Working Paper Series No. 65

DYNAMICS IN WEST-JAVA'S INDUSTRY AND CITY-SIZE DISTRIBUTION

Jos Hilhorst
November 1989

Table of Contents

FOREWORD

This working paper is the first related to a research project to be implemented over the next few years if a number of expectations are realized. The research project intends to identify variables that explain the differential growth of urban centres in Indonesia and it is meant to serve in preparing both regional and interregional policies.

As such, the paper is of exploratory nature. It has been prepared in relation to a seminar on economic development in West Java organized by the Royal Institute of Anthroplogy and Languages of Leyden University, so as to elicit comments on its approach and in order to inform colleagues in The Netherlands as to what could be done with the data that have been collected so far.

The wider context of the research project is a concern with defining policies for urban development in Indonesia in the aftermath of the former UNDP project that developed a National Urban Development Strategy. Such a strategy cannot without a well-elaborated economic component, which must go beyond the allocation of budgetary resources to lower levels of government. Also, it cannot go without an evaluation of the effectiveness of earlier policies in this field such as the establishment of industrial estates, or of policies related to other sectors, such as agriculture, having impacts upon phenomena in urban areas. Most of these latter aspects are not touched upon in this exploratory paper.

Here the emphasis is on a first attempt at identifying and explaining differential rates of urban growth in Western Java.

1. Introduction

From a quick glance at the 1970 and 1980 data for cities over 100,000 population in 1980 in Malaysia, Indonesia and the Philippines it can be discovered that over that decade some interesting changes in the size distribution have taken place. As can be observed in Table 1.1, Kuala Lumpur agglomeration is growing considerably faster than Metro-Manila and Jakarta.

Table 1.1
Annual growth rates for cities over 100 000 inhabitants ranked by 1970 population size in Malaysia, Indonesia and the Philippines, 1970-80

Peninsular Malaysia		San Pablo	2.2	Banjarmasin	3.4
Kuala Lumpur Aggl	7.2	Illigan	4.7	Pontianak	3.7
George Town	-0.8	Cabanatuan	3.3	Tanjung Karang	4.0
Ipoh	1.7	Lipa	2.5	Padang	10.0
Johore Baharu	5.9	Baguio	3.4	Bogor	2.6
Seremban	5.1	Lucena City	3.4	Kediri	2.4
Kota Baharu	11.1	Silay	4.7	Cirebon	2.5
Taiping	9.8	Angeles	26.3	Menado	2.7
Kuala Terengganu	12.2			Jambi	4.2
Kuantan	11.1	Indonesia(1)		Pekanbaru	2.8
		Jakarta	3.9	Samarinda	7.3
Philippines		Surabaya	2.9	Balikpapan	7.9
Metro-Manila	3.5	Bandung	2.2	Madiun	1.1
Cebu	3.5	Semarang	5.1	Pematan Siantar	1.7
Illolo	1.5	Medan	8.6	Pekalongan	1.9
Zambianga	5.4	Palembang	3.3	Magelang	1.3
Bacolod	3.4	Ujung Pandang	5.4	Tegal	2.4
Cadiz	0.4	Malang	2.1	Sukabumi	1.5
Batangas	2.8	Surakarta	1.4		
Olongapo	3.7	Yogyakarta	1.7		

Sources: UN (1979), UN (1988a), Govt of Malaysia (1971), Amin (1981), Evans (1984), Govt of the Philippines (1984).
Note: (1) Not all Indonesian cities over 100 000 are listed here.

* The author is grateful to A. Louter and I. Sadoko for discussions and help in elaborating the data and finding additional sources.

More relevant for this paper is, however, that in each of these three countries shifts appear to be taking place in the rank-order of the various cities, or at least, that some cities are growing faster than other ones. Two questions arise: what is the reason for this phenomenon, and secondly, does it also occur for cities between 20 and 100 thousand.

In considering an answer to these questions we enter some of the literature on intermediate and small cities, a literature that has been stimulated especially by members of the UN-family, that is to say, the UN Centre for Human Settlement and the World Bank, but which has also received attention from others. For the countries mentioned various monographs and articles have appeared, and from our point of view some of the most interesting are those by Amin, Hugo et al, Rietveld, Evans and Jones. We will come back to some of their arguments. It appears more useful to first consider what Hardoy and Satterthwaite (1986), Hamer and Linn (1986), Rondinelli (1982) and Uribe-Echevarria (1989) have to say on the subject. A preliminary question is of course what is understood here by small towns and intermediate cities.

Following Lubbell (1979) small towns are defined here as urban places with a population of less than 100 000 inhabitants. Intermediate cities are defined as urban places having populations of between 100 000 and 2.5 million inhabitants, a definition that begs for additional clarity, since it covers a very wide spectre of possibilities. In fact, a definition in terms of a city's functions and its position in the national transport system is to be preferred (cf. Hilhorst, forthcoming). In the context of a paper concerned with a given country, however, it appears acceptable to use it, if only to establish what the discussion is about.

Hardoy and Satterthwaite write primarily from a policy concern: what policies regarding small and intermediate cities have been successful and why should policies aiming at their growth be strengthened. Rondinelli is clearest on what these cities are, while Hamer and Linn and Uribe-Echevarria are largely concerned with identifying causes for their differential growth.

Although Lubbell's definitions differ from those employed by Hardoy and Satterthwaite it is interesting to recall the most important characteristics they ascribe to small towns and intermediate cities. For them, the former group - urban places with from 5 000 to 20 000 population - is characterised by: (i) their large proportion of agricultural labour; (ii) their minor administrative rank; and (iii) their important role in providing access to the population of their hinterlands to goods and services produced in these and other urban places and to the regional transport network. They say that their intermediate cities - urban places with more than 20 000 inhabitants - are generally characterised by: (i) a small proportion of agricultural labour; (ii) a higher administrative rank; and (iii) a better location on regional and national transport and communication systems (cf. Hardoy and Satterthwaite, 1986: 320-1).

Rondinelli (1982), using Lubbell's definitions, summarizes his findings as follows:

> Cities with populations smaller than 100 000 have high proportions of employment in agriculture and related marketing and commercial activities, in small-scale cottage and artisan manufacturing, and lower order services that have a relatively low growth rate in total urban employment. Cities with a population of between 100 000 and 250 000 have generally high rates of employment in small-scale manufacturing and in consumer-oriented commercial and service activities, and have relatively high [growth] rates of total employment. Cities with populations of from 250 000 to one-half million are characterised by an increasing rate of growth in the producer-oriented commercial sector. They tend to have substantial manufacturing and tertiary activities, with increasing rates of growth in the producer-oriented commercial and service sectors. Cities of one million or more have a relatively high proportion of employment in manufacturing, but their occupational structure is dominated by producer-oriented commercial and service sectors. (Rondinelli, 1982: 374)

There are some important differences between the two characterisations. Partly, of course, these are due to the differences in definition. However, regardless of these, the attention Hardoy and Satterthwaite give to the rank of administrative services provided by a given urban place, seems to be well deserved in view of its importance in most developing countries for the

number, level and quality of government services there, as well as for the modes of transport available to it. On the other hand, Rondinelli's greater specificity with regard to other aspects of the urban economic structure presents a welcome complement.

Differences in the dynamics of small towns and intermediate cities are in Hardoy and Satterthwaite's view related to the following. Small towns will show a greater economic dynamic if agricultural production and productivity in their hinterlands grow fast, although this positive factor may be thwarted by the negative impacts of an unbalanced structure and type of landownership. For their intermediate cities, they consider their position in the national transport system and industrial development (as influenced also by national and regional interests) of greater importance. The differences in economic structure they observe are to some extent explained by Rondinelli, when he says that they come about as a consequence of economies of scale, sectoral differences in efficiency and government policy on exports and infrastructure investment. Although he does not say so, these factors would also help in explaining differential urban growth.

Hamer and Linn (1987) are in the latter respect more specific. They consider two types of urban growth: (a) under severe constraints; and (b) under less constrained conditions. The constraints they refer to are scarcity of skilled labour; poorness of interregional and international transport; inadequacy of urban public services; and limited industrial experience. These constraints operate in most developing countries. In their view, whenever these constraints apply, large urban centres will tend to be preferred locations for all industries that are not by necessity bound to proximity to natural resources. In this sense, early industrialization is characterised by its dependence on urbanization economies, which are mostly associated with large urban centres. Public policy will tend to "favor a few centers that are preeminent in some respects, including major ports, administrative capitals, and other large cities, ... because the central government ... is committed to take as many shortcuts to achieve its modernization objectives as possible." (Hamer and Linn, 1987: 1262).

Under less constrained conditions, the growth of intermediate centres depends in their view on the growth of hinterland markets; growing experience in manufacturing which may lead to deconcentration of industrial activity, especially if the new markets have come about and localization economies exist; and thirdly, on the necessary redirection of public investment, to improve the general attractiveness of these cities. The growth of hinterland markets will depend on productivity increases in agriculture. In this process, a certain degree of specialisation among intermediate cities tends to emerge. Their employment base will then also be boosted by small and medium scale enterprises delivering producer goods. Uribe-Echevarria (1989: 6-7), basing himself on evidence for Colombia, contends that the dynamism of intermediate cities is the consequence of successful economic diversification in their hinterlands. In turn, both depend upon macroeconomic developments and inter- and intrasectoral competition.

This paper deals with two aspects of the theoretical propositions that were just reviewed: locational factors affecting a city's growth and the growth of large and medium and small scale industry upon urban growth. For that purpose the paper is divided into two sections: section 2 exploring factors of a more geographical nature, and section 3 taking employment in large and medium scale industry as an explanatory factor. In section 4 some conclusions are drawn.

2. Changes in the urban hierarchy in Western Java

This section starts with a short survey of what has happened to the urban hierarchy in the past sixty years in Indonesia, more particularly of those cities that had more than 100 000 inhabitants in 1980. This will provide a general background to a somewhat more detailed description of what has happened to the cities with a 1980 population over 20 000 in Western Java, i.e. the area covered by the province of West Java and DKI Jakarta. In section 2.3 a first attempt at explaining growth differentials will be made.

2.1 Changes in Indonesia's urban hierarchy

Table 2.1 gives data on population size for cities in Indonesia having more than 100 000 inhabitants according to the 1980 census. As such, these data do not necessarily refer to functional urban areas. They are compared to those for the years 1920, 1930, 1961 and 1971 on the basis of percentage growth figures. As all such data, they suffer from the problem that a number of the cities have changed their boundaries over the period under consideration. Sometimes these changes are important, sometimes they are not. They are less important, for instance, when settlements that eventually came to fall within the administrative boundaries of a given city were in the past separated from them so that they did not form part of it. This will especially tend to be the case when analysis covers longer periods.However, in extreme cases of this nature, i.e. when major concentrations of population are combined into a single city, the opposite would hold true. To my knowledge such cases are not represented in the table.

It follows from the growth percentages in the one but last column of Table 2.1 that urban growth in Indonesia has been quite uneven over the 60-year period. Growth ranges from 177 per cent for Magelang to 3748.2 per cent for Samarinda. Contrary to what Lasuen (1968) has argued, quite a few cities have changed rank in an important way. This has been the case for instance with Surakarta and Yogyakarta, two centres of traditional administration, that dropped from 4th and 5th place to 9th and 11th respectively and for places like Medan and Tanjung Karang that jumped from 12th and 26th to 4th and 12th respectively.

Table 2.1
Growth of Indonesian cities over 100 000 inhabitants in 1980 over the period 1920-1980 (arranged by 1920 size)

City	Pop 1920 (000)	Percentage growth 1920-30	1930-61	1961-71	1971-80	1920-80	Pop 1980 (000)
1.Jakarta	306.3	74.2	457.8	57.4	42.1	2023.2	6 503.4
2.Surabaya	192.2	78.1	194.7	54.4	30.3	955.2	2 027.9
3.Semarang	158.0	38.0	130.7	28.5	58.8	549.6	1 026.7
4.Surakarta	134.3	23.2	122.1	12.7	13.4	249.9	469.9
5.Yogyakarta	103.7	31.7	128.9	9.4	16.5	284.5	398.7
6.Bandung	94.8	75.8	475.8	23.6	21.7	1442.9	1 462.6
7.Palembang	73.7	46.5	339.8	22.7	35.0	967.7	787.2
8.Ujung Pandg	56.7	49.6	352.7	13.2	63.1	1150.1	709.0
9.Pekalongan	47.9	37.9	55.2	8.9	18.8	177.0	132.6
10.Banjarmasin	47.0	39.8	225.9	31.6	35.4	711.4	381.3
11.Bogor	45.6	43.4	135.6	27.1	26.3	542.6	247.4
12.Medan	45.2	69.5	525.5	32.7	117.0	2947.5	1 379.0
13.Kediri	43.2	12.5	227.0	12.6	24.0	413.2	221.8
14.Malang	43.0	101.4	294.3	23.7	21.2	1090.7	511.8
15.Padang	38.2	36.4	175.8	36.6	144.9	1160.0	480.9
16.Magelang	36.2	46.1	82.4	14.4	11.9	241.0	123.5
17.Tegal	34.7	23.9	107.0	18.8	24.6	279.8	131.7
18.Cirebon	33.1	63.4	192.6	12.8	25.3	577.1	223.8
19.Madiun	31.6	32.6	194.5	10.4	10.6	376.6	150.6
20.Pontianak	28.7	57.5	232.3	44.8	40.1	960.8	304.8
21.Sukabumi	23.5	45.5	135.1	19.6	14.3	367.4	110.0
22.Menado	17.1	61.4	371.7	30.6	28.0	1172.8	217.2
23.Jember	16.5	22.4	365.8	30.4	na	na	na
24.Tanj.Karang	15.0	68.0	431.3	48.6	42.9	1797.7	284.3
25.Tasikmalaya	14.2	80.3	390.2	8.3	na	na	na
26.Cianjur	12.0	73.3	200.5	na	na	783.3	106.0
27.Jambi	11.3	95.6	411.8	40.2	45.3	1936.7	230.4
28.Ambon	11.1	55.9	232.8	na	na	1782.0	208.9
29.Pem.Siantar	9.5	61.0	649.4	12.5	16.4	1489.6	150.4
30.Samarinda	6.9	61.2	528.9	97.3	92.5	3748.2	264.7
31.Balikpapan	na	na	207.3	49.8	104.4	840.5(1)	280.7
32.Pekanbaru	na	na	600.8	104.8	28.4	1762.6(1)	186.3
33.Bekasi	na	na	na	na	na	na	123.5
34.Tangerang	na	na	na	na	na	na	120.8
35.Probolingo	na	na	na	19.2	22.3	na	100.3

Sources: Hugo et al (1987):101-3; Amin (1981):203 and BPS: Census Reports
Note: (1) Figure refers to period 1930-80.

Using the data provided by Hugo et al (1987: 101-3) for the years 1920, 1930 and 1961, and those of BPS for 1970 and 1980, two primacy indices have been calculated, that are shown in Table 2.2. The 4-city index is the ratio of the population of the largest city over that over the three next largest cities, while the primacy index is defined as the share of the population in the four largest cities in the total population of all cities listed in Table 2.1. The data used always refer to the population within the administrative boundaries of a city, as is the normal case with census data. For both indices increasing primacy can be observed.

Table 2.2
Primacy indices, 1920-80

	4-city index	primacy
1920	0.6322	0.4305
1930	0.7339	0.4330
1961	1.1970	0.5032
1971	1.3439	0.5791
1980	1.3355	0.5834

Amin (1981) in his discussion of the size distribution of cities devotes particular attention to the hypothesis that primacy is related to historically centralized systems of government and that a log-normal distribution is likely to be found in countries with a history of decentralized government (cf. Hilhorst, 1969). Amin is somewhat critical of Friedmann and Wulff (1975) who classified Indonesia among the decentralized states, especially because in his view provincial governments in Indonesia strongly depend on central budget allocations (Amin, 1981: 27). There is no doubt that Amin is quite right in this respect for the post-independence period. The question goes a bit further, however. The data used by Friedmann and Wulff could not go beyond 1971 and by then Indonesia had been independent for barely 25 years. Before then, a rather light colonial administration - in terms of people involved- had governed the archipelago through indirect rule, thereby hardly affecting the existing urban structure. There is no doubt, however, that the Dutch introduced different administrative ranks among various

cities, a hierarchy that was largely adopted by the Indonesian government after independence. Thus, whereas over the approximately 350 years of colonial rule a fairly strongly decentralized system of government existed, it was only from about 1900 that a firmer and more peopled administration developed in Jakarta and the more important administrative cities. Especially outside Java, these cities appear to have been chosen in relation to the resource potential in their hinterlands and their suitability for port development.

In his discussion of the same topic, Hugo et al (1987) go back to 1850. They find that from that year onwards, the size distribution of cities moves more and more in the direction of a primate distribution. They say:

> The present degree of primacy in Indonesia is both historically large in the Indonesian context and substantial when compared to countries of comparable population size. In the post-Independence period, notwithstanding the deep political and social change which has occurred, Indonesia's economy has retained many of the 'dependent' features of the colonial years with a stress on exporting raw materials and importing processed goods. The extremely limited development of secondary industry associated with this, and the stress on import substitution, has favoured Jakarta's further moving to a primate situation. (Hugo, 1987: 98-9)

Rietveld (1988) has addressed the same issue. For the period 1971-80 he uses the data on functional urban areas for cities over 100 000 population elaborated by the project on the National Urban Development Strategy (NUDS), and he calculates the value of q in the equation

$$\log P = \log c - q\log R + u \qquad (2.1)$$

where P is city population and R is city rank (1 for the largest city, etc.) for the years 1971 and 1980. He finds that q decreases from 1.011 for 1971 to 1.001 for 1980, as he says: "an almost imperceptible decrease in polarisation". This change does not seem to be significant.

Rietveld has also calculated the value of q using census data for the years 1930, 1961, 1971 and 1980. With these data he observes an increase in the

value of q, from 0.881 in 1930 to 1.101 in 1980. In this exercise he uses the data for kotamadya, leaving out therefore those cities that did not acquire this administrative status. BPS kotamadya data exclude the population of contiguous urban desa, while they are not omitted in the definition of the functional areas as determined by the NUDS project. Rietveld's results confirm those shown in Table 2.2, but their meaning is in fact contradictory to the earlier conclusion that q would be decreasing. It is clear that this problem is related to the way in which population is assigned: to administrative areas or to functional ones.

The relevance of this short excursion into what it is that we observe will be obvious: if the administrative area data lead one to conclude that polarisation is increasing, while functional area data lead to the opposite conclusion, it would be worthwhile to have this problem avoided. In the context of this paper, this problem is avoided by making use of the concept of urban areas, i.e. kecamatan with at least one urban kelurahan or agglomerations of these. A quantitative comparison of this concept with the functional area and administrative area concept is of course necessary. This will be done in the next section. First we will see whether growth differentials of the cities listed in Table 2.1 are related to some of the factors mentioned in section 1.

Some of those listed by Hardoy and Satterthwaite as well as Rondinelli may have had an influence. In the first place, the administrative rank of a city could have played a role. Calling this variable A, we assign values to it from 1 to 5. Thus Jakarta gets a value of 5, provincial capitals a value of 4, kotamadya a value of 3, district or kabupaten capitals a value of 2 and sub-district or kecamatan capitals a value of 1. Also the existence of a port should have been of importance. Thus we introduce a variable H, which acquires a value 3 for places with an international port, a value of 2 for places with an interregional port, a value of 1 for cities with a regional port, and 0 for places without one. The percentage growth G is now assumed to be related to these variables in the following way:

$$G = a + bA + cH + v \qquad (2.2)$$

Using the simple least squares method, the results for a, b and c are: a = -2.705 (-0.49), b = 4.093 (2.21) and c = 0.936 (0.51), the figures in brackets showing t-values, while the adjusted value of R-squared is only 0.23. It turns out that A and H are rather closely related, this being one of the reasons that the results are not very trustworthy. It also follows that other factors must have played a role. These we will be considered in more detail for the case of Western Java.

2.2 Changes in size distribution of cities in Western Java

Since the data on industrial employment can only be obtained by kecamatan or aggregates, the data on urban population to be used in this research had to refer to a comparable unit of population. It was decided to start from the 1980 census definition of urban places, and whenever there was an urban desa in a kecamatan, the entire population of this administrative area was classified as urban. In the second place, whenever such kecamatan were contiguous to other similar kecamatan, they were taken together, and called an agglomeration with the name of the most central one. The first step obviously implies that the data used include rural population, and that the assigned values will be larger than what the censuses report as a city's population. This procedure can be evaluated to some extent with the aid of Table 2.3, showing data as produced by BPS, by NUDS and as will be used below. They refer to agglomerations over 100 000 inhabitants in 1980 and have been arranged according to their 1971 size.

The comparison leads to the following conclusions. The agglomerations always have a larger population than either the Census or the NUDS data. Since especially the NUDS data are interesting from our point of view, it is important to note that the differences between the agglomerations and the functional areas are quite irregular, ranging as they do from 1.18 to 3.39.

Table 2.3
Comparison of urban agglomeration data with BPS and NUDS data

City	1971 Census	1971 NUDS	1971 Aggl	1980 Census	1980 NUDS	1980 Aggl	ratio 71 A/C	ratio 71 A/N	ratio 80 A/C	ratio 80 A/N
Jakarta	4 576	4 085	4 933	6 503	6 072	7 188	1.08	1.21	1.11	1.18
Bandung	1 202	1 311	1 724	1 463	1 745	2 282	1.43	1.32	1.56	1.31
Bogor	196	330	554	247	545	768	2.83	1.68	3.11	1.41
Sukabumi	96	161	365	110	215	453	3.80	2.27	4.12	2.11
Tasikmalaya	136	147	331	165	193	405	2.43	2.25	2.45	2.10
Cirebon	179	195	313	224	266	403	1.75	1.61	1.80	1.52
Cianjur	132	81	239	161	106	294	1.81	2.95	1.83	2.77
Tangerang	121	*	234	192	*	353	1.93	-	1.84	-
Bekasi	123	61	207	189	144	310	1.68	3.39	1.64	2.15
Garut	93	113	207	108	146	254	2.22	1.83	2.35	1.74
Cibinong	51	*	188	115	*	313	3.69	-	2.72	-
Depok	34	45	**	107	127	**	-	-	-	-

Notes: * Tangerang and Cibinong were not considered by NUDS as functional areas over 100 000 population.
** Depok is considered a part of the Jakarta agglomeration, even if it is located in the Province of West Java.

Generally speaking, however, it also follows, that the ratio of these two series decreases from 1971 to 1980. This means that the two types of areas are approaching each other. In the last year, the ratios generally show smaller values. It will be clear that the agglomerations overestimate the urban populations. However, it should be noted that it is likely that the agglomeration data include many of the commuters from rural areas to workplaces located in the functional urban areas. This follows from what Hugo et al (1987: 203-4) have written on the subject of commuting. It will also be noted that the ratios are especially lower for the larger agglomerations and for those on important transport routes. This corresponds to research results that show that urban population growth has been especially fast near the larger centres (Jones, 1984).

The results of applying the procedure explained before are shown in Table 2.4. It lists all urban kecamatan of 1980 according to their 1971 size rank.

Table 2.4
Urban agglomerations and kecamatan in Western Java, 1971 and 1980. Population in 000

	1971	1980		1971	1980		1971	1980
JakartaA	4 933	7 188	Jalan Cagak	80	91	Kadugedeh	57	69
BandungA	1 724	2 282	Rangkasbetung	79	104	Serpong	55	80
BogorA	554	768	Jonggol	79	100	Dawuan	54	66
SukabumiA	365	453	Singaparna	78	97	Kawali	54	61
TasikmalayaA	331	405	Kandanghaur	76	97	Legok	53	71
CirebonA	313	403	Banjaran	75	101	Cibatu	53	67
CianjurA	239	294	Plered	75	96	Leuwimunding	53	63
TanggerangA	235	353	Cisarua	74	100	Kapetakan	49	65
BekasiA	207	310	Kalijati	74	81	Kertasemaya	49	65
GarutA	207	254	Ciranjang	73	89	Arjawinangun	49	64
KlangenanA	200	252	Pamanukan	72	92	Kadipaten	49	58
CibinongA	188	313	CicalengkaA	71	108	Jasinga	48	61
MajalayaA	177	223	Cibadak	71	92	Wado	48	54
Rengasdenklok	124	151	Babakan	71	89	Karangsembung	47	57
Pacet1	120	153	Ciampea	70	97	Cimalaka	47	56
IndramayuA	117	146	Teluknaga	68	96	Rajapolah	47	56
Subang	115	135	Cijeruk	68	92	Talaga	46	53
Ciledug	105	129	Cileungsi	68	92	Cipeundeuy	45	52
KuninganA	105	128	Cikarang	66	102	Jatibarang	44	57
Ciamis	105	120	Cibeber	66	76	Rajagaluh	44	53
SumedangA	102	120	Tanjungsari	66	75	Cilimus	44	52
Karawang	100	131	Lemah Abang	65	81	Cimanuk	44	50
Leuwiliang	97	131	Jatiwangi	62	77	Cikande	43	52
Bajar	96	107	Wanaraja	62	73	Pacet2	42	52
Cibungbulang	95	129	Ciawi Gebang	61	76	Cicurug	40	56
Pagaden	95	110	Ciwidey	61	76	Caringin	37	53
Cilegon	93	141	Soreang	60	77	Jatiluhur	37	43
Purwakarta	93	117	Parung Kuda	59	76	Pandeglang	36	49
Cikampek	92	120	Cikeruh	59	73	Labuhan	34	45
Cilamaya	89	106	Bayonbong	59	73	Maja	33	37
PadalarangA	86	125	Bluburlimbangan	59	72	Menes	31	38
Ciparay	84	121	Karangampel	58	76	Ciruas	29	33
Sepatan	82	110	Cikijing	58	70	Kramatwatu	22	29
Majalenka	81	74	Ciawi	58	66	Ciomas	18	22
Serang	80	111	Pelabuhan Ratu	57	76			

Sources: BPS (1972) and BPS (1982)

In order to be clear about what this set of data represents, Table 2.5 is added, showing the ratio between urban population and total population according to BPS and according to the definition used here.

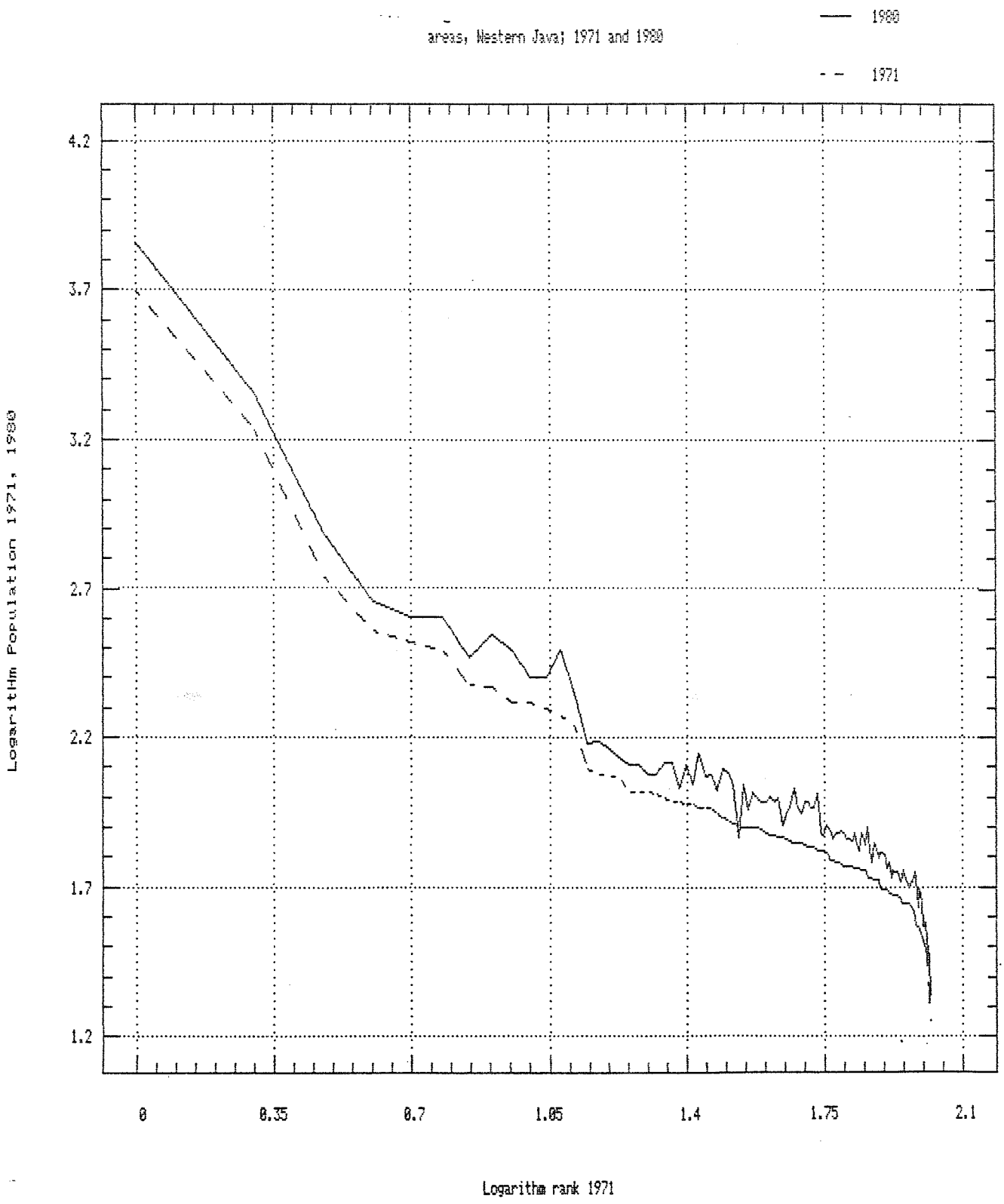
Table 2.5
Urban population in West Java by kabupaten (000) according to two concepts, 1980

Kabupaten	BPS	Aggl	Aggl:BPS
Pandeglang	47.3	181.5	3.8
Lebak	25.9	103.7	4.0
Bogor	872.9	1 935.7	2.2
Sukabumi	312.7	751.8	2.4
Cianjur	179.2	612.2	3.4
Bandung	2 099.9	3 215.9	1.5
Garut	196.8	538.1	2.7
Tasikmalaya	241.0	624.4	2.6
Ciamis	82.7	288.4	3.5
Kuningan	52.9	325.2	6.1
Cirebon	431.2	1 140.1	2.6
Majalenka	104.7	552.5	5.3
Sumedang	88.8	378.2	4.3
Indramayu	78.1	441.0	5.6
Subang	108.3	509.8	4.7
Purwakarta	78.7	255.2	3.2
Karawang	171.4	508.6	3.0
Bekasi	188.7	412.1	2.2
Tangerang	232.9	710.5	3.1
Serang	121.6	388.4	3.2
Total	5 715.8	13 873.2	2.4

It follows from the last column of Table 2.5 that the definition used here includes many people that are classified as rural by BPS. It also follows, however, that the growth rates for the 104 agglomerations and 'urban' kecamatan listed in Table 2.4 are likely to underestimate urban growth in functional terms. This also followed from Table 2.3. Therefore it makes sense to first consider the aspect of the data concerned with growth.

The data on the 104 urban areas imply rather different rates of growth. This is emphasized in Graph 2.1 that shows how some of them have changed rank. It

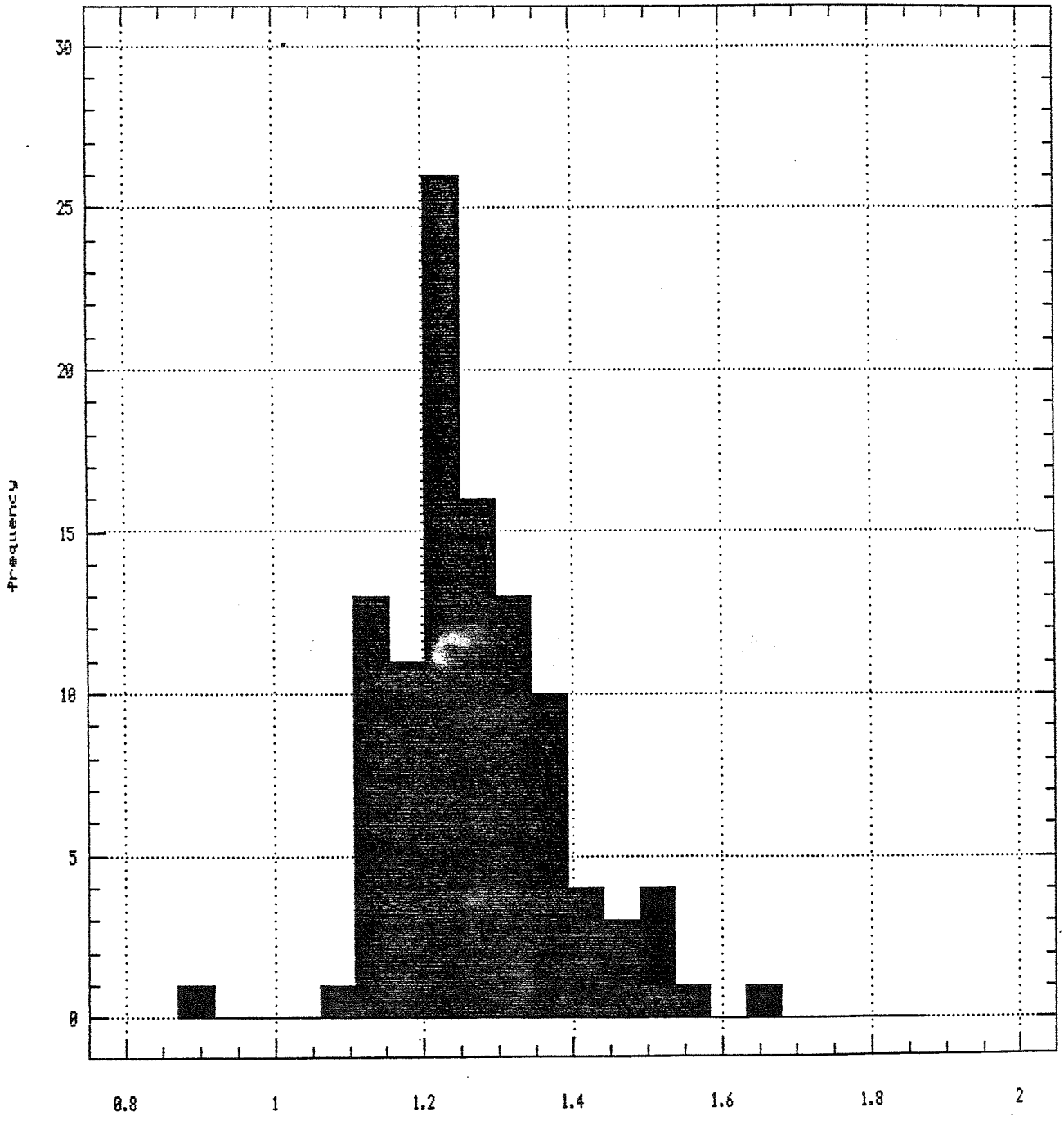
Graph 2.1 Rank-size distributions urban areas, Western Java; 1971 and 1980



appears that this has been especially the case at the lower end of the rank-order, although there are also some of the larger urban areas that have grown faster than the average. The average growth over the period 1971-80 has been 27.1 per cent. The lowest growth is experienced by Majalengka (-8.6 per cent) and the highest by CibinongA (66.5 per cent). Graph 2.2 shows the frequency distribution. Of particular interest are the areas where population has grown faster than the average. Apart from Jakarta, that saw its population increase by 45.7 per cent, 44 places grew faster.

Jones (1984: 125) says that population redistribution in Java "focused on the major metropolitan areas of the north coast ... and on Bandung. Serang, the area west from Jabotabek, and Tegal, another north coast city, also had high growth rates, partly through net immigration." This is confirmed by the data for the urban areas as used here: of the 45 fast growing urban areas most are located in a northern kabupaten or near Bandung and Bogor. Striking is the situation in the latter kabupaten, where all urban areas except Jonggol grew faster than the average. In Sukabumi all grew faster, except SukabumiA. More in general, it appears that location on one of the main West-East roads has stimulated growth. This holds also for the urban areas in Pandeglang and Lebak. Important exceptions to this rule are Sumedang and Purwakarta, where growth of urban areas was below the average.

The 104 urban areas have been classified into eleven size classes as shown in Table 2.6. These classes were determined for the year 1971. The urban areas belonging to a given class were then listed for 1980, and their 1980-range was recorded. Finally, percentage growth for the population in each 1971 class was determined.



Graph 2.2 Frequency of percentage growth
104 urban areas in Western Java

Table 2.6
Population growth by size class of urban areas, 1971-80

Class	Range 1971 (000 pop)	Range of 1971 class in 1980 (000 pop)	Growth 1971-80 %	Nr of areas
I	18.3 - 37.2	22.4 - 53.1	25.9	9
II	40.0 - 61.6	51.6 - 79.8	24.0	38
III	65.1 - 85.7	74.1 - 124.6	29.1	27
IV	89.4 - 123.8	105.9 - 152.7	24.8	17
V	177.4 - 207.5	222.5 - 313.3	37.9	5
VI	234.5 - 239.1	294.3 - 353.4	36.8	2
VII	313.2 - 331.2	403.5 - 405.4	25.5	2
VIII	365.4	452.7	23.9	1
IX	553.9	768.0	38.7	1
X	1 724.0	2 282.1	32.4	1
XI	4 932.6	7 188.0	45.7	1

The crucial part of this table is the last but one column showing that population in the urban areas of size classes III, V and VI has grown faster than the average. From what Hamer and Linn have written, it was to be expected that population growth in the urban areas of classes IX, X and XI should be faster than elsewhere, but the other three appear not to behave according to theory. Having answered one of the questions raised in section 1, it becomes necessary to look for the causes of the phenomenon.

In a first instance a re-estimate of equation (2.2) is made. For the present sample we take for G the ratio of the 1980 and 1971 populations for each of the 104 urban areas. For A and H the same conventions are used as before. The results are that a = 1.261 (53.59), b = -0.004 (-0.25) and c = 0.084 (3.46), while the adjusted R-squared has a value of 0.10. There is a low correlation between A and H. Quite contrary to theory, the value of b is again negative.

Another attempt at statistical explanation was made by banking on some other geographical variables: K, which measures the distance in kilometres to the nearest centre over 300 thousand inhabitants in 1971; B, the size of this centre in thousands of inhabitants in that year and W, a dummy variable, with values of 1 whenever the urban area is on one of the main West-East

roads, and of 0 in other cases. The centres are Jakarta, Bogor, Bandung, Tasikmalaya and Cirebon. Sukabumi was not selected because of the proximity of the urban areas to Bogor. The theory is that as K is higher G will be lower, because distant places are less attractive to stay in or to move to; that as B is higher G will be higher, because the dynamics of the large centre will attract migrants and keep inhabitants from moving; and finally, that whenever W is 1, G will be higher, because proximity of a small urban area to the main road will reduce the time needed to travel to a centre, making it more attractive to live in such small urban areas. Thus, we have:

$$G = d + eK + fB + gW + v' \qquad (2.3)$$

The results of regression analysis for this equation are as follows: d = 1.251 (64.91), e = -0.001 (-4.33), f = 0.00003 (5.76) and g = 0.048 (2.55), while the adjusted R-squared equals 0.29. There is a slight correlation between K and B. Although K, B and W exert the influence they are expected to show in terms of the signs of their regression coefficients, the conclusion should be that these influences leave 71 per cent of the variation in G without statistical explanation. This is too much to be satisfactory.

3. Growth of manufacturing industry in Western Java

3.1 Introduction

For Western Java as a whole, manufacturing industry contributed 10.8 per cent of gross domestic regional product (GDRP) in 1975 and 12.8 per cent in 1984 (BPS, 1986 and 1988a). DKI Jakarta produced 53.7 per cent of this in 1975 and 58.5 per cent in 1984 (Ibid.). It follows that manufacturing industry continued to concentrate in DKI Jakarta. The same appears to have happened with other economic activities, since in 1975 DKI Jakarta produced 37.5 per cent of GDRP for Western Java, while by 1986 this percentage had increased to 42.7 (Ibid. and BPS 1988b).

The data that will be used in the following analysis are based on the industrial census 1975 and the economic census 1986. Whereas the former only provides data on large and medium scale manufacturing industry, the latter covers large and medium scale enterprises and small scale enterprises in both manufacturing industry and services. Initially, only employment in large and medium scale enterprises will be considered. For both years the enterprises have been divided into those located in our 104 urban areas and those located in the remaining rural areas. The data on employment in large and medium scale manufacturing enterprises have been listed in Table A.1.

For the sake of completeness, it should be added that for 1975 this table excludes 12 818 workers in 199 establishments in rural areas and that for 1986 these numbers are 83 949 and 688 respectively. The total number of enterprises in urban areas is 2421 in 1975 and 4112 in 1986.

The table reveals considerable growth of employment in large and medium scale industry over the eleven year period: the index number for 1986 with 1975 as a base would be 246.8. It is also clear that this growth was not equally distributed over the various urban areas, even if the data for a number of centres cannot be given here. It follows from the table that large and medium scale manufacturing enterprises have appeared in 16 urban areas, but also, that they disappeared from Labuhan, Wanaraja, Cilimus, Tanjungsari, Pamanukan and Cilimaya. The relatively large number of times that the sign 'np' had to be used indicates that in many places there are no more than two large and/or medium scale enterprises.

Table A.2 provides data on employment by sector of large and medium scale manufacturing industry in rural and urban areas. It can easily be calculated that the 1986 index number for employment in rural areas (1975 = 100) would be no less than 654.9. The number of enterprises increased by 246 per cent.

Since the data are available at the 5-digit level, it is possible to classify industries into two types: those producing for consumers and those producing for producers. The data have been arranged in this way by the 104 urban areas that have been identified (see Table 3.1). This presentation is

Table 3.1
Industrial employment by type of industry and urban area in large and medium scale enterprises, Western Java, 1975 and 1986*

Nr	1975 cons	1975 prod	1986 cons	1986 prod	Nr	1975 cons	1975 prod	1986 cons	1986 prod
1.	70 290	40 972	168 784	71 631	50.	61	-	np	-
4.	np	-	-	-	51.	-	-	np	np
6.	np	np	np	87	52.	-	np	-	-
7.	-	-	-	np	53.	2 522	1 646	2 251	2 257
8.	2 212	5 587	6 203	8 709	54.	np	-	1 127	-
9.	np	-	np	np	55.	4 212	-	np	-
11.	np	132	np	79	56.	402	-	886	np
12.	-	np	-	np	57.	np	-	np	-
13.	np	-	np	np	58.	np	201	887	1 630
14.	np	-	np	np	61.	np	-	np	-
15.	-	np	1 101	5 082	64.	-	-	np	-
16.	726	1 873	7 498	12 455	65.	-	-	np	-
17.	-	-	np	-	67.	np	np	851	5 286
18.	-	-	-	299	68.	-	-	np	136
19.	-	np	323	442	69.	np	-	np	np
20.	np	-	np	-	70.	np	np	90	50
21.	133	171	125	822	71.	np	np	1 903	3 220
22.	np	np	165	np	72.	-	np	-	-
23.	np	np	442	647	73.	-	-	np	-
24.	-	np	np	355	74.	-	np	np	np
25.	np	-	57	-	75.	np	np	np	-
26.	np	-	np	145	76.	np	-	np	np
27.	14 418	29 822	33 618	73 831	79.	np	-	np	-
28.	-	-	-	5 003	80.	-	-	-	np
29.	-	83	-	np	81.	-	-	-	np
30.	-	418	np	282	83.	np	-	np	-
31.	np	np	-	np	84.	np	-	-	-
32.	-	-	304	np	85.	-	np	np	1 799
33.	-	-	-	np	86.	-	2 477	np	2 840
34.	74	236	208	111	87.	-	1 296	-	4 091
35.	62	14 622	1 571	18 614	88.	144	161	448	966
36.	633	892	2 784	1 868	89.	np	-	283	1 349
37.	400	2 043	869	880	90.	np	np	-	-
38.	-	-	-	np	91.	264	-	241	np
39.	-	np	-	-	92.	803	1 105	10 062	15 959
42.	673	898	2 107	935	93.	np	56	91	237
43.	-	-	np	np	94.	1 512	4 454	13 164	13 165
44.	71	-	92	-	95.	-	-	np	-
45.	-	131	-	98	96.	np	np	np	1 456
46.	333	np	225	np	98.	-	-	np	-
47.	np	-	69	165	99.	146	-	np	np
48.	np	np	np	-	101.	np	-	np	-
49.	np	np	np	-	103.	np	359	np	8 321
					TOTAL	103 904	112 169	263 724	269 459

* The numbers of 1 to 103 correspond to those of the urban areas listed in Table A.1. Areas not mentioned have neither consumer nor producer goods industries in the large and medium scale size class.

chosen in view of some of the theoretical propositions that have been made by Hamer and Linn and by Uribe-Echevarria (1989).

Hamer and Linn argue that under conditions of severe constraints, industry tends to concentrate in a few centres, with the exception of those industries that have to remain close to the natural resource they use as an input. For Western Java examples of such industries would be rubber and tea processing. Uribe-Echevarria draws attention to a relative shift of producer good industries from the largest urban centres to intermediate ones, a phenomenon also mentioned by Hamer and Linn, and explained by them by what they call localization economies. It would be interesting to find out whether any of these phenomena have occurred in the case of Western Java.

From the attempts at explanation of differential urban growth made in section 2 it is clear that important variables must have remained without consideration. In this connection it appears relevant to refer to some propositions made by Titus et al (1986) based on a study of some cities in Central Java. They observe that rural activity can be distinguished in commercial and peasant sectors, while urban activities are ordered into a corporate and a petty commodity sector. They furthermore observe that people in the peasant sector tend to interrelate economically mainly with the urban petty commodity sector, while the corporate sector interrelates mainly with the commercial sector. The two urban types of activity are in competition with one another. Sometimes this competition is between enterprises in the same city, but it may also be between enterprises in different cities. Enterprises in cities that are on major transport routes tend to gain the upper hand in such struggles, although they are of course constrained by the rate of change from peasant to commercial agriculture. Competition within cities would lead to the demise of the petty commodity sector.

One may add to this, that cities where modern successful enterprises are located should see their services activities increase more rapidly than other cities, at least if the economic base multiplier would be at work. Fast growing cities should therefore be located in kabupaten where productivity is above the average and they should show a larger than average

service sector. More specifically, we should expect that urban areas where certain sectors have grown at high rates are located in high agricultural productivity kabupaten. In these urban areas, especially employment in consumer services should grow faster than overall employment.

Jones (1984) has also addressed this subject. In his view "... manufacturing and trade do not appear to have played a major role in the growth of rural employment in the 1970s. The most logical explanation is that in trade, the growth of large, permanent market complexes, shopping centres and supermarkets in the towns was cutting into the employment prospects of hawkers and market sellers from nearby rural areas, and that in some sectors of manufacturing, the growth of larger and more technologically advanced firms was undercutting the small and cottage-type enterprises, so that the net gain in employment was minimal or even negative." This explanation for manufacturing is not necessarily inconsistent with our findings, and has some similarity with that of Titus et al.

The next section will consider developments of the producer and consumer goods sectors in large and medium scale enterprises, while in section 3.3 the relationship with the small scale industry sector will be discussed.

3.2 Differential growth of large and medium scale industry in urban areas

In a discussion of sectoral growth differentials in Western Java, it may be useful to mention some aspects of national sectoral growth. Average industrial growth over the period 1975-86 in Indonesia has been 10.1 per cent per annum. The fastest national growers among the various sectors were Wood products (14.2), Industrial chemicals (19.1), Glass and products (11.6), Non-metal products (20.9), and Iron and steel (27.0) (UN, 1987: 262). Some data suggest that of these fast growers, only Wood and products would be export driven. Whereas the Textiles industry grew by only 1.1 per cent over the period 1976-85, exports of textiles as recorded by the UN (1988b) constituted no less than 15.1 per cent in 1985 of total exports. In view of the data in Table A.2 as well as other information, it may be suggested that

with the exception of not only Wood and products but also Wearing apparel, the sources of demand must have been largely internal. In the absence of similar data for 1975 it is difficult to decide whether this growth has been at the expense of small scale enterprise or not. Population census data appear not the most adequate source for such comparisons.

Table A.2 makes clear that in Western Java especially Wearing apparel, Wood products, Industrial chemicals and Iron and steel have contributed to employment growth in the large and medium scale manufacturing sector. Although the Pottery and china sub-sector shows a high rate of growth, its 1975 base was rather small. Whereas the Wearing apparel sub-sector is mainly located in BandungA and JakartaA, Iron and steel is virtually concentrated in CilegonA. Rubber processing increased considerably in the rural areas. It is clear that Western Java contributes strongly to the growth of the two export sectors and that it also takes a major share of the national growth in Industrial chemicals.

This section reports on a shift-share analysis, in which producer goods and consumer goods represent the two sectors. Basic to this type of analysis is the following. It is assumed that there are three components of growth of a particular sector in a given urban area. The first is the overall rate of growth of all manufacturing industries in all urban areas; the second is the overall rate of growth of a given sector in all urban areas and the third is considered specific for a particular sector in a given urban area. In other words, if the increase in employment in a particular sector in a given urban area is considered, it is said that in order for it to maintain its position it should grow at least at the overall rate of growth of industrial employment. Since due to various reasons all sectors do not grow at the same rate, this first estimate as to what growth should have been is corrected for this aspect. This may imply that 'maintain-position' employment growth is increased or decreased, depending on whether the sector has grown faster than the average for industry or not. The resulting figure is compared with actual performance of that sector in a given urban area, and the difference between this and the norm based on the previous two calculations is considered area specific. Mathematically, this is expressed as follows:

$$U_c^i = g_u * E_{c,75}^i \quad (3.1)$$

$$S_c^i = [g_u^i - g_u] * E_{c,75}^i \quad (3.2)$$

$$D_c^i = [g_c^i - g_u^i] * E_{c,75}^i \quad (3.3)$$

where i indicates the sector of economic activity, c the urban area, g_u the overall rate of growth of urban large and medium scale manufacturing industry, g_u the rate of growth in all urban areas of sector i, g_c^i the rate of growth of sector i in urban area c and E_{75}refers to employment in the base year. Thus, U may be called the overall component, S the structural component, while D is normally referred to as the differential effect. It will be clear that for every urban area and sector the following identity should hold:

$$E_{86} - E_{75} = U + S + D \quad (3.4)$$

where E_{86} refers to employment in 1986.

The analysis is based on the data (listed and unlisted) in Table 3.1. In view of Uribe-Echevarria's findings for Colombia and the propositions by Hamer and Linn, we should expect that employment in the large and medium scale producer good sector has increased more in the main urban centres and the urban areas close to them than elsewhere. A second expectation is that employment in the consumer good sector has spread, since over the period 1975-86, there have been considerable investments in urban and road infrastructure in Western Java.

In terms of the earlier symbols, places with positive differential shifts in the producer goods sectors should be located near or in the main centres of Western Java: whenever D_p is large, K should be small.

Table 3.2
Results of shift-share analysis for consumer and producer goods produced in urban areas in Western Java, 1975-86

Urban area	D_c	D_p	Urban Area	D_c	D_p
1.JakartaA	-9622.6	-26794.4	53.CirebonA	-4150.2	-1697.1
2.Pandeglang	0.0	0.0	54.Lemah Abang	1015.3	0.0
3.Menes	0.0	0.0	55.Karangsembung	-9951.7	0.0
4.Labuhan	-261.5	0.0	56.CiledugA	-134.3	13.4
5.Cimanuk	0.0	0.0	57.Babakan	839.2	0.0
6.Rangkasbit.	-254.6	26.9	58.KlangenanA	-1511.5	1147.1
7.Jasinga	0.0	39.7	59.Arjawinangun	0.0	0.0
8.BogorA	588.6	-4712.4	60.Kapetakan	0.0	0.0
9.Leuwiliang	45.1	44.4	61.Majalengka	32.1	0.0
10.Cibungbulang	0.0	0.0	62.Cikijing	0.0	0.0
11.Ciampea	-271.9	-238.1	63.Talaga	0.0	0.0
12.Cijeruk	0.0	-141.8	64.Maja	15.2	0.0
13.Cisarua	-122.7	1264.3	65.Rajagaluh	13.3	0.0
14.Jonggol	-28.8	420.9	66.Leuwimunding	0.0	0.0
15.Cileungsi	667.2	3705.5	67.Jatiwangi	-1067.8	4015.2
16.CibinongA	5655.3	7955.6	68.Dawuan	16.4	79.4
17.Caringin	46.7	0.0	69.Kadipaten	-778.1	14.6
18.Pelabuhan R.	0.0	174.5	70.Sumedang	-80.1	-12.5
19.SukabumiA	195.7	259.4	71.Cikuruh	1806.6	3104.7
20.Parung Kuda	-98.3	0.0	72.Tanjungsari	0.0	-96.1
21.Cibadak	-212.6	411.2	73.Wado	20.6	0.0
22.Cicurug	71.1	-4.5	74.Cimalaka	105.4	-1040.0
23.CianjurA	322.7	599.0	75.IndramayuA	6.0	-72.1
24.Cibeber	18.2	280.5	76.Jatibarang	-29.1	28.0
25.Ciranjang	-42.0	0.0	77.Kertasemaya	0.0	0.0
26.Pacet1	21.9	84.6	78.Karangampel	0.0	0.0
27.BandungA	-2977.1	2190.8	79.Kandanghaur	-31.8	0.0
28.Ciwidey	0.0	2920.4	80.Subang	0.0	12.3
29.Pacet2	0.0	-173.4	81.Jalan Cagak	0.0	55.5
30.Ciparay	27.3	-722.1	82.Kalijati	0.0	0.0
31.Banjaran	-30.5	-104.3	83.Pagaden	-52.1	0.0
32.Soreang	184.2	56.6	84.Pamanukan	-48.2	0.0
33.Cipeundeuy	0.0	70.6	85.Purwakarta	13.9	1493.9
34.CicalengkaA	20.2	-455.9	86.Plered	13.9	-3110.4
35.MajalayaA	1413.6	-16511.8	87.Jatiluhur	0.0	977.7
36.PadalarangA	1177.4	-274.8	88.Karawang	82.5	579.2
37.GarutA	-146.3	-4027.8	89.Cikampek	189.1	787.4
38.Bayongbong	0.0	52.0	90.Cilamaya	-132.0	-28.8
39.Wanaraja	0.0	-96.1	91.Rengasdengklok	-429.0	22.8
40.Cibatu	0.0	0.0	92.BekasiA	8023.9	13304.5
41.Bluburlimb.	0.0	0.0	93.Cikarang	-35.9	102.5
42.TasikmalayaA	398.8	-1222.2	94.TangerangA	9326.3	2465.3
43.Singaparna	70.3	17.5	95.Legok	31.5	0.0
44.Ciawi	-88.2	0.0	96.Serpong	-99.8	1331.1
45.Rajapolah	0.0	-216.7	97.Sepatan	0.0	0.0
46.Ciamis	-620.2	-204.6	98.Teluknaga	70.9	0.0
47.Banjar	-111.2	96.3	99.Serang	-284.6	10.5
48.Kawali	-47.7	-55.3	100.Kramatwatu	0.0	0.0
49.Kuningan	-14.5	-52.8	101.Ciruas	-39.4	0.0
50.Kadugede	-122.8	0.0	102.Cikande	0.0	0.0
51.Ciawi Geb.	23.6	16.9	103.Cilegon	361.3	7458.6
52.Cilimus	0.0	-105.7	104.Ciomas	0.0	0.0

Note that the sum of the values in this table does not equal 0 as "should" be the case. The reason for this is that a slightly different formula has been used than shown above for urban areas where either of the two sectors appeared during the period 1975-86.

Table 3.2 presents the results of the shift-share analysis. It follows that there are 37 urban areas where the consumer goods industry has grown faster than it "should" have (these places increased their share), while there are 40 places that increased their share of the producer goods industry. As will be noted, there is a partial overlap: 18 urban areas increased their shares in both sectors. The places that lost relative position in a sector are listed with a negative number. There are nine urban areas that lost position in both sectors: JakartaA, Banjaran, GarutA, Ciamis, Kawali, Kuningan, CirebonA, SumedangA and Cilamaya. Even if DKI Jakarta increased its share in manufacturing GDRP, it follows from these results, that a certain degree of dispersion has taken place over the period 1975-86. Employment in large and medium scale manufacturing industry has not grown as fast as it would have if JakartaA had maintained its relative position in this regard. It is equally interesting that also BandungA lost some of its relative position: taken together, the value of its differential shifts is -786.3. Important loss of relative position is also experienced by BogorA, MajalayaA, TasikmalayaA, GarutA, CirebonA, Ciamis, Karangsembang and Plered.

But whereas the population of BogorA, CirebonA and Plered grew faster than the average for Western Java, the other five urban areas grew only between 14 and 26 per cent over the period 1971-80. For some of the urban areas, growth of employment in large and medium scale manufacturing appears therefore to have been less important for population growth than in other ones.

Table 3.3 summarizes the results of the shift-share analysis for the eleven size classes of urban areas. Obviously, the inter-urban area differentials that were just mentioned will then disappear to some extent.

It would seem to follow from this table that population growth in size classes IV, VII and VII is related to growth in employment in large and medium scale enterprises in the manufacturing sector. A second conclusion is that the producer goods industry has especially grown in the smaller urban areas. Since most of the producer goods industries active in Western Java are either processing industries or engage in making building materials,

Table 3.3
Differential employment shifts in producer and consumer good industries by 1971-size class of urban area

Size Class	Shifts Cons.goods	Shifts Prod.goods	Total Shifts	Percent Pop growth
I	-238.9	977.7	738.8	25.9
II	-10010.9	11232.0	1221.1	24.0
III	2588.5	1151.8	3740.3	29.1
IV	-835.7	10222.2	9368.5	24.8
V	13434.9	1867.6	15302.5	37.9
VI	9649.0	3064.3	12713.3	36.8
VII	-3751.2	-2919.3	-6671.5	25.5
VIII	195.7	259.4	455.1	23.9
IX	588.6	-4712.4	-4123.8	38.7
X	-2977.1	2190.8	-786.3	32.4
XI	-9622.6	-26794.4	-36417.0	45.7

this should not surprise us. If the producer goods sector were subdivided into intermediate and capital goods sectors, we would find that the latter is very under-represented in Western Java. Thus, what is found here, is that natural resource based industries are spreading over the region, which is in line with theoretical expectations. The capital goods industry is represented especially in JakartaA.

The most remarkable feat is perhaps what happened in class III, where growth percentages range from -0.09 to 55. In section 4 this group is singled out for closer inspection. Before that it is tried to obtain a more general insight in the factors affecting the growth of urban areas in Western Java.

The results of the shift-share exercise with regard to especially JakartaA and BandungA are of a certain consequence for this general analysis. As implied in the problem definition, this paper is not so much concerned with explaining growth of the large cities, but much more with finding factors that might help in understanding why a number of intermediate and small cities have grown faster than other such places. This means that from here on, it makes considerable sense to omit these two urban areas from the analysis. Their presence will of course be acknowledged, to the point that

their existence and location is considered as one of the exogenous variables of the problem.

For the remaining 102 urban areas it will first be tried to relate G (as defined before) for each urban area to the size of the nearest centre over 300 thousand population in 1971 (B), to the distance from this centre (K), and to whether or not the urban area is on the main transport routes (W). Thus we estimate the values of the coefficients of the same variables as mentioned in equation (2.3), but now for a smaller sample, designating them d′, e′, f′ and g′ respectively. The results of this are: d′ = 1.25 (58.83), e′ = -0.0012 (-3.29), f′ = 0.000029 (4.28) and g′ = 0.0521 (2.56), while the adjusted R-squared value is only 0.1798. These results had to be less satisfactory as before, if only because JakartaA and BandungA have extreme values. Nevertheless, the signs of the coefficient estimates are "correct", while also the t-values are acceptable.

Since in many countries a distance of two hours from an important centre appears to be a decisive locational factor for industrial activity, we have replaced W in equation 2.3 by the dummy variable T. Whenever an urban area is within two hours travel time of one of the main centres, T acquires a value of 1; in the other cases it becomes 0. Having taken T as an alternative for K, this variable is now omitted. The resulting estimate is as follows:

$$G = \underset{(50.67)}{1.158} + \underset{(4.43)}{0.000026B} + \underset{(4.46)}{0.099T} \qquad (3.5)$$

The value for the adjusted R-squared is 0.21. It is worthwhile noting that the coefficient of B has practically remained the same. Location on the main axes in Western Java appears as a significant variable. Although the value of the correlation coefficient has gone up it also indicates that there are some important other factors at play. Therefore, the increase in employment in large and medium scale manufacturing enterprises (GE) is added as an explanatory variable. It is then found that:

$$G = \underset{(55.61)}{1.1702} + \underset{(3.51)}{0.00002B} + \underset{(3.71)}{0.07736T} + \underset{(4.55)}{0.00001GE} \qquad (3.6)$$

The value of the adjusted R-squared is 0.34. It is interesting to note that the increase in employment contributes considerably to the increase in R. Nevertheless, there appears to be a need for another approach, if only because the level of an urban area's initial population is disregarded. To do this implies neglecting the effects of agglomeration.

Apart from this defect in model specification there is the fact that in many of the smaller urban areas large and medium scale industry have only emerged in the period 1975-86, so that it becomes impossible to relate the relative magnitude G to a similar magnitude in terms of this type of employment. A better approach is developed if the increase in population in an urban area (I) is related to to the area's base year population (P71), to the increase in employment over the period 1975-86 in large and medium scale industry and to B. In this relation it is expected that I will be higher for higher values of P71, of GE and of B. The result of estimating this equation is:

$$I = \underset{(-2.93)}{-5.2406} + \underset{(22.07)}{0.2955P71} + \underset{(1.47)}{0.0008B} + \underset{(9.15)}{0.0025GE} \qquad (3.7)$$

the adjusted R-squared value being 0.899.

It follows that the size of the nearest big urban centre had a positive influence upon an urban area's population increase. Considerably more important and statistically significant appear to be the base year population and the increase in employment in large and medium scale manufacturing enterprise. This conclusion should be qualified by saying that the consumer goods sector turns out to be more sensitive to proximity to the main centres than the producer goods sector. This qualification is based on correlating GEC (employment growth in the consumer goods sector) and GEP (employment growth in the producer goods sector) with K, T and B respectively. The correlation coefficients for GEC show a higher values than those for GEP.

The latter issue comes very close to asking why large and medium scale industry in the two sectors would go to particular urban areas. Since D_c and D_p as determined through shift-share analysis indicate the urban areas where the two sectors have grown differently or in line with what could be expected of them on the basis of their 1975 shares, it becomes relevant to identify at least some of the factors that have contributed to the observed shifts.

Since the consumer goods sector is generally market oriented, it is hypothesized that D_c will be higher in places that had large increases in population and that are located near to the main urban centres. Since D_c refers to the period 1975-86, it makes sense to replace B (which refers to the year 1971) by B80, which measures the 1980 population of the nine urban areas with over 250 thousand inhabitants in 1980 as shown on map 1. The result of this exercise is:

$$D_c = \underset{(-3.72)}{-828.193} + \underset{(3.97)}{20.9407I} + \underset{(3.47)}{0.2341B80} \qquad (3.8)$$

The adjusted R-squared value is 0.24. The point here is not to give a reasonably complete statistical explanation of locational behavour. In that case rather different data sets would have been required. Data on the various constraints on industrial location as mentioned by Hamer and Linn would then have to be considered, while also data on for instance skill requirements and availablities would be needed. Meanwhile it appears justified to conclude that urban areas showing larger population increases than other ones and that were close to the larger centres (JakartaA and BandungA) had a greater chance to see their employment in the large and medium scale enterprises in the consumer goods sector increase than other ones.

It is interesting to note that for D_p no acceptable result could be found on the basis of the available data. As implied before, this is most likely not caused by the possible irrelevance of Uribe-Echevarria's hypothesis with regard to the locational behaviour of the intermediate goods industry. The simple fact is, that the producer goods industry in Western Java is mostly linked to agriculture as processing industry, being therefore in the first

stage refered to by Uribe. In an attempt to explain D_p it would thus be necessary to have data on agriculture at the kecamatan level and these are very hard to come by.

3.3 Small scale industry

The data on small scale industry used here originate in the economic census 1986. For small scale industry, the concept covers registered enterprises with 5 or more workers but with less than 20.

The large and medium scale enterprise sector might be hypothesized to be of considerable importance for total employment in an urban area on the basis of the following argument, which is derived from urban economic base theory. In short, the argument is that the sectors selling their products outside the area where their workers live, generate the incomes that exert effective demand for consumer goods in these areas. (The "exporting" sectors are called the economic base sector, while the sectors providing goods and services to the local population are called the residentiary sector.) Subsequently, the workers of the residentiary sector spend the income they earned by producing and/or selling commodities on goods of the same sector, thereby generating income for each other. In other words, there should exist a relationship between employment in the residentiary sector and total employment, which is basically the same as saying that such a relationship should exist between employment in the basic and residentiary sectors.

Although this aspect is generally not discussed, an important question is whether this relationship would hold for the same period in which the two variables are observed or whether it should be expected that a certain time-lag exists. The argument in favour of the latter specification is that new employment in the economic base sector may initially not encounter the supply it wants, while on the other hand additional supply by the residentiary sector needs a lead time to install itself. This phenomenon may be of marginal importance in areas where the economic base sector is well established and relatively large, but it may be expected to be of more importance

in urban areas where it is relatively small. In the small and intermediate cities of Western Java it is likely that industrial economic base sectors are relatively new.

In practice, the residentiary sector generally covers all enterprises selling mainly to the inhabitants of the urban area where it is established. Generally, these are the small scale and household enterprises in the manufacturing and services sectors. The data used here only refer to the small scale industry sector, which has been split into again a producer goods and a consumer goods sector. Although a number of the former are involved in aspects of the Wearing apparel and Shoe industries, most of these are in agricultural processing and construction materials. The data on the small scale consumer goods sector represent only a fraction of all residentiary employment. Nevertheless, also for this fraction the above mentioned relationship "should" hold. Thus the following regression equation was estimated for employment in the small scale consumer goods sector (ESC):

$$\underset{}{ESC} = \underset{(5.74)}{0.10175E86} \qquad (3.9)$$

with a value of r-squared equal to 0.2462. It is clear that the coefficient of E86 (employment in large and medium scale industry) is statistically quite significant. It is interesting to note that E75 (employment in large and medium scale industry in 1975) gives a much better fit:

$$\underset{}{ESC} = \underset{(8.39)}{0.35039E75} \qquad (3.10)$$

with a value for r-squared of 0.4105.

This result implies that the time-lag mentioned before appears to be relevant for Western Java for the period studied.

Finally, it would seem interesting to know to which of the available variables employment in the small scale producer goods sector (ESP) is most closely related. The expectation would be that in areas where productivity

in agriculture is high and/or has gone up much there wil be more employment in this sector than elsewhere. Also, since such industries are likely to be linked indirectly (i.e. through marketing relations and transfer of technology) to large and medium scale enterprises in this sector, it is expexted that ESP will be high where employment in the large and medium scale producer goods sector (E86P) is high.

Taking productivity in paddy in 1986 as an indicator of overall productivity in agriculture in a kabupaten, the urban area data on ESP have been regressed against this variable together with E75P. Then the same was done with E86P replacing E75P. The results are rather unsatisfactory, only E75P and E86P showing a weak positive relationship. Productivity shows in all cases a negative relationship.

4. Urban Population Growth and Employment

It is time to draw some conclusions. The evidence provided in this paper indicates that urban areas as defined before in the size class of 65 000 to 86 000 (class III) have grown more rapidly than the other urban areas below 100 000 inhabitants in Western Java. A number of them score a percentage growth well over 30 per cent in the nine year period from 1971 to 1980.

These 27 urban areas and their growth percentages have been listed in Table A.3, with the same numbers as in Table 3.2. It is easily seen that these growth percentages have a very wide range, and that among the urban areas in this class no fewer than 13 grew more slowly than the average. Majalengka even lost population. Table A.3 also shows that there were only four areas where employment in large and medium scale manufacturing enterprises increased substantially, while seven areas lost this type of employment. In five it remained practically stable.

For the set of 102 urban areas as a whole it was found that an increase in population is strongly related to the increase in employment in the large and medium scale sector, their initial population and the size of the

nearest important urban centre. Employment in 1986 in the small scale consumer goods sector in turn, was shown to be related to employment in the large and medium scale sector in 1975.

Taking together these findings for the general case, one would expect in a first instance that the fast growers of class III are urban areas located fairly near to JakartaA and BandungA, where employment in large and medium scale industry grew fast and having already considerable employment in this type of sector in 1975. Although this expectation appears quite reasonable, the data point in rather a different direction. What is found is already suggested by the data in Table A.3, and this is confirmed by the following regression equation:

$$I_c = \underset{(-0.56)}{-12.5883} + \underset{(1.50)}{0.46522P71_c} + \underset{(0.47)}{0.00033B80_c} + \underset{(0.68)}{0.00097GE_c} \quad (4.1)$$

while the adjusted R-squared value is 0.03. In this equation the subscript c indicates that only class III urban areas are taken into account; otherwise the meaning of the symbols is the same as in equation (3.7). If one would think that this poor result might be due to the inclusion in class III of a number of notorious non-growers, the following result shows that the cause must lie somewhere else. Here the subscript f refers to the group of urban areas that grew faster than the average of class III.

$$I_f = \underset{(0.02)}{0.49428} + \underset{(1.41)}{0.37977P71_f} - \underset{(-0.45)}{0.00026B80_f} + \underset{(0.21)}{0.00022GE_f} \quad (4.2)$$

R-squared in this case equals the minimum of zero.

The data in Table A.3 were of course a warning that this would happen. More important perhaps is that in this type of cross section analysis many of the relevant macro-phenomena that occur cannot adequately be taken into account. One of these is the economic crisis that took place in the period between 1975 and 1986, and which must have been responsible for the relatively high number of urban areas that lost employment in the large and medium scale enterprise sector. However, this would explain why a number of the class III

urban areas did not grow, while at the same time it is clear that 14 of the 27 grew faster then the average of the class. This means that the initial hypothesis should be rejected and that another one might be formulated.

The one that will be offered here is of course very tentative and will require further and more detailed study. It runs as follows. The urban areas in class III were relatively well endowed with large and medium scale industry before the crisis hit. In general, this has set in motion the economic base employment multiplier mechanism refered to above. Hence these places had become attractive for migrants that were expecting to find work in the economic base sector and in the small scale industry sector. By 1980, when the population was being counted, the crisis was still not having its negative influence. However, when it struck a few years later, small scale enterprises were in place. These may even have increased in number, as medium scale enterprises had to fire workers, and fell below the lower limit of 20 workers that marks their class. As a minimum, this argument requires that the increase in population in the class III urban areas is positively related to the size of 1975 employment in large and medium scale industry and to the number of people employed in small scale industry in 1986. It is likely that the areas closer to the larger main urban centres have done better in this respect than the ones close to TasikmalayaA or CirebonA. In addition, however, the rural areas surrounding the class III urban areas should show a fairly high rate of out-migration until 1980 destined to the to the 14 fast growers. The latter aspect is beyond the scope of this paper. What can be offered here is some support for this hypothesis in the form of the following equation:

$$\underset{}{I_c} = \underset{(4.88)}{15.4971} + \underset{(2.26)}{0.01180E75_c} + \underset{(1.43)}{0.01134ES_c} + \underset{(1.15)}{0.00063B80_c} \qquad (4.3)$$

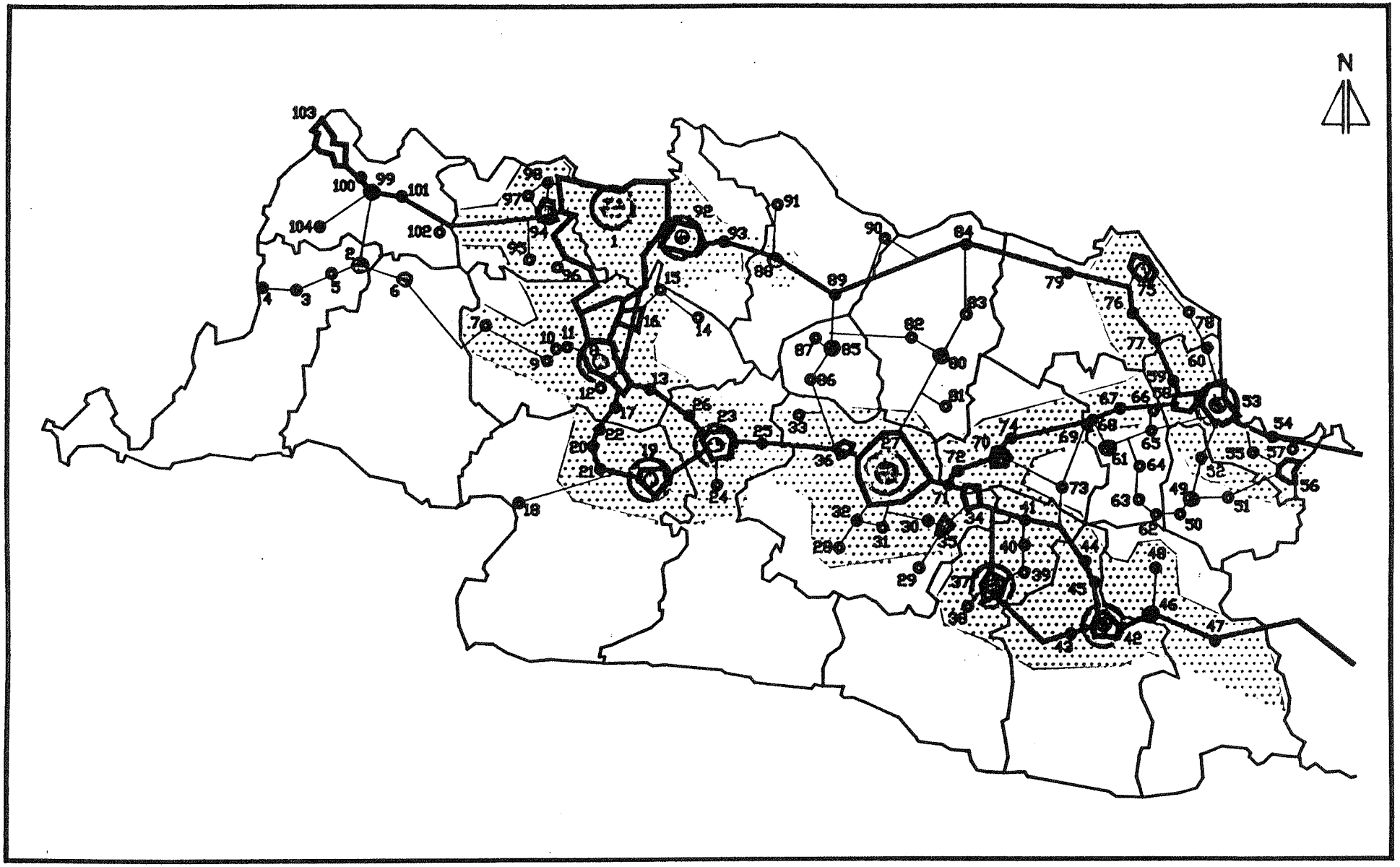
with a value for R-squared of 0.31, which leaves much to be desired. The same can be said of the t-values for the coefficients of ES_c (employment in small scale industry) and of $B80_c$.

A first general conclusion can be that the increase in population growth in the 102 urban areas of Western Java outside JakartaA and BandungA is

strongly influenced by the increase in employment in the large and medium scale sector, and the consequent increase in the small scale industry sector. Further research will be necessary to find out whether the first variable also has a positive impact on the household industry and upon the supply of services. This result supports the finding by Rietveld (1988) that urbanization in West Java is closely related to the value of approved investment projects, in the sense that these projects generally refer to the larger investments in economic activity and that they will have created direct employment.

A second general conclusion is that the population of small towns in the size class of 65 000 to 86 000 have grown faster than the average for the region, but that the mechanism of this growth has been different from that of the general phenomenon. A definite conclusion in this respect could not be drawn. It is probable that with the closure of a number of large and medium scale enterprises as indicated by the loss of employment in this sector in these urban areas, some new small scale enterprises have emerged, while other ones entered the market before the crisis of the early eighties. It is not impossible that the population growth rate of the class III urban areas has declined after 1980. It is clear that further analysis on this issue is necessary.

In this connection it would be relevant to also take into account some of the urban and industrial development policy measures that were taken by the Indonesian government. This aspect has remained without discussion in this paper.



LEGEND

- TOWN WITH MORE THAN 100,000 POP.
- PROVINCIAL CAPITAL
- KABUPATEN CAPITAL
- 61 TOWN CODE NUMBER (SEE LIST OF TOWNS)
- URBAN AGGLOMERATION

WEST JAVA
THE URBAN STRUCTURE

LEGEND

- ROAD
- MAIN ROAD
- KABUPATEN BORDER
- CENTRALLY LOCATED URBAN AREA
- 0 10 20 30 Kms

ISS
1989

Table A.1
Employment in Large and Medium Scale Industry by Urban Areas of Western Java, 1975 and 1986*

Urban Area	1975	1986	Urban Area	1975	1986
1.JakartaA	111 262	240 415	50.Kadugede	61	np
4.Labuhan	np	-	51.Ciawi Gebang	-	68
6.Rangkasbitung	184	236	52.Cilimus	np	-
7.Jasinga	-	np	53.CirebonA	4 168	4 508
8.BogorA	7 799	14 912	54.Lemah Abang	np	1 127
9.Leuwiliang	np	np	55.Karangsembung	4 212	np
11.Ciampea	260	132	56.Ciledug	402	909
12.Cijeruk	np	np	57.Babakan	np	np
13.Cisarua	np	2 221	58.KlangenanA	1 146	2 517
14.Jonggol	np	np	61.Majalengka	np	np
15.Cileungsi	np	6 183	64.Maja	-	np
16.CibinongA	2 599	19 953	65.Rajagaluh	-	np
17.Caringin	-	np	67.Jatiwangi	1 285	6 137
18.Pelabuhan Ratu	-	299	68.Dawuan	-	163
19.SukabumiA	np	765	69.Kadipaten	np	np
20.Parung Kuda	np	np	70.SumedangA	93	140
21.Cibadak	304	947	71.Cikeruh	86	5 123
22.Cicurug	98	307	72.Tanjungsari	np	-
23.CianjurA	67	1 089	73.Wado	-	np
24.Cibeber	np	385	74.Cimalaka	np	215
25.Ciranjang	np	57	75.IndramayuA	np	np
26.Pacet1	np	507	76.Jatibarang	np	95
27.BandungA	44 240	107 449	79.Kandanghaur	np	np
28.Ciwidey	-	5 003	80.Subang	np	np
29.Pacet2	83	np	81.Jalan Cagak	-	np
30.Ciparay	418	327	83.Pagaden	np	np
31.Banjaran	np	np	84.Pamanukan	np	-
32.Soreang	-	401	85.Purwakarta	np	1 822
33.Cipeundeuy	-	np	86.Plered	2 477	2 863
34.Cicalengka	310	319	87.Jatiluhur	1 296	4 091
35.MajalayaA	14 684	20 185	88.Karawang	305	1 414
36.PadalarangA	1 525	4 652	89.Cikampek	np	1 632
37.GarutA	2 443	1 749	90.Cilamaya	64	-
38.Bayongbong	-	np	91.Rengasdengklok	264	280
39.Wanaraja	np	-	92.BekasiA	1 908	26 021
42.TasikmalayaA	1 571	3 042	93.Cikarang	106	328
43.Singaparna	-	146	94.TangerangA	5 966	26 329
44.Ciawi	71	92	95.Legok	-	np
45.Rajapolah	131	98	96.Serpong	98	1 473
46.Ciamis	496	412	98.Teluknaga	-	np
47.Banjar	np	234	99.Serang	146	104
48.Kawali	np	np	101.Ciruas	np	np
49.Kuningan	np	np	103.CilegonA	384	8 761
			TOTAL	216 073	533 183

* The sign - is used when no employment in large and/or medium scale manufacturing industry is recorded. The letters np are used whenever there are less than 3 enterprises in a given urban area. The TOTAL, however, includes the omitted figures.

Table A.2
Manufacturing employment in large and medium scale enterprises in urban and rural areas by industry, Western Java, 1975 and 1986

Industry	1975 Urban	1975 Rural	1975 Total	1986 Urban	1986 Rural	1986 Total	Index 1975 = 100
311/2 Food products	23545	4026	27571	47848	17355	65203	236.5
313 Beverages	3786	-	3786	6571	150	6721	177.5
314 Tobacco	1644	24	1668	581	161	742	44.5
321 Textiles	77608	5668	83276	159229	15336	174565	209.6
322 Wearing apparel	1955	38	1993	47690	2792	50482	2533.0
323 Leather & prod.	709	-	709	1547	143	1690	238.4
324 Footwear	3306	-	3306	5099	91	5190	157.0
331 Wood products	679	480	1159	4559	2799	7358	634.9
332 Furniture & fixt.	2182	-	2182	5444	313	5757	263.8
341 Paper and prod.	2357	315	2672	8350	2821	11171	418.1
342 Printing & publ.	9951	-	9951	21453	313	21766	218.7
351 Ind. chemicals	2240	-	2240	8453	4041	12476	557.0
352 Oth. chem. prod.	15429	176	15605	35333	3677	39010	250.0
355 Rubber products	5136	140	5276	12512	10866	23378	443.1
356 Plastic prod.	8166	70	8236	21843	2876	24719	300.1
361 Pottery, china	157	-	157	3514	2853	6367	4055.4
362 Glass & prod.	3416	-	3416	5782	71	5853	171.3
363 Cement & prod.	5191	447	5638	5574	1490	7064	125.3
364 Clay products	3800	519	4319	10033	1261	11294	261.5
369 Non-metal prod.	282	206	488	1207	2160	3367	690.0
371 Iron & steel	1241	-	1241	10220	126	10346	833.7
381 Metal products	12613	496	13109	30018	2882	32900	251.0
382 Machinery n.e.c.	3439	-	3439	5762	665	6427	186.9
383 Electr.machinery	10994	74	11068	24376	4472	28848	260.6
384 Transp.equipment	14521	25	14546	40786	3327	44113	303.3
385 Profess. goods	176	35	211	1168	81	1249	591.9
390 Other industries	1547	79	1626	5808	794	6602	406.0
TOTAL	216073	12818	228891	533183	83949	617132	269.6

Table A.3
Some characteristics of Class III urban areas

No	Percent Populat. Gr71-80	Increase Empl.L&M 75-86	Total Shift	No	Percent Populat. Gr71-80	Increase Empl.L&M 75-86	Total Shift
6	0.32	52	-227.7	54	0.25	1083	1015.3
11	0.39	-128	-510.0	57	0.25	910	839.2
12	0.35	-31	-141.8	61	-0.09	66	32.1
13	0.35	2151	1141.6	72	0.14	-40	-96.1
14	0.27	723	392.1	79	0.28	2	-31.8
15	0.35	5610	4372.7	81	0.14	95	55.5
21	0.30	643	198.6	82	0.09	0	0
24	0.15	354	298.7	84	0.28	-19	-48.2
25	0.22	18	-42.0	86	0.28	386	-3096.5
30	0.44	-91	-694.8	93	0.55	222	66.6
31	0.35	-28	-134.6	97	0.34	0	0
34	0.52	9	-435.7	98	0.41	117	70.9
36	0.45	3127	902.6	99	0.39	-42	-274.1
43	0.24	146	87.8				

Literature cited

M.A.B. Amin (1981) — Interregional and Interurban Disparities in Indonesia, University Microfilms International, Ann Arbor (Mich).

BPS (1972) — 1971 Population Census, Population by sub-district; Java-Madura, Seri B no 2; Biro Pusat Statistik, Jakarta.

BPS (1982a) — Penduduk Propinsi DKI Jakarta 1980, SP'80-01(31), Biro Pusat Statistik-Kantor Statistik DKI Jakarta, Jakarta.

BPS (1982b) — Penduduk Propinsi Jawa Barat 1980, SP'80-01(32), Biro Pusat Statistik-Kantor Statistik Jawa Barat, Jakarta.

BPS (1986) — Pendapatan Regional Provinsi-Provinsi di Indonesia 1975-1982, Biro Pusat Statistik, Jakarta.

BPS (1988a) — Pendapatan Regional Provinsi-Provinsi di Indonesia 1979-1984, Biro Pusat Statistik, Jakarta.

BPS (1988b) — Pendapatan Regional Provinsi-Provinsi di Indonesia 1983-86, Biro Pusat Statistik, Jakarta.

J. Evans (1983) — The Growth of Urban Centres in Jawa since 1961; Bulletin of Indonesian Economic Studies, Vol XX no 1, April; 44-57.

Govt of Malaysia (1971) — Banchi Pendudok & Perumahan Malaysia 1970, Jabatan Perangkaan Malaysia, Kuala Lumpur.

Govt of the Philippines (1984) — Philippine Statistical Yearbook 1984, National Economic and Development Authority, Manila.

A.M. Hamer and J.F. Linn (1987) — Urbanization in the Developing World: Patterns, Issues and Policies; in E.S. Mills (ed): Handbook of Regional and Urban Economics, Vol II, Elsevier, Dordrecht; 1255-1284.

J.E. Hardoy and D. Satterthwaite (1986) — A Survey of Empirical Materials on the Factors Affecting the Development of Small and Intermediate Cities; in J.E. Hardoy and D. Satterthwaite (eds), Small and Intermediate Urban Centres, Hodder and Stoughton, London; 279-333.

J.G.M. Hilhorst (1969) — Spatial Structure and Decision Making; Development and Change, Vol.I, no 1; 50-75.

J.G.M. Hilhorst (forthcoming) — Rural Regional Development. An Introduction to Policy Making; Gower, Aldershot.

G.J. Hugo, T.H. Hull, V.J. Hull and G.W. Jones (1987) The Demographic Dimension in Indonesian Development, Oxford Universty Press, Singapore.

G.W. Jones (1984) Links between Urbanization and Sectoral Shifts in Employment in Java; Bulletin of Indonesian Economic Studies, Vol. XX, no 3, 120-57.

J.R. Lasuen (1968) On Growth Poles. Paper presented at the 28th Conference of the Southern Economic Association, Washington, D.C.

H. Lubbell (1979) Urban Development Policies and Programs (Working Paper for Discussion), Bureau for Program and Policy Coordination, USAID, Washington, D.C.

NUDS (1985) Laporan Akhir-National Urban Devlopment Strategy, Departemen Pekerjaan Umum and United Nations Centre for Human Settlements, Jakarta.

P. Rietveld (1988) Urban Development Patterns in Indonesia; Bulletin of Indonesian Economic Studies, VOL XXIII, No 1, April; 73-95.

D.A. Rondinelli (1982) Intermediate Cities in Developing Countries, a comparative analysis of their demographic, social and economic characteristics; Third World Planning Review, Vol. IV, No 4; 357-86.

M.J. Titus, W.M. de Jong and F. van Steenbergen (1986) Explorations into the Economic Structure and Role of Small Urban Centres in the Serayu Valley Region, Central Java; in P.J.M. Nas (ed.) The Indonesian City, Foris Publications, Dordrecht; 250-73.

UN (1979) International Trade Statistics Yearbook 1978, Vol. I, United Nations, New York.

UN (1980) Demographic Yearbook 1979, United Nations, New York.

UN (1983) International Trade Statistics Yearbook 1981, Vol. I, United Nations, New York.

UN (1986) Industrial Statistics Yearbook 1984, Vol I, United Nations, New York.

UN (1987) Industrial Statistics Yearbook 1985, Vol I, United Nations, New York.

UN (1988a) Demographic Yearbook 1986, United Nations, New York.

UN (1988b) International Trade Statistics Yearbook 1986, Vol I, United Nations, New York.

J.F. Uribe-Echevarria (1989) Small Scale Industrialization Policies and Industrial Development in Rural Regions; Paper contributed to the Conference on Policy Approaches toward Technology and Small Enterprise Development, organized by Queen Elizabeth House, Oxford University and the Institute of Social Studies, June 5-7, 1989, at the Institute of Social Studies, The Hague.