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IMPACT OF RECESSION ON SOCIO-ECONOMIC STRUCTURE  
OF FRENCH URBAN SYSTEM

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Abstract. In order to promote construction of dynamic models for socio-economic structure of national urban systems we need a better knowledge in mechanisms governing functional and social redistributions between cities. Empirical regularities are provided from the french case, with detailed information for 400 urban agglomerations covering a fast-growth period (1954-75) and a more recent phase of economical crisis (1975-80). Observations are made about structural persistency and time scale of urban change.

## INTRODUCTION

Since most of existing models which describe urban systems at a regional or national level are static ones, they fail to consider an important feature of such systems, that is the elaboration and maintenance of their structure by dynamic processes. In many cases, present state of interurban differentiation cannot be understood or simulated without taking into account these processes.

As it is too early to provide a comprehensive model for the evolution of socio-economic structure in a national urban settlement system, we choose to present here some empirical results obtained from french urban system, by the mean of data analysis. We first record with some detail a study about crucial question of how deeply slowing-down of economic activity since the middle seventies has altered interurban division of labour previously ongoing processes. We then use results of a broader research (PUMAIN, SAINT-JULIEN, 1978; SAINT-JULIEN, 1982) to replace those recent tendencies in the past thirty year-evolution of urban system. This can lead to some propositions for modelling change at a medium time-scale.

## RECENT EVOLUTION OF INTERURBAN DISPARITIES IN LABOUR-FORCE QUALIFICATION

Many questions about the present state of employment in french towns, its recent evolution and future trends, come up against that unknown fact : what is the effect of economic crisis upon urban employment structures ? Did it shatter the data, alter ongoing processes, stop certain redistributions, reinforce inequalities ? Detailed results of 1982' census will

not be available before two or three years. That is why we estimated intervened changes between 1975 and 1980 from another data source : the annual survey about employment structure of the Ministère du Travail.

This source has obvious limitations : the survey deals only with wage-earners working in firm establishments larger than ten persons. The cover rate of the survey varies according to the activity branch (from 85% and more in industrial sector to about 45% among tertiary activities). But main interest of the survey is its jobs classification, which describes rather accurately professional qualification levels, among production jobs on the one hand and services jobs on the other hand. Many scholars have underlined prominent role of professional qualification in contemporary processes of spatial division of labour (AYDALOT, 1980; LIPIETZ, 1978). The survey provides then an outstanding tool to measure effects of spatial strategies of economic actors and functional redistributions in urban network. It also allows to estimate intensity and evolution of spatial disparities in terms of knowledge, power and wealth associated with inequal concentrations of each kind of jobs. In reference to the particular context of economic crisis, such an information adds to quantitative data (demographic decline, unemployment rate...) a qualitative contents deeply significant for potential development of urban agglomerations.

1. State of urban disparities in professional qualification.

Ten levels in professional qualification of wage-earners were considered (five in production and five in services) for each urban agglomeration of more than 10.000 inhabitants at 1975 (table 1). A correspondence-analysis was made upon this 10x407

table (1). Results show that the nature and intensity of work specialization in urban network can be largely defined by the hierarchical order of professional qualification levels. The most important feature of interurban division of labour for wage-earners (two-thirds of total variance explained) is then related to an hierarchy of job qualification (figure 1). This exact coincidence between geographical structure and a social and economic nomenclature is remarkable.

The strength of these geographical contrasts and of interdependencies that they generate in urban network are most important among production jobs than for services jobs. Spatial division of labour, as defined by relative geographic segregation of qualification levels, is in 1975 in a more advanced state for production than for services.

Beyond this main principle of differentiation, other specialization characteristics are of minor importance. They are mainly generated by inequalities in skilled and unskilled workers concentrations, whereas executive services jobs have a more homogeneous distribution.

## 2. Qualification scale and urban hierarchy.

Geographical distribution of these main specializations follows rather strongly hierarchical organization of urban network. For production, as for services-jobs, the proportion of each qualification level among wage-earners varies in a systematic way with town-size. A higher position in urban hierarchy means a more skilled job structure and more services

(1) Correspondence analysis, as cluster analysis using a chi-squared distance, measure specialization in about the same way than location quotients do.

jobs than executant production jobs. Within a size-class of towns homogeneity of qualification profiles is significantly larger than between profiles from different size-class. On the axis of urban labour specialization (figure 2a) agglomerations are mostly arranged according to their size. Specialized profiles with unskilled workers concern mainly small towns. At the other end, a large proportion of towns having more than 200 000 inhabitants, and, in a particularly excentrated position, Paris agglomeration, are all characterized by an over-proportion of highest management and senior executive levels and by a more skilled executant labour.

### 3. Qualification scale and regional components.

Labour specialization and induced interurban segregations are not totally independent from the particular regional urban network which agglomerations belong to. Industrial or tertiary specificity of regional activity, a more or less central position of the region in urban network, and, of minor importance, local configuration of that network, interfere in nature and intensity of urban labour-skill specialization. Points figuring positions of average urban profile by region (barycentric projections) are ordered on the axis of figure 1, from northern and eastern part of France having more workers to South-eastern part and Paris region having more managers and technicians in production and services, the other regions being in intermediate positions.

### 4. General tendencies of change between 1975 and 1980.

Occured changes in interurban distribution of employment did not deeply alter the structure defined for 1975, and the

picture which could be given for 1980 would be very similar. So is it because in town-profile changes, common transformations were the most important. Two main tendencies characterize them.

-Tertiarization of salaried jobs.

First tendency is a relative substitution of services jobs to production ones. This process is sensible either in considering the whole set of cities, as different size-classes or regional groups. This is the prolongation of a former and rather old tendency of urban employment. Between 1975 and 1980, only twenty agglomerations do not follow that trend.

-Higher qualification of salaried jobs.

Second tendency corresponds to an increase in mean qualification levels of labour force in towns. It expresses reinforcement of proportions of qualified engineers, managers and technicians in production and services, and a sensible decline in proportion of unskilled workers, which decreases more rapidly than the one of total workers. Some authors suggested that crisis could put an end to the process of worker labour dequalification. Such an evolution is attested here, at the scale of a large number of towns. This evolution means the end of a cycle of expanding industrial employment which supposed a rapid growth of labour posts requiring unskilled workmanship. No new industry has relieved and everywhere executant industrial employment decreases.

Those two general tendencies combine with each other and explain similarities in length and directions of town trajectories along the main axis ordering labour force profile specialization (figure 3). (These trajectories are obtained by submitting simultaneously to correspondence analysis both

tables describing labour force composition according to the ten qualification levels for each of the 407 agglomerations at 1975 and 1980). Only twenty towns escape to this evolution.

Beyond these common changes have taken place some redistributions among categories of workers, but in a few towns only. Those redistributions above all concerned small towns having already a marked specialization in workers, skilled or unskilled. A better description of these secondary changes can be obtained by examining differential changes.

##### 5. Differential urban evolutions of labour force qualification.

Relative positions of towns in labour force structure of the urban system can only be altered by differential changes, which consist in slight retouches, comparing with importance of system general evolution. Those alterations proceed from changes differing in content or in velocity from general tendencies. They can be displayed by another correspondence analysis applied to regression residuals of each qualification variable measured at 1980 with itself at 1975. General change is then eliminated from factorial structure obtained, which figures differential change only. Agglomerations are positioned after their relative change in labour force composition between 1975 and 1980, in a way independent of their initial situation.

Differential changes for each qualification level are not uncorrelated. Despite a rather large diversity of town evolution directions, similar modifications do appear in labour force categories already associated in interurban labour division structure at 1975. Most of differential changes consist of two opposite evolutions (table 1) :

-one is a relative reinforcement of executant jobs in production . Concerned agglomerations either do not tertiarize at



all or mostly have a lower rate of tertiarization than the whole urban system. For half of <sup>them</sup> this process is mainly a higher specialization in unskilled labour force in production, for the other it means a higher qualification level with an increase in proportion of managers or technicians;

-the second type of differential changes (170 agglomerations) consist of an acceleration in substituting services jobs to production ones, with a faster relative increase in labour qualification level.

These differential changes are not without any consequence, because they do not appear randomly in urban network. At least in two cases out of three, they lead to emphasize an existing specialization. Indeed, these changes are at the same time function of labour force profile at 1975 (figure 4a) and of hierarchical position of the town in urban system (figure 4b).

Among agglomerations which are already specialized in services, the largest ones have reinforced more strongly and rapidly their tertiarization and high qualification. The smallest on the contrary tend to diversify their labour force structure by receiving relatively more unskilled production jobs.

Agglomerations initially specialized in production jobs have a large diversity of evolutions, without any specific role of their size.(figure 4 a and b).

#### SHORT-AND LONG-TERM CHANGES IN AN URBAN SYSTEM

Obviously, effects of the economic crisis are not - not yet?- sensible in recent processes of interurban division of labour. All the observed tendencies were already noticed in previous studies of post-war urban change in France (PUMAIN, SAINT-JULIEN, 1978 ; SAINT-JULIEN, 1982 ). Table 2 illustrates the large persistency of economical and social structure of the urban

system for a twenty-year period of fast economic growth and rapid urbanization between 1954 and 1975. During that period, many changes occur in urban labour force composition, town-size and structure, and in urban way of life, but all these changes diffused very rapidly in all towns and did not alter much their relative position in the urban system. Nevertheless, two main differential changes were discernible during that period : one is related with town size and leads to the emergence of a 'large town model' of economic and social structure; the other seems to be a more restructuring factor standing for an inequal diffusion of modernity and economic integration in the system and leading to a centre-periphery differentiation (PUMAIN, SAINT-JULIEN, 1979 ). What is important is that those restructuring tendencies are not unrelated with present position and past evolution of agglomerations in the urban system: figure 5 shows how main contemporary differentials in urban social structure (1) among the agglomerations having more than 10 000 inhabitants do correspond to differentiated past demographic evolutions - reflecting inequal assimilations of successive innovations and economic integration processes.

So at least two kind of processes have to be taken into account for a modelisation of evolving socio-economic structure of urban systems: general qualitative and quantitative changes diffusing in the whole system at a very fast speed, but not altering its structure, and slowly operating restructuring tendencies which should integer the long story of the system. Unless that dynamic models could modelize the first kind of changes in such a way that they also have as an effect some structural change on the long term...

(1) as established after a cluster analysis using a chi-squared distance upon labour force composition in 24 'categories socio-professionnelles' at 1975.

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QUALIFICATION LEVELS	1975		1980	
	Mean	S.D.	Mean	S.D.
PRODUCTION				
Engineers, Managers	1.8	.9	2.1	.9
Technicians	4.8	2.3	5.4	2.6
Foremen	4.0	1.2	3.9	1.3
Skilled Workers	28.0	8.0	26.9	7.7
Unskilled Workers	22.4	10.2	17.9	9.5
Total	61.0		56.2	
SERVICES				
Engineers, Managers	5.6	1.7	6.9	2.0
Technicians	3.9	1.9	4.6	2.3
Foremen	3.0	1.1	3.4	1.3
Skilled Employees	20.0	6.7	21.7	6.5
Unskilled Employees	6.5	3.3	7.2	3.4
Total	39.0		43.8	

Table 1- Mean and Standard Deviation (S.D.) of each qualification-level proportion in urban labour-force for 407 agglomerations in 1975 and 1980.

Table 2 : Stability of urban socio-economic structure.

Economic-activity groups	Factor 1		Factor 2		Factor 3		Average weight of each group (%)	
	1954	1975	1954	1975	1954	1975	1954	1975
Mining	0,5	0,4	0,2	0,4	- 0,1	0,1	1,7	1,4
Building-trade	- 0,2	- 0,5	0,5	0,5	- 0,2	- 0,2	8,8	9,2
Metallurgy	0,5	0,7	- 0,0	- 0,2	- 0,3	- 0,4	13,2	15,6
Chemicals	0,1	0,2	0,0	0,2	0,2	- 0,0	3,3	3,9
Food-products	- 0,3	- 0,3	0,3	0,2	0,6	0,6	3,6	2,2
Textile and clothing	0,3	0,4	- 0,4	0,0	0,3	0,7	9,4	4,0
Others industries	- 0,1	- 0,1	- 0,4	- 0,2	0,2	0,6	5,3	3,6
Transport	- 0,2	- 0,2	0,5	0,0	0,4	- 0,0	7,2	4,7
Wholesale trade	- 0,3	- 0,5	- 0,1	- 0,2	0,3	0,2	4,2	3,4
Food retail trade	- 0,4	- 0,4	0,5	0,7	0,6	0,1	4,2	3,4
Other retail trade	- 0,7	- 0,7	0,0	0,4	0,1	0,0	6,8	7,8
Hotel trade	- 0,4	- 0,5	0,2	0,5	0,2	- 0,3	3,4	2,3
Insurance banking	- 0,7	- 0,6	- 0,2	- 0,4	- 0,0	0,1	3,0	2,9
Professional services	- 0,4	- 0,6	0,3	- 0,0	0,3	- 0,2	0,8	2,4
Domestic services	- 0,8	- 0,6	- 0,2	0,0	- 0,0	- 0,2	4,2	1,5
Services to households	- 0,8	- 0,8	- 0,2	- 0,1	- 0,1	- 0,0	7,6	9,6
Water, electricity and gas services	- 0,4	- 0,3	- 0,0	0,0	- 0,2	- 0,1	1,2	1,0
Transmissions	- 0,8	- 0,5	- 0,2	- 0,4	- 0,3	0,0	1,7	2,0
Administration	- 0,8	- 0,7	- 0,1	- 0,4	- 0,4	- 0,0	8,4	15,0
Defence	- 0,3	- 0,2	0,2	- 0,2	- 0,2	- 0,3	2,0	2,0
		25 %		10 %		8 %	100	100

Correlations between urban economic activities and the first three factors of a principal component analysis (140 largest towns at 1954).

Socio-professional groups	Factor 1		Factor 2		Factor 3		Average weight of each group (%)	
	1954	1975	1954	1975	1954	1975	1954	1975
Employers (large firms)	+ 0,7	+ 0,5	- 0,5	- 0,8	+ 0,2	- 0,0	2,3	1,2
Employers (small firms)	+ 0,5	+ 0,2	- 0,8	- 0,8	+ 0,0	- 0,2	12,2	6,0
Senior executive - managers	+ 0,8	+ 0,8	+ 0,4	+ 0,4	- 0,0	- 0,0	4,6	7,3
Executive staff	+ 0,8	+ 0,8	+ 0,4	+ 0,4	- 0,1	+ 0,0	8,6	14,6
Employees	+ 0,8	+ 0,8	+ 0,4	+ 0,2	+ 0,0	+ 0,3	17,0	20,5
Skilled manual workers	- 0,8	- 0,8	- 0,2	- 0,2	- 0,5	- 0,1	25,7	18,8
Unskilled manual workers	- 0,6	- 0,9	+ 0,2	- 0,0	+ 0,7	+ 0,2	19,0	22,6
Domestic services	+ 0,8	+ 0,5	- 0,1	- 0,3	- 0,1	+ 0,4	4,2	1,8
Others personal services	+ 0,7	+ 0,7	- 0,3	- 0,4	+ 0,3	+ 0,0	9,4	4,2
Others	+ 0,6	+ 0,4	+ 0,1	+ 0,2	- 0,7	- 0,8	3,4	2,9
	51 %	45 %	15 %	20 %	10 %	10 %	100	100

Correlations between urban social categories and the first three factors of a principal component analysis (140 largest towns at 1954).

	1st factor	2nd factor	3rd factor
Economic activities	.9	.7	.6
Social categories	.9	.9	.5

Correlations between each factor in 1954 and the correspondent one in 1975.

Figure 1: Interurban structure of labour force qualification

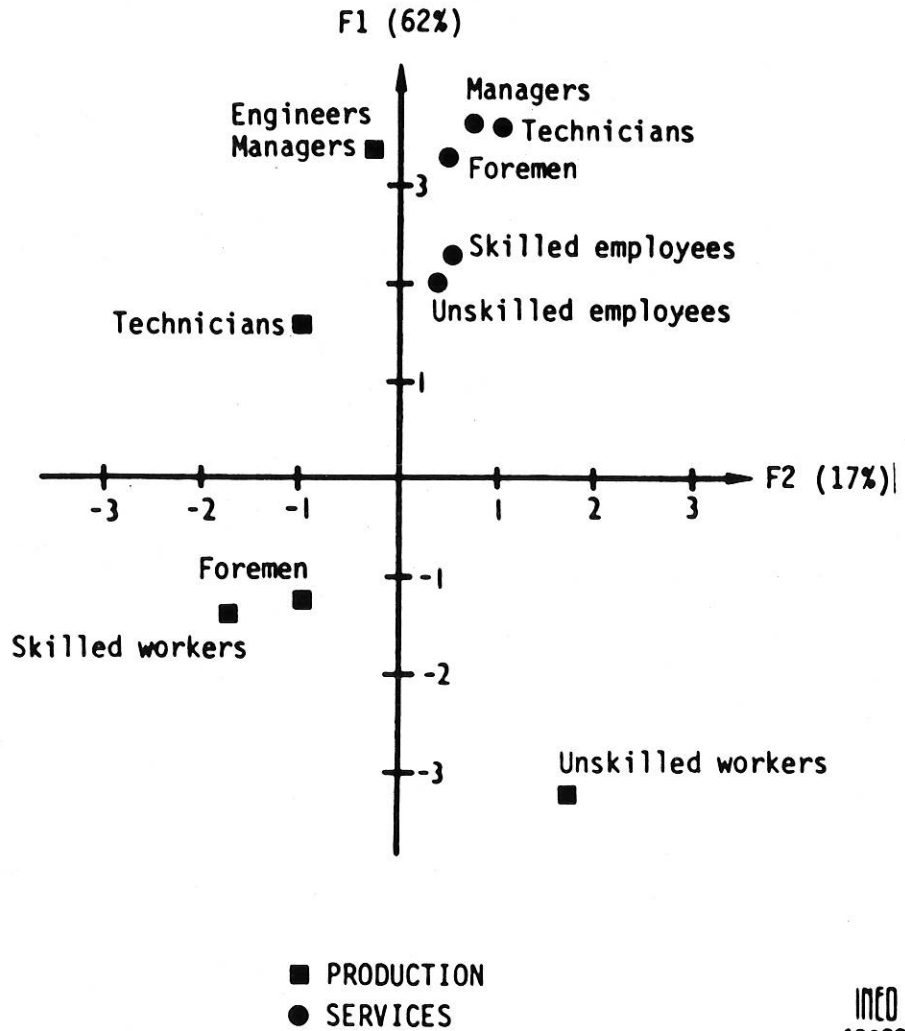
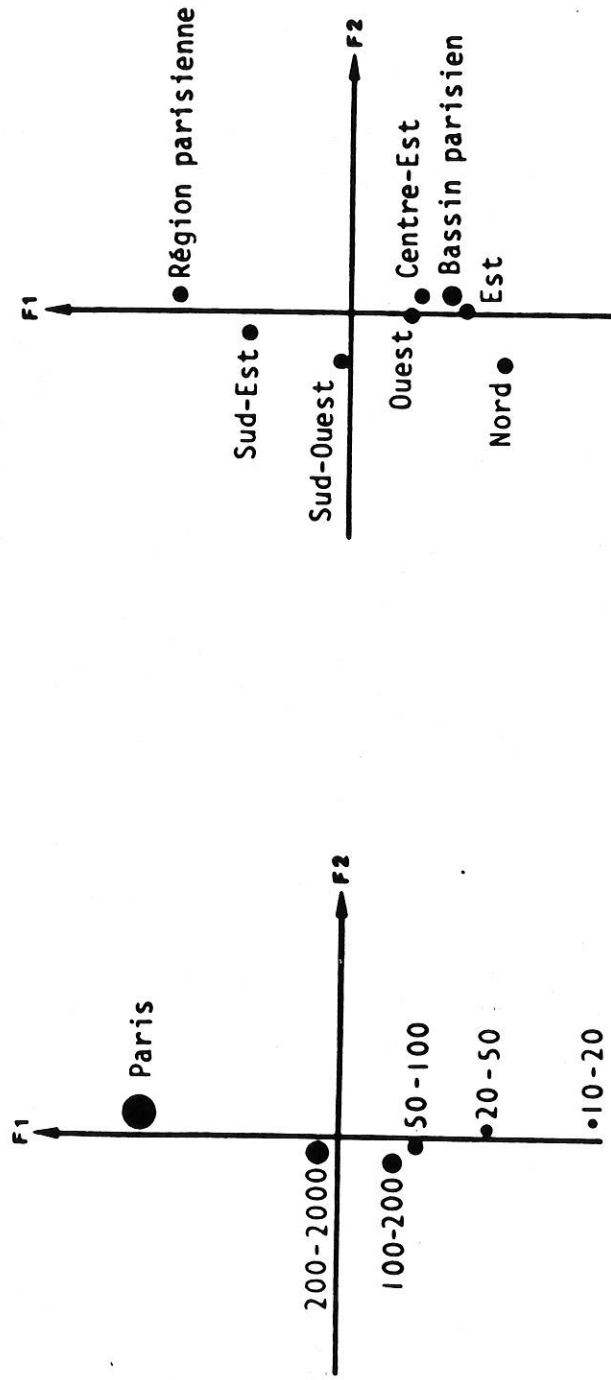


Figure 2: Labour qualification and hierarchical and geographical structure of urban system

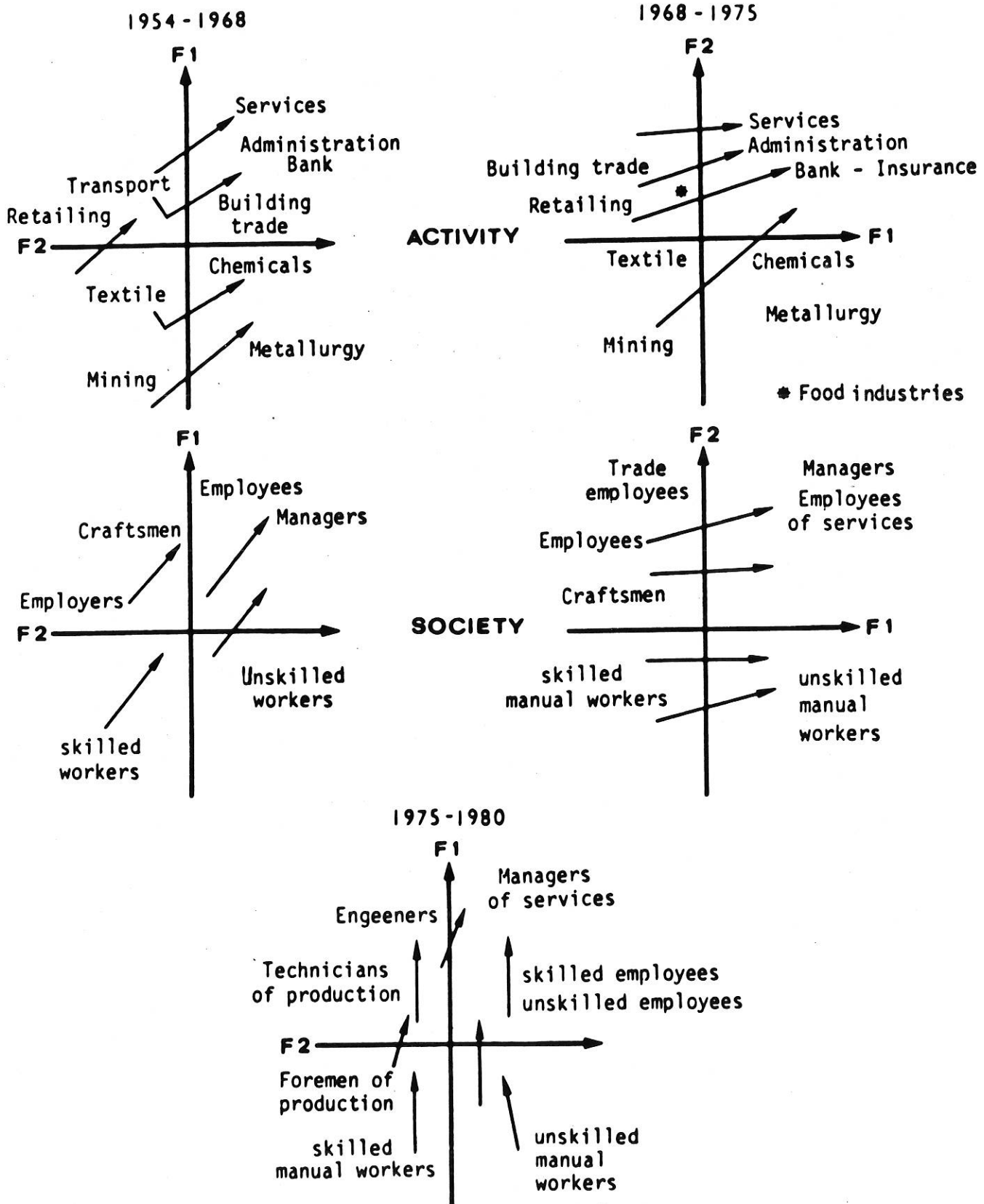


a) Size classes in labour qualification structure (see figure 5) (thousands)

b) Regional urban means in labour qualification structure (see figure 5)

FIGURE 3

TERTIARIZATION AND SUBSTITUTIONS :  
GENERAL TENDENCIES OF CHANGE BETWEEN 1954 AND 1980



QUALIFICATION OF WAGE-EARNERS



Figure 4 : Differential charges in labour force qualification

A : INITIAL SPECIALIZATION

DIFFERENTIAL EVOLUTION 1975-80 STRUCTURE 1975 SPECIALIZATION	ACCELERATION OF THE TERTIARISATION AND OF THE QUALIFICATION		TERTIARISATION SLACKENING WITH STRENGTHENING		
	VERY SKILLED	SKILLED	HIGH SKILLED WHITE COLLARS	SKILLED BLUE COLLARS	UNSKILLED BLUE COLLARS
TERTIARY TOWNS	●	●	○	○	○
MANUFACTURING TOWNS SKILLED BLUE COLLARS	○	●	●	○	●
MANUFACTURING TOWNS UNSKILLED BLUE COLLARS	○	●	●	●	●

B : TOWN SIZES

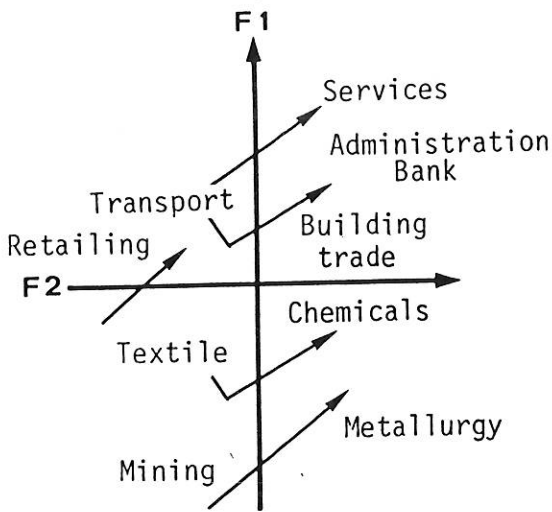
DIFFERENTIAL EVOLUTION 1975-80 CITIES SIZE	ACCELERATION OF THE TERTIARISATION AND OF THE QUALIFICATION		TERTIARISATION SLACKENING WITH STRENGTHENING		
	VERY SKILLED	SKILLED	HIGH SKILLED WHITE COLLARS	SKILLED BLUE COLLARS	UNSKILLED BLUE COLLARS
200-2000000	●	○	○	○	○
100-200000	●	●		●	○
50-100000	●		●	●	
20-50000	●	●	●	●	●
10-20000	○	●	●	●	●

DEVIATIONS FROM FREQUENCIES CALCULATED FOR INDEPENDANCE CASE

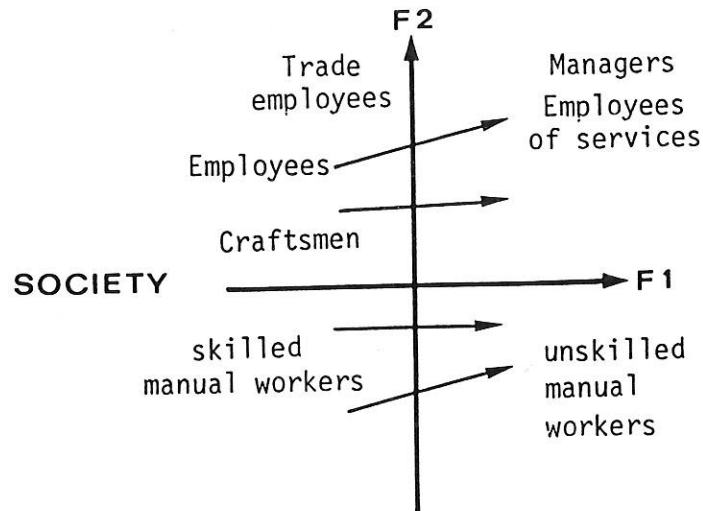
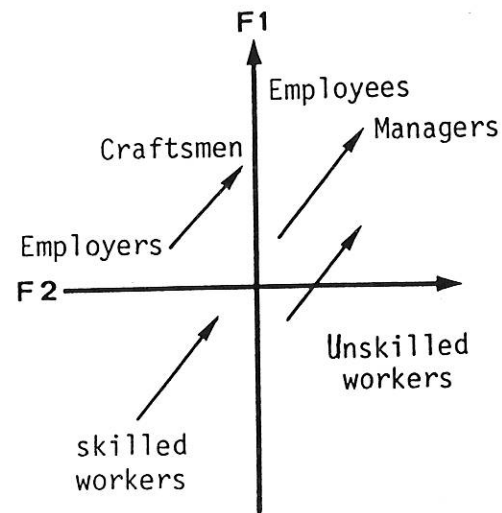
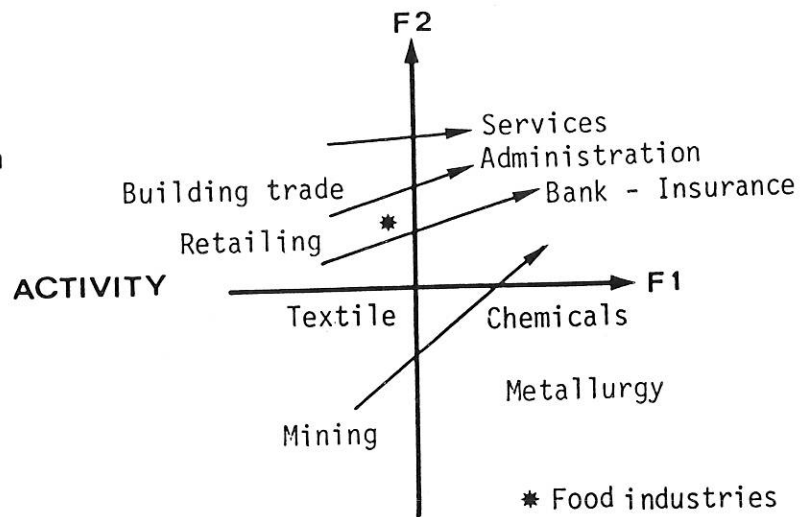
- POSITIVE DEVIATIONS
- NEGATIVE DEVIATIONS

TERTIARIZATION AND SUBSTITUTIONS :  
 GENERAL TENDENCIES OF CHANGE BETWEEN 1954 AND 1980

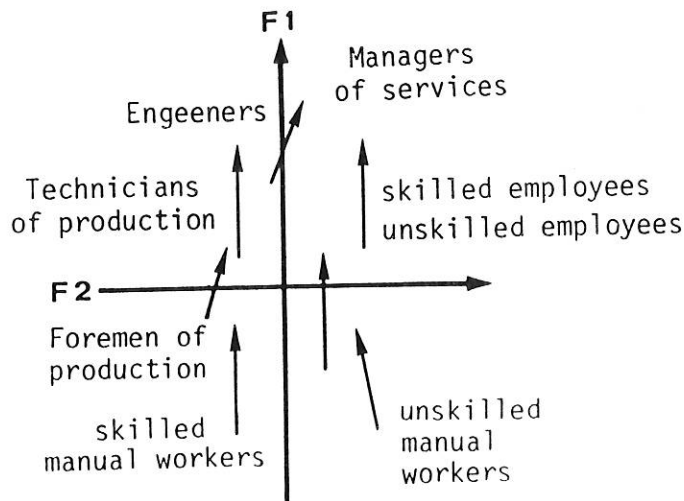
1954 - 1968



1968 - 1975

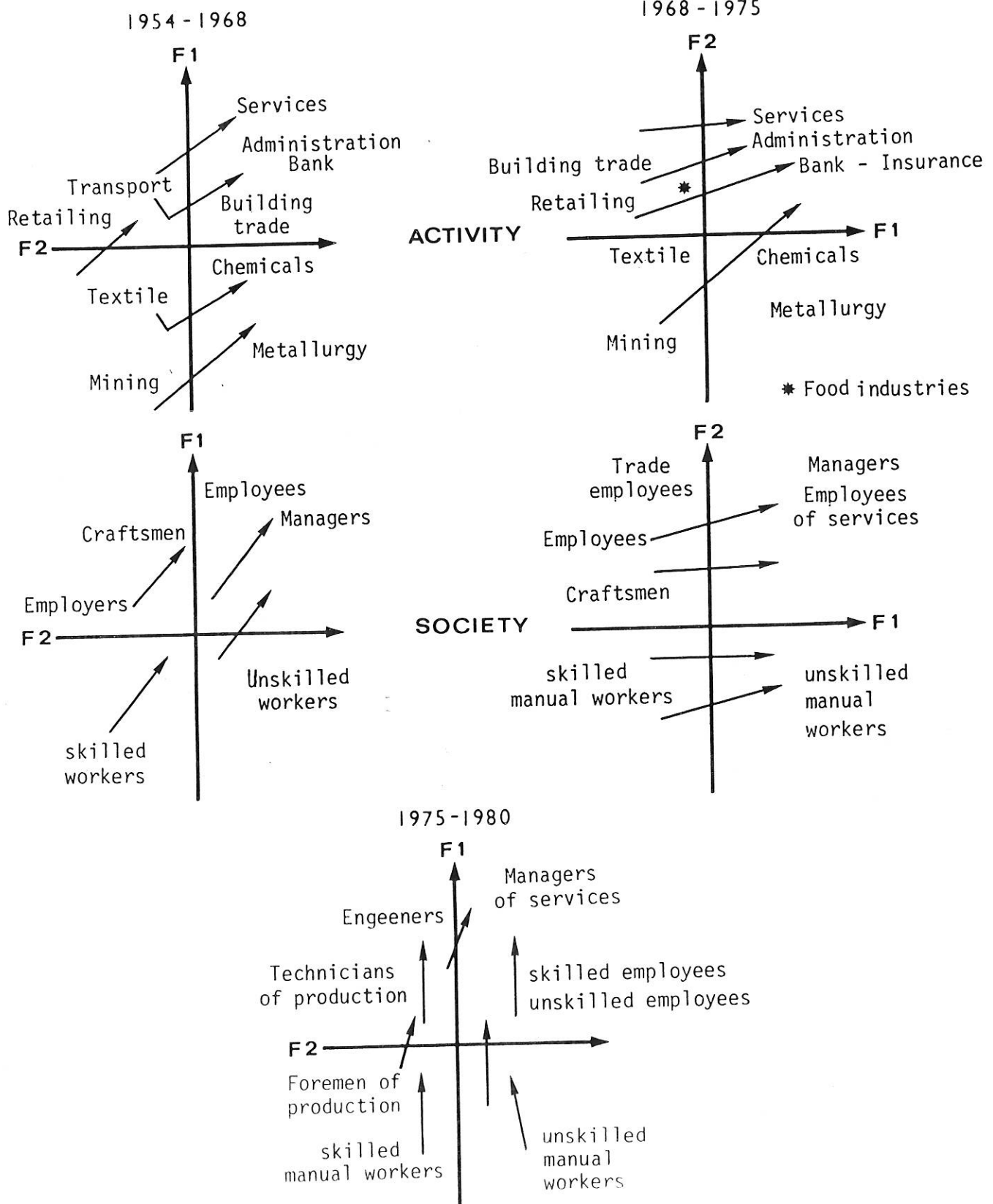


1975 - 1980



QUALIFICATION OF WAGE-EARNERS

TERTIARIZATION AND SUBSTITUTIONS :  
 GENERAL TENDENCIES OF CHANGE BETWEEN 1954 AND 1980



QUALIFICATION OF WAGE-EARNERS