URBAN CONCENTRATION, REGIONAL DISPARITY AND ROLE OF PUBLIC INVESTMENT POLICY

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Abstract: In the context of the renewed interest generated on the issue of regional disparity, this paper explores possible ways to address the issue through public investment policy. We consider the rising urban concentration as an early signal for lasting regional disparity, and make an attempt to identify the key determinants of urban primacy. Our research suggests that a higher amount of public spending may not simply be effective to induce a dispersal effect, rather effective sectors of investment need to be identified carefully. Investment in health service, rural infrastructure and transport and communication turns out to be principal candidates for public investment. Our result has also showed that the growing export orientation might indeed act towards reinforcing urban primacy, particularly in countries with smaller population. This offers a very important policy insight in the face of unabated globalization wave.

Key Words: Urban primacy, Regional Disparity, Public Policy

1. INTRODUCTION

In recent years, the issue of regional disparity has received a renewed attention from academics and policy makers alike. Development economists considered the problem of regional disparity as a natural outcome of economic growth process. The empirical pattern suggests that in early stage of economic development, the economic activities are concentrated in few advanced regions leading to further widening of gap between the advanced regions and lagging regions. However, such disparity declines at the later stage when effects of growth are dispersed across the regions and the lagging regions particularly attract more productive factors due to price differentials (Williamson 1965). Alonso (1980) expanded the list of similar concomitant effects of economic development to include social inequality, geographic concentration and demographic transition, and further suggested that these different phenomena are closely interrelated implying a possible link between the

problem of urban primacy and regional disparity. The recent surge of literature on endogenous growth theory has added more rigorous explanation on how an early accumulation of productive resources such as physical and human capital at a particular location sets a self-reinforcing cycle of economic and demographic concentration and helps sustain a persistent regional disparity (Black and Henderson 1999).

Though the problem of regional disparity was realized since long back, there remained a significant disagreement over policy approaches to address the issue. Two different models, namely the neo-classical and cumulative causation, have basically guided the debate and prescribed different policy approaches. The standard neo-classical growth model is based on diminishing return to factors and constant return to scale. It predicts that the trade and factor flows tend to equalise factor price at different locations, and as a result the disparity between developed and lagging regions diminishes over time. Hence, the regional disparity is only a short-term phenomenon and can be corrected automatically in the long run (Bort 1960). The cumulative causation school, on the other hand, places an emphasis on the process of agglomeration (localisation and urbanisation economy). It interprets the regional disparity as a result of difference in degree of agglomeration in different regions. The agglomeration phenomenon makes it possible for the leading regions to reap the increasing return to scale. Consequently, both capital and labour migrate from backward regions to advanced regions, continuously reinforcing the growth in core areas at the cost of peripheral areas (Kaldor 1970). The central element over which these regional theories differ in explaining the regional growth process is thus the mechanism of agglomeration process. The neoclassical school assumes that the agglomeration process loses its momentum leading to an automatic dispersal, once the optimal level of concentration is reached in the advanced region. While the cumulative causation school argues that, in the absence of judicious public policy, the agglomeration process once set in motion in the advanced region, goes far beyond the optimum level and incurs a net social as well as economic cost.

The differences in these two opposing models can indeed be boiled down to the respective philosophical stands they take. The disagreement is not about if a narrowing down of regional disparity is desirable, rather it is about justifying the cost of such narrowing down. Most policy measures directed towards reducing regional disparity take resources otherwise could be utilized for more productive uses. The debate is, therefore, about choosing between equity and efficiency. Regional policies aimed at promoting economic activities in backward regions are severely criticized not only on the ground of possible efficiency loss but also their ineffectiveness to make significant improvement in personal income distribution- an important policy agenda for policy makers.

With this background, this paper makes an attempt to examine the link between urban concentration and regional disparity and assess the possible role of public policy in narrowing the regional disparity. The basic premises we based our analysis on is that the issue of urban primacy or regional disparity involves a complex mechanism and cannot be possibly explained by a single factor for practical purpose. That is why we first take a closer look at the stylized facts in the process of economic development, urban concentration and regional disparity in the next section. In order to highlight the special pattern of developing countries, this section also presents a case of a group of rapidly developing countries- Indonesia, Malaysia, Philippines and Thailand- known as ASEAN-4. This will be followed by a regression analysis to examine the determinants of urban primacy, which is considered as the manifestation of increasing regional disparity in most developing countries. Finally, the policy insights gained through our analysis are discussed and conclusion is drawn.

2. EMPIRICAL PATTERNS OF REGIONAL DISPARITY AND PUBLIC POLICY

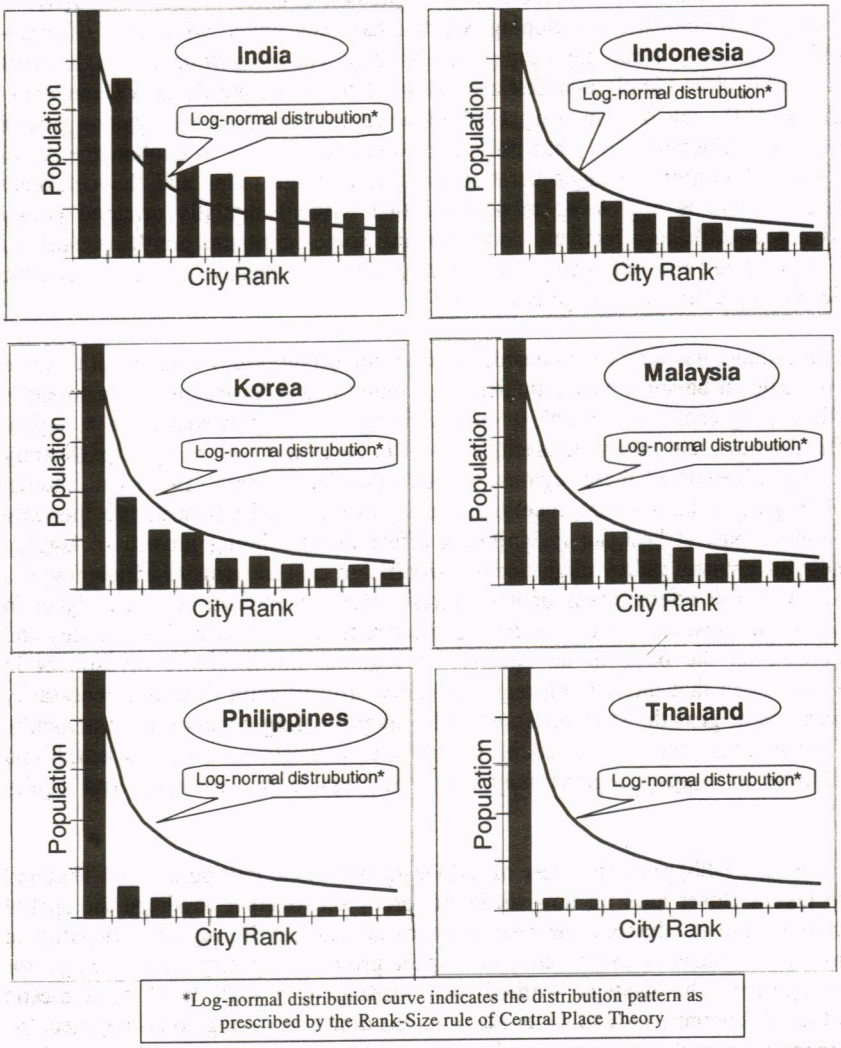
The recent experience from developing countries has compelled, even the mainstream economists, to reconsider an earlier notion that the problem of regional disparity does not deserve a policy intervention on its own merits. The explosion of urbanization, particularly in the form of giant primate cities, in developing counties has been linked with range of socio-economic problems and now receiving a top policy priority. The congestion and higher cost of infrastructure in big cities clearly manifest a situation of economic inefficiency (Henderson 2000). Recognition of the role of increasing return in the recently evolved endogenous growth theory (Romer 1986, Krugman 1991) has provided a theoretical basis to explain the direct link between the self reinforcing agglomeration process in large cities and the persistent regional disparity. There is a growing recognition that without spatially oriented policy measures, it is not possible to effectively address many socio-economic problems, such as poverty, further justifying the relevance of regional policies in improving socio economic condition in developing countries (World Bank 2000).

Infrastructure investment has long been considered as an important policy instrument to serve the objective of regional balance. Many studies have found that infrastructure investment is effective in stimulating economic growth or in sustaining the competitiveness in a region. Munnel (1990) advocates that infrastructure investment in backward regions can significantly improve the competitiveness of these regions. On the other hand, Mera (1973) and, Hulten and Schwab (1984) argue that such interventionist policy of increased infrastructure spending in backward regions has, at best, an insignificant effect in stimulating growth in lagging regions. But such investment policy might incur a significant cost in terms of efficiency loss at the national level. The effectiveness of new infrastructure investment is much higher in advanced region as, in most cases, they are facing infrastructure bottleneck. But Loonley and Frederiksen (1981), on the basis of an analysis of regional infrastructure investment in Mexico, have concluded that the lagging-region-friendly infrastructure does not necessarily result in a lower rate of growth. They observed that policy favoring economic infrastructure investment in intermediate regions and social infrastructure investment (such as health and education facilities) in lagging regions may serve both goals of efficiency and equity simultaneously.

Acharya et al (1998a, 1998b) presents a case of Indonesia, Malaysia, Philippines and Thailand (AEASN-4) to take a closer look on how different forces act together to shape the spatial pattern of a country and to illustrate the challenges of addressing the regional disparity in practical terms. All of these countries adopted export promotion policy as a strategy for economic development. The strategy worked well leading to a high level of domestic investment and rapid economic growth. Over the time, the domestic saving could not meet the investment demand making the economies to depend on external borrowing and foreign direct investment. On the other hand, the rapid economic growth has put a huge pressure on countries infrastructure system demanding new capital investment on various public infrastructures. However, the government budgetary system is already strained to its limit due to increasing expenditure on social sector and the worldwide wave of cutting down the budget size under the slogan of "fiscal discipline". As an alternative, all of ASEAN-4 countries have aggressively made institutional changes to attract private financing in infrastructure sectors.

As mentioned in Acharya et al (1998a, 1998b), past few decades have remained most successful in ASEAN-4 countries' effort of economic growth. However, the success in growth strategy has its flip side too. The geographical distribution of growth benefit in these

countries has not remained equitable. As is expected, the high economic growth has resulted in a rapid urbanization. During 1970-1995, the urban population went up almost by two folds in Indonesia, Korea and Thailand and 70 percent in Malaysia and Indonesia, and the rate of urbanization is still high.



Data source: *World Urbanization Prospects: The 1994 Revesion*, United Nations, 1995.

Figure 1: City size distribution in selected Asian countries

In the course of rapid urbanization, the capital cities grew very fast with higher level of primacy. Figure 1 shows size-distribution (size is normalized with the population of the largest city) of ten largest cities in selected Asian countries. The normal distribution curve indicates a desired pattern of distribution as prescribed by the Rank-size rule of Central Place Theory. The common characteristic of city size distribution in ASEAN-4 countries is that the capital city is too dominant not allowing any other city to compete with. The cases of

Thailand and Philippines are very extreme, as the capital cities are far bigger than the respective second cities.

It is not only population but also the economic activities that are concentrating in capital regions. For instance, in Korea, Seoul metropolitan area accounts for 45 percent of total GDP (Hong 1997) and in Thailand, Bangkok metropolitan area accounts for 50 percent of GDP (Kaothien 1991) while its share in total population is only 11 percent. Among different economic activities, manufacturing is the one, which is mostly concentrated in or around capital cities. For instances, Bangkok accounts for 72.8 percent, Manila and periphery 77 percent, and Java 75.6 percent of respective total manufacturing value added (Rameezdeen and Akatsuka 1997). In Thailand, per capita income in Bangkok is almost ten times higher than the per capita income in the least developed northeastern region, and the income disparity among the regions is widening over the time.

Realizing the possible socio-economic consequences of over-concentration in the capital region, the governments took various policy measures to induce spatial dispersion of population and economic activities. The main instrument employed for such policy was decentralization of manufacturing activities through fiscal incentives. But in most cases these policies did not succeed (Rameezdeen and Akatsuka 1997, Hong 1997). For instance, during 1987-1990, despite the government effort to decentralize the industrialization, Bangkok metropolitan region attracted around 75 percent of total new investment in Thailand (Daniere 1996).

3. DETERMINANT OF URBAN PRIMACY

The underlying mechanism of urban primacy, in fact, involves a complex interaction of economic, social, political and spatial forces. In this section, we make an attempt to empirically examine the determinants of urban primacy and the degree of their influences on the primacy with objectives of providing useful guidelines to policy makers and serving as a preliminary step for more rigorous analysis on the mechanism of urban primacy. Due to its simplicity and explanatory power, we have chosen the multiple regression model as the tool of our analysis.

We utilized cross-country data to test various hypotheses regarding the determinants of urban primacy. The data source we utilized for all variables except transport investment is the World Development Indicator (WDI) of the World Bank (1997, 2000). Data for transport investment is from The Government Finance Statistics Year Book (1999) of International Monetary Fund (IMF). However, as in the case of most cross-country analysis, we encountered the problem of non-uniformity of data availability with respect to variables, data year and countries. First, we explored a largest possible sample of countries for which data on key relevant variables are available. We conducted multiple regressions over this sample and examine the impact of exploratory variables on the urban primacy. Based on the degree, nature and significance, we picked up a group of variables, which is included in each regression along with other variables. These second set of variables have different sample sizes for the obvious reason.

While selecting the sample, another important consideration is the minimum population size that would qualify a country to enter the sample. There are countries with population size as small as ten thousand. Inclusion of such small countries in the sample may not be logical as

the functional characteristics of these countries significantly differ from the "normal" countries. However, we cannot avoid some degree of arbitrariness while setting the threshold for population size. To start with we have taken a population size of one million as the cut-off point, and compiled a sample of 116 countries. Later, we have checked the sensitiveness of the result with different threshold size. Also, a city-state like Singapore has been dropped from all samples. The list of the countries in 116-country sample is given in Appendix 1. Table 1 shows the variables we have considered for the regression.

Table 1.Defination of variables and data year

Variable	Definition	Year
EDU	Public spending on education, total (percentage of GNP)	1985-1995
EXP	Exports of goods and services (percentage of GDP)	1985-1995
PEXPD	Total government expenditure (budget) (percentage of GDP)	1985-1995
FDI	Foreign direct investment, net inflows (percentage of GDP)	1985-1995
GDFI	Gross domestic fixed investment (percentage of GDP)	1985-1995
GDPGR	GDP growth rate (annual percentage)	1985-1995
GNPPC	GNP per capita, Atlas method (current 100 US$)	1995
HEALTH	Public expenditure on health (percentage of GDP)	1990-1995
INDVA	Value added by industry (percentage of GDP)	1990-1995
ODA	Overseas development assistance (percentage of GDP)	1985-1995
PD	Population density (person per square km)	1995
PLC	Population in the largest city (percentage of urban population)	1995
POP	Total population (million)	1995
PRIMEX	Primary exports (percentage GDP)	1985-1995
PUBINV	Public investment (percentage of GDP)	1985-1995
PVDEBT	Present value of debt (percentage of GNP)	1995
PVROAD	Roads, paved (percentage)	1995
RAP	Relative agricultural productivity	1990
TRINV	Investment in Transportation (percentage of GDP)	1985-1995
URBPOP	Urban population (percentage of total)	1995

We find a good reason to include these variables in our regression exercise. All of these variables are linked, directly or indirectly, with the issue of urban primacy. The percentage of urban population in the largest city (PLC) is taken as the measure of urban primacy (dependent variable). As the primacy is assumed to be dependent, among others, on the level of economic development, variables such as INDVA, URBPOP and GNPPC are expected to serve as the proxies of the level of economic development. GDFI, HEALTH, and EDU are important variables representing creation of economic and human capital, which are likely to have a direct bearing on the formation of giant cities. PUBINV and PEXPD indicate degree of public sector involvement in economic development while EXP represents the extent of trade openness. ODA, PVDEBT and FDI indicate the public and private foreign capital inflows and country's exposure to foreign capitals. TRINV is chosen to serve as a proxy for the degree of priority the transport sector commands in getting the share of government budget while PVROAD represents the quality of road transport infrastructure.

RAP is defined as the ratio of the share of agriculture value added in GDP and share of agriculture labor in total labor force, and thus reflects the relative productivity of agricultural labor. RAP value of one means equal labor productivity in agricultural and non-agricultural

sectors while less than one means a lagging agricultural productivity. It is, in fact, expected to reflect the economic structure of a country in terms of competitiveness of rural economy. An adequate provision of agriculture infrastructure such as rural roads and agriculture service facilities is expected to enhance the labor productivity in agriculture sector, which in turn may not work towards supporting the growth of giant cities. Instead, such productive rural economies will support many small towns and cities in addition to the primal city. GDPGR has been included to examine if fast growing countries demonstrate any particular pattern of urban primacy. POP and PD stand for specific country characteristics.

As mentioned before, we make our regression analysis a cross-sectional one, and the percentage of total urban population in the largest city (PLC) is taken as the measure of urban primacy. The year we picked up for urban primacy data is 1995. But not for all variables the data year is 1995. This is mainly because of two reasons. As we can see, the variables we have taken into consideration falls on two distinct categories of stock and flow variables. The variables related to investment is, for instance, simply a flow variable for physical capital. Stock variables are usually slow changing while flow variables may subject to significant yearly variation. For flow variables, a figure averaged over few preceding years is taken as in the case of Ades and Glasser (1995). This is because the phenomena of urban primacy require significant adjustment time and average value over preceding years (of 5 to 10 years depending up on the variables) seems to be quite logical. For slow adjusting variables or stock variables, data for the year 1995 is picked up. Also, all variables (except POP) have been normalized (as reflected in the unit of measurement listed in Table 1) in order to make them independent of the size of country or economy.

Our regression strategy places emphasis on identifying policy relevant determinants of urban primacy rather than focusing on some policy irrelevant variables for the sole purpose of obtaining a high R^2 value. Such factors not only help to explain the mechanism of urban primacy but also offer important levers for policy intervention. For this reason, we have avoided using group specific dummy variables. Though dummy variables could be instrumental in enhancing R^2 value, they might soak most of the otherwise revealing variation in the dependent variable without any significant policy insights. We have, however, used population size dummy (a proxy for big or small population size) to test the sensitiveness of regression coefficient. The population size dummy can also have a direct policy relevance as it help us to make a distinction between possible deviation in the policy implications in the case of countries with bigger and smaller population sizes.

We perform multiple regressions with different set of independent variables at a time. Each combination however includes a fixed group of independent variables. The simple correlation result provides a basis for appropriate grouping of variables to avoid multicollinearity. All regression results are from OLS estimator.

Table 2 shows regression results from our standard sample of 116-country. As mentioned before, among the explanatory variables, total population (POP), relative agricultural productivity (RAP), urbanization (URBPOP) and population density (PD) enter in each regression. In addition to this group of variables, regression (1) includes export, public expenditure on education and gross domestic fixed investment as the explanatory variables. Regression (2) adds public expenditure on health and industrial value added in GDP, dropping urbanization and expenditure on education to avoid multicollinearity. Regression (3) further adds GDP growth rate. Likewise, regression (4) and (5) examine different combination of explanatory variables.

The regression results in Table 2 are very stable, as the size and significance of the variables do not change appreciably in different regressions. Population takes a negative value with high significance, implying that smaller countries have a tendency of higher urban concentration, which is in line with the previous research findings such as in (Mooman and Shatter 1996). Relative agriculture productivity, which measures productivity of agriculture labor with respect to the productivity of the rest of the economy, also records a negative coefficient with high significance.

Table 2: Regression result-I

Dependent variable: Population in the largest city (percentage of total urban population) , 1995					
	1	2	3	4	5
Intercept	48.55	47.58	41.66	41.54	43.84
	(8.19)	(7.77)	(7.23)	(7.65)	(7.59)
POP	-0.04	-0.03	-0.03	-0.04	-0.04
	(-3.53)[1]	(-2.98)[1]	(-2.94)[1]	(-3.45)[1]	(-3.42)[1]
RAP	-10.25	-11.38			-12.70
	(-1.93)[3]	(-2.08)[2]			(-2.38)[2]
URBPOP	-0.17			-0.20	
	(-2.56)[2]			(-2.94)[1]	
PD	-0.02	-0.01	-0.01	-0.01	-0.01
	(-1.42)	(-1.15)	(-1.16))	(-1.27)	(-0.94)
EXP	0.23	0.26	0.23	0.17	0.18
	(2.15)[2]	(2.30)[2]	(2.00)[2]	(1.65)[3]	(1.63)[3]
HEALTH		-1.68	-2.02		
		(-2.06)[2]	(-2.43)[2]		
INDVA		-0.34	-0.28		
		(-1.78)[3]	(-1.46)		
GNPPC					-0.03
					(-1.69)[3]
EDU	-1.15				-0.99
	(-1.25)				(-1.03)
GDFI	0.04	0.13	0.10	-0.04	0.01
	(0.19)	(0.56)	(0.41)	(-0.18)	(-0.01)
GDPGR			0.17	0.39	
			(0.36)	(0.88)	
Obs	116	116	116	116	116
R^2	0.23	0.22	0.19	0.19	0.20
F	4.52	4.29	3.55	5.54	3.88
	(7, 108)[1]	(7, 108)[1]	(7, 108)[1]	(7, 109)[1]	(7, 108)[1]

Note: *The number in parenthesis below the coefficient value indicates corresponding value of t statistics and that below the F value indicates degree of freedom.*
[1] Significant at 1 % level; [2] Significant at 5 % level; [3] Significant at 10 % level;

A country's level of urbanization appears to have negative effects on urban primacy. As shown in regression (1) and (4), the urbanization variable takes negative value and it is significant in both cases. The coefficient on this variable indicates that if the urbanized population increases by 10 percent of total population, the urban primacy is reduced by 2 percentage point. Thus, higher degree of primacy is basically a feature of relatively less urbanized countries as also argued by (Mooman and Shatter 1996). Likewise, the coefficient

of population density is not significant, implying that the population density of a country does not have anything to do with the level of urban primacy.

In regression (2) and (3), we can see a strong influence of public expenditure on health over the degree of urban primacy. The variable takes negative value and the coefficient is large and significant. Regression (3) reveals that an increase in public expenditure on health by one percent of GDP brings the urban primacy level down by two-percentage point. The possible mechanism behind this effect is that more public expenditure on health means more equitable distribution of heath services throughout the country, which encourage dispersion of population by offering reasonably good quality of life in locations other than the largest city. Likewise, regression (1) and (5) shows the effect of education expenditure to have been towards similar direction but statistically not significant. These results further confirm the decisive role of investment in human capital as emphasized in endogenous growth theory in promoting spatially balanced economic development. But, the investment in health service seems to be more powerful than that in education in decentralizing the urbanization. One possible reason may be the fact that educated population prefer big cities as they offer range of intellectual and professional opportunities while country-wide availability of better heath service may act as a disincentive for moving to large cities.

The coefficient of industry value added in GDP (INDVA), which takes negative value and is significant in regression (2), implies that urban primacy has much to do with the process of industrialization. Higher the level of industrialization, lower is the tendency of urban concentration. This might be because the industrialization opens opportunities for secondary cities to specialize on different products and attract capital and labor once the largest city suffers from negative externalities. Likewise, gross domestic fixed investment (GDFI) and GDP growth rate (GDPGR) both take positive value (except GDFI in regression-4), but in all regressions the coefficients are far from significance level, indicating an inconclusive effect of these variables on urban primacy.

Most interesting result in Table 2 is the coefficient of the share of export in GDP (EXP). The coefficient records robust positive values and is significant in all regressions. Contrary to the hypothesis forwarded by Krugman (1991) and empirical confirmation in Mooman and Shatter (1996), and Ades and Glasser (1995), the result suggests that countries with higher level of export (measured as percentage of GDP) are more likely to have primal cities. This finding is particularly, important as most of the developing countries are adopting export oriented development strategy and opening up their economy for international trade and investment.

Next step in our regression is to examine the effect of other relevant variables by regressing them one by one in combination with the group of variable mentioned earlier. The regression result is shown in Table 3. We can see that the coefficients of variables from the group largely retain the size and significance of those in 116-country sample. The public investment (PUBINV) and the central government expenditure (PEXPD), both measured in GDP's term, are added separately in regression (6) and (7). The coefficients of both of these variables are not statistically significant implying that they are not decisive factors for urban concentration. In regression (8), government expenditure in transport and communication measured as the percentage of GDP (TRINV) is included whereas regression (9) examines the effect of road transport infrastructure quality as represented by percentage of paved road (PVROAD). These variables represent quantity and quality of transport infrastructure. The regression result shows that both of these variables take negative value passing the significance test. The

coefficient in regression (8) indicates that an increase in transport expenditure by one percentage of GDP can bring down the primacy level by over one and half percentage points.

Table 3: Regression result-II

Dependent variable: Population in the largest city (percentage of total urban population), 1995								
	6	7	8	9	10	11	12	13
Intercept	33.07	47.77	46.21	42.45	49.90	37.70	44.69	32.10
	(6.39)	(8.78)	(6.92)	(11.98)	(10.72)	(7.88)	(8.31)	(6.07)
POP	-0.03	-0.04	-0.03	-0.05	-0.04	-0.03	-0.04	-0.03
	(-2.78)[1]	(-3.84)[1]	(-3.48)[1]	(-3.27)[1]	(-3.96)[1]	(-3.14)[1]	(-3.47)[1]	(-3.16)
RAP	0.01	-8.70	0.15	-6.14	-8.13	-7.01	-6.24	-6.23
	(0.72)	(-1.57)	(0.02)	(-1.14)	(-1.57)	(-0.75)	(-1.17)	(-1.00)
URBPOP		-0.16	-0.12		-0.16		-0.15	
		(-2.33)[2]	(-1.37)		(-2.48)[2]		(-1.98)[3]	
PD	0.00	-0.01	0.00	-0.01	-0.01	0.00	-0.01	
	(-0.37)	(-0.89)	(0.12)	(-0.50)	(-0.98)	(0.08)	(-0.58)	
PUB	-0.01							
	(-0.07)							
EXPD		0.02						
		(0.16)						
TRINV			-1.59					
			(-2.78)[1]					
PVROAD				-0.08				
				(-1.73)[3]				
FDI					-0.84			
					(-0.67)			
ODA						0.36		
						(1.93)[3]		
PVDEBT							0.04	
							(2.06)[2]	
PRIMEX								0.08
								(1.38)
Obs	56	102	65	117	119	77	96	93
R^2	0.15	0.21	0.27	0.15	0.19	0.19	0.22	0.15
F	2.25	4.9	4.2	4.73	5.34	4.13	5.10	5.15
	(4, 51)[2]	(5, 96)[1]	(5, 58)[1]	(4, 112)[1]	(5, 113)[1]	(4, 72)[1]	(5, 90)[1]	(3, 89)[1]

Note: *The number in parenthesis below the coefficient value indicates corresponding value of t statistics and that below the F value indicates degree of freedom.*
[1] Significant at 1 % level; [2] Significant at 5 % level; [3] Significant at 10 % level;

The regression (6), (7), (8) and (9) have thus revealed an important policy insight. The policy of higher level of public investment or government expenditure is often projected as effective policy instrument to address the problem of regional disparity. The result, however, does not lend a support to this view. Rather it suggests that a simple scaling up of public investment or government expenditure does not guarantee a balanced development. What matters most importantly is the choice of sectors such investment or expenditure is channeled to. We have now found that sectors like heath and transportation should be the prime candidate to be focused on for public investment in order to achieve a balanced spatial development.

Next, variables related to foreign investment, aids or loan are examined separately to see the effect of foreign capital on urban primacy. The coefficient of foreign direct investment (FDI) is negative but not significant (regression 10), where as both ODA and present value of debt have statistically significant positive coefficients (regression 11 and 12). These results support the arguments that the flow of foreign aids and foreign loans has a tendency of increasing primacy. However, it should be noted that the impact of ODA depends upon the ODA strategy adopted. Finally, in regression (13), the variable representing composition of export (share of primary good in merchandise export) is included. Though it records positive value, implying that countries relying more on primary export are likely to have primal cities, the coefficient has just missed the significance level.

The regression results in Table 2 and Table 3 are very much revealing in terms of confirming the role of different variables in the process of urban concentration. Though most of the results are in agreement with earlier empirical results, some of them are not. As indicated earlier, in cross-country regression, the regression results are likely to be very sensitive to the size of sample or, to be more specific, to the sample selection criteria employed. In a cross section of countries, there is a possibility to exist a structural break point. It is therefore important to test the sensitiveness of the results against such structural break. One way of examining this is by including a dummy variable and testing its significance. We have therefore rerun all the regressions by introducing population size dummy and compare the results. We chose a threshold point for population size dummy, which was determined by choosing the point to maximize the F-statistic, an approach adopted by (Ades and Glaeser 1999). For this purpose, we took our 116-country sample and run regression with all key variables (including POP) and population dummy (corresponding to different cutoff point). We found that F-statistic was maximized for a cutoff point of 12-million population size. Hence, our population size dummy (P12) takes a value of one for all countries with population less than 12 million and zero for those with population more than 12 million. In effect, if the coefficient of population dummy is significant, the regression result can be interpreted as the result coming out primarily due to the variation in data from bigger countries. This is because the variations in data of independent variable from smaller countries are partly soaked by population dummy.

Table 4: Comparison of regression coefficient with and without population dummy

Model	1	1	1	8	7	11	12	13
Variable	P12	POP	EXP	TRINV	PEXPD	ODA	PVDEBT	PRIMEX
Without P12		-0.04	0.23	-1.59	-0.02	0.36	0.04	0.08
		(-3.53)[1]	(2.15)[2]	(-2.78)[2]	(0.16)	(1.93)[3]	(2.06)[2]	(1.38)
With P12	16.8	-0.003	-0.91	-1.34	-0.02	0.17	0.04	0.08
	(6.2)[1]	(-2.4)[2]	(-0.08)	(-2.71)[2]	(-1.65)[3]	(0.80)	(2.15)[2]	(1.78)[3]
R^2 (with P12)	0.41	0.41	0.41	0.45	0.39	0.37	0.42	0.36

[1] Significant at 1 % level; [2] Significant at 5 % level; [3] Significant at 10 % level;

We repeated all regression models listed in Table 2 and Table 3 adding population size dummy (P12) without dropping POP. The regression coefficients of selected variables with and without the population dummy are shown in Table 4 for the purpose of comparison. Coefficient of P12 is significant and takes a positive value in all regression. With population size dummy too, POP retains negative sign and significance value but loses size for obvious reason. This implies that in addition to the population effect, smallness in population size exerts special effects to increase primacy. Inclusion of this population size dummy increases R^2 value but for most variables there is not appreciable change in size and significance of the

regression coefficients. Such as, TRINV and PVDEBT did not record a significant change in the size and significance of their coefficients while regressing with and without population size dummy.

The coefficients of some variables were, however, found to be very sensitive to the inclusion of population dummy. The most surprising reversal occurred in the case of EXP and PEXPD. With population dummy, EXP takes a negative value but not statistically significant. This indicates that the share of export in GDP has a strong tendency of supporting primacy in smaller countries while its effect is not statistically significant when size dummy is included. The coefficients of export in Table 2 were largely due to variation in data of smaller countries, which was mostly soaked by population dummy. As a result the coefficient of export reversed its sign and failed to be statistically significant. Likewise, in regression (7), share of government expenditure in GDP (PEXPD), has positive coefficient but not statistically significant. In regression with population dummy, the variable records a negative coefficient, which passes significance test. This result reflects that in countries with larger population, a higher level of government expenditure reduces primacy. This might be because of concentration government activities only in primal cities, which are also capital cities, in most countries with smaller population size.

ODA loses its significance when population dummy is included in the regression. This implies the concentration of ODA in primal cities in smaller population countries. Likewise, the coefficient of PRIMEX is significant when population dummy is included, indicating that the higher proportion of primary good in merchandise export works towards increasing primacy in countries with larger population.

4. POLICY IMPLICATIONS

The variables included in our regression analysis are of different types from the viewpoint of policy interest. Some of the variables are amenable and useful to policy intervention while others are not. Variables like total population, urbanization level, population density and industrial value added in GDP are not directly amenable to policy intervention. However, their relationship with primacy level could provide a useful reference for policy makers to fine-tune the policy with these variables. For instance, policy makers in small countries should be more attentive to the problem of primacy than their counterparts in bigger countries, as smaller countries are more likely to have primate cities. On the other hand, if higher level of industrialization, which is supposed to bring the level of primacy down, is not resulting in the lower level of primacy, it is an important signal to policy makers that there must be some stronger forces at work which support urban primacy. Variables representing public expenditure on health and education, government expenditure in transport and communication and percentage of paved road are directly amenable to government policy decisions even in the short-term. The effects of RAP, export, foreign direct investment, ODA and foreign loan on the level of primacy can be transmitted through medium to long-term development strategy.

The regression results and the stylized facts we discussed in earlier sections are broadly in agreement. The regression result also lends support to some of the policy relevant observations we made in the specific cases of ASEAN-4 countries. The most important policy insight we can gain from this exercise is that the process of urban concentration can be regulated through judicious policy choices. However, there is not a universally acceptable

single panacea to address the issue as the process involves a complex interaction of various social, economic and political forces. We can summarize the policy implications of our exercise as below.

Public investment has a significant potential to influence the level of urban primacy and thereby regional disparity. However, simply increasing the amount of public investment might be of little help or sometimes even counter-productive. The most important consideration in public investment decision is not about the investment amount alone but also the need of setting right priority. Different kinds of infrastructure are effective in different stages of economic development. Social and economic infrastructure such as health and education facilities and transport and communication appears to be more effective to disperse the growth in more balanced way. Hence, developing countries should pay special attention to adequately supply these infrastructures.

Another important policy implication coming out from our case study on ASEAN-4 and regression result is that the relative agricultural productivity has much to do with the emerging pattern of over-concentration in big cities. The higher agriculture productivity means a lesser incentive for rural population to migrate to cities. The agricultural growth may also help the growth of small cities, which specialize on agriculture-based industries. Rural infrastructure such as accesses roads and basic service facilities play an important role to enhance agricultural productivity and reduce the pressure of higher urban concentration.

The inflow of foreign capitals, especially in the form of aid and loan was also found to be positively associated with the urban primacy. The case is more clearly visible in the case of ASEAN-4 countries. The increasing burden of debt service and pressure for maintaining international competitiveness left no choice but rely on big cities for these rapidly developing countries. The government of developing countries should therefore make a thorough policy analysis to see the possible long-run impact of foreign aid and loan on spatial distribution of population and economic activities.

Finally, as widely emphasized in recent literature, the role of export is not conducive to reduce primacy. It is neutral at best but more towards increasing primacy in smaller countries. It is not our point that developing countries should discourage export, as export is the primary vehicle for economic growth in developing countries. Rather we argue that export oriented policies are likely to increase urban primacy; so such strategy should be accompanied by other decentralization oriented policies.

5. CONCLUSION

The problem of regional disparity, which was once viewed as a short-term aberration of development process, has now gain a wide spread importance on the ground of not only social equity but also economic efficiency. In this paper, we explored possible ways to make effective intervention through public investment policy. At first we tried to establish a direct link between urban concentration (or primacy) and regional disparity and then identified the factors influencing the primacy level. In other words, we envisage that most effective way to address the issue of regional disparity is through the promotion of balanced urban growth as cities are the engine of the growth in a region. Our research has confirmed some of the earlier empirical findings and also brought about new insights. Most importantly, we have adopted

an approach that is based both on cross-country regression and specific case study. This research can further be extended by including complete time series data for panel analysis.

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Appendix: 1: List of countries included in 116-country sample

Albania; Algeria; Angola; Argentina; Armenia; Australia; Austria; Bangladesh; Belarus; Belgium; Benin; Bolivia; Botswana; Brazil; Bulgaria; Burkina Faso; Burundi; Cameroon; Canada; Central African Republic; Chad; Chile; China; Colombia; Congo, Rep.; Costa Rica; Cote d'Ivoire; Croatia; Czech Republic; Denmark; Dominican Republic; Ecuador; Egypt, Arab Rep.; Estonia; Ethiopia; Finland; France; Gabon; Georgia; Ghana; Greece; Guatemala; Guinea; Guinea-Bissau; Haiti; Honduras; Hungary; India; Indonesia; Iran, Islamic Rep.; Ireland; Italy; Jamaica; Japan; Jordan; Kenya; Korea, Rep.; Kuwait; Kyrgyz Republic; Lao

PDR; Latvia; Lesotho; Lithuania; Madagascar; Malawi; Malaysia; Mali; Mauritania; Mauritius; Mexico; Mongolia; Morocco; Mozambique; Myanmar; Namibia; Nepal; Netherlands; New Zealand; Nicaragua; Niger; Nigeria; Norway; Pakistan; Panama; Paraguay; Peru; Philippines; Poland; Portugal; Romania; Russian Federation; Rwanda; Senegal; Sierra Leone; Slovak Republic; South Africa; Spain; Sri Lanka; Tajikistan; Tanzania; Thailand; Togo; Trinidad and Tobago; Tunisia; Turkey; Uganda; Ukraine; United Arab Emirates; United Kingdom; United States; Uruguay; Uzbekistan; Venezuela, RB; Vietnam; Yemen, Rep.; Zambia; Zimbabwe.