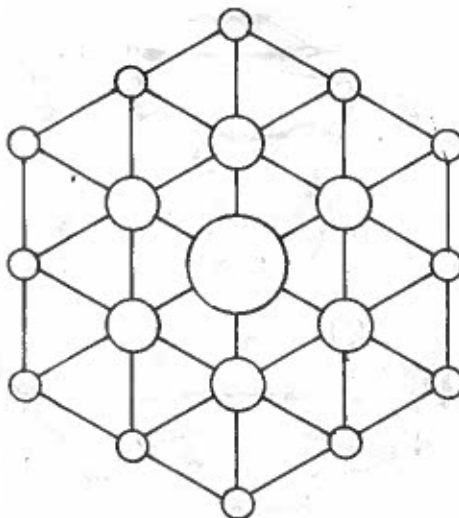


MIGRATION AND DWELLING QUALITY IN ROTTERDAM

BASIL N. BRINK

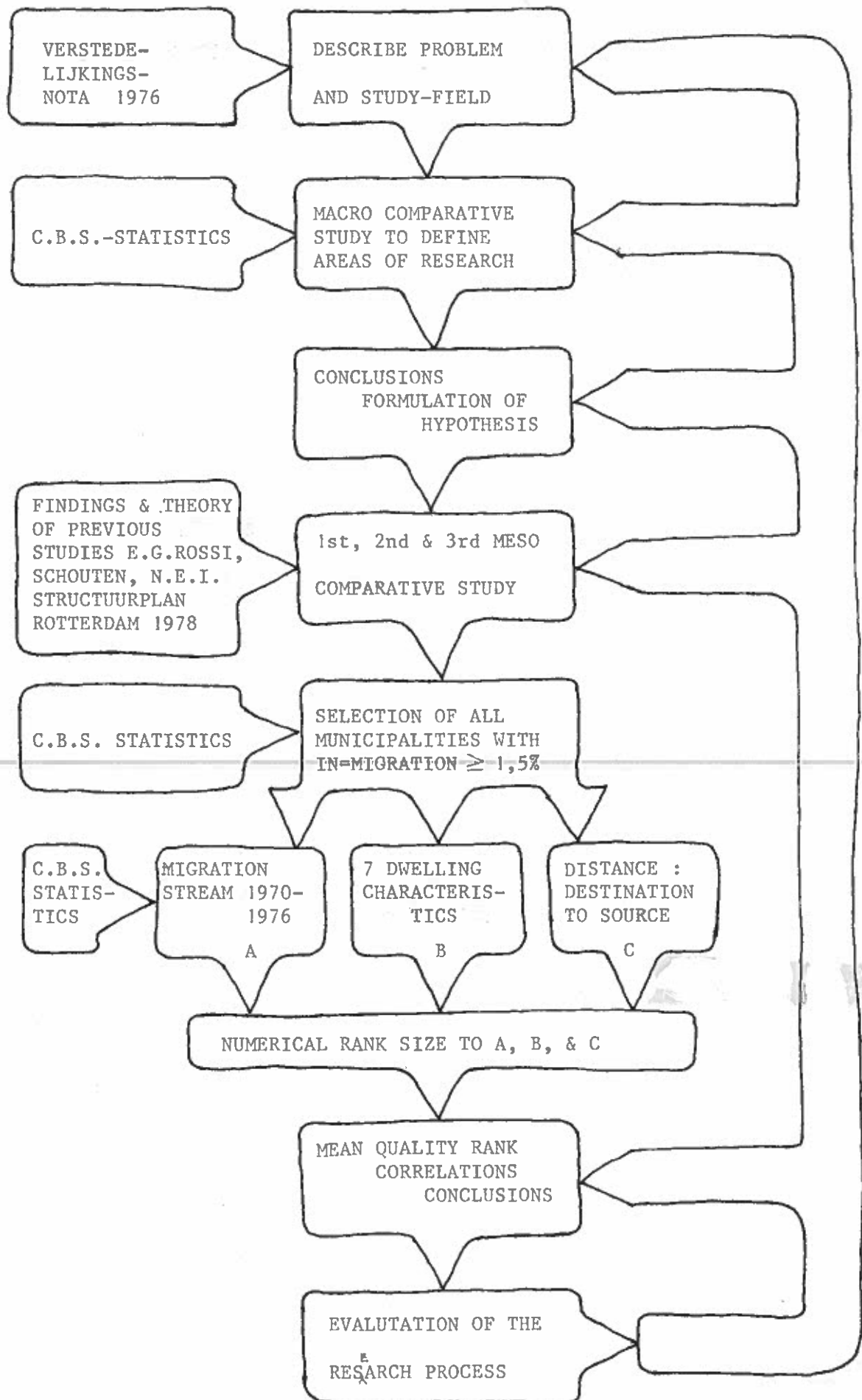
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SCHEMATIC REPRESENTATION OF RESEARCH / STUDY PHASES

DEFINITION OF TERMS

When referring to, and describing the process of migration, many terms and concepts crop up which require a closer definition for the sake of clarity.

MOBILITY: Adjusting the dwelling to the changing needs, as result of shifts in family composition , for example.

PUSH: The reason for moving from a former home is based on a decision taken to move - size of migration stream.

PULL: The reason for moving is informed by a choice among places to move to - direction of migration stream.

VOLUNTARY MOVE: The migrant has a clear choice between staying or moving.

INVOLUNTARY MOVE: The migrant is forced to move e.g. through eviction.

MIGRATION: Moving from one dwelling to another across a municipal border.

LIFE STYLE: Behaviour based on careerism, consumership and familism.

IDEAL: Depends on the nature and amount of information that an individual receives.

CONGRUENCE: The correspondence between the quality of the dwelling and the behaviour (life style) based on subjective perception.

LIVING-SATISFACTION: The degree in which aspirations correspond with (the quality of) the dwelling.

QUALITY OF DWELLING: Determined by characteristics of the dwelling such as its age, the number of rooms, presence of a bathroom and W.C., presence and size of kitchen and whether rented or owned.

DISTANCE OF MOVE: The quality of the dwelling is of greater importance in short distance moves (commuting) than long distance migration.

WINNER PROVINCE: Contains more single family homes, more green and recreational space, less people living in urbanised areas, higher home ownership and a lower per capita regional product as compared with a loser province.

MACRO: Zones with characteristics, municipality (Rotterdam).
Province (rest of Rijnmond) and country (Netherlands).

MESO: Zones (municipalities) with characteristics.

INTRODUCTION AND GENERAL BACKGROUND - STATEMENT OF PROBLEM

A trend which has established itself in most developed countries is the migration of people from densely populated cities to villages and towns in rural areas. This migration occurs mainly as a result of:

- a) Lack of space in the city: Business, roads, and parking space are gobbling up all available space.
- b) A desire for more space for reasons of need, comfort or prestige.
- c) Desires and wishes as regards housing: Increased welfare as well as changing life-style and aspirations (social, economic) result in greater demands being made on the size and quality of a house. Much research has been done to establish the desires, wishes and dissatisfaction of home owners. In general it may be stated that single family houses with available green space are preferred above flats or semi-detached houses.

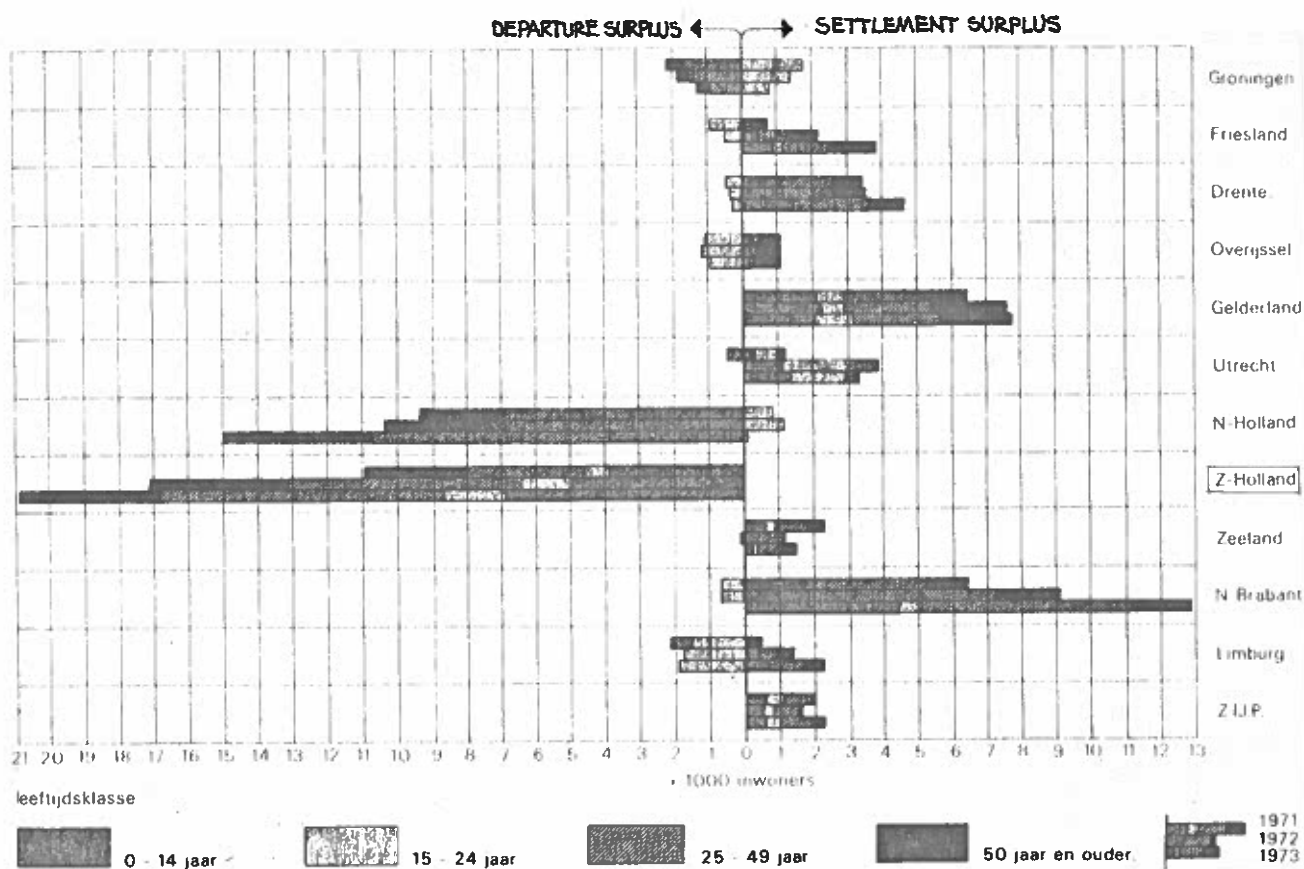
Schouten has indicated that the correlation between single family houses (as percentage of the total housing stock) as well as green spaces is high when compared with family net migration per province. This correlation is on the increase in the period 1968-1972. See graph 5

- d) Increase in car-ownership: Also as a result of increased welfare and changing life style (status). This increase enables more people to travel greater distances and increases the distance over which people commute to place of work and back to their homes. The migration from city to the countryside is disadvantageous for many reasons, among which:
 - i) Demand for increased road capacity and networks. These roads threaten nature and the rural land use.
 - ii) Increased urbanization of rural villages and towns. Virgin land has to be used for new houses and amenities
 - iii) Increase of dormitory suburbs. People commute to the big cities by day and make use of their homes mainly for sleeping in. Suburbs become inactive and lifeless by day - in some cases dangerous for the housewife. The cities become deserted by night which encourages crimes such as thefts and muggings.

The intention of this paper is to establish the relationship between migration and the quality and quantity of houses in broad terms - an exact mathematical correlation requires exhaustive research of all municipalities to verify or falsify the results, and this falls beyond the scope of this paper.

A preliminary survey of municipalities in the Netherlands indicates that the municipality of Rotterdam has, together with Amsterdam, the most departures to the rest of the Netherlands. Since 1957 municipalities of more than 100 000 inhabitants have shown an increase in departures up to 1973 of 8 times that of 1957, whereas influx to rural municipalities and urbanised rural areas has fourfolded and doubled respectively .

The municipality of Rotterdam has therefore been selected for further study with regard to the quality and quantity of housing in it, compared with the province of Rijnmond in which it is and the rest of the Netherlands.



INTEGRATION ACCORDING TO AGE GROUP PER PROVINCE FROM 1971 TO 1973 IN THE NETHERLANDS

SOURCE: 'VERSTEDELINGS-
NOTA' OF 1976

Gemeente	1960-1964	1965-1969	1970-1974	1960-1964	1965-1969	1970-1974
				in % van de bevolking per		
				1-1-1960	1-1-1965	1-1-1970
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Amsterdam	- 37 063	- 69 802	- 99 873	- 4,3	- 8,1	- 12,0
Rotterdam	- 32 454	- 70 501	- 85 905	- 4,4	- 9,6	- 12,5
's-Gravenhage	- 27 962	- 60 854	- 78 307	- 4,6	- 10,2	- 14,2
Utrecht	- 4 583	- 7 725	- 34 483	- 1,8	- 2,9	- 12,4
Eindhoven	- 479	- 1 679	- 11 675	- 0,3	- 0,9	- 6,2
Haarlem	- 5 608	- 6 608	- 10 718	- 3,3	- 3,8	- 6,2
Groningen	- 1 339	- 1 088	- 9 732	- 0,9	- 0,7	- 5,8
Tilburg	- 1 683	- 1 259	- 7 634	- 1,2	- 0,9	- 5,0
Nijmegen	674	- 148	- 7 422	0,5	- 0,1	- 5,0
Enschede	1 364	- 2 319	- 6 052	1,1	- 1,7	- 4,3
Apeldoorn	3 400	6 553	4 218	3,3	5,8	3,4
Arnhem	- 568	- 5 529	- 10 338	- 0,5	- 4,2	- 7,8
Breda	117	- 382	- 6 656	0,1	- 0,3	- 5,5

Bron: Berekend uit cijfers van het Centraal
Bureau voor de Statistiek.

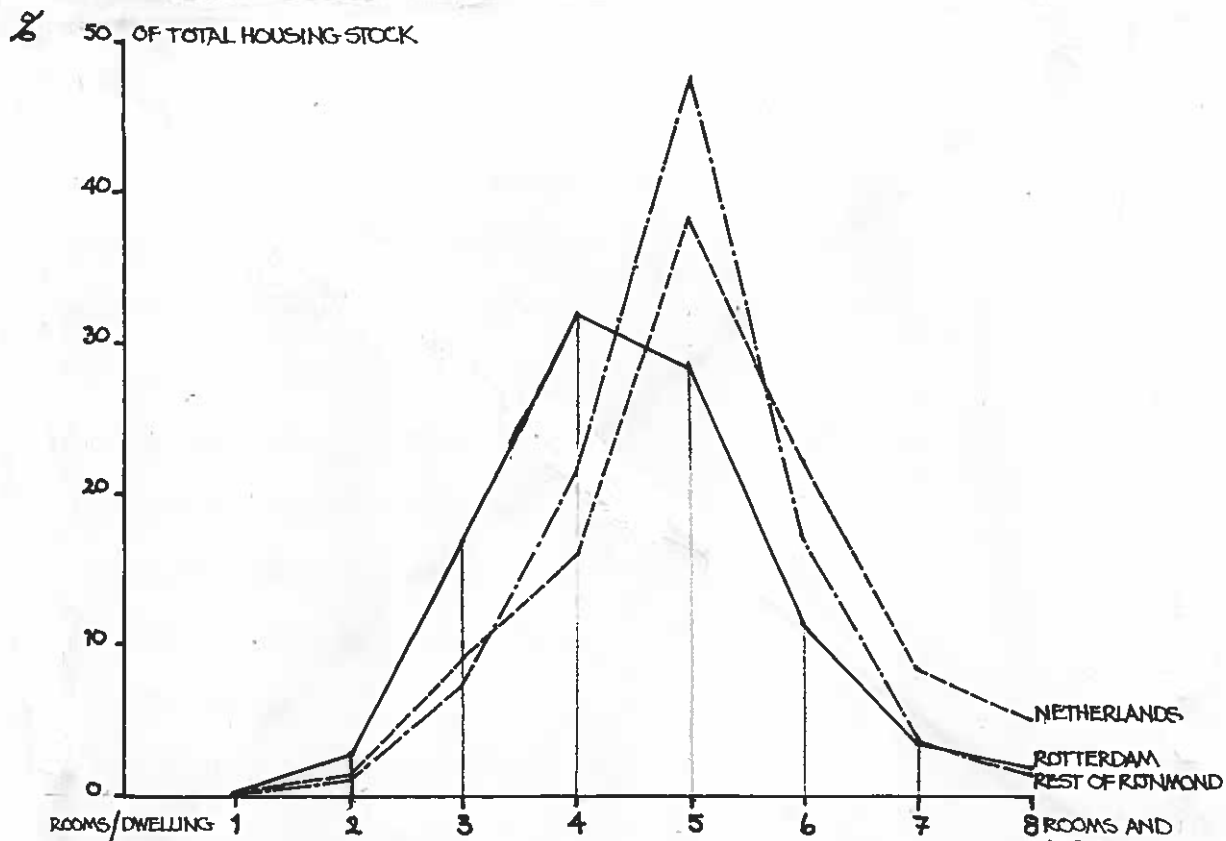
INLAND MIGRATION TOTALS FOR MUNICIPALITIES WITH MORE THAN 100 000 INHABITANTS

SOURCE: 'VERSTEDELINGS-
NOTA' OF 1976

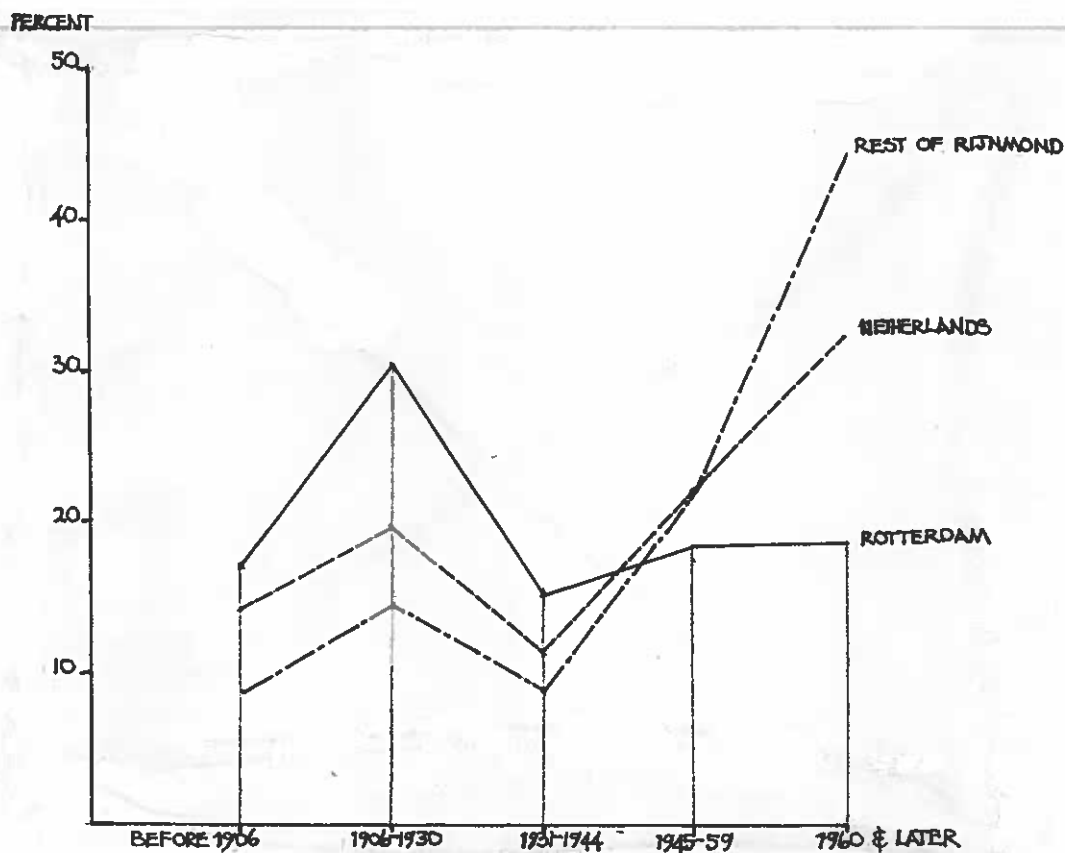
MACRO STUDY OF DWELLINGS IN ROTTERDAM

By comparing the quality and quantity of houses in the municipality of Rotterdam with that of the province of Rijnmond and the rest of the Netherlands, the following conclusions may be drawn from the graphs.

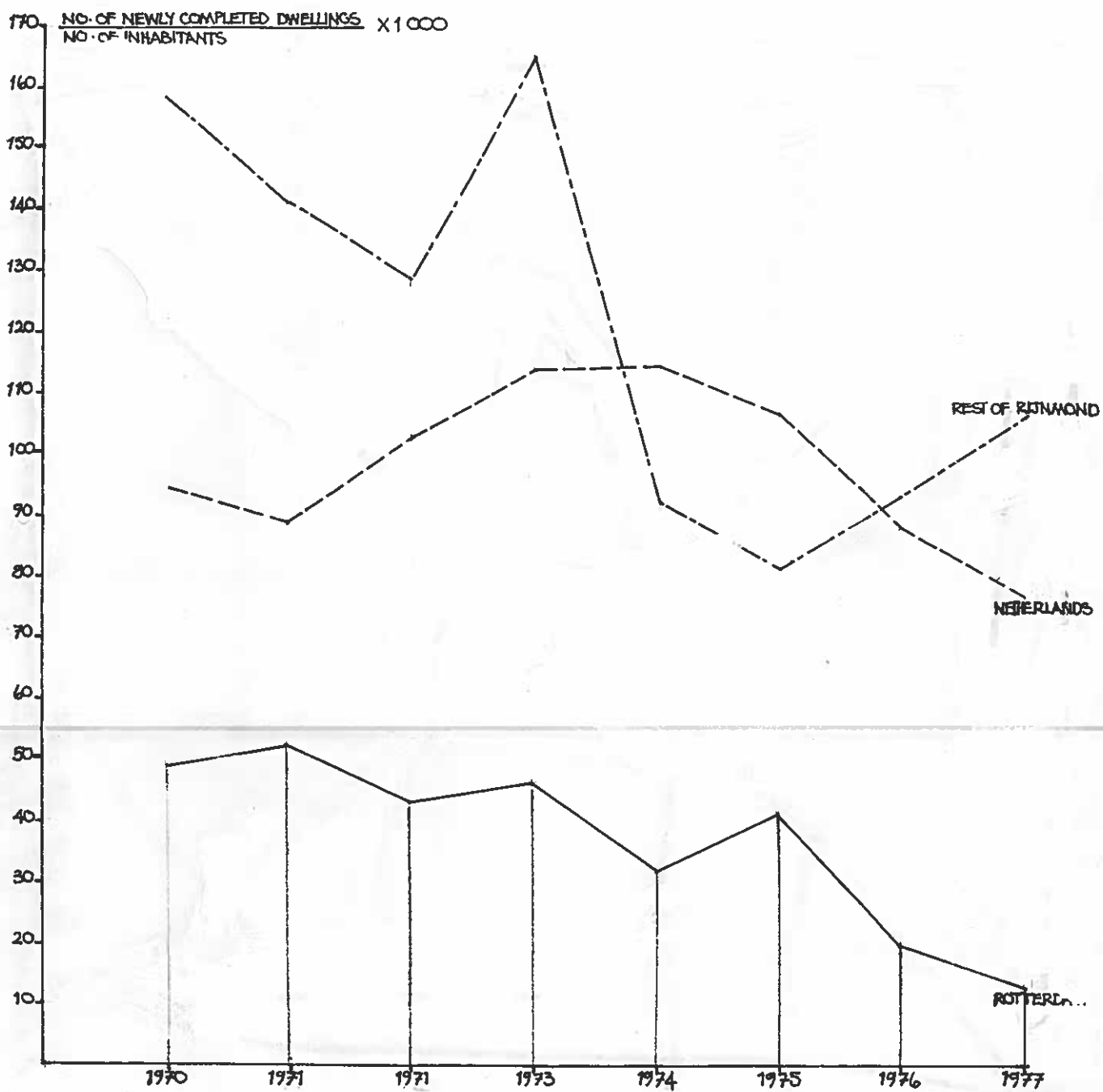
- 1) Rotterdam has relatively more houses with 2,3, and 4 rooms, and fewer houses with 5,6,7 and 8 rooms than Rijnmond and the Netherlands. The dwelling size is therefore smaller than the Netherlands average, and it may be stated (also from findings of Rossi) that space requirements are the most important of the needs generated by change in the family life cycle. Rossi indicates that that among voluntary moves the most important factor impelling (pushing) households to move is (in his findings) dissatisfaction with the amount of space in their old dwelling. See graph 1. As second most important factor he finds complaints of the former neighbourhood, and thirdly the cost of rent and maintenance in the previous home.
- 2) Rotterdam has more old dwellings (built before 1944) and less new dwellings (built as of 1945) in comparison with Rijnmond and the Netherlands. Though it may not be categorically stated that an old dwelling is unsound (as the quality of the dwelling fluctuated with the period it was built), it may be stated that quality and services (such as bathroom and internal W.C.) the old dwellings are at a marked disadvantage. See graph 2. It may also be stated that as far as the completion of new dwellings goes, Rotterdam has a distinct backlog compared with Rijnmond and the Netherlands. The number of newly completed dwellings per capita is on the decrease in Rotterdam, all the more surprising when one considers the fact that 10 000 people move from the municipality per year. See graph 3. If one considers that the average size of a newly built 'state'-dwelling increased from 85m^2 in 1960 to 102m^2 in 1974; that of a privately financed dwelling from 93m^2 to 110m^2 ; the importance of an adequate stock of new dwellings in a municipality reveals itself as a counter to the lack-of-space push indicated by Rossi.
- 3) 93% of all dwellings in Rotterdam are occupied by rent-payers, compared with 65% in the Netherlands. Of this large stock of rent-dwellings, Rotterdam has more dwellings with a low rent, and



DWELLING STOCK ACCORDING TO NO. OF ROOMS PER DWELLING PER 28-2-71 graph 1



DWELLING STOCK ACCORDING TO YEAR IN WHICH BUILT PER 28-2-71 graph 2



NO. OF NEWLY COMPLETED DWELLINGS IN RELATION TO NO. OF INHABITANTS SINCE 1970

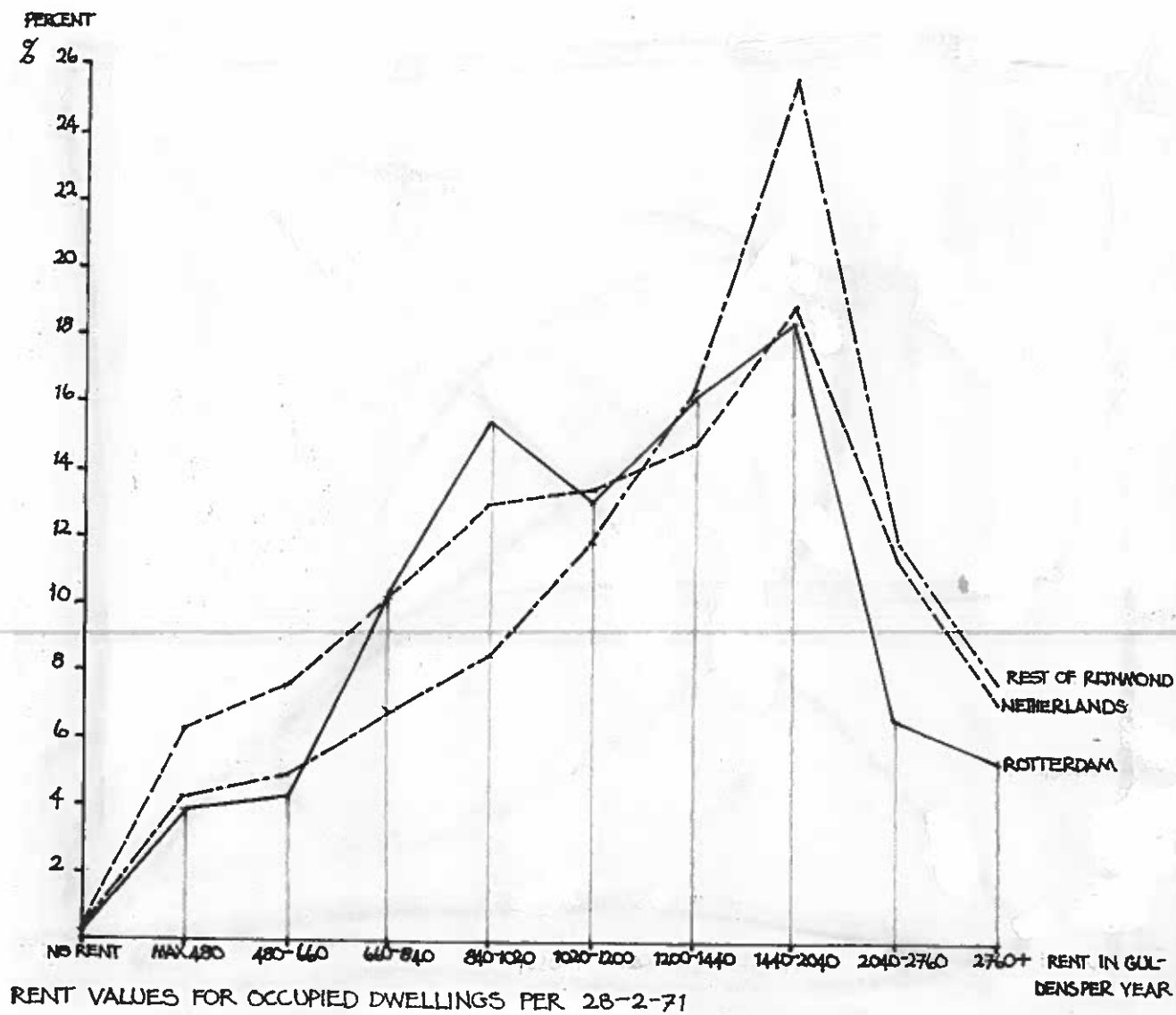
fewer with a high rent than Rijnmond and the Netherlands. It is obvious that a rented dwelling is at a 'psychological' disadvantage to the occupier when upkeep and investments in improvements are considered, an attitude which invariably leads to a shoddy and slummy dwelling-appearance if the landlord does not constantly invest in upkeep and renovation. See graph 4

Shoddy and slummy houses are not acceptable to the migrant labourer - he simply has no choice when choosing a house as his (financial) means are limited. Other social strata (e.g. the young well to do married couples) can afford to migrate and subsequently commute in their one or two cars. The married couples largely represent a group who migrate voluntarily; whereas migrant labourers remain behind involuntarily.

- 4) Only 17% of all dwellings in Rotterdam have a bathroom and/or a douche, a remarkably low figure when compared with that of the Netherlands with 76% which is at least four times as much.

The importance of this amenity in the dwelling should not be underestimated, and it is not in all newly built dwellings where a bathroom is included as a matter of course. A bathroom is realised to be first and foremost a hygienic necessity, and in exceptional cases a prestige object.

Rotterdam has 21% of its houses fitted out with central heating. In Rijnmond this amount is doubled at 41% and in the Netherlands it is 29%. Here again dwellings in Rotterdam are at a disadvantage, as the presence of central heating ensures the physical comfort of the owner or rent payer, and without it a dwelling may become unbearably cold in winter, which could lead to the contracting of diseases.



graph 4

MIGRATION FROM ROTTERDAM

Having established that Rotterdam is a loser-municipality when compared with all other municipalities (aggregated) in Rijnmond and the Netherlands, and also having stated that Rotterdam has the highest outflux of people per year in the Netherlands (together with Amsterdam), the destinations of all the migrant Rotterdammers is of interest, i.e. where do the migrants go?

The Central Bureau of Statistics provides the answer.

It is also of interest to study the figures for Rijnmond, as Rotterdam forms 90% of the out-migration from Rijnmond. Migration is mainly eastwards and southeastwards to the provinces of South-east South Holland (2 382 arrivals in 1976) and West-north Brabant (2 305 in 1976).

See illustration 1

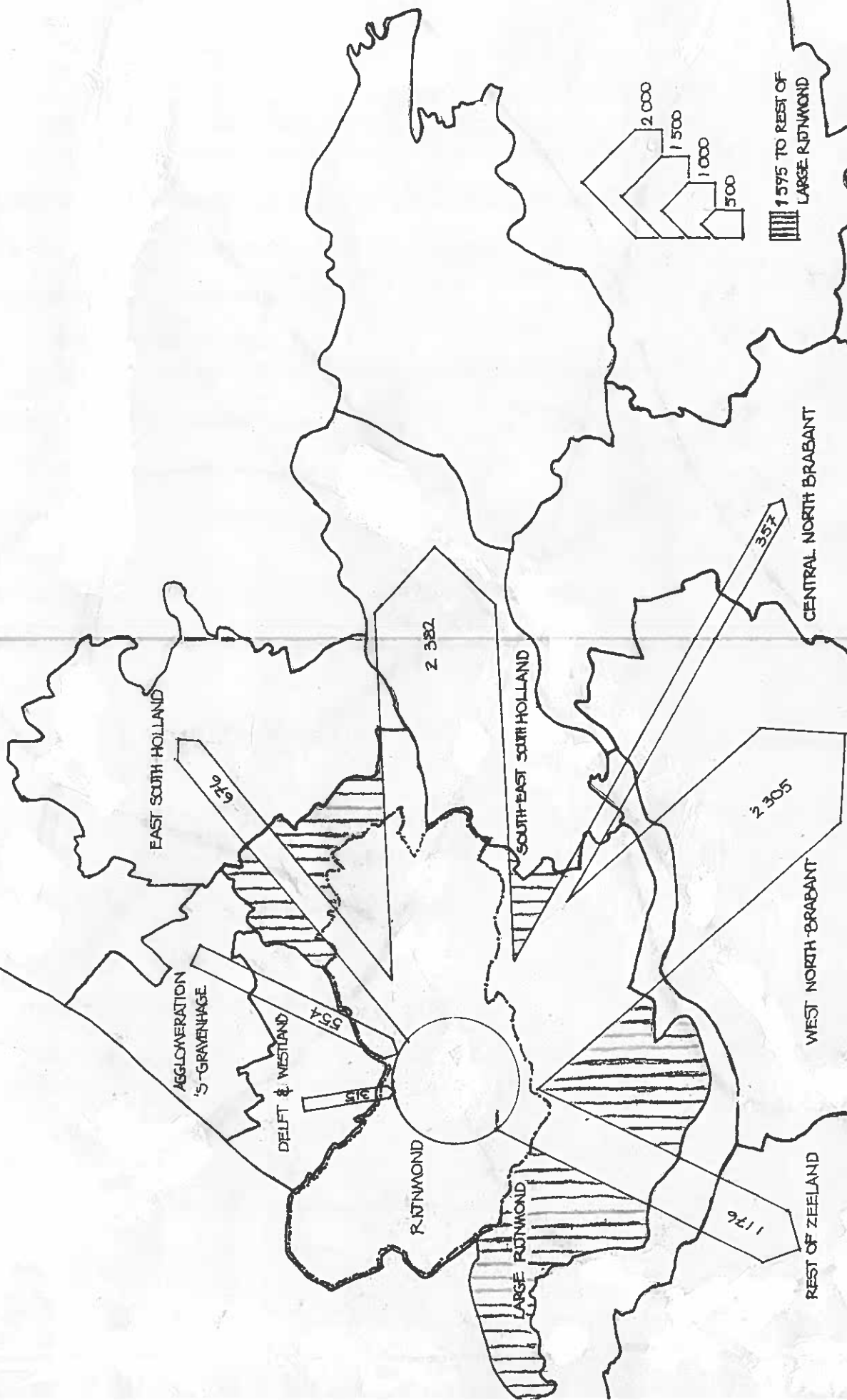
From Rotterdam approximately 7 000 people migrated to the rest of Rijnmond in 1975 and 3 500 to South Holland and the Netherlands respectively. The fact that 78% of the migrants leaving Rotterdam go to nearby municipalities indicates that they maintain strong physical ties with Rotterdam i.e. they retain their place of work in Rotterdam but change their place of abode thereby choosing to commute to work and back every day.

See graph 6

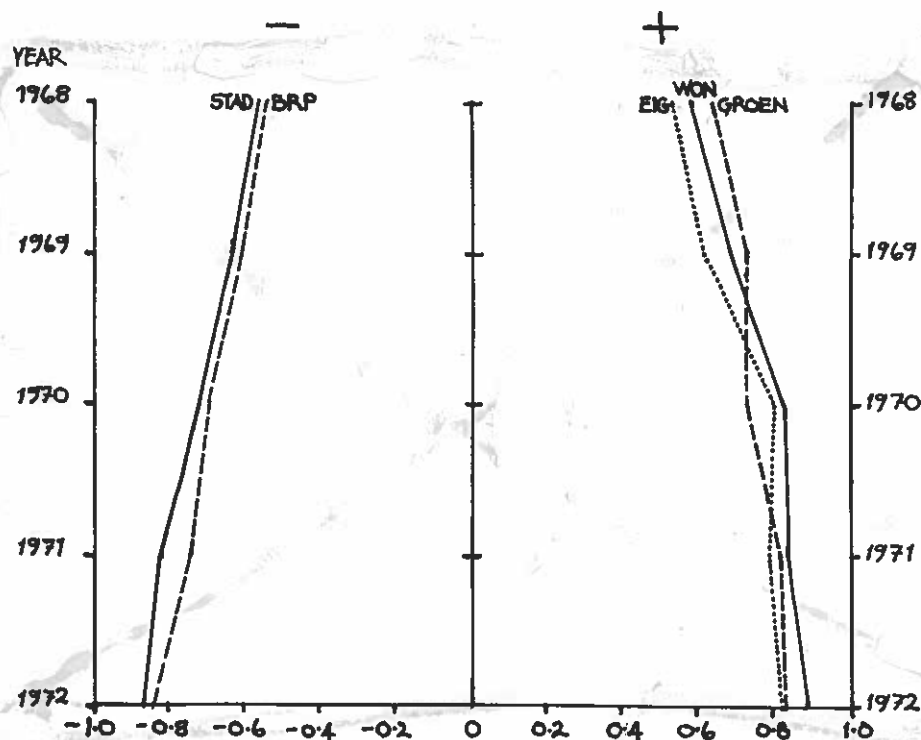
In 1970 (national census) 9,4% of the inhabitants in Rijnmond were commuting to Rotterdam, whereas only 1,4% of the inhabitants of Rotterdam were commuting to Rijnmond. In total there were four times as many commuters traveling into Rotterdam than leaving it in 1970.

See appendix

What may tentatively^{be} concluded from the figures is that 4 times as many people commuted from Rijnmond to Rotterdam than vice versa in 1970, a year in which 50% of the total migrants from Rotterdam went to Rijnmond. This indicates a strong correlation between migration and commuting.



INLAND MIGRATION OF ROTTERDAM FOR 1976

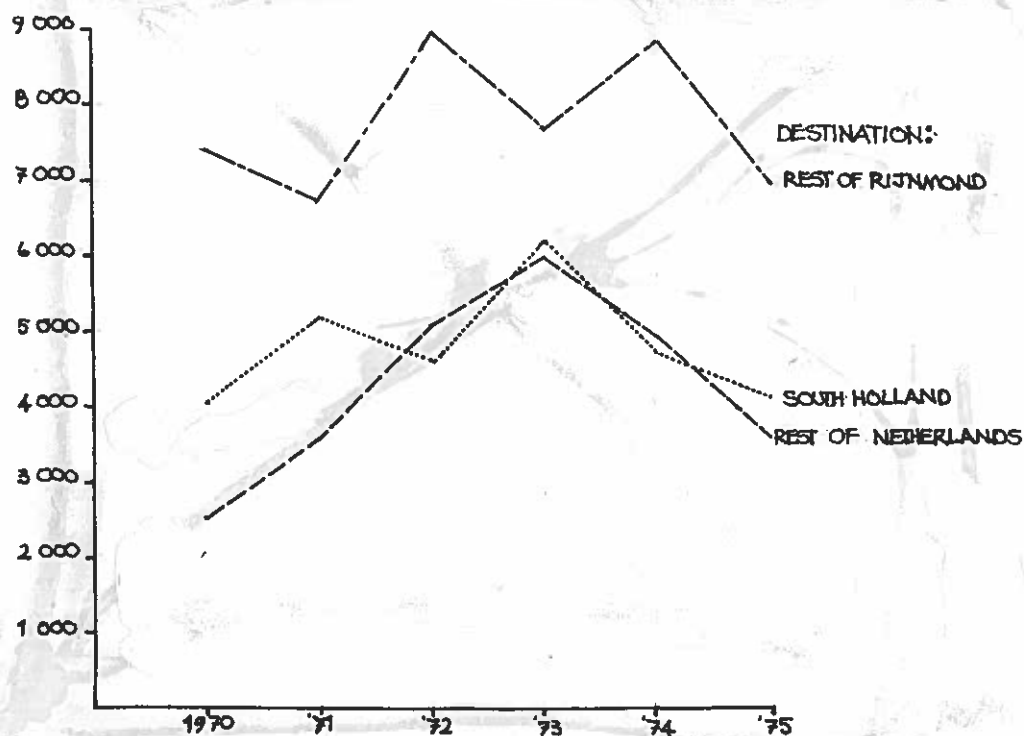


CORRELATION BETWEEN FAMILY NET-MIGRATION AND PROMINENT SOCIO-ECONOMIC INDICATORS BY PROVINCE AND YEAR IN THE NETHERLANDS SOURCE: SCHOUTEN

During the period 1968-1972 family net-migration by province has been highly correlated with:

- | | |
|---|-----------------|
| 1 single family houses as a percentage of total housing stock (in 1971): | +0.80 = WON |
| 2 green and recreational space (1972) | : +0.79 = GROEN |
| 3 number of district-nurses per 10.000 inhabitants (1971) | : +0.77 |
| 4 percentage of inhabitants living in urban communities (1970) | : -0.77 = STAD |
| 5 houses owned as a percentage of total housing stock (1971) excluding absentee ownership | : +0.75 = EIG |
| 6 people on welfare per 1.000 inhabitants | : -0.75 |
| 7 gross per capita regional product (1965) | : -0.74 = BRP |

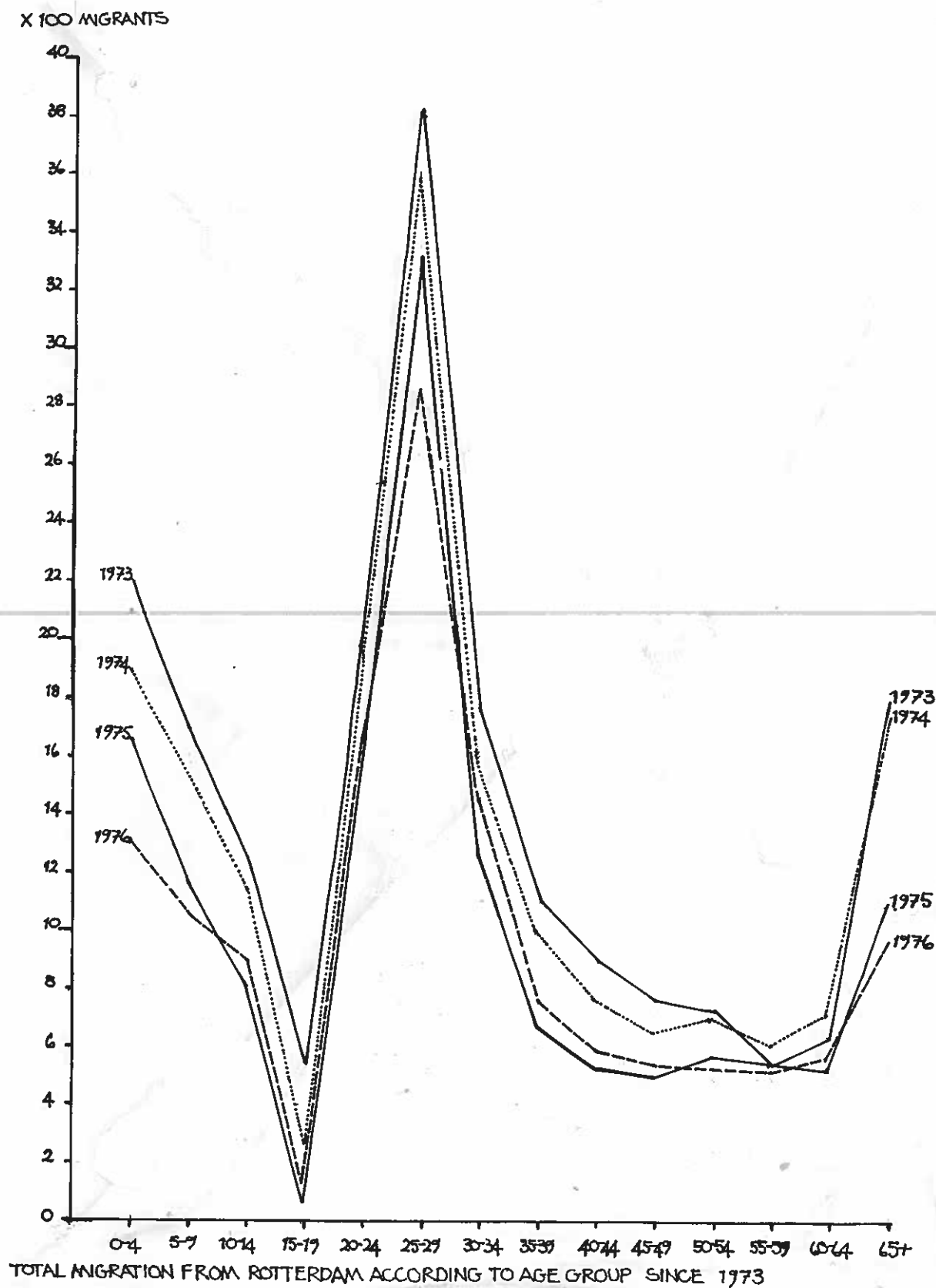
graph 5



MIGRATION FROM ROTTERDAM SINCE 1970

SOURCE: CBS

graph 6



SOURCE: CBS

graph 7

Four reasons were mentioned as pushes or pulls for the de-urbanisation trend in developed countries - lack of urban space, need for more space, dwelling desires and increase in car-ownership. Of these four any one or combination of reasons may be at the root of the migration development with regard to Rotterdam.

The hypothesis of this paper is that dwelling-quality and quantity is the main reason for out-migration in Rotterdam. We have seen that Rotterdam emerges, without exception, as a municipality far behind in dwelling quality and quantity compared with the province of Rijnmond and the Netherlands.

A second important question with regard to out-migration is, who migrates?

The answer to this might give further clues to the reason for migration.

See graph 7

Figures compiled by the Central Bureau of Statistics indicate that the greatest number of migrants from Rotterdam are 25-29 years of age. This age group could safely be called the 'young family' group, a group which experiences changing spatial needs over short periods of time as a result of changes in the life cycle (Rossi). The young family has its eye on the future and an adequate space for their children inside the house, and on environment congruent with their aspirations and changing social status. They desire a home of their own which may become a long-term investment for them. If they cannot find a suitable home in Rotterdam, they are forced to look elsewhere. Statistics indicate (as has been shown) that they migrate to nearby less urbanized municipalities than Rotterdam, but continue to work in Rotterdam. It may be concluded that they migrate to municipalities that have dwellings more congruent with their wishes, spatial needs and life style than the dwelling they leave behind in Rotterdam.

The Verstedelijkingnota and the Structuurplan Rotterdam indicate that out-migrants are mainly of a higher income group. Lower wage earners are concentrated in Rotterdam whilst higher wage earners reside in the Rest of Rijnmond - this division will probably enlarge in future.

The Integrated Environment Hygiene Research completed in 1973 has some interesting findings with regard to dissatisfaction of inhabitants with their environment in the province of Rijnmond. The highest dissatisfaction, out of a long list of amenities, services and infrastructure, ^{was} scored for the quality of the dwelling firstly and secondly its immediate environment.

Here follows extracts of the findings as set out in the Interim Report.

In Rijnmond the higher status groups live in suburbs such as Brielle, Hillegersberg, Alexanderpolder and Krimpen/Capelle. Lower status groups live (mainly) in the older Rotterdam suburbs, such as Oude Noorden, Crooswijk and Charlois. (p.16)

The inhabitants of Spijkenisse, Rozenburg and Vlaardingen are confronted with industrial air pollution. The inhabitants have a relatively high education and are younger. (p.24)

30% of Rijnmonders complain of lack of space in the dwelling, and the lack of a garden, or too small a garden.

20% are dissatisfied with the living costs and would like a more flexible home. (p.29)

Both in Rijnmond and in the North Sea Canal area the migration is more than the Netherlands. The explanation for this is that dwellers of these areas are housed in relatively greater amounts in old, small and badly fitted out, densely packed multi-storeyed dwellings.

THE MESO COMPARATIVE STUDY

In the macro comparative study it became apparant that Rotterdam has a marked difference in dwelling quality with the rest of Rijnmond and the rest of the Netherlands. The graphic differences as to the number of completed dwellings per inhabitants, the rent values of occupied dwellings were indicated, and in all cases Rotterdam suffered the most by the comparison.

It was decided, as next step in the study, to establish all those municipalities which have an in-migration from Rotterdam greater than 1,5% of the total net out-migration from Rotterdam for 1970. This date was chosen as it corresponds with that of the national census at which time statistics regarding the quality of dwelling stock per municipality in Holland were collated. Fourteen municipalities were found to have an in-migration from Rotterdam greater than 1,5% in 1970, and these municipalities were listed with their in-migration percentages. 1,5% was chosen as minimum figure to maintain a workable amount of municipalities for the testing of the hypothesis.

See following page

Specific dwelling characteristics of the dwelling stock in each of the fourteen municipalities were calculated, using the available statistics of the national census collated by the 'Centraal Buro van Statistiek'. The choice of dwelling characteristics used in the study depended upon:

- the available statistics, with the divisions and definitions of dwelling characteristics that were adhered to in these statistics. This is clearly a limitation for this study.
- the dwelling characteristic has to pertain directly to the quality of the dwelling i.e. it has to contribute in the definition of the degree of technical quality of a dwelling. This is a selection criteria in choosing the characteristic, e.g. the rent-value of a dwelling doesn't define the technical quality of a dwelling directly, whereas the presence/absence of a bath in a dwelling does.

The selection criterium for municipalities to be studied in the third Meso Comparative Study was as follows:

$$\frac{MR^T \rightarrow j - Mj^T \rightarrow R}{\sum_j MR^T \rightarrow j - Mj^T \rightarrow R} \geq 1,5 \%$$

where $j \neq R$

and MR = gross migration from Rotterdam to a municipality j within commuting range.

j = a municipality within commuting range of Rotterdam, excluding the municipality Rotterdam.

Mj = gross migration from municipality j to the municipality of Rotterdam.

R = the municipality of Rotterdam

T = the year 1970

Net migration percentages for the year 1976 were established using the same municipalities selected per 1970.

Note: The above selection criterium is not "normalised", making the application of a multiple regression analysis difficult. For the application of such an analysis, the criterium should use gross, and not net migration, as follows:

$$\frac{MR^T \rightarrow j}{\sum_j MR^T \rightarrow j} = \geq \text{a to be determined minimum \%}$$

$j \neq R$

This selection criterium (as immediately above) was used in the second Meso Comparative Study taken up in the appendix but random choices were made i.e. a minimum percentage was not adhered to.

Migration Municipalities	1/1/1971	1/1/1977
Cappelle a/d IJssel	7,88	14,47
Ridderkerk	7,68	3,08
Krimpen a/d IJssel	5,93	2,74
Spijkenisse	5,8	6,93
Vlaardingen	5,51	5,24
Schiedam	4,72	2,63
Nieuwekerk a/d IJssel	4,6	0,22
Poortugaal	3,84	3,22
Barendrecht	2,48	2,73
Maassluis	2,39	2,36
Zwijndrecht	2,39	4,10
Dordrecht	2,0	3,98
H.I. Ambacht	1,6	0,487
Delft	1,5	0,372

THE NET IN-MIGRATION FROM ROTTERDAM TO A MUNICIPALITY
AS PERCENTAGE OF THE TOTAL NET OUT-MIGRATION FROM
ROTTERDAM.

NOTE: 1,5% was not used as a minimum selection percentage for 1/1/77;
the municipalities selected per 1/1/71 were retained and used
for 1/1/77.

Taking the limitation and selection criteria mentioned above into account, the following characteristics were used in determining the quality of the dwelling stock in each of the fourteen municipalities.

- 1) The dwelling stock built before 1930 - this date is accepted in the Structuurplan of Rotterdam as being critical in the quality of the dwelling stock - dwelling built before 1930 are found to be of a poor quality, whereas the more recent dwellings are of a relatively better quality.
- 2) The percentage of dwellings in the dwelling stock per municipality with a small kitchen or no kitchen at all; this from a comfort and utility point of view.
- 3) The percentage of dwellings with an external W.C. or no W.C. at all, for reasons of comfort in use by the occupants.
- 4) The percentage of dwellings with no bathing facility, for reasons of personal hygiene and comfort in use.
- 5) The percentage of dwellings with no central heating; for reasons for comfort in use by the occupants.
- 6) The percentage of dwellings with either no gas, no water, no electricity connection or no service connection whatsoever - this again for reasons of comfort in use by the occupants.
- 7) The percentage of dwellings with one and/or two rooms - a small cramped dwelling is uncomfortable to live in and results in a lack of privacy which is a human need. Acoustic isolation, e.g. for study purposes or a private discussion, is lacking in a too-small dwelling. See following page

The seven characteristics listed above reflect in most cases the subjective preferences of the occupant of a dwelling, resulting from his physical or spiritual needs, and which are linked to the acceptable norms of the (westernised) society as to hygiene, comfort, prestige, privacy, norms which form the accepted base of the life style and aspirations of that society and are consciously or unconsciously integrated in the decision making process.

DWELLING CHARACTERISTICS PER MUNICIPALITY AS PERCENTAGE OF TOTAL DWELLING STOCK

Municipalities	up to 1930	small/ no kitch.	outside/ no W.C.	no bath	no cent. heating	no gas/ elec/H ₂ O	1 & 2 rooms	Proximity Rotterdam
CAPELLE A/D IJSSEL	9,3	10,3	1,00	3,8	26,6	2,37	1,314	3,8
RIDDERKERK	18,0	12,1	1,02	7,9	58,369	1,73	0,708	4,70
KRIMPEN A/D IJSSEL	13,2	13,1	0,369	5,7	51,0	1,47	0,553	4,2
SPIJKENISSE	14,9	11,52	0,59	1,6	40,8	2,56	1,514	6,5
VLAARDINGEN	18,2	19,7	3,53	15,8	68,2	1,17	1,972	5,4
SCHIEDAM	41,80	29,1	5,32	24,7	67,8	3,0	1,574	3,3
NIEUWEEKERK A/D IJSSEL	19,1	12,1	2,9	6,7	44,6	2,9	1,451	5,7
POORTUGAAL	6,9	10,6	0,44	2,1	51,3	0,78	0,223	4,75
BARENDRECHT	21,6	13,6	0,54	5,1	52,3	0,54	1,216	3,9
ZWIJNDRECHT	14,8	9,5	1,318	9,7	58,438	0,89	0,474	7,3
MAASSLUIS	19,0	11,48	1,32	2,9	42,0	1,1	1,262	7,9
DORDRECHT	34,5	9,1	1,782	22,6	72,4	2,88	1,591	10,4
H.I. AMBACHT	14,5	8,1	0,75	8,0	51,1	0,75	0,75	7,0
DELFT	37,5	20,0	3,644	22,0	56,6	3,22	3,784	6,35

The seven characteristics reflect the quality of the dwelling stock per municipality. In this regard it may be useful to refer to the term 'euvels', found in the Structuurplan of Rotterdam, which is used to define the technical shortcomings of a dwelling based on age, presence of bathroom and or W.C., size of kitchen and so on. The seven characteristics listed above may also be termed 'euvels' as they indicate the degree to which the dwelling stock has technical shortcomings and is of good, fair or poor quality.

A rank according to numerical (percentage) size was set up for a dwelling characteristic determined in a municipality. A mean quality rank was then determined based on the ranks determined for the seven dwelling characteristics per municipality. A matrix was set up to allow comparisons between migration rank and the dwelling quality rank per municipality. Subsequently correlations were established as well as significant discrepancies between dwelling quality rank and migration rank. See following page

Proximity to Rotterdam (first calculated in kilometres from centre of municipality to centre of Rotterdam) was ordered from most proximate (1) to the furthest away (14). See illustration 2

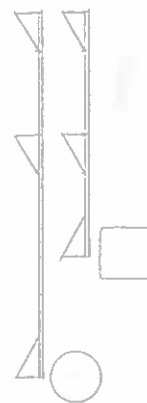
The relationship between the amount of in-migration to a municipality from Rotterdam (on the X-axis) and the degree of presence/absence of a dwelling characteristic in the dwelling stock per municipality (Y-axis) is indicated for the seven characteristics in seven graphs.

An eighth graph indicates the relationship between the amount of in-migration to a municipality (X-axis) and the direct distance of that municipality to Rotterdam. (Y-axis). See appendix

Two graphs were set up to indicate net in-migration rank as a function of mean quality rank, and net in-migration as a function of proximity to source rank.

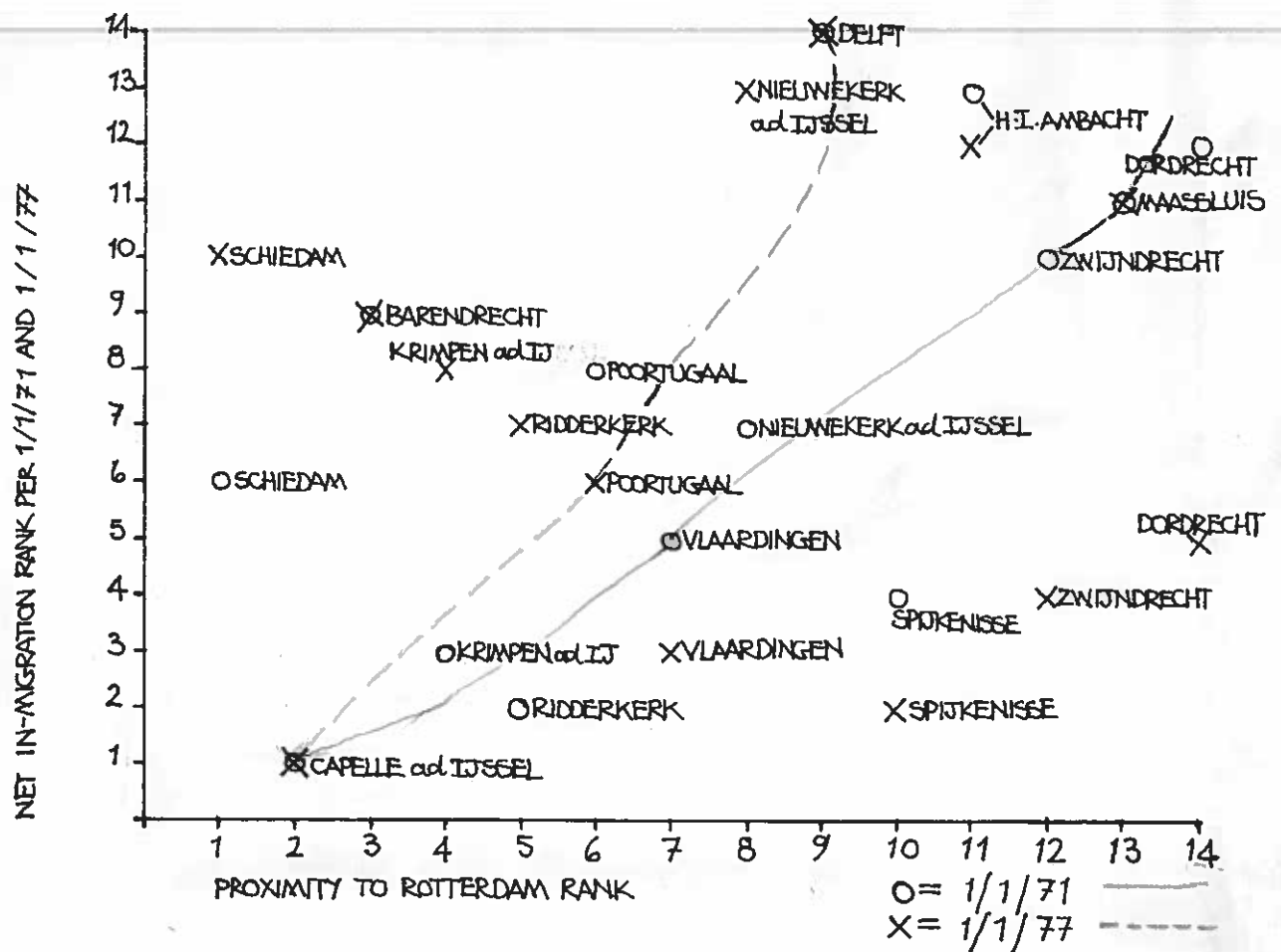
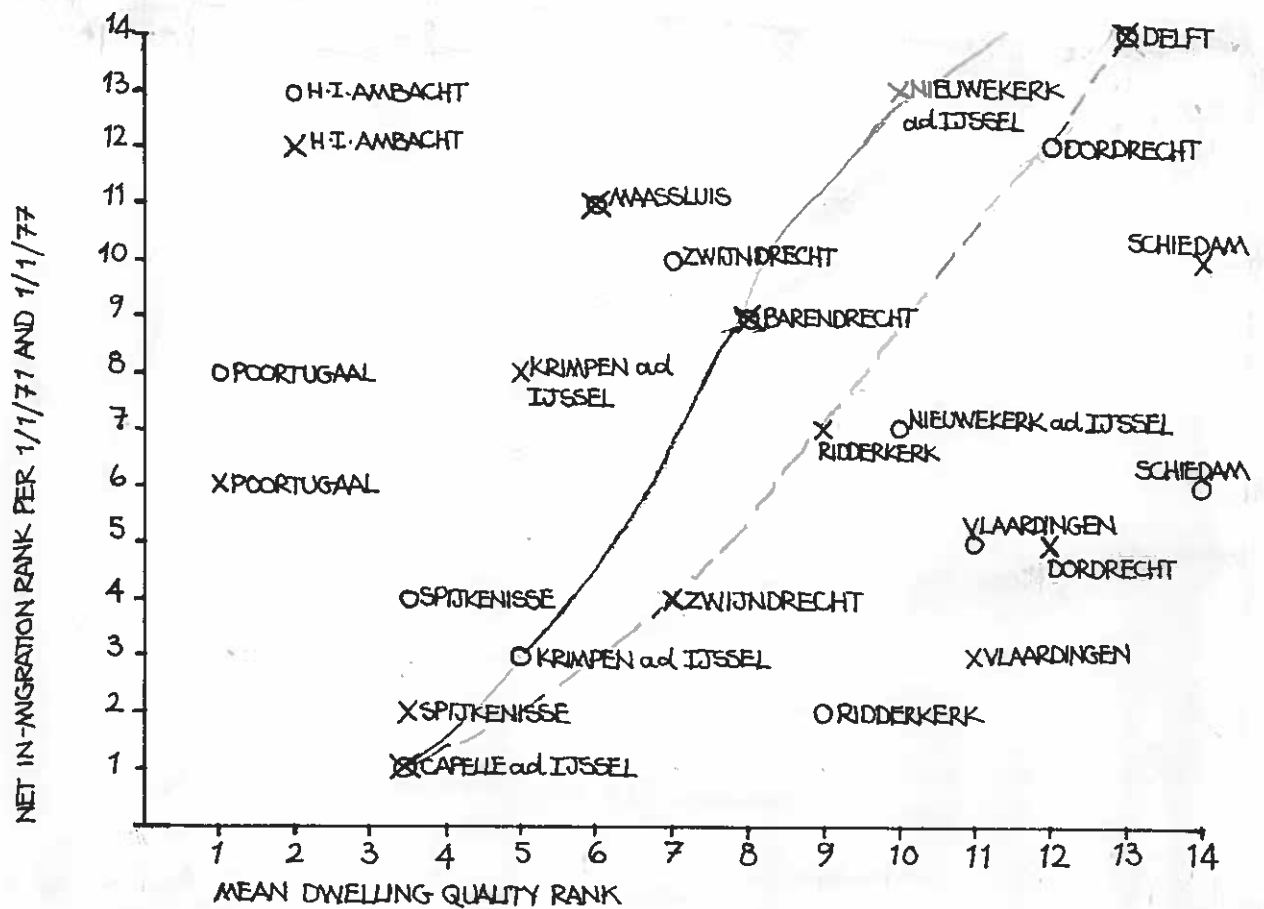
NUMERICAL RANK SIZE OF DWELLING CHARACTERISTICS AND IN-MIGRATION PER MUNICIPALITY

MUNICIPALITY	up to 1930	small/ no kit	out/ no WC	no bath	no cen heat.	no gas H ₂ O/ elec.	1 & 2 rooms	Mean Qual. Rank	Proxi- mity	Migration 1/1/71 1/1/77
CAPELLE A/D IJSSEL	3	3	6	4	1	9	8	3,5	2	1 1
RIDDERKERK	7	7	7	8	10	8	4	9	5	2 7
KRIMPEN A/D IJSSEL	4	9	1	6	5	7	3	5	4	3 8
SPIJKENISSE	1	6	4	1	2	10	10	3,5	10	4 2
VLAARDINGEN	8	12	12	11	13	5	13	11	7	5 3
SCHIEDAM	14	14	14	14	12	13	11	14	1	6 10
NIEUWEEKERK A/D IJSSEL	10	8	11	7	4	12	9	10	8	7 13
POORTUGAAL	2	4	2	2	7	3	1	1	6	8 6
BARENDRECHT	11	10	3	5	8	1	6	8	3	9 9
ZWIJNDRECHT	6	2	8	10	11	4	2	7	12	10 4
MAASSLUIS	9	5	9	3	3	5	7	6	13	11 11
DORDRECHT	12	11	10	13	14	11	12	12	14	12 5
H.I. AMBACHT	5	1	5	9	6	2	5	2	11	13 12
DELFT	13	13	13	12	9	14	14	13	9	14 14



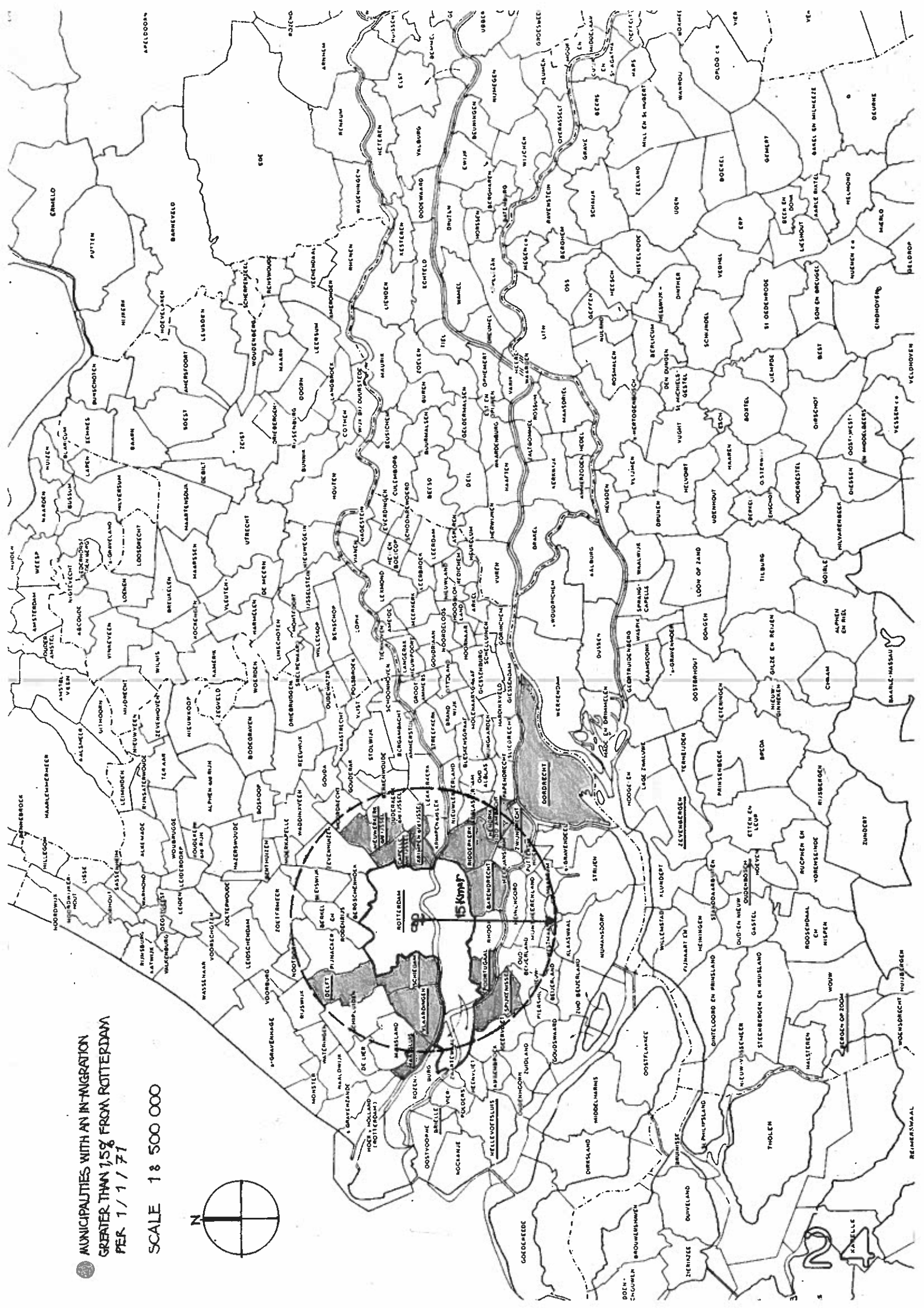
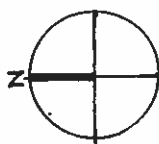
○ = Correlation if 2- or 2+

□ = Correlation if 2- or 2+



MUNICIPALITIES WITH AN IN-MIGRATION
GREATER THAN 1.5% FROM ROTTERDAM
PER 1/1/71

SCALE 1:8 500 000



CONCLUSIONS OF THE MESO COMPARATIVE STUDY

The mean dwelling quality rank was found to correlate in eight of the fourteen cases with in-migration in 1970 and/or 1976, on the assumption that correlation could occur in a range of two above or two below the mean dwelling quality rank. This represents a correlation of 57%.

The proximity of a municipality to Rotterdam correlated with the amount of in-migration from Rotterdam to that municipality; ten of the fourteen municipalities showed this correlation representing 71% . The importance of proximity to Rotterdam (place of work) is reflected strongly in the case of Schiedam (amongst other municipalities such as Vlaardingen and Ridderkerk). Schiedam has relatively the poorest dwelling quality but had a strong in-migration from Rotterdam in 1970 - this has subsequently diminished (1976). It may be concluded that proximity to Rotterdam was a priority when migrating to Schiedam in 1970. Seeing that the in-migration has subsequently diminished it may be assumed that the poor quality of the dwelling stock has become of greater importance and influence when selecting a new place to stay.

The opposite case i.e. where a municipality has a relatively good dwelling quality and is relatively a greater distance from Rotterdam, resulting in a relatively low in-migration to the municipality is also evident from the findings. Examples of this are Poortugaal, Hendrik's Ido Ambacht and Maassluis.

The rank correlation coefficient of Spearman was calculated to determine the statistical significance of the findings. It is apparent that the mean quality rank shows stronger correlation with migration per 1/1/77 than per 1/1/71. On the other hand, the proximity to the source rank, although found to have a strong statistic correlation to one percent level per 1/1/71, effectively became decimated by 1/1/77. The role of dwelling quality in migration within commuting range has therefore become more important in this period, whilst the role of distance to source (Rotterdam = place of work) has become less important.

See following page

Migration "At- traction"	Migration per 1/1/71	Migration per 1/1/77
Mean Quality	$r_s = 0,17198$	$r_s = 0,2956$
Rank	$t = 0,60476$	$t = 1,07189$
Proximity to source	$r_s = 0,6525$ $t = 2,98278^*$	$r_s = 0,08132$ $t = 0,28264$

Values for

the rank-correlation coefficient of Spearman (r_s) where

$$r_s = 1 - \frac{6 \sum_{i=1}^n D^2 i}{n(n^2 - 1)}$$

n is the assigned rank number (1,2,3,..... n)

$D i$ indicates the difference between Rank numbers
of a considered pair ($x i$ and $y i$)

i is the amount of considered pairs

and values for

the student t-test for significancy of correlation where

$$t = r_s \sqrt{\frac{n - 2}{1 - r_s^2}}$$

n and r_s defined as above

significancy for t (and r) is established using
non-parametric statistics

* strong statistic correlation to 1% level

FURTHER RESEARCH Comments apropos of the findings of this paper.

The research process and findings of this paper may be thought of as forming a framework/base for further research; as well as giving clues to directions of possible further research and new hypotheses. Here follow an indication of possible areas for further research which stem from the findings of this paper.

- a) Inter-regional migration could be studied to compare research and findings of migration beyond commuting range with the findings of this paper, which are based on migration within commuting range.
- b) A multiple regression analysis could be applied to determine the role and importance of various specific characteristics in their correlation with net- and/or gross in-migration; as well as the role of proximity to source and size of municipalities relative to one another.
- c) Two or more correlation tests could be carried out to determine trends and developments over time. The correlation tests as carried out in this paper could be done afresh for a later date i.e. ~~all municipalities to a minimum workable level as well as their~~ dwelling quality for the more recent year. It should be noted that up-dated statistics of the dwelling quality per municipality are not as yet available - statistics of 28/2/71 (national census) being the most recent available at the time of writing.
- d) The affect of the size of municipalities relative to one another could be taken into account as a refinement in the testing of the hypothesis - this was not done in the present research, and could have been allowed for by relating a dwelling characteristic to a unit of number of inhabitants per municipality, e.g. x houses of the dwelling stock have no bath per y (for instance 1 000) number of inhabitants in the municipality z. In this way the relative stronger attraction exercised by a larger municipality (relatively more dwellings of better quality taken absolutely could exercise stronger attraction) may be taken into account.

EVALUATION OF RESEARCH PROCESS AND FINDINGS

INTRODUCTION

Migration in itself is not a complex phenomenon - a person moves from one dwelling to another. The study of migration is however extremely complex, as there are so many subjective and objective variables which could influence a potential migrant in his choice of new dwelling. The line between a voluntary and involuntary move is no very sharp, for instance. In some cases a migrant may be of the opinion that he moved purely voluntarily, although the opposite may in fact be true.

The subjective and objective variables are infinite, and attempts at research at specific aggregation levels should always be viewed with scepticism. For this reason the findings of this paper may not be viewed as irrefutable seeing that research has been conducted at certain levels of aggregation and many assumptions had to be made to limit and select information.

The available information and statistics regarding migration and dwelling quality, as well as the accuracy, age and comprehensivity of these statistics may not be considered as optimal for the requirements of this study, and could be regarded as a serious limitation to the accuracy of the findings.

DESCRIPTION OF THE RESEARCH PROCESS

The Macro Comparative Study gave indications of migration and dwelling quality characteristics/similarities at a macro level. These findings were useful in narrowing and determining the field of study of the Meso Comparative Study.

The Meso Comparative Study was at first undertaken in a somewhat ad hoc manner - municipalities were selected at random proximate and distant from Rotterdam and their dwelling quality determined. The argument was advanced that the greatest possible range in in-migration from Rotterdam as well as a large range in distance from Rotterdam would form the basis for selection of the to be studied municipalities. The draw-back of these random choices of municipalities was that the selection of one or of a number of municipalities with the same distance and in-migration could not be rationalised and was founded on subjective choice.

The second attempt at the Meso Comparative Study had a slightly more rational base for selection of the to be studied municipalities. It was apparent from the Macro Comparative Study that the greatest amount of out-migration from Rotterdam was to the Rest of Rijnmond, with the rest of the Netherlands and South Holland receiving more or less equal amounts of migrants in second place. It was therefore decided to select the municipalities for the greater part from Rijnmond. At the same time three municipalities were selected in South Holland to be included in the study to see what effect the greater distance would have on the size of the migration stream. Once again all municipalities were selected at random, eight being chosen in Rijnmond and three in South Holland. The results of this study included much stronger foundation for the verification of the hypothesis than the previous study. For this reason the correlations are indicated in the appendix. It should however be noted that the migration statistics used in this study were faulty. The statistics used indicate the influx of migrants from Rotterdam to the municipality but not the return migration from that municipality to Rotterdam. Theoretically it is possible that the return migration could be much larger than the in-migration.

This error was avoided in the third attempt at the Meso Comparative Study which is discussed in this paper.

In conclusion it is apparent that the research process evolved gradually from one based on random choices to one with somewhat clearer selection criteria. By evaluating the process and findings of each successive meso comparative study the irrational decisions/choices became apparent and the research process could be started afresh to eliminate these faults and redefine the field of study. This cyclical research process is experienced as a result in itself by the researcher - it is a way of learning, of adapting to changing and changed information input and of discovering the how, whilst seeking to determine the why.



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