Urban primacy in Saudi Arabia

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Introduction

The rapid rate of urbanization and spatial concentration of population witnessed during the past 35 years had significant impact on the structure and pattern of urban settlements in the Kingdom of Saudi Arabia. The level of urbanization has increased from 15 percent in 1950 to about 70 percent in 1985, at the rate of 8.3 percent per annum (UNITED NATIONS, 1987). A significant share of this growth has taken place in major urbanized regions, such as Makkah, Riyadh and Eastern Province, and particularly in Riyadh, Jeddah, Makkah and Dammam urban centers (fig. 1). The urban population of these regions constitutes 46.3 percent of the national population and 72 percent of the national urban population and these primate cities alone shared about a quarter of the national population in 1987 (AL-HATHLOUL and EDADAN, 1989).

The rapid rate of urbanization witnessed during the past

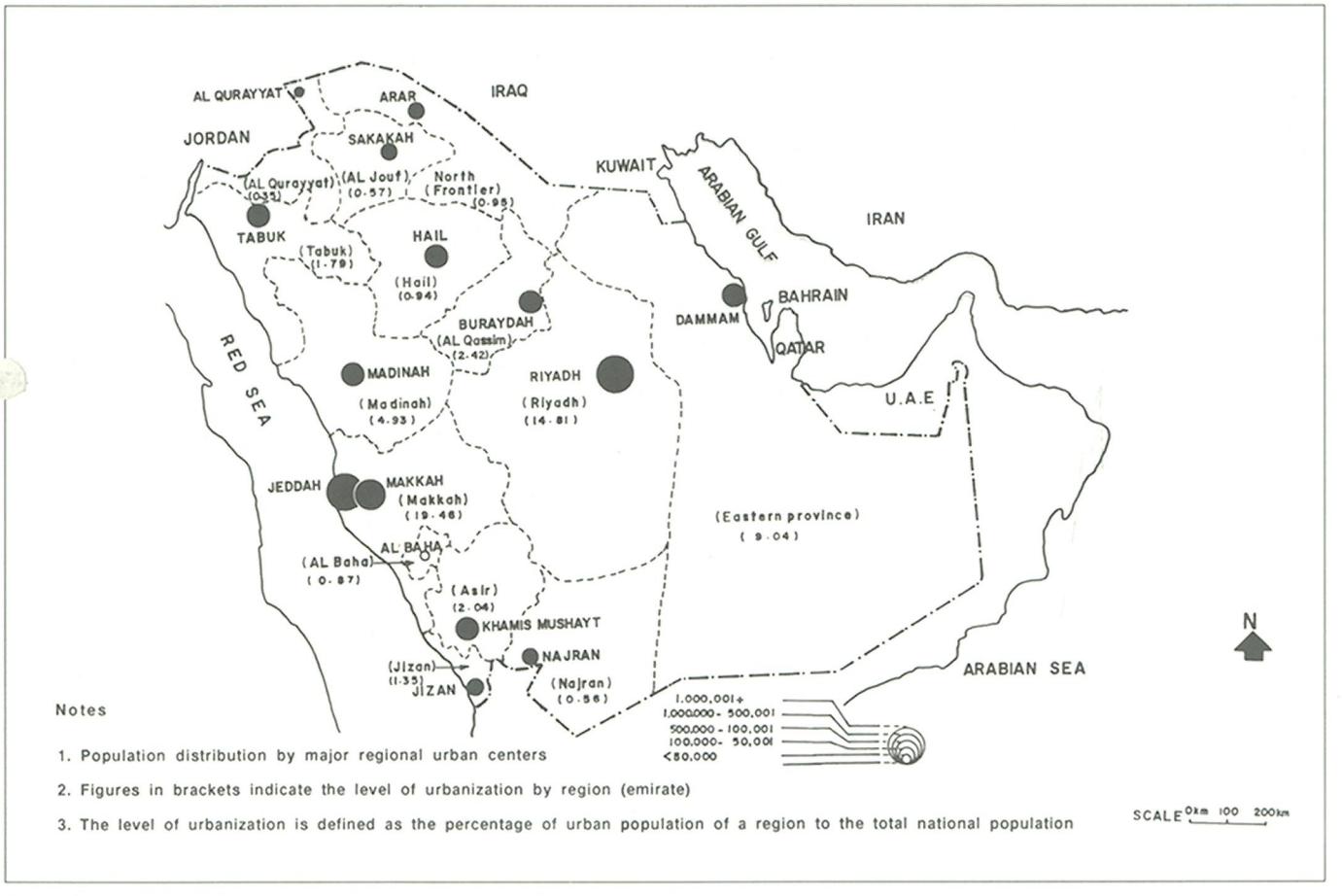

Fig. 1: Saudi Arabia — Regional pattern of urbanization, 1987.

35 years is the cumulative result of many factors such as: population growth and mobility, economic progress, development of the infrastructure sector and the private investment incentives provided by the government across all development sectors. Government investment at current prices increased from US$13.5 billion during the first five-year development plan (1970-1975) to US$322.5 billion during the third plan (1980-1985). Similarly the investment credit disbursed by the public institutions has grown from US$0.13 billion during the first five-year plan to US$29.3 billion during the third plan (MINISTRY OF PLANNING, 1986).

As a result of this big-push approach, the labor demand shot up beyond the supply limits of the country, thereby attracting a large inflow of expatriate labor. The process led to the migration of internal population and expatriate population to a few urban centers in the Kingdom. The share of expatriate population was as high as 31 percent in 1980 (SERAGELDIN, 1984). The high level of intra-regional population migration experienced during the early 1980s in turn contributed to the population concentration in a few regional centers.

Urban primacy

The pattern of urban primacy in Saudi Arabia underwent significant changes between 1962 and 1987. The four-city index, a measure of primacy, increased from 0.47 in 1962 to 0.59 in 1974, indicating the increasing trend in primacy (MAKKI, 1986). However, the Kingdom has experienced a decreasing trend in primacy during the last decade, indicating that settlement distribution in the upper limb portion of the population distribution tends to be polarized (fig. 2).

Regional comparison of the degree of primacy shows that the central region has the most unbalanced urban structure compared with other regions and the western and southern regions have experienced a slow but positive trend towards increasing urban primacy (table 1). The changing trend in primacy could be attributed to factors such as the level of economic development, demographic characteristics and the geographical extent of the regions.

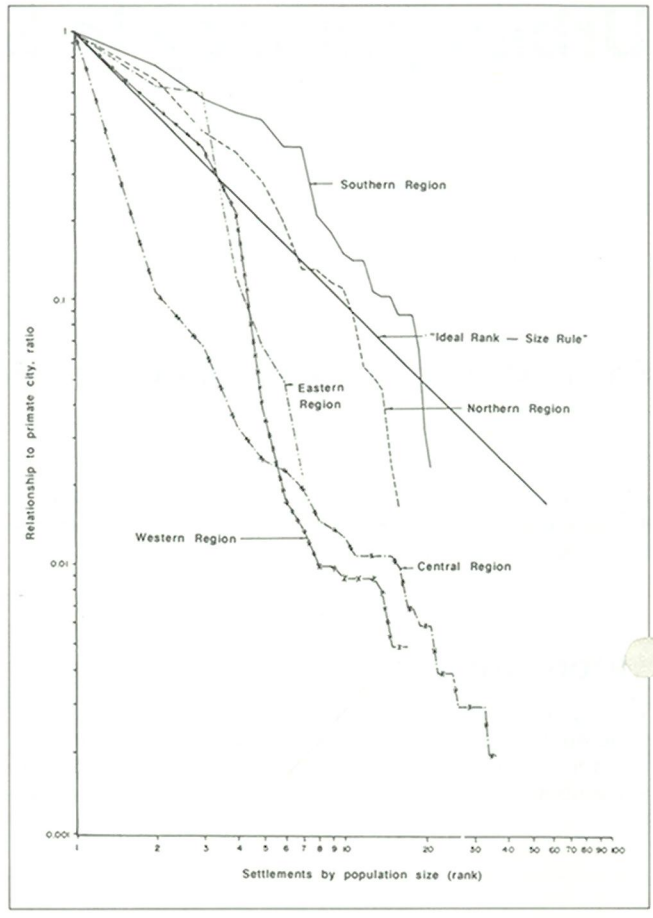

Fig. 2: Saudi Arabia — Trends in primacy by region during the decade 1978-1987. (*Source:* Al-Hathloul and Edadan, 1989).

This paper intends to examine the significance of a few of these structural factors to explain the variation in urban primacy among the regions of the Kingdom.

Table 1
Saudi Arabia — Degree of urban primacy by province, 1974 and 1987

No.	Province	Population share of primate city to regional urban population		Four-city index	
		1974	1987	1974	1987
1.	Southern	0.21	0.21	0.47	0.54
2.	Central	0.74	0.68	5.31	4.71
3.	Eastern	0.28	0.39	0.85	0.73
4.	Western	0.39	0.42	0.75	0.88
5.	Northern	0.37	0.25	0.97	0.68
6.	Country	0.21	0.19	0.59	0.56

Notes: 1. Southern Province includes Najran, Jizan and Assir Emirates
Central Province includes Riyadh and Al Qassim Emirates
Eastern Province includes Eastern Region
Western Province includes Medina, Makkah and Al Baha Emirates
Northern Province includes Qurayat, Tabuk, Al Jouf Northern Frontier and Hail Emirates

2. The four-city index is defined as C1/(C2+C3+C4), where C1 is the population of the first largest city and C2, C3 and C4 are the population of the three next order cities

Previous research in urban primacy

Methods such as the El-Shakhs Index (EL-SHAKHS, 1972), the Inverse H Index (WHEATON and SHISHIDO, 1981), the Sheppard Index (SHEPPARD, 1982), are often used to analyze the dominance of urban primacy, even though they are more useful to describe the pattern of city size distribution. However, simpler methods like the share of a primate city in the aggregate regional urban population and the four-city index are more widely used to describe the level of primacy.

Pioneering studies by El-Shakhs (1972) and Mera (1973) are often taken as the basis in the study of primacy and its relationship with economic development. El-Shakhs concluded that primacy increased with the development of developing countries and decreased with the development of developed countries, yielding an inverted "V" shape distribution. The main spatial planning policy implication of El-Shakh's study is that urban deconcentration and economic diversification strategies are desirable only during the maturity stage of economic development. The same policy implication was drawn by Kamerschen (1969).

Mera (1973) confirmed the findings of El-Shakhs through his study of 46 developing countries. Policy implications drawn from the positive correlation between the growth of gross domestic product and primacy suggest that population distribution and decentralization policy of investment are not conducive to economic growth during the early stages of development.

In a recent study of 116 countries, including 82 developing countries, Richardson and Schwartz (1988) found little support to the conclusions of El-Shakhs and Mera. Their analysis suggests that statistically no relationship exists between urban primacy and economic development. On the contrary, they found a significant positive relationship between primacy and demographic variables such as population size and the level of urbanization. Besides, the possible linkage between the geographical concentration and growth rate in population suggested by Alonso (1980) indicates another dimension of urban primacy.

Objective and methodology of the study

Although the studies mentioned above were conducted at global level across a large number of developed and developing countries, similar relationships between primacy and economic development are often hypothesized at the regional level in spite of the absence of similar analysis at the national level. National urbanization and regional development planning strategies in many developing countries are influenced by the hypothesized relationship between urban concentration and economic development.

In addition to the relationship of primacy with economic development and demographic factors, the geographical area of regions is another important factor that could influence the level of urban primacy, particularly in low density countries such as Saudi Arabia.

Economic development in Saudi Arabia is mainly determined by the public investment in the producing and infrastructure sectors. In the absence of regional income and investment statistics we have taken regional per capita public expenditure in municipal projects (MEPEC) and capital-labor ratio in the licensed industrial sector (CAPL) as proxy variables to represent the level of agglomeration economies and the level of industrial specialization of regions.

Per capita public expenditure in municipal projects indicates the distribution of urban infrastructure and the relative advantages of cities to attract population. We hypothesize that higher per capita public expenditure is likely to increase urban primacy during the initial stage of economic development. Supply constraints created by the increasing diseconomies of urban concentration and the growing popular pressure for public investment in lower order settlements tend to encourage the decentralization of public investment to lower order settlements and therefore decrease primacy during the phase of high economic development.

During the early stage of development, population tends to concentrate in major urban centers due to the advantages of agglomeration economies and increasing job opportunities in the industrial sector. As the urban economy grows and the diseconomies of urban over-concentration begins, the rate of labor absorption rises at a decreasing rate. We therefore hypothesize that urban primacy is positively related with government investment in the industrial sector during the initial stage of economic development and is less influenced during the phase of high economic development.

Population size (REPOP), population growth (REPGRO), geographical area (GEAR) and the level of regional urbanization (RURBA) are also likely to influence the pattern of urban concentration. A region with a large population and area tends to have more ordered urban centers than smaller regions. If this hypothesis is true, then urban primacy should be inversely related to population size and geographical area. The level of regional urbanization and growth of urban population are likely to influence the primacy positively during the early phase of economic growth. As the level of urbanization increases, the capacity constraints of primate cities to accommodate increasing rural-urban migration are likely to encourage the decentralization of growth opportunities to second and third order cities and thus increase the urban destinations for migrants.

The above hypotheses are tested through a regression model. The data refer to the year 1987 for the 14 regions (emirates) of the Kingdom. First the demographic hypothesis of urban primacy is tested by regressing the dependent variable of population share of primate city of the region (POSPIR) with the demographic variables. Subsequently, independent variables such as population growth, geographical area, and economic variables are introduced to test the respective hypotheses.

Empirical findings

The results of the regressions are summarized in table 2. The first column shows that the two demographic variables, regional population (REPOP) and the level of regional urbanization (RURBA), have the expected signs, but the relationships are not significant. It explains only 16 percent of the variation in primacy. This non-significance could be due to the high level of population size variation among the regions.

The regional population growth (REPOP) does not have any significant impact on primacy. The negative sign indicates that non-primate centers are growing at faster rates than the primate cities. This growth pattern is due to the low population base of lower order urban centers. However, the primate cities have continued to attract a larger share of migrants. The positive sign of RURBA suggests that the primate cities in Saudi Arabia do not yet experience the capacity constraints to absorb the in-migrants.

Geographical area (GEAR) increases the explanatory power of the equation. It helps to explain about 22 percent of the variation in primacy. The sign, however, is as expected but the relationship is not statistically significant. The result suggests that regions with a larger geographical area tend to have a more ordered settlement pattern than regions with a smaller geographical area.

Introduction of economic variables such as the MEPEC and CAPL did not improve the explanatory power of the model.

Table 2
Saudi Arabia — Significance of a few structural factors on urban primacy, 1987

Independent variables	Regression coefficients					
C	0.6204 (4.456)	0.6691 (1.227)	0.6041 (4.262)	0.5186 (3.136)	0.6189 (2.7931)	1.7892 (2.7931)
REPOP	-9.89E-02 (-1.4361)	-0.1004 (-1.3595)	-8.47E-02 (-1.1863)	-0.1505 (-1.8265)	-0.1011 (-1.3682)	-0.2587 (-2.7924)
RURBA	0.2208 (0.8442)	0.2242 (0.8111)	0.3072 (1.0933)	0.2438 (0.9401)	0.2391 (0.7849)	0.7998 (2.3712)
REPGRO		-1.31E-02 (-9.25E-02)				-0.4106(*) (-2.1001)
GEAR			-2.9159 (-0.8924)			-8.29E-07(*) (-2.2751)
MEPEC				19.2405 (1.1134)		52.5921 (2.4851)
CAPL					-1.09E-02 (-0.1392)	-4.36E-02 (-0.6451)
N	14	14	14	14	14	14
R2	0.16	0.16	0.22	0.25	0.16	0.59
Critical 't' value (95 percent)	2.201	2.228	2.228	2.228	2.228	2.365

Dependent variable: POSPIR (Population share of the primate city)

Figures in brackets are the 't' values.

(*) indicates significant 't' value for Pr=0.10 and df=7

REPOP = Population of the region
RURBA = Level of urbanization of the region
REPGRO = Population growth rate of the region
GEAR = Geographical area of the region
MEPEC = Per capita municipal expenditure
CAPL = Capital per industrial labor

Although the signs are in tune with the hypotheses, they are not significant. The municipal expenditure variable has relatively more impact on the variation in primacy than the level of industrial labor specialization. Higher level of municipal investment tends to increase the locational advantages of primate cities to attract a larger share of the in-migrants.

Interestingly, the regression of the combined six variables yields significant results. All the signs are as expected and the equation explains 59 percent of the variation in primacy. The 't' test values given in the brackets show that all variables, except the CAPL variable, are statistically significant. This suggests that primacy is a combined phenomenon of physical, demographic and public investment factors in the Kingdom.

Conclusion

The population distribution strategy and the pattern of urban primacy are significantly related to the regional investment policy of the government. The role of government in the Kingdom of Saudi Arabia, heavily influenced by its cultural background, is perceived to achieve the maximum social well-being and personal fulfilment of the citizens. The regional planning approach in this context becomes highly indicative and devoid of any regional differential policies.

The commitment to non-interference with the private sector demands that regional planning efforts are cast within the institutional framework of the private market. The maneuverability of government to achieve balanced regional development, therefore, depends upon the direct public sector expenditure. In Saudi Arabia, the role of public expenditure is very critical since oil revenue is the main source of national income and the structure of private sector investment is totally dependent upon the scale and pattern of public expenditure. It may be noted that, unlike conventional regions, the regional export sector is less important than the regional share of public expenditure in the Kingdom. The present analysis has shown that regional distribution of public expenditure significantly influences urban primacy. It is observed that the level of direct public expenditure expended on infrastructure development has more influence on urban primacy than the share of public sector finance in private sector industrial investment.

Since one of the main objectives of national spatial development strategy is to encourage a multi-polar spatial structure, it is very important to integrate the public investment

and population distribution policies of the Kingdom. Although the need to develop differential regional resource allocation criteria and the integration of population distribution and regional investment policies has been emphasized since the Second Five-Year Development Plan (1975-1980), no definite policies have been formulated so far. Our analysis indicates the need for such a policy for regional development.

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Hungary: Urbanization and the urban network

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Introduction

Hungary is situated in the Carpathian Basin in Central Europe at approximately an equal distance from the Equator and the North Pole, and occupies an area of 93,032 sq.km, which makes up less than 1 percent of all Europe. The country is bordered on all sides by land and is crossed by one of Europe's longest rivers, the Danube. Tisza is the second longest river of the country. Lake Balaton, the largest lake in Central Europe, is a very popular holiday resort. Hungary is rich in mineral and medicinal waters (figs. 1 and 2). Almost two thirds of the territory consists of fertile plains at an altitude of no more than 200 m above sea level. The highest peak is Kékestetö (1,014 m).

Hungary is divided into three large regions (fig. 3):

- Transdanubia = Dunántúl (to the west of the Danube);
- the Great Plain = Alföld (to the east of the Danube); and,
- Northern Hungary = Észak-Magyarország (the area of Nógrád, Heves and Borsod-Abaúj-Zemplén counties).

The country is in the continental zone and has a temperate climate.

Hungary has a population of 10.1 million, including 1.9 million in Budapest, the capital. The population density is 109 inh/sq.km. There are eight cities besides Budapest with a population of over 100,000. The official language is Hungarian. The number of national minorities is low, about 3 to 4 percent. Most of them are German, Slovak, South Slav and Rumanian. Hungary is divided into 19 counties, the most populous of which is Pest.

There is archaeological, linguistic and other scientific evidence to indicate that the Magyars belong to the Ugrian branch of the Finno-Ugric people. Their ancient home was in the Ural region. Search for pastures brought them to the territory that is Hungary today. The Hungarian conquest was in AD 896. Since then Hungarians have had a long and difficult history with many struggles, wars and battles such as the Mongolian

Fig. 1: Hungary within its broader geopolitical framework.

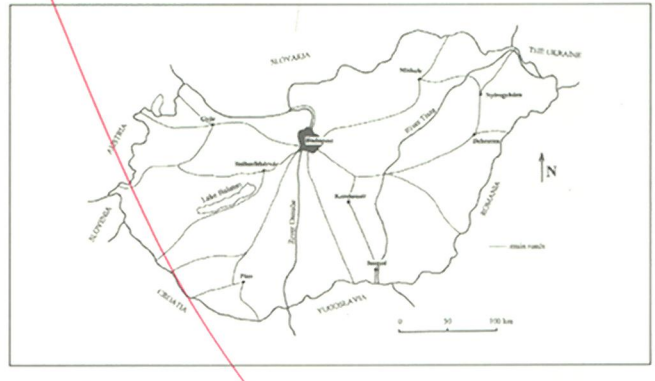

Fig. 2: Hungary — Main natural features and transportation lines.