

Western Experience in Small Towns Financing and Development Policies¹

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Introduction

China is facing a major urbanization problem. As is well known, there are hundreds of millions of Chinese peasants in rural areas. Most of them have a low or very low productivity, certainly much lower than the productivity of urban workers. As a result they have a low or very low income, certainly lower than the income of urban workers. This income differential induces peasants to leave the countryside, and to move into urban area. This is their interest, but it is also the interest of the economy in general.

From an economic viewpoint, this rural-urban migration is desirable. In an earlier study, presented in Annex A, we estimated the benefits of a 10 million workers migration from rural to urban areas. Because the marginal productivity is much higher (33,000 Y v. 3,000 Y in 1998, according to our estimates) in cities than in the countryside, the decline in output in rural areas is much more than compensated by the increase in output in urban areas. As a matter of fact, because increased income in urban area will increase the demand for agricultural products, it can even be predicted that agricultural output will increase rather than decrease. Overall, according to our calculations, this 10 million workers migration would increase Chinese urban output by nearly 10%, agricultural output by 3%, and total output by about 7%. The numbers may be questionable (it has been argued that the data utilized was faulty, and in any case it is outdated), but the mechanisms described are certainly at work, and the orders of magnitude arrived at are most probably meaningful. And there is little doubt that a

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significant part of the high growth rates of the Chinese economy merely and automatically reflect the present migration out of a low-productivity sector into a higher productivity sector.

These major potential economic benefits of urbanization have officially been recognized by the Chinese government. However, accommodating millions of peasants into Chinese cities is a major social and financial challenge. Additional factories, shops, houses, schools, hospitals, sewers, roads, etc. must be provided for these migrants —on top of the additional factories, shops, and services that are demanded by existing urbanites as a consequence of increasing incomes. The challenge is, or seems to be, particularly dramatic for large cities. The marginal costs of a new dweller are probably larger in a large city than in a smaller city — and they are very visible. The marginal benefits brought by a new dweller in a large city are certainly larger than in a smaller city —but they are not so visible. Whatever is the balance, it is quite obvious that not all migrants will, could and should move to large cities. The Chinese government is therefore fully justified to try and develop a small towns policy.

There is nothing particularly new in the present and future rural-to-urban migration in China, and in the problems associated with the rapid development of cities. Western countries have experienced similar trends and problems in the past. What if anything can be learned from their experience?

Magnitude of Rural to Urban Migration in Western countries

Figure 1 presents, for the five largest (in terms of GDP) Western OECD countries (the USA, Germany, France, the UK, Italy) the importance of agricultural labor force over time. We selected this concept for two reasons. First, it is less ambiguous than rural population, because the definition of "rural" as opposed to non-rural varies dangerously from country to country. Second, the decline in the absolute number of farmers (agricultural labor force) is the driving engine of rural to urban migration. For all countries, except the US, the data refers to male agricultural labor force, because of inconsistencies in the definition and counting of female agricultural labor force. For some countries, and some years, the data was intrapolated. For some countries, notably Germany, the area of the country changed over time. Several conclusions can nevertheless be drawn from these numbers.

The US case is strikingly different from that of other countries. In the US, because of expanding cultivated land and because of immigration, agricultural labor force actually increased until World War I. Rural-urban migration was a relatively minor factor in American urbanization. To be more precise, one should say "domestic rural-urban migration", because many of the international migrants that fueled urbanization in America were indeed European peasants.

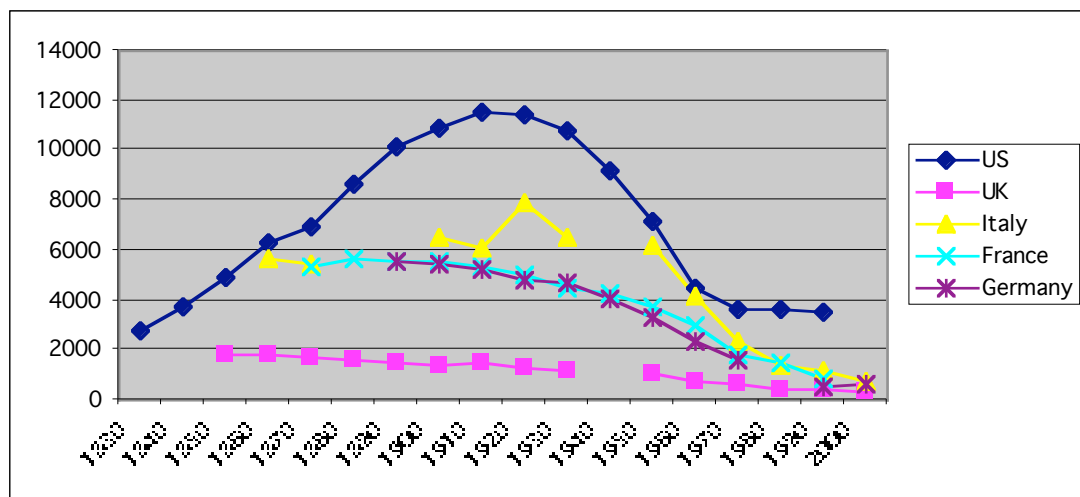


Figure 1 –Agricultural Labor Force, Selected Countries, 1830–2000

Sources and Notes : Mitchell 2003a and 2003b. For the US : total agricultural labor force ; for the other countries : male agricultural labor force.

The British experience is also singular. In the mid 19th century, agricultural labor force had already begun to decline. It declined at a moderate rate for a century. The decline accelerated after WWII, but at a time when the UK was already a highly urbanized country.

The three continental European countries exhibit patterns of more relevance to China. Agricultural labor force remained very important until WWI and even WWII. It is only after 1950 that it declined very sharply. Between 1950 and 1980, in 30 years, it was cut by 4 in Italy, and by nearly 3 in France and Germany. The shock faced by China to-day has therefore been faced by these three European countries in a relatively recent past. To obtain a better understanding of the "urbanization pressure" in Western countries one must also consider families and

children linked to male agricultural labor force, and take into account natural growth (the excess of birth over deaths) in rural areas. This is done in Table 1.

Table 1 – Agricultural Migration, Selected Countries, 1850–2000

	(in 1000 per year)			
	UK	France	Italy	Germany
1850–60	62	na	na	na
1860–70	150	8	na	na
1870–80	88	8	na	na
1880–90	83	8	208	314
1890–1900	68	169	55	na
1900–10	17	117	268	na
1910–20	101	80	220	342
1920–30	56	241	401	253
1930–40	32	188	233	351
1940–50	32	17–503 ^b	194	461
1950–60	75	417	761	336
1960–70 ^a	48	373	624	261
1970–80 ^a	66	280	275	150
1980–90 ^a	5	145	82	150

Sources and Notes: Mitchell 2003a; The figures are obtained by adding the change in agricultural population (male agricultural labor force multiplied by the ratio of total population to total male labor force) and the natural increase in agricultural population (natural growth rate multiplied by agricultural population); ^bThe first number (17) refers to the 1936–46 period, and the second (503) to the 1946–54 period.

According to these crude estimates, the number of people (and their families) leaving agriculture was around 300,000 per year in the UK and in Germany and even in Italy at the turn of the century. It then declined in the UK and in Germany, but it increased substantially in Italy and France and peaked in the post WWII period at about 400,000 people in France and 600,000 people in Italy.

These numbers, however, must be migration-corrected to give a better idea of the pressure created on urbanization, and to compare with China. Unlike what happens presently in China, out-migration and in-migration played an important role in Western Europe. Adding or subtracting net out-migration to get a better measure of the pressure exerted on cities assumes that international migrants were peasants. This was often the case. But even if this assumption is exaggerated –and it surely is– the conclusion drawn would be valid in net terms.

In the UK out-migration reached more than 300,000 persons per year at the turn of the century, with people leaving for the USA, Australia, South Africa, Canada and various British colonies. Throughout the period, net out migration in the UK was as important or more important than the number of people rejected out of agriculture, and

it counter-balanced its effects on the growth of cities. In the UK, the growth of cities was therefore primarily fueled by the natural growth rate of the urban population.

Long-term data on Germany is not always available, and when it exists it is delicate to interpret because the borders of "Germany" changed very significantly over the 20th century. Available information seems to suggest that out-migration flows were also significant (although much lower than in the case of the UK) and reduced the pressure on cities in the late 19th century and in the beginning of the 20th century.

In Italy, out-migration was also an important phenomenon: between 1880 and 1930, between 100,000 and 300,000 Italians were leaving their country every year, for the USA, Latin America, Australia, and other European countries. This broadly compensated the number of people who were leaving agriculture. In the post WWII period, however, the number of people leaving agriculture increased dramatically, at a time when out-migration declined significantly. The pressure on cities became very strong.

The French case is different. Out-migration was always negligible in France. But in-migration was not, even in the inter-wars period. After WWII, in particular, France absorbed large number of people, particularly from North Africa (both former French settlers in Algeria, and guest workers from Algeria and Morocco). The pressure on urban areas of people leaving agriculture was significantly increased by in-migration.

The pressure on cities in the West was therefore greatest in Italy and France in the post WWII period. Table 2 offers estimates of this pressure for the "peak" inter-census years. It also indicates the total population of France and Italy at the beginning of each period, and multiplies our indicator of pressure by the ratio of the population of China to that of France and Italy.

Table 2 – Yearly Pressure on Cities, France and Italy, Peak Periods, with Equivalent Pressure for China

(In million persons per year)

	Δ agric. pop. ^a	Out-mi- gration	In-mi- gration	Total	Pop	Chinese equivalent ^b
France 1946-54	0.503	-	0.047	0.537	38.0	18.4
France 1954-62	0.417	0.069	0.137	0.485	43.1	14.5
France 1962-68	0.373	0.207	0.308	0.474	47.0	13.1
Italy 1951-61	0.761	0.280	0.140	0.621	47.1	17.1
Italy 1961-71	0.624	0.322	0.175	0.477	50.5	12.3

Sources and Notes : ^a=Change in male agricultural labor force in Mitchell 2003, multiplied by the ratio of population to male labor force, plus natural growth rate applied to agricultural population, also in Mitchell 2003. ^b=Total multiplied by the population of the country considered and divided by the present population of China (1,300).

This produces a translation in Chinese terms of what France and Italy faced about 50 years ago. The amount of people they had to incorporate into cities or more precisely out of agriculture is equivalent to 12-18 million people per year for China now. This is an important figure for China. Since France and Italy did it, it means that there are no reasons why China could not do it. Absorbing 150 million ex-farmers in 10 years in China is not an impossible task. It does not mean that it is an easy task.

Was this massive movement out of agriculture the outcome of government policies? Not at all. In all Western countries, it occurred as a result of market forces. As a matter of fact, government policies were developed to stop it, or at least to slow it. Politically, rural interests were usually well represented. Socially, because so many people had peasant ancestors, and also because the fear of food shortages was still widespread in the post WWII period, there was something sacred about "supporting farms and farmers". Policies to that effect were largely unquestioned.

They mostly took the two forms of protection from agricultural imports and of subsidies to agricultural prices. The very high cost these policies was borne by consumers of agricultural products, and by taxpayers. To a certain extent, these policies are still in force at the European Union level. It is difficult to know precisely what would have happened in the absence of such policies, and to what extent they contributed to slow the decline of the agricultural labor force and the ensuing rural to urban migration. But it is difficult to imagine that the decline could have been much more massive or much more

rapid. This suggests that these policies have largely failed.

Absorption of Ex-Farmers in France

What happened to the millions of farmers who left agriculture. What did they do? Where did they go? We can try to answer this question on the case of France, in terms of activities, and of location.

Activities – Table 3 indicates, for the 1954-68 period, the changes that occurred in France in the structure of employment between 1954 and 1968, a period of 14 years during which agricultural labor force declined by 40%.

Table 3 – Changes in Labor Force by Sectors, France, 1954-68

	1954	New Intersectoral intrants	migrations	1968	Variation
Agriculture	5034	-	-2,049	2985	-2049
Industry	5318	141	271	5730	412
Construction	1322	203	390	1915	593
Services	4865	538	1031	6434	1569
Government	2444	187	357	2998	544
Total	18993	1069	-	20062	1069

Source : Bordes 1994 p. 67 for columns 1 (1954) and 4 (1968) ; author's estimates for other columns.

Notes : all numbers are in 1,000 workers

During the 14 years period considered, agricultural labor force declined by more than 2 million workers. In to-day China terms, this would be about 62 million workers. We have no direct information about their whereabouts. Many went into industry and construction, as unskilled labor. But many also must have gone into services and government employment. This is particularly true of women. It is known that women migrated from rural areas in even larger numbers than men –to the point of creating a shortage of marriageable women in rural areas. Very few of these female migrants went into construction, and many found jobs in services. It is therefore not unreasonable to assume that agricultural migrants went to the various other sectors pro-rata the increase in the labor force of each sector. This is how the third column of Table 3 (inter-sectoral migrations) is constructed. This procedure might underestimate the movement from agriculture to industry, because it ignores movements from industry to services that also occurred during this period. Total labor force during the period also increased, by about one million workers, because of the natural increase in working age population and because of immigration. This, by the way, implies that labor force

outside agriculture increased by more than 3 million workers—a 22% increase. In Table 3, these “new entrants” are also allocated to the various receiving sectors pro-rata the increase in the labor force of each sector.

This suggests several points. First, the non agricultural sector had no difficulty absorbing the large number of ex-farmers looking for jobs. Unemployment was extremely low at the time. There was even a shortage of workers in the non-agricultural sector and France had to import guest workers. Second, the majority of ex-farmers found jobs in the service sector rather than in industry. Third, this process had a qualitative dimension, in terms of flexibility. Agricultural migrants, who were very foot-loose, went in the sectors—and places—where they were most needed. This is a great difference with the “structural adjustment” processes of the 1990ies, which were much more difficult, and it contributes to explain why the absorption of ex farmers was relatively easy.

Location - Where, in geographical terms, did ex-farmers go? Ex-farmers went to three different kinds of location. Many changed jobs, but remained in rural areas. A second group moved to Paris and to the larger urban areas. A third group went to smaller cities, usually in the same region. Over the course of time, a number of these ex-farmers moved from one location to another, finding a job locally, then in a 20,000 people city, then in Paris, so that the magnitude of the different flows depends upon the period chosen. It also depends upon whether we are considering workers or people (including children and parents of workers). Gross movements out of farming are also different from net movements (including returning retirees)

It is important but difficult to assess the relative importance of these three groups, because hard data on this topic is hard to find. A 1971 study (Merlin 1971, quoted in Courgeau 1988), based on a detailed exploitation of the 1962 census, tells us where people living rural areas in 1954 and no longer living in rural areas in 1962 were living in 1962. This data is in net terms, that is taking into account reverse movements of population (such as people who took retirement in rural areas). These numbers are reproduced in Table 4.

Table 4 – Rural to Urban Net Migrations, by City Size, France, 1954-62

	In 1000/year	in %
To small cities		
<5,000 inh.	15.4	10.2
5-10,000 inh.	14.9	9.9
10-20,000 inh.	14.5	9.6
20-50,000 inh.	20.6	13.7
50,000 inh.	16.5	10.9
Total small cities	81.9	54.5
To larger cities :		
100,000-2m inh.	51.9	34.5
Paris agglomeration	16.5	11.0
Total larger cities	68.4	45.5
Total	150.3	100.0

Source : Courgeau 1988 p. 438

Table 4 says nothing about the importance of the group of ex-farmers who remained in rural areas and in many cases did not even change residence. Let us assume that it represents about half the farmers who moved out of their villages. In this case, it could be said that about one third of ex-farmers found jobs and remained in rural areas, another third in small towns and the remaining third in larger cities.

Regional Dimension of Rural to Urban Migrations in France

The joint movements of agriculture to non agricultural labor and of rural to urban residence also had a regional dimension in France. In 1950, there was a sharp division between three Frances : the Paris region, the Northern and Eastern regions, the Western and Southern regions. Per capita income differences were large: at least from 1 to 2 between the West and Paris. Paris and the Northern and Eastern regions were the most industrialized and urbanized. The Western and Southern regions were predominantly rural and agricultural, with few factories. Most of the farmers who left agriculture did so from these regions. The rural to urban shift was also a West to East shift.

This abundant supply of relatively cheap (and unskilled) labor favored the development of labor intensive enterprises in industry or services in the West and South. For instance, the automobile industry, which was traditionally based in Paris and in the East, created factories in Brittany and Normandy, in the Western part of the country. The same happened in mechanical and electrical industries. The insurance business also developed rapidly in the West, creating thousands of jobs. By 1980, the traditional geographical imbalance had largely been corrected.

Ironically, in the subsequent period, imbalances reversed. The older industries and enterprises of the North and East suffered more from the deindustrialization process that started in the late 1970ies and continues to date. The newer and younger enterprises of the West and South proved more innovative and dynamic. Per capita income is now higher in some regions of the West than in some regions of the North.

Direct and Indirect Small Towns Policies

What policies, if any, were developed to help small towns accommodate displaced farmers? A distinction must be made between direct and indirect policies. There were practically no policies *directly* aimed at favoring or, on the contrary at preventing, the rural-urban migration movement in general, and the development of small towns in particular. Policies were basically neutral relative to city size, notwithstanding political speeches to the contrary. These movements were driven by economic and social forces so strong that even a powerful government (and the government in office in France at the time was powerful, with a great degree of control over many sectors of the economy) could not do much about it. As mentioned above, there were strong and costly agricultural policies that tried to slow down the flow of farmers to cities, but they did not meet with much success.

On the other hand, a number of policies undertaken in other areas, or with other objectives, had important *indirect* effects upon rural to urban migrations and small towns development. Four such policies are worth mentioning.

First, there were strong and active regional policies. Such policies did not start in the immediate post war years, but became important in the 1960ies, with the creation of DATAR (Délégation à l'Aménagement du Territoire, or Agency for Regional Development) in 1964. A map, indicating the less developed regions of the West and South was prepared. Private sector investments in these areas received various type of subsidies. French and foreign large investors were advised to settle in these regions. By contrast private investments in the Paris region (which required central government approval) were discouraged. Central government infrastructure investments in the lagging regions were favored. These regional policies, the effectiveness of which is difficult to measure, were not directly aimed at accommodating displaced farmers, but they contributed to it.

Second, vigorous housing policies were pursued. They consisted in various forms of subsidies or reduced rates loans for private construction, and above all in highly subsidized public housing construction for low income renters (the so-called HLM program). By the end of the period under study, about 30% of the housing stock consisted of such HLM housing. There was no spatial dimension in this program, and it benefited small cities as well as large cities. But it can be said that most migrants from agriculture found themselves living in such housing.

Third, the role of local governments was strengthened. France had traditionally been a very centralized country (and remained so during much of the period under study). Nevertheless, communes (the lowest type of local government) began to play an increasing role in planning and in the provision of urban public services, under the supervision and control of the central government. Communes were –and still are– rather small. The central government tried to encourage mergers, but met with very little success. Communes, however, regrouped themselves voluntarily in a number of « syndicates », for water supply or waste management for instance, in order to benefit from economies of scale. Slowly, the control of the central government was relaxed, for instance in matters of local tax policy or of borrowing, and France began to decentralize.

Fourth, massive redistribution policies were developed. The share of taxes and social security contributions, and consequently of public administration expenditures in GDP increased very much (the latter now accounts for 55% of GDP). These redistributive policies have not been created as a regional policy instrument (they had explicit social goals), but they have had a key unintended spatial impact. Because central government expenditures per capita do not vary much over space, and because taxes paid per capita are much higher in richer areas, great amounts of money are transferred from the richer, more urbanized, regions to the poorer ones. The Paris agglomeration, in particular, subsidizes heavily the rest of the country. Because it has a much higher productivity, it has a much higher output per capita, pays much more in taxes, but does not get more per capita in central government expenditures. Education, for instance, at all levels (including the primary level) is funded by the central government budget, and teachers' salaries are identical all over the country. Expenditures per student are therefore about equal in all parts of the country. As richer areas –Paris, large towns– pay more taxes per

capita, and get similar amounts per capita, they lose at the central government budget game. Conversely, poorer areas –rural areas, small towns– gain at this budget game. The very large central government budget is therefore a formidable machine to redistribute income spatially. In the period considered, this raised incomes, created government jobs, and increased demand and activities in poorer regions and in small cities areas.

Present Situation in France

The end of the story is no less interesting for China. The end (or quasi end) of farmers in France did not mean the end of rural areas, much to the contrary. New statistical concepts introduced in the 1990ies throw light on the spatial distribution of population in France today. France is (and has been for the past two centuries) divided into 36,000 communes, the borders of which have practically not changed over time. INSEE, the Statistical Bureau, considers "urban units" (composed of urban centers and their immediate adjacent communes) with at least 5,000 jobs. They are called "urban poles". In reality, many people living in communes located in the vicinity of an "urban poles" commute daily to the pole, and can be considered as part of the same socio-economic city. To reflect this reality, INSEE considers the communes that send at least 40% of their labor force to a nearby urban pole. These peri-urban communes are added to the urban pole, to define an "urban area". Urban areas thus defined constitute one of the best possible functional concept of "city" or "town". They can be relatively large (20-30 km), but in a country in which most households have at least one automobile, this does not prevent them from constituting effective labor market areas. There are 361 such "urban areas" in France in 1990. Communes which are not part of "urban areas" are defined as rural (or more precisely "predominantly rural"). Table 5 presents a distribution of the French population in 1990 along these economically meaningful lines, with a distinction between urban areas of more than 100,000 inhabitants ("large towns") and urban areas of less than 100,000 ("small towns").

Table 5 – French Population by Large Towns, Small Towns, Rural Areas, 1990

	Pop.	Number (million)	Pop. (%)
Large towns (>100,000)	73	31.4	54.1
<i>of which : larger towns (>500,000)</i>	9	17.5	30.2
Small towns (8,000-100,000)	288	9.9	17.1
Rural areas	-	16.8	29.0
Total	-	58.1	100.0

Source: Calculated by B. H. Nicot (University Paris XII)

Table 5 shows that a significant share of the French population continues to live in rural areas. This "rural population" no longer declines absolutely, and declines only slightly in percentage terms. Who are the people living in rural areas? They are certainly not predominantly peasants. Table 6 presents (for 1998, a somewhat different year) a breakdown of employment in rural areas by sector.

Table 6 – Employment in Rural Areas by Sector , France, 1998

	In Million	In %
Agriculture	0.8	24
Industry	1.3	39
Services	1.2	36
Total	3.3	100

Source : Gagné & Goffrette-Nagot 2003 p.7

Note : For industry and services, self-employed and employment in the public sector, which is not covered by the data source utilized, is excluded. For agriculture, by contrast, employment includes self-employment (which is dominant).

Industrial employment in rural areas is alive and well. It represents (in 1998) as much as 36% of total French industrial employment (Gagné & Goffrette-Nagot 2003 p. 7). In food and food processing industries, the ratio reaches 50%. Far from declining, the relative importance of rural areas in industrial employment has increased in recent years, from 28% in 1975 to 37% in 1999.

Services also play an important role in rural areas. In part, they are a corollary of agricultural and industrial activities and incomes. For another part, they are a corollary of retirement and tourism activities and incomes. In a country like France, a significant share of households income is not linked to "production", but to "consumption". Many people chose to spend money earned earlier, or elsewhere, in areas of their choice, that often turn to be rural areas, including mountainous and seaside resorts (which are statistically considered as rural areas in most cases). Retirees and tourists and

second-home owners (from France and also from other European countries) live in rural areas, and demand groceries, health care, repairs or transport services. This demand in turn creates employment in these households-oriented services, including government services. Such a development is probably not very important in China to-day, but will gain importance in the future.

Table 5 also shows the relative importance of large and small towns. In population terms, large (i.e. larger than 100,000 inhabitants) urban areas dominate the urban picture. But small towns are by no means negligible. They are home to about one third of the total population. Their share of output is smaller, because output per worker, as well as workers per inhabitants, are lower in small towns than in large towns. But many industrial and services activities continue to develop in small towns, be they small enterprises, or branches of large national or international enterprises. In addition, like rural areas, they benefit from transfers and government services.

Financing Urban Development in France

The important flows of rural migrants into cities raised serious financing issues. Migrants had to be housed, offered urban public services, and provided jobs in factories, shops or offices. The stock of capital of cities had to be expanded rapidly. There is very little data on how this was done and financed in the post war period, particularly because estimates of public and even private capital stock were not produced at the time. The only available data refers to more recent years. It will nevertheless be presented and discussed here, because there are reasons to believe that many of the conclusions drawn from this data are relevant for earlier years.

Available data does not discriminate between small and large towns. This, however, is not a problem. There are no reason to expect any significant differences. The relative importance of the various types of capital stock to be financed must be similar in small and large cities. Financing mechanisms are driven by nation-wide rules or regulations, and apply equally to all types of cities.

Table 7 provides data on the relative importance of the three main components of urban capital in 1980 and 1994 in France.

Table 7 - Capital Stock by Type, France, 1980-94

	1980 (in G F)	1994 (in G F)	$\Delta 80-94$ (in G F)	$\Delta 80-94/1980$ (in %)	$\Delta 80-94$ (% per year)
Housing	10,330	12,782	2,452	+24	2.2
Infrastructure	1,871	2,969	1,099	+59	3.6
Productive capital	6,353	7,397	1,044	+16	1.2
Total, physical capital	18,553	23,148	4,594	+25	1.7
GDP	5,654	7,384	1,730	+31	2.1

Source: Calculated from: INSEE. 1995. *Rapport sur les comptes de la Nation 1994*, pp. 331 seq. Data is given in constant francs (of 1994). G (giga) stands for billion.

Two main points emerge from Table 7. First, at least in quantitative terms, housing is the most important component of urban capital. It accounts for more than half of the total. Productive capital comes next, and represents a little less than one third of the total. Infrastructure (defined here as the capital stock of all administrations, including streets, schools, and sewers) is by far the least important component of urban capital. There is every reason to believe that that the relative importance of these components has not changed much, and that the numbers given also reflect the realities of the 1960ies or early 1970ies.

Second, urban capital increases significantly. Over the 1980-94 period, it increased at a yearly rate of more than 1.7%, slightly less than the rate of growth of GDP, which means an increase of 25% over the period. In the preceding period, which is of interest to us here, because the growth rate of cities was much higher, the rate of increase of the stock of capital must have been higher.

Data available on *yearly* investments provides a different although complementary perspective, offered in Table 8.

This time, it is productive capital that appears the most important component of urban capital investment (85-90% of all capital investment takes place in cities), followed by housing, and then infrastructure. Why such a difference with the data on the capital stock? Because depreciation rates for the three kinds of urban capital vary greatly. Houses, particularly in France, have a very long life, and last for more than a century. This is in part also true, to a lesser extent, of infrastructure. Some public investments –like bridges or sewers or concert halls– also have a very long life; but other –such as garbage incinerators, or hospital equipment– have much shorter lives. Productive capital, on the other hand,

consists of buildings that become obsolete more quickly, of equipment that lasts 5-10 years, and more and more of electronic equipment with an even shorter life.

Table 8 - Capital Investments in France, 1980 & 1994

	1980 (in 1994 GF)	1994 (in 1994 GF)	Growth rate (in % per year)
Housing			
New housing	248	194	-1.8
Major repairs	100	155	+3.4
Total, housing	346	349	+0.1
Infrastructure	156	250	+3.7
Productive capital	598	712	+1.4
Total, capital investments	1,100	1,311	+1.4
GDP	5,616	7,376	+2.1

Source: INSEE. 1981. *Rapport sur les comptes de la Nation 1980*, vol. 2, pp. 103-109, & INSEE. 1995. *Rapport sur les comptes de la Nation 1994*, p.94-96; "infrastructure" is defined as gross fixed capital formation by the public sector.

The evolution of capital investment is rather like that of the stock of capital. Total investment increased more slowly than GDP. Of the different components of capital investment, infrastructure investment increased fastest, by a wide margin, just as in the case of the capital stock. In the case of housing, the stock of capital increased much faster (+2.2% per year) than investments—which stagnated (+0.1%). The opposite is true for productive capital: the sock increased more slowly (1.2%) than investments (+1.4%). This apparent paradox is explained by the obvious fact that the growth of a stock is not governed only by the growth of investment flows (contrary to what is often assumed in discussions of infrastructure needs), but also by the initial level of investment flows and by the length of life of the components of the stock.

The financing of urban development can therefore refer to a flow or to an increase in a stock. As a flow, the amount to be financed yearly is considerable. Gross investment in urban areas represented in the 1980ies about 15% of the national GDP. It certainly represented much more in the 1960ies and 1970ies. More than 50% of this amount consists of investments in productive capital. The net increase in the stock of urban capital is much smaller. It was in the 1980ies equal to about 2.5% of the national GDP, and consisted predominantly of increases in the stock of housing. Controlling urban development means controlling the location of these flows in order to control the location of these stocks.

Who controls the location of gross investments in urban areas, and what is the role of local governments in this respect? It is not impossible to allocate the various types of gross investment given in Table 8 to each of the main economic players. Productive investment in France have always been mostly undertaken by enterprises. Housing construction and repair is mostly (83%) in the hands of households. To a much smaller extent (8%), enterprises do also invest in housing. Local governments have in practice a complete control of low income housing construction (9%), even though expenditures on such construction does not appear in local government accounts. Infrastructure investment is decided (by definition) by governments, and can be broken down between central and local governments.

Table 9 - Financing Capital Investments, by Agent, France, 1994

	Housing	Infrastructure	Productive capital	Total
	(GF)	(GF)	(GF)	(GF)
Households	288			288
Enterprises	29		712	741
Central government		71		71
Local governments	32	179		211
Total	349	250	712	1311

Sources: INSEE. 1995. Rapport sur les comptes de la Nation 1994, p.94-96 & p. 214

Table 9 gives an idea of the relative importance of local governments in the financing of urban development in a country like France.

First, it appears that, at least in quantitative terms, enterprises are the main player in the urban development game. They control nearly 60% of gross investment made in urban areas. It could be argued that many of these investments are merely the replacement of outdated machinery by more efficient equipment, and do not have much of an impact upon the spatial development of the various urban areas. Such an argument, however, would ignore the impact of such investments upon the economic development of these urban areas. When and where such investments in productive capital are not undertaken, the economic viability of the city is in jeopardy. Income and employment is at risk, and economic decline cannot be dissociated from spatial development. Attracting such investments in productive capital is indeed one of the main objective of urban policy and planning.

Second, because of their involvement in housing, households remain a key player in urban development. In money terms, and even more so in square meters built,

housing is a major component of urban capital. Subject to rules and regulations, households determine the location and the type of the houses where they want to live. Their decisions define the look and the efficiency of cities. They do so for a very long time, because, as mentioned above, housing capital has a much longer life than productive capital. There is therefore an element of irreversibility in such decisions. The importance of households decisions is nevertheless reduced by the fact that, as indicated in Table 8 above, nearly half gross investment in housing consists of major repairs, not new investments. Housing repair certainly improves the welfare of households, and contributes to extend the life of the housing stock, but it is not as decisive as new investment for the spatial development of urban areas.

Thirdly, it appears that local governments are also, always by the same indicators, an important player. They control directly about 16% of gross investment in urban areas. Most of it consists of long-lived infrastructure and housing, that will also shape the city structure and efficiency, and do so for a long time. Note that in France nowadays, the weight of local governments in the financing of gross urban investment is much greater (about 4 times greater) than that of the central government. As a matter of fact, the figures given in Table 9 exaggerate the importance of central government relative to local governments in urban development. They relate to gross investment in infrastructure in general. It can be assumed that central government is particularly active in non-urban areas (think of roads and highways, for instance). In urban areas only, the ratio of local to central government investments is certainly higher than 4, and probably close to 5 or 6. To a very large extent, "government" financing of urban development in France means financing by local governments.

Figure 2 - Relationships Between Urban Development, Urban Functioning, Central Government & Local Governments, France, 1994

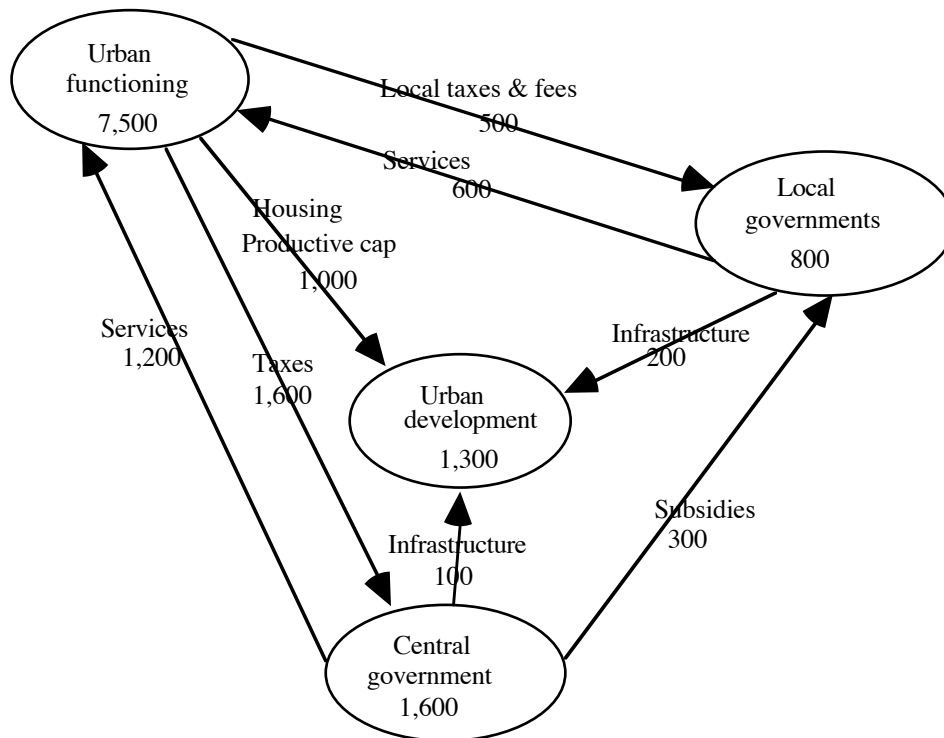


Figure 2 attempts, in a highly stylized fashion, to sketch the relationships between what could be called urban functioning, that is the operation of cities (or, for that matter of the economy at large), and urban development, as defined above, and central and local governments in France, during a year. The figures given, in billion francs (GF), for each of the concepts involved, are broad orders of magnitude.

The main point that emerges is probably that urban development as such does not "produce" any income of significance. Some development fees are extracted from developers, but the amounts involved are negligible relative to the investment flows considered. Over the course of time, urban development will of course contribute to urban functioning, that is to urban activity, and therefore to central and local taxes, and also produce income for the households and enterprises that invested in housing and in productive capital. But this is a delayed process. Urban development to-day is financed by to-day's urban activity, which is made possible by yesterday's urban development. Figure 1 could be completed, in a more dynamic fashion, by the addition of the stock of urban capital, as in Figure 3.

Figure 3 - A More Dynamic View of Urban Growth

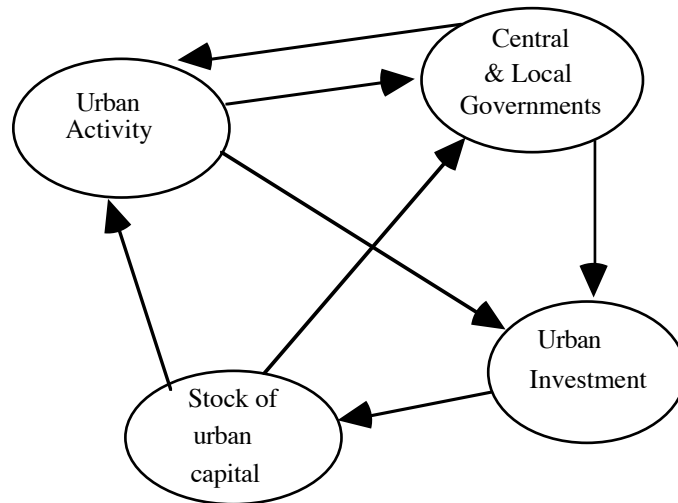


Figure 3 puts the role of urban investment or urban development in a proper perspective. The relationship between yearly urban investment and the stock of urban capital consists of accumulation minus depreciation. The contribution of urban capital to urban output is straightforward for housing capital and productive capital, and has been recently developed for infrastructure capital, both in theory (endogenous growth) and in empirical studies (a la Aushauer-Munnell), particularly for transportation infrastructure. The relationship between the stock of urban capital and government refers to property taxation. The other relationships are derived from Figure 1. Urban development only matters in the medium or long terms, because it increases the stock of urban capital.

Local Government Financing in France

There are only four sources of local government finance: (i) fees or charges, (ii) taxes, (iii) central government subsidies, and (iv) borrowing. Table 10 indicates the relative importance of these four sources in the case of France. There is always an element of arbitrariness in such tables. First, the concept of "local governments" is by no means clear. In most countries, and certainly in France, a number of local public services (such as water, or garbage collection) are supplied by "satellites" of local governments, that is by private enterprises controlled by local governments. According to sources, or countries, such satellites are classified as enterprises or as local governments. Because satellites

are usually much more dependent upon charges and fees than pure local governments, their classification as local governments tends to increase the share of fees in local government resources. Then, the distinction between local taxes and subsidies is also a matter of definition. The concept of local taxes is not clear. To some people (and certainly to this author), a local tax is a tax the rate of which has been decided by a local government. To others, it is a tax that accrue to local governments. This means that the local share of shared taxes decided by central governments (such as the so-called business rates, the property tax paid by enterprises in the UK, or the local share of the German income tax) are considered as subsidies by some, and as local taxes by others. Finally, it is easy to show that the distinction between local taxes and local fees is also often blurred. Some of the fees charged by local government monopolies easily include a tax element that is difficult to determine. International comparisons of local governments sources of revenues (including those which are published by international organization like the OECD or the IMF) must therefore be handled with caution.

Table 10 - Local Governments Income, by Source, France, 1994

	(in GF)	(in %)
Charges & fees	181	23
Local taxes	330	43
Subsidies	247	32
Borrowing (net)	12	2
Total	770	100

Source: Calculated from INSEE. 1995. *Rapport sur les comptes de la Nation 1994*, p.200: local governments (administrations publiques locales) are defined broadly to include satellites and quasi local governments (organismes divers d'administration locale) such as chambers of commerce, high schools, etc. Net borrowing (capacité de financement) is the difference between total resources and total expenditures.

Fees - Fees and charges are a very desirable source of local government revenues. They do not always deserve the standard criticism of unfairness. It is true that the sale of certain local government services can exclude the poor, or limit their consumption. But this impact has to be compared with the impact of the alternative solution: distribution free of charge coupled with tax financing. Local taxes are often regressive, which means that their burden is borne by the poor, who may end up paying as much as they would pay in the case of fees. Distribution free of charge does not necessarily means equal access. For many non-charged local public services, consumption is limited by income-related variables, such as central location, automobile ownership, or cultural endowment. Consider for instance music conservatories, which are run

by local governments in France. It happens that the families who send their children to piano lessons are not, statistically, low income households. Financing music conservatories by fees (paid by these households) rather than by local taxes (borne by everybody) is not necessarily unfair, much to the contrary.

The question of interest here is whether charges and fees (and also taxes, to be discussed below) should primarily be based upon urban development, upon urban capital or upon urban activities. There are several reasons why urban activities should probably be preferred. First, they constitute a much larger base than urban development: urban activities, that is output, weight about 7 times more than urban investments, and 25 times more than local governments investments in infrastructure. Then, urban capital does not lend itself easily to charges and fees. Most of it takes the form of privately owned housing or productive capital, that can be a basis for taxation, but not for fees. Thirdly, and perhaps more importantly, imposing charges upon urban development in a given area will make that area less attractive relative to other, limit the demand for urban development (that local governments want to facilitate), and jeopardize future charges and fees on activity.

Local taxes - The problem with local taxes is that they are necessary, but that there are no good local taxes. Local taxes are necessary, because they are the key to local autonomy, which is in turn the key to local efficiency. If local governments do not raise a sufficiently large share of their income from their own taxes (and charges), but get most of it in the form of central government subsidies, they can hardly be expected to behave in a responsible fashion. The theory of decentralization implies that local government officials, and their electorate, balance the benefits of additional expenditures with the disbenefits of additional taxes, and chose the expenditures-tax mix (in terms of amount and structure) that maximizes their satisfaction. If no choices are to be made about taxes, this maximization mechanism no longer functions. Decentralization cannot be: we, local governments, spend the money that you, central government, raise and give us. Local taxes are therefore very desirable.

On the other hand, it is extremely difficult to find tax bases that are suited for local government taxation. Income, which is a rather good base for a national tax, is not proper for a local tax. The reason is that income is mobile. A local income tax will induce households,

particularly high income households, to move away from high tax rates areas to low tax rates areas, generating serious —and self aggravating— disparities within the various jurisdictions of a given urban area. The more urban areas are fragmented, the worst this effect. In France (or in the USA for that matter) where urban areas consist of a large number of different local governments, this is a serious problem. Value-added, which is also an excellent tax base for a national tax, and the most important source of tax income in most European countries, particularly in France (where it was invented), value-added is entirely inappropriate as a local tax base. This is because the tax paid at one stage in the production process is deductible from the tax to be paid at the next stage (so that the tax actually paid will only bear on the value-added at each stage). This can only be done in practice if the tax rate is the same in the entire country. If the tax rates were to vary with the various jurisdictions, so would the amounts to be deducted. The administrative complexities, the dangers of fraud, and the impact upon the location of productive activities that this would create would be formidable. This is already a problem within the Economic Union. Property is another tax base that has virtues at the national level, yet creates problems at the local level. Financial assets, such as shares or bonds, are particularly mobile. If they were taxed at the local level (There are no examples to my knowledge), financial assets would immediately move to low tax rate jurisdictions. This is already happening to a certain extent at the international level.

Immovable properties, and also negative externalities, are about the only tax bases that are not dangerous at the local level. Negative externalities, such as congestion, or pollution, are theoretically ideal local tax bases. If they induce households or enterprises to modify their behavior, it is in the desired direction of reducing congestion and pollution. The trouble is that such taxes cannot be expected to have a sufficiently high yield, and also that they are technically difficult to introduce. Property taxes, on land, houses or productive capital, are said to be desirable because land, houses and productive capital cannot easily be moved out of high tax rates areas. This proposition, however, is only fully true for unimproved land, which cannot be moved, and also for the land value element of the value of houses and structures. High property tax rates in a given jurisdiction will necessarily deter housing construction and enterprises development in that jurisdiction.

The point made about charges and fees, namely that, as a potential revenue source, activity, or the stock of urban capital, offer better opportunities than urban development can also be made about local taxes. Local governments want very much to promote urban development, that is to attract productive capital, and also housing. Indeed, in many cases, they are ready to offer subsidies to that effect. Imposing taxes upon housing construction and enterprises development will not serve that purpose. In addition, because local governments compete between themselves for urban development, what matters is the tax rate of each relative to the tax rate of others. Furthermore, as mentioned above, the magnitudes involved are very different, with gross investment in houses and productive capital amounting (in France) to about 1,000 GF, whereas the stock of houses and productive capital is estimated to be around 20,000 GF, and activity over 7,000 GF. To produce a given tax yield, taxes based on urban development would require tax rates 20 or 7 times higher than taxes based on urban capital or on urban activity.

Subsidies – Central to local government subsidies do reduce local governments autonomy and responsibility, but they offer two or three important advantages. First, they limit the problems or damages associated with local taxes just discussed; the less local taxes, the less distortions created by local taxes. Second, they make it possible to reduce inter jurisdictional disparities; local governments with smaller tax bases, and possibly with greater needs can (and should) be given larger subsidies. Thirdly, specific subsidies give the central government a chance to influence local governments behavior in a direction deemed desirable (by the central government). Subsidy schemes, because they attempt to achieve many different objectives, are usually complicated, and often ineffective.

Borrowing – The foregoing analysis suggests that local government borrowing is very much justified. It is a natural way to finance the local governments share in gross investment in urban development. Such infrastructure investments will make it possible for other investments to be made, and contribute to increase for many years either the stock of urban capital or urban activity, thereby expanding local governments tax bases, and generating the tax income required to pay interest and principal on local government borrowing. It could even be argued that local government borrowing is more justified than central government borrowing, because (at least in France) local governments invest three times as much as the central government in infrastructure. It could also be argued that it is more justified than private enterprises borrowing,

because the infrastructure created by local governments have a much longer life than the productive capital invested by enterprises. This argument assumes that local governments infrastructure investments are really necessary for other urban development investments to be made and will contribute to increase output and/or efficiency. There are reasons to believe that this is often, although not always, the case.

In relation with these sources of revenues, what solutions prevail in France? The French local finance system, which is complex, and very much criticized (so are local finance systems everywhere), reflects a series of compromises.

There is a first compromise on the amount of central government subsidies. This amount is sufficiently small (relative to countries like Italy, or the Netherlands, or even the UK) to leave local governments a great deal of responsibility and freedom, and sufficiently large (relative to countries like the US) to limit the dangers of local taxation and even out, to a certain extent, inter jurisdictional disparities.

There is another compromise about the nature of local taxes, achieved thanks to a multiplicity of local taxes . Because there are many taxes, tax rates remain reasonable, and do not lead to outrageous misallocation. A general rule can be formulated: at the local level, many taxes at smaller rates are less harmful than a few taxes at high rates. This is because the danger of misallocation increases exponentially, not linearly, with tax rates. Then, French local taxes also strike a balance between taxes on households and taxes on enterprises. Taxes paid by households are in principal more appropriate as local taxes, because households, not enterprises, vote, and exercise control on the tax/expenditure mix selected by local officials. On the other hand, taxes paid by enterprises, which are indeed exported out of the jurisdiction where they are being paid, are usually high yield taxes. They also create an additional link between enterprises and local governments, and give local officials a supplementary reason to attract enterprises and to create an environment that will suit enterprises. Thirdly, the French local tax system has achieved a balance between taxes based on stocks, that is on capital, and taxes based on flows, that is on activity. This makes it more resilient in case of fluctuations (that hit flows more than stocks) without bearing too much on production factors (that are more in the nature of stocks than of flows). The following Table 6 indicates, for each of the

major local taxes, whether it is paid by households or enterprises, and whether it is based on stocks of flows.

Table 11 - Characteristics of Major French Local Taxes, 1994

	Amount (in GF)	Paid by	Assessed on
Business tax (<i>taxe professionnelle</i>)	128	E	S & F
Property taxes (<i>foncier bâti & non-bâti</i>)	73	H & E	S
Housing tax (<i>taxe d'habitation</i>)	57	H	S
Registration fees ^a	29	H & E	F
Wage tax (<i>versement transport</i>)	17	E	F
Automobile ownership (<i>vignette</i>)	13	H & E	S
Other local taxes ^b	37		
Total	354		

Source & notes: Ministère de l'Intérieur, DGCL. 1995. *Les Collectivités locales en chiffres*, p. 70; Paid by: E stands for enterprises; H for households; Assessed on: S stands for stocks, F for flows. ^aEnregistrement et droits de mutation). ^bOf less than 10 GF each

There is not much of a compromise between paying now and borrowing in order to pay later. What is striking in the French case is the very limited recourse of local governments to borrowing. The figure given, 12 GF, or 2% of total resources, comes from the National Accounts. It refers to net borrowing, and is obtained by subtracting all other income from expenditures. Gross borrowing is much more important. Nevertheless, this suggests that French local governments do not rely much upon borrowing. Part of the explanation is that they no longer have access to specific lending institutions or specific (reduced) rates. They borrow on the market, just like any commercial undertaking.

Conclusions

What lessons for China can be drawn from the experience of Western countries with rural to urban migration?

The challenge of successfully incorporating tens of millions of farmers in cities is not unique to China. Several Western countries, particularly France and Italy after WWII, faced a challenge of comparable magnitude. These countries were then about thirty times smaller than China to-day, and they were (each) absorbing about half of million farmers per year. This is like absorbing 15 million farmers per year in China.

This was done relatively easily, at no major social or economic or environmental cost. From a purely economic viewpoint, one can even see it as desirable. The absorption of these millions of peasants contributed to

increase productivity and incomes. Never in Italy and France were growth rates as high as during this period.

There is no choice to be made between small and large cities. Inasmuch as we can tell, about a third of rural migrants stayed in rural areas, where they found non-agricultural employment, a third went to small town and a third ended up in large cities. The cost of accommodating migrants was probably higher in large cities than in small towns. But productivity and income was also higher in large cities, which could therefore afford higher costs. Focussing merely on one or the other (costs, or productivity) will produce biased, and mistaken, perceptions of realities.

Endogeneous growth usually counts more than exogeneous growth. Planners tend to focus on « attracting » businesses from the outside world, preferably from other countries. Such « landings » exist, of course, and are welcome. But in most cases, the bulk of additional jobs is accounted for by what happens in existing enterprises or by enterprises created by the locals.

Western experience also suggest that enterprises count much more than sectors. Planners like to discuss the sectors they intend to promote. The concept of sector is rapidly loosing its usefulness. There are no good sectors and bad sectors, sectors appropriate for a given city and sectors not appropriate. Within each sector, including the most traditional ones like textile, there are enterprises involved in low tech and enterprises involved in high tech ; there are enterprises that innovate (in terms of products or of production processes) and succeed, and also enterprises that fail.

The importance of direct policies should not be exaggerated. In France and Italy, governments could do – and did– little to slow down or accelerate or modify the urbanization processes at hand. They did little to encourage or discourage the growth of small towns relative to that of large towns. These processes resulted from billions of decisions taken by millions of actors, and were driven by powerful market forces, leaving governments, particularly central governments, rather powerless. On the other hand, indirect policies, that is policies not aimed at urban development goals, often had serious impacts upon urbanization outcomes. This was the case of decentralization, housing, transport, fiscal, or industrial policies. Identifying these impacts, and making

sure they are taken into account in policy formulation is a difficult but key task of central government.

Available Western data suggests that the financing of cities and urbanization is primarily the financing of business and housing investments, and secondarily the financing of public infrastructure. This does not mean that infrastructure do not have a great importance for business and housing investments, but they are not as central as is often thought. Above all, most business and housing investments are undertaken by the enterprises and households that pay the taxes required to finance infrastructure. In other words, more taxes and more infrastructure also mean less business and housing investments. The relationship between these two groups of investments is a relationship of complementarity, but it is also –probably more significantly– a relationship of substitution.

Automobile ownership played an important role in enabling ex-farmers to stay on their farms while finding jobs in the nearby small, or even larger, towns. Although farmers were relatively poor –which is why they were leaving agriculture– most of them could nevertheless afford a motorbike or a small, second-hand, car. This will probably not be the case in China for the immediate future. China's cities and locational patterns should not be planned as if the majority of people had automobiles.

This paper has focussed on the "Western experience". But it does not mean that the "Eastern experience", that of Japan and Korea could easily be neglected. It is probably equally. or more relevant for China.

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Annex A - Estimating the Benefits of Urbanization in China¹

Urbanization can be defined as the movement of farmers to cities. Because they do not produce much, farmers are usually poor or very poor. Many want to leave rural areas to go and work in cities, in the hope of a better life. Because they produce more in cities, this hope is usually justified. When a farmer thus moves to a city, four economic magnitudes are modified.

First, urban output (non-agricultural output or industrial output plus services output) increases; it increases by the additional output produced by our new urbanite, i.e. his/her marginal productivity in non-agricultural activities.

¹ Annex A is taken from a paper prepared by the author in 2000 for the World Bank for the People's Republic of China ; the author is indebted to Dr. Cai Jianming, who contributed most of the data utilized

Second, agricultural output declines; even if the additional output produced by our farmer (his/her marginal productivity in agriculture) was low, it was not zero, and his/her departure means a small, but not zero, reduction in agricultural output, at least in the short term.

Third, the income of the remaining farmers increases; agricultural output declines less than agricultural labor force; this is because the marginal productivity is lower than the average productivity.

Last, but not least, the increase in urban output means an increase in the demand for agricultural output that will result in an increase in agricultural output that will also contribute to increase the income of the remaining farmers.

This paper is an attempt to put some numbers on these four changes. It is easy to know the average productivity in agriculture and in non-agriculture, by simply dividing output by labor force. The average productivity of labor in agriculture in 1999 is about 7,400 y, with large variations between provinces¹. The average productivity of labor in non-agriculture, or more precisely in urban areas, was in 1998 about 41,000 y, with large discrepancies between cities and regions.

It is more difficult to find out the marginal productivity of labor. This can be done by utilizing quasi production functions for both sectors, relating output to various inputs or explanatory variables –including the labor force. With an exponential specification, production functions yield elasticities, and in particular elasticities of output to labor force, that can easily be transformed into marginal productivities.

Quasi production functions for urban areas

China publishes information on about 220 cities. For each city, there is an estimate of the output of the city, that tries to capture all the elements of the urban GDP, i.e. the value-added by all industrial and non-industrial establishments in the city, plus wages paid in the non-commercial sector². There is also data for the labor force, and the stock of capital. This information is far from perfect. The numbers for the labor force refer only to workers with an urban permit. It ignores the so-called floating workers. To use it, we have to assume that the ratio of floating workers to urban permit workers is

¹ From about 3,000 in Guizhou to about 15,000 in Liaoning or Xinjiang.

² Very few countries in the world produce similar data.

constant over space, an assumption that is known not to be very true. The numbers for the stock of capital refer to the productive capital of enterprises with independent accounting system. The capital of these enterprises constitutes the bulk of total productive capital, there is no obvious reason why it would not be constant share of total productive capital, and we will use it as a proxy for total productive capital. An examination of the data showed that output per worker varied in an unbelievable fashion; for instance, there are cities with an output per worker 10 times as large as Shanghai, which is not plausible. In an attempt to reduce the uncertainty associated with such outliers, we ranked cities by output per worker, and discarded the first decile and the last decile. We are thus left with a set of 179 cities. They are further divided into two sets: cities in coastal provinces (73 cities), and cities in non-coastal areas (105 cities).

Let us assume that the output of a city (U_i) can be explained by its labor force (L_i) and its productive capital (K_i). We have:

$$U_i = q \cdot L_i^1 \cdot K_i^k$$

The results of regression analysis are given in Table 1 below.

Table 1 - Coefficients of Production Functions for Urban Output				
Dependent Variable	Explanatory variables		Intercept	R2
	L	K		
U for all cities	0.809 (13.7)	0.144 (2.82)	4.01 (17.4)	0.869
U for non coastal provinces	0.883 (18.2)	0.119 (2.67)	3.95 (19.2)	0.945
U for coastal provinces	0.917 (18.4)	0.054 (1.30)	4.54 (26.2)	0.965

Sources and notes: U = Urban output (in 100 M yuan; L = Labor force, in 10,000 workers; K = productive capital, in 100 M y. Number in parentheses are T-values

All the coefficients have the expected signs, and are significant, except for the coefficient of capital in the coastal provinces equation. The elasticities of output to labor (l) are high: about 0.8 for all cities, and about 0.9 for our two regional subsets. The elasticities of output to labor (k) are around 0.1 for all cities and for cities in non-coastal provinces, and about 0.6 for cities of coastal provinces. These numbers are translated into marginal productivities for labor (λ_u) and capital (κ_u):

$$\lambda_u = l \cdot \sum U_i / \sum L_i$$

$$k_u = k \cdot \sum U_i / \sum K_i$$

These numbers are given in Table 2 that also indicates average productivities.

Table 2 - Average and Marginal Productivities for Labor and Capital in Chinese Cities, 1998

	Non coastal provinces	Coastal provinces	China
Stock of capital (in G y)	1,290	850	2,140
Labor force (in M)	37.6	27.5	65.4
Output (in G y)	1,070	1,610	2,690
Capital/Worker (in y)	33,900	31,000	32,700
Elasticity output/labor	0.883	0.917	0.809
Average labor productivity	28,400	58,600	41,100
Marginal labor productivity	25,000	53,700	33,200
Elasticity output/capital	0.119	0.054	0.144
Average capital productivity	0.836	1.89	1.26
Marginal capital productivity (%)	9.9	10.2	18.1

Sources and notes: Data refer to 179 cities out of 225 cities; average capital productivity is the output per yuan of capital, the inverse of a capital output ratio; marginal capital productivity is additional output generated by an additional yuan of capital: expressed in percentage terms it is akin to an immediate rate of return on investment

Table 2 shows some of the large differences that exist between cities in coastal and non-coastal provinces. Although coastal cities have less workers (34% less) and less capital (27% less), they produce more (60% more) than non-coastal cities. This is not because they have more capital per worker (they have slightly less) but because they have a much higher labor and capital productivity. In marginal terms, however, differences in capital productivity appear to be small. The immediate rate of return in both types of cities appears to be about 10%, a rather low rate (the rate of return calculated for the entire set of cities is higher, but the regression results are probably less trustworthy). The most important findings for our purpose, however, are the estimates of marginal productivity for labor. When a farmer moves into a city, assuming he/she finds a job, the output of the city increases by 25,000 yuans in a non-coastal city and by 53,700 yuans in a coastal city (33,200 yuans for all cities according to the regression results for all cities). As mentioned above, the data utilized underestimates the importance of the labor force (because it ignores "floating workers". Consequently, the numbers given here

overestimate average and marginal labor productivity, by something like 10-15%.

Quasi production functions for agriculture

Let us assume that agricultural output in a given province (Ai) is a function of four factors: the agricultural labor force (Fi), the agricultural land area (Si), the average rainfall (Ri), and also –as a demand factor– the industrial output (Mi) of the province. Let us further assume an exponential relationship. We have:

$$A_i = k * F_i^f * S_i^s * R_i^r * M_i^m$$

The data is available by provinces for year 1999. Beijing, Shanghai and Tienjin are not included, because of the small share of agricultural output in these city-provinces. Chongqing is eliminated because the data for this province is incomplete. We are left with data for 26 provinces.

The results of regression analysis are given in Table 2.

Table 2 - Coefficients of Production Functions for Agriculture

Dependent Variable	Explanatory variables				Intercept	R2
	F	S	M	R		
A	0.94 (9.38)				0.042 (0.14)	0.78
A	0.87 (5.49)	0.79 (0.60)			-0.13 (-0.30)	0.78
A	0.48 (3.58)	0.002 (0.012)	0.40 (5.03)		0.141 (0.52)	0.89
A	0.41 (2.19)	0.074 (0.41)	0.39 (4.86)	0.083 (0.57)	-0.13 (-0.23)	0.90

Sources and notes: A=agricultural output, in 100 M yuan; F=agricultural labor force, in 10,000; S=agricultural land, in 10,000 mus; M=industrial output, in 100 M yuan; R=average rainfall in mm/year. Number in parenthesis are T-values.

The last equation is the most interesting. All the explanatory variables have the expected sign. Agricultural land and rainfall, however, are not significant. This is because the quality of soil (even when rainfall is introduced) varies greatly from province to province. Agricultural output per unit of land varies by a factor of 10 between provinces. Industrial output appears as a significant contributor to agricultural output. This is because industrial output is a proxy for the demand for agricultural products, both as consumption items and as raw materials items.

The elasticity of agricultural output to labor force (f) appears to be around 0.41. When the agricultural labor force increases (decreases) by 10%, then agricultural output increases (decreases) by about 4%. We can use this finding to estimate the marginal productivity of labor in agriculture (λ_a):

$$\lambda_a = f \cdot \frac{\sum A_i}{\sum F_i} = 3,046 \text{ yuans}$$

Whenever a farmer leaves the land for the city, all other things equal, agricultural output decreases, on average, by about 3,000 yuans.

Benefits of rural-to-urban migration

We can now assess the automatic changes that will be introduced by a rural to urban migration of a certain number of workers. Let us consider a migration of 10 million workers. Let us assume that the numbers available underestimate the urban labor force by 10%, which is therefore equal to about 90.4 million workers¹. A 10 million increase is a 10.9% increase in the labor force. With an elasticity of output to labor equal to 0.9, this will result in an increase of output of about 9.8%, amounting to an additional 347 G yuan of urban income.

This additional urban income will generate an increase in agricultural output, as indicated above. Since the elasticity of agricultural output to urban income is about 0.4, this increase in urban income means an increase of agricultural output of about 3.9%, that is an increase of 94 G yuans. On the other hand, 10 million farmers less means a decrease of the agricultural labor force of about 3%. With an elasticity of agricultural output to agricultural labor force of about 0.4 also, this means that agricultural output will decline by about 1.2%, or, in absolute terms of 30 G yuans. With a demand effect of +94 and a demand effect of -30, the net effect on agricultural output will be an increase of about 64 G yuans.

With this information, we can construct Table 4.

¹ 81.3 million*1.1; the number used here, 83.1 million is higher than the one which appears in Table 2 above, because it relates to the 225 cities, and not only to the 204 cities used in the regression.

Table 4 - Changes Associated with a 10 million Rural to Urban Migration

	Before Migration	After Migration	Absolute Change	Relative Change
Urban output (G Y)	3,530	3,870	+347	+9.8%
Agric. Output (G Y)	2,420	2,480	+64	+2.7
Total output (G Y)	5,950	6,360	+411	+6.9
Urban labor force (M)	91	101	+10	+10.9
Agric. Labor force (M)	328	318	-10	-3.0
Total labor force (M)	419	419	0	0
Output per worker				
in cities	38,800	38,400	-405	-1.0%
in rural areas	7,370	7,800	+433	+5.9%
in China	14,200	15,200	+980	6.9%

Table 4 provides orders of magnitude of the benefits to be expected from rural to urban migration. They are very significant. Urban output obviously increases when workers move from a low productivity sector to a high productivity sector. What is less obvious is that agricultural output would also increase, because of the very significant elasticity of agricultural output to urban income, the so-called demand effect. Let us consider a migration of 10 million workers. It represents only 3% of the agricultural labor force, but 11% of the urban labor force. It would increase urban output by nearly 10%, agricultural output by slightly less than 3%, and total output by about 7%. The remaining farmers would see their income increase by 6%. People living in urban areas would on average see a small (1%) decline of their present per worker income. An interesting paradox is that the average income per worker increases by 7%, more than the income of urban labor or of agricultural worker. This is because the shift is a shift from a low to a high productivity sector.

What are measured here are "first-round", mechanical and automatic, changes. In reality, the rural to urban migration studied would trigger other changes, most of them positive. The migration would not stop the progress of productivity, but would probably accelerate it. In agriculture, better-off farmers would be more liable to invest in productivity-raising equipment, inputs or knowledge. In urban areas, new migrants, who are particularly mobile, would increase a much-needed flexibility, and ease the always-difficult process of re-allocation of workers to enterprises and sectors. The analysis presented here ignores the fact that investments are needed to provide migrants with jobs, houses, infrastructure, and public services. But this provision itself might be an additional source of activity, employment and output.

Migration has costs, as well as benefits. And both costs and benefits are not linear. In reality, they do not increase proportionally to the importance of migration. The analysis presented here has only looked at benefits. And it treats them as if they were linear. Benefits associated with 20 million migrants, as estimated here, would be about twice as large as benefits associated with 10 million (except for per worker numbers), because the elasticities used are constant.

Obviously, these numbers must be taken with caution. They are no better than the database with which they have been produced. But they could probably be improved. For agriculture, Chinese provinces are so large that they do not constitute very good units of analysis. They are also so diverse that it is not sure that the averages for China produced by regression analysis are very robust. Marginal productivity, just as average productivity, certainly varies greatly from province to province and within each province. It would be useful to conduct similar analysis for the various districts of several provinces. For cities, better data could probably reduce, if not eliminate, the underestimation of the labor force, and explicitly take into account the floating labor force, perhaps at the cost of reducing the sample of cities. The infrastructure endowment of cities could perhaps be estimated, and introduced as an additional explanatory variable in the regression. The analysis has also largely ignored geography, except in the distinction made between two sub-samples of cities, one for non-coastal provinces and one for coastal provinces. In a country as large as China, this is of course a shortcoming. The distinction made showed great differences between the two types of cities. Introducing space in the analysis would improve it. Nevertheless, the overall findings are quite plausible, and producing numbers always contribute to the understanding of mechanisms.