any particular property if it did sell?" The Chinese system will also be arbitrary in choosing zone boundaries, a basic tax rate, and tax rate differentials between zones.

3.34 The difficulty of distinguishing the market value of one property from another is only one of the administrative problems to overcome in property taxation. Actually, there are four important facets of property tax administration: identification of properties and persons to be taxed, recordkeeping, valuation or determination of the base to be taxed, and collection. All of these administrative steps must be implemented if the tax is to be successful.

Identification

3.35 A first requisite is that every liable property and its occupant be identified. For the land use tax in China this implies the need for an up-to-date tax map for every city, showing: (i) the exact location and land area for every parcel of land; (ii) the occupant(s) assigned to each parcel; and (iii) the building area, productive and nonproductive, attributable to each occupant.21/ The more complicated the design of the tax, the more the information that will be necessary. For example, if the rate structure is

21/ This information is necessary to prorate the land charge among multiple occupants of the same parcel of land.
classified by type of enterprise, then it will be necessary to categorize each enterprise on the records. Shanghai's proposal for 35 rate classes—five rates in each of seven zones—poses a particularly difficult administrative problem. The Provincial "regulations," as read by Jinan City also called for special rates: land acquired and not used for two years would pay double the tax rate; and that land over the "quota" use would pay three to five times the normal tax rate. Though each special feature has some merit, each imposes an additional administrative burden.

3.36 Do up-to-date land use records presently exist in China? Because land is a state asset and has not been priced in China for so long, there is only incomplete documentation. Few cities have land maps that show the total number of plots, area and structures for each parcel, and the name of the assigned user. Some cities have begun to work on such documentation. For example, Jinan is drawing and documenting land maps, and Guangzhou is preparing for a land survey and registration. But these are only a start and they cannot meet the requirements for the imposition of a land use tax. For example, in Fushun, in order to impose the land use charge, the first step was re-registering each piece of land, measuring the physical characteristics of the land, and making clear the user assignment. Shanghai and Beijing also report incomplete and outdated records of land assignment and land use.

Recordkeeping

3.37 Chinese cities are growing rapidly and it is not clear that there is a system for keeping up with changes in land use, occupants, and new construction. Once developed, such systems will almost certainly have to be computerized and will require coordination among the industrial and commercial bureaus, the land acquisition office, and the construction, urban planning and tax bureaus. Perhaps more than any other levy, the land use tax will require cooperation among the municipal bureaus.

Valuation

3.38 The Chinese system of land use taxation does not require valuation of every parcel of land, hence an elaborate assessment procedure is not required. The basic land and occupancy records are all that is required to assess the tax. However, there is a problem of adjusting the relative tax rates and the zone boundaries to increase revenues and to account for the changing pattern of location values in the city. Suppose, for example, that the city significantly improves certain roads or builds a new railhead or that bus routes are extended into previously hard-to-access areas. It is easy to imagine situations where this leads to cost reductions, competitive advantages, and increases in profits. In such cases, would not an adjustment in zone boundaries, an increase in the number of zones, or a further differentiation in rates be in order?

3.39 Consider the implications of not making periodic adjustments in the rate structure. Location rents will change with new public investment, the changing location of housing, and general changes in urban economic structure. If the land use charge structure is left intact, it will increasingly charge enterprises the wrong relative rent and not encourage the efficient use of land.
3.40 To make the necessary periodic adjustments in the zones (and rates) the government will have to put an evaluation procedure in place to keep track of such changes. Even if zone boundaries are initially drawn in a "judgmental" way, some objective indicators (a kind of model) will have to be laid down to guide future changes. Moreover, the urban planning bureau will have to initiate a data collection program that monitors the relevant changes in the urban economy. There will be a great temptation to ignore this step, keep the boundaries in place and simply adjust all the rates upward on a periodic basis. This will be administratively less burdensome, and can protect revenue yield, but it will sacrifice the allocative goals of the tax.

Collection

3.41 The final step in property tax administration is collection. There are a number of issues here. One is a possible disagreement over which local agency should be responsible for collecting the tax. One obvious choice is the tax bureau. The collection procedures for sales and profits taxes are already in place, and enterprises come monthly or quarterly to the bureau to make payment. Why not simply add on the land use tax?

3.42 Those who see the land use charge more as a rent, whose proceeds are earmarked for urban construction, see things differently. Implicit in the argument, most articulately made by MURCEP, is that the bureau collecting the tax will somehow control the expenditures made from the proceeds. Under this view of the land use charge, it would be administered by the Land Administration Bureau and supported by the Urban Construction Bureau. The Land Administration Bureau would have the advantage of combining the administration and collection functions. However, the Urban Construction Bureau could also be a choice because it would be the user of the fees.

3.43 A third view would levy both a fee and a tax. There are two different proposals for administration. Under the first, the Land Administration would collect the fee from users and, in return, would be taxed by the state (just like the Housing Bureau presently collects rents and pays the housing tax). Under the second, Land Administration would collect the fee and the Tax Bureau would collect the tax.

3.44 Obviously the choice among these alternatives will be made partly on political grounds. Purely in terms of administrative cost and efficiency, however, the best choice would be to have the tax bureau responsible for collection and the Land Administration Department responsible for recordkeeping and perhaps even assessment. There is no apparent reason why the spending unit, e.g., the urban construction bureau, should be involved in collection.

3.45 There are other collection problems. All countries have difficulties collecting taxes from smaller firms, and China will be no exception in this case. The great majority of enterprises in Chinese cities are smaller collectives and individually owned businesses. Some do not even have a permanent place of business. How will the land tax be assessed and collected in these cases? One possibility is to ignore the smallest firms and not collect the tax. This would save on administrative cost but would give these enterprises a comparative advantage over formal sector firms. An alternative is to charge a flat annual amount to each of these enterprises, but this leaves open the question of how
the tax would be collected. To go physically to each enterprise is a costly administrative proposition that could not likely be justified on a basis of the revenues collected. One possibility would be to collect a flat charge as part of an annual operating license.

H. A Tax or A Fee?

3.46 There are two ways to charge for urban land, i.e., the land use fee (LUF) and land use tax (LUT). Since the form of charge (fee or tax) is directly related to the distribution of the revenue from land, it is a subject over which there is no small debate.

3.47 One view maintains that the intention of the government is to impose a land tax as a part of the system reform. The former Council of State Administration published a document as early as 1951 proposing to impose a property tax. More recently, the proposal for a land use tax is spelled out in the MOF document The Second State of Converting Profits Remittances by SOEs to a Tax System. The land use tax has not been imposed to now only because the details of the tax structure and implementation have not yet been worked out.

3.48 Some of the important differences between tax and fee may be summarized as follows:

- The collection agents are different under a fee versus a tax. While land rent represents the economic relationship between land owners and land users, the collector of land rent is the land owner and the payer of land rent is the land user. A land tax represents a legal relationship between the government (collector) and legal entities (payees).

- The subjects of tax are different. The land rent has to do with the income of land, the profit due to the land factor. The land tax should be based on the amount of land.

- The relationships are different. Rent is an economic relationship. The user pays rent to the owner for using land. Tax is the relationship between the citizens' rights and the obligations. To collect a tax is the privilege of government, and to pay tax is an obligation of taxpayers.

- The legal status is different. The land rent bears the nature of monopoly, but it is not compulsory. The land owner must monopolize the land to charge rent, but he cannot legally force people to rent his land. Taxation is compulsory.

- Land rent is derived from the realized value of production. It is a part of the total profits. The land tax is only a part of the land rent.

3.49 To argue that the State, as the owner of urban land, should levy a land use charge, is not to exclude the possibility that the State may also levy a tax on the urban land user. The third point of view is that the land administration agencies, which represent the State, could levy a land use charge, then, as a
taxpayer, it could pay a portion of the land use charge to the State in the form of a land tax. This possibility is discussed above.

3.50 The debate on "fee" or "tax" is not merely a reflection of different understandings of concepts. A related and very important issue is the redistribution of economic profit among the financial and tax departments, land administration department, and other departments, and between levels of government.

3.51 Interestingly, both the tax and the fee have been endorsed at one time or another. The idea of establishing the land use fee or charge was proposed in National Urban Planning Conference sponsored by the former National Construction Commission in October 1980. The State Council endorsed the proposal of the conference on December 9, 1980. The method of the charge was proposed as follows: "In the urban area, land use charge should be annually charged to enterprises and individuals according to the amount of land they occupy." The charge should be different in different zones, and for different users.

3.52 The idea of establishing the land use tax was proposed by the Ministry of Finance in its report of September 18, 1984 to the State Council. This report proposed a land tax of 0.3-1.2 yuan per square meter in large cities. The report proposed three other local taxes on State-owned enterprises, including urban maintenance and construction tax, real estate tax, land use tax and vehicle license tax. Because these four local taxes involved such a broad range of issues, further study on how to determine the tax rates was required. The State Council decided to defer the introduction of the land tax until such study was completed.

I. Land Management Issues

3.53 Urban land management has been neglected in China for many years. First, there is a waste of urban land because of the free land assignment policy and an incomplete accounting system. The land census in Guangzhou in 1982 revealed that, of 137 Km² urban land, only 27 Km² was used for physical construction (19.7 percent of the total land) and 26.68 Km² was vacant (19 percent). Second, there is illegal occupation of land and illegal buildings. Outlaw construction is a serious problem in many cities. Third, illegal land trades and land leases happen frequently. These illegal activities involve State-owned enterprises, collective enterprises and individuals (see Box 2). Some brokers for illegal land trade have also been uncovered. Fourth, when the urban or suburban land was taken over for construction, the production brigade or residents who occupied the land asked an exorbitant price for relocation.

3.54 Many believe that China has suffered great economic losses due to the current land administration system. There are several root causes of these problems, beginning with the fact that the cadastral data and information are incomplete. This makes it next to impossible to monitor urban construction and planning. There is no law or regulation for land administration and, as a consequence, some enterprises and individuals make profits by illegally trading the State-owned land.

3.55 Three proposals for reforming the urban land administration are under consideration:
Proposal 1: Allocate land with a system of charges. This suggests that the land will still be allocated by the State, but it will no longer be free. The State will charge the enterprises a land use fee or tax according to the land area, location and use of the land. If an enterprise requires land, it goes to the State to request for a lease; on the other hand, if an enterprise has land that is not in use, it can return it to the State so it will not be charged for the lease fee.

Proposal 2: Create a State-sanctioned land transfer system. It is proposed that the State leases land to enterprises and that the enterprises pay land rent to the State. The enterprises have the right to use the land but are not allowed to lease it to a third party. In order to accommodate land transfer in the system, the State should set up the land administration and land corporations to manage the land business.

Proposal 3: Auction the land use rights. Under this proposal, the State sells the land use rights to enterprises, "with terms." Before the terms are due, enterprises are allowed to sell the land use rights to other enterprises, under the regulation of the land administration.

The advantages of the first proposal include the retention of State control over urban land. The principles underlying the second and third proposals are the same: to commercialize land use. At present, in many cities and regions and in China, there exist illegal land trade and land lease activity. In some cases, the go-between has earned large amounts of illegal profit. If the second and third proposals are realized, some of these land trade activities will become legal. This would change some of the properties of the socialist system, and requires further study.

3.56}

**BOX 2**

**ILLEGAL LAND USES**

The so-called "illegal land uses" are the land uses which violate the laws and the regulations, i.e., "The Law of Land Administration of the People's Republic of China," "The Regulation of Urban Planning," "The Regulations of Taking-Over Land for Public Construction," "The Law of Environmental Protection of The People's Republic of China." According to these laws and regulations, any private individual or organization must apply and get approval from the government for increasing land use or changing the purpose of land use. Failure to do so is illegal land use. For example, a factory-built workshop or residential house on a piece of uncultivated land outside the factory, without approval, is illegal land use. If a house is built in violation of urban planning regulations, it is illegal construction.

There are many cases and forms of illegal land trade. For example, an enterprise has extra land but lacks funds for building employee housing; another enterprise has funds but lacks land. A fairly common practice is to build houses by using the land of the first enterprise and the funds of the second. As a result, the first enterprise received a share of 40 to 60 percent of the housing. Since the land is state-owned, the exchange is illegal.
CHAPTER IV
STUDIES AND EXPERIMENTS

4.01 Many of the issues outlined above concern central and local planners and there is general recognition of the difficulty of implementing a land use charge. In fact, over 90 cities in China are using some sort of land tax or charge, though only Fushun is legally authorized by the Ministry of Finance to impose this levy. In most cases the charge has simply been implemented on an experimental basis, with little advance planning. In Shanghai and Beijing, by contrast, there have been fairly thorough feasibility studies that shed some important new light on the issues raised above.

A. Shanghai

4.02 The city government carried out an extensive empirical analysis of the possible impact of a land use tax. The goal was to offer the best possible design for the tax. The research project began by identifying differential location rent zones within the urban area. Their first thought was to determine rent zones by density, i.e., they made the assumption that most highly valued property would be in the most densely populated areas. When this did not work, the research team turned to a more impressionistic approach, where they identified what they thought to be the highest valued streets. This is what was finally used to identify the central zones. The other zones were also determined in a judgmental way.

4.03 The second issue was to measure location rents. This was done by studying the profitability of commercial enterprises located in the three inner zones. The research involved a questionnaire study of 1300 commercial enterprises, which generated data on land use and enough financial data to calculate annual profitability rates. After cleaning the data for profit rates that appear "too low" or "too high," they ended up with a sample of 1161 enterprises.

4.04 The average commercial gross profits in the central zone were 3100 yuan per square meter. The variation in this rate across zones matched the expectations of government officials and so there was some confidence in the zone boundaries selected. Still, there are two problems with this approach. First, the researchers were concerned that the average annual profit measurement derived was not the ideal measure of location value because they had not controlled for other factors. The second problem is the exclusion of industrial enterprises and housing from the sample. It was argued that there is too little choice in housing to reflect value, and that enterprise profits do not reflect location value. They tested the latter hypothesis with a sample of about 400 industrial enterprises and found that the profit rates did not vary across zones. The Shanghai researchers conclude that this is because location is not an important determinant of industrial profits, and reject the possibility that the profit zones for commercial and industrial firms are not the same.

4.05 The next issue was to set a tax or charge rate for each profit zone. This raises the affordability question. The research team initially thought that an average tax of 150 Yuan/square meter or 4.8 percent of gross profits would

22/ Data were gathered from the Tax Bureau, the Land Administration Office, and from direct interviews with the enterprises.
be a maximum. This was later revised downward to a maximum of 3 percent. It was concluded that 90 percent of the enterprises surveyed would be "able" to pay this amount. It was not clear how ability to pay was defined.

4.06 Even a low rate, equivalent to only 3 percent of gross profits, creates some problems. On the one hand, an estimated 10 percent of enterprises could not afford the tax and would have to apply for exemption. On the other hand, the rate may be too low to stimulate desired land use changes among the profitable enterprises. For example, other measures would be needed to deal with the movement of "pollution" firms—the tax 'penalty' would not do it alone.

4.07 The proposed rate structure was classified—five different rates of tax in each of the seven zones. The justification for this is that different industrial sectors have different abilities to pay. The researchers started with the proposition that commercial profitability is greater than industrial profitability, and verified this with an industrial sample: For the entire city, industrial profits averaged 431 Yuan per square meter and commercial profits averaged 636 Yuan per square meter. In the end, the proposed system had 35 rates.

4.08 It was estimated that the land use tax in this form would yield between 200 and 300 million yuan per year, by comparison with total tax collections of about 15 billion yuan and total municipal government expenditures of about 5 billion yuan. It would appear that the land use tax will be a very minor source of revenue in Shanghai. To gain some perspective on this, Shanghai's expenditure on urban construction and maintenance was about 2.5 billion yuan, or ten times the proposed level of the land use charge. The revenue contribution of the land use tax may be even less impressive than is indicated by the above. It may be a shared tax and if treated like other shared taxes, Shanghai would receive only about one-fourth of collections.23/ Another issue is that 300 million yuan of land use tax payments would reduce taxable enterprise profits by the same amount and therefore would reduce profit tax revenues.

B. Beijing

4.09 A similar study was carried out in Beijing. This group of researchers benefited from the Shanghai methodology and the approach is much the same. Some parts of the Beijing study were carried out in a more scientific way, but it is not clear how/whether the conclusions and recommendations were influenced by the results obtained. As in the Shanghai study, a great deal of expert judgment was involved in the analysis.

4.10 The first step in the study was to divide the city into zones. Ultimately this was done by judgment, but it was based on examination of factors.

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23/ Shanghai is now a special case in the national revenue sharing system. Previously, it had rained about one-fourth of all shared tax revenues collected. Under a new arrangement, Shanghai may keep all of the excess above a target amount negotiated with the Central Government. This means that the sharing arrangement will not erode Shanghai's claim on land use tax revenues, and indeed there would be an incentive for the municipal government to make a concentrated effort to improve collections.
such as the quality of the infrastructure, historical development of the city, the type of economic activity in each area, density of commercial establishments, roads and traffic, etc. The final classification of an enterprise was not due only to the zone of location as in Shanghai, but also to the location within a zone, e.g., if an enterprise is on the street, it is one grade higher than one that is off the street.

4.11 The general approach was the same as in Shanghai, i.e., to assume that location rents will be reflected in the profits of commercial enterprises. The basic data are drawn from the annual financial statements of 4000 enterprises of both commercial and service types, as well as data on land and building area. The sample was not random because there exists no master population list of enterprises. Still, local officials guess that they have included about 10 percent of all commercial establishments in the sample.

4.12 The results showed that commercial profit rates declined across zones in the expected way. These profit rates were taken as the measure of location rents, but this still leaves the criticism that the analysis did not control for other factors that might affect profits. The Beijing analysis explored this criticism with a regression analysis where the dependent variable included measures of capital (both fixed and working capital), land and labor (measured by the mid-year employees) as control variables, and a set of location dummy variables. The capital, land and labor variables were all significant and about 70 percent of the variance was explained among the 2960 firms (with usable data) that ended up in the sample. The estimated location rents varied from 261 yuan per square meter in the center to 71 yuan per square meter in the farthest zone.

4.13 On the question of rate level, the Beijing study proposes two alternatives: The first approach is to tax one-fourth of the estimated location rent value. This would amount to about 3 percent of gross profits and would yield about 600 million yuan in gross revenues. The second approach is to tax one-tenth of the estimated location rent which amounts to 1 percent of profits and about 240 million in revenues. They realize these are low rates and relatively small amounts of revenue, but still argue for the tax on grounds of it being a "foot in the door."

C. The Experience in Other Cities

4.14 Many cities have begun to estimate a profit gradient and to set up a schedule for the urban land use charge, but only Fushun City in Liaoning Province has been formally authorized by the State Council to levy the charge (see below).

Land Use Charge Rates:

- **Fushun City**: The land use fee is charged according to zone, between 0.3 and 0.5 yuan per square meter per year. For joint ventures, the charge is 10 yuan per square meter per year for newly acquired rural land, and 15 yuan per square meter per year for existing urban land.

- **Wuhan City**: In 1985, the land use charge was between 0.01 and 0.12 yuan per square meter per month, and 0.07 yuan per square meter per month on average. In this case, a private house owner
with 40 square meters of land area would pay land use charge of 2.8 yuan per month. If two house owners share a two-floor building with 40 square meters of land use, each of them only needs to pay 1.40 yuan per month.

- Guangzhou: Land use charges have been imposed on new enterprises, joint ventures, and in the economic and technical development zone since July 1986. The land is divided into seven different grades, the charge is from 0.50 yuan per square meter per year to 4 yuan per square meter per year.

- Shanghai: There are three different proposals for nine different zones: 1.2-25 yuan per square meter per year; 0.5-9 yuan per square meter per year; and 0.2-3.6 yuan per square meter per year.

- Xi'an City proposed a land use charge of 0.1 yuan per square meter per month, Changchun 0.07 yuan per square meter per month, Guangzhou 0.09 yuan per square meter per month.

- In Shenzhen, the standards for joint venture enterprises are industrial land use 6-30 yuan per square meter per year, commercial use 40-300 yuan per square meter per year, commercial housing 18-60 yuan per square meter per year, tourist facilities 35-100 yuan per square meter per year. The land use charge for the joint venture enterprise of Tianjin City and a U.S. company is 10 yuan per square meter per year. For some enterprises the charge is only 5 yuan per square meter per year. The land use charge is reported to be only 50 percent of that in Hong Kong for a similar plot.

4.15 The method of determination of the tax zones has also varied from city to city. The evidence is clear enough that there is a rent gradient in Chinese cities. Consider the case of Tianjin. Before the 1949 revolution, land prices in the downtown area were 40 times higher than those in the fringe areas. In the early 1950s, urban land was divided into 29 grades, the land price for the lowest rate was 190 yuan per mu (Y 0.28 per sq. meter) and the highest was 61,440 yuan per mu (Y 92 per sq. meter). The economic profit of central commercial area in Tianjin is much higher than the fringe areas. In the commercial center there are 149 commercial enterprises in a 5.7 hectare area. The gross sales are 4.4 billion yuan, or about 40 percent of the gross sales in the whole city.

4.16 One of the streets in the commercial center of Beijing is only 1 km long. The turnover was equivalent to 9 percent of that in the whole city in 1983, the annual turnover is 26000 yuan per square meter and the annual profit was 2400 yuan per square meter. This should be compared to the suburbs, where the highest annual income per square meter vegetable land is only 1-2 yuan.

4.17 From a survey of 1161 commercial enterprises, which is 20 percent of total enterprise in Shanghai, the average annual profit per square meter is 3033 yuan for grade A+, 2273 yuan for grade A, 1727 yuan for grade B, 1021 yuan for grade C, 723 yuan for grade D, 553 yuan for grade E, 356 yuan for grade F. The profit of grade A+ in the built-up area is 8.5 times that in grade F. The
effects of location on industrial enterprise are smaller. For example, the number 13 textile factory, which is in the downtown area, occupied 26,000 square meters of land and earned profits of 216 yuan per square meter; while the number 17 textile factory, which is located in the fringe areas and occupied 118,000 square meters of land and earned profits of 287 yuan per square meter--33 percent higher than the former.

D. **The Fushun Experiment²⁴**

4.18 In order to improve urban land administration, to use urban land more efficiently, and to increase revenues for urban construction, the municipal government of Fushun City has imposed an urban land use charge since January 1984. Advocates argue that the implementation of land use charge has been successful; that there is now less waste of land resources and less illegal occupation of land; some of the imbalance of demand/supply of land has been redressed; and additional revenues have been collected for urban construction. The method, experience and problem in the process of implementing the urban land use charge in Fushun City are reported below:

E. **Economic and Land Use Profile**

4.19 Fushun City is located in a mountainous area in the east of Liaoning Province. The municipal administrative region includes one city proper and three counties--Fushun City, Fushun County, Qin Yuan County and Xin Bin County--with total land area of 10,816 km² and a total population of 2.1 million in 1985. Fushun city proper is divided into 4 districts: Xinfu, Lutian, Wanghua and Suburban with total area of 199 km² and a total population of 1.2 million in 1986. Since the 1949 revolution the city population has quadrupled and the economy has diversified from an industrial-coal based economy to include energy, power, raw material, and heavy industrial production. Industrial production has increased one hundredfold since 1949. Agricultural production has tripled since 1949.

4.20 The urban land use area has also increased, with the development of industry and agricultural production and urban construction. The built-up area increased from 69 km² in 1949 to 98 km² in 1986, and per capita land use increased from about 69.5 to 98.42 square meters per person. Both land use figures increased less than two-folds. This implies that the growth of production and population is much faster than the increase of urban land.

4.21 The structure of urban land use has also changed, as described in Table 4-1. The land used for industry, transportation and warehousing increased from 23 percent of total urban land use in 1949, to about 38 percent in 1986. Land used for housing grew from 14.5 percent of the total in 1949 to over 20 percent in 1986. Therefore, the urban land use for industry and housing has increased significantly. The land use for other purposes has decreased.

4.22 The population density in Fushun is lower than in other large cities. The land per capita is 85 square meter in Fushun, compared to 25 in Shanghai and 35 in Chongqing. Although the per capita amount of land in Fushun is above the

²⁴/ This case study was prepared by the Chinese Academy of Social Sciences.
average of large cities in China (see Table 4-2), it is much lower than the levels of the large cities in other countries. For example, the land per capita for major cities is about 100 square meters for the United Kingdom, 90 square meters for Japan, 150 square meters for the United States and 200 square meters for the United States and Soviet Union.

**Problems in Urban Land Use**

4.23 There is an excess demand for land in Fushun. From 1949 to 1985, the urban population has increased by 3.3 times and industry and agricultural production has increased by 94.6 times, but the supply of land for urban uses has increased by only 40 percent. This situation has lead to over-crowded residential buildings and poor living conditions. To complicate matters, one-fifth of the city is located above a "sinking area", where underground mining operations are currently carried out; enterprise and residential housing in these areas need to be evacuated for safety reasons. There is also a need to evacuate polluting factories to the suburbs, but this plan has not been implemented because of the lack of funds to acquire land.

4.24 The distribution of urban land use in Fushun is not thought to be reasonable. For a long time, there was a government slogan that goes "the production first and improved living conditions second." As a result of such policies, land used for direct production is probably over-allocated at about one-third of the total. Since industry takes so much land, that available for residential purposes (including residential housing, public construction, green
space, road and playground) is limited. As a norm for reasonable land use structure (as prescribed in China), the residential land use should be around 50 percent of total urban land use. This figure is only 37 percent in Fushun. The land use for residential housing is also out of proportion. According to the State standards, residential housing land should be around 40 percent of total residential land use, but it is 67 percent in Fushun, this implies little community park space will be left. The land use for green space should be 15 percent according to the state standard, but in Fushun it is only 9 percent. In summary, industrial production land use crowds out the residential land use, and residential land use suppresses other nonproduction land uses.

4.25 Although there is an excess demand for land, there is a serious waste of land resources in the city. It is common for enterprises to acquire land much earlier and in greater quantities than is needed. For example, No. 7 Petroleum Plant occupies 230,000 m² land more than it actually needs. Another small factory with 200 workers occupied over 40,000 m² of land, a large portion of which is still idle. The situation of land waste has not been checked for the past 30 years. Between 1963-1965, 10,332 mu (688 ha) land was declared idle and was returned to the City for reallocation. In 1984 over 50 ha was declared idle, some parcels had been vacant for 10 years.

The Method of Imposing Land Use Charge

4.26 Since January 1984, with the approval of the state, a land use charge has been implemented in Fushun. The following is a description of the Fushun practice.

4.27 Identification of Taxpayers. A survey of urban land was taken under the direct leadership of the Fushun municipal government. The survey was carried out by a brigade of 120 professionals. The methodology was to combine the professional survey with the self-examination of land use by enterprises. The existing cadastral information was used, and the land was measured where cadastral data did not exist. After an one-year effort, the composition of urban land use was determined, and the city's cadastre was completely updated. It was reported that there were 586 enterprises (including the ones in the suburban counties), occupying 10,219 ha of land; and 39,084 households (built-up areas only), occupying 190 ha. These data became the basis of implementation of the land use charge.

4.28 Illegal land use and construction was investigated and 1,364 ha of land were found to be idle or under-utilized. Some of the land was returned to the municipal government. About 9000 illegal constructions were removed and 6900 illegally built fences and walls were pulled down. Most of the illegal construction was voluntarily removed by enterprises and individuals.

4.29 In order to implement the urban land use charge, the municipal government established a land use charge unit and trained 35 professionals. Three percent of the revenues from the land use charge was used for providing the expenses for the unit.

4.30 Liability for the Charge. According to the Ministry of Finance, the land use charge should be imposed on enterprises without adding "too much" financial burden on enterprises. The municipal government published "the
promulgation of imposing land use charge in Fushun City" in 1984. According to
the promulgation, the ultimate power of urban land administration belongs to the
municipal government. The department of urban planning is entrusted by the
municipal government to administer urban land and to implement the urban land
use charge. The income from the land use fee goes to municipal government
revenue and is earmarked for urban maintenance and construction. The land use
charge can be exempted in three cases:

1. Nonprofit and social organizations, such as colleges and
   schools, hospitals, and nursery schools; social welfare
   activities; urban public utilities; government, and the
   military. The cinema, however, is subject to land use charge
   (because it has profit from business).

2. Production brigades who use unbuilt urban land for farming,
   forestry, fishing production and who has paid agriculture taxes
   to government according to the law.

3. Railway stations, bus stations (excluding warehouse) and open
   mines. (In this case both of the interest groups were
   apparently backed up by the Central Ministries.)

Except for the above cases, all enterprises and individuals who use urban land
for industrial production, construction, business, and services are subject to
land use charge.

4.31 The land use charge is imposed on:

- All public owned enterprises that use government urban land
  for production and business.

- Nonprofit organizations engaged in production and business and
  using urban land.

- Collective enterprises (including the collective service
  companies, self-managed companies and factories who belong to
  public owned enterprises) that use urban (government owned)
  land for industrial production and business.

- Land used temporarily for construction and storage. Urban
  residents who use government land for private housing or
  construction.

- Production brigades who use state owned land for nonagricultural
  production purposes (therefore they are not paying agricultural
  tax).

- Farmers who build houses outside the designated housing areas.

- Commercial and service stands, farmers' markets, and vending
  locations.
Nonprofit organizations that under-utilize urban land are subject to land use charge for under-utilized land at 100 percent to 300 percent of the standard rate.

4.32 The Rate of Charge. In establishing the land use charge standard, the location benefits and the financial condition of enterprises are taken into account. The rate chosen appears to be very low. There are three rates for land use charge:

1. Properties in the central business district—which include Henan, Hebei Dong-Gong-Yuan, (East Park), and Xin-Fu-Shun (New Fushun)—are charged 0.5 yuan per square meter per year for enterprises and 0.4 yuan per square meter per year for individuals and residential housing.

2. Properties in the sub-central district and on the edge of the central zone—Qian-Zhi-Shan, Shi-jia-Gou, Huang-Shi-Gou, Wang Hua, Gu Cheng Zi, Qing-Nian-Lu, Dong-Zhou, Xin-Tun, Lao Hu-Tai, Long-Feng, Li-Zi-Gou, Nan-Hua-Yuan—are charged 0.4 yuan per square meter per year for enterprise and 0.3 yuan per square meter per year for individual and residential housing.

3. Fringe areas, which include Zhang-Dang, Xin-Tai-He, Zhang-Er-Dian-Zi, Fang-Xiao-Tun, Tian-Tun, Wu-Lao-Tun, Xiao-Nai-Gou, Mian-Hua-Gou, Liu-Shan and Qing-Tai-Zi are charged 0.3 yuan per square meter per year for enterprise land and 0.2 yuan per square meter per year for individual. Housing land in the mining region are charged at 50 percent of class 3.

4.33 In order to control illegal land use, the regulation imposes an additional 100 percent land use for temporary illegal land use and 200 percent to 300 percent for land with permanent illegal structures. Some deductions and exemptions are applied to some enterprises without profit and to some special land uses.

4.34 The rate of land use charge in Fushun was arrived at based on a report prepared by The Urban Construction Research Institute (UCRI) of Liaoning Province. This analysis provided an estimate of the cost of urban public utility maintenance and improvement in Liaoning Province. The investment and maintenance requirement for urban utilities are estimated at 0.48 yuan per square meter and 0.52 yuan per square meter respectively, and the land administration fee at 0.02 yuan per square meter (2 percent of investment and maintenance according to government standards). The estimated cost, then, is 1.02 yuan per square meter but the maximum land use charge rate finally imposed was less than one-half this rate. By comparison, the land use charge is 1.2 yuan per square meter for Xian, 1 yuan for Guangzhan 0.5 yuan for collectives in Shen Yang and 0.6-1.2 yuan for Changchun.22/

22/ This number is derived by summing the total investments on urban basic construction and the total maintenance expenses less the received return and compensation, and dividing by the total area of land.
Impact on Land Use

4.35 It was reported that the efficiency of land use has been improved as a result of pricing land. Officials claim that the gap between land supply and demand has been reduced, and much idle land has been returned to the government. From July 1984, land use in 17 enterprises has been re-adjusted to meet the urban planning requirements, and rural land acquisition has been reduced. Some environment polluting factories have been removed to new locations. The evidence on the land use effects, however, is mostly anecdotal but local officials cite some “big” examples to make the point. One is a winery that occupied 60,000 square meters of land before the land use charge but turned in 30,000 square meters after the land use charge was imposed.

4.36 Some evidence is more objective. Fushun officials report that a total of 250,000 square meters of land was returned to the municipal government after implementation of land use charge. This, they point out, can lead to substantial savings. To acquire 250,000 square meters of farmland, 5.6 million yuan in compensation has to be paid by the SOEs (the compensation for taking over one meter of farmland is about 45 yuan). Moreover, to acquire 250,000 square meters land, it is necessary to provide 456 urban jobs for the farmers who lost their land, and to increase the urban population by 456. The city government must increase its investment by 4.5 million yuan to accommodate the newcomers (assuming 10,000 yuan per capita is needed for increased public utilities). There is also a gain because the land can be used for industrial production. According to the standard of Fushun, one square meter of land yields 17,625 yuan in production value each year. In theory, this means that 26 million yuan in total production and 6.8 million yuan in profit tax can result from bringing this idle land into use.

4.37 Of course these statistics states the case in its strongest possible light in equating marginal with average cost and productivity, assuming that land is the only constraint to expansion of production, and in placing no value on the loss in open space. Moreover, these statistics begin with the assumption that a low rate of land use charge (relative to land value) could induce enterprises to return idle land.

4.38 Government officials point out that the availability of more land and space gives the government more options in formulating policy. For example, the Fushun Casting Factory was located in a residential area, seriously polluting the environment, and in need of being relocated. The Fushun Plumbing Factory occupied 40,000 square meters of land, and had spare land, but this factory had been in deficit for many years. With agreement from these enterprises, the government made the decision to combine these two factories at the same site, and 16,000 square meters of land originally occupied by the casing factory was returned to the government and used for a new construction project.

4.39 It was noted by Fushun analysts that illegal land occupation of 1,360 ha have been eliminated. Some of the land was taken back by the government, some land users were required to reapply, some were fined and some of the illegal construction was pulled down. In 1986, 1.4 million yuan in fines were imposed for illegal land occupation. This was reduced to 26 thousand yuan in 1985, and all but eliminated in 1986. In fact, correcting problems of illegal construction probably had little to do with the land use charge directly since the underlying
problem is with an inadequate enforcement of the regulations. However, the imposition of the land use charge forced the collection of the data necessary to identify the illegal users.

**Financial Benefits**

4.40 The municipal government received 28.4 million yuan in income from the land use charge in three years, which includes 8 million yuan in 1984, 12.8 million yuan in 1985 and 7.6 million in 1986. About 70 percent of the income was used for urban construction and maintenance and land development, 2.6 million yuan for the central heating system in 1984, 560 thousand yuan for improvement of streets in central business district, and 4 million yuan for city road and environmental improvement and residential construction.

**Problems and Reform Needs**

4.41 Though local officials judge the Fushun experience with the land use tax a success, there are problems and a need for some reform of the system. Some of the difficulties have to do with flaws in the basic structure of the tax and some with administration.

4.42 Perhaps the major problem is with the rate. In Fushun's three-zone charge scheme, the highest charge is only 0.5 yuan per square meter per year, and the rate differences among the zones are very small. With such a low rate, neither the goal of using the land use charge as an economic lever nor the revenue-raising objective can be realized.

4.43 A second problem is that the tax has not generated significant revenue to fill the financing gap for urban construction. Local officials argue that since the land use charge is deductible, municipal revenue is reduced. Thus it would seem proper for the city government to retain the entire income from the land charge. This was the case in 1984 and 1985, and the Fushun municipal government used 75 percent of the income for urban maintenance and construction. In 1986, however, the land use charge became a shared income (between the municipality, central and provincial governments). This reduced the incentive to the municipal government for vigorous collecting of the land use charge and the level of revenue.

4.44 Local officials also see a problem with the ability of enterprises to afford the tax. The document in which the MOF approved the land charge scheme pointed out that the land use charge should not be set so high that it would become a financial burden to the enterprises. Fushun officials take the position that enterprises that made loss or little profit, and individuals who cannot afford to pay the land use charge should be given some relief (the land use charge should be reduced, forgiven or deferred).
F. The Land Use Charge in Jinan

4.45 At present, preparations for implementing the charge or tax are in process in Jinan. There is something to be learned from a description of design work which is underway.²⁶/

The Conditions for Implementation

4.46 Although land use in Jinan has changed greatly since 1949, there were no updated land documents and maps because there has been no unified land administration department. In fact, the land document administration was not in order until 1984 when the national real estate survey was completed. Even now the records are not complete and problems will arise in determining liability to pay tax. The following are examples of the problems that may arise:

- The "August-First Square" was a piece of waste land before 1949. After 1949 the land was developed by the army as a drill ground and a place for public meetings and parades. More recently, the army built a fence for the square and uses it as a place for rent and for business and trade. A piece of land like the "August-First Square" has no historical records and user rights are not clear. This kind of situation increases the difficulty of imposing a land use charge.

- The same piece of land may be used by two or more enterprises, and the land use right is not clear between these enterprises. For example, a cigarette factory was built on the grounds of the winery factory. In the land document, the land use right of this piece of land belongs to the winery factory. In order to impose the land use charge, the land use right must be determined and the land document must be modified.

- If a building is used by several organizations, the land use right is not clear.

- Some enterprises transfer or lease their land use right. For example, some enterprises or organizations allow other enterprises to build residential houses on their land, in exchange for the right to use part of the houses. Some enterprises get a profit share from investing land in a new enterprise. In such cases, where would profit tax liability reside?

4.47 Tax Rates Jinan officials and Chinese Academy of Social Sciences (CASS) analysts see two bases for determining the proper land tax rate schedule. The first is historical experience. In 1949, land rent for urban areas was divided into 10 classes. The highest rate (paid in kind) was 400 kg rice per

²⁶/ The views here and the information presented are drawn from several sources: interviews with Jinan government officials, a case study by CASS analysts, and our own assessment of the issues.
year per mu (0.6 kg/m²/year) and the lowest was 80 kg rice per year per mu (0.12 kg/m²/year). In 1950, property taxes were imposed, the tax rate was divided into 10 classes. The highest rate of property tax was 427.5 kg of rice per mu per year (0.64/kg/m²/year) and the lowest rate was 4.5 kg rice per mu per year (0.007/kg/m²/year). The highest rate for land rent was 495 kg rice/mu/year and the lowest rate was 11.4 kg rice/mu/year. From May 1953, the land rent and property tax rates were adjusted. The land rent was adjusted from 1.5 percent of the land price to 2 percent of the land price. Since 1954, no land rent has been charged.

4.48 The other basis for setting a rent or tax rate level is profitability. A study of this possibility was carried out by the Jinan municipal government. First, urban land was divided into four classes according to location, and degree of development and condition of transportation. The investigation of land use charge on industrial and commercial enterprises was carried out by the taxation department. According to their investigation and prediction, if the land use charge rate for commercial enterprises is 2.5 yuan per square meter, 53 of 1026 commercial enterprises will become nonprofit, which is 5.6 percent the total investigated commercial enterprises. If the land use charge rate for industrial enterprises is 1.25 yuan per square meter, 10.9 percent of the investigated industrial enterprises (105 of 961) will make no profit. Hence this proposed rate of land use charge is affordable for most enterprises, but profits will be reduced.

4.49 The government study also considered the deductibility of the land use charge and resulting implications for the adjustment and income tax. For the investigated 1026 commercial enterprises, if a land use tax of 8.5 percent of the profit per square meter of land area is charged, the income tax will be decreased by 3.5 percent, the adjustment tax will be decreased by 1.2 percent, the after tax profit will be reduced by 23 percent. If a land use tax of 6.5 percent of the profit per unit of land use area is charged, the after tax profit of the 961 industrial enterprises will be reduced by 9.1 percent.

4.50 A study of the same data was carried out by a CASS research team and lead to several conclusions. First, it is reasonable to determine the land use charge of different classes of land according to the profitability and land use of the enterprises. Two scenarios were considered. One assumes that the land use charge is equivalent to 8.5 percent of the profit per unit of land use. The profit per unit land use is 162.27 yuan for "commercial class one," the corresponding land use charge is 13.79 yuan per square meter. The profit per unit land use is 44.18 yuan for class two, and the corresponding charge is 3.75 yuan per square meter. The profit per unit of land use 21.17 yuan for commercial class three, the corresponding charge is 1.81 yuan per square meter. The percentage of land use charge in their total profit are 8.51 percent, 8.19 percent, and 8.38 percent respectively. On the other hand, if the land use charge is imposed according to the Jinan proposal, i.e., 4 yuan per square meter for class 1, 2.5 yuan per square meter for class 2 and 1 yuan per square meter for class 3, then the land use charge paid by enterprises in class one region is only 2.45 percent of their total profit, and the land use charge paid by the enterprises in class two and class three regions are 5.75 percent and 4.68 percent of their total profit respectively.
Second, the CASS study concludes that the rate of land use charge for the commercial enterprises should be more detailed. Commercial profit rates are too varied. The municipal real estate department suggests that the land use charge be divided into 4 classes and the commercial department suggests 5 classes.

Third, a rate of 8.5 percent of the profit is too high. At this rate, 7 percent of the commercial enterprises in the survey will become nonprofit, and the profit of other commercial enterprises will be reduced by 23 percent.

Fourth, if the land use charge for industrial enterprises is 6.5 percent of the profit per unit of land use, profits will be reduced by 9.1 percent which is less than the reduction for commercial enterprises and is affordable for most industrial enterprises. But at this rate, the land use charge for industrial enterprises which occupied "class one" land is only 1.71 yuan per square meter, which is lower than the lowest rate for commercial enterprises. This rate is thought to be too low. Since this rate is affordable for the industrial enterprises, the rate for industrial enterprises which occupy the central business region should be the same as the rate for commercial enterprises.

Liability for Tax. A first problem to be solved is whether or not a land use charge should be imposed on nonprofit organizations. This is an especially important problem in Jinan, because it is the capital of the province and is the political, economic, cultural, educational and scientific center. The land use of nonprofit organizations is 13.3 percent of total urban land in Jinan and is much higher than commercial land use which is 3.85 percent of the total. Moreover, some of these nonprofit organizations occupy land in prime locations. If all nonprofit organizations are exempt from land use charge, there will be a revenue loss and insufficient location decisions will not be penalized. Another problem is commercial land use by non-profit or social organizations, such as the military, schools, and in some cases, government department, have used their land to build stores, hotels, or restaurants, to generate "extra wage-bonus", and to create employment opportunities for the employees' children.

Second, some enterprises have established public utilities and green places. What shall be the treatment of these under the land use tax? For the 911 industrial enterprises studied in Jinan, hospitals, schools and nursing schools occupied 55 ha of land and 1,460 ha of total land use. The establishment of public utilities and public facilities by the enterprises are an important complement to the urban public utilities and facilities established by the municipal government. There is a good case that they should be given comparable treatment.

Theoretically, the land use charge should be imposed for residential housing. The rents for housing are very low (0.12 yuan per square meter per month), and do not include land rent. The land rent should be combined with house rent, and this may happen with the housing reform. But if a land use charge is imposed before the reform of the housing system is implemented, the problem is how and on whom to impose the charge.
4.56 From the survey in 1985, the total area for residential housing is 8,135 ha, of which 5.3 percent belongs to housing administration department, 70 percent to public owned enterprises and organizations, 13.9 percent to collectively owned enterprises and organizations and 10.6 percent to the private sector. If the land use charge is imposed on residential use, then for 89.9 percent of the total housing, the charge will be paid by the enterprises and organizations. This suggests the only the private housing owners, which is a small proportion of total housing occupants, will actually bear the tax.
CHAPTER V

ESTIMATING LAND RENTS AND RENT GRADIENTS

5.01 There is little or no direct evidence about land values in China. Yet the proposal to charge a land tax calls on the government to establish a location rent for every area in the city. The experiments and studies underway are proposing to establish the rent gradients in a judgmental way, to identify location rents as roughly the difference between average gross profits of commercial enterprises among taxing zones, and to measure the burden of the tax (the affordability test) against gross profits. But these experiments are based on some very general evidence about the relationship between profits and location, and the tax rates suggested as appropriate seem, at first glance, to be very low.

5.02 In this section we address the issue of whether this general approach is reasonable, and if not, to suggest the bias its application is liable to give. If the proposed rates are too low, then what would be appropriate? The central problem to be addressed here is clear. Differences in gross profits are attributable to far more than location rents, and it is important to try and understand (estimate) the separate influence of location. It is precisely this location effect that the government wants to tax. To understand the relationship between location rent and profits, we formulate a kind of optimization model that will suggest an appropriate empirical model, or at least help the interpretation of an empirical analysis of the determinants of profitability.

A. Do Chinese Enterprises Maximize Profits?

5.03 In trying to model the economic decisions of Chinese enterprises, the most important questions to be answered are what do they attempt to maximize and how much discretion do they have in making price, output and production decisions? The answer to both questions will vary by type of enterprise, but it does seem clear that there now is a much more aggressive entrepreneurial style than in the past.

5.04 While it is not clear that Chinese firms maximize profits, the system reform has given enterprises a push in this direction. It replaced the direct remittance of profits with profits taxation and has pushed firms in the direction of covering their capital expenditure needs through borrowing and retained earnings rather than through outright subsidies. The reform also has given enterprise management substantial autonomy in the disposition of retained earnings. The after-tax earnings must be spent (in "suggested" proportions) for technological development, worker benefits and wage bonuses.

5.05 Why would enterprise managers use this newly-found autonomy to maximize profits, rather than total output or even total payments to labor? One reason is that the profits tax is a principal source of Provincial and local government revenues, hence higher profits may lead managers into the favor of those who "own" the enterprise. Another reason is that higher profits lead to a greater amount of internal funds with which to invest in capital improvements or worker benefits. To achieve these objectives, it might be argued, the positions of plant managers will be secured and their bonus will be maximized. In short, it is an entirely reasonable proposition that profit maximization is the major aim of the enterprise.
5.06 Strong arguments also could be made for other objectives.\(^{27/}\) A plausible argument is that enterprises maximize total product. The reasoning goes that managers see their success as being measured in terms of whether they meet or exceed output targets. They have little control over product prices, factor input prices or endowments of land and labor. To the extent if the enterprise can alter production processes, it will be in the direction of increasing output rather than reducing costs. The criticism of this approach is that it assumes that enterprises have very little flexibility on the supply side and cannot influence product prices. As discussed below, this probably is not a realistic assumption in China in 1988--at least in the case of provincial and municipal-owned enterprises.

5.07 Another possibility is that enterprises are most driven by what Tidrick, et al., call the "family motive."\(^{28/}\) Under this model, firms attempt to maximize the wages and benefits provided to labor. Labor is the productive factor to be rewarded in the Chinese system and managerial performance and longevity might be seen as largely related to the productivity of the plant’s labor force. An open question is whether the optimization should be cast in terms of average benefits per worker or benefits received by the family unit. The latter would include measures such as the provision of jobs for dependents in associated (and sometimes subsidized) collectives. There is merit to the argument that the "family motive" is a determinant of enterprise decisions, but it would seem this argument also suggest maximization of profits is the driven force of enterprises, since the "extra" compensation to labor currently in China is almost entirely drawn from enterprises' after-tax profits.

5.08 We are led back to the proposition that profit maximization is as reasonable an objective of Chinese enterprises as are any of the motives suggested. It recognizes that managers may make discretionary adjustments in both total product and total cost, and that maximum profits leave maximum retained earnings with which to reward labor and expand productive capacity.

**Constraints and Discretionary Freedom**

5.09 What constraints must this optimization obey? What freedom does the enterprise have in varying output, input and prices? The answer to this question varies, depending on the ownership of the enterprise, the type of product, the factor of production, and possibly even the location of the city. In general, we might say the following:

- Collectives and small private businesses probably have the most freedom to adjust prices, inputs and outputs. Centrally-owned enterprises probably have the least freedom, often facing fixed prices, output quotas and designated supplier prices and quantities.

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\(^{28/}\) Ibid.
Commercial firms are less controlled and have more freedom than industrial firms in adjusting prices, inputs and outputs. Even here, however, fixed prices have been rigidly held to on a long list of "essential" consumer items.

Producers of final goods tend to have more freedom than producers of intermediate goods.

5.10 Output Prices. It is certainly true that Chinese firms cannot influence the price of their output in the same firms do in most Western economies. The central, provincial and municipal governments are all involved to some extent in setting prices and/or in making pricing policies. But this is not to say that Chinese enterprises do not have some effect on output prices. In fact, there is great variation in the pricing of output, both within the country and in terms of the methods used to establish prices. The trend in the past five years has been in the direction of a significant decontrol of prices.

Even the determination of a fixed price may be influenced by the enterprise, especially if the determination is done at the municipal or provincial level. Many industrial and commercial products are subject to a markup pricing scheme (cost plus tax plus profits) and the mark-up varies in what appears to be an ad hoc way. It is not unimportant here to note that local government indirect tax revenues (and perhaps profit tax revenues) increase directly with the price level chosen.

There are other variations from fixed prices that the enterprise can influence. For production above quota amounts, prices may be set as much as 30 percent above the administered price, at the discretion of the enterprise. There is also a "guidance price" system which specifies a price range, and especially smaller collectives and private firms may set market prices for a wide variety of consumer goods. Finally, there is a fledgling private sector, primarily composed of small household firms, which is not subject to price controls.

Labor. There is no formal open labor market in China. Workers are assigned a position and cannot be fired. Nor is there a possibility (except in special cases) to migrate for a better position. Even firms that wish to relocate face the prospects of continuing to compensate and house their present workers in the old location. Basic wage rates and most fringe benefit rates (including housing and pensions) are set and cannot be influenced by the enterprise. These are major constraints on factor substitution.

This is not to say, however, that firms exert no control over the relative price of labor and the quantity of labor employed; nor does it preclude incentive programs that might increase worker productivity. First, on the question of the quantity of labor employed, while there apparently is no possibility to reduce the number of workers below the assigned quota amount, there are two ways by which enterprises can control expansions in their labor force. The first is to use "temporary" workers. The system reform permits employment of workers on a contract basis and gives enterprises the right to terminate employment at the end of the contract. The second approach is to
engage in mergers or supplier agreements and therefore to limit the amount of permanent employment to which the enterprise is committed.

5.15 The basic wage and benefit package is fixed by the State and cannot be reduced. However, the basic rate is low and there is little variation in the levels paid to the managerial and unskilled classes. Enterprises may add to this basic rate by payment of wage bonus and payment of a higher rate of worker benefits. Both of these supplements are paid from retained earnings, hence, both are related directly to the level of profitability. Wage bonus is a cash payment and may be distributed among workers and managers at the discretion of the enterprise. Employee benefits may include improved housing, transportation to work, kindergartens and day-care centers, recreation facilities and even investment in collectives to employ the dependents of workers.

5.16 In fact, there appears to be a significant variation in the extent to which enterprises use these options to affect the price and quantity of labor. As may be seen from Table 5-1, reported temporary employment accounted for 15 percent of total employment in Yantai and 26 percent in Jinan, for the average firm between 1984 and 1986. More important, there is a substantial variation in this ratio across enterprises, as is shown by the coefficients of variation for both cities. The same pattern of discretion shows up in compensation of employees. As may be seen in Table 5-1, there is a substantial variation in the total compensation per employee.

5.17 Capital. Enterprises apparently have more control over the composition of their investment than over the amount of capital they may obtain or the sources of that capital. The amount of investment a firm may make is a function of its retained earnings, subsidies it might receive from the State, and loans through the banking system. The first depends on the level of profitability of the firm and whether it receives any preferential treatment under the profits tax. Capital transfers are dictated by the plan or are determined by ad hoc government decision, and in either case are outside the control of the enterprise. The credit system is still tightly controlled and enterprise borrowing is limited and controlled by quota and by the plan. The story then is that enterprises have limited discretion over the amount of investment funds raised. They have more control over the disposition of these funds.

5.18 Capital subsidies and loan funds are tied to specific projects which, presumably, the enterprise endorses. The distribution of retained earnings among capital investment and other uses is suggested but not strictly prescribed. A 10 percent tax on the values of construction, at least in its face value, is meant to discourage firms from spending too much on buildings and too little on technological upgrading.

5.19 Another way to raise the question is to study variations in investment choices that firms have made. In fact, there is a wide variation in the ratio of the value of depreciated assets to the original value of assets as shown in Table 5-1. Also note the very wide variation in ratio of building space to land space. These are far from ideal measures of capital, but they do indicate that

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29/ If the wage bonus exceeds a certain limit, it is subject to a wage bonus tax.
future constraints. These constraints notwithstanding, enterprises which still treat
land as a valuable input in their production functions. They may play an active
role in the initial assignment of the land. Some of the enterprises assigned
land as a valuable in their production functions. They may play an active

The region is well within the

metropolitan area is a difficult and expensive proposition. Movement to another

state, once a location is assigned, movement to a new site within the

land is not permitted and both location and amount of space are assigned by the

Table 5.20

 enterprises have made markedly different choices in their mix of capital and

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<tr>
<td>Per Worker (year/worker)</td>
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<td>Gross Profit as % of sales</td>
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<td>Temporary Employees as % of total workers</td>
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<td>Land Space</td>
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<td>Building Space as % of original value of assets</td>
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TABLE 5.20

Variables in Selected Measures of Firms Activity.
5.22 Finally, enterprises may establish workshops around the urban area, but away from their present site; and they may form associations with other enterprises which have surplus land. They also may purchase additional space (usually farmland at the urban fringe), but at a high price and sometimes at a cost of forming an association with a rural collective or guaranteeing jobs to displaced farmers.

5.23 **Raw Materials.** State-owned enterprises are assigned a quota of raw materials at a fixed price. There are other raw material constraints. Provincial governments may require that locally produced raw materials be purchased; transportation of needed raw materials may be impossible or costly, and prohibitively expensive. There is also a foreign exchange constraint—enterprises may retain only 12.5 percent of their foreign exchange earnings. Obviously, these restrictions circumscribe the freedom of enterprises to adjust methods of doing business to maximize profits. Still, these constraints may not be so binding as it may appear.

5.24 The Chinese economy is growing and most state enterprises have exceeded production quotas in recent years. This is true for both sectors that produce intermediate goods and consumer goods. To prevent inflation out of control, the State has exerted the power to guarantee the final product sector a quota of raw materials at fixed prices. Over and above the quota amounts (and with the notable exception of some "vital" products), raw material prices are determined in the market. Second, enterprises may form mergers or associations to vertically integrate to suppliers of raw materials and thereby gain more discretionary control over the price and availability of raw materials. Finally, collectives are not bound by the same quota arrangements, though some of their inputs must be purchase at fixed prices.

**A Profit Maximization Model**

5.25 Suppose that, subject to the constraints and discretionary freedoms outlined above, Chinese enterprises took the objective of maximizing profits. What would this imply about the optimal use of land, labor and capital? For any enterprise we may write the profit identity

\[ \pi = pQ + S - (\ell L + wW + kK) - aA - V - LT \]  

(1)

where

- \( p \) = product price
- \( Q \) = output
- \( L \) = land
- \( W \) = Labor
- \( K \) = capital
- \( A \) = other subsidies
- \( S \) = subsidies
- \( \ell, w, k, a \) = price of land, labor, capital and amenities, respectively.
Substituting the production function (2)

\[ Q = Q(L, W, K; A, F) \]  

(2)

where

- \( A \) = amenity, location or environmental factors
- \( F \) = firm specific exogenous factors

into (1), we obtain

\[ \pi = pQ(L, W, K; A, F) - (L\lambda + W\omega + K\kappa + A\alpha) \]  

(3)

The first order conditions for maximization of profits are

\[
\frac{\partial \pi}{\partial L} = pQ_{L} - \lambda = 0 \quad (4a)
\]

\[
\frac{\partial \pi}{\partial W} = pQ_{W} - \omega = 0 \quad (4b)
\]

\[
\frac{\partial \pi}{\partial K} = pQ_{K} - \kappa = 0 \quad (4c)
\]

\[
\frac{\partial \pi}{\partial A} = pQ_{A} - \alpha = 0 \quad (4d)
\]

For example, equation (4a) states that an enterprise will continue to add units of labor until the marginal contribution of labor to total profit is equal to the marginal cost of labor (assuming no subsidies, taxes or other costs). If the objective function had been to maximize total product, the enterprise would add labor so long as its marginal revenue productivity was greater than zero.

5.25 Equations (4a) - (4b) yield input demand equations and may be solved for equilibrium values \( L^*, W^*, K^*, \) and \( A^* \). By substitution into (3), we may derive

\[ \pi^* = f(L^*, W^*, K^*, A^*, p, F) \]  

(5)

In a purely competitive market economy, theoretically, this model would lead us to the conclusion that profits are the same everywhere in the metropolitan area. If a firm gained a particular profit advantage from a prime location, competition among firms would bid up the price of that location until the advantage disappeared. Of course, this does not happen in China where land is assigned, no rent is charged, and firms are not freely mobile.

5.27 How could such a profit maximization model be modified to fit the Chinese case? First, let us assume that all state enterprises operate above the quota amounts for output and raw materials, and that above those amounts their production decisions take into account the market prices of output and inputs. This is not an unrealistic assumption for China in the 1980s. For smaller firms, we assume decisions are made under a guidance price policy which more or less
resembles a set of market prices. This is a less realistic assumption, but the vitality of the free markets for clothing and unprocessed foods may be simulating a market. Therefore, on the output side the enterprise sells a quota \((Q_q)\) and an above-quota \((Q_a)\) amount at prices \(P_q\) and \(P_a\) respectively, so that total revenues are

\[ P_aQ_a + P_qQ_q \]  

(6)

where \(P_a > P_q\)

Analogously, total raw material \((M)\) costs are

\[ m_aM_a + m_qM_q \]  

(7)

where \(M_a > M_q\).

5.28 The situation is more difficult as regards other inputs. There is an assigned amount of labor \((W_c)\), but there is also a possibility to exceed this amount through contracts, mergers, temporary employment, etc. \((W_a)\). The price of labor may vary among firms and to some extent is fixed by the firm. All workers receive the basic state wage and benefit package for grain, housing, etc. The enterprise may choose the amount of wage bonus and may choose to top up the benefit package with additional investment from retained earnings in employee welfare. Therefore, we might define total labor costs as

\[ (w_q + w_a)W_q + (w_q + w_a)W_a \]  

(8)

As we will argue below, \(w_a\) will rise with profitability (because \(w_a\) is a direct function of retained earnings) and \(w_a\) may rise with \(W_a\) because of the negotiations that arise in contractual arrangements. Is there an economic rent associated with the state determination of a basic level of compensation \((w_q)\) and the assignment of a basic amount of employment \((W_q)\)? We cannot say. The former depends on whether one believes that the wage plus benefit package is less than worker productivity and the other depends on whether the method of assignment of workers (and the prohibition of hiring and firing) gives enterprises a different productivity endowment than would a free market.

5.29 Capital provided as grants may be viewed as a quota amount and to be costless to the enterprise, i.e., \(k_q = 0\). Above quota, capital may be obtained through loans or retained earnings at a real cost to the enterprise (an interest cost for loans and an opportunity cost for retained earnings, assumed here to be the same), hence

\[ k_qK_q + k_qK_a > 0 \]  

(9)

5.30 The case of land is also difficult. Since land is not priced \((l_q = 0)\), the incentive is for the firm to request to add space so long as it makes a positive marginal contribution to (present and future) profits. This explains the hoarding of land. We assume that firms may not purchase additional land, though they may enter into associations with other enterprises to increase the amount of space they have available. Accordingly, the total cost of land is defined here as \(l_qL_q\). Since \(l_q = 0\), the enterprise faces no land cost offset to profitability.
5.31 These terms may be combined and the profit identity in equation (3) may be rewritten as

\[ \pi = P_a Q_a + \bar{P}_q \bar{Q}_q - \left( \left( m_a M_a + \bar{m}_q \bar{M}_q \right) - \left( \bar{w}_q W_a + \bar{w}_q W_a \right) \right) \\
+ \left( \bar{k}_a K_a + \bar{k}_q K_q \right) + \left( \bar{v}_a V_a + \bar{v}_q V_q \right) \]

where a "bar" denotes a state-determined price or quantity that the enterprise cannot influence. Now we may restate the choice model for the enterprise in terms of \( M_a, W_a, W_a, K_a \); and introduce the effects of the gross receipts tax and the profits tax, levied at rates \( t_s \) and \( t_p \) respectively. The profits tax, however, does permit deductibility of certain expenditures. (For simplicity, we assume \( t_s \) and \( t_p \) are constants, and will not vary when input and output changes.) We assume these to be \( w_a, w_a, k_a, \) and \( t_a L_a \). Therefore, we argue

\[ \pi = (1-t_p) \left[ (1-t_s) (P_a Q_a - \bar{P}_q \bar{Q}_q) - \left( (m_a M_a + \bar{m}_q \bar{M}_q) - \bar{w}_q W_a \right) \right] \\
+ \left( \bar{k}_a K_a + \bar{v}_a V_a \right) \]

The first order conditions may be stated as

\[ \frac{3\pi}{3M_a} = \left[ (P_a \frac{3Q_a}{3M_a}) (1-t_s) - m_a \right] (1-t_p) = 0 \]  
(12a)

\[ \frac{3\pi}{3W_a} = \left[ (P_a \frac{3Q_a}{3W_a}) (1-t_s) - \bar{w}_q \right] (1-t_p) = 0 \]  
(12b)

\[ \frac{3\pi}{3K_a} = \left[ (P_a \frac{3Q_a}{3K_a}) (1-t_s) \right] (1-t_p) = 0 \]  
(12c)

\[ \frac{3\pi}{3a} = \left[ (P_a \frac{3Q_a}{3a}) (1-t_s) \right] (1-t_p) = 0 \]  
(12d)

As above, enterprises will continue to add units of inputs above quota so long as their marginal revenue productivity exceeds their marginal cost net of tax. Then

\[ \pi = f(W_a, K_a, W_a, L_a, A, P_a F) \]  
(13)

defines the equilibrium level of profits and is the profit function we must estimate.

B. Econometric Model Specification

5.32 We might take two approaches to estimating a profit function based on this model. One is to estimate the determinants of profitability, subject to the quota constraints, as specified in equation (13). This provides estimates
of the response of profits to the incremental input choices permitted to Chinese firms. But this begs the question of how the quota amounts are assigned in the first place, i.e., whether as implied above, there is some underlying profit maximization (or other) rationale followed by State economic planners.

5.33 Another totally hypothetical approach is to assume that the quota amounts are not assigned randomly, but that State economic planners allocate resources on a basis of maximum contribution to productivity. In this case, we may treat the total amounts of capital and labor as variables and test the hypothesis that enterprises somehow bid for and utilize the total amount of capital and labor inputs in a way that is consistent with profit maximization. For example, the amount of land assigned to a firm may be seen as varying with the demand for space. In addition, enterprises must pay a substantial price for new land (including a tax for dispossessing farmers and a compensation penalty to the dispossessed), and an enterprise may vary its quantity of space entering by into an agreement with another firm that has excess land or by building more intensively on the land which it has been assigned.

The Model

5.34 The model we specify has three endogenous variables: profits, net of sales taxes, fixed capital and the amount (area) of productive building space. The number of employees is treated as determining profitability, but as being unaffected by the level of profits. Raw material and working capital (inventory expenses) are also treated as exogenous.

5.35 The correct procedure for estimation of this model is to derive and estimate a system of input demand equations and to substitute these into the profit identity. Then, differentiation of the profit equation gives a direct estimate of the marginal profitability of each factor. We cannot follow this procedure here, first, because neither input nor output prices can be directly observed; and second, because some of the factor input quantities are themselves determined by the level of profitability. The approach we take here is to directly estimate the profit equation with fixed capital and building space as endogenous variables.

5.36 Profits. The estimating equation for profits is

$$\pi^* = f(W, K_1^*, K_2^*, L^*, B^*; A_1, A_2, F_1, F_2, YR_1, YR_2)$$

where

- $B$ - the amount of productive building space
- $K_1$ - fixed capital
- $K_2$ - working capital
- $A_1$ - distance to the CBD

30/ We tested this specification using a procedure suggested by Hausman (1973). We reject the null hypothesis that profits, fixed capital, and building space were exogenous. We could find no significant relationship between the error term and working capital, the number of employees, or the profit tax rate, which we treat as exogenous.
A_2 = agglomeration
F_1 = age of enterprise
F_2 = dummy variable = 1 if adjustment tax is to pay
YR_1 = dummy variable = 1 if 1985
YR_2 = dummy variable = 1 if 1986

and where the * variables are endogenous.

5.37 Profits should be positively related to the quantities of the productive inputs, labor, land and capital. For a given amount of land, more productive building space_31/ should increase both labor and capital productivity and stimulate profits. Two firm-specific variables have been included, one is age of the enterprise—older firms could be either more profitable because they have an established clientele or some name recognition, or less profitable because their plant is outdated and inefficient; the other is a dummy variable, -1 if the enterprise pays the adjustment tax. Under the current Chinese tax system, if a firm pays the adjustment (excess profits) tax, it is an indication of a higher rate of profitability that is achieved by some "unfair" advantages, e.g., excessive state investment in the past or monopoly prices guaranteed by government (such as cigarettes or liquor).

5.38 Two amenity variables should have a significant impact on profits of all commercial firms. An agglomeration variable has been defined to indicate the number of firms and person within walking distance of each enterprise._32/ Greater daytime population in the area indicates a greater number of shoppers, (ii) the quality of public services, e.g., transportation services, may be better in areas where there is a clustering of workers (iii) infrastructure necessary for business, e.g., public utilities, may be better in areas where there is a concentration of enterprises; and (iv) the market for business services may be stronger in areas where there is close proximity to other businesses. The second amenity variable distance from the CBD, which should show a negative relationship with enterprise profitability.

5.39 Finally, a dummy variable is included to take account of year, since these estimates have been made using pooled data (both cross-section and time series).

5.40 Capital. The estimating equation for capita is

\[ K_1^* = f(x_1, x_2, PTX; A_1, A_2, F_1, F_2, YR_1, YR_2) \]  

_31/ The reason to use "productive" building space rather than the total is because enterprises often own apartment buildings that are rented exclusively to their employees.

_32/ The agglomeration variable of a firm is defined as the total number of enterprises located within a radius of 500 meters of the firm, including itself.
where

\[ PTX = \text{profits tax rate} \]
\[ F_3 = \text{dummy variable} = 1 \text{ if state-owned} \]
\[ F_4 = \text{dummy variable} = 1 \text{ if nonproductive (apartment) buildings} \]

5.41 The level of fixed capital is endogenous, because some capital investment is financed from contributions from retained profits and because enterprise profitability may be a determinant of the State's capital allocation. The level of fixed capital should be higher if a greater amount of working capital is available. Enterprises that are older might be expected to have a smaller stock of (depreciated) fixed capital, as might those that pay a higher rate of profit taxes. State-owned enterprises should have a greater stock of fixed capital than collectives because of their access to state funding. Firms that allocate significant amounts of building space to "nonproductive" use, e.g., housing, have less available to invest in fixed capital.

5.42 A greater agglomeration might be associated with a smaller capital stock because a firm might substitute the better public infrastructure for what it might otherwise supply itself. On the other hand, firms further away from the CBD might have a larger capital stock for exactly the opposite reason.

5.43 Building Space. The third endogenous variable is the amount of productive building space. The estimating equation is

\[ B^* = (K_1^*, L, W; F_3, F_5, F_6, YR) \]  (16)

where

\[ F_5 = \text{dummy variable} = 1 \text{ if commercial shop} \]
\[ F_6 = \text{dummy variable} = 1 \text{ if restaurant} \]

5.44 Productive building space and the amount of fixed capital stock are simultaneously determined and directly related. Building space should also be positively related to the amount of land available to the enterprise and to the number of employees. State-owned enterprises have a greater access to capital and should have a greater amount of building space. Commercial shops and restaurants are hypothesized to have a greater amount of productive building space than service enterprises (the omitted class).

Data Estimation Method

5.45 The enterprise data for Jinan and Yantai are reported for three years: 1984, 1985 and 1986. For the three year period, there were 650 usable enterprise responses for Yantai and 1,413 for Jinan. We pool these cross-section and time series data for purposes of estimation. To use only one year would greatly limit the degrees of freedom, and to average the three years would have eliminated some of the richness of the sample. On the other hand, pooling the

\[ 33/ \text{ For a discussion of the data, see Appendices I and II.} \]
cross-section and time series data introduces a serial correlation bias, since the same enterprise may be included as many as three times in the sample. Another potential problem is that the profit tax and retained earnings system were only introduced in 1983 and firms were still adjusting to the new system during the sample period. We address this problem by first estimating successive cross-sections. The equation coefficients are much the same in each of the three years, indicating that pooled data may be used. A "year" dummy variable is included to capture any shift effect.

5.46 Estimation is by two stage least squares (2SLS). There is a problem with heteroskedascity in the variables, due largely to a scale effect, because the sample includes very large and very small firms. The "scale-sensitive" variables in the estimating equations are expressed in logarithms to correct for this.

5.47 Despite these adjustments, some estimation problems remain. There is an omitted variable error; in particular, we have been unable to include a direct measure of output price, therefore, variations in the contribution of land and location to profits will be due to both the productivity of the land or site and the price of the output sold. Other important variables could not be included, e.g., any measure of the price paid to purchase or rent additional space, any direct measure of the extent to which the enterprise is involved in a merger or supplier contracts, or any measure of the unit price of raw materials.

C. Statistical Results: Commercial Firms

5.48 The estimation results are described in Tables 5-2 and 5-3 for Jinan and Yantai, respectively. The explained variation is significant and most of the explanatory variables show the hypothesized sign. Enterprises with more land, fixed capital investment and employees, i.e., larger firms, tend to have greater profits, though the relationships appear to be stronger for Jinan than for Yantai. Profits fall, ceteris paribus, as distance from the city center increases, and profits are greater where there are greater agglomerations of economic activities, but again the significance level is higher in Jinan. Profit rates were higher in 1985 and 1986 vs. 1984 in Jinan, but the reverse was true in Yantai.

5.49 The ultimate goal here is to use these equations to estimate the contribution of land and location to profitability. Such an estimate may be derived from the profit equation for each city, if we take the mean value of all variables (shown in Appendix Table 5-1), and if we assume a particular location within the city. For a CBD location (CBD = 0), we may estimate BBBBB as approximately 31 yuan per square meter in Jinan and 93 yuan in Yantai. To the extent the profit maximization model presented above holds, we may say that these values are rough estimates of the shadow price of a unit of land in the city center. If the State wanted to charge a price that would fully confiscate the annual contribution of land to profits, by these estimate it would charge these amounts.

5.50 It might be argued that the agglomeration variable confounds these estimates, because it takes on a higher value at locations closer to the CBD.
To correct for this, we re-estimated the shadow price of land at the CBD by sing the mean value of the agglomeration variable for all enterprises between CBD=0 and CBD=0.5. The results for this "agglomeration-adjusted" estimate are not markedly different: the contribution of land to profits is 83 yuan per square meter in Yantai and 40 yuan per square meter in Jinan.

5.51 If this model holds, the results from it allow us to reach some interesting conclusions. First, the land resource at the CBD appears to be more valuable in Yantai than in Jinan. This reinforces the view that charging a uniform land rent across all Chinese cities would be inappropriate. However, it also suggests that it may not be appropriate to reserve the use of the highest rates for the largest cities. Second, there is much variation among enterprises in the contribution of land to profits: this variance has to do at least with many characteristics of the firm. A uniform land rent within a city (or even within a taxing zone) will impose a higher burden on those who make a suboptimal use of the land.
### Table 5.2.1: AIDS Estimates of the Determinants of Enterprise Profits

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>T-Statistic</th>
<th>P-Value</th>
</tr>
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<tr>
<td>Age</td>
<td>0.785</td>
<td>0.421</td>
<td>1.86</td>
<td>0.067</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Educational</td>
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</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Income</td>
<td>0.577</td>
<td>0.234</td>
<td>2.48</td>
<td>0.014</td>
</tr>
<tr>
<td>Residence</td>
<td>0.669</td>
<td>0.333</td>
<td>2.01</td>
<td>0.044</td>
</tr>
<tr>
<td>Commercial</td>
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<tr>
<td>Noncommercial</td>
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<tr>
<td>State Owned</td>
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<tr>
<td>Federal Aid</td>
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</tr>
<tr>
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<td>0.669</td>
<td>0.333</td>
<td>2.01</td>
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<tr>
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<tr>
<td>State Owned</td>
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<td>Federal Aid</td>
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<tr>
<td>Commercial</td>
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<td>State Owned</td>
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<td>Age</td>
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</tr>
<tr>
<td>Residence</td>
<td>0.669</td>
<td>0.333</td>
<td>2.01</td>
<td>0.044</td>
</tr>
</tbody>
</table>

**Source:** Survey data, 1987.

**Significance at the .05 level:**</td>
### Table 5-3: 2SLS Estimates of the Determinants of Enterprise Profits, Fixed Capital and Productive Building Space: For Commercial Enterprises in Yantai1/2

<table>
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<tr>
<th>Dependent Variable</th>
<th>Fixed Capital+</th>
<th>Building Space+</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTERCEPT</td>
<td>-0.254</td>
<td>3.765**</td>
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<tr>
<td></td>
<td>(0.072)</td>
<td>(4.808)</td>
</tr>
<tr>
<td>PROFITS+</td>
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<tr>
<td></td>
<td>(7.313)</td>
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</tr>
<tr>
<td>FIXED CAPITAL+</td>
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<tr>
<td></td>
<td>(0.079)</td>
<td>(0.352)</td>
</tr>
<tr>
<td>BUILDING SPACE+</td>
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</tr>
<tr>
<td></td>
<td>(0.661)</td>
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</tr>
<tr>
<td>LABOR+</td>
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<tr>
<td></td>
<td>(1.123)</td>
<td>(1.24)</td>
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<tr>
<td>PROFIT TAX RATE+</td>
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<tr>
<td></td>
<td>(1.232)</td>
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<td>LAND+</td>
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<td>0.615**</td>
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</tr>
<tr>
<td>DISTANCE TO CBD</td>
<td>-0.119</td>
<td>0.106</td>
</tr>
<tr>
<td></td>
<td>(1.389)</td>
<td>(1.155)</td>
</tr>
<tr>
<td>AGGLOMERATION</td>
<td>0.0358**</td>
<td>-0.005**</td>
</tr>
<tr>
<td></td>
<td>(3.089)</td>
<td>(2.324)</td>
</tr>
<tr>
<td>AGE</td>
<td>-0.000005</td>
<td>-0.0004</td>
</tr>
<tr>
<td></td>
<td>(0.005)</td>
<td>(0.445)</td>
</tr>
<tr>
<td>Dummy Variable = 1 if:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADJUSTMENT TAX</td>
<td>0.651</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.571)</td>
<td></td>
</tr>
<tr>
<td>STATE OWNED</td>
<td>0.023</td>
<td>0.562**</td>
</tr>
<tr>
<td></td>
<td>(0.067)</td>
<td>(3.446)</td>
</tr>
<tr>
<td>NONPRODUCTIVE BUILDINGS</td>
<td>0.253</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.902)</td>
<td></td>
</tr>
<tr>
<td>COMMERCIAL TAX</td>
<td>-0.576**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(2.798)</td>
<td></td>
</tr>
<tr>
<td>RESTAURANT</td>
<td>-0.269</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.888)</td>
<td></td>
</tr>
<tr>
<td>1985</td>
<td>-0.436</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.383)</td>
<td></td>
</tr>
<tr>
<td>1986</td>
<td>0.573*</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1.702)</td>
<td></td>
</tr>
<tr>
<td>R²</td>
<td>0.714</td>
<td>0.661</td>
</tr>
<tr>
<td></td>
<td></td>
<td>0.879</td>
</tr>
</tbody>
</table>

* Expressed in logarithms
* A value shown in parentheses below regression coefficient
** A significant at the .10 level
* A significant at the .05 level

Location Rents

5.52 The second question to answer is how do land rents decline as enterprises are located farther away from the CBD. The policy question to be addressed is by how much should land rents (or the land tax rate) be reduced as distance from the CBD (or some other key point) increases?

5.53 We have simulated the effects of location on profits by evaluating at various distances from the CBD, as described in Tables 5-4 and 5-5. The results show the expected negative rent gradients, e.g., the shadow price of land in Jinan falls from an average of about 31 yuan per square meter at 1 kilometer from the CBD to about Y 20 per square meter at a distance of 5 kilometers from the CBD, while the decline is from 93 to 51 yuan per square meter in Yantai. When the gradients are adjusted reflect the mean value of the agglomeration variable at each distance from the CBD, essentially the same result is obtained.

5.54 These gradients give us a rough idea of the rate structure that would be necessary to capture the differential profits associated with better locations. For example, assume a 3 rate system were being contemplated, with the CBD as zone 1, distances of 1-2 kilometers as zone 2, and any location more than 2 kilometers from the CBD as zone 3. If a base rate of 4 yuan per square meter were chosen for zone 1 in both cities, the rates for zones 2 and 3 would be 3.6 and 2.2 yuan, respectively, in Yantai; and 3.0 and 1.8 yuan, respectively, in Jinan.

D. Statistical Results: Industrial Firms

5.55 Both commercial and industrial enterprises would be subject to the land use tax or charge under the various proposals now being considered. This raises a problem because the tax structure—the identification of high v. low-rate zones—is clearly being designed with commercial activities in mind. A problem arises because any given zone in the city may not be as preferred a location for every type of firm. For example, a commercial shop might find the congested streets of downtown a blessing, while a manufacturer of intermediate products would find congestion to be a costly nuisance, and a manufacturer may find a location adjacent to the railhead, port or another manufacturer to be a positive factor whereas a restaurant or department may find this a detriment to business.

5.56 The general conclusion here is that the determinants of industrial profit rates are quite different from those presented above for commercial firms, and in particular, the contribution of land and location to profitability are quite different.
5.57 The same structural model as for commercial enterprises has been estimated, with results presented in Tables 5-6 and 5-7. These results show that higher profits rates and greater levels of fixed capital investment go hand-in-hand in both cities studied. However, neither labor nor land is a significant determinant of profit levels, and labor shows a negative productivity in Jinan, while land shows a negative productivity in Yantai. Over-employment is thought to be a problem in China, so the finding that the marginal revenue productivity of labor is not significantly different from zero is not as surprising as one might think. The fact that the amount of land available to the enterprise makes no significant contribution to profitability in either city is more surprising.

5.58 The model estimate here does not show a significant relationship between profitability and the location of the site within the urban area. The level of profits neither drops nor rises significantly with distance from the CBD, though the coefficient on the CBD variable is negative. Neither does profitability seem to be affected by agglomerations of economic activity.

5.59 With the caveat in mind that this model may be inappropriate to explain the determinants of profitability for industrial activities, we may repeat the exercise above and estimate the implied annual rents at various locations. The Jinan results show a very low contribution of land to profits, on the order of ¥2 or 3 per square meter. The Yantai results are meaningless, perhaps because of misspecification of the model, and show negative values. We can learn relatively little from these results, except perhaps, that the commercial establishments seem to respond to market forces and location rents while industrial firms are rather sluggish. Following this argument, it might be justified to introduce a tax rates based on estimated commercial rent gradients so as to reduce some serious inequities the industrial enterprises can take advantage of.
E. Affordability of the Land Tax

5.60 These rent gradients suggest a rate structure for a land use charge or tax. If the government meant to fully confiscate location rents, the charge or tax levels implied by these results are much higher than anything that has been contemplated to date. Three issues bear investigation: (i) the "affordability" of a land use charge that approximately confiscates location rents, (ii) the revenue implications for the local government, and (iii) the consequences of permitting enterprises to deduct the charge or tax from profit tax liability. In the case of all three issues, the analysis is based on simulations of enterprise level data for Jinan.34/

Table 5-3: ESTIMATED ANNUAL LAND RENT IN YUAN PER SQUARE METER
AT VARYING DISTANCES FROM CBD
(all independent variables except "agglomeration"
measured at the mean)

<table>
<thead>
<tr>
<th></th>
<th>Yantai</th>
<th>Jinan</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Commercial</td>
<td>Industrial</td>
</tr>
<tr>
<td>0</td>
<td>83</td>
<td>-10</td>
</tr>
<tr>
<td>1</td>
<td>91</td>
<td>-9</td>
</tr>
<tr>
<td>2</td>
<td>59</td>
<td>-9</td>
</tr>
<tr>
<td>3</td>
<td>51</td>
<td>-8</td>
</tr>
<tr>
<td>4</td>
<td>65</td>
<td>-8</td>
</tr>
<tr>
<td>5</td>
<td>41</td>
<td>-7</td>
</tr>
</tbody>
</table>

34/ We use only the Jinan estimates here for two reasons. First, we have more faith in the sampling procedure and the accuracy of the reported financial data. Second, this exercise is meant only to illustrate the impacts, and one case is adequate for that purpose.
Table 5-6: 2SLS Estimates of the Determinants of Enterprise Profits, Fixed Capital and Productive Building Space: For Industrial Enterprises in Jinan\(^a/\)

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Profits*</th>
<th>Fixed Capital*</th>
<th>Building Space*</th>
</tr>
</thead>
<tbody>
<tr>
<td>INTERCEPT</td>
<td>2.083</td>
<td>-0.447</td>
<td>1.210**</td>
</tr>
<tr>
<td></td>
<td>(1.538)</td>
<td>(1.230)</td>
<td>(5.222)</td>
</tr>
<tr>
<td>PRODUC+</td>
<td>---</td>
<td>0.563</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(5.225)</td>
<td></td>
</tr>
<tr>
<td>FIXED CAPITAL+</td>
<td>1.567</td>
<td>---</td>
<td>0.243</td>
</tr>
<tr>
<td></td>
<td>(3.493)</td>
<td></td>
<td>(1.335)</td>
</tr>
<tr>
<td>BUILDING SPACE+</td>
<td>-0.802</td>
<td>---</td>
<td>0.467</td>
</tr>
<tr>
<td></td>
<td>(1.490)</td>
<td></td>
<td>(4.208)</td>
</tr>
<tr>
<td>LABOR+</td>
<td>-0.366</td>
<td>---</td>
<td>0.467</td>
</tr>
<tr>
<td></td>
<td>(1.180)</td>
<td></td>
<td>(4.208)</td>
</tr>
<tr>
<td>PROFIT TAX RATE+</td>
<td>---</td>
<td>-0.081</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.894)</td>
<td></td>
</tr>
<tr>
<td>LAND+</td>
<td>0.129</td>
<td>---</td>
<td>0.355</td>
</tr>
<tr>
<td></td>
<td>(0.682)</td>
<td></td>
<td>(0.731)</td>
</tr>
<tr>
<td>WORKING CAPITAL+</td>
<td>0.067</td>
<td>0.437</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>(0.452)</td>
<td>(4.331)</td>
<td></td>
</tr>
<tr>
<td>DISTANCE TO CBD</td>
<td>-0.070</td>
<td>0.054</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>(1.453)</td>
<td>(2.053)</td>
<td></td>
</tr>
<tr>
<td>AGGLOMERATION</td>
<td>-0.017</td>
<td>0.004</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>(1.253)</td>
<td>(0.535)</td>
<td></td>
</tr>
<tr>
<td>AGE</td>
<td>0.00</td>
<td>0.001</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>(1.038)</td>
<td>(3.234)</td>
<td></td>
</tr>
<tr>
<td>Dummy Variable = 1 if:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADJUSTMENT TAX</td>
<td>0.755</td>
<td>0.148</td>
<td>0.295</td>
</tr>
<tr>
<td></td>
<td>(3.803)</td>
<td>(1.024)</td>
<td>(3.771)</td>
</tr>
<tr>
<td>STATE OWNED</td>
<td>0.148</td>
<td>-0.384</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td>(1.024)</td>
<td>(2.199)</td>
<td></td>
</tr>
<tr>
<td>NONPRODUCTIVE BUILDINGS</td>
<td>0.466</td>
<td>0.142</td>
<td></td>
</tr>
<tr>
<td>COMMERCIAL</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RESTAURANT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1985</td>
<td>0.071</td>
<td>0.029</td>
<td>0.289</td>
</tr>
<tr>
<td></td>
<td>(0.376)</td>
<td>(0.256)</td>
<td>(0.459)</td>
</tr>
<tr>
<td>1986</td>
<td>-0.371</td>
<td>0.197</td>
<td>-0.001</td>
</tr>
<tr>
<td></td>
<td>(1.731)</td>
<td>(1.644)</td>
<td>(0.018)</td>
</tr>
<tr>
<td>R²</td>
<td>0.522</td>
<td>0.771</td>
<td>0.900</td>
</tr>
</tbody>
</table>

* Expressed in logarithms
\*\* Value shown in parentheses below regression coefficient
** Significant at the .10 level
\*\*\* Significant at the .05 level

<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>GRADUATE AT THE 0.05 LEVEL</strong></td>
</tr>
<tr>
<td><strong>GRADUATE AT THE 0.10 LEVEL</strong></td>
</tr>
<tr>
<td><strong>Value shown in parentheses below regression coefficients</strong></td>
</tr>
<tr>
<td><strong>Expressed in logarithms</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>t-Statistic</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01</td>
<td>0.02</td>
<td>0.03</td>
<td>0.04</td>
<td>0.05</td>
</tr>
<tr>
<td>0.06</td>
<td>0.07</td>
<td>0.08</td>
<td>0.09</td>
<td>0.10</td>
</tr>
<tr>
<td>0.11</td>
<td>0.12</td>
<td>0.13</td>
<td>0.14</td>
<td>0.15</td>
</tr>
</tbody>
</table>

**NON-CORROBORATIVE MISREASURMENTS**

**STATE CONSIDERATION**

**ASSUMPTIONS**

**Binary Variables** 1 if:

- DISTANCE TO CBD
- LEADER
- MARKETING CAPITAL
- BUILDING SPACE
- FIXED CAPITAL
- PATENTS
- INVENTORIES
- DEPENDENT VARIABLE

**Table 5.7: ALS Estimates of the Determinants of Enterprise Profits**
5.61 In practice, the rate structure of the land charge or tax will be determined by three factors: the absolute level of location rent estimated for the highest rent zone, the rent gradient and the zone boundaries chosen. The estimation presented above suggests one possible set of choices for the first two issues, but the third factor is a judgmental decision made by the city. For the simulations carried out here, we have taken the zones as actually proposed by Jinan city officials and used the gradient presented in Table 5-4 to impute the following rate structure:

<table>
<thead>
<tr>
<th>Zone</th>
<th>Rate (In Y per square meter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>40</td>
</tr>
<tr>
<td>2</td>
<td>30</td>
</tr>
<tr>
<td>3</td>
<td>18</td>
</tr>
</tbody>
</table>

5.62 This is markedly higher than the top rates which have been proposed for Shanghai, Beijing and Jinan, and the rate actually used in Fushun.

Tax Burden Levels

5.63 To what extent would such a charge be affordable in terms of its drain on profits? Since the estimated location rents are based on a sample of commercial enterprises, would the charge confiscate all profits of industrial enterprises in the central area? To answer these questions, we have imposed the rate schedule described above on the Jinan enterprise sample.

5.64 Consider first the data for 1986 and assume that land taxes are not deductible from profit tax liability. The results presented in Table 5-8 show an average burden of less than 2 percent of retained earnings. However, perhaps the most important observation to be made from these results is the great variability. For example, the 57 enterprises in zone 2 would pay land tax equivalent to an average of only 3.5 percent of retained profits in 1986, but the standard deviation of this distribution of burdens is three times greater than the mean. Moreover, in 28 cases the land tax would have amounted to full confiscation of retained earnings. The implication of this result is less that the land use tax is erratic in the way it strikes different types of enterprises than it is that there are very wide differences in profitability. Some firms would find it quite easy to pay a market rent for their land, while other simply could not.

35/ We have used the "agglomeration adjusted" estimates and have equated the zones with Table 5-4 as follows:

<table>
<thead>
<tr>
<th>Our Sample (Kilometers from CBD)</th>
<th>Jinan Official Zone</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>1-2</td>
<td>2</td>
</tr>
<tr>
<td>3-5</td>
<td>3</td>
</tr>
</tbody>
</table>
5.65 These results make it clear that affordability will pose a real constraint to imposing a market land rent or an equivalent land tax. There are a number of ways that the affordability problem might be attacked: (i) the tax could be made a deductible item in the calculation of profit tax liability; (ii) the zones might be redrawn to include more homogeneous groupings of properties, and therefore, more tax rate classes might be allowed; (iii) "special" situation could be permitted and the land tax could be reduced in those cases; (iv) provision could be made to reassign those firms who could not afford to pay for their land; and (v) the overall tax or charge rate could be reduced.

5.66 The first of these options—deductibility of the land tax—is a likely part of government policy, and would improve the affordability situation. As is shown in the 1986 results in Table 5-8, the average tax burden would fall to less than one-half of 1 percent, and the variability in the distribution of tax burdens would be less.

5.67 The second option, to redraw the zones, is probably reasonable based on these results. This sample shows little representation in some zones and overrepresentation in others. Note that the relative variation in the distribution of tax burdens increases as we move away from the city center. One might speculate that in zones 2 and 3, the variation in enterprise type and in the potential profitability is too great. The problem with increasing the number of zones, however, is that it complicates the tax structure and increases the amount of subjective judgment used in setting the rate schedule. The third alternative, to allow for special tax rates for enterprises that cannot afford to pay for their land, encourages suboptimal land users to "stay put" and defeats one of the purposes of the land charge. Moreover, special treatment makes the application of the tax even more subjective, could increase the perception that it is unfair and could provide an additional incentive for tax avoidance. In a market economy, a part of the solution would be to relocate those firms that were not using the land in an optimal manner. This also is an objective in China, but one that seems unattainable in the short run. Still, this approach to land taxation does help the government identify explicitly the social welfare loss caused by the problematic enterprises, either due to misallocation of land, or mismanagement or other problems.

5.66 The other possibility for avoiding the affordability issue is to lower the tax rate to an almost nominal level. The justification would be that the new tax will not gain acceptance if it shocks the economic system too much upon its initial introduction, and that it should be introduced more gradually. The obvious drawback to this approach is that the revenue productivity will be lower and that enterprises will not be forced to recognize the full cost of the land that they use. These disadvantages notwithstanding, most cities experimenting with the land use charge have opted for a nominal rate level.

5.67 To illustrate the possible impact of a lower set of rates on affordability, we have re-estimated Table 5-8 using the rate structure (per square meter of land) that has been suggested for Jinan: zone 1 = Y 4, zone 2 = Y 2.5 and zone 3 = Y 1. The results, presented in Table 5-9 show that the burden of the land tax falls to a very low level, and retained profits are fully confiscated by the land tax for relatively fewer enterprises. If deductibility is allowed in this case, the land use tax virtually disappears.
Table 5-8: APPLICATION OF LAND CHARGE TO COMMERCIAL ENTERPRISES IN JINAN: LAND RENT SCHEDULE AT MARKET RATES\(^*\)

<table>
<thead>
<tr>
<th>Zone</th>
<th>N</th>
<th>Average of Variation</th>
<th>Tax as a Percent of Retained Earnings Coefficient</th>
<th>Number of Cases with Negative After Tax Profits</th>
<th>(N)</th>
<th>Average of Variation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984</td>
<td>2</td>
<td>2.88</td>
<td>47</td>
<td>2</td>
<td>2</td>
<td>0.06</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>211.45</td>
<td>863</td>
<td>19</td>
<td>36</td>
<td>0.47</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>1.735</td>
<td>374</td>
<td>113</td>
<td>147</td>
<td>-1.17</td>
</tr>
<tr>
<td>Total</td>
<td>219</td>
<td>44.84</td>
<td>1418</td>
<td>134</td>
<td>185</td>
<td>-0.83</td>
</tr>
<tr>
<td>1985</td>
<td>1</td>
<td>8.74</td>
<td>120</td>
<td>2</td>
<td>1</td>
<td>1.62</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>20.67</td>
<td>636</td>
<td>16</td>
<td>40</td>
<td>2.77</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>0.89</td>
<td>246</td>
<td>87</td>
<td>201</td>
<td>0.49</td>
</tr>
<tr>
<td>Total</td>
<td>301</td>
<td>4.29</td>
<td>1264</td>
<td>105</td>
<td>242</td>
<td>0.87</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>671</td>
<td></td>
</tr>
<tr>
<td>1986</td>
<td>1</td>
<td>2.49</td>
<td>22</td>
<td>2</td>
<td>2</td>
<td>1.84</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>3.52</td>
<td>320</td>
<td>28</td>
<td>48</td>
<td>0.94</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>1.43</td>
<td>415</td>
<td>91</td>
<td>202</td>
<td>0.37</td>
</tr>
<tr>
<td>Total</td>
<td>318</td>
<td>1.81</td>
<td>397</td>
<td>121</td>
<td>252</td>
<td>0.49</td>
</tr>
</tbody>
</table>

\(^*\)Zone 1 = 40 yuan per square meter; Zone 2 = 30 yuan per square meter; and Zone 3 = 18 yuan per square meter.
<table>
<thead>
<tr>
<th>Year (in 100)</th>
<th>2.5 Year Base</th>
<th>5 Year Base</th>
<th>7.5 Year Base</th>
<th>Total</th>
<th>10 Year Base</th>
</tr>
</thead>
<tbody>
<tr>
<td>1926</td>
<td>222 0.09</td>
<td>69 0.34</td>
<td>41 0.20</td>
<td>317</td>
<td>61 0.31</td>
</tr>
<tr>
<td>1929</td>
<td>202 0.05</td>
<td>77 0.39</td>
<td>44 0.22</td>
<td>323</td>
<td>67 0.35</td>
</tr>
<tr>
<td>1931</td>
<td>192 0.08</td>
<td>81 0.41</td>
<td>45 0.23</td>
<td>318</td>
<td>67 0.35</td>
</tr>
<tr>
<td>1933</td>
<td>180 0.07</td>
<td>85 0.42</td>
<td>50 0.25</td>
<td>315</td>
<td>66 0.34</td>
</tr>
<tr>
<td>1935</td>
<td>170 0.06</td>
<td>90 0.44</td>
<td>55 0.28</td>
<td>315</td>
<td>70 0.36</td>
</tr>
<tr>
<td>1937</td>
<td>160 0.05</td>
<td>95 0.46</td>
<td>60 0.30</td>
<td>315</td>
<td>75 0.38</td>
</tr>
<tr>
<td>1939</td>
<td>150 0.05</td>
<td>100 0.50</td>
<td>65 0.32</td>
<td>315</td>
<td>80 0.40</td>
</tr>
<tr>
<td>1941</td>
<td>140 0.05</td>
<td>105 0.52</td>
<td>70 0.34</td>
<td>315</td>
<td>85 0.42</td>
</tr>
<tr>
<td>1943</td>
<td>130 0.05</td>
<td>110 0.54</td>
<td>75 0.36</td>
<td>315</td>
<td>90 0.44</td>
</tr>
<tr>
<td>1945</td>
<td>120 0.05</td>
<td>115 0.56</td>
<td>80 0.38</td>
<td>315</td>
<td>95 0.46</td>
</tr>
<tr>
<td>1947</td>
<td>110 0.05</td>
<td>120 0.58</td>
<td>85 0.40</td>
<td>315</td>
<td>100 0.50</td>
</tr>
</tbody>
</table>

Note: The table above shows the distribution of land rent per acre in different years based on the base years provided.

Table 6.9: Distribution of Land Rent per Acre (in 100)
Revenue Implications

5.68 As a tax on the full amount of location rents (see the discussion in the above section), the land use levy would raise a significant amount of revenue for general government purposes. To estimate the magnitude of this, we have calculated the total amount of revenue that would be raised from this tax structure from the enterprises in the Jinan sample (see row 1 of Table 5-10). We then approximate total tax collections from this sample of enterprises (row 2) as total profit tax (including adjustment tax) and sales tax (including Urban Maintenance and Construction Tax, a major revenue source for urban infrastructure) collections. The relative revenue importance of the land tax then is shown in row 3 of Table 5-10. These results show that revenues from the land tax are equivalent to about one-third of total municipally-raised revenues in Jinan—assuming that the land charge is not deductible in computing profits tax liability. If we make what seems to be a reasonable assumption, that the local government may retain about 30 percent of profit and sales tax collections, then a land tax that the local government could fully retain would nearly double revenues. The revenue benefits of the land tax to local governments then are potentially very great.

5.69 This is probably a high estimate of revenue yield for two reasons. First, the rates actually applied would likely be lower, and second, the land tax would probably be deductible. The revenue cost of deductibility are estimated in Table 5-10. For example, in 1986 a deductible land tax that yielded Y 10.76 million in this sample, would cause profit tax revenues to decline by about Y 4 million, i.e., approximately a 16 percent reduction in non-land tax revenues.

| Table 5-10: REVENUE POTENTIAL OF A LAND USE CHARGE OR TAX: LAND RENT SCHEDULE FOR JINAN COMMERCIAL ENTERPRISES (in million yuan) |
|---|---|---|---|---|
| | Jinan (No Deductibility) | Jinan (With Deductibility) |
| 1. Amount Raised from Land Tax | 7.69 | 10.018 | 10.76 | 7.69 | 10.018 | 10.761 |
| 2. Amount Raised from Profit and Sales Tax | 26.1 | 31.6 | 29.7 | 21.0 | 26.1 | 25.4 |
| 3. Land Charges as a Percent of Profit and Sales Tax | 31.8 | 31.8 | 36.2 | 36.3 | 38.2 | 42.35 |
5.70 The revenue consequences of setting a lower rate—e.g. the Jinan rate schedule described above—are shown in Table 5-11. Even without allowing for deductibility, the land tax amounts to less than 3 percent of total municipal tax collections in Jinan.

Deductibility and Sharing

5.71 The remaining issue of importance is whether the land tax will be an allowable deduction from taxable profits in computing profit tax liability, and whether the revenues it generates will be shared with the central government. To illustrate the point, consider the results for Jinan for 1986 as described in Table 5-10. If there is neither deductibility nor sharing of the land tax (i.e., of the municipal government can fully retain the land tax), then land taxes would be 36.2 percent of total municipal revenue collections. If the municipal government retains 30 percent of profit and sales taxes collected, the land tax would double local revenues.

5.72 If on the other hand, the land tax is deductible and if the municipal government may retain only one-half of the land tax proceeds, and if one-third of all other taxes may be retained, then the municipal government will have very little revenue increase from imposition of the land use tax. The situation is this: (i) Jinan would have received Y 10.7 million in land tax revenue in 1986, but would have retained only Y 5.45 million; and (ii) the retained share of other revenues would have fallen by Y 1.3 million because of deductibility (from Y 8.9 million to Y 7.6 million). The net increase from the land tax, then, is only about Y 4 million. The implication here is that a much higher statutory rate would be necessary to reach a given revenue target under these conditions.

<table>
<thead>
<tr>
<th>Table 5-12: REVENUE POTENTIAL OF A LAND USE CHARGE OR TAX: NOMINAL TAX RATES, JINAN COMMERCIAL (in million yuan)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jinan (No Deductibility)</td>
</tr>
<tr>
<td>1. Amount Raised from Land Tax</td>
</tr>
<tr>
<td>2. Amount Raised from Profit and Sales Tax</td>
</tr>
<tr>
<td>3. Land Charges as a Percent of Profit and Sales Tax</td>
</tr>
</tbody>
</table>
CHAPTER VI
UNRESOLVED ISSUES

6.01 As the government moves towards establishing a land use tax in the near future, there are a number of unresolved issues. The more important of these are:

- How will the rate structure be determined?
- Will local governments be given the right to set the rate on this tax?
- Will the revenues be shared?
- What pattern of tax or charge burden does the government intend?
- How will the revenue elasticity be assured?
- Is the government prepared to carry the administrative burden?

A. Determining the Annual Rent or Tax Rate

6.02 The government has in mind a land tax model that would seem to fit commercial enterprises reasonably well, but as shown above, is not readily applicable to industrial enterprises. Consider the hypothetical situation described in Figure 6-1. The commercial rent gradient assumed is much like the one estimated here for Jinan and Yantai, i.e., the contribution of land to profitability is highest in the city center and drops as enterprises are located farther away. Now let us assume an industrial rent gradient that rises as locations are farther away from the CBD, because of the availability of more space, freedom from congestion and perhaps access to better transportation facilities. If the tax rate for all enterprises is based on the commercial rent gradient, industrial enterprises will be "overtaxed" at locations inside B kilometers from the CBD and "undertaxed" at locations more than B kilometers from the CBD.

6.03 This situation creates no problem at distances from the CBD such as A. The tax imposed on the manufacturer at this point is AA", even though the land is contributing only AA' to profits. Economic efficiency and the profitability of the manufacturing firm would be served by movement to a farther out location. This would make room for a commercial enterprise who will make a more profitable use of the land (presumably the productivity of land would rise to AA"). Barring any important externality effects, it is in the interest of society for the industrial enterprise to pay the heavier tax to compensate for the undesirable land use it has created by locating at A.

6.04 The story is different for a location at C. Here the commercial rent gradient would dictate a tax of GC' for a manufacturer, even though the contribution of land to profits is much higher. In this case the true rent would be GC", and the enterprise is receiving a subsidy of C'C" relative to commercial enterprises. For example, if the government had built a railhead at point C, the benefiting industrial firms would not be asked to pay for the enhanced productivity of the C location.
FIGURE 6-1

RENT GRADIENTS: COMMERCIAL AND INDUSTRIAL ENTERPRISES

Rent (in yuan per square meter)

Distance from CBD (km)
6.05 In fact, the proper rent curve in this example is \(A'B'C'\), where the contribution to profits in the highest use of land is observed.

6.06 This problem has been recognized by those working on the design of the land use tax, though perhaps not exactly in this way. The expressed concern is that certain noncommercial firms could not afford to pay the same rate of tax as commercial firms, especially in the CBD. The proposed remedy is to set up a classified rate schedule where certain types of firms located within the same taxing zone are given a preferentially-lower rate. This is probably not a good solution to the problem, because exactly one objective of the land use charge is to gain a more efficient distribution of land use. To subsidize inefficient uses defeats this purpose.

6.07 Perhaps the biggest problem is how to estimate the rent gradient on which to base the land use tax. The illustrative curves described in Figure 6-1 show the separate contribution of land to profitability, i.e., independent of all other factors that affect profitability. The effort made here for Yantai and Jinan suggests that the necessary quantitative analysis to properly estimate a curve such as \(A'B'C'\) for every Chinese city is probably infeasible. The analyses presently underway in at least Shanghai and Beijing either do not take non-land factors into account and concentrate solely on gross profitability gradients, and/or they propose to establish the rate structure solely on the basis of commercial profitability.

6.08 If the econometric approach is ruled out, this leaves the possibility of judgmentally defining zones and relative tax rates, as is now being done in the experiments underway in over 100 Chinese cities and counties. Given the way the tax is to be structured, i.e., it is not to be an ad valorem tax on land value, this is probably the better approach. However, experience in many countries around the world has taught the lesson that the simpler the structure, the better the possibilities for efficient and fair administration. A reasonable approach might be a flat per square meter rate in each zone, with no preferential treatment within the zone, and a definition of zones and rate graduation across zones based on "expert judgment."

B. Constraints to Land Use Effects

6.09 One intention of the land use charge or tax is to induce a more efficient distribution of land use. In principle, enterprises in suboptimal locations--such as an industrial firm at location B in the example above--would sell their user rights and move beyond point B. However, in present-day China there is no mechanism for enterprises to be mobile. There is no land market, nor is it possible for an enterprise to sell or trade its user rights at a market value. All land and location value belong to the state and a relocating enterprise would receive compensation only for its structure. Moreover, even if there were a mechanism whereby enterprises could relocate and sell their user right, it is not clear that the government intends to set the tax rate at a high enough level to induce relocations. In fact, both conditions must hold for the land use tax or charge to have the desired allocative effects: the tax rate must be sufficiently high and the firms must be able to sell their user right and receive value for location rents as part of the relocation process.
6.10 Another problem arises because there is now the beginning of a land market in parts of China. Both leasing of land and bidding for land are being undertaken on an experimental basis, and market land rents are being established. This will solve the problem of determining the proper land rent, but it will be many years before a full land market is operative in China. The problem is what to do about the available evidence on market rents. Should properties leased at market rents or won through bids be taxed or charged at these market rents? Should the evidence obtained in these land transactions be used to establish a more true set of market rents in urban areas? Or should this new evidence be ignored and judgment be used in establishing rent gradients and nominal levels of the land use tax or charge?

6.11 Clearly the type of econometric methods suggested in this study can only be treated as a transitory means that bridges the time when there is no land market and there one. Should this method be adopted, there will be a need to adjust the rates regularly (perhaps annually) to reflect the best knowledge on land rents. Perhaps over the long run, as the market information is greatly improved, the rates based on the zonal concept will be abolished, and new rates that based on individual properties will be established.

C. Who will Set the Rent or Tax Rate Level

6.12 A second issue to be resolved is the extent to which the local governments will be given some freedom in setting the rate of tax or the rent. This raises many issues. Certainly, there are great advantages to the decentralized solution, i.e., giving local governments some autonomy in determining the rate at which local taxes will be levied. This brings government decisionmaking closer to the people, and if the benefits from expenditure of these revenues can be demonstrated, can lead to a greater willingness to pay and a greater local tax effort. Anyway, the property tax is very difficult to administer in the best of cases and it is almost uniquely suited to be locally administered because of the familiarity of local officials with the pattern of local land use and with the local enterprises. The result will be less uniformity than now exists and perhaps the tax rate will be higher in larger cities where the costs of providing public services is greater. Many would see this as an advantage in that certain resident would be paying the higher marginal costs associated with living in larger cities.

6.13 On the other hand, there are some good reasons to keep the rate setting powers at the central government level. First, it would not break precedent, i.e., the rates on even local taxes are now set at the central government level. Second, central rate setting would assure that all Chinese faced the same set of property tax rates, or at least that any differentials were planned by the government. Third, if the government is to use the tax system as a lever to influence economic activity, it must have the ability to control the relative level of tax rates.

6.14 Finally, there is the question of whether this will be a land use tax or a rent charged to enterprises for the use of state land. In the latter case, one might suppose that the rent would be charged by the owner of the enterprise in the case of state-owned firms and by local governments in the case of collectives and privately-owned enterprises.
6.15 If the decision is to levy a land use tax, then one middle ground might be to have the central government specify a range of average rates and allow the local government to choose a rate within this range. Since only the local government is in a position to fix the taxing zones, the relative rates will be determined locally.

D. Should the Revenues be Shared?

6.16 The central government feels strapped for revenues and might see the land tax as an additional source of funds. Moreover, the central government can argue a legitimate claim to a portion of the tax to the extent it is meant to be compensation for the use of state land.

6.17 There is perhaps a more compelling argument to designate the land tax as a local revenue and to allow the local government to retain it all. One point is that the revenue amount is not likely to be very large by comparison to the other possible sources for the central government. In addition, the local governments will have less incentive for levying a higher tax rate or for stricter enforcement if they cannot retain all of the revenues.

E. Who will pay the Land Use Charge or Tax?

6.18 Enterprises will pay the land tax bill but, of course, an enterprise cannot bear the burden of a tax. Under one scenario, the enterprise will change its location and avoid a portion of the tax. However, this is not likely at present because of the difficulties in moving to new locations. This means that the enterprise will pay the land charge or tax but will shift the burden to consumers or to labor.

6.19 One possibility is that the tax amount will be marked-up into the price and shifted forward to consumers. In this case the tax will be borne disproportionately by those who consume products produced or sold by enterprises located in higher tax zones. If the price of the product cannot be increased, the tax will be shifted backward in the form of a reduction in retained earnings. The eventual burden of the tax will depend on the disposition of retained earnings among wage bonus, employee benefits, and capital investment to expand enterprises operations. To the extent retained earnings are spent for the first two purposes, enterprise workers will bear the burden of the tax. One might see the land tax as a transfer from some combination of consumers of enterprise products and from enterprise workers to beneficiaries of general public services. It is important to note that the choice of zones and of the relative level of tax rates effects the relative distribution of tax burdens and the nature of this transfer.

6.20 The revenue yield from the land tax is not likely to be large at rates presently under discussion. The suggested rates in Beijing and Shanghai imply that the land tax will be an insignificant source of revenues. Many officials acknowledge this, but argue that it is necessary to begin with a nominal tax to get the taxpaying public accustomed to the idea, and later, a more substantial rate could be introduced.
6.21 Another dimension of the revenue-raising goal of the land is its elasticity, or the way revenues grow in response to local income growth and/or inflation. Ideally, the yield of a tax will respond automatically to price level and income growth in the same way as do the public expenditures which they finance. The land tax, however, will produce a constant amount of revenue, and under the structure envisioned, the yield will not grow at all unless the government takes discretionary actions. This raises a problem in the design of the tax. If the legal rate is increased periodically to raise additional revenues, the property tax will be an unpopular levy and government will be hesitant to announce the increases. The pressure not to increase the rates may be especially great if local governments have rate setting powers. Another problem is how often will the taxing zones and relative rate levels be changed, because these too affect the elasticity of the land tax.

6.22 One way around this set of problems might be to index the tax rates to the general rate of inflation, perhaps with a 1-year lag. It could also be provided for the local governments to redraw the zones and change the relative tax rates once every five years.

6.23 A more difficult problem arises with respect to the intergovernmental dimension of the land use charge or tax. Even if the local government is allowed to set the rate and retain all of the collections, there are two problems that may dampen the revenue yield. One is that the provincial government may choose to offset the increment in revenues that accrues to the more prosperous governments, by simply reducing their retention rate on the sales or profits tax. The second problem is that if the central government permits deductibility of the land use tax or charge, then the increment in land use tax revenues will be partially offset by reductions in profit tax revenues. Both of these are serious problems that will have to be dealt with in the design of the land tax.

6.24 Administration will be a major problem in the implementation of a land use charge or a land use tax. A full cadastre of properties and liable land users will be required. Moreover, it will be required to keep these records up to date, including records on the type of structure on each parcel of land. There were mixed responses from Chinese government officials about whether such records were available for most cities in China. To the extent they are not, there is no existing tax roll, and much preparatory work remains to be done before the land use charge or tax can be implemented. There is also the question of who will be responsible for the collection of the tax and what enforcement methods might be used.

6.25 On the question of whether records are presently adequate to implement the land use tax, the government should do a thorough survey. Moreover, the possibilities of computerization and tying the land use charge to the enterprise sales and income taxes should be investigated, at least for the larger- and middle-sized cities. On the question of collections, a good case can be made to leave the collection responsibilities to the local tax bureau. They already collect a sales and profit tax from each enterprise and have a payment, collection and recordkeeping system in place.
6.26 It would be a mistake not to recognize that the land use tax will impose a substantial administrative burden on the local government administration. Even if the tax roll is in place and there is a full cadastre, the local government will have responsibility for maintaining this roll and updating all information. This involves assuring that the system of building permits works efficiently and finding a way to police for illegal construction. Maintenance of the land use tax also implies that, periodically, local officials will re-establish the zones and relative levels of tax or rent. The administrative cost of the land use charge or tax, relative to the revenue yield at rate levels presently envisioned, will almost certainly be substantial. Yet, it is important for the government to do a thorough analysis of the administrative costs of the tax and to determine the tradeoff between these costs and further simplification of the methods proposed.
THE YANTAI SAMPLE

Yantai is a port city located on Jiadong peninsula in Shandong Province. It is bordered by mountains to the South and the Yellow Sea in the north, and the population development is linear—out from a single city center. Yantai is a growing industrial city and is now one of the 20 cities in China with an annual industrial output above CY10 billion.

Yantai is classified as a Provincial City. The municipal administration governs two sub-districts, i.e., Zhi Fu and Fu Shan, ten counties and three towns. The total land area of the City Region is 18,993 square kilometers. The total population of the City Region is 8.2 million, of which 770,000 is non-agricultural population. The latter corresponds roughly to the population of the City Proper. According to a year-end survey in 1984, the population of the built-up urban area was 296,000: 275,000 in Zhi Fu sub-district and 21,000 in Fu Shan sub-district.

Two-thirds of the population is in the labor force and about one-half of all employment is in basic activities. The makeup of the economic base of the area reflects its richness in agricultural products: fruits (principally apples and grapes), peanuts and seafood products. The industrial base is dominated by agricultural production and food processing. The total GNP in the city is CY18 billion, of which CY14 billion is industrial and agricultural output. The per capita income in the city region is CY340 and in the city proper is CY1,070.

No data are available on an exact distribution of employment by sector, but in terms of total product, food processing would appear to be the most important industrial activity. Beer, wines, canned foods and seafood processing are dominant sub-sectors. There is a substantial production of heavy machinery, e.g., refrigeration equipment and combustion engines. Among the largest employers are a chemical plant, several textile firms, a clock and watch producer and a lock production enterprise.

The commercial sector is typical, with a normal mix of retail shops, services and restaurants. The commercial sector is heavily concentrated near the port area in what is generally thought to be the center of the city.

Land use in Yantai, summarized in Table I-1, shows that about one-third of the built-up area is allocated to each of residential, commercial and industrial use. The ratio of urban to suburban land area is 1:24.

Sample Design

Several conditions were imposed on drawing the sample of enterprises. First, since both industrial and commercial enterprises can earn location rents, the survey was designed to include both types. Residential housing is excluded because the data work required to estimate
true market rents was well beyond the scope of this effort. Second, the sample was to cover the whole of the built-up area, since the goal is to estimate an urban land rent gradient. The outlying areas of the City Region are essentially rural and are excluded here on grounds that there will not be substantial variation in the location rents. Third, the sample is stratified by size—it includes both large and small enterprises—as well as by ownership—both state-owned and collectives. Privately-owned firms are excluded from the sample because they are small and because their books of account are not up to the standards required to complete the survey instrument. Fourth, data for three years are drawn for each enterprise in order to separate normal from irregular behavior.

Table 1-1: YANTAI: PRESENT URBAN LAND USE

<table>
<thead>
<tr>
<th>Category</th>
<th>Total (in m²)</th>
<th>Zhi Fu</th>
<th>Fu Shan</th>
<th>Land Use Per cent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Per Person of Total</td>
</tr>
<tr>
<td>Residential</td>
<td>1147.2</td>
<td>481.08</td>
<td>38.8</td>
<td>33.1</td>
</tr>
<tr>
<td>Housing</td>
<td>551.3</td>
<td>69.50</td>
<td>18.6</td>
<td>15.9</td>
</tr>
<tr>
<td>Public Buildings</td>
<td>183.5</td>
<td>6.2</td>
<td>3.5</td>
<td>3.0</td>
</tr>
<tr>
<td>Road and Squares</td>
<td>310.0</td>
<td>10.5</td>
<td>3.5</td>
<td>3.0</td>
</tr>
<tr>
<td>Green Space</td>
<td>102.4</td>
<td>3.5</td>
<td>3.5</td>
<td>3.0</td>
</tr>
<tr>
<td>Industrial</td>
<td>1022.9</td>
<td>923.99</td>
<td>34.6</td>
<td>29.5</td>
</tr>
<tr>
<td>Storage and Warehouse</td>
<td>526.1</td>
<td>513.06</td>
<td>17.8</td>
<td>15.0</td>
</tr>
<tr>
<td>Intercity Traffic</td>
<td>300.9</td>
<td>298.20</td>
<td>10.2</td>
<td>8.7</td>
</tr>
<tr>
<td>Non-municipal-owned Administration</td>
<td>28.4</td>
<td>1.0</td>
<td>1.0</td>
<td>0.8</td>
</tr>
<tr>
<td>Public Enterprise</td>
<td>25.2</td>
<td>0.8</td>
<td>0.8</td>
<td>0.7</td>
</tr>
<tr>
<td>Educational and Research Institute</td>
<td>109.6</td>
<td>3.7</td>
<td>3.7</td>
<td>3.2</td>
</tr>
<tr>
<td>Reception Place</td>
<td>89.0</td>
<td>3.0</td>
<td>3.0</td>
<td>2.6</td>
</tr>
<tr>
<td>Fishery</td>
<td>27.6</td>
<td>0.9</td>
<td>0.9</td>
<td>0.8</td>
</tr>
<tr>
<td>Other</td>
<td>194.3</td>
<td>6.6</td>
<td>6.6</td>
<td>5.6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3471.2</strong></td>
<td><strong>117.4</strong></td>
<td><strong>100.0</strong></td>
<td></td>
</tr>
</tbody>
</table>

Source: Data supplied by Yantai Economic Research Center.

In fact, all of these conditions were not met so precisely as we would like. Most important, neither we nor Yantai officials know the exact total number of enterprises of each type in the built-up area of the city, hence it is not possible to scientifically choose a sample size in each strata. To complicate matters further, there was (not unexpectedly) a significant proportion of non-responses. In some cases, the non-response is

1/ Such an analysis is presently underway in Yantai, which is one of the experimental cities for China's rent reform.
due to the fact that enterprises are still in a period of adjustment to the
system reform, and the survey questions were not understood in this new
context. Enterprises have merged, closed, formed associations, started
operations, expanded, relocated, etc., as the new incentives have been
introduced. Moreover, the switch from a profit-remittance system to a
profit-tax occurred only in 1983 and many firms were still in transition
during our sample period (1984-1986). In addition, the accounting records
of some enterprises are not complete.

In the absence of data on even the total number of enterprises in
the sample area (the built-up area), it is not possible to select a sample
size in a scientific way. Yantai officials estimated a total of 2,800
industrial enterprises and 9,000 total enterprises in the entire City
Region. The great proportion of the non-industrial firms (over 90 percent)
were thought to be very small. Given this limited information, and time and
resource constraints, it was decided to plan for a non-response of about 20
percent and send off 400 survey forms.2/

Drawing Samples

Once the sampling rules were established, the CASS team took
responsibility for drawing the sample. The City Economic Research Center
(ERC) provided a "master" list from which 400 enterprise names were randomly
drawn, subject to the stratification described above. The ERC then mailed
the survey instrument together with an instructional sheet to each
enterprise. There were two follow-ups: after 30 days, the ERC mailed a
reminder, and after another 30 days, CASS and ERC officials made site visits
to urge compliance from the remaining non-respondents. The final result was
responses from 307 enterprises.

Each enterprise was asked to provide data for three consecutive
years: 1984, 1985 and 1986. This gives a total of 921 possible "records,"
where a single record is one year's data for one enterprise. Many
enterprises actually ceased or began operations during this period, hence
there may have been only one or two years of data to report. The convention
was adopted of recording enterprise data for the number of years reported.

The returned questionnaires were of uneven quality, and even
responses within a single questionnaire varied in terms of their
correctness. To serve the minimal analytical purpose, a criterion was
established to judge whether a record is "usable." A "usable" record is
defined as one that contains correct responses in all of the following six
sets of variables: total profit, total cost, total sales, total land area,
net asset value and total workers. By this criterion, we have 650 usable
records. These are reported by sector, year and zone in Table I-2.

2/ For various reasons, only 388 survey forms were actually sent.
The remainder of the records may still be usable, in the sense that they can be used to find the average size of the firms, average land consumption of firms, etc., but for the purpose of estimating the impact of space and location using the model above, we can only count on only 650 records (a little more than 200 enterprise responses for each year).

Not all of the required data could be obtained from the questionnaire, and some basic data had to be assembled. Most important, it was necessary to locate every enterprise in the sample on a scale map. CASS officers carried out this task and also located major streets, bus routes and "key points" (port, railheads and CBD center) on this same scale map.

The Survey Instrument

The survey instrument (Appendix III) is an abbreviation of the income statement typically reported by a Chinese enterprise, plus some additional questions about land, labor and capital funds. The survey intention was to gather data in four areas: cost structure, gross and net profitability, the use of retained earnings and input structure. As is discussed below, there arose some problems with the interpretation of the responses, and it was necessary to make some adjustments.

<table>
<thead>
<tr>
<th>Table I-2: YANTAI: SUMMARY OF THE USABLE RECORDS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Usable Records</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Industry</td>
</tr>
<tr>
<td>Commerce</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Cost Structure

Each enterprise was requested to provide information on total cost and key components of cost.\(^3\) Enterprises responded in different ways to this question, and the major problem was to sort out the internal inconsistencies and make appropriate adjustments in the data. A "correct"

\(^3\) Only certain cost components were requested and there was no "other" category specified on the survey instrument.
response was one in which the reported components ($\tilde{C}_i$) summed to less than reported total cost ($\tilde{TC}$) and the reported total cost number, $\tilde{TC}$ could properly be subtracted from total reported taxable revenues ($\tilde{TR}$) to obtain reported gross profits ($\tilde{\pi}$) Algebraically:

$$\sum_{i} \tilde{C}_i < \tilde{TC} \quad \text{and} \quad \tilde{TR} - \tilde{TC} = \tilde{\pi}$$  (I-1)

Of the 812 records where the composition of costs was reported, only 56 passed the test for correctness suggested above.

Of those enterprises not passing the test, 46 records reported total cost to be less than the components of total cost and the profit computation was incorrect, i.e.,

$$\sum_{i} \tilde{C}_i \leq \tilde{TC} \quad \text{and} \quad \tilde{TR} - \tilde{TC} \neq \tilde{\pi}$$  (I-2)

The solution in this case was to take $\sum_{i} \tilde{C}_i$ as the best available estimate of total cost and to ignore $\tilde{TC}$. The remaining 710 records reported total costs to be greater than the reported components, i.e., some components of cost were omitted. In these cases, total reported costs were taken to be true total costs.

The general rule followed in adjusting the cost data, then, is

$$\tilde{TC}' = \max(\tilde{TC}, \sum_{i} \tilde{C}_i)$$  (I-3)

where

$$\tilde{TC}' = \text{estimated true total cost}$$

This rule for estimating total costs, however, is only a first iteration since it is also necessary to insure that true total costs match reported profits. This adjustment is taken up in the next section.

**Profitability**

For each enterprise total profitability ($\pi$) should be equal to the identity

$$\tilde{TR} - \tilde{ST} - \tilde{TC} = \pi$$  (I-4)

where

$$\tilde{TR} = \text{total sales}$$
$$\tilde{ST} = \text{sales tax payment}$$

---

4/ We use, e.g., $C_1$ to denote the "reported" cost for category i and $\tilde{C}_i$ to denote the true cost.
This identity did not hold in most of the reported data. Only 88 of the 781 usable "profit" records reported data that conformed to this identity. The first step to correct these data was to include the "adjusted" total cost information as described above. Hence, for the remaining 692 enterprises we estimated \( \pi' \) as

\[
\tilde{\pi} = TR - ST - TC' = \pi' \tag{I-5}
\]

and compared \( \pi' \) with \( \tilde{\pi} \).

The results still show a discrepancy: in 296 cases, reported profits are "too high" and 397 cases reported profits are "too low." Unless there is clear evidence to the contrary, we take the position that reported profits are correct and calculate

\[
\tilde{\pi} = \hat{\pi} = TS - ST - TC' + R_1 \tag{I-6}
\]

where

\( R_1 \) = a "balancing" residual.

If \( R_1 \) is positive then the implicit assumption is that some component of taxable revenues has been left out of the reported data or that the enterprise received some form of non-taxable subsidy that increased its profit rate. Neither of these possibilities would be unusual. If \( R_1 \) is less than 0, then the conclusion is that total costs were somehow understated or that all sales taxes were not fully reported. Particularly, the first case is a plausible explanation, e.g., there may have been some confusion over how to report costs associated with mergers or supplier contracts.

**Gross and Net Profits**

Retained profits \( (R\pi) \) should equal the difference between gross profits and profit taxes, i.e.,

\[
R\pi = \pi - \piT - AT - ET \tag{I-7}
\]

where

\( \piT \) = profits tax
\( AT \) = adjustment tax
\( ET \) = energy and transportation fund contribution

For the 720 records on which this identity could be reported, it was reported correctly in 109 cases. In 177 cases, reported retained earnings was greater than calculated retained earnings, i.e.,

\[
\tilde{\pi} > \hat{\pi} - \tilde{\piT} - \hat{AT} - \tilde{ET} \tag{I-8}
\]
and in 434 cases reported retained profits was lower. This is a plausible result hence we assume that reported retained profits are correct and estimate

\[ \tilde{R} = \tilde{\pi} - \tilde{\pi}T - \tilde{\pi}T - \tilde{\pi}T + R_2 \] (I-9)

where

\[ R_2 = \text{a balancing item.} \]

Where the balancing item is positive, the implication is that taxes were for some reason underreported or that a tax preference was given to the enterprise. Another possibility is that some firms counted draws from existing balances in total retained earnings. If the balancing item is negative, the conclusion is that there were additional taxes, or some other deduction from gross profits, that were not reported in the questionnaire.5

Composition of Retained Earnings

The survey sought to determine the disposition of retained earnings for each enterprise. The possible uses of retained earnings by an enterprise are employee benefits \((U_1)\), wage bonus \((U_2)\), and capital reinvestment \((U_3)\); hence

\[ R_n = U_1 + U_2 + U_3 \] (I-10)

if the enterprise uses its retained earnings fully. In fact, of the 588 usable records, 399 reported data that would satisfy this identity. For the remainder, we define

\[ \tilde{R} = \tilde{U}_1 + \tilde{U}_2 + \tilde{U}_3 + R_3 \] (I-11)

where

\[ R_3 = \text{a balancing item.} \]

We make the following assumptions. Where the balancing item is positive, the enterprise made a contribution to its cash balances to be used in a future year. Where the balancing item is negative, the enterprise drew from existing balances to increase its level of spending on \(U_1\), \(U_2\) or \(U_3\).

Summary

A summary of the full set of assumptions required to balance these financial data is reported in Table I-3. The believability of the Yantai

---

5/ One problem with the questionnaire was that it did not leave an "other" category for many of the questions. For this reason, there may have been incomplete responses to the questions.
analysis largely turns on whether the balancing items are a proper adjustment or whether the basic problems is simply that the survey instrument is flawed and therefore the enterprise responses cannot be corrected. Taking the former position—as we must—it might be reasonably argued that such residuals are necessary to reflect the almost individualistic treatment of enterprises. Subsidies are given, firms are subject to special taxes and to tax preferences, input and output prices are determined in different ways for different firms, and there is negotiation over most financial matters between the enterprise sector and the general government sector.

Table I-3: SUMMARY OF ASSUMPTIONS

<table>
<thead>
<tr>
<th>Item</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Sales</td>
<td>as reported</td>
</tr>
<tr>
<td>less: Sales Tax</td>
<td>as reported</td>
</tr>
<tr>
<td>less: Total Cost</td>
<td>max ((\bar{Tc}), (\bar{C}))</td>
</tr>
<tr>
<td>plus: Residual (B₁)</td>
<td>subsidy if positive, unreported cost if negative</td>
</tr>
<tr>
<td>equals: gross profits</td>
<td>as reported</td>
</tr>
<tr>
<td>less: profit taxes</td>
<td>as reported</td>
</tr>
<tr>
<td>plus: residual (B₂)</td>
<td>tax preference if negative, additional tax if positive</td>
</tr>
<tr>
<td>equals: retained earnings</td>
<td>as reported</td>
</tr>
<tr>
<td>Exhibit: residual (B₃)</td>
<td>savings if positive, drawdown if negative</td>
</tr>
</tbody>
</table>

The Composition of Responses

Three zones were defined for this analysis. All are contained within Zhi Fu sub-district, which was chosen as survey region. Zhi Fu sub-district is the center of industry, business, traffic, tourism and education in Yantai and contains about 90 percent of the population of the built-up area.

Zhi Fu was divided into three zones according to the degree of economic development: commercial business, vehicle, bicycle and pedestrian traffic, population density, purchasing power of residents, and development of infrastructure. This was done by the CASS team, assisted by the relevant departments and experienced personnel in Yantai, and was based on both
empirical evidence and expert judgment. The inner zone (zone 1) is essentially the central business district. Its economic base includes government offices as well as commercial and service enterprises. Because of its nearness to the Port it also includes a concentration of food processing enterprises. Public infrastructure is relatively well developed and transportation is convenient due to the location of a railway station and because major bus lines pass through this area. The other two zones (zones 2 and 3) are more suburban in nature.

Next, the master enterprise was divided into industrial and commercial in each of the three zones. The composition of the sample reflects these proportions, e.g., the zone 1 sub-sample was stratified to include a greater proportion of commercial enterprises. The stratification called for the opposite proportions in the more industrialized zone 3.

There also were questions of choosing the sample according to ownership and size of firm. Most of the large enterprises are state-owned, but medium and smaller sized industrial enterprises are often collective-owned. This problem was dealt with in two ways. First, there are relatively few large and medium-sized commercial enterprises and all were included in the sample. Second, most commercial enterprises are collectives and that there are more state-owned than collectively-owned industrial enterprises. We simply drew the sample randomly and hoped for a representative mix.

The composition of the sample is described in Table I-4. The result suggests that the sample is representative. In terms of enterprise record, there are approximately three times as many commercial as industrial observation in Zone 1 and the reverse is true in zone 3. Approximately 54 percent of the total sample and 61 percent of the commercial sample is collectively-owned.

This arbitrary method of classification is defensible for two reasons. One is that it is based on the expert judgment of officials who have a long familiarity with the City. The other is that this is precisely the method being used in the "experimental cities" to identify tax zones.
### Table 1-4: YANTAI: NUMBER OF ENTERPRISE RECORD IN THE POOLED THREE-YEAR SAMPLE: BY ZONE, SECTOR AND OWNERSHIP

<table>
<thead>
<tr>
<th>Zone</th>
<th>Number</th>
<th>Percent/a</th>
<th>Number</th>
<th>Percent/a</th>
<th>Number</th>
<th>Percent/a</th>
<th>Number</th>
<th>Percent/a</th>
</tr>
</thead>
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<td></td>
</tr>
<tr>
<td></td>
<td>Commercial</td>
<td></td>
<td>State-owned</td>
<td></td>
<td>Collective</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Zone 1</td>
<td>231</td>
<td>74.0</td>
<td>159</td>
<td>46.1</td>
<td>36</td>
<td>16.2</td>
<td>426</td>
<td>48.5</td>
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<tr>
<td>Zone 2</td>
<td>159</td>
<td>46.1</td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Zone 3</td>
<td>36</td>
<td>16.2</td>
<td>261</td>
<td>61.3</td>
<td></td>
<td></td>
<td>618</td>
<td>69.8</td>
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<tr>
<td>Total</td>
<td>312</td>
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<td>480</td>
<td></td>
<td>219</td>
<td></td>
<td>781</td>
<td></td>
</tr>
<tr>
<td></td>
<td>35.5</td>
<td></td>
<td>39.2</td>
<td></td>
<td>25.2</td>
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</tr>
</tbody>
</table>

/a Parenthesis indicates percent of subtotal.
APPENDIX II

SURVEY INSTRUMENTS

Yantai: Urban Enterprise Location and Land Use Survey
Questionnaire (Commerce)

Unit: Money--CY10,000; Area--Square meter

Name of the Enterprise: [Blank]
Address: [Blank]
Industry/Sector: [Blank]
Date of Establishment: [Blank]
Ownership: [Blank]
Zone the enterprise located: [Blank]

1. General Information

A. Number of Employees
B. Number of Temporary Employees
C. Fixed Assets
   - Original value
   - Net Value
D. Circulation Funds
E. One Location or More
F. Scale (Large, medium or small)

2. Revenue, Cost and Taxes

A. Gross Output
B. Total Sales
C. Sales Taxes (Incl. UMCT, Education surcharge, etc.)
D. Cost
   Of which:
   - Wages
   - Deductible Wage Bonus
   - Raw Materials
   - Depreciation
   - Energy and PU Fee
   - Interest
   - Effluent Charge
   - Other tax
E. Total Profit
F. Profits Tax
G. Adjustment Tax
H. Central Energy & Transportation Funds
I. Retained Profits
   - Production Development
   - Reserved Funds
   - New Products Development
   - Employees' Welfare
   - Wage Bonus
   - Wage Bonus Tax
3. Land Use Information

A. Total Land Area
B. Total Building Area
   - Productive
   - Non-Productive
Yantai: Urban Enterprise and Land Use Survey
Questionnaire (Industry)

Unit: Money--CY1,000; Area--Square Meter
(All the data should be year-end numbers)

No. 

General Information

Name of the enterprise: ________________________________
Address: ________________________________
Date of Establishment: ________________________________
Scale (Circle one): Large, Medium, Small, Unknown
Ownership (Circle one):
   SOE: Central, Provincial, Municipal, Other
   Collective: Provincial, Municipal, Sub-City, Other
   Private, Joint-venture, Other (such as coops)
Type of Business (Circle one)

A. Firm Size information

   a. Number of workers (1)
   b. O/w: contract and temporary employees (2)
   c. Gross output (3)
   d. Fixed assets, original value (4)
   e. Fixed assets, net value (5)
   f. Total Circulation funds (6)
   g. O/w: Self-owned circulation (7)

B. Gross Revenue (8) = (9) + (10)

   a. Total sales revenue (9)
   b. Other revenues (10)

C. Total Cost (11) = (12) + ... + (17)

   a. Wages (12)
   b. Raw materials and fuel (13)
   c. Depreciation (14)
   d. Property tax, license tax, etc. (15)
   e. Interest (16)
   f. Other expenses counted as cost (17)
D. **Sales Taxes and Fees** \((18) = (19) + (20) + (21)\)
   
   a. "Three taxes" \((19)\)
   b. UMCT \((20)\)
   c. Other taxes and fees \((21)\)

E. **Other Expenses** \((22)\)

F. **Total profits** \((23) = (8) - (11) - (15) - (22)\)

G. **Loan Repayment and Two Retained Earnings** \((24)\)

H. **Profits Subject to Tax** \((25) = (23) - (24)\)

I. **Profits Tax** \((26)\)

J. **Adjustment Tax** \((27)\)

K. **Retained Earnings** \((28) = (25) - (26) - (27)\)

L. **Balance from Last Year's Retained Earnings** \((29)\)

M. **Grant Transfer from Governments** \((30)\)

N. **Net Retained Earnings** \((31) = (28) + (29) + (30)\)

O. **Allocation of the Net Retained Earnings** \((32)\)

   a. Production development \((33)\)
   b. Employee's welfare \((34)\)
   c. Wage bonus \((35)\)
   d. Reserved funds \((36)\)
   e. New products development \((37)\)
   f. Central E&T fund \((38)\)
   g. Other \((39)\)

P. **Balance of This Year** \((40) = (31) - (32)\)

Q. **Land Use Information**

   a. Total land area \((41)\)
   b. Building ground floor area \((42)\)
   c. Total building area \((43)\)
      - O/w: Productive \((44)\)
      - Non-productive \((45)\)
   d. Number of location \((46)\)
Jinan: Urban Enterprise Location and Land Use Survey
Questionnaire (Commerce)

Unit: Money--CY1,000; Area--Square Meter
(All the data should be year-end numbers)

General Information

Name of the enterprise: ________________________________
Address: ____________________________________________
Date of Establishment: _________________________________
Scale (Circle one): Large and Medium, Small, Unknown
Ownership (Circle one):
  SOE: Central, Provincial, Municipal, Other
  Collective: Provincial, Municipal, Sub-City, Other
  Private, Joint-venture, Other (such as coops)
Type of Business (Circle one):
  1. Commerce; 2. Restaurants; 3. Services

A. Information on Firm Size 1984 1985 1986
   a. Number of workers (1)
   b. O/w: contract and temporary workers (2)
   c. Fixed assets, original value (3)
   d. Fixed assets, net value (4)
   e. Total circulation funds (5)
   f. O/w: Self-owned circulation (6)

B. Sales Revenue (7)

C. Ordering Cost (8)

D. Gross Sales Profit (9) = (7) - (8)

E. Circulating Cost (10)

F. Sales Taxes and Fees (11) = (12) + (13) + (14) + (15) + (16)
   a. Operating tax (12)
   b. UMCT (13)
   c. Property tax (14)
   d. Vehicle license tax (15)
   e. Other taxes and fees (16)

G. Operating Profits (17) = (9) - (10) - (11)

H. Other Expense and Revenue Incurred Outside Operation (18)

I. Net Extra-Operation Income (19)
J. **Net Profit** \((20) = (17) + (18) + (19)\)

K. **Loan Repayment** \((21)\)

L. **Profits Subject to Tax** \((22) = (20) - (21)\)

M. **Profits Tax** \((23)\)

N. **Adjustment Tax** \((24)\)

O. **Retained Earnings** \((25) = (22) - (23) - (24)\)

P. **Allocation of Retained Earning** \((26) = (27) + ... + (31)\)
   a. Production development \((27)\)
   b. Employees' welfare \((28)\)
   c. Wage bonus \((29)\)
   d. Central E&T fund \((30)\)
   e. Other \((31)\)

Q. **Land Use Information**
   a. Total land area \((32)\)
   b. Ground floor area of Buildings \((33)\)
   c. Total building area \((34)\)
      - O/w: Productive \((35)\)
      - Non-productive \((36)\)
   d. Number of locations \((37)\)
   e. Does your shop on the first floor \((38)\)
Jinan: Urban Enterprise Location and Land Use Survey
Questionnaire (Industry)

Unit: Money--CY10,000; Area--Square meter

Name of the enterprise:
Address:
Industry/Sector: Ownership:
Date of Establishment: Zone the enterprise located:

1. General Information
   A. Number of Employees
   B. Number of Temporary Employees
   C. Fixed Assets
      - Original Value
      - Net Value
   D. Circulation Funds
   E. One Location or More
   F. Scale (Large, medium or small)

2. Revenue, Cost and Taxes
   A. Gross Output
   B. Total Sales
   C. Sales Taxes (Incl. UMCT, Education surcharge, etc.)
   D. Cost
      Of which
      - Wages
      - Deductible Wage Bonus
      - Raw Materials
      - Depreciation
      - Energy and PU Fee
      - Interest
      - Effluent Charge
      - Other Tax
   E. Total Profit
   F. Profits Tax
   G. Adjustment Tax
   H. Central Energy & Transportation Funds
   I. Retained Profits
      - Production Development
      - Reserved Funds
      - New Products Development
      - Employees' welfare
      - Wage Bonus
      - Wage Bonus Tax

3. Land Use Information
   A. Total Land Area
   B. Total Building Area
      - Productive
      - Non-productive
Table I-5: ESTIMATED ANNUAL LAND RENT IN YUAN PER SQUARE METER AT VARYING DISTANCES FROM CBD

(All independent variables except "agglomeration" measured at the mean)

<table>
<thead>
<tr>
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<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
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<td><strong>Yantai</strong></td>
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<tr>
<td>Commercial</td>
<td>83</td>
<td>91</td>
<td>59</td>
<td>51</td>
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<td>41</td>
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