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RIO DE JANEIRO: A CITY STUDY

Volume II

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ABBREVIATIONS AND ACRONYMS

CEDAE	=	Companhia Estadual de Agua e Esgotos: State Water Company
CLT	=	Consolidação das Leis Trabalhistas: Federal Labor Code
COMLURB	=	Companhia Municipal de Limpeza Urbana: Municipal Waste Management Company
CSN	=	Companhia Siderurgica Nacional: National Steel Company
FUNDREM	=	Fundação para o Desenvolvimento da Região Metropolitana do Rio de Janeiro: Fund for Development of the Rio Metropolitan Region
FUNDEF	=	Fundação para o Estímulo e ao Fortalecimento da Educação: Fund for Strengthening Education
IBGE	=	Instituto Brasileiro de Geografia e Estatística: Brazilian Statistical Agency
ICMS	=	Imposto sobre Circulação de Mercadoria e Serviços: State Tax on Goods and Services
IPEA	=	Instituto de Pesquisa Econômica Aplicada: Institute for Applied Economic Research
ISS	=	Imposto sobre Serviços: Municipal Services Tax
INSS	=	Instituto Nacional de Seguridade Social: National Social Security Institution
METRO	=	Companhia do Metropolitano do Rio de Janeiro: State Metropolitan Rail Company
MRJ	=	Município do Rio de Janeiro: Municipality of Rio de Janeiro
PNAD	=	Pesquisa Nacional por Amostra de Domicílios: National Annual Household Surveys
PPV	=	Pesquisa das Padrões de Vida: Living Standards Measurement Survey
PROER	=	Programa de Estímulo a Restruturação e ao Fortalecimento do Sistema Financeiro: Program for Restructuring and Strengthening the Financial System
SUS	=	Sistema Unica de Saude: National Health System
TELERJ	=	Telecomunicações do Rio de Janeiro SA: Telecommunications Company of Rio de Janeiro
TELEBRAS	=	Telecomunicações do Brasil SA: Telecommunications Company of Brazil

CHAPTER 1

RIO: ECONOMIC PROSPECTS AND GROWTH STRATEGY

This chapter was prepared by Shahid Yusuf, Staff Director, World Development Report 1999, and Marcelo Neri, IPEA-Rio de Janeiro. The views presented here are those of the authors, and should not be attributed to the institutions they represent.

Rio: Economic Prospects and Growth Strategy

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I. THE ROLE OF LARGE CITIES IN THE GROWTH PROCESS

1.1 The message of this study is that Rio must deepen its industrial base and strengthen producer services in order to maintain its position as a major regional center. The appropriate place to start, therefore, is with a few important but neglected facts: a small handful of cities are directly responsible for much of the growth achieved by the most dynamic economies over the past two decades; growth of these cities has been spearheaded by urban industries that have aggressively sought domestic or external markets for their products; the more successful cities have diversified their industrial base and acquired a comparative advantage in producer services, which augment industrial competitiveness, and are becoming a source of exports in their own right. Prospering cities have benefited from a good macroeconomic policy, but metropolitan planning, management, business incentives and the socio-physical environment have been critical to their continuing success. The increasing concentration of people in urban areas suggests that future economic progress and social well being will be a function of the enabling conditions in cities, operating in an increasingly decentralized national milieu.

1.2 The good and the less palatable features of recent trends can already be seen in cities such as Singapore, Hong Kong, Los Angeles, Sao Paulo, Mumbai and Lagos. In East Asia, Singapore is a city that has worked hard at being competitive. It is a thriving industrial center, a regional transport hub, one of two financial poles in South East Asia (the other being Hong Kong) and, as a result of painstaking regulation, it has preserved a relatively clean and congestion free environment. At the other extreme is a city such as Lagos rendered anarchic by decades of mismanagement and fiscal impoverishment. In between, but closer to the Singapore end of the spectrum, are cities such as Bangkok, Jakarta and Kuala Lumpur. These are cities with substantial industrial depth. The Bangkok metropolitan region accounts for one half of Thailand's GDP and has grown at an annual average rate of over 12 per cent since the mid 1980's (Kaothien 1995). The Jabotabek metropolitan area in Indonesia contributes a third of Indonesia's GDP and its economy has expanded at over 10 per annum for the last decade (Dharmapatri and Firmin 1995). However, in spite of the impressive economic gains, the quality of public services has deteriorated and both cities are struggling with a host of environmental and social problems (Pendakur 1995). Within the Malaysian economy, Kuala Lumpur's share of GDP is comparable to that of Jakarta although its population is less than 2 million. Kuala Lumpur has also sustained a growth rate of over 10 per cent and has emerged as one of the major players on the South-East Asian stage (Thong 1995). These cities, can remain in the economic forefront by constantly searching for fresh opportunities, for new economic niches that can be occupied. The cities must be innovative in finding resources to expand and modernize the physical infrastructure. And they must maintain the upper hand over congestion, crime and pollution that can rapidly undermine the quality of life and in time, imperil prosperity. The economic crisis that has gripped the East Asian Region since mid 1997, by tightening resource constraints, only sharpens the challenge for the major cities.

1.3 Rio differs from these Asian comparators in important respects: it is not a primate city equivalent to Bangkok; it ceased to be Brazil's capital in 1960; and it is not the dominant industrial center of the country, a distinction that only Sao Paulo can possibly claim. In other key respects: size, industrial imperatives, competitive pressures and socio-environmental problems - Rio resembles some of the major cities in Latin America and Asia. More importantly, Rio must redefine its comparative advantage and move quickly to recover the dynamism it displayed during the first half of the century. This will require a searching analysis

of local trends, of current and potential sources of growth and constraints. It also involves drawing upon the wealth of international experience that can fruitfully inform policies as well as institutional development (See Porter 1990).

1.4 The challenge for Rio is clear and it cannot be sidestepped for long. The city must devise a strategy to reverse a long spell of slow growth, reduce high levels of poverty and mobilize the resources to deal with urban decay. There is little time to lose. The purpose of this report is to describe Rio's current economic circumstances, analyze the factors underlying recent performance and suggest how Rio might utilize its resource endowment and strengths to achieve better economic results over the long run.

II. RIO : A SOCIO-ECONOMIC BALANCE SHEET

1.5 Among Brazilian cities, Rio has easily the highest name recognition. It is a profound advantage. People the world over have heard of Rio and the associations are generally positive. In the Brazilian context, it remains an urban pillar and an economic giant. Rio city, which is divided into 30 administrative districts, had a population of 5.6 million in 1996 when the metropolitan total was 10.1 million. The GDP of the metropolitan area was about an eighth of the national aggregate or about \$92 billion. The share of Rio municipality was approximately \$60 billion. Thus per capita GDP was close to \$10,000. In terms of both population and GDP, Rio was second only to Sao Paulo. But during the 1990's it has grown at a faster pace than its sister metropolis to the south and reduced the rate of formal unemployment to 2.8 per cent, which is below that of Sao Paulo. Greater economic stability in 1994-97 together with an improved business climate led to modest acceleration in metropolitan growth. Since the population of metropolitan Rio corresponds roughly to 76% of Rio state population, and average incomes are higher than in the rest of the state, the use of the Rio State GDP is not an unreasonable proxy for the same statistic at the metropolitan level. The share of Rio State in the Brazilian GDP fell from 12.1% in 1987 to 10.4% in 1994, but then recovered to 11.4% in 1996.¹ The sharp fall in migration to Rio from smaller cities and the Northeast, plus a low rate of natural increase in the labor force, has served as a check on poverty and unemployment. Income inequality has declined in the mid 1990s albeit from levels that were among the highest in the country. The quickening of economic activity, along with more determined policing, also lessened the incidence of crime in 1995-96 (although violent crime rebounded in 1997). Other trends and the longer term perspective on living conditions in the city point to deterioration. Of greatest significance is the pattern of change in industry.

1.6 Industrialization in Brazil commenced behind high trade barriers and under public sector tutelage in the 1930's. It gathered momentum after World War II when import substituting policies profoundly biased against exports were put in place. High tariff barriers quota restrictions and an overvalued exchange rate encouraged the growth of an inefficient industrial sector. (Cardoso and Helwege 1992, Edwards 1995, Fishlow 1996). Manufacturing activity, again largely of an import substituting nature, flourished in the 1960's and 1970's, driven in part by public sector investment in steel, petrochemicals, other heavy industries and infrastructure. During 1968-73, the so-called Golden Years, per capita GDP rose at an annual average rate of 7 per cent, among the highest in the world. However, throughout this period and especially in the latter part of the 1970s, Brazil was supplementing the modest rates of domestic investment through inflows of foreign capital (Fishlow 1996). The accumulation of foreign debt, and the crisis it precipitated in the early 1980's, brought the growth in per capita GDP to a halt throughout the decade. Economic expansion resumed in the 1990's, but now industry was increasingly exposed to

foreign competition as Brazil began dismantling barriers to imports starting in 1989 and at an increasing pace after 1991, as required by international treaties, and out of a need to reduce industrial inefficiency. (Cardoso and Helwege 1992, Tulio and Ronci 1996).

1.7 Economic stagflation, lasting for more than a decade, followed by trade liberalization, had major consequences for the mature industrial centers such as Rio (see Huddle 1997). First, light, labor intensive industries such as textiles, clothing, leather products and food processing became less competitive and have migrated South to lower wage regions of the country (Parana), the west (Minas Gerais) and the north-east (Tolosa 1995), a tendency visible in other developed countries (Markusen 1985, Crandall 1993). Second, producers of capital goods for the domestic markets have had difficulty matching the prices, technology and financing terms offered by foreign suppliers and have either curtailed production or gone out of business entirely. This has been the fate of shipbuilding, engineering, and metallurgical industries in the Rio metropolitan area. With even loyal public sector corporations - such as Petrobras - buying more of their equipment overseas in order to remain competitive, industrial activity in Rio municipality and in the near vicinity has been severely cutback. The paucity of data on industrial trends in the 1990's makes it difficult to track changes with much precision, nevertheless a sense for what is happening can be gleaned from a handful of indicators. The share of employment in modern and traditional manufacturing industry fell from 16.1% of the occupied population in 1986 to 14.6% in 1991 and then down to 11.1% in 1996. The share of industry in GDP at the state level fell from 47.2% in 1986 to 37.3% in 1991 and then down to 31% in 1995¹ (see Table 2). This stems from a decline of engineering and transport industries, but also others of such as clothing, textiles, leather working and jewelry making, all of which are labor intensive. Clothing was the largest industrial employer in 1985 (12.5% of the workforce), but its share is much reduced. Producers of clothing along with some of the engineering, and metallurgical industries have either moved out of Rio municipality into the suburban areas or migrated to other states. Their place has been taken by the expansion of pharmaceuticals, food processing and petrochemical industries, which tend to be capital intensive and employ mostly skilled workers. The gaps created by the shrinkage of traditional manufactures have only been partially filled, and aside from food processing, the activities that have expanded are creating few employment opportunities for the unskilled. The contraction of shipbuilding and repair eliminated a substantial number of jobs in the shipyard itself as well as in ancillary industries. Meanwhile, paper and publishing, which remains a major activity in Rio municipality, has expanded very little and because of computerization it has absorbed few more workers. The bulk of employment is now in services (see Table 1)

1.8 It is not easy to identify the leading industrial subsectors of the next decade. The presence of CSN, the largest Brazilian producer of steel rods for construction purposes in the metropolitan area, ensures the continuing prominence of the metallurgical industry. But there are no signs of new downstream activities taking root. Although city administrators attach importance to the large new production facility established by Boroughs Welcome, the linkage effects from such a plant for the municipality are likely to be meager. They will be to the chemicals and packaging industries overseas or in other parts of Brazil. Food processing continues to attract investment, and as in any other large city, this industry will retain a sizable presence without becoming a leader.

1.9 The development of the huge petroleum fields in the Southern Atlantic, east of Rio, has enhanced the prospects of the metropolitan petrochemicals industry. This subsector already accounts for about 15%

¹ At the level of the whole country the share of GDP in industry fell even more dramatically during this period from 47.2% in 1986 to 38.4% in 1991 and then down to 32.5% in 1996.

of industrial production in the area. In addition, a site north of Rio city is the collection and distribution point for the petroleum products produced by the offshore Compos Basin fields. The easy availability of feedstock and the planned development of the Sepetiba harbor facilities in the southern part of Rio municipality could become the basis for a major petrochemical complex comparable to the one in Singapore. The Gas-Chemical Complex adjacent to the Duque de Caxias Refinery has already begun to put together the first few building blocks, starting with a 400,000 ton ethylene cracker. Whether these activities can revitalize Rio's industry will depend not just on the scope of investment in the basic petrochemical facilities, but also on the creation and spread of downstream activities that are the principal sources of jobs and value added.

GDP STRUCTURE - 1995
RIO DE JANEIRO AND OTHER STATES

	RJ	SP	MG	RGS	BA	PE
Agriculture	1.6%	6.0%	15.5%	16.6%	15.9%	10.9%
Industry	42.8%	35.7%	32.8%	27.5%	33.6%	23.4%
Manufacturing	31.0%	32.0%	24.0%	23.0%	15.3%	13.6%
Civil Construction	10.0%	1.6%	4.9%	3.2%	15.4%	6.6%
Industrial services	1.8%	2.1%	3.8%	1.3%	2.9%	3.2%
SERVICES	55.7%	58.3%	51.7%	55.8%	50.5%	65.7%
Commerce	7.5%	5.4%	6.2%	8.6%	7.6%	10.0%
Transportation	3.8%	3.9%	4.8%	5.0%	2.1%	3.6%
Communications	1.3%	1.3%	1.3%	1.2%	1.3%	1.4%
Financial institutions	11.2%	9.6%	4.1%	6.4%	5.8%	8.4%
Public administ.	10.4%	9.6%	10.5%	11.6%	9.6%	13.2%
Rents	5.4%	11.4%	8.7%	7.4%	7.1%	8.4%
Other services	16.0%	17.1%	16.0%	15.7%	17.0%	20.7%

Source: National Accounts

III. INDUSTRIAL STRUCTURE AND DYNAMICS

1.10 The gradual erosion of Rio's industrial base has left a strong imprint on the structure of industry. More than 83 per cent of industrial output is produced by large firms that employ 4 per cent of the labor force in the sector (from data provided by FIRJAN). Four fifths of all workers are employed by small enterprises with the balance in medium sized companies. There are three worrisome trends. First the number of new entrants into the light manufacturing, engineering, electronics and metal working subsectors are few. Second, there is the marked absence of mid-sized firms. Rio lacks the industrial backbone of dynamic medium sized companies (as in Germany and Italy - See Rommel et.al 1995) that have risen from the ranks of small firms and serve as role models for others to emulate. Third, there is limited evidence of subcontracting relationships linking many of the smaller companies to the larger corporations.

1.11 New entrants bring ideas and technology into a subsector. They can spur competition, induce innovation and stimulate exports. When entry drops off to a trickle, specially into subsectors that have the potential for leading industrial growth, a municipality's industrial health is in peril. If few small firms are able to mature into medium-sized enterprises, the business environment is clearly unfavorable and sustaining a competitive industrial base becomes more difficult. Moreover, a system with a small number of capital intensive and relatively autonomous, large firms and few midsize companies might provide limited scope for networking and the exchange of information as well as technical assistance between firms. Industrial

composition also determines the scope for networking. The possibilities are greatest in electronics, and engineering industries. They are weakest in pharmaceuticals, petrochemicals, publishing and metallurgical industries. The shift in Rio's industrial structure towards capital intensive and mature process industries may be leading towards a less integrated and possibly, a less innovative industrial system.

1.12 Deindustrialization and shifts in industrial composition have begun taking their toll on exports from the metropolitan area. The available statistics collected by FIRJAN are somewhat deceptive because they also include goods from neighboring states transshipped through Rio. What this data shows is an increase in exports from \$1.45 billion in 1990 to a peak of \$2.30 billion in 1994, followed by a drop to \$1.88 billion in 1996. Conversations with local businessmen and administrators indicated little understanding of the importance of trade, an absence of information on exports generated within the municipality and the lack of interest in measures to promote exports. Even though trade liberalization has been ongoing for several years, an inward orientation remains deeply rooted in even Brazil's most cosmopolitan city. This attitude is reflected in the inattention of Cariocas towards the business world beyond the confines of the Region and the limited penetration of English in a city that is a center of both finance and tourism.

1.13 The scantiness of information on industry and trade highlights another aspect of the business environment in Rio: economic and social statistics are sketchy and the data at hand is outdated. In an era when the importance of current and accurate information is constantly reiterated and the significance of certain kinds of data for planning as well as decision-making is crucial, neither public nor private agencies collect and supply the kind of information that is viewed as a necessity in cities such as Singapore or Shanghai. For a city that is the center of publishing in Brazil and aspires to be a hub of finance and transport for the Region, Rio de Janeiro remains on the fringes of the Information Age. Nigel Harris has drawn pointed attention to the constraints imposed by inadequate information. "The city economy is unknown terrain for most city officials; they know little of the city's comparative advantages and disadvantages, so management can hardly be other than blind. A symbol of this blindness is the lack of an up-to-date regularly produced statistical yearbook for the city, and instrument both for the city's officials for promotion, and above all for the citizens to be effective participants. Hither to such information has not been at all important for running cities. However, decentralization within an open world economy implies that subnational levels of government acquire responsibilities that were formerly exclusively held by national governments, and correspondingly are required to begin to operate more like national governments - where the supply of information, monitoring and evaluating the performance of key sectors, becomes a critical factor in public action." (Harris 1997 p. 1702.)

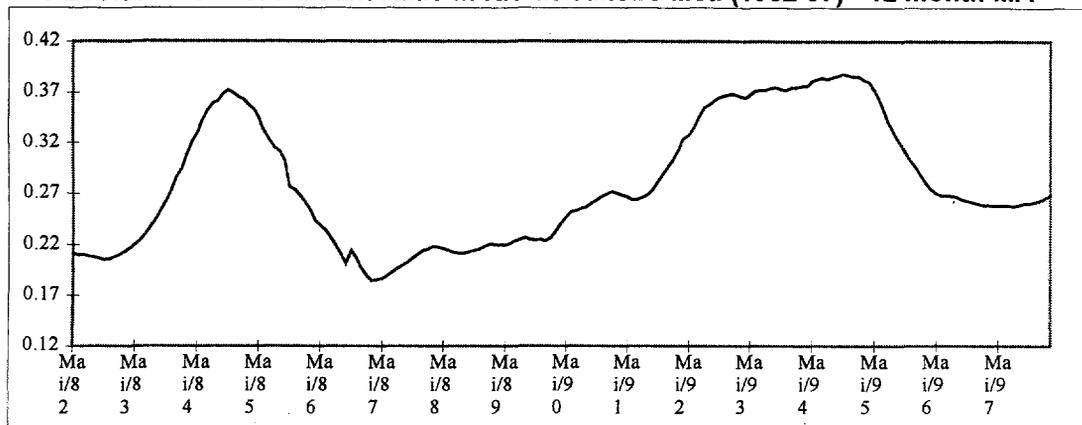
IV. SOCIAL AND PHYSICAL ENVIRONMENT

1.14 Although the 1980's were a difficult time for the municipality, living conditions as measured by a number of social indicators improved largely as a result of investments made in the previous decade. For instance infant mortality fell from 26.2 in 1985 to 21.8 in 1993. Literacy rose from 68 per cent in 1980 to 93 per cent in the early 1990's. Medical services became more widely accessible. During the last fifteen years at least, access to public services such as piped water, sewage, and garbage collection did improve substantially. However, poverty, income inequality and the numbers living in favelas or poor quality dwellings in suburbs distant from downtown areas all increased in the 1980s (See Box 1). Graph 1 shows two big inverted -U patterns in the head-Count ratio measure based on labor earnings during the last two decades: the first during the 1981-mid 84 recession when poverty rose from 20% in 1982 to 37% in 1985 and then fell to 17% in 1987. The second rise of poverty started in 1987, but increased during the

recession years of the Collor Government (1990-92) and because of inflation during the Itamar Franco years (1992-mid 94). Poverty reaches an all time high in 1994 when 37% of the population fell below the poverty line. The decline of poverty, that has occurred during the Real years (mid 1994-97) is relatively strong in Rio metropolitan region, the number of poor dropped to be low 20% during this period. Nevertheless, as of January 1998, the level of poverty found in Rio metropolitan area was above the average found for the six main Brazilian metropolitan regions (see Graph 2).

Graph 1

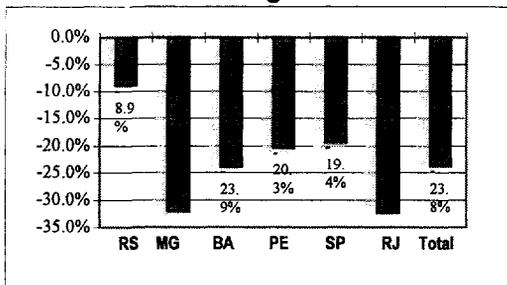
The Evolution of Head-Count Ratio in Rio de Janeiro Met. (1982-97) - 12 month MA



Source: PME

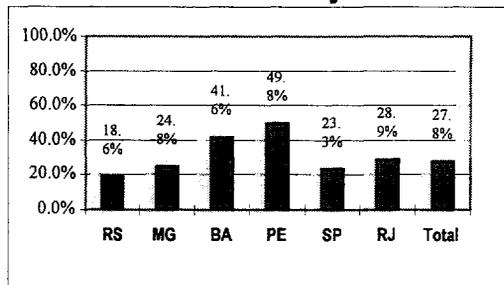
Graph 2

The Evolution of Head-Count Ratio in the Six Main Brazilian Metro Regions Rate of Change 1994-97



Graph 3

The Evolution of Head-Count Ratio in the Six Main Brazilian Metro Regions Level - January



BOX I

Rio's Favelas

No one who lives in Rio or visits the city, however fleetingly, can remain unaware of the numerous squatter settlements - favelas - which dot all parts of the city even the select neighborhoods such as Ipanema and Leblon. These shantytowns are homes for between one and two and a half million people (Leeds 1996). They are at the core of many of Rio's social problems, in particular crime and the distribution of cocaine. The very first favela dates back to 1898. It was built by veterans of the campaign against the mystic rebel Antonio Conselheiro (Pino 1997). The big surge in the numbers of favelas came in the 1940s when industrialization drive pulled thousands of migrants to Rio and precipitated an acute and persistent housing shortage. Instead of living in tenements, poor Cariocas occupied vacant land and built irregular dwellings. The continuing flow of new migrants through the 1970s led to a multiplication of favelas and periodic, bitter confrontations with the authorities who resisted such encroachments.

According to a 1991 survey there were 661 favelas in Rio housing close to a million people in about a quarter million

shacks. Needless to say, the population estimates are subject to a wide margin of error. Over the past fifty years favelas have become stable communities with a permanent population which now spans several generations. Many favela residents are employed by industry and services in the adjoining suburbs. Others are engaged in a variety of informal activities. However, a significant minority are engaged in drug dealings, robbery and kidnapping by way of organized criminal networks which the police have difficulty controlling because to a significant degree the favelas are a world unto themselves, a world not readily entered by the police.

Crime is not the only problem posed by the presence of favelas. Some of them occupy prime land in the richest localities while paying no taxes, others are perched precariously on hillsides and are responsible for deforestation and erosion. All are poorly provided with basic services. The inadequate access to education and health facilities is especially problematic and may explain the persistence of poverty traps.

Periodically federal, state and municipal authorities have attempted to root out some of the favelas and resettle the inhabitants (in the 1970s, in 1988, and in 1994-95) but with little success. Now there is a move to integrate these settlements with the rest of the municipalities and provide more of the essential services. The Favela-Bairro program is a part of this effort to improve the living conditions of the poor. Whether it will reduce crime, provide ladders out of poverty for favela residents and eventually broaden the tax base of the municipality, remains to be seen. The approach risks encouraging an upsurge in squatter settlements; the fiscal implications for the city are by no means positive; and it is difficult to determine whether crime and drug peddling will be curbed through such attempts at integration.

1.15 The Brazilian metropolitan average was 28%. Inequality as measured by the Gini coefficient deteriorated over the course of the 1980's from 0.58 in 1981 to 0.67 in 1989. At the end of the period Rio had the most unequal distribution of income of any metropolitan area in Brazil. The national average in 1985 was 0.59 (Cardoso and Helwege 1992). Economic recession forced more people into the informal sector. By 1987, this sector was absorbing almost a third of the active population in myriad, generally low paid services activities (Rio Municipality 1996). There was also an increasing spillover of the underemployed into crime and drug dealing (mainly cocaine imported from Bolivia, Peru and Colombia), a vocation that once embraced can become too rewarding to relinquish. The incidence of homicide, drug peddling and crimes against property all climbed rapidly in the 1980's (Leeds 1996). It was during this period that Rio acquired a certain notoriety worldwide for urban violence which not infrequently touched visiting tourists.

1.16 Fragmentary information for 1995-97 suggests that the rebound in metropolitan growth rates, combined with reduced net in-migration has led to a sharp decline in the number of people with incomes below the poverty line, as shown in Graph 1 and 2. Per capita income inequality has diminished alongside the national average as more people have found employment although the majority of new jobs are personal services and are relatively low paid. This might be a temporary respite. Unemployment has risen in Sao Paulo during 1996-97 and with the anticipated slowdown in economic activity during 1998-99, is likely to affect the job situation in Rio as well. Privatization of the Metro, the Gas Distribution Company, two distributors of electricity, (Light and CERJ and Coelba which raised \$6.76 billion), Banco Liberal CSN (Companhia Siderurgica Nacional, now controlled by Grupo Vicunha owned by the Steinbruch family, Economist January 17, 1998) and other entities will also lead to a reduction in the number of better paid, public sector jobs, although thus far, the privatization of Light has failed to improve service. (Economist February 14, 1998).

1.17 Prior to 1960, Rio derived considerable employment and other benefits from the presence of the Federal Government. Even after the capital moved to Brasilia, a significant fraction of Federal offices and

the head offices of major public entities remained in Rio. For example 20 per cent of staff of the Central Bank is in Rio and much of the armed forces are headquartered in the municipality. The Banco do Brazil maintains a sizable presence and BNDES (National Social and Economic Development Bank) plus eight of Brazil's twenty largest state-owned companies have their head offices in the city (Rio Municipality 1996). These entities provide the large flow of invisible earnings that partially compensate for the limited volume of merchandise exports originating in the city. A number of domestic and foreign corporations also have their headquarters in Rio. Collectively these companies are a major source of employment and their presence give some credence to Rio's claim to being a major regional center if not a World City in the sense of Friedman (1986). However, as its industrial base has diminished in relative terms, and industrial activities have shifted to other parts of the country, financial institutions have tended to move their staff and operations to Sao Paulo. In several instances, what remains behind in Rio is a much reduced presence. Investment and merchant banks still find it useful to maintain a large body of professionals in Rio, but for others a foothold or a representative office is enough. In the eyes of many in the financial community, Brazil's economic center is receding away from Rio and the attractions of the city are on the wane.

1.18 Environmental deterioration is a problem confronting all megacities and Rio is no exception. Water and air pollution is becoming serious, even though the city gets some relief from coastal breeze, and the small share of manufacturing activities contains the intensity of industrial pollution (World Bank 1996). The steady increase in the number of vehicles, which reached two million in 1996, has contributed to the deterioration of air quality. Vehicles generate Nox, ozone and VOCs (volatile organic compounds that are ozone precursors). Industrial sources contribute particulates and sulfur dioxide. In parts of the metropolitan area, especially those subject to thermal inversion between May and September, the health costs are very high. The discharge of largely untreated sewage and industrial waste, together with garbage runoff, has led to a sharp deterioration of the water quality in Guanabara Bay and is raising pollution levels in the coastal areas as well as in Sepetiba Bay (Tolosa 1996). The amenity and health costs of these trends are substantial. Declining environmental conditions, crime and poverty combine to reduce the attractions of Rio for high tech manufacturing, producer services and tourism.

V. MEDIUM-RUN TRENDS

1.19 Twenty years ago, Rio municipality had the highest per capita GDP in Brazil. Since then Sao Paulo has taken the lead and other cities are catching up. The literature on convergence suggests that the less developed parts of Brazil, which are now favored by industry and are the focus of infrastructure building, could register higher growth rates and gradually catch up with wealthier metropolitan areas such as Rio. However, Rio's human capital resources, its geographical location and early start in creating a diversified base of industry and financial services might yet enable the city to retain its lead and achieve growth rates that exceed the national average.

1.20 In the absence of a vigorous, outward oriented development strategy, Rio's longer run ability to reduce poverty and sustain a respectable rate of income growth are bleak. The municipality past economic performance was closely related to trends in the national economy. A tighter fiscal policy and high real interest rates are likely to constrain the increase in aggregate GDP during 1998-99 to about two per cent. This downturn in nationwide business activity might be partially offset by investment in the pharmaceutical subsector, the petrochemical complex and the development of Septaiba harbor. Privatization of some of the remaining public enterprises, such as TELERJ should help to raise efficiency as well as the quality of services, but it will entail a cut in jobs. CSN, the steel giant, has already slimmed its workforce and the Metro expects to decrease the number of employees by several thousand.

Furthermore, restructuring of the manufacturing sector triggered by a continuing liberalization of trade and takeovers by MNC's will eat into Rio's already narrowing industrial base. Even Sao Paolo, where the manufacturing sector is larger and more competitive, has absorbed a 14% cut in industrial sector jobs since 1996. If Rio's economy stagnates unemployment and poverty will deepen, these will worsen a social and physical environment that has only recently begun to show signs of recovery. The end result would be a further exodus of financial institutions and greater reluctance on the part of major corporations to maintain their headquarters in Rio or to invest in factories within the metropolitan area.

VI. RIO'S STRATEGIC OPTIONS

1.21 Rio's multipronged strategic plan adopted in mid 1996, reflects a widely perceived need for urgent action (Strategic Plan 1996). It is comprised of seven strategies with 21 objectives to be achieved in large part through the implementation of 159 projects. The scope and ambition of the Plan are impressive and the list of projects is certainly imposing. Our concern is with the absence of a clear framework and the necessary focus. Without these it is not obvious how the municipality can arrive at tangible results, given the administrative and financial resources at its disposal. We would define Rio's objectives more narrowly in terms of growth, employment generation and poverty reduction. Moreover, we would present the options in terms of four substrategies that are not mutually exclusive. Our sense is that the desirable approach would be a hybrid that combines all four substrategies. However, as we will argue, one of these substrategies dominates the other three and it is this strategy that is the key to the full realization of municipal goals. The four growth strategies are:

- infrastructure led;
- tourism led;
- business services led; and
- industry led.

1.22 It is the fourth that is critical to Rio's success as indicated by the experience of cities such as Singapore, Hong Kong and Seoul. We will briefly discuss the merits of the other three and then concentrate on defining the advantages and principal ingredients of a strategy that relies on the direct and indirect impetus provided by a clustering of dynamic industrial activities.

Infrastructure Led Growth

1.23 The quality and adequacy of urban infrastructure - transport, communication, power, water and sanitation - is often a weak point of many cities in industrializing countries. Investing in infrastructure can be a means of stimulating growth directly, of improving the quality of life and also making the municipal environment more conducive for business. Until the last few years, the causal link between infrastructure building and growth was not well established. However, recent research suggests that investment in infrastructure e.g. telecommunications or roads can spur growth (Canning 1997). Such investment has also been shown to raise the productive efficiency of manufacturing firms and to lower the costs of doing business (Morrison and Schwartz 1996 and World Bank 1996). In particular, communications technology has a vital role in promoting business activity and, increasingly, it is in a position to facilitate urban logistics. For instance the more widespread availability of telephones can lessen the growth in the number of vehicle

trips while new technologies, by simplifying the levying of road user charges and the distribution of traffic information, can avert the worsening of congestion.

1.24 Rio would certainly benefit from increased investment in water and sanitation infrastructure. Telecommunication facilities are weak and definitely require attention. In addition, a recent World Bank report (1996) has underscored the inefficiency of the port system, which adds 4-6 per cent to the cost of exports, thereby hindering the growth of trade. But, compared to many mega cities in developing countries, the quality of urban infrastructure in Rio municipality is reasonably adequate. The completion of the Yellow Line (a 21 km highway linking Barra da Tijuca with the rest of the road network) and the metro link to the Ipanema area, the concessioning of the Metro system, improvement in the service provided by Flumitrens (the State-owned suburban railway) and a closer integration of Flumitrens with the 150 bus lines in 30 terminals will facilitate the flow of traffic. These developments which are being assisted by the World Bank (1997) will make it easier for those living in the distant suburbs such as Baixada Fluminense to commute to jobs in the downtown areas (Bollinger and Ihlantfeldt 1997). It is the management of traffic and of the Metro that matters more than new investment. Likewise, the ongoing investment in port facilities in Sepetiba Bay will strengthen the physical infrastructure for trade. Whether this reduces the costs of shipping goods to the levels attained in the U.S. or Singapore or Argentina depends on the removal of restrictive practices, the efficient use of labor and the application of information technology to eliminate paperwork and to speed up container handling. Rio's telecommunications have benefited from the spread of cellular phones as well as the building of a teleport in a decayed part of the downtown area (Tolosa 1995). The planned privatization of TELERJ could substantially improve the quality of service with only a modest dose of investment.

1.25 From the perspective of industry, the infrastructure needs are or on the way to being met. Further investment, which could create jobs in the construction sector and ease constraints is likely to have limited impact on either growth or industrial productivity. A survey of the effects of public services and business location and economic growth in the U.S. found them to be fairly weak (Bartik 1991). This is not to deny the benefits of investment in water and sanitation for the quality of life, especially for the poor (Tolosa 1996). But such investment, which needs to be pursued, if the funds can be raised will do little to stimulate growth. It can only support a development of Rio municipality that is spearheaded by other sectors. And it can reverse the deterioration of the environment.

Tourism and Growth

1.26 The Plan Maravilha (1996) emphasizes the importance of tourism for the municipality and presents the case for a thorough overhaul of the industry. Such an overhaul is desirable but Rio's potential to attract many more tourists and to obtain a significant growth 'push' from the industry needs to be carefully assessed. At present, Brazil attracts some 1.8 million tourists annually (Financial Times, Survey Brazil, December 2, 1997). By comparison the Caribbean region is visited by 19 million tourists annually. London, which derives more than 7% of its GDP from tourism, receives 27 million visitors, half from overseas (Financial Times, October 25-26, 1997). New York pulls in nearly 31 million. In 1994, a total of 331 thousand foreign visitors came to Rio, and less than two million came by air from other parts of Brazil (this corresponds 30% of national tourists). The current level of tourist traffic is easily accommodated by the available supply of 19,000 classified hotel rooms and no new hotels are planned over the next three years.

1.27 The vast majority of Brazilian tourists, who come to Rio, spend no more than three days in the city. About two thirds of foreign visitors also spend three days or less and their daily average expenditure is a modest \$104. National tourist daily average expenditure is US\$33. Such visitors generate little revenue for the city. The long stay, high spending tourists are less likely to visit Rio in larger numbers for four reasons. First, the cost of hotel accommodation is high while service in even the priciest hotels does not match the levels of five star hotels in Bangkok, Hong Kong, Singapore and Kuala Lumpur. About two thirds of hotel beds are in the four to five star category and only a third in the one to three star category, when in fact the ratios should be the other way around. The number of large hotels belonging to the international chains is also limited. Smallness increases unit costs of inputs and services and the relative absence of the flagged hotels inhibits a certain category of tourists from visiting the city. Second, air travel to Rio is expensive because regulations, airport charges and fuel costs have limited charter traffic to 5% of the total as against 45-50% in Europe and the U.S. Third, for the long stay tourist, Rio has relatively little to offer. The beaches tend to be crowded and the coastal waters are increasingly polluted. There are few cultural attractions in the metropolitan area and no archaeological sites (as in Mexico and Central America) or old colonial cities in the near vicinity. The tract of virgin forest within the municipality, which could serve as draw for the nature tourists, has not been developed for this purpose (Rio Municipality 1996). Fourth, since the 1980's Rio has acquired a reputation in the tourist world as a city with a high incidence of crime. Any visitor, even one who remains in the exclusive Leblon and Ipanema beach areas is conscious of the favelas scattered over the hillsides and quickly becomes aware of the crime that these communities have made endemic in even the most select neighborhoods (Box I.).

1.28 More active overseas marketing (beyond what is done for the Carnival) plus a sustained effort to make the municipal environment more congenial for the long stay tourist could increase the flow of visitors as well as the volume of earnings. However, over the foreseeable future, the additional gains are likely to be marginal. Rio does not yet have the potential to join the ranks of major tourist destinations such as Paris, London or Hong Kong, and while tourism can be made to yield more income for the city, the tourist industry cannot be viewed as a potential leading sector.

Growth from Producer Services

1.29 The high value added services industry, which includes finance, insurance, real estate (FIRE) accounting, consulting, publishing, movie making and entertainment, can be important sources of growth and employment. These services are the lifeblood of cities such as New York and London, which over the past three decades have lost most of their industry to the distant suburbs or to other parts of the country. London for example, employed 800,000 workers in the business and financial services sector (Harris 1997). These so-called "world cities" owe their prosperity to the export of a large volume of services commanding high prices. World cities are financial and transport hubs on an international scale, and home to a large number of major MNCs, NGOs, intergovernmental organizations and powerful media corporations (Know 1997). In addition, there is a second rank of cities that not only depend upon the conventional range of producer services, but are important purveyors of education and medical services as well. Boston falls in this category, so does Singapore which has developed its hospital sector to meet the needs of wealthy East Asians for quality health care.

1.30 Cities that have established themselves as regional or international hubs for producer services are capitalizing on the growth in sales arising from the trend towards leaner organizations and the outsourcing of services by firms. This process, which is most noticeable in the U.S., is likely to spread more widely overseas, thereby stimulating demand for services. A second reason is the continuing appearance of new

products and services side by side with an ever finer division of labor. A third factor driving the growth of producer services is the appearance of capital intensive computer and telecommunications technology which makes it easier to supply suitably tailored services to more distant clients at lower costs (Harris 1997).

1.31 Producer service providers tend to concentrate in relatively few hubs because of agglomeration economies, the importance of reputation associated with particular centers, and for major providers, the advantages of scale and ease of transmission. Economic geography plays a large role in the emergence of a hub. A strategic location, historical accident, the accumulation of skills and the size of the industrial base all contribute. Strategic location in relation to the industrial base are arguably the most important. Hong Kong is a prime example of a city whose producer services arose in response to the needs of traders located in the territory, but now serve the entire Pearl River Delta Region and reach all parts of south-east Asia (See Box II).

BOX II

Hong Kong: From Light Manufacturing to Riches

For Lord Palmerston, the island of Hong Kong acquired through the Treaty of Nanjing in 1842, was little more than a barren rock sparsely populated by 15,000 fisherman and their families. But this rock, in defiance of all expectations, has achieved a per capita GDP of over \$22,000, which is greater than that of the U.K. Three facets of Hong Kong's development are noteworthy from the perspective of this study. The first phase of modern economic growth commenced in the early 1950s, propelled in large part by the influx of Chinese émigré industrialists. For close to twenty five years thereafter, Hong Kong's growth was driven by the production and export of light manufactures, which also contributed to the emergence of Hong Kong's harbor as one of the two busiest in the region.

From about the mid 1970s, and at an accelerating rate after China's "opening" in the late 1970s, Hong Kong's center of gravity shifted towards finance and producer services catering to the needs of southern China and of Southeast Asia. Restrictions imposed on the entry of migrants after 1981 were a key factor in the shift away from industry, as was the opening of China. By the early 1980s manufacturing, producer services and transport were the three pillars of Hong Kong's economy.

During the 1980s and through the mid 1990s a rising proportion of Hong Kong's manufacturing establishments transferred their operations to the Pearl Delta area with the result that close to 5 million Chinese workers in Southern Guangdong are linked to Hong Kong's industrial system. Even the smallest enterprise in Hong Kong has affiliates in the Delta region or elsewhere. More than a third of the soft goods industry, with an average workforce in Hong Kong of just 8 people per establishment, have a majority of their staff outside Hong Kong and more than 80 percent employ at least 20 per cent of their operatives outside the territory. This has prompted even small companies to acquire expertise in logistics, currency transactions, legal codes in trading partners, industrial standards and tax regimes. Thus, because of its strong, trade oriented manufacturing sector, Hong Kong has been able to diversify into a mix of specialized, high value services that satisfy industrial demands from throughout the area. Hong Kong now has "one of the world's largest communities of sourcing companies, traders, freight forwarders and trade financiers." Hong Kong's port handles the largest volume of container traffic in Asia and its airport ranks second in the volume of air cargo processed. The importance of manufacturing and trade, have in turn made Hong Kong the favored location for exhibitions, conferences and trade fairs.

None of this would have been possible if the city had not first created the manufacturing base, built up the skills needed to compete in the export markets and honed its capacity for the management of dispersed industrial activity. (See Enright et.al 1997)

1.32 Rio was Brazil's first industrial city and it has the advantages of an early start that were reinforced by its being the administrative center of the country. The city's hinterland, which extends by way of the Paraiba Valley to Sao Paolo, remains Brazil's industrial axis. Thus location wise, Rio de Janeiro's credentials as a service provider are strong. The presence of federal agencies and state owned enterprises is conspicuous. Several MNC's have their headquarters in Rio and a large number of financial institutions have maintained offices in the city. However, in the last nearly three decades the concentration of industry has shifted to the region around Sao Paolo. More recently, certain kinds of industry has migrated to Campinas, Sao Jose dos Campos, Belo Horizonte, Salvador, Curitiba and Porto Alegre. In other words, several new industrial centers have emerged mainly towards the south of Rio, and it is Sao Paolo with its diversified industrial base and rich hinterland which has become the regional hub. While not yet in the class of world cities, Sao Paolo is the preferred location for the service industry. Whether Rio can compete with Sao Paolo and build the high value added producer services sector to the point where it becomes one of the principal sources of municipal growth, will depend mainly on industrial development in the metropolitan area. It is the type and volume of producer services that will be the prime determinants of growth.

1.33 Rio already has a large and expanding services sector, but the majority of services - retail, personal, etc., are in the low value added category. They generate low paid jobs but are not a source of innovation and they give rise to few spillover benefits that would stimulate other sectors. Such activities also contribute little to the increase in total factor productivity (TFP) within the municipal economy. The trend in the Rio municipality has been away from high value producer services that parallels the shrinkage of the metropolitan industrial base. Looking ahead, privatization of public corporations and consolidation of financial sector entities will further trim the number of relatively well paid services sector jobs in Rio city and push more people into personal services or informal employment. The service sector, by virtue of its size, will continue to drive growth in Rio over the foreseeable future, but the changing mix of services, with an increase in the share of traditional services, means that productivity increase is likely to be minimal and this will limit the push imparted by the sector. Producer services could contribute significantly to Rio's economic performance as they do to the performance of Singapore, Hong Kong, Los Angeles, Tokyo, San Francisco and Miami, but only in conjunction with a revival of industrial and transport sector related activities.

An Industrial Strategy

1.34 As Williamson has observed "Industrial productivity is the main engine of city growth..... Where that engine sputters, city growth is slow." (Williamson 1992 p. 14.) For cities which have developed an industrial base and a supporting hinterland, making the engine stronger and keeping it humming smoothly depends on the macroeconomic environment, broadly defined, and creative management of the microecology.

1.35 There are five strands to the industrial strategy sketched below. First is the need for decent rates of aggregate growth, price stability and low real interest rates. These have proven elusive in the past, but the last two years provide grounds for hope and the ability to weather the East Asian crisis will critically influence the friendliness of the macro-environment for industrialization in Rio. Second, the city must look to its resource base and find ways of effectively utilizing the available stock of skills, the university infrastructure and the rich mix of producer services. Third, the growth of high-tech industry would be significantly aided by the arrival or emergence of a major international corporation, which would develop a local network of supplies and become the source of spinoff enterprises.

1.36 Fourth, a lowering of entry barriers to new firms, bringing in fresh technology and ideas, would be highly desirable development, as would be the growth of existing firms to fill a gap in the industrial system - which is the near absence of mid sized companies. Fifth, the spread of interfirm networking, with a few large corporations serving as nodes, assisted by municipal promotional schemes would be an important source of dynamism. A strengthening of the transport infrastructure would encourage firms to tap regional as well as international markets inculcating the outward orientation Rio based enterprises seem to lack.

1.37 Lastly, new firms might usefully adopt an “open systems” architecture, to minimize overheads, achieve flexibility and partake fully in the commerce of ideas. This is not the only recipe but it is an attractive one.

Macroframework

1.38 Dynamic industrial cities have special historical roots and an advantageous geographical location. In the case of both Miami and Los Angeles, (See Boxes III & IV) it was the concentration of military related activities during the Second World War and after that provided the spark, the concentration of skills, some of the infrastructure and the beginning of an industrial system. Geography, together with migration of labor and industry, did the rest. An explanation for the remarkable performance of Singapore (See Box V).

BOX III

Miami: A Triumph of Geography and Entrepreneurship

Miami is an example of a regional center oriented towards Latin America which has exploited its locational advantages to develop a dynamic metropolitan economy integrating light manufacturing, tourism, financial services and transport services. Together these four have provided the basis for robust growth since the late 1960s. Prior to 1940, Miami was a small city almost entirely dependent on tourism. During the Second World War, it became a major training area for the military which built up a network of airfields and roads. In the post war period, and especially during the 1960s and 1970s, Miami attracted emigrants from the North-east, from Cuba and other Central American countries. The Cuban community, with support from the US government, has proven to be highly entrepreneurial and was instrumental in establishing thousands of businesses. Cubans helped galvanize the local economy by building up the clothing industry drawing upon labor from the informal sector. They have also invested heavily in retail and trading services. The continuing rise of tourism, which is the second largest income earning activity for the state of Florida, has pushed the development of commercial real estate, the hotel industry and associated services.

The growth of Cuban businesses and tourism helped to make Miami the focus of financial activities for the Latin American region thereby inducing a large number of bank and non-bank intermediaries to set up their regional offices in the city. Tourism and producer services have jointly contributed to the emergence of Miami as an air transport hub and the home port for many of the cruise ships that ply the Caribbean. Passenger traffic has spurred the growth of cargo through Miami's airport with the result that this busy and sprawling establishment now provides direct or indirect employment for a fifth of Miami's workforce.

The case of Miami first draws attention to the role of the state in augmenting the attractions of a municipality by building roads and contributing to industrialization. Second, it highlights the significance of local entrepreneurship and the existence of business networking - in this case among the Cuban community. Third, it shows how a largely immigrant workforce, much of it subsisting in the informal sector, could supply the labor for the garments industry, construction, and some of the services of the tourist industry. Fourth, it underscores the importance of multiple and mutually reinforcing economic foci - finance, tourism and transport. Any one of these would have been insufficient as a source of economic vigor. Alongside manufacturing activities, the three together have enabled Miami to prosper over a period spanning three decades. (See for instance Stepick 1989).

BOX IV**Los Angeles: "America's Leading Third World City"**

Three factors have shaped the economy of Los Angeles since the early 1940s. One is the development of aerospace and research intensive, defense industries in response to a series of conflicts (World War II, Korea and Vietnam) and the Cold War. A second is the integration of the metropolis in the web of trade that has emerged around the Pacific Rim. The third is the wave of

Los Angeles is the largest port in the US. It is a center of the entertainment and communications industry (multimedia firms employ 133,000 people). The metropolitan region is well known for FIRE activities, medical facilities, consulting services and the quality of its universities. And its many theme parks attracts millions of tourists from elsewhere in the US as well as overseas. Each of these groups of activities are vital to the economy, but the interesting feature of metropolitan economy is the centrality of manufacturing. Until the early 1990s, defense related and electronic industries were paramount. These, especially the former, as well as the auto, steel, glass, tire and consumer durable subsectors, have since downsized but other manufacturing activities have continued thriving drawing selectively on the ethnically differentiated labor market. Korean émigrés dominate the garments and textiles business, the largest in the US with sales of \$10 billion. Mexicans are prominent in jewelry making, leather working and furniture (600 firms); while Asians are heavily represented in the labor intensive segments of the electronics assembly operations. More than 50,000 people work in the city's 1100 food processing firms with turnover of \$12 billion per year. There are 800 biomedical companies that provide jobs to 30,000 workers. Last but not least, there is the toy making industry, closely linked to producers on the other side of the Pacific, with over 100 companies actively engaged.

The important point to note is the axial nature of manufacturing now as well as in the past. And the diverse, labor intensive mix of activities that flourish in a World city located in the US (Soja and Scott 1996 and Economist May 31, 1997).

BOX V**Singapore: Geography, Governance, Efficiency and Skills**

Before it became a major center of manufacturing - in the 1970s - and of finance - in the 1980s - Singapore, by virtue of its location was one of Asia's greatest port cities. Initially it exported staples. Later it also acquired a large volume of trans-shipment business. Once industrial activities took root in the late 1960s, domestic manufacture augmented the flow of goods through Singapore's port.

Exceptional port facilities and a solid base of manufacturing activities provided the foundation for development over the past two decades. The commitment of the leadership, the quality of governance and the efficiency of regulatory agencies have brought the costs of doing business in Singapore to levels that are among the lowest in the world. These plus the labor skills that have been assiduously built up by the government, have attracted a vast amount of foreign investment into manufacturing, and financial services. Over 650 MNCs have manufacturing facilities on the island and many have invested in research centers as well.

Even though its labor costs are rising, Singapore expects to remain a fast growing economy drawing strength from diversification. Its ability to do so will depend on whether it can sustain or improve upon its past recipe for success: a supremely effective and dedicated administration, a transport and communications infrastructure that is a model of efficiency, and the progressive upgrading of research and technical skills that will allow Singapore to attract high value added activities seeking a politically stable, clean and safe environment. (Huff 1994, Sisodia 1992) and Hong Kong must start with certain historical events and trace the course of change through the complex geo-politics of the region, while fully acknowledging the significance of location. However, these success stories and others have occurred within a macroeconomic context and the crucible of macroeconomic trends is a critical determinant of metropolitan level outcomes.

1.39 For the large industrial cities, which are integrated with the national economy, (such as New York) overall GDP growth paces economic activity within the city (See Box VI).

BOX VI
New York City and the National Economy

Since the 1960s, employment, personal incomes, wages and salaries and GDP growth in the New York metropolitan region have tracked movements at the national level, with the integration tightening in the 1990s. However, regional shocks, in particular the decline in defense related employment in Long Island and Connecticut, triggered the recession in the 1990s although the slow recovery was because of sluggish national growth in the early part of the decade. Interestingly, employment suffered more during the 1990s than did incomes and wages, which points to the attractiveness of goods and services produced in the Region.

Three factors contributing to New York's future health and its ability to absorb shocks are:

- the higher productivity associated with density of jobs and industrial agglomeration
- the diverse nature of the services industry which reduces its susceptibility to a decline in demand for some services. The rapid change in product mix also helps.
- improved fiscal health, lower rates of crime and better public services. This is attracting business back to New York further stimulating tourism and encouraging an expansion of the hotel industry.

(Netzor 1997, McCarthy and Steindel 1997, US News and World Report September 29, 1997).

Hence in most instances, the expansion of urban economies will track the national GDP, with declining cities trailing behind and the more vibrant centers leading the pack. Rio is no exception. During the 1980's, stagnation of the municipal economy mirrored the problems of the country. The revival of the Brazilian economy in the 1990's has in turn brought prosperity to Rio.

1.40 Stability is close behind growth as a factor influencing performance. In this respect, Brazil's record was dismal from the late 1970's through the early 1990's. It has only improved in the last three years. High and variable rates of inflation, combined with steep real rates of interest discouraged investment, for all the well known reasons, might have depressed domestic savings and dampened financial development. The ratio of M2 to GDP in Brazil is only ____ percent which is low given the country's \$4800 per capita income. Price instability may have accelerated the decline of producer services in Rio and contributed to the flight of industry to other cities with lower costs and more flexible labor markets. (see Table 3).

1.41 Throughout the 1980's and into the 1990's economic conditions in Brazil discouraged foreign investors. Most foreign capital went elsewhere. This affected industrial investment, and it reduced technology transfer. It meant that foreign companies spent less money on establishing or expanding regional offices in cities such as Rio and in setting up research facilities that could draw upon the rich pool of scientific talent to be found in the municipality. Other cities also suffered, but arguably Rio suffered more, in part because of its troubled social environment. The rekindling of interest on the part of foreign investors since 1992 has sharply increased the flow of FDI. It reached \$9 billion in 1996 before climbing to \$17 billion in 1997, second only to China among the emerging economies. This surge in foreign capital, which has infused capital into Rio's economy, is a result of greater economic stability, perceived opportunities in industries such as automobiles and the governments privatization policy. But as we will argue below, much more could be achieved in the industrial sector.

1.42 Brazil's merchandise exports in 1997 were just \$49 billion and the share of trade to GDP was 6 percent. This is small relative to other economies of comparable size and reflects a protectionist development strategy that is only now being relaxed. Until 1991 the weighted average nominal tariff rate was 27%. Non-tariff and regulatory barriers as well as transport charges added to the protection enjoyed by local producers. Since then nominal tariffs have been lowered to 11.5%, some of the non-tariff barriers are being removed and an effort underway to do away with restrictive practices that are mainly responsible for the high port charges (World Bank, 1996). But damage has been done and valuable time lost. Much Brazilian industry is inefficient and has difficulty competing against foreign producers. Large firms are family owned (265 of the top 300 fall into this category), overly diversified and their financial management is uneven (Financial Times Survey June 10, 1997). The stripping away of trade restrictions is imperiling the textiles, clothing, footwear, leather goods, toy and engineering industries in which East Asian producers have a pronounced lead. A lead that will only be lengthened by the depreciation of their currencies during 1997-98. It is hollowing out the light, labor intensive industries in the large cities that had, so far, managed to absorb the high labor costs. Some of Rio's traditional subsectors, for example clothing, leather and footwear are a fraction of their former size. They have not been replaced by new, high tech manufacturers, although software production is beginning to flourish. But the informal sector has not so far spawned the type of industrial activity that flourishes in the cities of Third (northern) Italy.

1.43 Trade liberalization in Brazil means the start of a new industrial era. It offers an opportunity for a new round of industrial development, that draws strength from accumulated skills and supplements domestic resources with foreign capital. For Rio, outward oriented industrialization might be the only avenue for accelerating growth, augmenting its producer services and ameliorating its social problems. It will be a difficult process, but the alternatives to a strong industrial push offer fewer rewards and may not even be viable if the deindustrialization is not reversed.

1.44 Industrial trends in urban Brazil carry the imprint of restrictive labor practices that limit the flexibility of labor markets, non wage social security costs that are borne disproportionately by the employer and a complex, and a burdensome tax regime that adds to the cost of doing business. Each of these are discussed in a recent Bank report (World Bank 1996) and legislation introduced by the government in 1997, if passed, should ease each of these constraints. Fiscal issues, specifically relating to Rio, while also of importance are beyond the scope of this report. The points to be emphasized here are first, that labor costs and labor market flexibility are crucial to industrial dynamism, especially at a time when urban centers are making a transition to a new industrial regime. Average Labor Costs in Rio are lower than in Sao Paulo and Porto Alegre, R\$530 as against 696 and 544 during 1997, while average years of completed years of schooling is higher. Second, the tax system, and in particular, the future shape of fiscal federalism in Brazil will powerfully influence the level of revenue effort in Rio municipality, the overall supply of resources available to the city and the incentives which the city authorities can offer investors in the form of lower taxes and the quality of urban services.

1.45 These are some of the macroeconomic parameters that Brazilian cities must contend with in defining their industrial strategies. By virtue of its size and its integration with the rest of the economy, Rio is probably more susceptible to national trends than some of the smaller industrial centers to the south. Labor market institutions might also be more firmly entrenched for reasons that Mancur Olson has described in another context (Olson 1982). Hence, Rio might need to try harder in order to pull well ahead of national average. In other words, the microecology of the industrial sector may require radical change if the sector is to generate the kind of performance that will raise municipal growth rates at least two per cent points over the national level.

The Microecology of a Successful Industrial System

1.46 Rio de Janeiro's per capita GDP is half that of Singapore and about the level of Seoul. The literacy rate is about 90 per cent, which is similar to that of Kuala Lumpur and a few notches lower than in Korea. Unemployment is low in all three cities - in the three per cent range but rising - but the informal sector in Rio is larger and absorbs possibly a third of the labor force, a significant proportion of which might be under-employed. Even though the growth of the workforce in Rio during 1990-97 was less than one per cent, the supply of labor might be fairly elastic because of the numbers in the informal sector, rising participation among women and the likelihood that public sector bodies will be shedding thousands of workers in the coming years.

Rio's four substantial assets are:

- the volume of its scientific and technical manpower, its tertiary education system, the largest in Brazil, and the breadth of its research establishment;

BOX VII

THE SIZE AND QUALITY OF RIO DE JANEIRO UNIVERSITIES

Nationwide data reveals that high-level education institutions consume nearly half of the federal budget devoted to education. In 1994 there were 851 institutions of high level education in Brazil. Of these; 15% were Universities, 10% were School Federations and Colleges; and 75% were Isolated institutions. Together these consume nearly half of the Federal budget for education. As shown in the table below in Rio de Janeiro State during 1995, there were 101 of high-level education institutions, 75% concentrated at the metropolitan region: 16% Universities, 22% School Federations and Colleges and 63% Isolated institutions. There is a relative concentration in Brazil and especially in Rio de Janeiro in the area of Applied Social Sciences: nearly half of Rio's undergraduate students were enrolled in the area of Management, Law and Economics. Three fourths of the high-level education institutions in Rio State are private. This statistic contrast with nearly 90% São Paulo State.

TABLE

SUPERIOR DEGREE INSTITUTIONS AND REGISTRATIONS FROM GRADUATE, ACCORDING TO THE NATURE OF INSTITUTION ACCORDING TO THE GOVERNMENT REGIONS AND MUNICIPAL DISTRICT RIO DE JANEIRO STATE - 1995

	Institutions				Registrations			
	Total	Univer- sities	Federation of Schools and Integrated Faculties	Isolated Establishment	Total	Univer- sities	Federation of Schools and Integrated Faculties	Isolated Establishment
State	101	16	22	63	204,868	128,820	39,551	36,497
Metropolitan Region	76	15	17	44	181,987	124,383	30,477	27,127
Rio de Janeiro	60	10	14	36	138,898	88,320	26,711	23,867
Belford Roxo	2	-	1	1	1,708	-	1,708	-
Duque de Caxias	2	1	-	1	6,540	5,322	-	1,218
Itaboraí	1	-	-	1	158	-	-	158
Itaguaí	1	1	-	-	4,867	4,867	-	-
Nilópolis	1	-	-	1	639	-	-	639
Niterói	6	1	2	3	19,952	16,798	2,058	1,096
Nova Iguaçu	2	1	-	1	3,793	3,644	-	149
São Gonçalo	1	1	-	-	5,432	5,432	-	-

Source: Ministério da Educação e do Desporto - MEC, Serviço de Estatística da Educação e Cultura - SEEC.

The main Universities in Rio city are: Universidade Federal do Rio de Janeiro (UFRJ), Universidade Federal Fluminense (UFF), Universidade Federal Rural do Rio de Janeiro (UFRRJ), Universidade do Estado do Rio de Janeiro (UERJ), Instituto Militar de Engenharia (IME) and Pontifícia Universidade Católica do Rio de Janeiro (PUC-RJ). Public universities provide a series of social services to the nearby communities. In particular, Federal university hospitals play a central role in the city health system.

Besides the support of federal agencies such as CAPES and CNPq, local FAPERJ (Rio de Janeiro State Foundation for Research Support - Fundação de Amparo à Pesquisa do Estado do Rio de Janeiro) provided a total of 6 thousands scholarships in 1995 for high level education institutions. From these 28% were for undergraduate training in the services, 25% for project support and 24% to post-graduate studies.

There are two main, high-level education quality indicators available in Brazil: the National Courses Examination (Exame Nacional de Cursos), known as *Provão* (big test) and the Capes post-Graduate schools ranking.

Provão – Once a year undergraduate students are compulsorily enrolled in the National Courses Examination as a condition to attain the diploma. Grades range from A to E. The main purpose of the *Provão* is to evaluate undergraduate courses. Courses that get D or E in two consecutive years, face an academic inspection by MEC and may be closed. The *Ministry of Education (MEC)* in 1996 first applied the *Provão* in the areas of Civil Engineering, Law and Business. Each new year three new courses are incorporated into the *Provão*: during 1997, Chemical Engineering, Veterinary and Odontology were added to the *Provão*. The results of the *Provão* showed that most of tertiary level institutions in Rio are of a poor quality, especially private institutions. From 93 courses evaluated 23 accomplished grades A or B.

Synthetic Quality Indexes - Schwartzman (1996) provides a ranking of Brazilian Universities constructing synthetic quality indexes from Capes Graduate studies evaluation and other statistics such as number of graduate and undergraduate students, number of professors with different weights for different degrees attained (Undergraduate level, Ph.D. etc), The relative results obtained in Rio were qualitatively similar to those obtained from the *Provão*. The Public Universities performed better in terms both of undergraduate and graduate studies, qualification of professors and research. In the national ranking two of Rio de Janeiro Institutions are in the top five: PUC-Rio and UFRJ, in fourth and fifth places respectively.

- the existence of a broad range of producer services to assist industry, the presence of five industrial incubators (**SEE BOX VIII**) a new port in Sepetiba bay (**SEE BOX IX**) and a large modern airport;

BOX VIII MICRO-ENTERPRISES INCUBATORS IN RIO DE JANEIRO

The enterprise incubator is an environment specially designed for the development embryonic enterprises over a 3 to 5 year period. The activities developed are of a technological nature benefiting from the interaction with universities and research institutes. The perception of the potential role to be played by enterprises incubators date back to the successful experience in Silicon Valley in the 1950s. But it was not until the second half of the 1980s that the creation of incubators around the world became widespread.

Besides Rio municipality five other institutions are directly involved in supporting incubators located in the city. These are: SEBRAE/RJ, FIRJAN, CNPq, FAPERJ and Rio de Janeiro Commercial Association. There is today five incubators operating in Rio municipality:

BIO-RIO - aims at consolidating micro-enterprises and technological projects in the area of biotechnology and related sectors. BIO-RIO also seeks to enhance the link between science and manufacturing activities besides providing administrative services such as imports management and financial management

CEFET/RJ – hosts micro-enterprises in the area of telecommunications, computers, electronics and high precision mechanics. By providing support in technical, administrative and commercial areas, CEFET/RJ enhances the access to markets and reduces financial risks of the newborn enterprises.

IEBTec (RIO DE JANEIRO STATE UNIVERSITY POLITÉCHNIC INSTITUTE)-Provides physical facilities and technical services for the rise and consolidation of innovative micro-enterprises in the center-north region of Rio de Janeiro, transforming technological knowledge into benefits to society

PUC-RJ (Rio de Janeiro Catholic University) has two incubators:

Gênese – aims at stimulating new, technology intensive enterprises derived from research and development activities conducted by the university students and professors.

InfoGene - is an incubator in the info area which promotes the creation of new enterprises with an university background that will be able to improve Rio's competitiveness in domestic and international markets for software, services and information.

COPPE-UFRJ – Pioneering the creation of institutional mechanisms of interaction with the rest of society. COPPE allows the transformation of results from new research into new business, creating employment opportunities and incubating modern entrepreneurial attitudes in the municipal economy. Under the auspices CNPq, FINEP, and Rio de Janeiro Municipality, the small enterprises can stay in the incubator up to five years periods.

BOX IX

THE PORT OF SEPETIBA

Once it has been completed, Sepetiba Port will have some of the most modern facilities in the world. It will provide access to raw materials and supplies from any region of the country or overseas, besides serving as a low-cost point for the distribution of output to the other regions of MERCOSUR as well as to foreign markets.

The port will have a ship channel with a depth of 18.5 meters, sufficient for operations with vessels of over 150,000 deadweight tons. This port could enable Rio to become the Logistic Center of Mercosur, providing clear advantages to companies that decide to get established here.

The Federal Government, through BNDES - Development Bank - allocated the amount of US\$150 million to Company Docas of Rio de Janeiro in order to dredge 22Km of the entry channel, building and maintenance of railroads access and to create the basic infrastructure including electrical energy and water (see also Financial Times September 7, 1997 on the Santos Port of Sao Paolo).

- a moderately diversified industrial base in the metropolitan area (rather than in the municipality proper) and a long tradition of manufacturing that can serve as the basis for new kinds of manufacturing networks; and
- a reputation for design in clothing and jewelry as well as worldwide name recognition that could underpin a marketing drive for products manufactured in the city. Each of these can contribute materially to industrial change that could sustain rapid growth. To define the nature of such change we will assemble a synthetic model that stitches together the experience of several cities around the world in a manner that is meaningful for Rio.

1.47 We start with the type of industry. There are five criteria that might guide industrial decision. First, the desirable industrial options are ones that allow Rio to achieve international competitiveness after a fairly short learning period at prevailing wage rates and enjoy good market prospects for a decade and more into the future. Second, a point related to the first, the subsectors must offer good prospects for innovation and for earning quasi rents drawing upon the research base that can be developed in Rio. To put it differently, the industry should register a healthy growth in TFP well into the future. This would lessen the attractiveness of certain subsectors where the entry barriers related to basic research, are exceedingly high. Some segments of the pharmaceuticals industry, chemicals, and new materials are likely to pose problems for a new entrant. Enos et. al (1997) after examining 10,000 interfirm technology partnering agreements worldwide observe that "some sectors such as biotechnology, new materials and subfields of information technology were almost completely closed to the developing countries. Given that these core technologies constitute many future technological developments affecting manufacturing and services, it will be increasingly difficult for developing countries to acquire comparative advantage."

1.48 Third, the mature capital intensive industries, such as petrochemicals, and iron and steel are amenable to turnkey construction. Once debugged, the operating rules are relatively well-codified. And servicing can be contracted out to the equipment suppliers or to specialist firms. Such industries, because they are mature, generate modest profits, spawn few linkages, and in the case of petrochemicals, create few jobs direct or indirect. However, they can be a source of industrial diversity as, for instance, in the case of Shanghai which has numerous downstream industries induced by the iron and steel subsector. But the externalities, if any, are less apparent in Rio, where the shipbuilding industry has died out, auto assembly and consumer durable production is non-existent and the construction industry operating on a limited scale.

1.49 Fourth, a broad industrial base reduces a regions' susceptibility to fluctuation in demand for particular products. Diversity also enables an area to branch out in many new directions and strengthens growth prospects. In fact, research in the U.S. suggests that most industries are only marginally concentrated and where this does happen it is often because of natural advantages (Ellison and Glaeser 1997). However, the evidence of agglomeration economies is reasonably firm and it points to the advantages of a high concentration of firms from interlinked subsectors. Examples of such 'synergistic' concentrations are the textiles and associated engineering firms in Tuscany, manufacturers of ceramic tiles in Emilia - Romagna, electronics producers in the Silicon Valley area and in Singapore, and companies that produce consumer electronics in the Tokyo area (Costello and Evans). An industry that can give rise to an integrated system is more likely to benefit from locational economies with the associated prospects of sustained growth. The automobile subsector satisfies all the requirements but is unlikely to take root in the Rio metropolitan area because the current focii of development is farther to the south. The industry has a strong preference for greenfield sites in some of the less industrialized cities (e.g. in Parana), where the labor market is more flexible.

1.50 Fifth and finally, trade oriented industries have better growth prospects and may register higher rates of TFP growth. It is very probable that industries fitting the other four criteria will be able to sell their products in the domestic market, in the MERCOSUR region and eventually on the world market.

a. Large Firm Spinoffs, Networking and Industrial Districts

1.51 As noted above for certain kinds of industries, concentration is good long-run economics. The "new economic geography," which is associated with the work of Paul Krugman, has again drawn attention to the localized clustering of the fastest growing industries. The first and most important step is the arrival of one or a few companies that emerge as major players in an industry. Once these are established on the industrial landscape, the area becomes associated with a kind of activity. This pulls in other firms that broaden and deepen the subsectoral base, in the process inducing agglomeration economies that draws the industry into a virtuous spiral. The most desirable outcome is a dynamic, internationally competitive industry with a worldwide reputation. Agglomeration economies come in two forms: localization economies or urbanization economies (Jacobs externalities). The first refers to the accumulation of knowledge in a closely connected set of specialized firms, who fully exploit scale economies. By congregating together in a compact area, the firms minimize transport costs and can depend on Just-in-Time delivery (JIT). Clustering encourages information exchange on high-tech activities and has the added advantage of lessening urban congestion as well as land rental costs (see Box VIII). (Henderson 1997 and Netzer 1997). Urbanization economies are the product of the cultural variety and social interaction at many levels that can be found in a large and diverse metropolitan region. The possibility of realizing Jacob's externalities attracts high fashion apparel, up-scale publishing, advertising and media services. Rio already possesses the industrial tradition and the environment conducive to both kinds of externalities. What it lacks are the industrial drivers which were responsible for putting Silicon Valley and parts of northern Italy on the road to prosperity. It is hard to minimize the importance of a key firm or firms that then spawn many other competitors and pull in numerous suppliers, parts producer and service facilities. A couple of famous examples must suffice. The beginning of the electronics industry in Silicon Valley can be traced to the founding of Fairchild Semiconductor by eight engineers who were previously employed by Shockley Semiconductor. One of these eight, Bob Noyce, subsequently left Fairchild to establish Intel. Other firms that emerged in the area at around the same time were Hewlett-Packard, Varian Associates and Litton Engineering Laboratories. These companies were responsible for the unique culture of Silicon

Valley, and it was their former employees who created most of the firms whose names are associated with the success of the area - firms such as Sun Microsystems, Connor Peripherals, Cypress Semi conductor, Cirrus Logic and Maxim Integrated Products (Saxenian 1994, Audretsch 1997).

1.52 The Friuli region in the north-east corner of Third Italy, a center of silk production since the thirteenth century, provides a second example. A hundred years ago, cotton and silk spinning factories were established in the area and textiles remained the main industrial activity through the 1940's. In the mid 1950's the owner of a small wire factory, Andrea Pittini collaborated with eight other small producers to acquire a tract of land in order to set up a complex of metal working enterprises that drew on imported technology. For his factory, Pittini assembled a workforce not just from northern Italy, but also from France, Germany and Belgium. "The social capital of his company, included more than just workers and technicians, it amounted to a vast network of fellow steel industry entrepreneurs, clients and suppliers and politicians. In the course of the expansion and diversification of his industrial group, Pittini played an active role in numerous national and European wide organizations and helped found an association to promote electrowelded mesh" (Baker 1996). Pittini was one of the major forces sparking and leading industrial development in the region. A handful of other firms also played important roles. These were Zanussi, Danieli and Funtoni. Zanussi, which grew to become one of the largest producer of TV's and white goods in Italy, contributed significantly to the strengthening of specialized engineering companies in Third Italy thereby sealing its reputation in consumer durables.

1.53 Recent industrial arrivals to the Rio metropolitan area such as (Smith Kline Beecham and Glaxo) are giant MNC's with an interest in setting up a production facility in Brazil, but with no medium run plans of transferring research laboratories or regional offices to Rio. The likelihood of spinoff's from these capital intensive facilities is quite small, and, given the nature of the pharmaceutical industry, the appearance of a network of suppliers is unlikely. What Rio needs are one or two major companies, which could serve as nodes of specialized industrial networks with substantial capability to export. One of the tasks for the municipality is to either draw in such firms from outside the area or to make it possible for local companies to play a lead role.

1.54 The quality of Rio's labor force will be one of the critical factors influencing the course of industrial development, the level of technology and the pace of growth. As noted earlier, from the labor market perspective Rio has three advantages. The supply of technical and scientific manpower is large by Brazilian standards because of the many universities and technical institutes in the municipality (Rio 1996) although the quality could be improved. Second, the city has a sizable pool of unskilled workers, many of whom currently hold jobs in the informal sector or have low paid service occupations. Several industries, that could be expected to flourish in the municipality, have labor intensive segments that could utilize the unskilled workers currently engaged in informal activities. Fashion garments, leather goods and jewelry all require sizable labor inputs and to function efficiently under dispersed production arrangements. Interestingly, these subsectors are important employers in the Los Angeles metropolitan area, and garments is one of the few industries that continues to thrive in New York City. Less well known is the labor intensity of the electronics subsector. This industry depends on an array of assembly services conducted on a batch production basis by unskilled workers. The tasks include the attaching of electronic components to circuit boards, wire-wrapping, cable harnessing, chasis assembly and testing. (Scott 1992). Third, Rio has leftover skills and traditions from four industries now in retreat: apparel, engineering, footwear and shipbuilding. These can be harnessed for a fresh round of industrialization. But if the recovery is long delayed a decay of skills and a migration of workers will erode the base that remains.

BOX VIII
HIGASHIOSAKA, JAPAN

The city of Higashiosaka located in the Kansai Region of Japan close to Osaka, offers an example of how a high wage region can carve out a niche for 9,000 small and medium firms in a tiny and seemingly unimportant industrial corner. Higashiosaka is one of the foremost producers of nuts and bolts for users with large but exacting requirements such as the ship building industry, nuclear plants and the petrochemical sector. Even as costs have risen, the small, usually family owned companies in the area have stayed a step ahead and held on to their markets through innovations and implacable attention to quality as well as delivery. (Financial Times Kansai Survey, October 8, 1997).

1.55 These advantages are partially offset by two characteristics of municipal labor market. One of these is shared by other major cities in Brazil. This is the cost of labor in the formal sector stemming from high non-wage payments for social security, unemployment insurance and other allowances. Together these almost double the base wage rate. A more troublesome feature of the labor market is the ubiquity of restrictive practices that make it difficult for employers to deploy their labor flexibly. Laying off workers in response to cyclical downswings is nearly impossible. And the well organized labor force is strongly wedded to customary practices and not easily persuaded to change. These tendencies are typical of mature labor markets in older industrial cities, where a large proportion of the active population is employed by government bodies or public enterprises.

1.56 Analysis by the World Bank (World Bank, 1996) suggests that non-wage costs might not be too burdensome for employers. But restrictive practices, that significantly reduce market flexibility, are a serious drawback. Although direct labor costs in most industries are now relatively low - well below 20 per cent - the expansion of existing industries and any substantial influx of new industries will be critically dependent on the perceptions of potential employers about total wage costs, the quality of workers, and labor relations. Potential entrants, whether Brazilian or foreign, are in a position to choose from among a number of destinations. The preference for greenfield sites around cities, where there is little industry, is grounded in labor market considerations. Employers are looking for workers with some education, who can be easily trained, but are unencumbered by the baggage of past experience and entrenched work rules. Modern production methods increasingly rely on flexible manufacturing systems (FMS) to realize economies of scope and maximize utilization of equipment; on total quality management (TQM) to ensure that products are defect free; and the use of Just-in-Time (JIT) scheduling practices to conserve on inventory and lessen the clutter on the work floor. To yield acceptable results all of these assume a level of training of the workers, a willingness to accept a degree of responsibility, to take initiative and to undertake multiple tasks (MacCormack et.al 1994). One of the reasons why so many manufacturing activities have gravitated to the cities close to Mexico's border with the U.S. is because managers are seeking flexible production arrangements and want to hire people with "few preconceptions about industrial organization" (Shaiken 1994, p. 43).

1.57 Rio has an image. New industry will approach the city with preconceptions about the labor force. These must be altered. How they change will depend on the experience of newly privatized companies and of firms that have recently established facilities in the municipality. Rio's longer run industrial prospects would be appreciably improved if labor leaders, businessmen and administrators work together to transform the labor market in the city, thereby enhancing its competitiveness with respect to other cities.

1.58 The arrival or emergence of a few large companies in dynamic, fast growing industrial subsectors would provide a major boost to economic activity in the metropolitan area. However, the gains in

production, in employment and in TFP will come mainly from the entry and expansion of new enterprises. Casual empiricism suggests that new entry is proceeding on a limited scale. The few firms in the medium sized category operating within the municipal area points both to problems with entry and to constraints on the growth of enterprises. A large company(s), which gave rise to many spinoffs, which served to induce concentration of a particular industry and helped bring into existence a network of suppliers, could provide the start of a virtuous spiral. But the continuation of the spiral would depend upon the evolution of the SME sector.

1.59 Research in the U.S. shows that entry by small firms is greatest during the upswing of the business cycle. Furthermore, entry is promoted in industries where smaller enterprises are in a position to introduce process or product innovations. Audretsch observes "that new firm start-ups are shaped by the underlying knowledge conditions in an industry – new firm start-ups tend to be lower in industries that are best characterized by the routinized regime -- that is where the overall innovation rate of the industry is high, but the small firm innovation rate is low. On the other hand, new firm start-ups tend to be greater in industries that are best characterized by the entrepreneurial regime, where for any given level of innovative output the small firm innovation rate is particularly high." (Audretsch 1996, p. 62). Other research on several emerging economies, notes the role of new entrants in introducing the latest technology and equipment into an industry (Roberts and Tybout 1997). Although these firms are initially at a disadvantage in terms of productivity with established firms, if they are able to survive for a year or two, they can pull ahead of the incumbents. New entrants, who can overcome the initial teething difficulties, are also more likely to grasp export opportunities, thereby increasing the prospects for growth. The evidence on this is somewhat equivocal, but export oriented, mid-sized firms make a greater effort to absorb technology and to be competitive.

1.60 For Rio, electronics or engineering industries would offer much better longer run opportunities and they might be the sectors to cultivate. However, fashion garments, jewelry and leather goods industries are already present in the municipality and entry into these subsectors could impart growth momentum. The jewelry business enjoys a considerable standing because of the success of H. Stern and Co. What Rio needs are many more firms of equivalent caliber and an international reputation as a manufacturer of jewelry comparable to Amsterdam or Tel Aviv. The craft skills can be broadened, the constraint might be one of Entrepreneurship, design and marketing.

1.61 Fashion garments and leather goods serve a local and at best a domestic market. Outside Brazil the Rio based industries are unknown. The shortcomings of these subsectors are traceable to quality, design, materials, and cost. These are industries in need of a revolution in technology and in networking. They need to be rejuvenated by entrepreneurs with wider horizons and the ambition to enter the international markets for luxury items. H. Stern and company provides a local role model. But imitators in Rio could draw lessons from Hong Kong, Milan and New York, which are home to numerous small enterprises who live and breathe the air of high fashion.

1.62 Entry by entrepreneurial new enterprises, which introduce ideas and technology, is fraught with difficulty even in the U.S. Smaller American companies have to contend with regulatory requirements, health insurance for employees, the need to acquire expensive employment practices liability insurance to survive in a notoriously litigious society and the impenetrable nature of the tax code. (Economist December 13, 1997). In other parts of the world, Rio included, access to raw materials, machinery, assistance with managerial and technical skills, marketing and, of course capital present hurdles for smaller firms (Acs and Audretsch, 1993 p. 219). The registration and licensing requirements a potential

new entrant must fulfill in Rio municipality can involve six months of red tape and a exhausting paper trail. Credit is expensive, technological spillovers from the research establishment are few and industrial networking is not the developed art form it is in Third Italy.

1.63 Some entry barriers such as registration and regulatory requirements can be solved by determined administrative or legislative action. Certain other barriers related to marketing, information gathering, debugging and servicing equipment and replenishing inventory are being brought down by the access to Internet. This is especially advantageous for small businesses for whom the transaction costs are burdensome. The Apparel Exchange provides on-line sourcing service to 26,000 textile companies. Suppliers bids can be dealt with over the net and subcontractors can obtain detailed design information through this expansive medium of communication (Financial Times July 16, 1997). Other hurdles relating to technology, networking and capital will require sustained collective effort by business and the municipality. We turn to these below.

b. Technology Intensive New Starts

1.64 Traditional light industries seeking to move upscale into high value added segments and the newer high tech industries, draw extensively on research findings embodied in equipment or in products and processes, through technical assistance, by way of publications and through word of mouth. From the perspective of Rio, the most important source of research of industrial relevance is likely to be the city's vast university establishment. MNC's, another possible source, have not played a notable role in transferring technology to a broad range of enterprises in emerging economies or for that matter in Brazil (Enos et.al 1997). The assistance they provide usually takes the form of design provisions and quality control to their subcontractors (Battat et al. 1996).

1.65 Universities that have deliberately cultivated research related industrial contacts are responsible for several major innovative milieu in the vicinity of cities. Stanford University, which triggered the electronics industry boom in Santa Clara Valley, with its Industrial Park, is the most famous example. More recently the Universities of Chicago and of Illinois - Urbana- Champaign are responsible for the multiplication of information technology and software firms. Chicago now has the fourth largest number of information technology jobs. (US News and World Report, February 9, 1998). There are others as well: Cambridge University, MIT, Ecole National des Mines - responsible for the birth of Sophia-Antipolis - and Taipei's two main universities with linkages to Hsinchu Science Park. Proximity to a great university does not always yield industrial results. Oxford, and the University of Moscow have had no perceptible impact on local industry. (Castells and Hall 1994). However, when a university is able to engage in relevant industrial research and in collaboration with the municipality is able to induce entrepreneurial activity, the results can be far-reaching, especially for those activities where new knowledge has a large role. Virtually all the biotechnology firms in the U.S. were formed by scientists from universities and research institutes. Audretsch notes that university research is a key input into innovative activity by small enterprises and university graduates are among the principal vectors disseminating research findings to industry. Furthermore, university research is directly related to innovative activity in the surrounding metropolitan area and it indirectly influences the tempo of private R & D (Anselin et.al 1997).

1.66 Rio's university and research system is the largest in Brazil (Rio 1996). Now with the five incubator facilities, the entry barriers for university researchers trying to establish industrial facilities have been lowered. But, as noted above, Rio needs a few important trailblazers, who inculcate a business outlook among researchers, encourage many more young scientists to work in the industrial field and

attract the interest of financiers in Rio, in Sao Paolo and other parts of the Region. It is hard to deliberately engineer the success stories that are responsible for Silicon Valley size reputations. Much of it is a matter of luck. However, the municipality can play an active hand in building business networks strengthening the infrastructure and easing financial constraints.

1.67 Most new business initiatives are financed from the resources of the entrepreneur supplemented in many instances by those of other family members or business associates. This is the case the world over and it certainly reduces the number of new entrants, especially into the riskier, high tech areas. In countries, such as Brazil, where rates of saving are low (about 15% of GDP) funding, and especially venture capital for innovative activities, can be even more scarce. Unfortunately, the supply of venture capital is limited outside of the U.S. and 45% of all venture capital available in the world is managed within a ten mile radius of Sand Hill Road in Silicon Valley (Asian Business Review October 1977). The U.S. experience, which has relevance for Rio, suggests that the most effective venture capitalists are local financiers with an interest in and knowledge of a particular industry. Such individuals are not only prepared to put in their money, they are prepared to assist the entrepreneur starting a new business with contacts, and guidance on marketing management and financial planning. If these local capitalists thrive, it draws in venture capitalists from other cities and encourages pension funds, insurance companies and investment banks to try their hand at such financing, often in collaboration with knowledgeable locals. The growth of this activity can be self reinforcing. But it needs early successes, to attract interest to a mode of financing, to build confidence and to generate momentum. Rio has the wealth, the pool of savvy people the broad institutional base and a milieu in which innovation would be encouraged. For all these ingredients to come together and start an economic chain reaction may require a research cum industrial focus and possibly some municipal pump priming of both R & D as well as investment by new firms.

1.68 Attempts to induce innovative business activity has led to a large number of schemes being tried worldwide. A few could be adapted to Rio's circumstances and resource availability. For example:

- a) Israel has launched an industrial research consortia plan (Magnet) that provides grants to groups composed of at least two industrial corporations and an academic institution. The research supported by the government must meet certain criteria regarding commercial worth and the entities involved must demonstrate the capacity to do the research as well as develop and market the product. If the consortia passes the test, grants are extended to cover 66% of the cost of research. Academic institutions receive 80% of their costs from the Government the and the remainder from participating companies. (Oxford Analytica, August 26, 1996).
- b) In Modena, Italy, a local consortia comprised of 3500 small and medium sized firms have introduced a Guarantee System for credits obtained by the members. Each firm in the consortia pays a membership fee that goes to the fund and is supplemented by contributions from the municipal regional and provincial governments. A committee comprised of local entrepreneurs screens applications from member businesses. If a project is accepted, the associated loan application is forwarded to a commercial bank with a partial guarantee for the loan. (Schmitz & Musyck 1994 p. 892).
- c) The Landeskredit Bank in Baden-Wurtttemberg, Germany is a public institution that provides subsidized credit to companies that intend to introduce new products and processes or new technology intensive enterprises.

- d) Argentina is planning to introduce a number of schemes to raise the level of research and the technology intensity of small firms. A \$20 million credit line will be established for local or foreign companies that undertake to do research or contract with research institutes. Credit certificates would be allocated for each project accounting for up to 50% of its value. They would help generate private financing. The certificates themselves would offset income tax liabilities (Oxford Analytica October 20, 1997).
- e) A separate scheme, also in Argentina, would pay for half of the costs of technical advisers hired by SME's to solve their technical problems and enable them to introduce new technology. The advisers would work under the supervision of participating specialists drawn from local universities and research institutes (Oxford Analytica, October 20, 1997).
- f) Singapore's Institute of Standards and Industrial Research (SISIR) assists firms to absorb new technology through a wide variety of services provided by its own staff and affiliated universities as well as research centers. Its incubator scheme gives small and medium enterprises access to space, equipment and technical advice. SISIR charges firms for its services although the availability of government financing allows it to provide some subsidy. The China Productivity Center in Taiwan (China) offers technical assistance and a range of teaching courses of relevance to its SMI clientele. (Battat et al. 1996).

c. Strengthening Transport Infrastructure

1.69 A dynamic, export oriented, industrial Rio will need a logistics capability to match a 21st century business system. One of the municipality's current weaknesses is an inefficient port. This will be remedied by 2000 when the physical infrastructure of the new port at Sepetiba Bay is in place, restrictive labor practices abolished, port charges reduced and cargo clearance procedures simplified (**SEE BOX VII**). Progress has been made in all these areas and Rio can become competitive. Telecommunications facilities are inadequate and must be upgraded to give Rio's industry and the financial sector the services required by a world class city. An expanding cell phone network is providing some relief. The completion of a Teleport will also improve business access. But the real change will occur once TELERJ has been privatized and the new operator has put in the necessary investment. Finding a buyer(s) for TELERJ is an urgent next step as modernizing and expanding the network might take 2-3 years.

1.70 For Rio to realize the full potential of its new port and to derive the benefits of a regional hub, road and rail links with hinterland and neighboring cities must be improved. Road connections and truck based services are adequate although crime is a hindrance, with about \$320 million worth of goods being stolen in transit (Financial Times, October 8, 1997). It is the railway system which looms as a constraint. Only a small percentage of Brazil's freight is shipped by rail, which raises transport costs because rail shipment of bulk cargo is far cheaper. Expanding the rail network and increasing its efficiency is a matter of priority. Rio municipality must exhort the State and Federal governments to act. The business sector should add its voice as it stands to gain the most from a lowering of transport charges.

1.71 The pursuit of a high tech industrial base, a robust producer services sector and a lucrative tourist business will increase the demand for air services. The facilities of Galeao Airport (and of the Santos Dumont shuttle airport) are already utilized to the full. In 1996, Galeao handled 4.1 million passengers and Santos 2.4 million. A substantial expansion of existing capacity would yield many advantages. Miami's international airport is a major asset for finance, industry and tourism in the area aside from being one of

the biggest employers. A larger, user friendly airport would reinforce other actions dealing with logistics and with industrial development in general (See Box III).

d. Future Industrialization Through Open Systems

1.72 So far we have described some of the pillars of economic prosperity, but the future success of Rio's industrial economy will also require a capstone. Rio's industry old and new will have to build dynamic networks in the form of open systems so that the full resources, specialized skills and inventiveness of many firms can be made to work together in mutually reinforcing collectivities. The open systems model is one of several forms of industrial organizations that might be consciously adopted, and arguably, it is the one most suited to Rio's existing industrial base, skill mix, research infrastructure and wage levels. As we indicated earlier, there is scope for certain kinds of low wage, labor intensive activities in clothing, and electronics. These might attract their share of start-ups, but only as adjuncts to a core of higher value added activities. Core industries must be competitive, initially in the domestic market, but soon thereafter on the international plane. Competitiveness can be on grounds of cost, quality, delivery and service. If this is achieved, the industry can survive and make normal profits. But rapid growth calls for competitiveness in the sphere of innovation - the ability to introduce new products with regularity, products that reflect associated progress in manufacturing technology. It is this kind of competitiveness, with its focus on market trends, close interaction with clients, speed of response, product development and effective marketing of new items, that can derive from open systems.

1.73 There are several features of open systems conducive to efficiency and innovativeness. First an open networked structure blurs the distinction between large and small firms. In fact, the norm of such an organization is the medium or small size business. Even large companies either divide into a number of autonomous, interlinked units thereby, bringing the market into the midst of the firm, or they transform themselves into virtual companies that concentrate on a core activity in which they can derive the greatest added value and subcontract all their other needs to specialized firms. The stem company be it NIKE or Benetton or Sun Microsystems designs the product, collaboratively with its supplier, defines specifications for the items it needs and encourages its associated business as well as others to bid for contracts. This stratagem allows the stem company to remain small and to concentrate on market research, product development, and strategy. There are large savings in managerial costs and overheads, labor relations are enormously simplified and with proper inducement, product development can be a collective effort which taps the capabilities of numerous suppliers.

1.74 Second, an open systems arrangement, encourages new entry, promotes the specialization of firms and builds subsectoral depth. New entry brings with it ideas, technology and entrepreneurial dynamism. Firms compete against each other, but can also derive benefit from a sharing of knowledge by way of social or business networks, information centers or the circulation of employees. The mobility of engineers and skilled personnel within the US semi-conductor industry is critical to the diffusion of production knowledge.

1.75 Third, a flexible industrial structure that draws strength from business and social networking is well positioned to benefit from information technology and is likely to nurture many small, fruitful, joint research activities. The incremental refinement of existing products and steady emergence of new products requires such knowledge augmenting interaction all along the production chain. (Irwin and Klenow 1994). The advantages of collaborative manufacturing, mutual assistance and joint development of products have

been noted for industries ranging from metal working, to textiles, furniture and food products (Appold 1995).

1.76 Fourth, networking builds trust which can be the basis for an agreement on technical standards and certification requirements. It also reduces transaction costs because the necessity for drafting formal contracts or maintaining a large force of lawyers diminishes (Saxenian 1994). As a networked industry acquires a reputation for quality, innovation and export success, all the members gain from greater access to capital from banks as well as venture capitalists.

1.77 There is no recipe for bringing successful open systems into existence. However, the experience of manufacturers in Tuscany and Lombardy in Italy, Denmark, Baden-Wurtemberg in Germany and elsewhere offers a few clues. First, the formation of business associations that work closely with the municipal administration is a definite plus. This arrangement can reduce red tape. It can improve the quality of the services that are of the greatest importance for businesses. Associations can pool their resources to organize private fairs (e.g. leather goods producers in Lombardy, Italy) give specialized technical assistance (e.g. Danish food processors use the services of professional chefs) and to advertise their products nationally and worldwide.

1.78 Second, a jointly sponsored center like CITER was remarkably effective in allowing the knitwear industry of Emilia Romagna (Italy) sustain its competitiveness in the 1980's and 1990's. Established in 1980 with the help of public funds, CITER is now largely financed by the private businesses. Its small staff of ten and lengthy roster of consultants have provided member companies with invaluable guidance in the areas of fashion forecasting and international market trends. It informs artisans about the prices and nature of available yarns. It offers technical services to small firms that face difficulty adapting new technology. And it has played a key role in introducing CAD/CAM techniques (Humphrey and Schmitz 1996). In part, because of CITER's contribution, Carpi is now the richest city in one of the most affluent regions of Europe.

1.79 Third, a point already stressed above, there are clear advantages to be gained from the presence of a large company that champions open systems and, in the style of Hewlett-Packard, embeds a social environment conducive to informal networking. Referring to firms such as Asea-Brown Boveri, NIKE and Benetton, the Economist observed that "judged in terms of their core work, [these] firms are small local operations; judged in terms of contract workers, however, they are sprawling multinationals. Indeed organizations like this are not so much single entities as fluid networks, adding value by coordinating activities across geographical and corporate boundaries. In other words the best firms are both "big" and "small", depending on what they are doing. Size it appears is all in the mind" (June 11, 1994, page 66).

1.80 Fourth, as is being attempted in the U.S. (Harvard Business School, Wharton, Columbia, University of Missouri, Financial Times, September 8, 1997), business schools can enable small urban entrepreneurs to set up firms by providing three critical inputs which often constrain the emergence of new businesses. These are: banking, and other contacts with buyers and/or suppliers; advice on marketing; and assistance with financial and accounting services. By lowering these hurdles, Rio's business schools could not only create a potentially profitable sideline for themselves but also stimulate new entrants. Local community development corporations with a little help from the Municipality could also contribute to this effort. (Urban Age, Winter 1998) as could unconventional venture capital organizations modelled along the lines of Ashoka (Atlantic, January 1998).

1.81 A very small number of firms conforming to this type - even a single major company - would push Rio into a higher industrial orbit. Other actions would also be needed, but a few industrial leaders that quicken innovation and induce the culture of networking would move the industrial sector a long way forward.

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Rio: Prospects and Strategy

STATISTICAL APPENDIX

1- POPULATION SIZE

RIO DE JANEIRO

	1940	1950	1960	1970	1980	1991	1996(*)
State	3,611,998	4,674,645	6,709,891	8,994,802	11,291,520	12,807,706	13,316,455
Metropolitan Region	2,221,527	3,181,629	4,874,619	6,891,621	8,772,265	9,814,674	10,117,733
Rio de Janeiro	1,764,141	2,377,451	3,307,163	4,251,918	5,090,700	5,480,768	5,533,011
Belford Roxo	6,149	23,750	73,178	173,272	282,428	360,714	393,520
Duque de Caxias	29,613	92,459	243,819	431,397	575,814	667,821	712,370
Guapimirim	3,774	7,026	8,631	14,467	23,188	28,001	32,482
Itaboraí	24,370	30,228	41,739	65,912	114,540	162,742	158,631
Itaguaí	8,429	21,817	34,416	55,839	90,133	113,057	69,961
Japeri	3,315	8,630	21,594	36,386	56,334	65,723	66,427
Magé	19,627	29,735	50,445	98,556	143,414	163,733	180,550
Mangaratiba	7,880	10,787	12,655	12,338	13,845	17,925	19,690
Mericaé	18,892	18,976	19,468	23,664	32,618	46,545	60,268
Nitópolis	22,341	46,406	96,563	128,011	151,588	158,092	155,190
Niterói	146,414	188,309	245,467	324,246	397,123	436,155	450,129
Nove Iguaçu	38,960	103,125	240,275	455,017	661,789	772,442	801,036
Paracambi	8,699	10,968	15,611	25,368	30,319	36,427	38,844
Queimados	3,733	9,944	24,317	62,465	94,264	98,825	108,531
São Gonçalo	85,521	127,276	247,754	430,271	615,352	779,832	827,967
São João de Meriti	39,569	76,462	191,734	302,394	388,826	425,772	433,713

Sources: Fundação Instituto Brasileiro de Geografia e Estatística - IBGE, Censos Demográficos.

(*) Estimate

2 - DEMOGRAPHIC INDICATORS I

	1980/1991			1991/1994		
	average Geometric Growth Rate annual (%)	Net Migration Rate (%)	vegetative Growth Rate (%)	average Geometric Growth Rate annual (%)	Net Migration Rate (%)	Rate of Growth vegetative (%)
State	1.15	-0.39	1.54	1.06	-0.19	1.25
Metropolitan Region	1.03	-0.44	1.47	0.96	-0.28	1.23
Rio de Janeiro	0.67	-0.60	1.28	0.64	-0.41	1.06
Duque de Caxias	1.36	-1.07	2.43	1.24	-0.37	1.61
Itaboraí	3.24	1.73	1.52	2.62	1.31	1.32
Itaguaí	2.08	0.35	1.73	1.81	0.23	1.58
Magé	1.29	-0.30	1.58	1.18	-0.60	1.78
Mangaratiba	2.38	0.59	1.79	2.03	0.74	1.29
Maricá	3.29	1.51	1.78	2.65	0.98	1.67
Nilópolis	0.38	-1.38	1.77	0.37	-0.87	1.24
Niterói	0.86	-0.77	1.63	0.81	-0.31	1.12
Nova Iguaçu	1.56	0.08	1.48	1.40	-0.17	1.57
Paracambi	1.68	-0.29	1.97	1.50	0.06	1.44
São Gonçalo	2.18	0.62	1.56	1.88	0.66	1.23
São João de Meriti	0.60	-1.26	1.86	0.57	-1.20	1.77

Source: Fundação Centro de Informações e Dados do Rio de Janeiro - CIDE.

Employment by Sector of Activity - 91

RIO DE JANEIRO

	Total	Mining	Industry	Construction	Commerce	Services	Public Sector	Agriculture and Cattle breeding	Other
State	159,137	486	18,820	4,954	55,890	56,227	5,584	2,182	14,531
Metropolitan Region	123,174	238	13,980	3,480	41,635	46,216	4,476	1,458	11,331
Rio de Janeiro	92,432	118	9,805	2,733	28,718	37,323	3,896	1,208	8,631
Duque de Caxias	4,657	5	922	114	1,847	1,336	59	13	361
Itaboraí	903	5	159	31	394	186	15	11	102
Itaguaí	806	52	64	21	338	224	13	15	79
Magé	991	9	134	19	485	230	11	32	71
Mangaratiba	199	2	5	6	58	95	5	5	23
Maricá	425	6	49	7	183	111	4	13	52
Nilópolis	956	-	99	22	458	268	23	7	79
Niterói	8,231	5	634	270	2,954	3,065	305	106	892
Nova Iguaçu	5,550	26	725	107	2,551	1,580	83	22	456
Paracambi	250	3	32	3	121	64	4	1	22
São Gonçalo	4,467	7	736	81	2,078	1,124	39	19	383
São João de Meriti	2,927	-	616	46	1,450	610	19	6	180

Sources: MTB - RAJS 91 e CIDE

METROPOLITAN REGION - RIO DE JANEIRO
Employees by Sector of Activity

Activity	1981	1985	1990	1995
Agriculture	46214	57561	64021	40180
Industry	699916	668968	841605	632553
construction	316905	313336	312324	320297
Commerce	454249	73443	727780	660681
Services	815970	551049	1214342	1162370
Other Auxiliary Services	151240	1059361	244723	287002
Other atividades	1061673	1225571	1439210	1262813
TOTAL	3546167	4162502	4844005	4365896

Source : PNAD

Employees Attained By Years of Schooling

	1981	1985	1990
Total	3546167	4162502	846306
Illiterate or less than 1 year	282263	308247	145631
1 to 4 years	1066195	1089202	242011
5 to 8 years	1119797	1361706	207689
9 or more	1059544	1398963	250549

Source: PNAD

	1995
Total	8 604 361
Illiterate or less than 1 year	631 981
1 to 3 years	1 369 005
4 to 7 years	2 875 204
8 to 10 years	1 495 862
11 to 14 years	1 533 747
15 or more	685 934

Source: PNAD

**EMPLOYMENT COMPOSITION BY SECTOR OF ACTIVITY AND YEARS OF SCHOOLING
METROPOLITAN REGION - RIO DE JANEIRO**

1985

	Manufactur	Mining	Construction	Commerce	Services	Public Sector	Other
0 Years	3.82	8.79	17.39	4.84	9.04	1.23	16.54
0 to 4 Years	24.07	13.29	39.81	22.45	26.39	8.50	32.08
4 to 8 Years	26.96	8.64	23.15	23.88	20.92	13.24	20.32
8 a 12 Years	35.51	34.50	14.22	41.90	29.98	45.78	23.82
12 Years +	9.65	34.79	5.43	6.94	13.67	31.26	7.24

1990

	Manufacture	Mining	Construction	Commerce	Services	Public Sector	Other
0 Years	3.32	4.89	17.24	4.51	7.38	0.96	13.10
0 to 4 Years	19.20	12.16	37.16	18.25	21.92	6.75	30.06
4 to 8 Years	27.08	11.33	24.84	25.22	21.88	11.80	21.87
8 a 12 Years	39.42	29.73	16.15	43.09	33.65	45.04	26.93
12 Years +	10.97	41.89	4.60	8.94	15.17	35.45	8.04

1996

	Manufacture	Mining	Construction	Commerce	Services	Public Sector	Other
0 Years	2.56	3.11	11.07	2.74	4.28	0.88	9.39
0 to 4 Years	16.89	7.14	32.60	15.42	18.24	5.85	27.24
4 to 8 Years	23.82	4.95	27.34	22.40	19.33	8.47	21.30
8 a 12 Years	44.22	39.38	21.84	48.73	39.60	45.54	33.20
12 Years +	12.51	45.42	7.14	10.71	18.54	39.27	8.87

Migration
Resident Population Native and Non Native
Rio de Janeiro State - 1995

Gender and Age Groups	Total	Native of Municipal District		Non native of Municipal District			
		Total	always lived in Mun. District	Total	Native of Municipal District		
					Total	Always live in State	Not Native of State
Total	13,324,242	8,935,116	8,278,970	4,389,126	1,928,890	1,828,761	2,460,236
0 a 4 years	1,035,069	980,753	964,372	54,316	40,770	40,770	13,546
5 a 9 years	1,090,259	986,690	957,910	103,569	75,756	74,427	27,813
10 a 14 years	1,275,416	1,108,289	1,051,448	167,127	124,258	121,602	42,869
15 a 19 years	1,283,825	1,036,148	963,321	247,677	162,104	157,365	85,573
15 a 17 years	806,936	659,786	617,263	147,150	94,557	93,426	52,593
18 e 19 years	476,889	376,362	346,058	100,527	67,547	63,939	32,980
20 a 24 years	1,139,057	852,330	802,363	286,727	159,904	150,721	127,823
25 a 29 years	1,028,950	682,466	629,822	346,484	169,021	161,543	178,463
30 a 34 years	1,092,827	687,845	620,394	404,982	189,867	178,651	215,115
35 a 39 years	1,005,817	601,668	532,266	404,149	173,948	163,484	230,201
40 a 44 years	960,473	525,959	460,165	434,514	176,581	165,743	257,933
45 a 49 years	807,790	383,698	337,619	424,092	159,206	150,645	264,886
50 a 54 years	626,031	276,035	240,759	349,996	120,468	109,972	229,528
55 a 59 years	541,349	232,514	206,439	308,835	113,855	106,033	194,980
60 a 64 years	468,741	192,857	169,783	275,884	89,209	81,815	186,675
65 a 69 years	406,081	171,140	149,412	234,941	79,110	75,306	155,831
70 years or more	561,983	216,150	192,323	345,833	96,833	91,684	249,000
age unknown	574	574	574	-	-	-	-
Male	6,345,082	4,340,443	4,047,619	2,004,639	915,628	886,007	1,088,011
0 a 4 years	511,769	486,399	482,038	25,370	20,991	20,991	4,379
5 a 9 years	564,917	515,410	501,700	49,507	36,551	35,796	12,956
10 a 14 years	669,710	578,692	548,730	91,018	67,584	65,682	23,434
15 a 19 years	646,209	528,364	493,268	117,845	78,585	76,126	39,260
15 a 17 years	401,714	334,691	312,567	67,023	43,195	42,441	23,828
18 e 19 years	244,495	193,673	180,701	50,822	35,390	33,685	15,432
20 a 24 years	562,245	431,249	411,783	130,996	72,811	68,809	58,185
25 a 29 years	491,573	330,664	306,081	160,909	79,238	76,565	81,671
30 a 34 years	523,462	330,556	298,332	192,906	87,178	82,062	105,728
35 a 39 years	445,702	269,308	240,477	176,394	85,507	80,571	90,887
40 a 44 years	433,762	232,935	206,269	200,827	92,606	85,195	108,221
45 a 49 years	379,055	179,760	156,345	199,295	73,604	70,373	125,691
50 a 54 years	278,872	126,585	111,514	152,287	55,856	50,329	96,431
55 a 59 years	246,058	103,450	93,561	142,608	53,230	51,131	89,378
60 a 64 years	216,011	79,996	69,124	136,015	43,635	39,274	92,380
65 a 69 years	164,945	73,532	63,431	91,413	29,535	27,633	61,878
70 years or more	210,218	72,969	64,392	137,249	38,717	35,470	98,532
age unknown	574	574	574	-	-	-	-
Female	6,979,160	4,594,673	4,231,351	2,384,487	1,013,262	963,754	1,371,225
0 a 4 years	523,300	494,354	482,334	28,946	19,779	19,779	9,167
5 a 9 years	525,342	471,280	456,210	54,062	39,205	38,631	14,857
10 a 14 years	605,706	529,597	502,718	76,109	56,674	55,920	19,435
15 a 19 years	637,616	507,784	470,053	129,832	83,519	81,239	46,313
15 a 17 years	405,222	325,095	304,696	80,127	51,362	50,985	28,765
18 e 19 years	232,394	182,689	165,357	49,705	32,157	30,254	17,548
20 a 24 years	576,812	421,081	390,580	155,731	86,093	81,912	69,638
25 a 29 years	537,377	351,802	323,741	185,575	88,783	84,978	96,792
30 a 34 years	569,365	357,289	322,062	212,076	102,689	96,589	109,387
35 a 39 years	560,115	332,360	291,789	227,755	88,441	82,913	139,314
40 a 44 years	526,711	293,024	253,896	233,687	83,975	80,548	149,712
45 a 49 years	428,735	203,938	181,274	224,797	85,602	80,272	139,195
50 a 54 years	347,159	149,450	129,245	197,709	64,612	59,643	133,097
55 a 59 years	295,291	129,064	112,878	166,227	60,625	54,902	105,602
60 a 64 years	252,730	112,861	100,659	139,869	45,574	42,541	94,295
65 a 69 years	241,136	97,608	85,981	143,528	49,575	47,673	93,953
70 years or more	351,765	143,181	127,931	208,584	58,116	56,214	150,468

Source: Fundação Instituto Brasileiro de Geografia e Estatística - IBGE, Pesquisa Nacional por Amostra de Domicílios - PNAD.

METROPOLITAN GDP

	1980 (Cr\$)	1990 (106 Cr\$)	1991 (106 Cr\$)	1992 (109 Cr\$)	1993 (106 Cr\$)	1994 (103 R\$)
State	1,654,708	3,902,334	20,819,902	210,888	4,642,377	42,192,884
Metropolitan region	1,374,342	3,213,884	17,254,259	173,821	3,786,885	34,976,915
Rio de Janeiro	1,041,616	2,352,182	12,789,989	126,933	2,781,330	25,720,505
Duque de Caxias	97,400	248,794	1,291,103	14,180	286,953	2,384,302
Niterói	63,415	108,649	677,423	7,247	166,886	1,858,740
Nova Iguaçu	69,317	236,652	1,161,493	11,836	247,141	2,059,025
São Gonçalo	42,286	101,993	557,601	5,783	116,263	1,032,391
Other	60,308	165,593	776,651	7,643	187,311	1,921,953

Sources: Secretaria de Estado de Fazenda, Fundação Instituto Brasileiro de Geografia e Estatística - IBGE e Fundação Centro de Informações e Dados do Rio de Janeiro - CIDE.

PER CAPITA GDP

	1980 (Cr\$)	1990 (Cr\$)	1991 (Cr\$)	1992 (Cr\$)	1993 (Cr\$)	1994 (R\$)
State	0.1465	308,001	1,609,961	16,273,434	354,830,231	3,191
Metropolitan Region	0.1567	330,651	1,758,024	17,520,999	378,433,887	3,463
Rio de Janeiro	0.2046	431,965	2,333,613	23,010,760	500,988,087	4,604
Duque de Caxias	0.1692	377,272	1,933,306	20,970,943	419,185,079	3,441
Niterói	0.1597	251,150	1,553,171	16,480,672	376,504,144	4,160
Nova Iguaçu	0.0633	184,992	895,037	8,982,673	185,180,625	1,522
São Gonçalo	0.0687	133,345	715,027	7,276,376	143,581,513	1,252
Other	0.0604	145,473	674,004	6,553,354	158,702,842	1,609

Sources: Secretaria de Estado de Fazenda, Fundação Instituto Brasileiro de Geografia e Estatística - IBGE e Fundação Centro de Informações e Dados do Rio de Janeiro - CIDE.

GDP BY SECTORS OF ACTIVITY - 1980

	Total	Agriculture and Cattle breeding	Industry				Total	Commerce	Services		Public Sector
			Total	Manufacturing	Construction	Industrial Services of Public Utility			Transport and TeleCom.	Rent	
State	1,654,708.00	24,391.59	885,482.99	407,489.43	136,388.86	41,602.72	1,044,836.08	191,388.88	70,096.99	134,428.80	197,373.00
Metropolitan Region	1,374,341.83	4,372.79	461,488.12	312,612.72	104,668.89	34,219.88	918,488.82	166,288.42	82,823.88	128,486.34	182,868.88
Rio de Janeiro	1,041,615.91	1,642.07	325,851.42	242,417.26	61,163.89	22,270.18	714,122.42	120,702.58	44,466.97	94,158.32	117,362.16
Duque de Caxias	97,399.87	114.11	37,282.24	29,094.89	6,784.09	1,453.46	60,003.32	31,839.33	2,629.82	4,689.50	3,562.54
Rabonal	5,761.03	591.43	2,375.02	936.22	1,235.36	203.44	2,854.57	364.24	394.71	431.01	337.10
Itaguaí	6,480.93	608.20	2,825.21	719.85	1,999.38	208.17	2,947.52	278.21	286.03	445.74	463.51
Migoi	12,122.57	211.82	7,188.18	4,657.53	2,129.34	382.31	4,741.47	549.33	471.82	659.67	630.33
Margareta	267.71	44.63	323.61	10.77	278.02	34.82	618.47	36.73	45.87	140.84	104.06
Mericá	1,901.91	120.59	715.27	81.51	545.24	78.51	1,088.06	138.61	138.30	195.84	152.43
Nikópolis	9,845.49	0.00	2,170.24	339.49	1,144.84	686.11	7,875.28	894.31	889.77	1,228.08	2,315.32
Niterói	63,415.13	348.53	18,386.36	11,788.46	4,481.78	2,121.13	44,688.24	4,489.25	2,810.02	6,329.57	12,125.69
Nova Iguaçu	69,317.18	316.86	31,280.29	12,868.46	14,615.14	3,578.66	37,710.20	4,328.02	5,128.74	5,318.02	6,598.33
Paracambi	1,851.79	73.38	768.86	559.52	136.98	72.37	811.57	88.84	87.91	111.01	135.51
São Gonçalo	42,285.83	357.48	15,385.84	7,214.64	6,153.85	2,017.38	28,542.30	2,574.70	2,648.43	4,493.41	6,230.04
São João de Meriti	21,857.00	5.78	6,855.59	1,938.53	3,610.09	1,105.97	14,685.84	2,188.28	2,044.78	2,322.28	2,908.86

Sources: IBGE e CIDE

GDP INDEX BY SECTORS OF ACTIVITY - 1980

	Total	Agriculture and Cattle breeding	Industry				Total	Commerce	Services		Public Sector
			Total	Transformation	Construction	SIUP			Transport and TeleCom.	Rent	
State	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	
Metropolitan Region	83.86	17.83	77.14	78.72	78.73	82.23	87.87	88.48	86.41	91.38	
Rio de Janeiro	82.85	6.73	55.86	59.49	44.85	53.53	66.35	63.10	63.49	67.53	
Duque de Caxias	5.89	0.47	6.37	7.13	4.88	3.49	5.74	16.64	3.75	3.37	
Rabonal	0.35	2.18	0.41	0.23	0.91	0.49	0.27	0.20	0.59	0.31	
Itaguaí	0.39	2.49	0.50	0.18	1.47	0.50	0.29	0.15	0.43	0.32	
Migoi	0.73	0.87	1.22	1.14	1.88	0.82	0.45	0.29	0.87	0.47	
Margareta	0.08	0.18	0.09	0.00	0.20	0.08	0.06	0.02	0.07	0.10	
Mericá	0.11	0.49	0.12	0.02	0.40	0.19	0.10	0.07	0.19	0.11	
Nikópolis	0.59	0.00	0.37	0.08	0.84	1.85	0.73	0.38	1.24	0.86	
Niterói	3.83	1.42	3.14	2.89	3.29	5.10	4.38	2.35	4.01	4.54	
Nova Iguaçu	4.19	1.30	5.34	3.16	10.88	8.80	3.61	2.28	7.31	3.81	
Paracambi	0.10	0.30	0.13	0.14	0.10	0.17	0.08	0.03	0.13	0.08	
São Gonçalo	2.58	1.47	2.63	1.77	4.51	4.85	2.54	1.35	3.78	3.22	
São João de Meriti	1.30	0.02	1.17	0.48	2.79	2.88	1.41	1.14	2.88	1.87	

Sources: IBGE e CIDE

Infant Mortality Rate

	(by 1000 birth)								
	1985	1986	1987	1988	1989	1990	1991	1992	1993
State	39.8	36.6	36.0	34.4	33.5	30.8	30.2	28.9	29.6
Metropolitan Region	36.8	33.6	33.6	31.6	30.9	27.3	26.7	25.5	27.0
Rio de Janeiro	26.9	25.6	26.1	24.4	23.9	20.8	20.6	19.9	21.8
Duque de Caxias	52.9	46.1	44.3	42.1	40.4	35.1	34.6	33.1	35.6
Itaboraí	71.0	57.4	55.2	46.9	45.0	39.7	40.9	38.0	39.5
Itaguaí	38.1	36.1	35.5	37.9	33.7	32.5	29.9	29.5	29.6
Magé	65.1	55.0	50.1	51.2	52.2	51.2	44.6	38.1	35.4
Mangaratiba	39.5	32.1	27.6	28.3	22.8	21.7	19.9	29.6	32.0
Maricá	27.6	24.8	26.2	29.1	26.9	23.1	20.0	17.4	19.1
Nilópolis	64.0	58.3	57.8	57.3	55.3	49.5	41.2	33.6	29.2
Niterói	29.3	28.3	27.9	26.7	26.6	24.2	21.8	19.9	20.2
Nova Iguaçu	54.4	48.8	47.8	44.0	42.3	38.2	38.9	37.4	39.1
Paracambi	33.2	27.3	30.7	32.1	38.3	35.2	38.2	39.4	37.7
São Gonçalo	37.9	33.2	33.5	31.2	30.2	26.7	26.2	25.0	24.7
São João de Meriti	49.9	41.4	40.3	35.3	34.5	30.7	31.5	28.4	30.0

Source: Fundação Centro de Informações e Dados do Rio de Janeiro - CIDE.

SANITATION - 1980, 1991

	Households	Connected to Central Water Supply			
		With Canalization		Without Canalization	
		Absolute	Relative(%)	Absolute	Relative(%)
State					
1980	2,704,812	1,850,581	68.42	118,785	4.39
1991	3,454,962	2,790,955	80.78	91,258	2.64
Metropolitan Region					
1980	2,148,796	1,564,784	72.82	102,934	4.79
1991	2,690,896	2,309,468	85.83	75,602	2.81

Source: Fundação Instituto Brasileiro de Geografia e Estatística - IBGE, Censo Demográfico.

PROVISION OF WATER - 1994

State	Economic					Ligations				
	Total	Residential	Comercial	Industrial	Public	Total	Residential	Comercial	Industrial	Public
State	2,796,548	2,597,191	185,256	7,511	6,590	1,428,071	1,293,442	107,968	7,139	5,001
Metropolitan Region	2,442,943	2,267,437	164,439	6,101	4,966	1,162,752	1,060,292	93,208	5,732	3,620
Rio de Janeiro	1,601,380	1,473,773	118,974	4,685	3,948	649,015	580,761	61,328	4,360	2,566
Belford Roxo	99,360	95,483	3,710	76	91	68,981	65,336	3,482	75	88
Duque de Caxias	124,068	117,976	5,632	309	151	79,848	75,062	4,326	309	151
Itaboraí	6,733	6,104	577	25	27	5,685	5,124	410	24	27
Itaguaí	17,487	16,657	728	50	52	12,711	12,094	529	50	38
Magé	18,208	17,215	951	16	26	13,955	13,147	768	14	26
Mangaratiba	6,388	6,036	286	40	26	4,670	4,364	240	40	26
Miracá	4,166	3,869	267	18	12	3,524	3,335	160	18	11
Nilópolis	39,140	37,061	1,994	49	36	29,773	28,089	1,599	49	36
Niterói	118,438	108,673	9,298	190	277	41,630	36,435	4,772	165	258
Nova Iguaçu	110,937	104,373	6,336	165	63	73,396	68,446	4,722	165	63
Paracambi	5,504	5,270	209	6	19	4,242	4,040	177	6	19
Queimados	25,733	24,913	773	11	36	19,158	18,377	734	11	36
São Gonçalo	161,607	152,106	9,054	315	132	96,958	90,201	6,345	301	111
São João de Meriti	103,794	97,928	5,650	146	70	59,306	55,481	3,616	145	64

Source: Companhia Estadual de Águas e Esgotos - CEDAE.

Health Establishments

State	Total		Health Posts		Health Centers		Mix Units		Hospitals		Clinics		Comp. dist.
	1987	1992	1987	1992	1987	1992	1987	1992	1987	1992	1987	1992	
State	2,118	3,780	37	18	714	1,876	3	8	550	675	808	1,835	22
Metropolitan Region	1,148	2,360	6	2	222	342	1	6	403	427	603	776	13
Rio de Janeiro	671	1,375	-	-	88	78	1	4	275	292	297	482	10
Duque de Caxias	42	141	1	1	8	51	-	-	17	16	15	38	1
Itaboraí	28	50	1	-	14	27	-	-	6	6	6	8	1
Itaguaí	26	45	-	-	12	16	-	-	4	2	10	14	-
Magé	33	47	2	1	16	23	-	-	6	7	7	7	-
Mangaratiba	12	12	-	-	3	9	-	-	1	1	5	2	-
Miracá	7	19	-	-	5	13	-	-	1	2	1	-	-
Nilópolis	25	41	-	-	5	5	-	-	4	5	18	17	-
Niterói	85	198	1	-	21	20	-	-	35	41	28	50	-
Nova Iguaçu	139	211	1	-	30	43	-	-	16	17	91	105	1
Paracambi	18	28	-	-	9	10	-	1	5	5	4	6	-
São Gonçalo	46	128	-	-	9	28	-	-	22	24	15	26	-
São João de Meriti	16	67	-	-	2	19	-	-	9	9	5	19	-

Source: IBGE - AMS e CIDE

NUMBER OF HOSPITAL BEDS AS A RATIO OF POPULATION - 1996

	Population	number of Beds hospital	Ratio (1000 People)
State	13,316,466	57,399	4.31
Metropolitan Region	10,117,733	41,982	4.15
Rio de Janeiro	5,533,011	26,432	4.78
Belford Roxo	393,520	310	0.79
Duque de Caxias	712,370	1,661	2.33
Guapimirim	32,482	44	1.35
Itaboraí	156,631	1,296	8.27
Itaguaí	69,961	268	3.83
Japeri	66,427	220	3.31
Magé	180,550	440	2.44
Mangaratiba	19,690	57	2.89
Maricá	60,268	91	1.51
Nilópolis	155,190	442	2.85
Niterói	450,129	3,291	7.31
Nova Iguaçu	801,036	1,502	1.88
Paracambi	38,844	2,161	55.63
Queimados	108,531	57	0.53
São Gonçalo	827,967	2,739	3.31
São João de Meriti	433,713	971	2.24

Sources: Ministério da Saúde, DATASUS, Sistema de informações Hospitalares - SIH/SUS

TELECOMUNICATION

Number of telephones lines

	1990			1994			1995		
	Residential	Public	Total	Residential	Public	Total	Residential	Public	Total
State	1,336,366	966,729	2,303,094	1,830,337	18,348	1,848,685	1,864,632	24,487	1,889,119
Metropolitan Region	1,170,047	22,694	1,192,741	1,281,858	14,396	1,296,254	1,823,481	20,018	1,843,499
Rio de Janeiro	999,488	22,694	1,022,182	1,103,248	11,849	1,115,097	1,357,082	15,997	1,373,079
Duque de Caxias	22,280	254	22,544	24,153	322	24,475	34,792	473	35,265
Itaboraí	1,995	42	2,037	2,594	38	2,632	4,512	46	4,558
Itaguaí	2,419	245	2,664	2,991	44	3,035	5,280	73	5,353
Magé	3,221	67	3,288	3,786	48	3,834	4,211	64	4,275
Mangaratiba	1,478	29	1,505	1,828	20	1,848	2,032	40	2,072
Maricá	2,212	19	2,231	3,703	54	3,757	3,874	60	3,934
Nilópolis	8,590	67	8,647	8,820	164	8,984	9,178	230	9,408
Niterói	84,732	1,530	86,262	85,693	1,051	86,744	109,290	1,192	110,482
Nova Iguaçu	27,254	236	27,490	28,159	438	28,597	28,858	618	29,476
Paracambi	719	30	749	1,175	29	1,204	1,848	21	1,869
São João de Meriti	15,661	83	15,744	17,806	339	18,147	18,954	428	19,382

Sources: TELERJ - FFA 24 e CIDE

TOURISM SET OF RELATED VARIABLES

Variables touristic	1993	1994
01 - Way of Hospitality	305	300
02 - Number of hotel rooms	18,953	18,948
03 - International Tourist Arrival (by air)	361,865	330,809
04 - National Tourist Arrival (by air)	1,920,646	1,962,830
05 - Brazilian Tourist Arrival	9,082,000	9,205,000
06 - Foreign Tourist Arrival	361,865	330,809
07 - Total National Expenditure	2,770,112	2,762,634
08 - Total International Expenditure	269,787,654	276,340,801
09 - Total National Expenditure in Hotel	163,700	163,523
10 - Total International Expenditure in Hotel	192,008,536	173,175,699
11 - Foreign Tourist's mean Expenditure/day	97	104
12 - Brazilian Tourist's mean Expenditure/day	31	33
13 - Foreign Tourist's mean Expenditure/day in Hotel	69	65
14 - Brazilian Tourist's mean Expenditure/day in Hotel	47	44

Source: Instituto Brasileiro de Turismo - EMBRATUR.

HOTELS INFRASTRUCTURE

	Total		Classified		Not Classified	
	Hotels	Hotel Rooms	Hotels	Hotel Rooms	Hotels	Hotel Rooms
State	1,318	39,509	304	19,147	1,012	20,362
Metropolitan Region	308	20,649	122	13,183	186	7,486
Rio de Janeiro	174	15,946	113	12,431	61	3,515
Belford Roxo	3	134	-	-	3	134
Duque de Caxias	21	750	-	-	21	750
Guapimirim	2	28	-	-	2	28
Itaboraí	-	-	-	-	-	-
Itaguaí	7	214	3	161	4	53
Japeri	-	-	-	-	-	-
Magé	3	59	-	-	3	59
Mangaratiba	11	576	3	441	8	135
Maricá	15	208	1	8	14	200
Nilópolis	6	120	-	-	6	120
Niterói	8	266	2	142	6	124
Nova Iguaçu	21	659	-	-	21	659
Paracambi	2	43	-	-	2	43
Queimados	-	-	-	-	-	-
São Gonçalo	11	259	-	-	11	259
São João de Meriti	24	1,387	-	-	24	1,387

Source: Companhia de Turismo do Estado do Rio de Janeiro - TURISRIO.

NATIONAL AND FOREIGN TOURISTS
CLASSIFIED BY LENGTH OF STAY, TRIP MOTIVATION AND TRANSPORTATION
RIO DE JANEIRO STATE - 1995

Origem	Characteristics	(%) Annual Average
National	Length of Stay	
	1 day	44.3
	2 days	23.6
	3 days	13.4
	4 a 7 days	15.1
	8 a 15 days	3.1
	16 a 30 days	0.6
	More than 30 days	0.3
	Trip Motivation	
	Tourism	42.5
	Business	36.6
	Convention	9.0
	Other	11.9
	Transportation	
	Airplane	30.0
	Ship	0.7
Car	53.2	
Bus/Train	16.1	
Foreign	Length of Stay	
	1 day	26.3
	2 days	19.6
	3 days	16.0
	4 a 7 days	28.4
	8 a 15 days	7.8
	16 a 30 days	1.4
	More than 30 days	0.5
	Trip Motivation	
	Tourism	71.2
	Business	20.1
	Convention	4.3
	Other	4.7
	Transportation	
	Airplane	85.3
	Ship	0.8
Car	8.7	
Bus/Train	5.3	

Source: Companhia de Turismo do Estado do Rio de Janeiro - TURISRIO.

INITIAL REGISTRATION IN SCHOOL BY TEACHING LEVEL RIO DE JANEIRO

State	Preschool		Elementary school		High school	
	1989	1994	1989	1994	1989	1994
State	244,666	418,097	1,976,063	2,168,103	373,645	406,447
Metropolitan Region	168,580	252,884	1,488,972	1,583,286	291,428	305,275
Rio de Janeiro	106,293	139,183	801,313	812,501	185,998	188,056
Duque de Caxias	5,878	12,873	137,640	116,505	14,291	14,453
Itaboraí	1,646	5,674	25,796	30,731	1,572	2,281
Itaguaí	1,487	5,619	20,902	25,226	2,399	3,460
Magé	2,314	6,783	34,320	30,918	4,044	3,124
Mangaratiba	438	1,154	2,750	3,180	428	483
Maricá	1,467	2,874	7,348	10,050	839	1,309
Nikópolis	2,949	5,405	30,351	29,041	7,026	7,080
Niterói	16,785	18,458	69,577	74,123	24,281	25,346
Nova Iguaçu	13,963	17,806	205,799	136,892	26,194	23,826
Paracambi	515	1,241	5,410	6,753	786	1,178
São Gonçalo	11,128	16,860	113,190	119,576	15,815	16,356
São João de Meriti	3,677	6,099	64,576	62,972	7,755	8,822

Source: Secretaria de Estado de Educação - SEE

LITERATE RATE BY AGE

State	15 Years old or more (%)											
	Total	5 to 9 Years Old	10 to 14 Years Old	Total	15 to 19	20 to 24	25 to 29	30 to 34	35 to 39	40 to 49	50 to 59	60 years or more
State	88.9	88.9	88.9	88.3	88.3	88.3	88.7	88.8	88.7	88.2	88.3	88.3
Metropolitan Region	88.7	87.2	88.9	88.9	88.4	88.8	88.7	88.1	88.8	81.3	87.8	88.8
Rio de Janeiro	91.2	82.5	88.1	88.9	87.3	88.5	88.4	88.1	88.5	83.8	81.4	88.7
Belford Roxo	82.9	48.0	88.5	87.9	84.8	84.9	84.3	82.8	80.2	85.1	78.3	81.9
Duque de Caxias	85.9	48.0	80.5	88.3	85.1	88.3	84.5	83.2	81.0	85.9	77.8	84.0
Quatzenberg	74.9	38.0	84.5	80.1	81.3	88.5	88.2	88.1	82.7	78.2	84.9	82.9
Itaboraí	75.9	44.6	80.1	82.4	83.0	81.2	88.7	85.8	78.6	78.6	88.9	81.5
Itaguaí	78.5	42.2	88.2	84.5	83.8	83.2	82.7	80.2	87.1	80.9	71.4	88.2
Japeri	78.1	34.4	82.3	81.1	81.5	82.1	88.9	87.8	84.3	78.0	84.1	88.8
Magé	79.7	44.1	88.2	84.2	83.1	82.8	81.8	80.7	87.7	80.9	72.4	87.8
Mangaratiba	85.0	45.8	87.7	83.9	82.7	81.5	88.4	88.3	87.4	82.7	74.8	83.8
Maricá	81.4	30.9	81.5	84.4	82.9	82.0	81.9	81.1	85.9	80.9	75.5	83.5
Nikópolis	81.0	61.8	85.2	84.2	87.7	87.8	87.8	87.2	88.6	84.6	80.6	78.9
Niterói	82.0	63.5	88.0	84.6	87.1	88.9	88.9	88.5	88.8	84.3	82.6	88.0
Nova Iguaçu	84.9	50.1	80.6	88.2	85.4	85.6	85.0	83.9	82.0	87.2	80.4	87.1
Paracambi	78.5	47.2	82.3	80.8	85.4	81.6	88.9	84.8	80.9	75.6	88.7	87.3
Quatzenberg	78.8	41.8	87.3	85.0	83.9	83.6	82.7	80.5	87.5	81.2	70.9	88.6
São Gonçalo	88.4	59.4	84.7	81.4	88.8	88.3	88.1	88.4	84.0	80.5	85.2	72.3
São João de Meriti	87.2	51.9	82.8	81.4	88.5	88.0	88.2	85.4	84.2	80.8	84.2	71.5

Source: Fundação Instituto Brasileiro de Geografia e Estatística - IBGE, Censo Demográfico - 1991.

NUMBER OF SCHOOLS BY TEACHING LEVEL

Rio de Janeiro

	Preschool		Elementary school		High school	
	1989	1994	1989	1994	1989	1994
State	3113	6,528	6416	6,976	942	1,100
Metropolitan Region	1,900	3,180	3,130	3,178	666	747
Rio de Janeiro	1,024	1,608	1,610	1,709	398	411
Duque de Caxias	95	201	234	240	38	38
Itaboraí	38	97	94	97	6	6
Itaguaí	31	76	60	77	10	12
Magé	46	85	109	98	12	14
Mangaratiba	13	32	24	28	2	2
Maricá	33	45	45	47	2	6
Nilópolis	38	53	43	44	11	13
Niterói	145	168	158	162	48	48
Nova Iguaçu	213	244	392	268	70	72
Paracambi	9	24	20	23	3	3
São Gonçalo	171	235	235	262	46	62
.	44	96	106	123	20	24

Source: Secretaria de Estado de Educação - SEE.

NUMBER OF REGISTERED STUDENTS IN GRADUATE COURSES BY AREAS OF KNOWLEDGE

Knowledge	Stud. Registered	Graduated		Scientific Production	
	Master	Master	Doctor	Articles and Chapters of books Published	Research
Total	127	4	-	585	247
Biology Science	28	1	-	(2) 210	71
Engineering	46	-	-	(2) 70	29
Agrarian Science	53	3	-	305	147

Source: Universidade Estadual do Norte Fluminense - UENF

**BY AREAS OF KNOWLEDGE
IN UNIVERSITY OF RIO DE JANEIRO STATE - 1996**

Courses	Pupil Matriculated		Docentes
	Total	Phd	
Total	1,029	89	621
Teaching	120	-	34
Psychology	30	-	11
Medicine	131	-	148
Biology	81	26	63
Odontology	40	-	25
Social Science	21	-	31
Philosophy	69	-	19
History	22	-	20
Law	86	-	51
Engeneering	11	-	10
Other	408	63	163

Source: Universidade do Estado do Rio de Janeiro - UERJ

General Data of Superior Teaching By Area of Knowledge

Area of Knowledge	Course	Enrollment	Graduate	Vacancy Supply	Inscriptions	Ingress
Total	625	179,599	25,444	87,950	293,769	61,188
Exact Science	110	16,843	1,862	11,206	27,931	8,835
Biologic science	18	2,898	425	1,990	5,762	1,237
Engineering and Tecnologic	24	14,619	1,395	7,460	23,567	4,155
Health Science	83	27,053	4,355	9,850	81,851	8,206
Agrarian Science	11	2,872	244	743	5,479	620
Social Science	201	85,930	11,342	36,691	117,935	28,401
Human Science	117	21,264	4,619	13,307	22,112	7,005
Linguistic	59	7,742	1,202	6,703	9,132	2,729
Basic Cycle	2	378	0	0	0	0

Source: Ministério da Educação e do Desporto - MEC, Serviço de Estatística da Educação e Cultura - SEEC.

General Data of Course of post-graduation By Institutions

Institutions	Master			PHD		Permanent	
	Courses	Enrollment	Title	Courses	Enrollment	Title	Teacher
Total	190	7,488	1,689	105	3,603	383	3,733
Brazilian Center of Research Physics (CBPF/CNPq)	1	37	7	1	60	9	82
Getúlio Vargas Foundation (FGV/RJ)	2	161	28	1	31	2	38
Oswaldo Cruz Foundation (FIOCRUZ)	5	263	73	4	224	24	275
Severino Sombra Integrated Faculty (FISS)	1	22	-	-	-	-	13
Militar Institute of Engenharia Institute(IME)	6	148	44	2	22	3	75
Institute of Mathematics Pure and Aplicated (IMPA/ CNPq)	1	21	12	1	50	7	30
Universitarian Institute of Research of Rio de Janeiro (IUPERJ)	2	34	26	2	71	4	33
Pontificia Universidade Católica (PUC/RJ)	23	1,084	258	15	471	39	399
GamaFilho University (UGF)	4	191	33	2	41	3	55
University of Rio de Janeiro State (UERJ)	17	601	96	3	69	3	285
Federal Fluminense University (UFF)	32	840	204	8	181	20	577
Federal University of Rio de Janeiro (UFRJ)	82	3,577	782	62	2,278	257	1,646
Federal Rural University of Rio de Janeiro (UFRRJ)	9	247	87	4	105	12	168
University of Rio de Janeiro (UNI-RIO)	4	129	21	-	-	-	48
Santa Úrsula University (USU)	1	53	9	-	-	-	9

Source: Fundação Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - CAPES

COURSES OF POST-GRADUATION BY CONCEPTS OF VALUATIONS

Courses	Total								Concept				
	A	B	C	CN	CR	D	E	SA					
Total	299	98	29	32	8	5	4	-					
Master	193	63	22	14	7	4	4	-					
Phd	106	35	7	18	1	1	-	-					

Source: Fundação Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - CAPES

Nota: A=excellent, E=Bad

CN - New Course

CR - Course in Reestruccion

SA - not Valued

ROAD TRANSPORTATION
OPERATIONAL INDICATORS OF BUS SERVICES FROM CTC(1) BY MUNICIPAL DISTRICTS

Operational Indicators	Municipal Districts							
	Rio de Janeiro				Niterói			
	1988	1989	1990	1995	1988	1989	1990	1995
Lines operation	27	26	27	13	9	9	9	6
Numbers of Fleet in operation	214	224	142	110	51	51	41	30
Numbers of Trips	627,286	606,295	359,311	216,404	232,476	205,090	147,241	89,373
Kilometers Travelled (1000Km)	17,461	18,726	10,325	9,598	6,476	7,318	3,386	2,593
Numbers of Passengers(1000)	53,829	54,538	31,309	19,391	13,363	12,331	6,285	4,557
Supply of Seats (1000)	86,138	84,287	52,107	33,447	32,192	28,746	19,779	12,065
Occupation Rates(%)	62.7	64.7	60.1	58.0	41.5	42.9	31.8	38
Operation Revenuel (1)	2,229,887	27,525,931	437,761,102	7,991,888	894,236	9,387,095	112,817,750	2,628,179

Source: Companhia de Transportes Coletivos - CTC, Diretoria de Operações.

Note: 1988 em mil cruzados
 1989 em cruzados novos
 1990 em cruzeiros

AIR TRANSPORTATION
NUMBERS OF TAKE-OFF'S, LANDINGS AND PASSENGERS IN
RIO DE JANEIRO STATE

AIRPORTS	1984	1985	1986	1987	1988	1989	1990	1995	Changes between	
									1995	1990-1995
Rio de Janeiro Airport										
Landings and take-off's	88,654	93,912	96,991	97,753	101,142	91,240	92,574	79,696	80,147	-13
Passengers	5,568,461	5,768,461	6,702,623	6,470,497	6,536,335	5,669,129	5,670,390	4,390,467	4,112,661	-27
Leaving	2,800,854	2,899,031	3,353,173	3,227,500	3,266,677	2,803,755	2,866,308	2,212,578	1,951,221	-32
Arriving	2,767,607	2,879,781	3,349,450	3,242,997	3,269,658	2,865,374	2,814,077	2,177,889	2,161,440	-23
Airport Santos Dumont										
Landings and take-off's	46,358	49,345	59,952	60,958	71,744	16,565	68,347	74,591	82,396	21
Passengers	1,508,831	1,654,360	2,005,087	1,955,423	1,940,558	1,568,536	1,760,351	2,201,675	2,408,714	37
Leaving	754,727	834,968	1,013,123	997,952	981,161	926,614	898,247	1,100,846	1,206,370	34
Arriving	754,104	829,392	991,964	957,471	959,397	631,922	862,104	1,100,829	1,202,344	39
Airport of Jacarepaguá										
Landings and take-off's	14,586	14,693	19,237	25,612	31,535	26,164	18,901	57,638	40,456	114
Passengers	5,464	8,368	15,100	20,796	22,773	15,061	12,075	32,666	38,598	220
Leaving	3,307	6,221	10,334	13,099	14,168	7,759	6,397	17,192	20,864	226
Arriving	2,157	2,147	4,766	7,757	8,605	7,302	5,678	15,504	17,734	212

Source: DAC e Empresa de Infra-Estrutura aeroportuária - INFRAERO

TRANSPORTATION - SUBWAY
RIO DE JANEIRO - MUNICIPAL DISTRICT

Lines	(by 1,000 passengers)										
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Total	111,618	97,141	104,987	94,822	82,319	78,044	58,855	71,000	74,102	74,271	70,122
Line-1	105,041	91,088	98,572	88,811	76,013	71,361	53,622	64,852	67,189	67,543	64,341
Line-2	6,577	6,043	6,415	6,011	6,307	6,682	5,233	6,148	6,913	6,728	5,781

Sources: Metrô-ASPES e ODE

TRANSPORTATION - TRAINS- FLUMITRANS RIO DE JANEIRO STATE

Stations	1989	1990	1991	1992	1993	1994	1995
Total	182,270,135	160,993,193	160,124,976	143,495,578	115,867,729	107,920,602	98,784,201
Deodoro	74,075,596	71,096,845	71,927,522	61,459,512	49,658,253	52,117,506	49,380,659
Japeri	37,052,711	34,172,411	33,208,142	34,988,384	28,090,018	24,466,460	20,377,978
Santa Cruz	29,694,282	18,584,279	17,234,215	13,129,412	9,858,500	7,862,868	9,527,736
Linha Auxillar	14,813,574	14,092,479	14,317,547	15,730,827	9,246,535	7,715,682	6,306,684
Leopoldina	22,896,329	20,478,618	21,142,374	16,037,310	15,886,135	13,105,426	11,235,155
Bitola Estreita	3,737,643	2,568,561	2,295,176	2,150,133	3,128,288	2,652,660	1,955,989

Sources: CBTU - 1990-91 e FLUMITRENS - 1992-94

QUALITY OF WATER (DBO, N-TOTAL, P-TOTAL, OD E COLIFORMES TOTAIS)

Main River	Bay Area (km ²)	Class CONAMA	DBO (mg/l) (1)	N-Total (mg/l) (2)	P-Total (mg/l) (3)	OD (mg/l) (4)	Coli Total x 1000 (NMP/100ml) (5)
Canal do Canto do Rio	7.40	4	26	14.6	1.2	2.8	5,050
Rio Bomba	26.20	4	75	23.4	3.4	1.7	42,333
Rio Imboassu	30.80	4	9	4.0	0.6	2.5	527
Rio Alcântara	114.60	2	614	24.8	18.4	3.9	49,667
Rio Mutondo	...	2	58	20.2	3.1	1.2	27,867
Rio Guadalupe	...	2	12	9.4	1.6	1.3	5,225
Rio Caceribu	846.70	2	9	1.8	0.3	1.8	20
Rio Guapimirim	1253.10	2	3	0.9	0.1	3.8	98
Rio Macaçu	256.00	2	2	0.7	0.1	6.9	322
Rio Soberbo	132.40	2	55	1.2	0.2	4.3	4,665
Canal de Magé	18.30	2	28	9.3	1.6	1.1	53,317
Rio Roncador	111.40	2	2	0.8	0.1	6.1	91
Rio Iriri	27.80	2	8	1.5	0.3	1.3	132
Rio Suruí	68.80	2	4	0.9	0.2	4.4	150
Rio Estrela	342.50	2	15	2.4	0.4	1.0	776
Rio Inhomirim	139.00	2	3	1.8	0.1	3.6	338
Rio Saracuruna	186.00	2	10	2.3	0.1	3.3	166
Rio Iguaçú	562.80	2	9	4.8	0.8	1.1	3,007
Rio Sarapuí	165.50	2	26	14.5	2.2	0.7	17,450
Rio São João de Meriti	164.50	4	25	13.0	1.7	0.5	30,600
Rio Acari	57.90	4	36	11.1	2.0	2.0	29,800
Rio Itajá	35.70	4	50	13.7	2.1	0.9	100,833
Canal da Penha	...	4	49	14.3	2.3	0.4	86,333
Canal do Cunha	63.60	4	50	12.3	1.8	0.6	47,000
Canal do Mangue	42.80	4	44	12.1	1.9	0.7	24,060

Sources: Fundação Estadual de Engenharia do Meio Ambiente - FEEMA.

Note: 1- Número de dados = 9. 2- Classe CONAMA; baseada na Res.20 do CONAMA e classificação FEEMA, de acordo com os usos benéficos.
(1) Demanda Bioquímica de Oxigênio. (2) Nitrogênio Total. (3) Fósforo Total. (4) Oxigênio Dissolvido. (5) Coliformes Totais.

CO2 EMISSIONS - ACCORDING TO ENERGETIC SOURCE RIO DE JANEIRO STATE

Sources	1980	1985	1990	1994
				(t)
Total	7,150,800	7,899,404	7,766,450	8,698,725
Primary				
Natural Gas	2,682	747,332	652,962	1,012,177
Energetic Coal	3,282	102,142	71,171	17,257
Firewood	138,662	177,225	140,790	122,919
Secondary				
Diesel	1,346,219	1,258,936	1,351,997	1,520,054
Combustible Oil	2,275,958	1,505,317	1,384,606	1,346,857
Automobily Gasoline	901,055	630,935	653,627	791,833
Airplane Gasoline	3,672	3,672	3,880	766
GLP	322,144	335,664	400,155	420,746
Kerosene	561,373	674,230	981,639	703,306
Manufactured Gas	106,730	130,833	128,574	96,869
Coque	1,037,341	1,763,692	1,502,778	2,096,276
Vegetable Coal	110,250	97,637	91,208	106,457
Other secondary and Mineral Coal	203,400	322,909	137,408	306,454
Other secondary and petroleum	138,032	148,880	265,655	156,754

Source: Balanço Energético do Estado do Rio de Janeiro - 1995.

ENVIRONMENT

SHARE OF RIO DE JANEIRO METROPOLITAN REGION IN TOTAL C-CO2 EMISSIONS IN STATE BY SECTOR OF ACTIVITY -1994

Sector of Activity	C-CO2
Transformation	43.4
Energetic	64.9
Residential	74.3
Commerce/Public	85.5
Agriculture and Cattle breeding	11.9
Transportation	74.4
Industrial	13.9

Source: Balanço Energético do Estado do Rio de Janeiro - 1995.

ENVIRONMENT
AIR QUALITY - PARTICULES IN SUSPENSION
IN RIO DE JANEIRO MUNICIPAL DISTRICT (1990-95)

(% - Days in Year)

	Air Quality					
	Good	Regular	Inadequate	Bad	Very Bad	Critical
Bonsucesso	0.0	7.1	32.5	47.5	9.6	3.3
Centro	5.4	44.0	46.6	4.0	0.0	0.0
Copacabana	13.4	71.0	14.8	0.4	0.0	0.4
Coelho Neto	0.0	14.0	62.0	19.0	5.0	1.0
Inhaúma	1.0	29.0	46.8	20.0	2.7	0.5
Jacarepaguá	0.0	3.8	59.0	34.6	2.6	0.0
Maracanã	1.8	50.4	43.2	3.4	0.8	0.4
Méier	26.5	55.8	16.3	1.4	0.0	0.0
Realengo	8.1	43.0	44.2	3.5	1.2	0.0
Santa Cruz	24.8	67.2	8.0	0.0	0.0	0.0
Santa Tereza	55.0	40.4	4.6	0.0	0.0	0.0
São Cristóvão	5.4	53.1	39.2	2.3	0.0	0.0
Sumaré	73.2	24.2	2.6	0.0	0.0	0.0

Source: Fundação Estadual de Engenharia do Meio Ambiente - FEEMA.

Note: A unidade de medida (%) corresponde ao tempo médio da condição de qualidade indicada em cada uma das colunas.

JUSTICE
POPULATION IN PRISON IN POLICE STATION, FOR DEPARTMENT,
ACCORDING TO THE PRISIONAL SITUATION
RIO DE JANEIRO STATE- 1995(1)

Prisonal Situation	Total	Capital	Baixada	Interior	DPE
State	6,692	3193	691	2294	514
Convicts	2,880	1594	162	971	153
Preventive	722	113	110	423	76
Flagrants	3,090	1,486	419	900	285
Temporary	2	-	-	-	2

Source: Secretaria de Estado de Segurança Pública - SESP, Polícia Civil.

(1)December 1995

**JUSTICE - INPRISONED POPULATION IN PENITENCIARY
SYSTEM ACCORDING TO TYPE OF ESTABLISHMENT
RIO DE JANEIRO STATE - 1995**

Unity	Real Capacity	Effective
State	9,038	9,336
Women	380	362
Talavera Bruce	320	316
Romeiro Neto	60	46
Open and Half-open	1,060	1,014
Agrícola de Magé	110	97
'Edgard Costa	110	117
Plácido de Sá Carvalho	420	498
Vicente Piregibe	410	302
Norte do Estado	10	-
Closed	7,008	7,337
Alfredo Tranjan	574	562
Laércio da Costa Pelegrino	48	46
Moniz Sodré	185	190
Pedrolino W. de Oliveira	125	124
Ary Franco	956	1,015
Hélio Gomes	920	924
Evaristo de Moraes	1,000	1,555
Esmeraldino Bandeira	1,120	928
Milton Dias Moreira	1,030	911
Lemos Brito	545	541
Vieira Ferreira Neto	345	301
Norte do Estado	160	240
Hospitals	590	623
Hamilton A. Vieira de Castro	42	56
Hospital Central	60	88
Heitor Carrilho	144	164
Hospital Psiquiátrico Roberto Medeiros	110	104
Henrique Roxo	110	106
Hospital de Niterói	24	8
Sanatório Penal	100	97

Source: Departamento do Sistema Penitenciário - DESIPE.

SECURITY
NUMBER OF OCCURRENCE REGISTERED BY MILITARY POLICE AND TYPE
RIO DE JANEIRO STATE

Unity	Total	Criminal	Contravention	Transit	Assistances	Severals
State	288,210	44,993	13,834	89,036	34,158	106,189
Capital	159,198	20,262	3,709	45,479	13,969	75,779
1º BPM	6,037	639	84	1,428	618	3,268
2º BPM	12,587	1,427	200	3,635	948	6,377
3º BPM	16,158	1,571	312	3,775	834	9,666
4º BPM	6,113	630	62	2,115	590	2,716
5º BPM	8,442	1,010	241	2,210	1,053	3,928
6º BPM	15,712	1,684	196	3,799	1,053	8,980
9º BPM	14,204	1,638	207	4,296	864	7,199
13º BPM	7,067	1,126	117	1,413	791	3,620
14º BPM	9,887	2,018	114	2,693	1,195	3,867
16º BPM	11,472	1,110	471	2,940	701	6,250
17º BPM	5,609	771	373	2,031	848	1,586
18º BPM	9,822	1,237	381	3,802	812	3,590
19º BPM	11,526	1,616	204	2,286	1,182	6,238
22º BPM	4,814	499	309	1,849	368	1,789
23º BPM	10,832	1,170	156	3,964	1,068	4,474
27º BPM	2,549	718	54	860	278	639
RCECS	4,957	945	165	2,075	545	1,227
1ª CIPM	21	5	-	11	1	4
1ª CIPM	1,389	448	63	297	220	361
Interior	87,785	18,203	7,849	22,907	14,019	24,807
7º BPM	9,654	993	994	1,896	1,215	4,556
8º BPM	14,846	2,932	2,052	2,765	2,758	4,339
10º BPM	7,426	2,364	676	1,710	1,373	1,303
11º BPM	7,692	2,044	300	2,272	1,620	1,456
12º BPM	13,489	1,021	873	3,587	1,838	6,170
25º BPM	3,331	1,033	261	1,063	612	362
26º BPM	4,651	1,079	218	1,845	527	982
28º BPM	8,872	2,150	270	2,703	929	2,820
29º BPM	8,732	2,184	1,149	2,488	1,752	1,159
4ª CIPM	3,535	1,149	95	1,206	457	628
5ª CIPM	3,565	910	603	966	465	621
6ª CIPM	1,992	344	358	406	473	411
Special Unity	19,187	745	371	14,446	2,153	1,472
BOPE	60	14	2	7	4	33
BPChq	204	31	11	77	11	74
BPFMA	1,523	477	274	11	167	594
BPRv	12,153	91	52	9,623	1,755	632
CEPTran	5,247	132	32	4,728	216	139

Source: Polícia Militar do Estado do Rio de Janeiro - PMERJ.

SECURITY
CRIMINAL OCURRENCE RECORDED BY MILITAR POLICE
ACCORDING TO SUBGROUP TYPES
STATE OF RIO DE JANEIRO - 1991-1995

Subgroups and types	1991	1992	1993	1994	1995
Total	57,431	51,663	50,233	47,294	44,926
Crimes against individuals	29,658	26,304	26,748	25,585	25,034
Homicidy	1,640	2,309	2,746	3,033	3,144
Homicidy Attempt	1,516	1,263	1,146	1,059	989
Corporal lesions	15,908	13,579	13,823	13,415	12,770
Bad Treatment	491	495	390	344	334
Quarrel	1,994	1,770	1,776	1,563	1,833
Kidnapping and private prison	143	157	85	106	107
Dwelling violation	1,410	1,132	929	794	685
Other	6,556	5,599	5,853	5,271	5,172
Crimes against the patrimony	23,676	21,977	20,234	18,335	15,662
Stealing	10,847	6,024	2,534	2,111	1,663
Qualified Stealing	...	99	136	126	126
Stealing in cars	...	485	708	593	341
Stealing in bus	...	79	101	92	77
Stealing in Comercial Establishment	...	1,508	2,526	2,013	1,836
Stealing in Financial Establishment	...	26	61	48	71
Stealing in Teaching Establishment	...	200	328	286	266
Stealing in Residence	...	2,333	3,959	3,591	2,657
Stealing in Trucks	34	73	44	45	29
Robbery	8,118	4,689	2,671	2,469	2,108
Robbery in Trucks	169	150	121	126	104
Robbery in Cars	...	102	121	128	109
Robbery in bus	...	130	281	307	301
Robbery in Comercial Establishment	...	1,042	1,362	1,432	1,467
Robbery in Financial Establishment	...	150	271	359	453
Robbery in Teaching Establishment	...	40	76	53	35
Robbery in Residence	...	969	1,389	1,316	802
Extortion	29	22	39	20	21
Damage	2,965	2,625	2,546	2,349	2,253
Apropriação indébita	462	504	481	400	216
Swindle and fraud	971	469	389	365	333
Others	81	258	90	106	394
Crimes against the costumes	589	578	600	519	540
Rape	282	282	276	261	224
Outrage to chastity	137	137	143	127	144
Seduction	48	64	66	54	56
Ravishment	48	47	57	26	42
Lenocide and women traffic	5	1	-	1	7
Others	69	47	58	50	67
Crimes against the public administration	669	624	537	627	725
Corruption	3	3	3	4	25
Resistance to the prison	145	154	107	139	270
Disregard	395	326	320	384	314
Smuggled Goods	8	7	-	19	30
Others	118	134	107	81	86
Others Crimes	2,839	2,180	2,114	2,228	2,965
Possession and usage of narcotic	919	890	768	777	1,636
Documental Falseness	71	40	40	39	41
Ideological Falseness	27	25	17	22	19
Crimes against the Environment	286	187	325	609	485
Others	1,536	1,038	964	781	784

Source: Polícia Militar do Estado do Rio de Janeiro - PMERJ

PENAL INFRACTIONS BY TYPE OF OCCURRENCE

State	Total		Homicides		Corporal Lesion		Transit Delict		Robbery		Stealing		Swindle		Rape		Veh
	1985	1989	1985	1989	1985	1989	1985	1989	1985	1989	1985	1989	1985	1989	1985	1989	
State	218844	237073	5483	8124	35179	37758	30371	28670	28651	23868	58180	65138	11082	7950	1184	1287	33231
Metropolitan Region	179327	193875	4613	7898	27518	28443	25470	22899	24516	21500	42463	49,321	9,645	7325	968	935	32585
Rio de Janeiro	125237	144699	2068	3629	18977	17847	17848	16378	17785	16771	29905	39,170	7,367	5835	555	545	25785
Duque de Caxias	8913	7072	453	780	1485	1511	1129	1025	702	668	1307	1,022	358	200	66	50	849
Itaboraí	1590	1754	82	154	341	452	319	258	184	150	448	445	25	40	18	27	95
Itaguaí	1655	1304	98	113	323	261	184	220	181	108	521	374	78	27	20	12	98
Miguel	1759	2127	155	289	360	529	250	277	204	117	451	385	39	62	27	27	143
Mangaratiba	534	344	9	12	113	82	14	55	28	4	191	144	9	4	1	2	21
Miracó	1070	848	25	50	115	130	135	145	59	45	515	317	18	17	8	9	109
Nilópolis	1942	1799	48	110	424	480	224	228	208	139	269	351	137	44	13	7	362
Niterói	10073	10008	175	272	1565	1802	1321	1297	1413	940	2517	3,104	478	375	26	41	2045
Nova Iguaçu	12371	11699	978	1434	2345	2568	1812	1315	2075	1317	2288	1,859	487	188	124	116	1688
Paracambi	404	302	16	10	119	76	59	68	23	10	88	88	15	5	3	4	12
São Gonçalo	8027	7930	285	518	1848	1971	1384	1279	1022	870	1951	1,390	300	408	58	81	713
São João de Meriti	3872	3891	329	347	898	976	511	444	425	341	693	634	188	120	43	34	747

Source: Polícia Militar do Estado do Rio de Janeiro - PMERJ.

Manufacturing

PROJECTS - IMPLEMENTED, DURING IMPLEMENTATION and PLANNED
ACCORDING TO DISTRICTS
RIO DE JANEIRO STATE - 1994

Distritos industriais	IMPLEMENTED			IN IMPLEMENTATION			PLANNED		
	Number Of	Investments	Direct	Number Of	Investments	Direct	Number Of	Investments	Direct
	Firms	(US\$ 1,000)	# Jobs	Firms	(US\$ 1,000)	# Jobs	Firms	(US\$ 1,000)	# Jobs
Total	143	1,295,837	30,845	18	22,157	1,928	46	244,943	6,165
Campos	5	12,060	1,000	1	2,430	267	3	2,600	375
Campo Grande	25	50,212	3,210	4	1,700	207	7	11,500	679
Duque de Caxias	12	86,985	1,333	4	11,132	973	9	16,640	1,436
Fazenda Botafogo	41	146,366	6,351	4	1,100	173	2	500	30
Macaé	3	4,200	65	-	-	-	4	8,200	290
Paciência	8	19,100	1,866	2	3,095	168	1	5,000	300
Palmares	15	133,372	3,137	-	-	-	-	-	-
Queimados	15	271,980	3,696	2	1,700	40	10	124,692	1,024
Santa Cruz	19	571,562	10,187	1	1,000	100	9	74,811	2,016
Três Rios	-	-	-	-	-	-	1	1,000	15

Fonte: CODIN

Industrial Investments	by Activity		
	ACTIVITY	COMPANIES	JOBS
Metallurgical	12	3,139	1,439,345
Chemical	16	2,234	900,275
Transportation Material	1	2,000	300,000
Pharmaceutica	7	2,690	266,360
Beverage	6	811	198,500
Electronic	4	508	158,052
Non-metalic minerals	3	390	153,200
Printing	2	500	130,000
Food	10	890	126,977
Rubber	1	150	60,000
Textile	5	339	38,530
Several	3	850	25,150
Cosmetics	1	250	25,000
Naval	1	1,500	20,000
Mechanic	2	450	16,000
Cosmetics and candles	1	120	8,000
Cardboard and Paper	2	300	5,300
TOTAL	77	17,175	3,870,689

SOURCES: FIRJAN E CODIN / Secretaria Estadual de Indústria, Comércio e Turismo

<i>Industrial Investments</i>				
<i>by Company</i>				
<i>COMPANIES</i>	<i>LOCATION</i>	<i>VALUE (US\$1,000)</i>	<i>JOBS</i>	<i>ACTIVITY</i>
Rio Polímeros / Petrobrás	Duque de Caxias	400,000	550	Química / Chemical
Rio Polímeros / Unipar Suzano / BBM	Duque de Caxias	250,000	600	Química / Chemical
O Globo	Duque de Caxias	120,000	500	Gráfica / Printing
Cepel	Rio de Janeiro	117,000	---	Eletroeletrônica / Electric-electronic
Smithkline	Rio de Janeiro	70,000	1,200	Farmacêutica / Pharmaceutical
Latasa	Rio de Janeiro	60,000	250	Metalúrgica / Metallurgical
Michelin	Rio de Janeiro	60,000	150	Borracha / Rubber
Gerdau / Cosigua	Rio de Janeiro	60,000	150	Metalúrgica / Metallurgical
Prosint (Grupo Peixoto de Castro)	Rio de Janeiro	50,000	200	Química / Chemical
Rio de Janeiro Refresco	Rio de Janeiro	50,000	300	Bebidas / Beverage
Insol (Nestlé / Yopa)	Rio de Janeiro	45,000	200	Borracha / Rubber
Aga S/A	Rio de Janeiro	44,000	100	Química / Chemical
Pan Americana	Duque de Caxias	43,300	150	Química / Chemical
Almax Alumínio	Rio de Janeiro	38,000	100	Metalúrgica / Metallurgical
Knoll / Basf	Rio de Janeiro	37,000	150	Farmacêutica / Pharmaceutical
Refinaria de Manguinhos	Rio de Janeiro	28,500	50	Química / Chemical
L'oreal	Rio de Janeiro	25,000	250	Cosméticos / Cosmetics
Bergitex	Nova Iguaçu	25,000	150	Têxtil / Textile
Rio Gás	Duque de Caxias	20,000	150	Outros / Others

SOURCES: FIRJAN E CODIN / Secretaria Estadual de Indústria, Comércio e Turismo

GOVERNMENT REFORM PROGRAM

COMPANIES	DESESTATIZATION MODALITY
CERJ - Cia. de Eletricidade do Est. do RJ (*)	Sale of Shareholder Control
CEG - Cia. Estadual de Gás	Sale of Shareholder Control
BANERJ - Banco do Est. do RJ	Sale of Shareholder Control
CONERJ - Cia. de Navegação do Est. do RJ	Sale of Shareholder Control
CODERTE - Cia. de Desenvolvimento Rodoviário e Terminais do Est. do RJ	Sale of Shareholder Control
CEDAE - Cia. Estadual de Água e Esgoto	Concessions
METRÔ - Cia. do Metropolitano do Est. do RJ	Concessions
FLUMITRENS - Cia. Fluminense de Trens Urbano	Concessions
CSERJ/CEASA -Cia. de Armazéns e Silos do Est. do RJ Centrais de Abastecimento do Est. do RJ	Merging
EMATER/SIAGRO - Emp. de Assist. Técnica e Extensão Rural do Est. do RJ/ Emp. de Serviços e Insumos Básicos do RJ	Incorporation
COPPERJ - Cia. do Pólo Petroquímico do Est. do RJ	Incorporation
CTC/SERVE - Cia. de Transporte Coletivo do Est. do RJ / Empresa Estadual de Viação	Wholesale
FLUTECH - Empresa Fluminense de Tecnologia	Wholesale
BD - RIO - Banco de Desenvolvimento Econômico do Est. do RJ	Wholesale
DIVERJ - Distribuidora de Valores do Est. do RJ	Wholesale
CELF - Centrais Elétricas Fluminense	Wholesale
PESAGRO - Empresa de Pesquisa Agropecuária do Est. do RJ	Restructuring
EBSE - Empresa Brasileira de Solda Elétrica	Sale of Shareholder Control
TURISRIO - Cia. de Turismo do Est. do RJ	Restructuring

(*) Privatized in Nov, 1996.

CHAPTER 2

RIO: POVERTY IN THE MUNICIPALITY

This chapter was prepared by Joachim von Arnberg and is based on visits to Rio de Janeiro in November 1997 and February 1998. The author would like to thank many officials of the Municipality for their cooperation and assistance, particularly Dr. Renato Villela, Secretary of Strategic Affairs, and Dra. Sônia Rocha. All tables, unless otherwise noted, are based on special tabulations of PNAD household surveys prepared by Marcelo Neri, IPEA. Jeffrey Hammer, World Bank, provided special tabulations of the PBVL/SMS. Sônia Rocha, IPEA, provided special tabulations of the 1991 Population Census.

Rio: Poverty in the Municipality

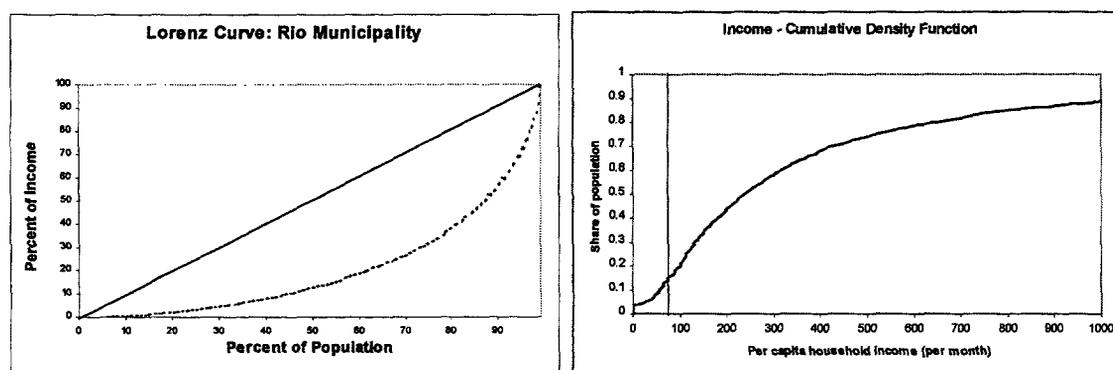
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1. POVERTY PROFILE

POVERTY, INCOME AND EXPENDITURES

2.1 In 1996, there were about 840,500 poor people in Rio Municipality (RJ-Mun) (or 15.6% of a population of 5.4 million), as defined by a commonly used poverty line of about R\$86 household income per capita per month for Rio de Janeiro.¹ (*interpretation of Poverty Line*). The Rio de Janeiro Metropolitan Area (RJ-MA) has a poverty rate of 20.8% which is higher than the rate of RJ-Mun because of even higher poverty rates in the neighboring municipalities of the Baixada Fluminense. The RJ-MA, in turn, has lower poverty rates than the Metropolitan Areas of the North and Northeast (26-38%) but higher rates than the other metropolitan areas of the Southeast and South (5-20%).

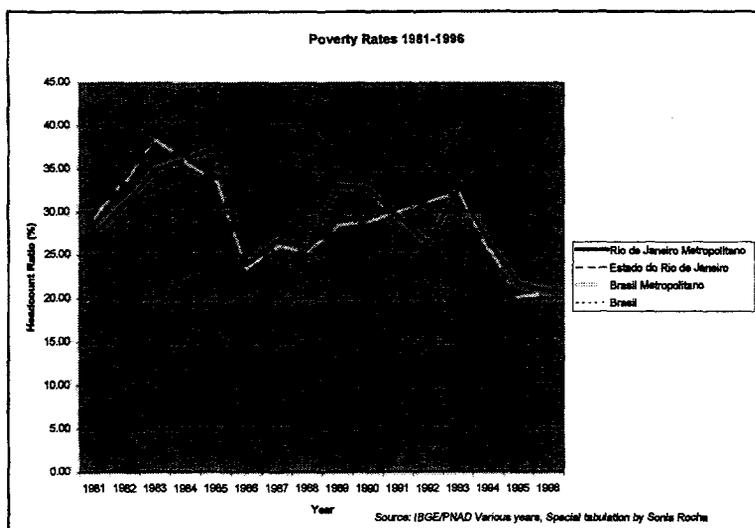


Area	Number of Poor	Share of Population below the Poverty Line (Headcount Index)
Metropolitan Brazil	9,512,500	21.0%
MA Belem	360,200	38.4%
MA Salvador	914,700	35.1%
MA Recife	872,900	33.1%
MA Fortaleza	676,100	26.6%
[REDACTED]	[REDACTED]	[REDACTED]
MA Belo Horizonte	703,300	19.7%
Brasília	326,600	19.3%
MA São Paulo	3,034,100	18.9%
MA Porto Alegre	435,700	13.7%
MA Curitiba	121,300	5.5%

Source: IBGE/PNAD - 1996 Special Tabulation by Sonia Rocha

2.2 As elsewhere in Brazil, income is extremely concentrated with only 0.65% of aggregate income accruing to the bottom 10% of the population and 43.2% of aggregate income accruing to the top 10% of the population. With an income gap ratio of 0.431, the poverty gap of RJ-Mun is about R\$373 million per year. This theoretical measure indicates that R\$373 million per year (or about 10.5% of the municipal

¹ This poverty line is constructed as the cost of a basket of goods necessary to meet the basic nutritional and other requirements.



budget or 0.6% of the city's approximate GDP of US\$60 billion) could lift every person that is currently below the poverty line up to the poverty line.

2.3 Until 1985, RJ-MA poverty rates were significantly lower than the corresponding rates for all of Brazil. Since then, however, Rio has lost its relatively favorable position and missed out on progress in poverty reduction achieved countrywide during a growth phase after 1984. In particular, at the end of the 90's Rio's poverty rates were significantly above the Bra-

zil metropolitan poverty rates. Thereafter, Rio has followed the country-wide averages, including the recent pronounced drop in poverty following the introduction of the Real-Plan. As elsewhere in Brazil, the poverty gains from the end to inflation have resulted in a significant one-time drop after 1994. However, while there has been no further progress, or even a slight reversal in poverty gains in other metropolitan areas since then, recent developments (from 1995 to 1996) in Rio continue to be positive.

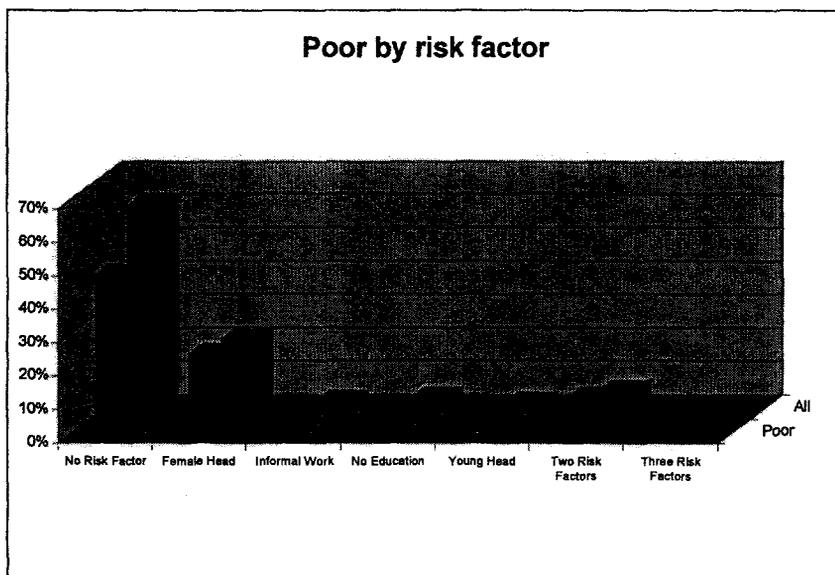
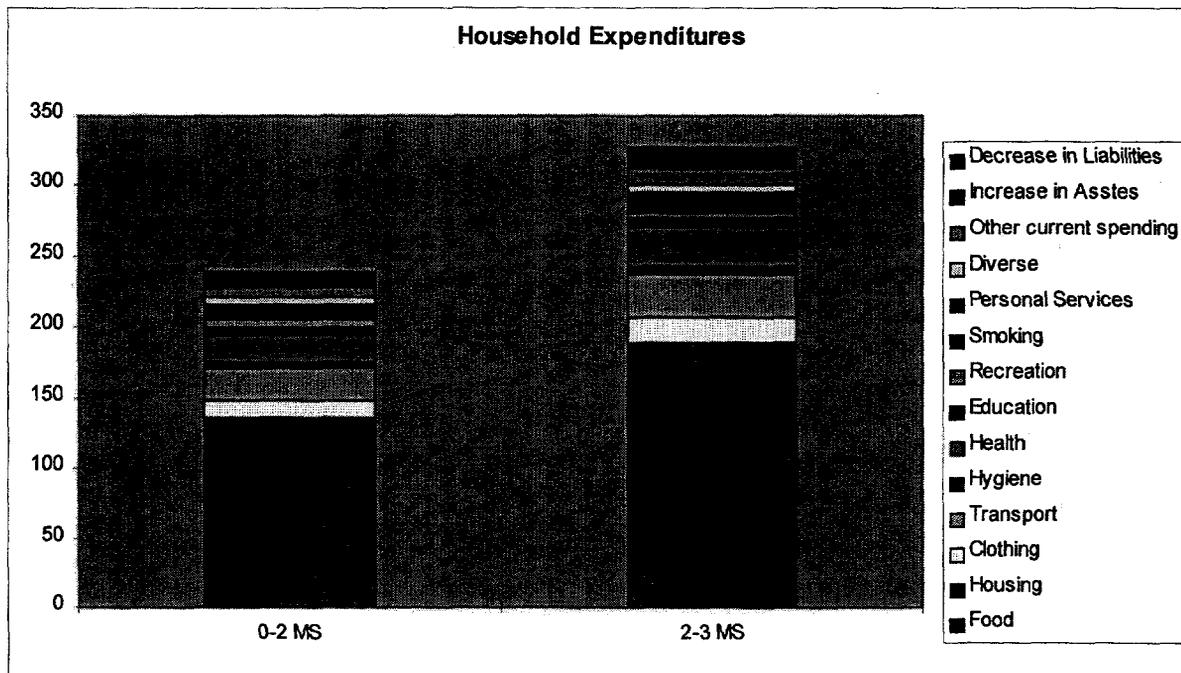
Household Expenditures of the Poor

2.4 Recent household survey data allows the analysis of expenditures of poor households. Noticeable features of household expenditures include:

Income	0-2 MS	2-3 MS	Over 30 MS
Food	25%	33%	10%
Housing	32%	25%	22%
Clothing	5%	5%	3%
Transport	10%	9%	9%
Hygiene	1%	2%	1%
Health	8%	9%	6%
Education	2%	2%	3%
Recreation	2%	1%	2%
Smoking	3%	3%	0%
Personal Services	1%	2%	1%
Diverse	3%	2%	4%
Oth. current spending	3%	4%	18%
Increase in Assets	4%	4%	20%
Decrease in Liabilities	1%	1%	1%

- Most broad categories of spending are roughly proportional to income, with the exception of food and investments. The poorest spend a much larger share of expenditures for food (25-33%) compared to the richest (10%). Increase in assets account for 20% for the richest but only 1% for the poorest.
- Within broad expenditure groups there are large differences between income groups, such as a much higher share of eating out and a higher share of automobile transport by the richer groups.

c) There are some discrete jumps in expenditure patterns that suggest that certain expenditure items become a standard feature only above a certain threshold income. Examples include drastic increases in expenditures for health insurance (above 10 minimum salaries - MS²), dental costs (above 10 MS), private primary school (above 10 MS), own vehicle (after 15 MS), medical consultations (above 30 MS).



CHARACTERISTICS OF THE POOR

2.5 A breakdown of the poor in Rio (RJ-MA in this case) shows that certain characteristics of the household head are associated with a higher probability of being poor. In particular, the percentage of poor (compared to the overall poverty rate) is higher for particularly vulnerable groups, including female-headed households (29% higher poverty rate); young households, headed by under 25 year olds (105% higher); uneducated households, heads without formal schooling (85% higher); blacks (55% higher) and unemployed (230% higher) and informal sector workers (26% higher).

² The monthly minimum salary is currently R\$120.

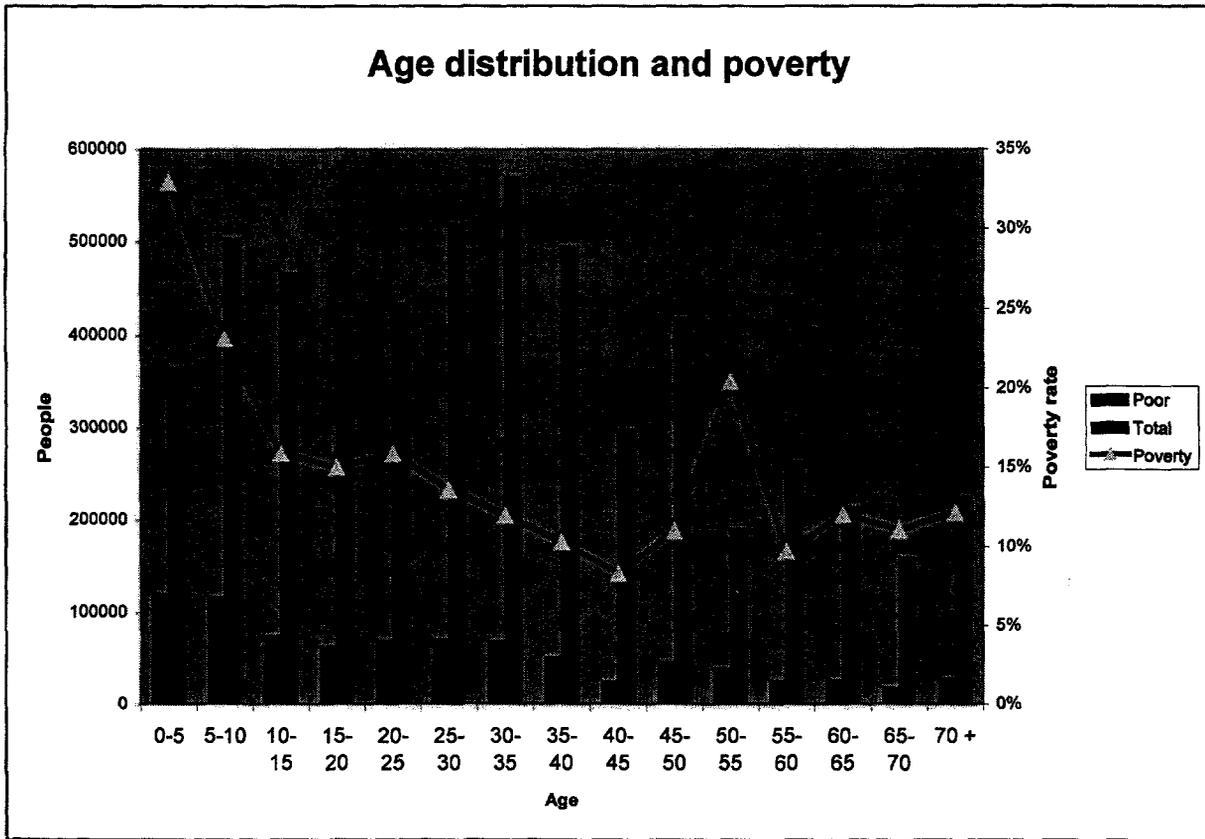
	Subgroup poverty rate	Subgroup share in population	Difference between subgroup poverty rate and average poverty rate	Share of subgroup poor in all poor
All	15%	100%	0%	100%
Male	14%	72%	-10%	65%
Female	19%	27%		35%
15 to 25 years	31%	3%		7%
25 to 45 years	18%	44%	22%	54%
45 to 60 years	11%	31%	-27%	23%
More than 60 years	12%	21%	-18%	17%
0 years	28%	6%		11%
0 to 4 years	25%	9%	63%	14%
4 to 8 years	22%	26%	46%	38%
8 to 12 years	12%	39%	-20%	32%
More than 12 years	4%	20%	-72%	6%
Indigenous	0%	0%	-100%	0%
White	10%	62%	-32%	42%
Black	24%	38%		58%
Yellow	0%	0%	-100%	0%
Agriculture	26%	1%		1%
Industry	12%	13%	-21%	10%
Construction	18%	8%		10%
Public Sector	6%	16%	-61%	6%
Service	14%	62%	-10%	56%
Inactive	19%	26%	23%	32%
Unemployed	50%	3%		10%
Formal Employ.	15%	28%	-2%	28%
Informal Employ.	19%	8%		10%
Self - Employed	11%	16%	-25%	12%
Employer	5%	5%	-66%	2%
Public Servant	6%	12%	-60%	5%
Unpaid	28%	1%		2%

Source: IBGE/PNAD 1996, Special tabulation by Marcelo Neri

2.6 Each of these risk-groups, however, is relatively small. Therefore, none of these vulnerable groups make up a dominant share of overall poverty. In fact, the average poor household is more likely to be headed by a male (65%), 25-45 year old (54%) with 4-8 years of schooling (38%) who works in the service sector (56%) and is either inactive (32%) or employed in the formal sector (28%). About 50% of the poor belong to none of the risk groups. About 25% of poor households are female-headed households. The remaining quarter of poor consists of households with different combinations of risk groups. In summary, about half the poor are members of particularly vulnerable groups (high risk of poverty). The other half are more "normal" poor who do not belong to any one of the vulnerable groups.

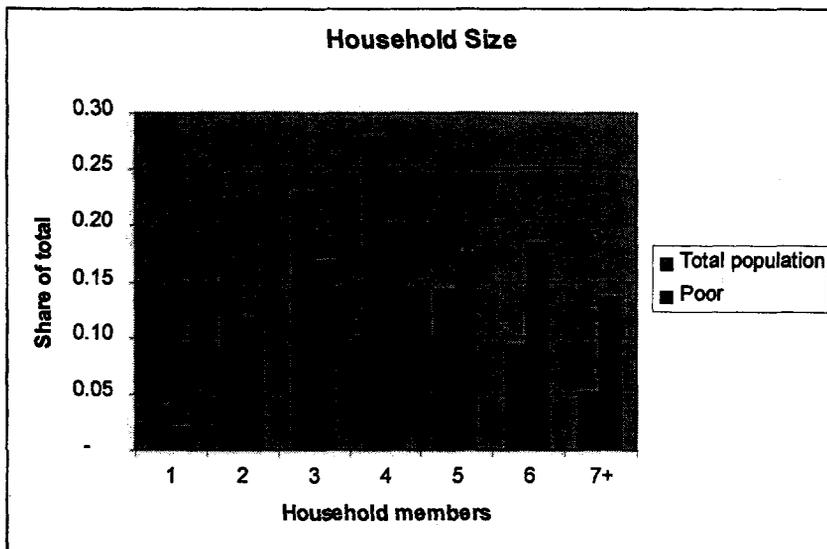
Poverty and Family

2.7 Poor households are larger and have more children than the general population. As a result, a large share of the poor are children and a large share of children are poor. In fact one third of all children up to five years are poor and one fourth of children age 5 to 10 are poor. 27% of all poor are less than 15 years old while the share of the general population under 15 years is only 24%.



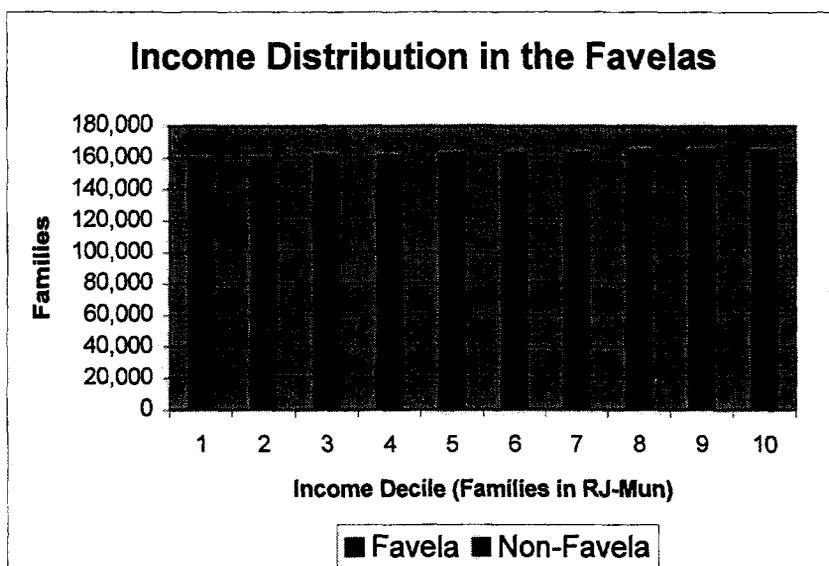
Poverty and Migration

2.8 Rio Municipality does not receive net migration. RJ-Mun's population has grown by 8% from 1980 to 1991, which is a growth of 0.8% per year and below the national average of 1.8% over the same period. Also, recent migration is not a contributing factor to poverty. In fact recent migrants as a group have a lower poverty rate than non-migrants (15.8% for non-migrants, 10.5% for migration during the last 4 years, 15.1% for migration between 5 and 9 years ago and 12.0% for migration 10 years and more ago).



Poverty and Location

2.9 The public discussion and image of poverty in Rio is often linked to the favelas, which are settlements without secure property rights typically consisting of sub-standard housing with low levels of urban services often located on the many hillsides scattered throughout the eastern (more



central) part of the city. According to the 1991 Census, there are 462 favelas in RJ-Mun with a total of 882,667 people in 224,350 households. Favelas thus housed 16% of the population. The favela population has grown 23% from 1980-91 compared to city wide population growth of 8%. Favelas span small settlements of less than 100 people to the biggest favelas with 43,000 (Rocinha) and 35,000 (Jacarezinho) people.

2.10 In addition, 318,604 people are estimated to live in 590 irregular subdivisions, where demarcated lots have been purchased from developers but titles cannot be registered due to incomplete infrastructure. These irregular subdivisions are usually located far from the city center in its western half. Finally 944,200 people are living in housing projects ("*conjuntos habitacionais*") many of which have been created decades ago to accommodate *favelados* resettled during earlier attempts to forcefully remove the *favelas*. They often have suffered severe deterioration and social problems.

Households in RJ-Mun (by per-capita household income)

Decile	Favela	Non-Favela
1	51,222	107,579
2	47,681	112,311
3	39,474	122,131
4	32,379	129,000
5	25,861	136,513
6	18,570	144,305
7	11,933	150,867
8	7,008	157,917
9	2,442	162,828
10	815	163,972
Total	237,385	1,387,423

Source: IBGE/Censo Demográfico 1991, Special Tabulation by Sonia Rocha

2.11 The number of poor presented above (840,500 in 1996) is similar to the population of Rio's favelas (882,700 in 1991). Given the high degree of visibility of Rio's favelas, this could lead to the suggestion that there is a high degree of coincidence between poverty and residence in a favela. However, data from the 1991 Census shows that this is not true. Only 31% of the poorest 20% of households in RJ-Mun live in the favelas, and of all favela households, only 42% are among the poorest 20% of households of RJ-Mun. This means the share of the favela households that is poor is about twice as high as the share of all households. However, more than half the *favelados* are not poor (even among the eighth decile, *favelados* still make up 5%), and there are more than twice as many poor outside the favelas than inside.

2.12 The *favelados* are typically an entrepreneurial segment of the poorer population that has taken the risk of land occupation without title in order to escape the high transport costs that come along with otherwise more affordable housing. The same entrepreneurial trait, however, enables the majority of the *favelados* to make a meager living that keeps them above the poverty line. Moreover, the classification of favelas includes older favelas that are by now well established and often even relatively well served with public services.

2.13 In terms of many public services, however, favelas do present a particularly bad picture. Coverage with public water services with in-house connection in the favelas was 83% and with sewage collection 48% compared to city-wide rates of 96.6% and 94.4%, respectively. In fact, most of the households without water connection are located in the favelas.

	No Water Connection		No Sewage Connection	
	No.	%	No.	%
Favela	37,375	16.6%	106,592	47.5%
Total	52,346	3.3%	481,620	30.9%

POVERTY, HOUSING AND PUBLIC SERVICES

2.14 While income is an extremely useful indicator of poverty, it does not capture other important factors that determine well-being and deprivation, such as access to public services or public goods (health, education, water and sanitation, transport, clean environment and absence of crime). In addition, income does not capture the imputed rent of assets that people own, for example housing. In fact, someone who is living just below the poverty line but who owns a house and has access to all these goods and services may be far better off than someone just above the poverty line without a house and without access to such services. Thus, there is a group of the population that is non-poor in income terms which may deserve at least as much attention from policy makers as a part of the population considered poor in income terms. This is of particular relevance to municipal policy makers which often have better instruments at their disposal for addressing poor services as opposed to poor income.

2.15 While it would be desirable to have a single welfare measure that captures money income as well as other services, the valuation of many of these services is difficult and not attempted in this report. However, complementing the measure of monetary poverty with an indication of ownership of physical assets (typically a house), can provide a richer picture of actual welfare poverty.

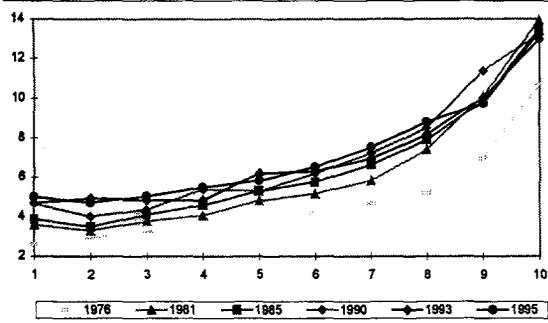
2.16 In the RJ-MA, as in most other places, access to public services is strongly correlated with income. On the one hand, the poor choose more affordable housing in poorly served areas. On the other hand, services are not extended to poor areas either because of physical difficulties (steep slopes and narrow pathways) or because of the perceptions that the poor are unable or unwilling to pay for the services.

2.17 However, the reach of public services, especially to the poor, has drastically improved over the last twenty years. Among the poor, average education levels have risen from less than three to about five years of schooling, access to bathrooms has increased from 86% to 95%, garbage collection has increased from 37% to almost 70%, electric light has increased from 84% to virtually 100%, piped water has increased from 60% to 87%, and sewage network collection has increased from 20% to 40%. The trend

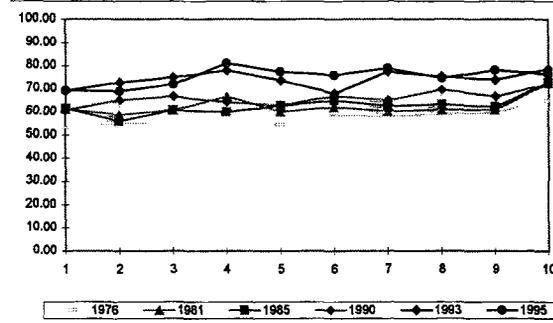
are almost all positive. Only the housing quality indicators show a decline over the 90s after gains in the 70s and 80s that needs to be further investigated.

Education and Housing Indicators by Income Decile

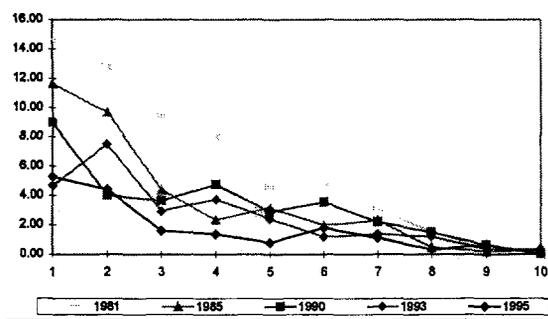
Average Education



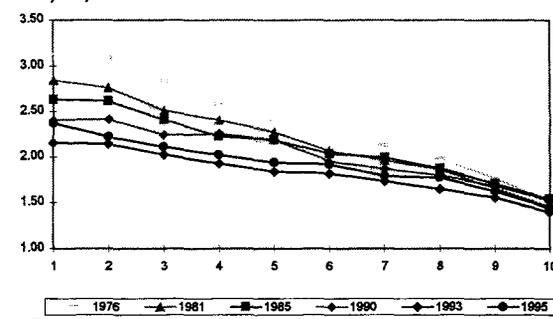
House Ownership



No Access to Bathroom

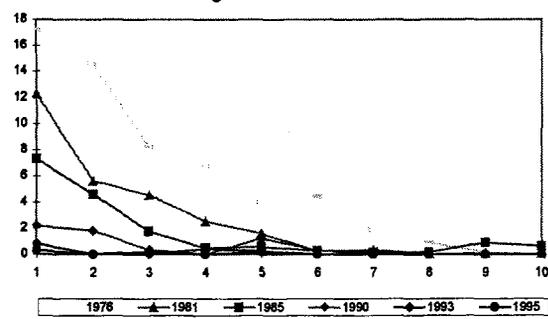


People per Bedroom

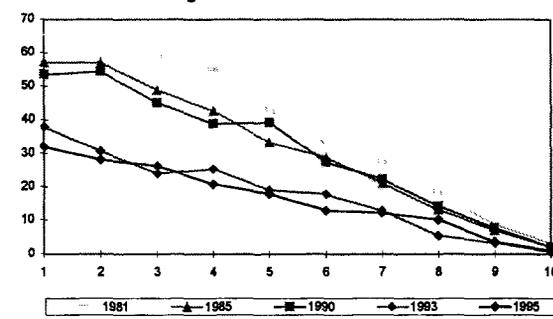


Public Services by Income Decile

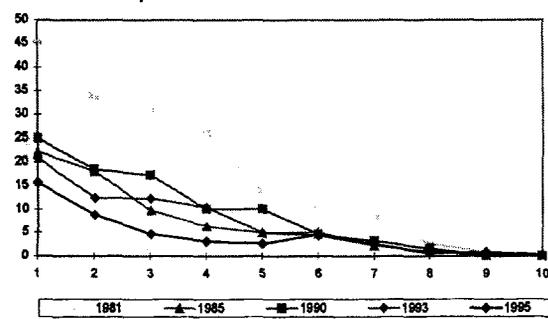
Absence of Electric Light



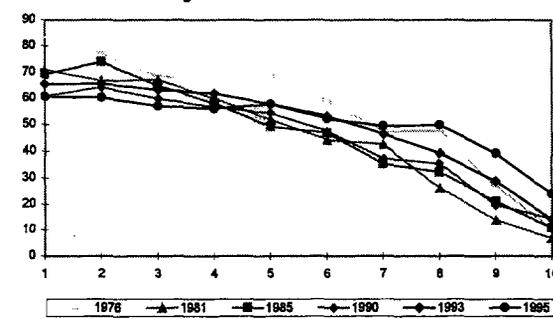
Absence of Garbage Collection

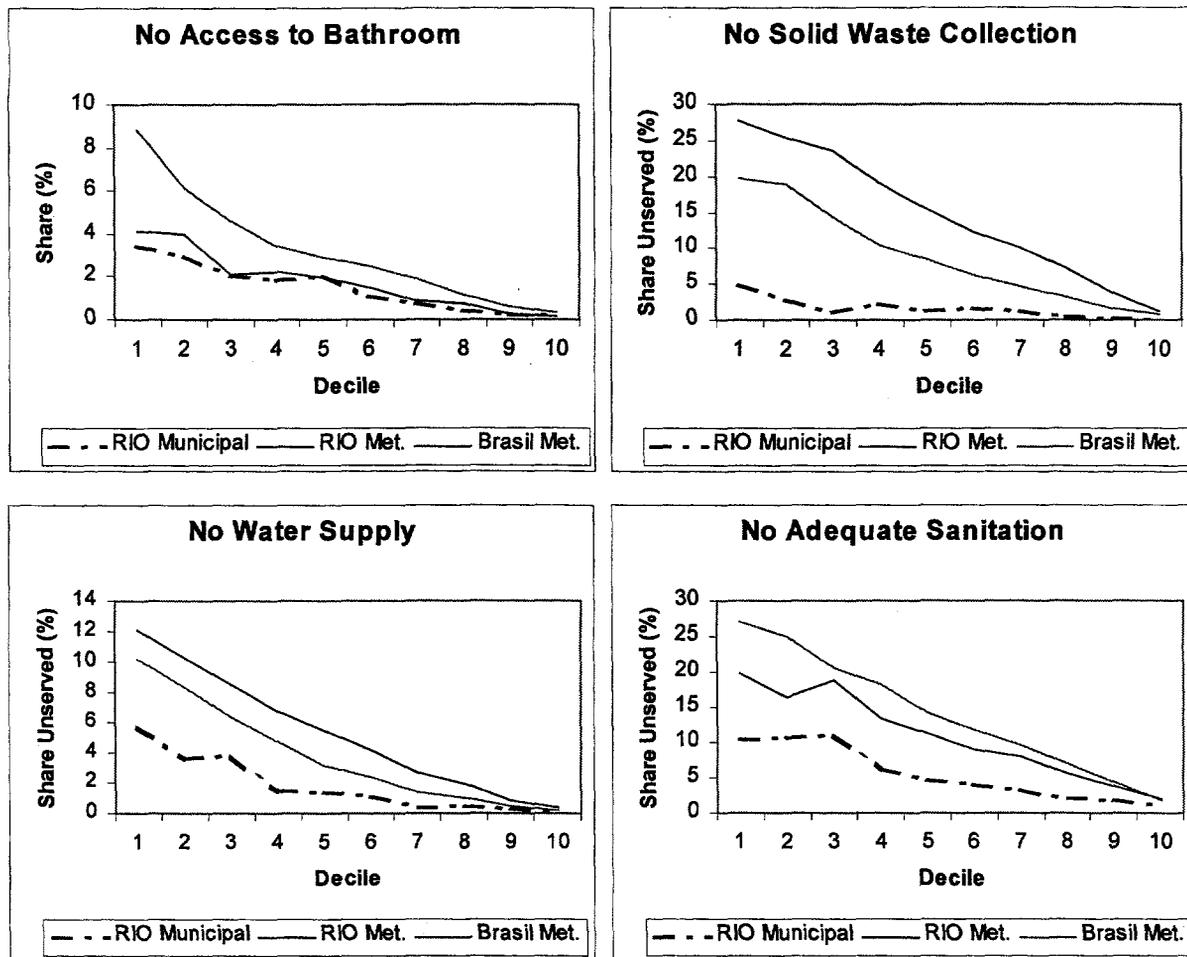


Absence of Piped Water in House



Absence of Sewage Network





2.18 Also, with respect to all these indicators of housing and services, Rio Municipality shows better coverage of the poor than the Rio Metropolitan Area, which in turn shows better coverage than the average of all Metropolitan Areas in Brazil.

Poverty and Violence

2.19 Violence is strongly correlated with poverty. In fact, poverty and violence form a vicious circle. Violence against property undermines the security of investments and thus reduces the incentives to invest either in housing or income earning activities thus trapping the affected groups in a cycle of poverty and low investment. Poverty, without social structures that effectively control violence, in turn breeds more violence. This report does not deal adequately with the complex problems involving the linkages between violence and poverty but flags them as important areas for more detailed analysis and action.

Poverty and Environment

2.20 By choice of location and by political process directing efforts to clean the environment toward richer areas, the poor are more affected by adverse environmental conditions. More of the poor live in the

northern part of RJ-Mun, which is affected by serious, and health threatening, air pollution.³ They live closer to heavily polluted waterbodies, such as Guanabara Bay, which leads to health risks, for example, for bathing children. Many poor neighborhoods, especially favelas, are located on lands exposed to natural hazards (landslides, flooding, etc.).

2.21 The health costs of pollution particularly affect low-income households which typically live in more polluted areas and lack the resources for protective expenditures and investments. Environmental improvements will, therefore, often more than proportionately benefit the low-income population. Measures that improve environmental conditions and generate benefits primarily for the poor, such as the extension of basic sanitation, are an obvious top priority. On the other hand, it would be misguided to try to address income inequalities through environmental improvements that would not otherwise be a priority. For example, investments in secondary and tertiary sewage treatment would in many locations not likely be a priority for the poor who might instead prefer faster expansion of sewage collection or better health care and education.

³ See World Bank, 1996, *Brazil: Managing Environmental pollution in the State of Rio de Janeiro*, Report No. 15488-BR

2. MUNICIPAL POLICIES AND THE POOR

MUNICIPAL SERVICES IN THE CONTEXT OF OVERALL GOVERNMENT SERVICE PROVISION FOR THE POOR

2.22 Municipal policies toward poverty are complicated, on the one hand, by the dependency on policies of other Government levels (for example, public security and water and sanitation under the responsibility of the State, and growth policy, minimum wage and unemployment policy under the Federal Government), and on the other hand, leakage of municipal services to residents of other, typically poorer, municipalities of the RJ-MA.

2.23 Traditionally, the role of the municipalities, including its policy toward the poor, has been focused on the provision of urban services, and more recently the provision of basic health and education services. However, there is an increasing recognition of the potential role of major municipality, such as RJ-Mun, in fostering local growth and employment, and in establishing an effective system of social protection to complement the basic functions of a municipality.

2.24 While even in RJ-Mun, policies toward the poor will continue to focus primarily on basic urban and social services, it is important to recognize that Rio de Janeiro is one of those municipalities that have the economic strength to make a significant difference with regard to poverty within the municipal boundaries. Possible limits to the effectiveness of municipal action are the possible use of municipal services by residents of other municipalities or the creation of undesired incentives for migration into RJ-Mun. While better poverty programs targeted at municipal residents might have an undesirable effect of attracting low income migrants into the municipality, the absence of significant migration at current shows that this has not occurred so far.

2.25 Leakage of benefits to residents of other municipalities, however, is a real issues. RJ-MA forms an integrated labor market where a large share of daily commuting occurs from the outlying municipalities into RJ-Mun. Some important municipal services (for example health) are legally available to residents of other municipalities as well. For other services, it would not be feasible to discriminate against residents of other municipalities. Leakage of services to poor from other municipalities (who do not vote and do not pay taxes in the municipality, if they do so at all) is not bad from a social targeting point of view. However, it undermines incentives for the municipality to offer social services.

2.26 This section focuses on municipal programs but also includes urban services provided by other levels of Government (such as water and sanitation). Other Government programs, such as minimum wage legislation, unemployment insurance, pensions., etc. are not discussed.

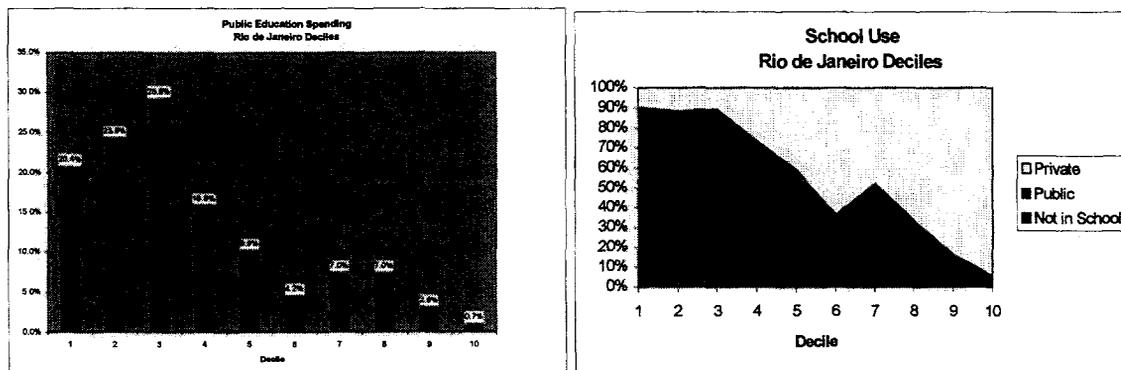
INCIDENCE: WHO GETS WHAT

2.27 Using new data from the recently completed Living Standard Measurement Study (LSMS)⁴, the incidence of social expenditures in RJ-MA is briefly analyzed to gain an appreciation of the extent of current targeting (or lack thereof) of social expenditures. While it is interesting to understand the effect of current expenditures on the poor, it is important to bear in mind that the targeting of current expenditures is not identical to the likely targeting of service expansion.

2.28 The following analysis shows the distributional incidence of social policies within the RJ-MA. It is important to recognize that Rio's overall income levels are higher than the national average. Someone who is relatively poor within Rio (within the bottom two deciles) is not necessarily poor within Brazil overall. Showing the incidence of social expenditures in Rio by national deciles would give a picture of far less poverty targeting than the incidence of expenditures by Rio deciles shown in this section.

EDUCATION

2.29 In 1996, the Education Secretariat administered a budget of R\$ 401 million or 11% of the municipal budget. This amount is now increasing significantly with federal transfers as a result of the full decentralization of primary education to the municipalities. (The 1998 budget provides for R\$622 million education spending or 16% of the budget). RJ-Mun is responsible for running almost the entire public primary education system and serves about 640,000 students from pre-school through grade 8. State primary schools attend to an additional 10,000 students. In RJ-MA, about 38% of students are attending private school and 6% are not attending school. If these ratios were the same in RJ-Mun, 68,000 children would be not attending school in RJ-Mun.



2.30 Public schools are perceived to provide lower quality education than private schools. As a result, most people who can afford it (typically above 10MS monthly household income) send their children to private school with the result that public schools serve mostly the lower income segments of the population. As a result of this perceived inferiority of public education, education expenditures are relatively well targeted with about 44% of the expenditures occurring to the bottom 20% and 73% of expenditures occurring to the bottom 30% of the population.

⁴ The Brazil LSMS (*Pesquisa das Padrões de Vida*) was recently completed by IBGE with assistance from the World Bank. The survey is unique in its depth and its focus on consumption (as opposed to income), as an indicator of well-being. The LSMS sample size is insufficient for analysis at the level of RJ-Mun. Therefore RJ-MA is used as the basis of analysis.

Primary School Attendance by Income Decile

	1	2	3	4	5	6	7	8	9	10
Public	71%	79%	87%	73%	52%	27%	48%	33%	17%	6%
Private	10%	12%	11%	27%	41%	64%	48%	67%	83%	94%
None	20%	9%	2%	0%	7%	9%	5%	0%	0%	0%

Source: IBGE LSMS/PPV 1996, for RJ-MA, Special Tabulation by Jeffrey Hammer

2.31 Among the city's ten school districts, per student expenditures range from \$683 to \$941. While within a relatively narrow range, these expenditures are positively correlated with average income of households in the school district. In order to equalize per student expenditures, about \$15 million (or 3% of the education budget) would have to be reallocated toward the poorer school districts.

School District	Average Head of Household Income (MS)	Annual Expenditure per Student (\$)	Language Performance Score	Math Performance Score
1	4	941	74.7	74.3
2	12	848	77.6	74.5
3	4.7	761	76.5	77.6
4	3.8	692	72.6	72.7
5	3.7	674	69.4	73.3
6	2.8	734	72.3	73.3
7	7.7	712	75	76
8	3	714	72.3	74.2
9	3.2	691	69.1	66.7
10	2.4	682	63.9	59.3

Source: Municipal Education Secretariat

2.32 There is no particular effort to bring low income children to school other than a program of food baskets for about 20,000 households at present, a share of which is targeted to support school maintenance. Also, there is no systematic tracking effort for children not attending school.

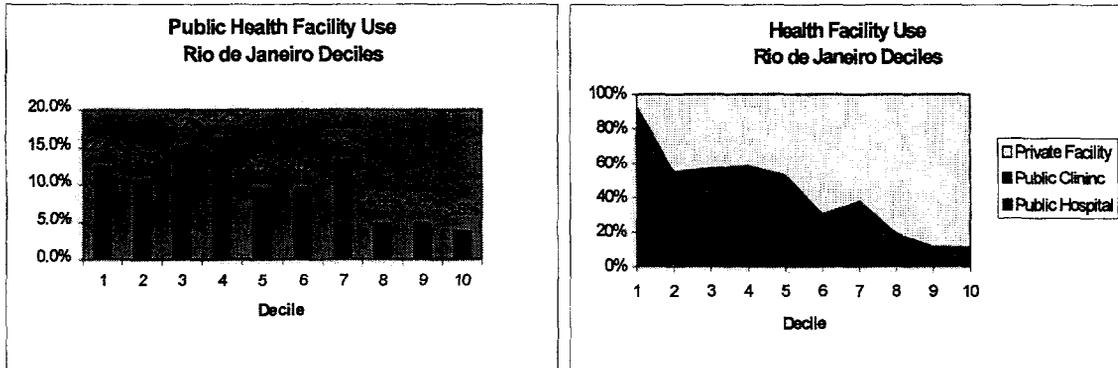
Health

2.33 In 1996, the Health Secretariat administered a budget of R\$ 253 million or 7% of the municipal budget. Health care services are universal and free to the entire population. A large share of municipal health expenditures is for emergency services and clinics, which are perceived to be of high quality and therefore used universally by the entire population. Similar to primary education, most other public health services are perceived to be of inferior quality. However, higher income groups have a higher usage of health care overall. As a result, municipal health expenditures are less well targeted at the poorer population groups than education expenditures. There is significant usage of public health care up to the top income deciles. Moreover, expenditures for higher income deciles is likely to be even higher than usage since richer people would typically use only the (more expensive) emergency services, whereas usage by the poor includes minor (and cheaper) services provided in health clinics for which richer people would typically use the services of private doctors. If expenditures were proportional to usage, the bottom 20% of the population would receive about 23% of expenditures. The bottom 30% would receive about 38% of expenditures.

2.34 Despite the less well targeted health expenditures, public health services are of critical importance to the very poorest. Only 7% of the bottom decile use private health facilities. This share rises quickly to

about 40% for the second to fifth decile. Thus, a reduction in public services would create serious problems for the poorest who do not have the resources to access any private facilities.

2.35 There is ample room for improving the efficiency and provision of health services. Nevertheless, most communities are said to have reasonable access to basic public health care. However, there are spatial inequalities in terms of insufficient hospital capacity closer to low income areas.



2.36 There are basically three issues with respect to social targeting and incentives for efficient service delivery by the municipality:

- a) The health system is in a transition during which RJ-Mun is taking over primary care. However, this transition is not complete and currently, all three levels of Government provide some primary care and operate their own facilities without effective coordination. This situation leads to difficulties in matching supply and demand for health care and undermines the incentive for efficient service delivery since each level of Government can blame the other levels for service insufficiencies.
- b) The municipal health facilities provide free of charge services to patients who carry private health insurance. Currently, these services are not reimbursed by the insurers. This issue is particularly acute for ambulance and emergency services which are exclusively and free of charge provided by the municipality. Overall, about 17% of residents of RJ-Mun are said to have private health insurance. Since the municipal facilities focus on emergency services, it is conceivable that 10-20% of municipal expenditures are for insured patients. While privately insured patients should not be denied services, recovery of costs from private health insurance would be reasonable and allow better social targeting of health expenditures.
- c) The municipal health facilities provide better services than the surrounding, poorer, municipalities of the RJ-MA. (Per capita health expenditures in the Baixada Fluminense are about half the level of RJ-Mun). Therefore, there is significant usage of municipal health services by residents of other municipalities. Usage of municipal health facilities by non-residents has been estimated as about 15-20%. Since most of these services are likely provided to the poor of those municipalities, this is less a social targeting than an incentive problem. Given this spill-over benefit, RJ-Mun will invest less to improve its own health care system since its expenditures and efforts will only partially improve health care access for the population of the municipality. Again, instead of restricting access, the solution would be a system of transfers or cost recovery that would lead to these services being paid through the patient's residence municipality or through transfers within the national health system.

	Population	Health Expenditures	Per Capita Health Expenditures
Rio de Janeiro	5,500,000	R\$ 426,000,000	R\$ 76.06
Duque de Caxias	697,729	R\$ 50,892,600	R\$ 72.94
Quimados	103,847	R\$ 2,725,000	R\$ 26.24
Nilopolis	160,203	R\$ 4,170,000	R\$ 26.03
Japeri	69,127	R\$ 1,776,461	R\$ 25.70
Sao Joao de Meriti	434,518	R\$ 7,535,155	R\$ 17.34
Belford Roxo	379,036	R\$ 5,103,000	R\$ 13.46
Novo Iguaçu	811,667	R\$ 8,800,613	R\$ 10.84

Source: Luis Gustavo Martins and Jose Eduardo Prates, 1997, Perfil Orçamentário dos Municípios da Baixada Fluminense em 1997. RJ-Mun: World Bank estimates for 1998.

Housing

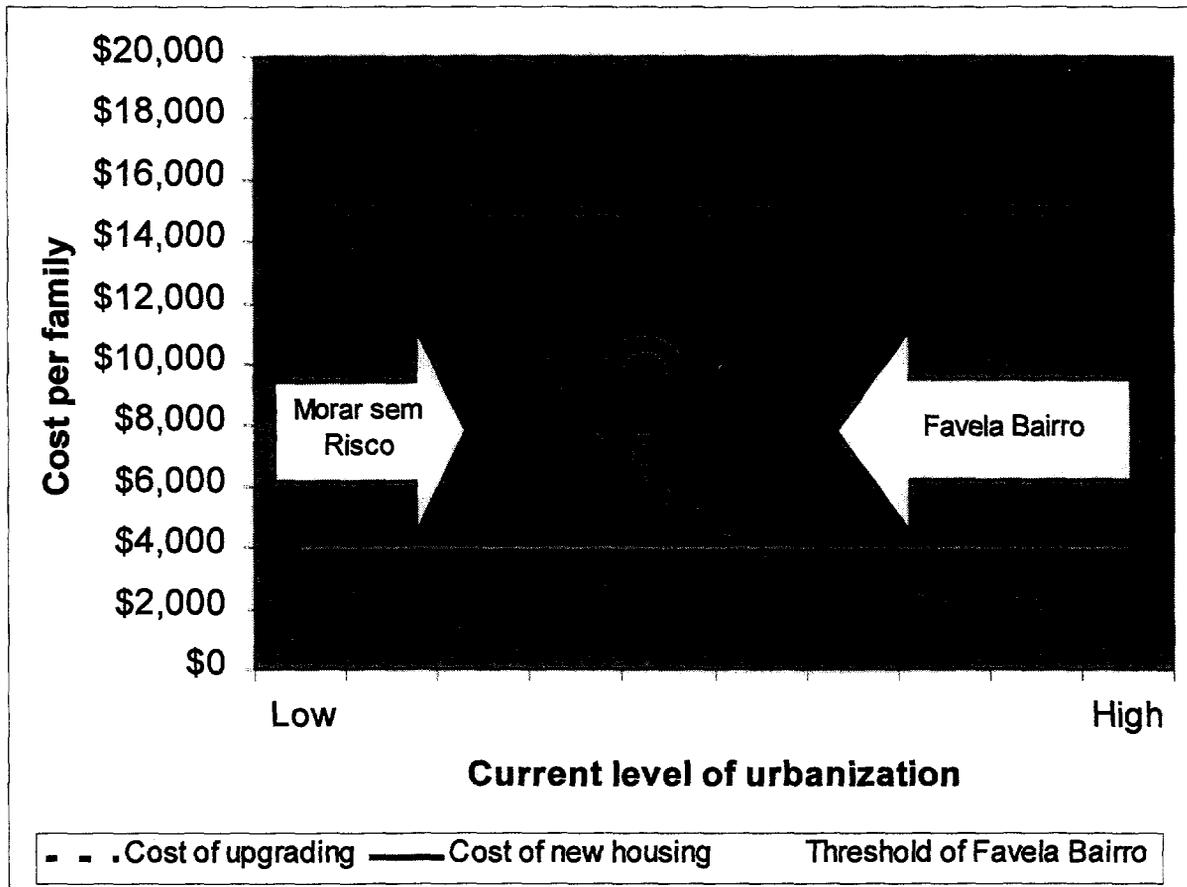
2.37 The Housing Secretariat administered in 1996 a budget of R\$ 56 million or 1.6% of the municipal budget. In 1998, this budget is expected to rise to R\$291 million or 6% of the municipal budget.

2.38 The flagship initiative of the Housing Secretariat is the Favela Bairro Program. Under the Favela Bairro Program, partially financed by the IDB, RJ-Mun has embarked on an extremely ambitious program to urbanize Rio's favelas. The underlying philosophy of the program is that most favelas can be converted into regular, urbanized, neighborhoods by coordinated provision of several urban services. Favela Bairro has focused on medium sized (500-2,500 households) favelas which already have some basic infrastructure so that complete urbanization can be achieved at a relatively modest cost (up to US\$ 4,000 per household). Favela Bairro targets 60 favelas with a total population of about 220,000 (a quarter of RJ-Mun's Favela population).

2.39 Favelas were selected for inclusion in the program by a ranking that considers social deficit and deficit of physical infrastructure, on the one hand, and easiness of urbanization and completing infrastructure, on the other hand. The selected favelas show slightly better social indicator and somewhat higher service coverage than the total universe of favelas. Following this information and the earlier discussion of the relative economic position of the favela population, it can be estimated that about 40% of Favela Bairro beneficiaries are among the bottom 20% of the population. Thus, Favela Bairro would benefit about 90,000 (or 9%) of RJ-Mun's poorest one million inhabitants.

2.40 Even though the majority of the beneficiaries of Favela Bairro are likely to be above the poverty line, the extension of basic urban services is nevertheless a highly desirable activity for the city, especially since favela residents, while not the poorest, have undoubtedly large unmet needs.

2.41 With Favela Bairro, the city targets a segment of the population for which a significant improvement in well-being can be achieved at a modest cost. This strategy is reasonable as long as it does not divert attention from the poorest for whom similar achievements in quality of life are much more difficult to achieve through urban upgrading. Exactly this diversion of attention, including diversion of other Government programs, from the invisible poor to the Favelados, is the main danger of the project. Favela Bairro aims at catalyzing municipal programs and directing them toward the favelas. As such, the program already guides several other municipal initiatives such as employment and microenterprise programs. While this attempt to coordinate municipal programs is positive and its strong focus on the favelas is understand-



able because of the political visibility of the favelas, it may be mistaken in the sense of taking attention away from the neediest part of the population.

2.42 Favela Bairro initially focuses on Favelas where urbanization is relatively advanced so that the project can be completed at a moderate cost. Again this is understandable and allows important benefits to be generated at a limited cost, but it also biases the program toward the relatively better-off Favelas. Favela Bairro aims at resolving the problem of Favelas in the medium term. It is questionable, however, whether the Favela Bairro approach can be easily expanded downward toward favelas at a much less urbanized level. Here the issue of cost-effectiveness needs to be raised with respect to the urbanization versus voluntary relocation of less urbanized favelas. Also, the urbanization approach is likely to be much more difficult in Favelas which lack the social organization and support favored by the selection criteria for the first phase of the program. Thus, serious questions are in order whether the program can indeed resolve the problem of Favelas.

2.43 Favela Bairro is complemented by an (also IDB financed) urban upgrading program (PROAP) for 120,000 residents of irregular subdivisions (32 of the total). The Favela Bairro Program is also complemented by the much smaller Morar Sem Risco program which aims at the resettlement of households that have located in physically unsuitable locations (flood or landslide dangers, environmental risks, traffic risks). This program is mainly driven by emergency situation and does not follow the same systematic planning process that characterizes Favela Bairro. Given the concerns about downward expandability of Favela Bairro, it will be important develop a more systematic approach to resettlement and to reconsider

the current boundary set between Favelas to be urbanized and to be resettled. It is quite conceivable that a significant share of residents at the "bottom" favelas (however not in physically hazardous locations), currently targeted for future phases of Favela Bairro, would be better and more cost-effectively served by voluntary resettlement to new sites.

Urban Services and Infrastructure

2.44 Water and sanitation services make a critical contribution to the health status of the population, and in particular influence the health of children.⁵ These services are currently provided by CEDAE, the state water company of Rio de Janeiro. Privatization of these services is under active consideration by the state. Universal coverage with piped water should be an immediate priority under any management regime. Universal coverage with sewage will require high investments and will take longer, but should also be a high priority. Tariffs are already high and sufficient to cover the full costs of services with cost reductions that can typically be achieved by an efficient private sector operator. Therefore, the critical issue is incentives and contractual obligation for the service provider to fully serve the poor population.

2.45 There continues to be a significant gap in the collection of solid waste from all of the cities' neighborhoods. Solid waste collection is the responsibility of the municipal solid waste management authority COMLURB. Uncollected or improperly disposed solid waste not only creates unsanitary and unsightly conditions in poor neighborhoods but also contributes to clogging of drainage system, and thus contributes to floods that continue to cause fatalities in RJ-Mun.

2.46 If urban services are extended to poor neighborhoods at a price that does not exceed the willingness to pay for these services, the value of residences in these neighborhoods rises. If poor residents own their residences, these benefits will accrue to them. If, however, the poor do not own the residences, some or all of the rents may accrue to non-poor owners. Given the high level of house ownership even among the poor, this phenomenon should not be of excessive concern. However, there is a danger that poor non-owners are crowded out of areas with improved urban infrastructure.

2.47 The cost and time spend for transport from residence to work is a significant burden for many poor. Bus is the predominant form of transport for the poor. Since there is no fare integration between different bus lines, costs can escalate up to one minimum salary for the daily commute between distant locations within RJ-Mun. In fact, the cost of commuting is sometimes mentioned as an important factor that has led to the formation of favelas, which are closer to centers of employment than most regular low-income housing. The bus system is mostly operated by private concessionaires for specific line. The suggestion of subsidizing bus fares is sometimes made. Given the poor experience with bus subsidies elsewhere both in terms of fiscal sustainability and poverty targeting of the expenditures, careful analysis should be undertaken before considering such proposals.

2.48 Road-based infrastructure is unlikely to provide important benefits for the poor (while investments may very well be desirable to address notorious congestion problems). Whether the potential time saving of better rail-based infrastructure is important to the poor, would need to be analyzed in more detail, but is not obvious as a cost effective policy for poverty alleviation (notwithstanding the desirability of transport investments to alleviate the city's notorious congestion problems).

⁵ See World Bank, 1998, Brazil: Managing Pollution Problems, Report No. 16635-BR, for quantifications.

Labor, Training and Microenterprise Programs

2.49 The recently created municipal labor secretariat is experimenting with extremely interesting and innovative initiatives in the area of adult training, advice and facilitation for unemployed, microcredit and microenterprise programs.

2.50 In July 1997, the secretariat launched an adult education program, which in its first phase helps 4,000 adults complete their primary education. Most of these students attend night classes. The majority of students are female (61%) and currently unemployed (63%). Courses are designed to bring students up to primary education level in about eight months and implemented through partnerships with industry federations, NGOs and community organizations. The cost of the program is about R\$ 625 per student, somewhat less than one year of regular primary education for children. It is estimated that the total target population for adult education could reach 1 million in RJ-Mun. Additional adult education initiatives are foreseen for secondary and pre-university education.

2.51 Other areas of action of the secretariat are support to microenterprises in simplifying bureaucratic requirements, providing access to marketing channels and, in the future, credit, training for micro-entrepreneurs, and intermediation in the labor market. Most of these activities are in their incipient or planning stage. Even though not explicitly targeted at the poor, most of the programs of the secretariat are likely to bring important benefits for at least some segments of the poor population. If properly evaluated, these programs will provide valuable lessons for new labor market related policies.

2.52 There is no explicit attempt to use municipal employment as a poverty alleviation device. Such attempts have been made elsewhere and have typically not been successful in targeting the poor. Municipal employment is not directly affected by minimum wage legislation since even the lowest paid municipal jobs (for example street sweepers of COMLURB) receive a salary of at least R\$280, more than twice the minimum wage.

Social Development and Protection

2.53 In 1996, the Social Development Secretariat administered a budget of R\$ 40 million or 1.1% of the municipal budget. The budget proposal for 1998 is R\$ 58 million. The Secretariat administers several programs targeted at specific population groups, most of which are likely to be part of the overall poor population of RJ-Mun. The Social Development Secretariat pursues a strategy of partnership with NGOs to increase its reach. Moreover the Secretariat is responsible for the coordination of the municipality's "macro-function" social policy. The main programs and their current reach are summarized in the Table below.

2.54 The relatively new food-basket program is of particular interest. In addition to the distribution of the food basket, social workers provide general social assistance to the households participating in the program. The network of NGOs and social workers affiliated with the secretariat identifies the beneficiaries of the program. A large share of baskets are given to households as an incentive to maintain their children in school. The fact that assistance is given in kind (food) would make the program less attractive to non-poor households and thus further helps assure effective targeting to the poor.

2.55 The kindergarten program aims at giving single mothers the opportunity to earn a regular income while ensuring adequate care for her children. Alternatively, the program allows a an additional adult household member to become income earner. An expansion of the kindergarten program from 26,000 to

85,000 children in 2001 is currently under preparation, with World Bank assistance. In this context, it is also planned to increase the coverage of pre-natal care, immunizations and nutritional supervision. Kindergartens are installed in neighborhoods which a certain minimum share of households below a specified income level. These programs thus attempt spatial targeting at the neighborhood level.

Program	Potential Target Population	Households Reached (1997)	Approximate Cost
Kindergarten program for 0-6 year old children (Crecches)	Households with young children and under R\$360 monthly household income (about 100,000 households)	26,055	R\$9 mio
School Maintenance Program for 7-14 year old	About 100,000 poor households with children 7-14 years	2,648	R\$0.8 mio
Youth Training Program for 15-18 year old	About 65,000 poor households with children 15-19 years	1,702	R\$0.3 mio
Street Children Program		1,422	R\$1.5 mio
Disabled Support Program	Up to 10% of the population (530,000) are likely to be affected by some disability	1,702	N/A
Elderly Support Program	About 35,000 poor elderly that do not receive pensions (women above 60 and men above 65 years)	2,494	N/A
Food Basket Distribution		20,000	R\$3.5 mio

Source: Municipal Secretariat of Social Action. Target numbers from special tabulations of the 1996 PNAD by Sônia Rocha.

2.56 On the one hand, the programs of the secretariat have a limited reach compared to the scale of poverty and other population groups with special needs. Even the larger programs (kindergarten and food basket) reach currently only a fraction of possible (and needy) beneficiaries. On the other hand, programs are implemented with great devotion to the needs of individual households and linked to the provision of a large range of formal or non-formal types of social assistance to the supported households. As the result of the small scale of programs and the intensive personal involvement of secretariat staff and NGOs, it is plausible that current programs are rather well targeted at households in high need of assistance. Also, a significant share of overall costs is likely to reach beneficiaries.

2.57 The problem is that these programs cannot easily be expanded to the necessary scale without running the risk of large-scale leakage beyond the poor or the specific target population. Since no effective system for means-testing is in place or easily available, the amplification of any means-tested programs would pose a great challenge in terms of institutional and administrative burden.

THE RELATIVE EFFECTIVENESS OF POVERTY PROGRAMS

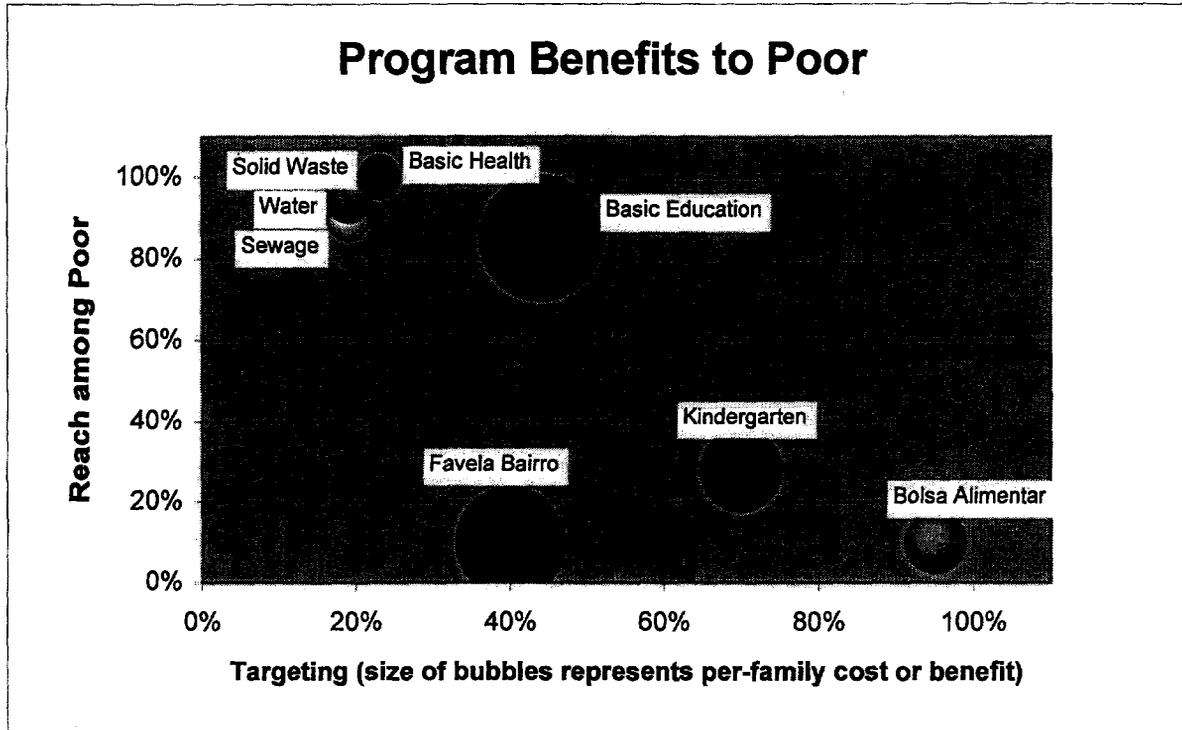
2.58 This section attempts to put municipal programs and spending for the poor into a broader perspective and compare their relative contribution to poverty reduction. The numbers provided in this section need to be interpreted with great care since they are based on rough order of magnitude estimates. While

Program or Service	Current Total Spending (R\$ million per year)	Share of Spending for Poor (%)	Municipal Spending for the Poor (R\$ million per year)	Share of Poor Served	Average Monthly Benefit/Spending per Served Poor Household
Basic Education	400	44%	176	About 85%	\$66
Basic Health Care	253 (RJ-Mun) 520 (all SUS)	23%	58	Access for 100%	\$8
"Favela Bairro" (full implementation)	50	40%	20	10%	\$52
In-House Water Service		19%		95%	\$10
Sewage Connection		19%		90%	\$8
Solid Waste Collection		20%		96%	\$3
"Bolsa Alimentar"	3.5	100%	3.5	About 10%	\$16
Kindergarten (with planned expansion)	25	70%?	18	About 28%	\$29
Other social development programs	40	80%?	32		

relying on coarse assumptions, the value of this analysis lies in the possibility of making comparison of orders of magnitude across different services and programs.

2.59 RJ-Mun has put a great emphasis on urbanization and urban development projects, including Favela Bairro and, without a specific poverty focus Cidade Rio. This focus corresponds well to the strategic objective of urban recovery and the traditional municipal responsibilities for urban development. Some of these projects have significant benefits for the poor, but they are not particularly well targeted to the poorest population of the city.

2.60 RJ-Mun spends about R\$650 million for basic health and education, R\$50 million for social development, and another US\$50 million for poverty-directed urbanization. Of this total of R\$750 million (about 20% of the budget), about R\$300 million are estimated to reach the poor (about 9% of the budget). While there are other municipal services from which the poor undoubtedly benefit, only one fifth of the municipal budget is spent on programs with a particular focus on serving the poor, and only one eleventh actually reaches the poor through these services.



2.61 Even though a small share of municipal spending, the current program have an extremely important benefit for those poor households reached by them. What is the relative importance of different Government programs in relation to the income and expenditures of a typical poor household? Households up to 3 MS household income represent about the bottom 15% of the Rio Metropolitan Areas. These households have a household budget of on average \$240 (0-2 MS) and \$326 (2-3 MS). The table shows the cost of providing public services per household (for a typical household of four with one child in basic education and one child kindergarten age). Comparison should ideally be made in terms of benefits and not expenditures. However, this is not attempted here. In the case of these services, previous studies show that the benefits of these services to the poor typically equal or exceed the costs of providing the service. The value of a broad package of municipal and urban services (including water and sanitation, one child in kindergarten and one in primary school, as well as health care and participation in Favela Bairro) would be near \$200 per household per month, or about 80% on top of the household income of the poorest groups. On average, poor households receive \$125 per month, or 50% on top of their household income.

2.62 The Figure shows the relative importance, the degree of targeting and the reach of current programs. Water sanitation, water, solid waste, and basic health are almost universal, therefore reach almost all poor and are untargeted (the share of expenditures to the poor is similar to the share of the poor in the population). In the other extreme, the food basket and some other specific programs of social development are well targeted. However, these programs are small and their reach among the poor is limited. In between are the relatively most important programs: basic education, kindergarten and urban upgrading with high per household benefits, moderate to strong targeting and small (Favela Bairro) to wide (basic education) reach among the poor. There is clearly a trade-off between targeting and reach among the poor. The more complete the reach to the poor, the more difficult it is to control leakage. This is the challenge faced in up-scaling the currently small and well targeted social development programs. The challenge is to move existing and new programs toward better targeting and, at the same time, wider reach among the poor.

2.63 The Figure shows the targeting of current expenditures. The expenditures for the expansion of these services would likely be much better targeted, simply because coverage among the poor is lower. Any effort, or investment, to increase coverage of basic education and water and sanitation is almost by definition well targeted simply because current coverage among the non-poor is near universal. This difference between current provision of services and expansion of coverage highlights the importance of cost recovery for currently provided services, so that public resources can be focused on coverage expansion which would be much better targeted toward the poor.

2.64 According to the earlier analysis, the 840,000 poor of RJ-Mun can be divided into four groups by their location (favelas or not) and their social risk group (member of vulnerable groups or not), assuming that the share of special risk groups is the same between favela and non-favela poor. While there are important programs targeted at the favelas and some (albeit small) programs targeted at special vulnerable group, there is a group of about one third of the poor (almost 300,000) who do not fall in any of these categories, who are almost invisible and do not receive much attention from policy makers.

2.65 Among the programs that target the poor, many have an implicit bias against the poorest among the poor. For example, urban upgrading projects benefit those poor which already own or occupy a house. The focus on the not quite so poor, which already have some assets, such as a house and who have some basic social organization, is understandable since there is often a tradeoff between targeting the poorest, on the one hand, and achieving sustainable and large benefits, on the other hand.

The Poor	Favela (1/3)	Non Favela (2/3)
Vulnerable Group (1/2)	About 1/6	About 1/3
No Vulnerable Group (1/2)	About 1/6	About 1/3 (The Invisible, Normal Poor)

Approaches to Targeting

2.66 The key to successful poverty alleviation programs is effective targeting to the poor. While the cost of any universal program quickly reaches fiscally unsustainable levels, effective targeting allows reduction in poverty levels at a moderate fiscal cost. In fact, given the fiscal limitations that RJ-Mun faces just like other Brazilian Governments, there is really no fiscal room for alleviating poverty through expansion of universal programs. As indicated before, perfectly targeted programs could eliminate poverty in RJ-Mun at a cost of R\$311 million per year or 9% of the municipal budget. In contrast, the cost of eliminating poverty through a universal entitlement program would be R\$5.2 billion (this is the poverty line multiplied by the entire population), or 17 times as much, equivalent to 147% the municipal budget.

2.67 Within the existing programs, RJ-Mun faces the dilemma that some programs, such as municipal health services and to a lesser extent primary education, are not particularly well targeted. Yet, these services are of critical importance to the poor who don't have the resources to access alternative private services. Even though these services are not well targeted, they cannot be cut back without hurting the poor over-proportionally. In some of these cases, universal access is legally guaranteed and cannot be revoked by the municipality. In these cases, policies should aim at improving targeting without formally eliminating universality. For example, municipal policies should directly aim at improving education and

health for the poor while at the same time recovering costs or cutting down discretionary universal services. This implies a significant change in attitude and management approach for sectors where not even statistics about the incidence of expenditures across income groups are maintained.

2.68 The next question is who to target among the poor. Often, it is easier to implement projects and programs and achieve sustainable results with programs targeted not at the poorest among the poor but those poor closer to the poverty line. Examples include the urbanization programs discussed before. If there are thresholds of urbanization required for investments to yield sustainable improvements, it may be more effective to target neighborhoods where this threshold can be reached at limited incremental cost. On the other hand, this approach may imply missing out on the very poorest which would have to be targeted by other programs. Thus, targeting may sometimes involve a tradeoff between reaching the poorest and achieving high and sustainable benefits.

2.69 The critical question is how to target. Possible instruments include spatial targeting, category targeting, means-testing, and self-targeting. In Rio, spatial targeting at a macro-scale is complicated by the high degree of income mixing in many parts of the city. At a micro-scale, spatial targeting is more feasible but suitable only for services which are directly tied to the residence such as typical urban services. Spatial targeting at a small scale for services that are not linked to the residence is complicated by the fact that there is no simple mechanism for verifying a person's residence. In Brazil, proof of residence is typically provided by utility bills showing the person's name address. Even in the case of services tied to the place of residence, spatial targeting is rather weak as the example of the favelas illustrates. In RJ-Mun, a program targeted at all favelas would only reach 30% of all poor while 60% of the spending would accrue to non-poor.

2.70 Targeting by personal or demographic characteristics of vulnerable and easily identifiable groups (households with – many - young children, disabled, elderly, informal sector workers) is attractive where programs would not create perverse incentives to become a member of this category. It is currently used for several programs of the Secretary of Social Development. Targeting by category will be less suitable to reach the large number of “normal poor” that do not have any particular risk characteristic. A program targeted at the highly vulnerable groups in RJ-Mun (female, young, informal sector, and uneducated household heads) would succeed in reaching about half the poor, however, about 80% of the benefits would accrue to non-poor.

2.71 Means-testing is theoretically most effective in targeting the poor. In practice, however, means-testing requires good knowledge of the resources of each beneficiary household. Effective means-testing typically requires a complete cadastre of target households and periodic visits to all registered households. In Rio, there are no large scale precedents for such effective means-testing or data collection and no tradition of transparency and evaluation as required for this approach. This, however, does not mean, that Rio could not acquire the capacity to administer means-tested programs in the medium term. If a conscious effort is begun now to collect the needed data through existing programs, such programs could possibly be started in a few years time. The experience of Chile demonstrates that means-tested programs can be relatively effectively implemented in a country at a similar income level.

Box: Super-targeting in Chile

Chile has developed a refined system of means testing ("Ficha CAS") for the targeting of social programs (a household subsidy, old-age pension, housing and water subsidies). The system is based on household visits by social workers to every potential beneficiary household. Household surveys cover housing characteristics, educational attainments, labor activities, health, income, wealth, and participation in social programs. A computer program uses a secret (to avoid simple manipulation of results) formula to convert the results of the household survey into a score. This score determines eligibility for social programs. This refined system has been running since 1987 based on an earlier cruder system implemented in 1980.

The system has achieved rather effective targeting of social expenditures with 72% and 62% of the benefits of the two most important social transfer programs accruing to the poorest 30% of the population. The Chilean experience shows that means testing can be successfully applied IF it is based on complete household surveys and an efficient and relatively corruption-free public administration.

Source: Margret Grosh and Judy Baker, Means Tests for Targeting Social Programs, LSMS Working Paper, World Bank

2.72 Finally, programs can be designed to be self-targeting, either by offering an inferior good that is not attractive to the non-poor (perception of lower quality of public education and health care, and low-key packaging of food items) or by imposing a cost on beneficiaries that is relatively lower for the poor (for example work requirements, or waiting in line, which deters the non-poor with a higher opportunity cost of labor).

3. SUMMARY AND PRIORITIES FOR ACTION

THE ROLE OF THE MUNICIPALITY IN POVERTY REDUCTIONS

2.73 The effort of RJ-Mun to reduce poverty is currently focused on: (a) the provision of basic health and sanitation services; (b) urban upgrading with a strong focus on the favelas; (c) relatively small social assistance programs targeted at specific segments among the poor; and (d) pilot initiatives in adult education and labor market intermediation. These services are very important to the poor. Many programs, however, implicitly favor the better-off among the poor. In particular, there is a large group of "invisible, normal poor" (almost 300,000), who neither live in favelas nor belong to a specially targeted risk group and do not receive particular attention under RJ-Mun's poverty programs.

2.74 With a poverty gap of about 10% of the municipal budget, Rio de Janeiro is one of the municipalities whose resources would allow it to implement measures of significant scale for the reduction of poverty among its residents. RJ-Mun faces a strategic choice whether it wants to continue its current focus on urbanistic improvements and urban service provision, complemented by limited social assistance programs, or assume a broader more proactive strategy of poverty alleviation. The following paragraphs outline the possible elements of a broader policy alleviation agenda as it could be pursued by RJ-Mun.

2.75 Clearly, improved coordination with other Governments, especially the State, would be desirable to assure more effective policy making with respect to areas such as water and sanitation, security and health. However, coordination problems will always exist and should not, and do not need to be, misused as a justification for inaction.

GROWTH

2.76 While RJ-Mun is embedded in the Brazilian macroeconomy and dependent on its overall performance, this report stresses the importance of municipal policies for local growth. Such increased local growth would be expected to contribute to the reduction of poverty among the local residents.

2.77 Brazil-wide, the growth elasticity of poverty (measured as headcount ratio) has been -0.68. This means, for every one percent increase in average income, poverty rates have fallen by 0.68%.⁶ If this elasticity was applicable for Rio in the next decade, Rio's economy grew at a national average of 4% per year, and population growth continued at 0.8% per year, the poverty rate in RJ-Mun would fall from 15.6% to 12.6% over a decade with a reduction in the number of poor from currently 840,000 to 740,000. Alternatively, if Rio grew at 2 percentage points above the national average, poverty rates could drop to 11.0% and the number of poor to 650,000. These numbers show that growth is important for poverty reduction

⁶ Due to Brazil's extremely high income inequality, growth elasticity of poverty is low in comparison to global cross-country estimates in the order of -2.1. However, since all international experience shows how difficult it is to change inequality parameters, the Brazil-based low elasticity is used for the following calculations.

and that there is scope for municipal policies to speed the alleviation of poverty through higher growth. However, these numbers also show that growth alone will not resolve the problem of poverty in Rio over the medium term.

INFRASTRUCTURE AND URBAN SERVICES

2.78 Given the strong health benefits of and the high willingness-to-pay for basic sanitation services (water, sewage and solid waste removal), the provision of these services to all residents of the municipality should have top priority. At the income level of the RJ-MA, and given adequate contractual incentives and pricing structures, a concession for water and sanitation services should be able to provide universal services, at least for water, within a few years and within current tariff levels. Equally, solid waste collection should be extended to the entire city.

2.79 Urbanization projects such as Favela Bairro can be effective to significantly improve service delivery and quality of life in the already relatively well-established favelas. However, Favela Bairro is less likely to be successful and cost-effective in reaching the poorest and least urbanized favelas and is not targeted at the large number of poor living outside favelas. It would be important to undertake a careful analysis of the minimum level of existing urban infrastructure required for the urbanization approach of favela Bairro to be cost-effective, versus a voluntary relocation program that could complement Favela Bairro and Morar sem Risco.

2.80 Other urban infrastructure, in particular road infrastructure, is less likely to be a high priority for the poor in the short to medium term even though there will be benefits to the poor in the long-term if transport time and costs between distant points of the municipality can be reduced.

HUMAN CAPITAL

2.81 For a city with a limited industrial base, education and investment in human capital is even more important for the poor to have an opportunity to escape the cycle of poverty and low human capital. In the provision of basic social services (health and education), policy makers should shift their focus from universal coverage to serving the poor more effectively, without abandoning universal access per-se. This would imply a significant change in resource allocation and management approach that would begin with systematic assessment of the impact of service provision on the poor.

2.82 Among the government programs, basic education provides the largest per-household benefit and is relatively well targeted at the poorest. Among the poorest decile in the RJ-MA, about 20% of children of primary school age do not attend school. A major effort should be undertaken to increase enrollment rate among the lowest income groups. One of the reasons for low school enrollment is the opportunity cost of the time of children who work, typically in the service sector. Recent experiences in Brazil have shown that grants of relatively small amount to households which send their children to school can provide an effective incentive for increasing enrollment rates. While most of these programs are still at a pilot stage, initial results are encouraging. The largest program in Brasilia pays the equivalent of one minimum salary (R\$120 per month) to low-income households who send all their children to school.

2.83 Building on the small Food-Basket program in RJ-Mun, an expanded school grant program could be a cornerstone of a broadened municipal poverty alleviation program and combine the objective of in-

creased school enrollment of the poor with direct assistance to the poorest households. It is doubtful whether a significant increase in the scope of this program could be cost-effectively achieved through an in-kind program as in the case of the current Food-Basket program. While in-kind transfers have the advantage of a certain degree of self targeting, they are typically more expensive to administer. If the program was expanded and switched to a cash basis, an effective means-test or another self-targeting device would have to be introduced to avoid leakage to non-poor (see social protection, below).

2.84 Even though health care expenditures are not as well targeted at the poor as education expenditures, improvements in health care provision are important since the poor have very little access to private health care services. Improvements could be expected from: (a) clear assignment of responsibilities for health care services within RJ-Mun between the three levels of Government; (b) recovery of costs of services provided to privately insured patients from the insurance; and (c) cost recovery for services provided to non-resident patients.

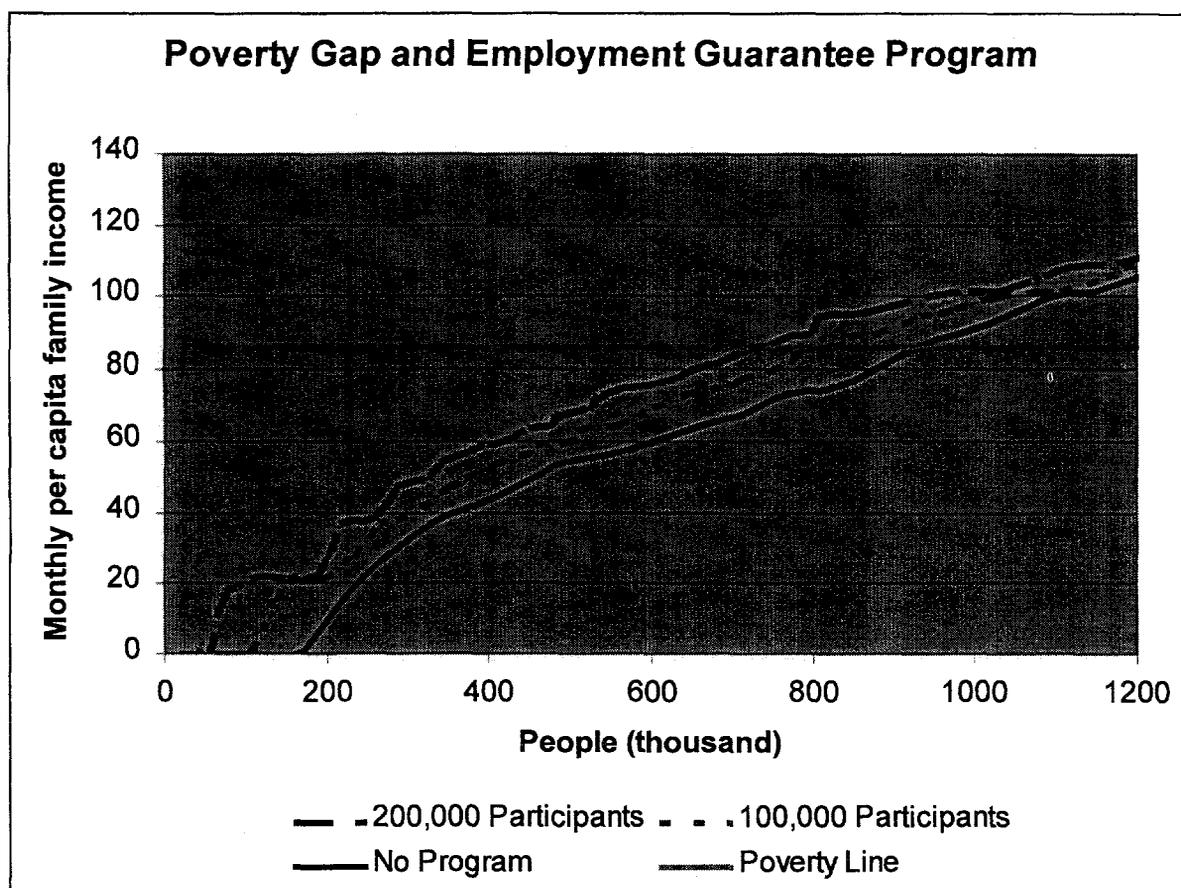
SOCIAL PROTECTION

2.85 Currently, social protection program of the municipality and for residents of the municipality are limited and leave a serious gap, especially for those poor who do not reside in favelas and do not belong to one of the special risk groups with targeted programs. Possible elements of an expanded social protection program of the municipality could be: (a) a broader school grant program for low income households; (b) a minimum income program for low income households; and/or (c) a guaranteed employment program.

2.86 A school grant program would require means testing since spatial targeting alone would unlikely be sufficient if significant monetary incentives are involved. A minimum income program, under which the municipality would pay the difference between actual and some established minimum household income, would even more depend on effective means testing. Given the administrative weakness of the city and the problems of means testing even in high-income countries, it is not conceivable that RJ-Mun would be able to effectively administer such means-tested programs in the short and medium term without incurring very significant leakage which would grossly dilute the poverty reduction effect of such programs.

2.87 The problem of means-testing focuses attention on self-targeted programs, such as a guaranteed employment scheme. Such a program would guarantee every municipal resident above school age employment at a very low salary (significantly below a minimum salary). Due to the low salary and the work requirement, such a program would be effectively self-targeted and could be implemented with relatively minor administrative effort. Key for the success of such program is that the guaranteed salary is low enough to ensure self targeting and that administrative and capital costs of the program are kept very low. The nature of the work requirement is of secondary importance but should ensure low supervision and complementary capital, equipment and administration costs. Typical examples would include street sweeping and some public works. A guaranteed employment program would provide some (albeit at a very low level) basic protection for households with individuals able to work but unable to secure better paid employment. Most international experiences with such programs are with rural areas (such as the Maharashtra Employment Guarantee Program in India), however, the concept is adaptable to an urban context.

2.88 In case of a municipal guaranteed employment program, effective measures are required to limit access to non-residents. One option is to offer work under the program at many locations within the mu-



nicipality but only at a minimum distance from the border with other municipalities which would require residents from other municipalities to use public transport whose costs (at least about R\$25 per month for daily commuting) would deter participation.

2.89 A guaranteed employment program could be linked with a school grant program. Participants in the employment program would receive a basic salary. They would receive an additional grant if all their children regularly attended municipal school. This would, first, overcome the means testing problem for a school-grant program and, second, further complicate use of the program by non-residents.

2.90 A guaranteed employment program could be introduced at a very low salary level (for example R\$50 per month) and gradually increased if demand at this level turns out to be insufficient. An additional school grant could be another \$50 per month. To understand the implication of such program, it is assumed that 100,000 individuals would chose to participate of which 75,000 also would participate in the linked school grant program. The annual cost of this program (salaries and grants only) would be R\$105 million (or 3% of the municipal budget). Assuming 20% leakage to non-poor, benefits to the poor would be R\$84 million which would fill 23% of the poverty gap. If participation was uniform across income levels among the poor, the poverty rate would fall by about 2 percentage points (from 15% to 13%). If instead 200,000 individuals chose to participate (almost one person out of every poor household) and leakage was 30%, program cost would be R\$210 million and benefits to the poor R\$ 147 million which would fill 40% of the poverty gap and reduce the poverty rate from 15% to 11%.

2.91 The data generated by a careful monitoring and evaluation effort for this pilot program could be expanded to form the basis of future means-tested programs.

BETTER DATA AND MORE ANALYTICAL EVALUATIVE APPROACH

2.92 Beyond the periodic household surveys by IBGE, there is a remarkable absence of systematic tracking of poverty and the poor at all levels of Government in Brazil. Moreover, there is little practice or tradition of systematic quantitative analysis of the impact of governmental policies and projects on the poor. Policy makers in the social sectors (health and education), on the one hand, focus on universal access to their services rather than emphasizing the need to focus resources on the poor and track the impact of their services on the poor in particular. Policy makers working on social protection, on the other hand, are deeply involved and highly committed to specific programs to assist certain subgroups within the poor. An effort to track and address overall poverty levels has been relatively absent. In addition, most analysis focuses on inputs to social programs rather than poverty impact.

2.93 Given the decent availability of basic data, the municipality is well placed to develop its own system to systematically track poverty of its residents and evaluate the impact of its policies and projects on the poor. This report aims at demonstrating the scope and usefulness of such analysis but by itself does not complete the task that could be taken on by the municipality and would include:

1. A periodic compilation and publication of a report on social development in the municipality, based on IBGE's surveys and complemented by local research as required. This report would track the extent and depth of poverty and characterize changes in the different groups of the population constituting the poor.
2. A systematic and comparative analysis of the quantitative poverty impact of all existing and new government initiatives aimed at improvements in poverty.
3. A periodically updated comparison of the poverty reductions expected by different programs and policies over different time frames to compare targets and achievements.
4. The development of the database and instruments necessary to administer means-tested programs.

2.94 This report is incomplete in its coverage of several critical issues of urban poverty in RJ-Mun that would require urgent study. One of these issues is the linkage between urban poverty and violence of different forms, related to policies that can be implemented to break the poverty-violence circle.

2.95 In addition, it would be worthwhile to consider additional options to involve the poor themselves and NGOs in policy making for poverty alleviation. In addition to partnerships with NGOs in the implementation of projects, a Social Development Council with poor and NGO representatives could oversee the impact evaluation, tracking and policy design efforts.

CHAPTER 3

RIO: MAINTAINING FISCAL HEALTH

This chapter was prepared by William Dillinger, LCSPP and WDR, and is based on two missions to Rio de Janeiro in December 1997 and January 1998. The author would like to thank the many officials of the Municipality for their cooperation and assistance, particularly Dra. Sol Garson Braule Pinto, the Secretary of Finance, and Dr. Luiz Villela. This chapter was written in May 1998, and reflects the state of affairs at that time. Volume I uses revenue and expenditure data that are more recent than the numbers utilized in this chapter.

RIO: Maintaining Fiscal Health

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INTRODUCTION

3.1 This chapter is ultimately about what the Municipality of Rio can do to improve the city's economic climate and quality of life. Two points stand out. First, although the municipality is large—with a population of 5.5 million and a budget of US\$ 2.7 billion—it is only one of three levels of government in metropolitan Rio—the other two being the state and federal government—and only one of the 19 municipalities that comprise the metropolitan area as a whole. Rio cannot act alone. In fact, improving its relations with the other parts of the public sector may be as crucial as the quality of its internal management.

3.2 Second, Rio municipality is at a fiscal turning point. The city has taken on many new responsibilities, as federal decentralization and state fiscal distress have forced the two higher levels of government to reduce their roles. Rio has moved aggressively into the breach. Although the city's previous administration coped successfully with this expanding role—financing US\$ 2 billion in capital works from internal savings—the economic conditions that made this possible no longer exist. The present administration thus confronts the full burden of these responsibilities in a more difficult economic climate. In addition, it must deal with looming longer term fiscal issues, particularly the rapid growth of the city's bond debt and a possible leap in pension costs. This chapter looks at the city's fiscal prognosis and some of the options available. It also addresses the current focus of dispute between the municipality and the state: a battle over responsibility for water supply and sanitation.

Who does what

3.3 Rio Municipality serves a population of 5.5 million and is the core of Brazil's second-largest metropolitan area. The scope of MRJ's functional responsibilities and its ability to exercise them are defined by the activities of the other two levels of the public sectors acting within its jurisdiction. At present, the **Federal government** plays only a minor role as a direct provider of public services. With the recent sale of the federally-owned power company (LIGHT) and the devolution of transport and health care facilities, the federal government's direct role is now limited to phone service, which it provides through a subsidiary of the federal telecom holding company, TELEBRAS.

3.2 The federal government nevertheless plays two important indirect roles in Rio. The first is as regulator. Federal legislation defines the tax bases assigned to Rio municipality and mandates certain state-municipal tax sharing arrangements. It also imposes certain management restrictions on the Municipality. The most important of these concern personnel. The federal Constitution prohibits the dismissal of staff (except for cause), prohibits nominal reductions in salaries and requires the municipality to provide costly retirement benefits.

3.4 The second federal role is as financier. Federal current transfers to MRJ account for about 5% of the city's recurrent revenue. The majority of the city's contractual borrowing is through agencies of the federal government—particularly the Banco do Brasil (as agent for rescheduled debt now owed to the Federal government) and the Caixa Economica Federal.

3.5 The direct provision of public services is largely the responsibility of the **state and municipal** government, whose respective roles shift frequently and are the subject of ongoing conflicts. This is partly due to ambiguities in the federal Constitution. Unlike other federal countries—where municipal governments are creatures of their respective states and thus subject to their control—Brazil is unique in recognizing

municipal government as a third tier of government with the same Constitutional status as the states. States cannot compel or prohibit actions by the municipalities within their jurisdictions. At the same time, the Brazilian constitution provides no clear division of functional responsibilities between the state and municipal government. The federal Constitution merely assigns to the states "all responsibilities (*competencias*) not explicitly forbidden by the Constitution", while reserving for the municipios "the power to legislate over subjects (*assuntos*) of local interest, and provide...services of local public interest." Subnational government thus consists of two equally "sovereign" levels of government with no clear functional boundary between them.

3.6 Tension in the state-municipal relationship is exacerbated by peculiarities of the history, geography and politics of Rio itself. Until 1961, the present city of Rio was the federal capital. When the capital was moved to Brasilia in 1961, the district was temporarily transformed into the state of Guanabara. In 1975, it was demoted to a municipality and merged with the surrounding state of Rio de Janeiro, which had a considerably larger territory but was largely rural except for the immediate suburbs of the former capital. The municipality remained in one piece, however, and thus continues to play a large role in the state as a whole. Roughly 40% of the state population lives in the city. With nearly half the electorate, MRJ plays an important role in state politics. Since Brazil's return to democracy, the Rio mayorship has served as a springboard to the governorship. The last two governors were former mayors of the city, and the most recent incumbent is a strong contender in the current campaign. This has not fostered a harmonious relationship between state and municipal government. Because the sitting mayor and governor may belong to different parties or have personal rivalries, relations between state and municipal government are frequently strained.

3.7 The present division of functional responsibilities between the two levels of government is based on an agreement reached at the time the state of Guanabara was municipalized and an accretion of subsequent adjustments. Under the agreement, the state assumed all secondary education in MRJ, while leaving primary schools to municipality. The state also took over all responsibility for public security. The Municipality therefore has no police, other than small force solely responsible for guarding municipal buildings. Municipalization also brought the merger of the city's water and sewer department, which was merged with the state water utility, CEDAE.

3.8 Other functions have subsequently been assumed by one level or the other. Rail-based mass transit has become a state function, following the decentralization the federal commuter rail service to the State of Rio, and the construction of the Rio metro system. As discussed below, the municipality has taken over most of the federal hospitals in the city and the majority of highways. As a whole, the municipal government's principal responsibilities fall into four major categories.

3.9 Primary education (grades 1-8) is the sole responsibility of the municipal government. Spending on education accounts for about 22% of the 1998 budget (excluding overhead¹), and roughly 65% of the city's active payroll. The vast majority of the city's education budget is spent at the primary level: 80% in 1986 and 88% in the 1988 budget. The municipality's monopoly on primary education is unusual in Brazil, where some degree of state involvement in primary education is common. The majority of primary education in the city of Sao Paulo, for example, is provided by the state. Similarly, the state government of

¹ defined as "general charges (including payments to retirees and debt service); and spending in the secretariats of finance, personnel, legal counsel, and transfers to the legislative branch.

Rio de Janeiro is the principal provider of primary education in municipalities outside of MRJ.

3.10 The city is also the predominant provider of public health care, though a network of city-owned clinics and hospitals. The city has been intentionally expanding its role in health care by taking over federal hospitals. Between 1994 and 1995, 19 federal health facilities—four hospitals and fifteen clinics—were transferred to the Prefeitura. As of February 1998, another twelve hospitals were in the process of being decentralized. Of these, six—consisting of five specialized hospitals and one general hospital—were to be transferred to the state government. The remaining six were to be transferred to the municipality.²

3.11 The city bears only part of the costs of these health services. A federal insurance system—the Sistema Unica de Saude (SUS)—reimburses private and public health providers for part of the costs of providing this benefit. SUS reimbursements fall far short of the city's actual costs, however. Subsidies to the municipal clinics and hospitals therefore constitute a major claim on the city's resources. In 1996, subsidies to municipal clinics and hospitals equaled 8% of total expenditures, excluding overhead. In the 1998 budget, this figure is to increase to 11.5%.

	1996	%	1998	%
Scia de Educacao e Cultura	401	11%	622	16%
basic education	325	9%	551	14%
Scia da Saude	253	7%	426	11%
medical assistance***	217	6%	387	10%
Scia de Obras e Servicos	1036	29%	478	12%
streets and highways	620	18%	186	5%
drainage and erosion control	211	6%	146	4%
public lighting	38	1%	47	1%
Gabinete do Prefeito	381	11%	392	10%
solid waste (COMLURB)	217	6%	238	6%
Scia de Habitacao	55	2%	291	7%
slum upgrading, regularization	27	0%	236	6%
Encargos Gerais	520	15%	779	20%
debt service*(net of bond rollover)	80	2%	97	2%
payment to retirees	404	11%	462	12%
Administrative overhead**	139	4%	176	4%
Camara Municipal, Tribunal de Contas	127	4%	192	5%
Other spending units	233	7%	80	19%
Total spending*	3535	100%	3930	100%

1996 data is actual; 1998 data is budget
 *net of bond rollover and (in 1998) net of budget contingency
 **Scia do Governo, Fazenda, Administracao, Procuradoria
 *** expenses financed from SUS and PREMUNI reimbursements are excluded from 1996 data, included in 1998 data

3.12 The city is also the principal provider of **streets, highways, and drainage works** in the city. As in health care, the city has been expanding its share of this sector. At the time of municipalization, the city's highway network was divided between the federal and state government. Since then the city has taken over the principal federal highway (Avenida Brasil) and virtually all the state network, except the recently constructed Red Line. Under the Cesar Maia administration, the city assumed responsibility for the state's long-standing proposal to build a major freeway and tunnel system connecting the north and south sectors of the city (the Yellow Line.) This work has now been completed, at a cost to the city of approximately Rs\$ 400 million.

3.13 The volume of spending on this function varies with the availability of resources. It also varies with political cycles, rising in election years and falling in the year subsequent. The previous

(Caesar Maia) administration spent Rs\$ 2 billion on capital works during its four years in office, of which half was spent in its final year. Spending on capital works consumed 24% of the budget (excluding overhead) in 1996, but is budgeted for 17% of the 1998 budget.

3.14 The city is also responsible for traffic management (facilities but not enforcement) and the

² Once completed, the federal facilities would be limited to the national cancer hospital (under the ministry of health) and hospitals specifically linked to federal universities and branches of the military.

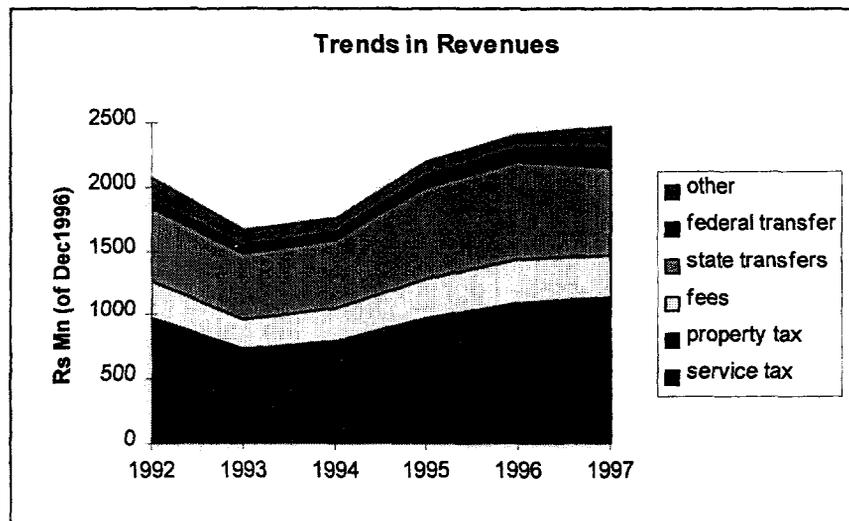
regulation of buses. The city sets tariffs and determines routes and frequencies on busses operating solely within the municipality. Buses crossing municipal boundaries are regulated by the state government.

3.15 The fourth major service provided by the city is **solid waste collection and disposal**. Solid waste services are provided by a city enterprise, COMLURB, and more recently by private firms (hired by the city in response to threatened labor action by COMLURB employees.) Solid waste services account for about 9% of city expenditures excluding overhead.

3.16 In addition to these four core services, the city also operates a modest **slum upgrading** program. This consumed less than 1% of expenditures in 1996 but is budgeted for 8% of expenditures in 1998. The city also has ambitions to enter the **water and sewer** business. This is discussed in the last section of this report.

Revenue Sources

3.17 To finance these responsibilities, the city relies on a combination of taxes and intergovernmental transfers. The city's principal tax is on services, the ISS. The ISS contributed 30% of current revenues in 1997. The largest contributing sectors are data processing, construction, financial services, machinery and equipment leasing. The tax is assessed and collected by the municipality, at rates set by the municipality but subject to a maximum fixed by federal law. As an ad valorem tax, the ISS is relatively buoyant with respect to economic activity and price changes. Receipts were dampened by triple-digit inflation in the early 1990's, however, as delays in tax payments reduced the real value of revenues by the time they were received (the Tanzi effect). The introduction of the Plano Real in mid-1994 reduced inflation to single digits. The reversal of the Tanzi effect (combined with improvements in the collection process) produced the real increase between 1994 and 1996. The reverse-Tanzi effect was largely exhausted by 1996, however, and ISS revenues fell by about 10% in 1997.



3.18 The city's second large source of tax revenues is a property tax. Assessments are based on capital value, and are adjusted according to an inflation index. Receipts fell sharply in 1993 due to a reduction in the effective tax rate, and have rebounded somewhat following the elimination of Tanzi effects after 1994. According to the city's analysis, the property tax base remains undervalued due to a lack of

accurate data on property characteristics and a general under-valuation of land. (Over the next three years, the city will resurvey property characteristics in the most problematic parts of the city and implement a more accurate procedure for valuing land.) In 1997, property tax revenues accounted for 17% of current revenues. Property tax receipts are substantially boosted by surcharges, the largest of which is a surcharge for garbage collection. Together with surcharges, the property tax contributed about 26% of current revenues in 1997.

3.19 Formula-driven transfers from the state government contributed 31% of the city's current revenues in 1997. By far the most important such transfer is the city's share of the state government's value added tax, the ICMS. Under the federal Constitution, the state is obligated to transfer one-quarter of its ICMS receipts to the municipalities within its jurisdiction. Seventy-five percent

	1992	1993	1994	1995	1996	1997
current revenue	2066	1862	1751	2200	2413	2464
taxes						
services tax	488	417	459	590	713	734
property	488	316	329	378	392	407
property surcharges (fees)	232	177	201	224	235	226
real estate transfer	58	55	61	85	90	101
transfers						
state ICMS	512	471	498	610	641	560
state motor vehicle tax	52	47	46	110	131	126
federal transfers	59	61	51	90	99	149
other	178	119	107	114	112	160

of this must be distributed on the basis of origin, with the remaining quarter distributed according to a formula devised by the state legislature. The present formula is roughly proportional to population. The state legislature is, however, contemplating a revision that would reduce the city's share to nil.

3.20 Federal revenue sharing comprises another 6% of current revenues. About half of this consists of constitutionally mandated shares of federal income and industrial products taxes (the Fundo de Participacao dos Municipios). The remainder comprises the retention of federal income taxes on salaries of municipal employees. (Note that federal reimbursements for health care under the SUS program are not reflected in these totals.)

3.21 Recent legislation will increase the municipality's revenues from transfers beginning in 1998. Under Constitutional amendment 14 (1996), 15% of the Fundo de Participacao and 15% of state ICMS tax revenues are to be diverted to a special education fund established in each state. Revenues of the fund will be allocated between the state government and its various *municipios* on the basis of primary school enrollment. Although this is zero-sum game for subnational governments as a whole, it favors *municipios* with disproportionately large primary school enrollments. As Rio is an extreme example of such a municipality, the city estimates that its net gain from Constitutional Amendment 14 will be about Rs\$ 323 million in 1998.

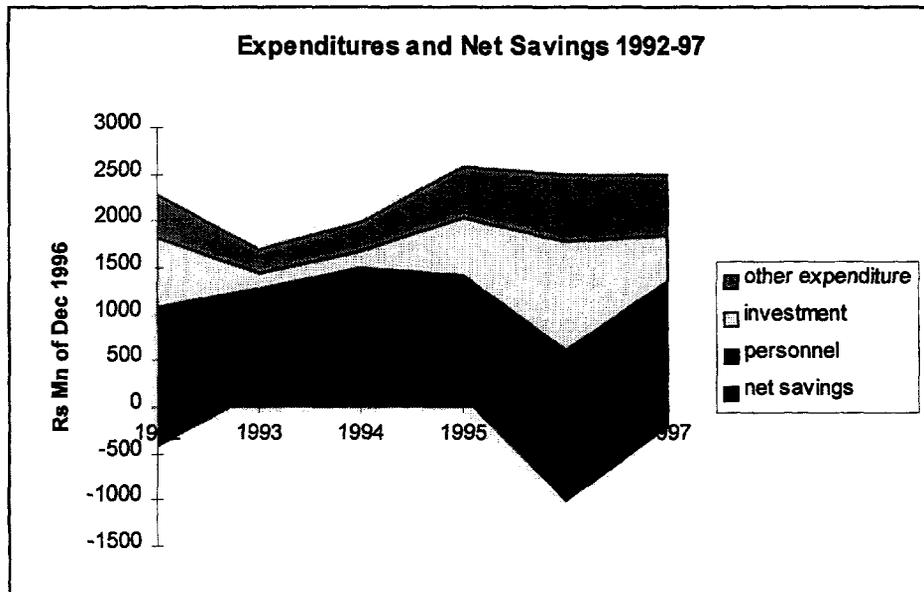
Fiscal Prospects and Issues

3.22 The city is now at a turning point. Now in its second year in office, the Conde administration finished its first year with a modest operational deficit³, in cash terms, equal to 6% of revenues. This was financed through modest contractual borrowing (Rs\$ 60 million) and the sale of assets (Rs\$ 107 million).

³ Defined as current revenues less current and capital expenditures excluding amortization.

These figures exclude off-budget interest capitalization, however. When interest capitalization is included, the city's operational deficit rises to 16% of revenues.

3.23 The prognosis for 1998 and the longer term is unclear. One thing is certain, however. The city cannot expect to continue the momentum of the preceding administration. The previous mayor financed Rs\$ 2 billion in capital investments from current savings. Changes in the economic environment will not permit the current mayor to repeat this performance.



3.24 Mayor Cesar Maia took office in a difficult position. The city's cash reserves totaled Rs\$ 47 million. Based on his campaign promises, he was obligated to reduce property tax rates by 30% and abolish the city's business license renewal fee. As a result, tax revenues fell 25% in real terms in his first year of office. The mayor's response was to cut expenditures. Capital investment took the largest cut, falling from Rs\$ 729 million (in 1992) to Rs\$ 168 million.⁴ Salaries also fell. Although the Constitution prohibits reductions in nominal salaries, it is silent on the subject of cuts in real terms. Quadruple-digit inflation in 1993 and 1994 made this feasible. Despite periodic increases in nominal salaries, the city's real wage bill dropped 26% between 1992 and 1994.⁵ Together with cuts in maintenance expenditures, this permitted the mayor to finish his first two years in office with a cash surplus of nearly Rs\$ 1 billion. This cash was invested in high-yield municipal securities, producing another Rs\$ 226 million in interest earnings.

3.25 The *Plano Real* put a crimp in this strategy. In 1995, inflation dropped to 22%; in 1996, to 9%. With inflation sharply reduced, the city's ability to restrain real salaries weakened. As a result, the wage bill rebounded, increasing 26% in 1995 and another 14% in 1996. But the *Plano Real* also caused an abrupt increase in revenues, due to the reverse-Tanzi effects noted earlier. Current revenues increased 25% in real terms in 1994 and another 10% in 1995. As a result, the city was able to continue to run current account surpluses (in cash terms) in its last two years of office and undertake a \$ 1.8 billion capital

⁴ The actual reduction was even larger, as roughly half of reported 1993 capital expenditures were in fact payments of overdue salaries.

⁵ After adjusting for differences in the number of salaries paid each year.

spending program, financed largely from accumulated savings⁶.

3.26 It is unlikely that the current administration will be able to duplicate this performance, given the new economic conditions in Brazil. With inflation at single digits, the city's ability to squeeze salaries is extremely limited, even if it were desirable to do so. (Inflation in 1997 totaled only 7%.) Major exogenous increases in tax revenues are also unlikely, as the Tanzi effects of the Plano Real are unlikely to recur. Given the city's reduced amount of cash, interest earnings are also likely to remain modest. The only positive certainty in the city's fiscal situation is the start of FUNDEF. As noted earlier, the city has budgeted Rs\$ 323 million in receipts from this new transfer in 1998.

There are four issues in particular that the city will need to address.

Debt Service

3.27 Rio confronts debt service obligations of indeterminate size. Rio's stock of debt is not large by Brazilian standards. As of December 31, 1997, total debt outstanding was Rs\$ 2.2 billion, or about 89% of revenue. About one quarter of this consisted of domestic contractual debt, mostly owed to the federal treasury for external debt rescheduling and to the federal housing and savings bank (CEF) for various project loans. Another 6% represents a Eurobond floated in 1996 and due July, 1999. The vast majority – Rs\$ 1.6 billion—consists of bonds. This is where the problem lies.

3.28 Domestic bond issues by subnational governments have a long and controversial history in Brazil. The market is dominated by large state governments: Sao Paulo, the state of Rio, Minas Gerais and Rio Grande do Sul. Only two municipalities issue bonds: Rio and the municipality of Sao Paulo. In response to states' difficulty in marketing their bonds, the federal government federalized most of the state bonds in 1994. This prompted the federal government to prohibit subnational governments from issuing new domestic bonds, other than to refinance the principal and accumulated interest on the existing stock.

3.29 The major bond-issuing states are now in the process of negotiating debt rescheduling agreements with the federal government. The largest debtor, Sao Paulo, signed an agreement in late 1997 and the other three major debtors are expected to sign agreements on similar terms. The agreements will allow the states to transform their bond debt (along with certain other liabilities) into a long term (30 year) debt to the federal treasury. Interest would be charged at a subsidized rate (6% in real terms, compared to the present overnight rate of 20%.) In addition, debt service will be subject to a cap. If debt service on the newly rescheduled debt, plus debts rescheduled under earlier agreements, exceeds 13% of revenues, the amount in excess will be deferred and capitalized into the stock. In cash flow terms, these agreements are quite generous. Because debt service on earlier rescheduled debt is already close to 13% in most of the major states, the additional amount they be required to pay will be relatively small.

⁶ Note that city's bond debt increased by Rs\$ 941 million (in prices of December 1997) over this period, due to the capitalization of interest.

3.30 Rio's bond situation is different from the states in that its bonds continue to be marketable in the private domestic capital market. As of January 1998, about half the bonds (Rs\$ 750 million) were held by private pension funds, banks, and similar investors. Another Rs\$ 400 million were held by the city's survivor-benefit fund (Previ-Rio), at market rates. The remainder were in the held by the Prefeitura itself.⁷

3.31 MRJ's bonds carry four year maturities and pay a variable interest rate equal to the overnight rate,

debt stock as of Dec 31 of year	1991	1992	1993	1994	1995	1996	1997
domestic bonds	352	490	817	1025	1361	1431	1658
external bonds	0	0	0	0	0	139	139
internal bank debt	511	502	467	570	629	579	566
external bank debt	112	102	113	0	0	23	70
total	975	1094	1397	1595	1990	2172	2433
less securities held in treasury	392	23	485	996	1160	219	197
less other funds available	38	24	19	21	8	17	8
net debt	545	1047	893	578	822	1936	2228
fiscal indicators							
gross debt as % of revenue		53%	84%	91%	90%	90%	99%
net debt: as % of revenue		51%	54%	33%	37%	80%	90%

plus a spread (now 0.15%). To remain in the market, Rio does not market its bonds at their full maturity, but rather floats them on the overnight market, giving the purchaser the option to relinquish them on short notice. Interest is capitalized and due at maturity.

Under existing federal legislation, the city is authorized to roll over a fixed proportion of the bonds as they mature, issuing new debt sufficient to cover both outstanding principal and accumulated interest. The proportion of bond debt that can be rolled over is determined by annual Senate resolutions. In each of the last two years, the Senate has authorized a 98% rollover.

3.32 At present, Rio is taking full advantage of this opportunity, rolling over 98% of its bond debt. As a result, the city is paying very little debt service on the bonds in cash terms --only the 2% amortization required by the Senate. The debt stock, however is growing rapidly, due to the accumulation of capitalized interest. The debt is growing at a pace dictated by the overnight rate and this has been extremely high. The real overnight rate was 22% in 1994--the year the Plano Real was introduced--and reached 25% in the following year. Although it fell to 16.4% in 1996, it has rebounded to 19.5% in 1997. As a result, Rio's bond debt has doubled, in real terms, over the last four years.

3.33 Over the medium term, this constitutes a serious threat to the city's financial situation. Eventually, the debt will presumably have to be paid. The longer the debt continues to grow through interest capitalization, the higher the debt service will be when this occurs. If the city were to begin servicing the debt in 1998, interest payments alone would equal Rs\$ 323 million, or 10% of projected revenues. If the overnight rate remains 15% over the next five years, interest on the bonds would equal Rs\$ 450 million.

3.34 At present, however, the city is not pursuing a federal debt agreement. While the city is aware of its growing debt obligations, it argues that the terms offered by the federal government are unfavorable. Rio has considerably less eligible debt than the major debtor states. As of June 30, 1997, the city had only

⁷ The city holds its own bonds as a hedge against future cash requirements. Because the city is prohibited from issuing new bonds, it prefers to maintain its existing stock at the maximum level permitted by law. When the city has surplus cash, it holds the bonds in its portfolio. When it requires cash, it floats them on the overnight market.

Rs\$ 124 million in previously rescheduled debt other than bonds. Service on this debt is less than 1% of current revenues. As a result, the standard terms of federal debt rescheduling would require a major increase in debt service payments in cash terms. Rio would have to increase its debt service payments by roughly 12% of revenues, as opposed to the one or 2% of revenues that the major bond states will have to contribute. In the absence of any immediate pressure to redeem the bonds, Rio is holding out for a better deal.

Unfunded retirement liabilities

3.35 The city may also be facing the prospect of increasing retirement costs. Under the 1988 constitution, Rio is obligated to provide an expensive package of retirement benefits to its civil servants. The federal Constitution stipulates that staff can retire after 35 years of service (30 years in the case of women), with five years less for teachers of either sex. Retirements benefit are based on 100% of the exit salary of the retiree and are indexed to wage increases in the position he or she formerly occupied. MRJ is particularly hard-hit by these terms, due to the large proportion of female teachers in its staff. Such staff can retire after 25 years of service, and—being women—have relatively long life expectancies during which to receive pension benefits. In 1997, payments to retirees constituted one-third of MRJ's wage bill (excluding staff in indirect administration). As Rio's retirement obligations are unfunded, pension costs must be paid out of general revenue.

Table 4: Trends in Number of Staff, Direct Administration

	active	inactive	% inactive
1993	85337	29612	26%
1994	83159	32019	28%
1995	81390	34404	30%
1996	78007	38313	33%
1997	76421	41610	35%

3.36 In principle, MRJ may be confronting an abrupt increase in these costs. As shown in table 4, the number of retired staff increased by nearly 40% between 1993 and 1997, and now constitutes 35% of the payroll (excluding indirect administration). This may be a demographic trend, reflecting the aging of the city's bureaucracy. In a expanding bureaucracy, the number of retirees is likely to be small, as the majority of staff have a relatively short tenure in the

government. Once a bureaucracy ceases to expand, the proportion of retirees would be expected to grow, as an increasing proportion of staff meet length-of-service requirements. The proportion of retirees would be expected to continue to grow until the number of retirees reached the point at which the death rate among existing retirees was sufficient to offset the number of new retirees added each year. This is an expensive equilibrium given the generosity of existing retirement benefits in Brazil.

3.37 There may be another explanation for the growth in the number of retirees, however—one that is strategic rather than demographic. The growth in the number of retirees may be a transitory response to threatened policy changes. Since 1994, the federal government has been considering scaling back the retirement benefits mandated by the Constitution. Inter alia, this would include the imposition of a minimum age for retirement and a minimum number of years of employment with the municipal government. (Staff particularly fear the loss of wage parity—the indexation of retirement benefits to wages of active staff—although this is unlikely to be included in the final reform package.) The threat of reduced pension benefits has reportedly prompted a surge in retirement by staff who are presently active but meet the existing criteria for retirement. (Staff often prefer to remain working even after they meet retirement criteria, since retirement entails some loss of salary supplements and bonuses.) If this is the case, the growth in the number of retirees would be expected to halt once the pool of potential retirees was exhausted.

3.38 Due to data constraints, it is not possible to determine which of these two factors is more important. It would be useful to perform an actuarial analysis of the city's pension liabilities, to resolve this question.

Health Care Subsidies

3.39 The city's health care costs may also represent a potential fiscal risk. Health care financing is a national problem in Brazil. It has its roots in constitutional reforms in 1988 and contemporaneous reforms in the health financing system itself. Prior to the reforms, national health insurance was provided only to workers who contributed to the national health system (INSS, now SUS) through mandatory employer contributions and payroll taxes. Payments were made directly to hospitals—whether private or public—on a per-treatment basis. Although reimbursements were less than actual treatment costs, private hospitals willingly participated in the program, exploiting opportunities for overbilling and other forms of fraud to supplement legitimate receipts from the system.

3.40 Two important changes in the system were introduced in the late 1980's. First, the 1988 Constitution expanded the coverage of the system to include all Brazilians, whether they were contributors or not. This greatly increased the number of potential patients without increasing the system's revenues. Second, the system itself was reformed to tighten financial controls. While successful, this had the ironic consequence of shifting more of the patient load onto public hospitals. Having lost the opportunity to overbill, private hospitals lost interest in government-insured patients. As a result, demand for treatment in Rio's public sector hospitals and clinics expanded rapidly.

3.41 The SUS reimbursement schedule is devised by the Ministry of Health, which establishes nationally uniform reimbursement levels according to type of treatment. MRJ is also subject to an absolute ceiling on the total amount of reimbursements, based on population, installed capacity and a fixed amount intended to compensate the city for costs of treating referrals from neighboring municipalities. In total, Rio's reimbursements fall well below its treatment costs. As shown in the table below, SUS payments covered less than half the city's *non-personnel* health care costs over the last six years. When personnel costs are added, the proportion drops to 20%.

3.42 The city's decision to assume most of the federal hospitals in its jurisdiction will increase this financial burden. During the transition period, the federal government is providing grants to cover the non-personnel costs of federal hospitals. It is also paying the present staff of the hospitals as federal employees until they quit or retire. These arrangements are merely transitional, however. Operating grants are to be phased out. Similarly, when the existing hospital staff depart, the municipality must replace them with employees on the municipal payroll. This is likely to occur sooner rather than later. Due to the high turnover rate of doctors in the public sector—doctors typically join the public service just out of medical school, gain a few years experience, and then leave for private practice—the city will have to begin paying these costs in the next few years.

3.43 The only concrete proposal the city has for addressing this problem is to begin charging neighboring municipalities for referrals. At present, surrounding municipalities refer patients to the city for more sophisticated form of treatment. Beyond the normal SUS compensation, the city receives no compensation for these costs. The city's intention is negotiate fee-for-service contracts with each surrounding municipality. These would be based on a fixed number of treatments to be provided, and would be payable in advance by each municipality. The city has yet to determine the net revenues from such a proposal, nor has it determined how it will handle referral patients once a municipality's ceiling has been reached.

	SUS	Federal transitional grants	Treasury	Other	Total Rcts	Total Expenses
1992	23276	0	43621	0	66897	59979
1993	23316	0	28244	0	51560	50357
1994	29744	0	35489	13	65246	90470
1995	41880	30688	54187	1	126756	102070
1996	55080	21758	89752	2	166592	189712
1997*	75266	34170	68332	4537	182305	169938
1998	65914	21092	85249	2812	175067	175972

Note: excludes Treasury financing of salary costs. Data in thousand of Rs\$ of Dez 1996.

Financing Capital Works

3.44 The fourth fiscal issue confronting the city is the financing of works. The city has an ambitious capital spending program. According to the 1998 budget, the city intends to spend about Rs\$ 803 million on capital works. In the past, capital investment has been largely financed through current account savings. As described earlier, The mayor's's ambitious capital works program was financed almost entirely from current savings. This option is no longer readily available. With price stability, real cuts in personnel costs and reverse Tanzi effects can no longer be counted on. Likely increases in interest payments, retirement costs and health care subsidies will also diminish current savings.

investment program (US\$ mn)	treasury	recursos externos	total
Total	804	1230	2035
primary education	228	342	570
highways (urban beltway)	198	198	396
environmental protection	133	200	333
slum upgrading	100	200	300
early childhood care	97	146	243
other	48	145	193

3.45 The city's strategy is to finance much of its capital program from borrowing. According to the 1998 budget, 60% of the city's investment program would be financed from debt. As shown in the table at right, the Conde administration is proposing to borrow US\$ 1.2 billion from external sources alone over the mayor's four year term.

3.46 This strategy is not financially sustainable. How and when it fails will depend upon a number of factors. Scenario 1 illustrates the impact of the city's 1998 budget strategy, extended over the next five years. As shown, extensive reliance on borrowing would cause the stock of debt to rise 152% of revenue by the end of the period. Debt service would consume nearly 20% of revenues, in accrual terms. Under these conditions, it is unlikely that Rio would be able to continue to obtain long term credit, at least from the private market. (Equally importantly, Rio would be spending too much on interest. To make economic sense, the marginal return on expenditures has to exceed the real rate of interest. In an environment of double-digit real interest rates, few expenditures can meet this test.)

3.47 The second scenario illustrates a more fiscally sustainable scenario. Under this scenario, new borrowing would be eliminated, limiting capital expenditures to the amount that can be financed out of current savings. As shown, this scenario would result in the approximate stabilization of the city's debt:revenue ratio, but would reduce capital spending to about 12% of revenues.⁸

3.48 The third scenario shows the impact of a concerted effort to reduce the stock of bond debt. Under this scenario, the city would refinance the bond debt on the same terms offered to the state governments. As shown, this would further reduce the volume of cash available for capital investment, as debt service obligations would rise in cash terms. It would, however, result in a rapid reduction in the city's overall debt:revenue ratio, permitting some new borrowing to finance capital works once interest rates fall to a level consistent with plausible rates of return.

Table 7: Alternative Fiscal Scenarios						
	1997	1998	1999	2000	2001	2002
Scenario 1: no debt agreement, major borrowing program to finance capital investment						
capital spending as % revenue	20%	26%	19%	22%	21%	20%
total debt service as % revenue	14%	12%	18%	16%	17%	19%
of which financed by capitalization	9%	6%	7%	7%	8%	9%
net stock of debt (EOY) as % revenue	89%	94%	108%	124%	138%	152%
Scenario 2: no debt agreement, no borrowing						
capital spending as % revenue	20%	9%	6%	11%	12%	12%
total debt service as % revenue	14%	10%	15%	11%	11%	12%
of which financed by capitalization	9%	6%	7%	7%	8%	9%
net stock of debt (EOY) as % revenue	89%	76%	74%	77%	81%	84%
Scenario 3: debt agreement, no borrowing						
capital spending as % revenue	20%	9%	2%	8%	8%	9%
total debt service as % revenue	14%	7%	11%	7%	6%	6%
of which financed by capitalization	9%	0%	0%	0%	0%	0%
net stock of debt (EOY) as % revenue	89%	72%	65%	61%	56%	52%

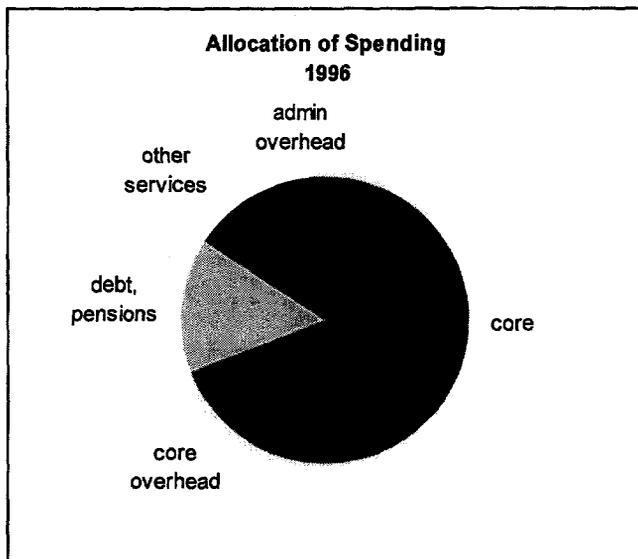
SPENDING REFORMS

Budget Allocation

3.49 In principle, improvements in the efficiency of spending could also be used to generate additional resources for capital investment. The city's spending does not set off any of the classic alarm bells, however. At this level of aggregation, public expenditure reviews typically examine three parameters. The first is the sectoral allocation of spending; i.e., whether the government is spending enough on its core functions, or exhausting its budget on overheads and low-priority activities. The available evidence suggests that it is not.

⁸ The drop in 1999 reflects the cost of paying off the city's Eurobond.

3.50 The pie chart at left divides the city's 1996 expenditures between core functions (defined as primary education, medical assistance, street/highways, drainage, and garbage collection); the administrative overheads of these functions (defined as the remaining costs of their respective secretariats); mandatory overheads (debt service and retirement benefits), administrative overheads (the city council, auditor, legal counsel and the secretariats of government, finance and administration) and other services (defined as all other secretariats.) As shown, spending in the core functions accounted for just over half of total spending. Excluding mandatory overheads, core spending accounted for about 62% of total spending. Spending on administrative overheads accounted another 28%, with other services accounting for the remainder. At this level of aggregation, it is not obvious that administrative overhead costs are excessive. Further disaggregation of overhead items revealed no glaring examples of excess, although the spending on the city council appears to be quite high (Rs\$ 192 million.) The "other services" comprise a wide range of activities, including the secretariat of culture and the secretariat of sports and leisure. None constitutes a major share of total expenditure.



3.51 The second target of public expenditure reviews are subsidies to loss-making enterprises. Operating subsidies to public utilities and periodic capital injections to loss-making banks are the frequent object of concern. Rio has neither. At present, the city owns none of the major public utilities operating in the city. As noted earlier, electric power is provided by now-privatized companies. Water and sewerage are provided by the state water company, itself in the process of concession. The city's commuter rail and subway system are owned by state. (The state government recently concessioned the subway and intends to concession the suburban rail system on the same basis.) Neither does the city own major loss-making banking, manufacturing, or commercial enterprises.

Although operating subsidies and capital subventions ostensibly account for a large proportion of expenditures (30% in 1996; 19% in budgeted 1998) the majority of these consist of transfers to non-revenue generating units of indirect administration, particularly the city garbage collection company, security service, and (in 1996) the city's wholly owned construction company, RIOURBE.

3.52 The third target is the input mix, particularly the proportion of expenditure consumed by personnel. This is an extremely crude indicator, as the desirable level of spending on personnel will vary according to the labor intensity of the services provided (education requiring a higher proportion of personnel spending than civil works) and the mode of delivery (force account requiring more personnel spending than contracting out.) As an indicator of expenditure allocation, it is only meaningful when it exceeds 80 or 90% of expenditure, at which point personnel spending can be presumed to be crowding out the complementary expenditures (equipment, supplies, utilities, capital works or debt service) that would be required for staff to perform their jobs. Rio falls well below that figure. In the last three years, the proportion

of spending on personnel has ranged from 46% to 57%.

Budget Process

3.53 Further analysis at the sectoral level might reveal areas where potential for improvements in spending efficiency exists. At this time, it appears that the city's budget process is only beginning to serve as a device for doing so.

3.54 The present budget process begins early in the calendar year, with the preparation of the budget directives law (LDO) by the Secretariat of Finance's budget unit. The LDO, in principle, is a policy document. It specifies, *inter alia* (1) the priorities of the administration, at a sector and subsectoral level (e.g. "advance the process of municipalizing the health system by transferring large and medium sized federal and state health units to the municipality, particularly in the western zone of the city") along with an annex providing even greater specificity ("implement a system of nutritional monitoring in 70% of the municipal health posts"; (2) the organization and format of that the budget will take (e.g., the type and level of detail to be specified); (3) general guidelines on the preparation process (requiring for example, that priority be given to ongoing civil works rather than new projects (4) a general policy on debt (limiting new borrowing, for example, to the sum of debt service, authorized bond rollovers, priority investments and capital transfers to city owned enterprises); and (5) a ceiling on personnel spending.

3.55 A draft LDO is submitted to the city council, which debates it internally and with the mayor. A final LDO is passed, under the mayor's signature, before the council adjourns for its winter recess. No spending can be included in the final budget which has not been authorized in the LDO. Note that at this stage, no costs have been attached to any spending proposals. In May, the Finance secretariat makes its projections of receipts and expenditure. In projecting receipts, Finance analyzes the prognosis for each major revenue source, and expected disbursements of project loans. Projections of expenditures are made for personnel, other operating costs (*custeio*) and debt service. Total projected receipts, less the total of these projected expenditures, yields the amount available for internally-financed capital works.

3.56 The draft budget is submitted for the city council's consideration on September 30. The council's ability to modify the budget is limited: spending amendments can only be made if: (a) they are compatible with the LDO (as well as with the city's multi-year investment plan) and (b) a corresponding cut in other expenditures is identified (which may not come from personnel, debt service, transfers to indirect administration, or joint projects with other levels of government.) The final budget is passed by the council and signed by the mayor just prior to the start of the new fiscal year.

3.57 Whether these procedures produce a good budget depends on how they are put into practice. This depends upon the quality of the data used in budget preparation, the soundness of the estimates of revenues and expenditures, the extent to which the budget proposals of individual secretariats are subject to informed scrutiny, and the quality of the analysis of intersectoral tradeoffs.

3.58 One of the most egregious problems that has historically affected Rio (as well as other subnational governments) has been the quality of revenue and expenditure estimates. Until 1994, the city budget was prepared and enacted in nominal terms, based on an estimate of inflation. Because the estimate was

consistently low, actual revenues would quickly exceed budgeted amounts. In order to increase expenditures correspondingly, the law requires a supplemental spending authorization from the council. These authorizations were passed, but without reference to the distribution of spending in the original budget. This resulted in an ad hoc reallocation of the budget in real terms as the year proceeded.

3.59 This problem has been largely resolved. In 1994, the budget was enacted in UFIRs (inflation indexed units of account.) As a result, budget allocations remained valid for the entire year, regardless of inflation. This practice was continued until the current (1998) budget. For 1998, the budget has been enacted in nominal Reais, due to the expectation that inflation will remain in single digits.

3.60 It is not clear how well the remaining conditions for a successful budget have been met. In particular, there may be a case for strengthening the finance secretary's ability to analyze the budget proposals of individual secretariats. At this time, budget officers perform a largely clerical function; transmitting budget data from individual secretariats to the budget unit in the Secretariat of Finance. Over time, it would be desirable to expand their role to that of full-fledged budget analysts, who would be able to provide the Secretariat of Finance with critical analyses of the efficiency of expenditure in their respective sectors.

ANNEX: THE DISPUTE OVER WATER SUPPLY AND SEWERAGE

3.61 One of the areas of dispute between the city and the state has to do with water supply and sewerage. Within Rio Municipality, these services are presently provided by a state-owned enterprise, CEDAE. CEDAE operates throughout the state, providing water services in 63 of the state's 81 municipalities.

3.62 From the mayor's point of view, the dispute arises from two controversies. Both involve CEDAE's investment priorities and its reluctance to collaborate with the mayor's own investment programs. The first concerns the Favela Bairro program, a slum upgrading program aimed at converting consolidated, long-established favelas into ordinary neighborhoods. Among other services, the Favela-Bairro program regularizes water supply systems, upgrading networks that typically began as clandestine connections to CEDAE trunk lines and were expanded *ad hoc* as the favela grew. The program also provides sewerage, replacing existing open drains with separate piped networks that connect either to CEDAE sewerage trunk lines or--where CEDAE trunk lines are not available--to primary treatment plants, after which they discharge into storm drains. These upgrades are provided free-of-charge to favela residents. The programs are financed from the city's general revenues and from IDB loans, which are general obligations of the municipality.

3.63 The city's intent is to turn the completed water and sewerage assets over to CEDAE, which would then provide trunk water supply and sewerage as well as operation and maintenance of the on-site distribution and collection networks. CEDAE would also have the authority to impose water and sewer tariffs, as it does in formally developed neighborhoods in the city. The problem, according to the mayor, is that CEDAE will not accept the customers or the assets once they are in place. Although it allows the water system to remain connected to its trunk water lines, it will not guarantee water service, nor will it provide maintenance to the newly constructed works. By the same token, it declines to charge tariffs in these areas. For the present, residents rely on the firms that constructed the works for maintenance, and reimburse the firms through ad hoc collections.

3.64 The second problem is, to date, confined to a single neighborhood. The neighborhood is Recreio dos Bandeirantes, a high income area in the city's expanding western coastal area. Housing sites were developed in Recreio in accordance with existing sanitary regulations, which permitted single family residences to use septic tanks. Densities later proved too high for septic tanks, and the residents brought pressure on the mayor to provide a piped sewerage system. The mayor's request to CEDAE was declined, on the grounds that the work was not a priority. The mayor then chose to have the municipality install the system, financed from municipal funds. (The system is largely complete but not yet operational.) Unlike the Favela-Bairro situation, the mayor does not intend to transfer the Recreio assets to CEDAE. Instead, he intends to continue to own and operate the system as a municipal enterprise. His concern is that he has no means to recover his costs. Sewerage is normally charged as a surcharge on the water bill, with the receipts collected by CEDAE.⁹ According to the mayor, CEDAE is presently refusing to transfer its existing sewerage surcharge revenues in Recreio to the municipality, or to permit the municipality to impose its own separate charge.

3.65 Both disputes present a serious problem. The impasse in the Favela Bairro program deprives residents in upgraded favelas of reliable water service and sewerage, even when the city is willing to pay for the construction of water and sewer works and residents are (purportedly) willing to pay adequate tariffs. The Recreio case, similarly, appears to be a case in which residents who are willing to pay for an upgraded sewerage system but have no means of doing obtaining one from CEDAE.

3.66 The state's position is that these problems will be resolved under the proposed concession agreement. The state is now in the process of concessioning all CEDAE operations in metropolitan Rio¹⁰. The concession would be offered to a single operator which would be responsible for bulk production, transmission, distribution, collection, adequate treatment and disposal, for a period of 25 years.

3.67 The concession agreement is explicit in mandating increases in service coverage. According to the draft of the concession agreement available at the time of the mission, the concessionaire is required to increase the coverage of water supply in the metropolitan area to 96% within in five years, with at least 95% coverage in each municipality. For sewerage collection, the concession establishes a phased-in schedule of improvements in coverage. The concessionaire would be required to achieve 60% coverage in the metropolitan area as a whole within five years, with further increases in each of the three following five year periods. Rio, along with two other large municipalities have more ambitious targets: 80% coverage within five years, and 90% coverage five years later. In addition, the concession sets targets for sewage treatment, requiring that 90% of the effluents meet legal standards within five years, and 95%, five years hence. (Note that these targets may be relaxed in the final concession document.)

3.68 The concessionaire would be exclusively responsible for obtaining the financing required to achieve these targets. Debt or private equity is apparently expected to provide the bulk of it. Under the concession's tariff formula, no provision is made for generating internal savings from tariffs (other than to cover depreciation and provide a return to the investors). Compliance with the concession contract, including coverage targets, would be monitored by new state regulatory commissions, ASEP). The commission's members are nominated by the Governor (subject to approval of the state assembly.) As of

⁹ CEDAE reportedly imposes sewerage charges even where it provides no service. This cannot be universally true, however, as the average amount of sewerage it bills (1.46 million cu meters/day) is only 60% of the volume of its water billings.)

¹⁰ This includes the entire municipality of Rio plus another 18 surrounding jurisdictions.

February, 1998 the minimum number of commissioners (3) were in office.

3.69 The mayor believed that this would not entirely address his concerns. Although the coverage targets would presumably require some expansion of water supply (and certainly of sewerage) within Rio municipality, it provides no guarantee that the expansion will occur in the Favela-Bairro projects. In fact, it appears that the concessionaire could have satisfied the coverage targets without extending service to any of the neighborhoods eligible for the Favela Bairro project.

3.70 Both sides in the dispute exacerbated the problem by issuing rival legislation asserting their respective jurisdiction over water supply. The state based its claim on Chapter III, article 25, of the Federal Constitution, which authorizes state governments to "institute metropolitan regions to integrate the organization, planning and execution of public functions of common interest." On this basis the state declared that the nineteen *municipios* of metropolitan Rio constitute a metropolitan region and that that basic sanitation, including bulk water production, transmission and distribution, and the collection, treatment and disposal of sewerage, constitute a function of common interest. The metropolitan region thus constituted is to be administered by the State (as the executive power) assisted by a deliberative council of 13, nominated by the Governor and approved by the assembly. (Under the state legislation, the Mayor of Rio retains only the right to propose two candidates to the deliberative council.)

3.71 The municipal government, for its part, passed a law (2617 of January 1998) authorizing the city to "provide water supply and sewerage services (either directly or through concessions) anywhere within the municipality boundaries." The law specifically gives the mayor the authority to restrict or cancel the terms of the CEDAE concession "particularly in area where CEDAE demonstrates the impossibility of undertaking the investment itself."

3.72 These contradictory laws threaten to make a bad situation worse, by injecting a uncertainty into concession process. Potential concessionaires are looking for an unambiguous contract and a stable operating environment. The city's assertion that it can cancel parts of the state concession runs counter to these aims. At present, the concessionaire, for example, has no guarantee that the city will not attempt to assume the most lucrative parts of the concession for itself. Similarly, it has no guarantee that expansions of the water or sewerage network financed by the Municipality would qualify for the coverage targets specified in the concession agreement. In increasing the ambiguity of the operating environment, the state-municipal dispute is likely to reduce the price the state receives for the concession, and slow the process itself.

3.73 One solution, clearly, would be to exclude the Municipality entirely from any involvement in water and sewerage. While this would remove the ambiguity in the concession, it would also leave the Favela-Bairro program without a sponsor¹¹. An alternative would be to permit the Municipality to continue to upgrade water and sewerage in favelas, interacting with CEDAE and its successor (the private water concessionaire) on the same footing as any private developer. Present development regulations require private developers to install on-site water and sewerage facilities and to donate completed works to CEDAE, without cost, for operation and maintenance. Prior to development approval, CEDAE must confirm

¹¹ Unless the concessionaire found it advantageous to extend services into favelas in order to meet its coverage targets. Under the terms of the present concession, such extensions would have to be financed by the concessionaire and recovered through tariffs or connection charges.

that (a) sufficient trunk water is available (and does not require extraordinary pumping); (b) trunk sewerage is available, or that an acceptable technical standard will be met for effluent, and (c) technical layout and engineering standards conform to its standards. These requirements would be maintained under the proposed concession, with an important proviso. Where the water concessionaire finds a particular development proposal financially unattractive, the developer would be free to negotiate subsidies or other incentives in order to meet the concessionaire's financial requirements.

3.74 Under such an arrangement, the city could continue to upgrade favelas, as long it is willing to pay the costs of the works (including any incentives required to render the development attractive to the concessionaire.) At the same time the concessionaire would not be obligated to provide services where trunk lines are not available, or to take over infrastructure that does not meet its technical standards.¹²

3.75 It would seem reasonable for the city to abandon its intention to operate separate systems. This is a significant source of ambiguity in the concession agreement and would appear to be unnecessary, provided the city has the authority to build systems with its own financing and donate them to the concessionaire (under the process described above.) Ambiguity in the concession contract could also be reduced by explicitly defining how water and sewer connections provided by the municipality would be treated in monitoring the concessionaire's compliance with its coverage targets.

¹² An alternative approach would be to have the concessionaire act as the executing agent for the water and sewer components in Favela Bairro programs. Although this is done in World Bank- financed upgrading projects, it would not seem to be in the interests of either the municipality or the concessionaire in this case.

CHAPTER 4

RIO: IS INSTITUTIONAL CHANGE POSSIBLE?

This chapter was prepared by Braz Menezes, LCSFP, World Bank. Charts in Annex are based on information provided by Mrs. Rachel Coutinho, Coordenadora de Ação Urbanística, Secretaria Municipal de Urbanismo, Municipality of Rio de Janeiro.

Rio: Is Institutional Change Possible?

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RIO DE JANEIRO-CITY MANAGEMENT IN A METROPOLITAN CONTEXT

4.01 The purpose of this chapter is to outline the complexity of the institutional issues that are constraining the efficient functioning of the Municipality of Rio de Janeiro (MRJ). While the city is the engine that drives the economy of the metropolitan region, the State of Rio de Janeiro (RJ) is also a key player. Historical tensions and intermittent political rivalry have characterized relations between city and state.

4.02 This chapter highlights that economic competitiveness in an age of globalization demands certain institutional adjustments. It identifies the inter-dependence between MRJ and RJ, and the municipalities that make up the economic region, and sets out some suggestions for an institutional focus by the MRJ, in order to strengthen its own institutions at the local level, as well as contribute (provide leadership) to improve the efficiency of the metropolitan area (RJ-MA) as a whole. These recommendations are addressed within the context of the discussion and conclusions reached in the previous chapters on the economic, fiscal and social options facing the Municipality of Rio.

4.03 This chapter also traces the progress to date in the process of institutional building, since the World Bank's first arrival as a partner in Rio's development, in the aftermath of the disastrous floods of 1988. Institutional change is not only possible but inevitable, as already evident in both MRJ and RJ. The efficiency gains as the metropolitan region moves towards global competitiveness can be substantial. This report is another building block in a process of institutional reform in Rio de Janeiro.

4.04 Rio Municipality's sheer size and economic power dwarfs that of its urban neighbors within the region. It has a population of about 5.6 million persons and generates about two thirds of the metropolitan region's GDP. In spatial terms, MRJ has a lot in common with many other metropolitan regions- New York, London, Paris, Barcelona and Toronto, among others- a vast hinterland of dormitory suburbs and some industrial areas. But unlike the other metropolitan regions, MRJ's peripheral municipalities suffer from a severe disparity in income and institutional capacity, in comparison to the primary city.

4.05 The first glance at Rio conveys an impression of a bustling sophisticated metropolis and market of 10.2 million people--thanks to the MRJ. A closer look at the region is more revealing. Nineteen municipalities including MRJ, comprise the Rio de Janeiro metropolitan region. Ten (10) municipalities of the remaining 18 have a population of over 100,000 of which three have each a population of over 700,000¹ and another three a population of between 400,000-700,000² each. About 27% of the population of these peripheral municipalities have incomes below the poverty line, as against about 15.6% in the MRJ³.

4.06 These are each separate municipal jurisdictions, generally lacking institutional and economic capacity to resolve and manage their own problems, with perhaps Niteroi municipality an exception.. The

¹ Duque de Caxias, Nova Iguacu, and Sao Gonsalo

² Belford Roxo, Niteroi, Sao Joao de Meriti

³ See Chapter 2-Poverty

State (RJ) is legally responsible for resolving trans-municipal problems, and for the delivery of a number of urban services of a metropolitan nature such as water, sanitation, urban rail transit, and METRO. It is the inherent weak institutional capacity of these municipalities, and the ambiguity of state-municipal responsibilities, that is probably MRJ's biggest constraint. Unfortunately it is one which MRJ can do little alone to resolve without help of higher levels of government.

4.07 The New Constitution of 1988 redefined the legal status of municipalities in the country, and as one of the objectives, reallocated their resources and responsibilities. This "one size fits all" approach characterized the form of decentralization that eventually evolved, and has posed many practical challenges in practice, as typified by MRJ's experience.

Municipalities and the Constitution

4.08 The MRJ as noted above, is one of about 19 municipalities that make up the economic region of Rio de Janeiro, and one of about 5,000 municipalities in Brazil. Although municipal administrations have existed for a longtime in Brazil, it was only with the "new Constitution" of 1988, that municipalities (in addition to the Federal District of Brazil, and States) were again formally designated as separate juridical entities in their own right, and declared an integral part of the Federal Union.

4.09 Municipalities are given constitutional powers "competencias" under Article 1 of the Constitution, and like States, endowed with self-responsibility and autonomy in the areas of political self-government, administration, finance and legislation⁴. Political autonomy enables each municipality to elect its own Mayor, Vice-Mayor and Councilmen (*Vereadores*). Every municipality is required to establish its own "mini-constitution"- *Lei Organica*. Prior to 1988, each State established a *Lei Organica das Municipalidades* for the municipalities within that State's territorial limits.

4.10 Administrative autonomy permits the municipality to create its own organization and administrative cadre, manage delivery of services either directly, indirectly or through the private sector.

4.11 Under the Constitution, the municipality has financial autonomy to establish, implement and collect its own taxes and charges, prepare its budget, and exercise sole discretion over its expenditures, including of funds from other sources such as State and federal transfers, within the external controls or limits set only by the Municipal Council.

4.12 Finally, a municipality exercises Legislative autonomy in that it can legislate for almost all issues of a *local* nature such as those affecting subdivisions and land use, taxes, construction, human resources, environment, etc., always respecting the legislation of higher levels of government at the State and Federal level.

4.13 The Constitution is explicit that the in all matters of **local interest** the municipality has exclusive *Competencia (Privativas)*, while in some areas it may share such *competencias* with the State (*Comuns*). In addition there are areas of *competencias* exclusively reserved for the Federal Government, the Federal

⁴ Campos, Silvia Butters de, 1997 *Organizacao Administrativa*: Rio de Janeiro: IBAM: SOMMA-BDMG

District of Brasilia, and the States (*Concorentes*). These were intended to reflect some broad regulatory powers.

Decentralization of Responsibilities

4.14 By all accounts, the distribution of responsibilities between the three levels of government did not receive the same treatment as the distribution of tax revenues, during discussions preceding the adoption of the New Constitution⁵. Fiscal reform always generated a great deal of interest and discussion, while ideas were scarce when it came to discussion of the appropriate re-distribution of responsibilities to accompany these reforms. Consequently, it resulted in a complicated arrangement of multiple and parallel responsibilities –referred to as *competencias concorrentes*. This effectively makes it almost impossible to introduce accountability for the non-delivery, or the inadequate delivery of basic services.

4.15 In Rio de Janeiro for example, the health sector even today demonstrates the effect of parallel systems of the state and municipality, and a network of hospitals owned and managed by the federal government. All operate some form of primary health care, but there is little coordination between the three levels of government.

4.16 Under the Constitution of 1988, the States' *competencia* was diminished, perhaps inadvertently, as compared to that of Municipalities. In this case, the text of the earlier Constitution was almost reproduced intact, reserving for the State the residual *competencias*--in other words, those responsibilities that were left over after defining more explicitly those of the federal government and the municipalities.

4.17 The Constitution marked an important milestone for municipal governments, in that their roles were more detailed. Municipalities were assigned responsibilities for primary education and primary health, and implementation of urban policy, as well the execution of actions for social services. In addition, old clauses (which had already in practice interfered with the smooth delivery of services) from the earlier Constitution, were also included making Municipalities responsible for "*all services of local interest*".

Metropolitan Regions under the Constitution

4.18 The Constitution also empowers the *states* with the authority to establish metropolitan regions⁶, urban agglomerations and micro-regions, through complementary laws. This is a big advance on the earlier Constitution under which, only *federal* legislation could authorize the establish such regions. It thus opens up opportunities for the municipalities in conjunction with the respective host state to define and institute such metropolitan economic regions.

⁵ Lobo, Thereza. 1995 *Distribucao de Encargos na Area Social*: in *A Federacao em Perspectiva*, Affonso, R. et al: FUNDAP, 515p.

⁶ Capitulo III, "Dos Estados Federados" paragrafo 30 do art.25 : 1988 *Constitution*; 1994 Lobo, Thereza. *Os Municipios e a Decentralizacao de Encargos-Uma Nova Oportunidade*.

Rio de Janeiro-an Historical Context

4.19 The institutional framework⁷ within the State and the MRJ was also shaped by its history and the turn of events, following the transfer of the Government from the then State of Guanabara, which had been designated the Federal District, to the new national capital in Brasilia in 1960. This transfer marked a significant decline in the economic and political importance of the Rio de Janeiro.

4.20 The State of Guanabara, without any adjustments of its administrative territorial limits, was incorporated under its new name as the new Municipality of Rio de Janeiro, and continued its existence for another 15 years as both a State and Municipality (S-MRJ)

4.21 By virtue of its role as the capital of the Republic, S-MRJ inherited a series of federal institutions which had legal responsibility (*competencia*) for the delivery of a number of infrastructure works and public services. These included for example the suburban rail system, part of the road network, hospitals and schools.

4.22 In 1975 the institutional framework was rearranged. The two old states of Guanabara and Rio de Janeiro were merged into one new State of Rio de Janeiro (SRJ) and its capital moved from Niteroi across the Bay of Guanabara, to the MRJ. Various institutions delivering public urban services in of the State of Guanabara were transferred to the new State of Rio de Janeiro. Thus the MRJ assumed responsibilities only for primary education, and for some minor services.

4.23 The Federal Government continued to influence the institutional arrangements, in spite of its distance from Rio. One year earlier in 1974, in response to very rapid urbanization in Brazil from the early sixties, it had decreed (as empowered under the pre-1988 Constitution) the establishment of the *Fundacao para o Desenvolvimento da Regiao Metropolitana do Rio de Janeiro (FUNDREM)*⁸. The prime objective was to promote the socio-economic development of the Metropolitan Region of Rio de Janeiro (RMRJ) through integrated planning. FUNDREM was empowered to promote inter-institutional coordination involving inter-sectoral and trans-municipal investments and policies. It was also entrusted to transfer federal funds for investments of a metropolitan nature.

4.24 FUNDREM (as with other Metropolitan Regions in Brazil) was always regarded as a creation of the authoritarian regime, and as a means of exercising political clientelism from Brasilia. With the transfer of responsibility to the states under the new Constitution, FUNDREM was abolished in 1989—it did not reflect the political, institutional and financial realities of the day. According to state officials at the time, FUNDREM did not deliver on any of its responsibilities. Although the state administration had promised to put in place a new arrangement, neither it nor successive state administrations have done anything, and the issue remains unresolved and open to more innovative solutions at the appropriate time in the future.

⁷ Source: Municipality of Rio, 1997

⁸ Nine Metropolitan Regions were established at the same time: Sao Paulo, SP; Rio de Janeiro, RJ; Belo Horizonte, MG; Salvador, BA; Recife, PE; Porto Alegre RS; Fortaleza, CE; Curitiba, PR; and Natal, RN

Recent steps towards Institutional Change

4.25 Moving from a *modus operandi* of conflict to competitiveness for MRJ and the metropolitan regions many players will require a period of adjustment. This section describes briefly the World Bank's first encounter⁹ with the complex institutional framework in Rio, and its support to initiatives at institutional strengthening or development (ID) by the MRJ and RJ. This first phase of ID through technical assistance and studies accompanied physical investments financed under the Project¹⁰. A number of studies were exploratory in nature to attempt to flush out the fundamental weakness in the institutions responsible for service delivery and environmental management in the metropolitan area.

4.26 The second phase of ID reform focused on support of privatization of some key state enterprises (now in progress). It must be emphasized that the ID effort in the latter phase was primarily in support of financial objectives, and not an end in itself.

PHASE ONE: THE RIO EMERGENCY FLOOD RECONSTRUCTION AND PREVENTION PROJECT

4.27 In 1988, nearly five years before the 1992 United Nations Conference on the Environment (UNCED) the Bank was invited to help with an emergency loan following the devastating problems resulting from severe and prolonged summer rains. The nature of the damage (landslides, flooding, collapsed structures, and a breakdown of basic municipal services), and the geographically-dispersed incidence of the damage across the metropolitan region, required more than direct replacement of infrastructure. Though much of the damage was a result of natural hazard, it was also a consequence of man-made problems: mistreatment of fragile eco-systems of Rio de Janeiro, neglect of basic operation and maintenance, and an absence of controls to prevent further deterioration and destruction.

4.28 The nature of the damage, demanded a broader and longer-term view of urban environmental management – one focused at addressing prevention rather than just reconstruction. There was the need to embark on a program of institutional strengthening and development (ID). If successfully implemented, this would lead eventually to increased and sustainable capacity by MRJ and RJ for dealing with Rio's serious urban environmental degradation and related social problems. There was broad consensus among the MRJ, RJ, the Caixa Economica Federal -CEF- (the Borrower) and the Bank, that the project would include a significant component to initiate a program of institutional development initiatives (improved financial management, strengthening of institutional coordination, new instruments, policies, and plans).

4.29 It should be noted also that at that time, even the Bank was also a very new player on the scene, and given the emergency conditions, some risk-taking in institutional arrangements was in order. There was no institutional memory on Rio de Janeiro for reference within the Bank. The Rio Emergency Flood Reconstruction and Prevention Project was the first major project financed by the World Bank in over two decades within the RJ. The Inter-American Development Bank (IDB) had also not been active in the metropolitan region. The Bank's experience with an integrated metropolitan project in Recife, PE, was not very encouraging. A recent similar project in Salvador, BA, was experiencing a two-year delay from

⁹ 1993 Braz Menezes and Thereza Lobo: *Rio and the World Bank-The Start of a Productive Relationship* in Alcira Kreimer et al: *Towards a Sustainable Urban Environment-The Rio de Janeiro Study*, World Bank Discussion Papers No.195.

¹⁰ See Rio Emergency Flood Reconstruction and Prevention Project (Ln.2975-BR)

approval, and struggling to get going. The Rio Reconstruction Loan had to invent institutional arrangements.

4.30 As the project's ICR¹¹ points out the project was highly complex in its content and organization. It included a total of 15 components, and 22 studies (8 carried out by the State and 14 by MRJ). It was to be implemented by 9 state and 8 municipal agencies. This complexity required complicated decision-making and coordination mechanisms, and improved information systems. Much effort focused on institutional capacity-building at the project management level.

4.31 Although the problems were particularly acute at the state level, these were common also in the MRJ. The lack of continuity of democratically elected local government leaders during previous authoritarian administrations had weakened local institutions. Consequently, the emergence of partisan solutions and approaches, exacerbated by severe disparities in the human resources capacity of MRJ and RJ, meant that simple problems constantly erupted in conflict. As a result third party intervention became necessary--the Borrower--Caixa Economica Federal (CEF), came to assume most coordination functions for much of the project implementation period.

4.32 One of the principal lessons from experience under the Project was confirmation that the ambiguity of the Constitution in not assigning clear roles (Competencias) often made relatively simple tasks turn complex. There was a constant shift in the respective relationship between the MRJ and RJ, attributed to political rivalries, and on-going partisan conflicts, with consequent delays to execution.

4.33 This problem continues to constrain the efficient functioning of major urban economic regions in Brazil. An example of these over-lapping roles of RJ and MRJ, both as legally defined under the Constitution, and as implemented in practice, is illustrated in Charts I-III of *Annex 4.1.*

4.34 To support the sustainability of project investments, the reconstruction project included a number of studies and preparation of strategic plans (for example, for solid waste management, metropolitan transport, etc.). The ICR includes a useful summary of the status and impacts of these studies. The performance of MRJ was particularly good in implementing financial management¹², updating of its tax cadastres, and installing a new database, and in internal re-arrangements and capacity strengthening of some its technical departments.

4.35 In retrospect, in many cases for which studies were not concluded--and more important--where follow-up actions to completed studies did not take place, are still weak, projects continue to generate frequent headlines in the media: (i) finger-pointing between RJ and MRJ (ii) the unpreparedness in civil defense; (iii) problems of flooding and macro-drainage in the city; (iv) problems of inadequate services delivery, especially solid waste collection in the favelas, among others.

4.36 With hindsight the World Bank could have achieved more if adequate supervision resources had been allocated to accompany ID execution during the latter stages of project execution. The quality of management and human resources in MRJ, and more so in RJ, could have been further improved, through

¹¹ Implementation Completion Report, BRAZIL, Rio Reconstruction and Prevention Project (Ln 2975-BR)

¹² It is worth noting that MRJ had declared bankruptcy at about the same time the loan was approved.

some selection, some reduction, and a serious attempt at re-training the remainder, towards achievement of pre-determined objectives.

4.37 Significant change did take place in some areas with very tangible results, however, a more focused targeting of ID would have yielded substantial benefits in the medium term. Implementation of ID was often stalled, as such initiatives are seen as lower priority, lacking the instant visibility that construction of new infrastructure does. Although MRJ had a cadre of competent staff at the 2nd and 3rd levels, these staff members were over committed and could not do justice to the studies, or oversee follow-up in the short time frame of 4-year administrative periods.

Some tangible results of Phase One

4.38 As noted earlier, the erstwhile Mayor of Rio (Braga) had formally declared the MRJ "bankrupt" at the start of the project. Consequently, under the Project Agreement MRJ was to carry out a time-bound financial action plan which included: (a) an evaluation of the Municipality's budgeting and accounting systems, to be used as a basis for policy formulation to ensure cost recovery and budgeting for maintenance of infrastructure; (b) improvements in property tax revenues (IPTU); (c) improvement in the efficiency of collection of the service tax (ISS); and (d) implementation of tariff adjustments for solid waste collection and disposal.

4.39 The incoming municipal administration¹³ started a major financial recovery. Tax revenues increased continuously from 1988 to 1991 (accumulated tax collection was 151%), but decreased in 1992 (88%). The land records updating and modernization program was the main reason for this improvement (IPTU increased from 30% to 90% of the ISS in 1992), and the second reason being the new federal constitution which increased revenues from tax transfers to the municipalities. Two additional measures taken by that administration helped improve the financial situation: (a) two successive 40% increases in real terms of the solid waste collection tariff in 1989 and 1990; and (b) a significant increase in the ISS tax exemption. Pre-election "splurges" undermined some systemic gains.

4.40 By January 1993, the financial situation was not as good for the incoming administration¹⁴. An amendment to the Loan Agreement that year, included as a condition of disbursement under the MRJ's components, the preparation of an evaluation of municipality's finances and a five year projection, including a targeted action plan. The appointment by the incoming Mayor of a very competent Secretary of Finance, who assumed full ownership for overseeing a recovery of the municipality's finances, implementation of the updated action plan, boosted by the Plano Real arrival in 1994 resulted again in a very satisfactory financial situation for the MRJ - as of December 1995, it had R\$990 million in cash assets, equivalent to 54% of its 1995 fiscal income.

4.41 Other major areas of discernible change and follow-up investments brought about by ID at the state level resulted in the digital and conventional mapping of the State of Rio de Janeiro and the Paraíba do Sul water basin (using satellite imagery); the Solid Waste Management Plan for the MMRJ and the Slope Stabilization Plan for the RJ. The water resources master plan for the Iguacu River/Sarapui basin

¹³ Mayor Marcelo Alencar (January 1989-December 1992)

¹⁴ Mayor Cesar Maia (January 1993-December 1996).

with emphasis of flood control paved the way for Guanabara and Paraiba do Sul River basin studies and others.

4.42 In addition, the MRJ (through IPLANRIO) during the latter part of the project, successfully completed a number of studies of a metropolitan nature. These would normally have been the responsibility of the State, but were justified on the grounds of MRJ's particular geophysical characteristics and economic interdependence with the regional economy.

A Flood of New Projects

4.43 A flood of new projects followed. The capacity building efforts in strengthening the financial and technical areas in MRJ and RJ started to yield results. The institutional capacity to plan ahead and prepare bankable projects was evident. Prior to 1992, neither the World Bank nor the IDB had shown any interest in investing in MRJ nor RJ. With the improved situation, both the Bank and IDB, as well as the EBRD and OECF were eager to offer assistance through new loans. Many of these projects partly emerged as a consequence of studies, experiences and approaches under the Rio Flood Reconstruction Project.

4.44 The Bank led the way in 1993, with a project to rehabilitate the CBTU suburban rail system¹⁵ that daily transports about 600,000 passengers to and from the MRJ. Finding a way to reduce pressure for settlement on the hillsides of Rio by improving access for mass transit to cheaper housing land in the suburbs, was a logical step.

4.45 The IDB-financed Guanabara Bay Pollution Control Project (US\$234m); the Baixada Viva Project (US\$60m) in the State, and a similar integrated project in the MRJ-the Favela Bairro Project (US\$150m), among others, quickly followed. Implementation of the Rio component of the Bank-financed Prosanear I project took on a new life.

4.46 In addition, MRJ has a pipeline of new projects awaiting approval: The environmental rehabilitation of the Baixada de Jacarepagua to be financed by OECF (US\$333m); Favela Bairro II (US\$300m) and Program of Support for Children and Youth in Risk (US\$100) both by IDB; and an Early Childhood Project (US\$58m) by the World Bank.

PHASE TWO- THE PRIVATIZATION OF STATE ENTERPRISES IN RIO DE JANEIRO

4.47 A second phase of institutional reform was initiated by RJ with World Bank support, in Rio de Janeiro in 1995, as part of a broader concern for economic destabilization at the national level for both macro- and microeconomics reasons¹⁶. The impact of some of these actions will have repercussions on urban water, sanitation and transportation services in the metropolitan region.

¹⁵ Rehabilitation of the Rio Metropolitan Transport, World Bank, SAR, 1993 (Ln 3633-BR)

¹⁶ Staff Appraisal Report-Rio de Janeiro State Reform-Privatization Project-(US\$250m) (Report No: 15869-BR) dated June 6, 1997.

4.48 Approximately half of budgetary public expenditures are made by sub-national governments, and fiscal deficits are greater at the state level than at the federal level, with Sao Paulo, Rio de Janeiro, Minas Gerais and Rio Grande do Sul being the largest debtor states. The federal government signed comprehensive debt rollover agreements with each of these states, which included also that the states embark on a program of actions for microeconomic structural reform.

4.49 From this perspective, according to the SAR, the concern is with the cost and quality of services provided by subnational governments. Key infrastructure services, including power, gas, water supply and sanitation, as well as urban transport, are currently provided by state-run monopolies. Due to overstaffing, weak management and lack of investment, the coverage and reliability of these services lags behind consumer demand. Subsidies to loss-making enterprises divert funding from key state social services such as education, health, and public security.

4.50 Three major sectoral privatizations that will have a direct impact on services in the MRJ and the metropolitan region as a whole are in Water and Sewerage, Urban Transport and Highways. The Companhia Estadual de Agua e Esgoto-CEDAE (State Company of water and Sewerage) has been progressively deteriorating over a number of years, since it lacks resources for making investments necessary for improving and expanding the service. High personnel costs and systemic losses have reached very high levels. The transfer of these services will be achieved through concessions to the private sector.

4.51 Similarly, two state transportation companies too, are to be transferred to the private sector. The Companhia Fluminense de Trens Urbanos-FLUMITRENS (State of Rio de Janeiro's Urban Train Company) which operates the urban and suburban railway system in the metropolitan municipalities¹⁷, and the Companhia do Metropolitana do Estado do Rio de Janeiro -METRO (the state's subway system), consume high subsidies, need substantial capital investment in rolling stock, in expansion of their systems, organizational and operational restructuring to improve services to the population¹⁸. METRO was successfully sold in 1997.

4.52 A major urban expressway (the *Linha Vermelha*) owned and managed by the State, running through MRJ is also under consideration for concessioning to the private sector. Altogether these major structural changes will present major opportunities and challenges for MRJ and RJ to fundamentally change and modernize the delivery of some city services in Rio de Janeiro metropolitan region--another step on the road to improving its competitiveness among world cities.

4.53 In the area of environment management and pollution control, the Bank has recently completed a report jointly with MRJ and RJ.¹⁹ The report also highlights the institutional weakness resulting from overlaps and ambiguity, between the different levels of government for policy making, implementation, regulation and enforcement of environmental legislation.

¹⁷ the CBTU regional system, rehabilitated through a Bank Loan (Ln 3633-BR) 1992

¹⁸ World Bank, Rio de Janeiro Mass Transport Project (US\$185m) includes development of integrated urban transport system.

¹⁹ World Bank, 1998, Brazil: Managing Environmental Pollution in the State of Rio De Janeiro, Report No. 15488-BR

LOOKING AHEAD - WHAT ARE THE OPTIONS?

4.54 The previous chapters have concluded that Rio's best economic option is to build up capacity at the middle-level, and facilitate market access to small and medium size entrepreneurs. Similarly, the windfall in MRJ's finances that blessed the previous administration (reverse Tanzi effect) was unlikely to repeat, and that MRJ had already taken on upon itself too many responsibilities, for which its financial and institutional capacity may already be fully extended. On the other hand, the city has embarked on a number of well-directed poverty targeted programs that need refining to address the needs of the very poor.

4.55 MRJ's fortunes are inevitably inter-linked to the region's progress and prosperity, and MRJ is the engine that will guide that progress. The challenge for the city administration is: (a) strengthen its own local institutions, and (b) at the same time reinforce and support institutional strengthening of peripheral municipalities, increase cooperation with the state, and to provide the vision for the region's development. It is a challenge to put aside political rivalries (or minimize these) and look at the "big picture" if Rio is to yet become competitive and achieve world class city status.

4.56 It is a message worth repeating-- as public policy discussion world wide has moved to issues of globalization and an inter-dependent world system of trade and commerce--and the competitiveness of cities-- Rio de Janeiro with its historical advantage and global name recognition, cannot afford to be mired in yet unresolved intergovernmental and intra-metropolitan relationships.

4.57 This is not to argue for the introduction of another layer of "metropolitan government". For some time the trend around the world has been quite the opposite. For example, Prime Minister Thatcher in 1982 dismantled the Greater London Council in 1982. Metropolitan services were managed by a number of autonomous entities that ensured adequate liaison between different local authorities in their own interests, as their profits were dictated by customer satisfaction. This is true also for the USA where there has been a steady decline over the past 15 years in the number of governments with legal jurisdiction over metropolitan regions. These have been substituted with less formal, but in practice more effective, "Counsel of Governments". Adequate representation from each local authority and active citizen advocacy group participation seems to be the solution.

4.58 One recent innovation that "bucks the trend" is that of Greater Toronto, Canada (pop.c.3 million). In 1997 the various cities that made up the Greater Toronto Metropolitan Region were disbanded following a long period of public consultation, and merged into a "Megacity Toronto", to achieve efficiency gains, improve access to region-wide services (water, transportation ,etc) . The first steps were to put into operation an equalization of valuation for property taxes, and a plan to equalize access of social services to various sub-regions. In Toronto²⁰ too, the active participation of citizen advocacy groups seems to be at the core of changes.

4.59 In summary, there seems to be a trend in more successful big city management to focus of a) efficiency gains; b) equity; c) citizen involvement. In almost cases there is an underlying priority that urban environmental management must change for the better.

²⁰ Toronto was recently voted #3 in world cities for livability, quality of life. Vancouver was voted #1 (UN Survey of World Cities, 1998)

RECOMMENDATIONS--STRATEGY AND INSTITUTIONAL FOCUS

4.62 The Mayor's stated objective is to make Rio de Janeiro a functional world class city--with a vibrant economy, and safe, livable and attractive for all its residents and its many visitors. This means providing an attractive investment and operating environment for the private sector; employment, services, and improved quality of life to the urban population, including the urban poor.

4.63 Achieving these objectives requires: (a) competent institutional capacity at the municipal level to implement policy; (b) proactively implanting a working partnership between MRJ and the State and other metropolitan municipalities, focused on similar objectives; (c) supporting federal and state incentives to strengthen the institutional capacity of metropolitan institutions and of their constituent municipalities, to minimize leakage of the city's programs.

4.64 The trend followed in other big city management worldwide, as described above, provides a useful organizing framework for directing attention on areas for institutional strengthening:

Efficiency gains

4.65 There is much to be gained from closer coordination with the State and other municipalities, in making and implementing effective policies in multimodal transportation, water supply and sanitation, public safety and security²¹, and health, among others. In the short term MRJ's best option is to continue with pragmatic institutional arrangements to address specific issues on a case by case basis, under which MRJ can and should take the lead and provide the vision (hopefully a shared vision) of a world class metropolis. MRJ's sheer economic size and scale will assist the process of implementation of a metropolitan vision.

4.66 At the local level, institutional reorganization and strengthening should focus reducing the daily transaction costs of living and working in the city through increased efficiency, and improved management of existing infrastructure. Priority should be given to resolving critical and chronic structural infrastructure deficiencies that are exacting high cost from population, in particular macro-drainage/ flooding, and inadequate traffic and public transportation management²².

Equity

4.67 Rio's image worldwide is one of immense natural beauty and wealth against a backdrop of favelas. A number of programs (mainly in urban services up-grading) targeted to the poor have been initiated, as described in Chapter 2. A systematic assessment of these programs as proposed may indicate areas for fine-tuning later phases to minimize some unintended consequences²³.

²¹ The Journal de Brasil on April 26, 1998 reported an average of murder/hour in the RJ-MA for the period Jan-Mar.98.

²² Each working day about 13.9 million person trips take place in the RJ-MA of which about 85% cross MRJ, resulting in acute congestion, and generating severe air pollution.

²³ A study by the UFRJ suggests that "gentrification" has commenced in some areas improved under the Favela Bairro program. The lack of titling to inhibit sale by original beneficiaries has led to "under the counter" property transactions.

4.68 Institutions delivering human capital building services (education, health, nutrition) should be reinforced.

Citizen involvement

4.69 More active participation by citizen groups can only help make the Mayor's task easier to manage. This is already evident from the effectiveness of community involvement in on-going programs such as the *Favela Bairro*, as it was in the earlier Rio Flood Reconstruction Project, for the implementation of the sanitation and reforestation programs. Also NGO participation has been suggested for consideration: to involve the poor themselves in policy making for poverty alleviation; in implementation of projects; and to oversee evaluation, tracking and policy design efforts.

Environmental Management

4.70 Rio de Janeiro is in a class with San Francisco, Vancouver, and other such cities where mountains meet the sea, while remaining tracts of virgin forest appear to hang on to the hillsides. This combination of geology and geography also create a very special natural beauty, and a delicately balanced ecosystem.

4.71 As noted earlier, although much of the damage a decade ago was a result of natural hazard, it was also a consequence of man-made abuse of the fragile eco-system of Rio de Janeiro: deforestation and encroachment of hillsides of Favelas, and illegal mining--leading to landslides; uncollected solid waste clogging drainage systems and rivers; raw sewage discharged into rivers and the Bay of Guanabara, etc.; an overall neglect by the MRJ and other smaller municipalities of basic operation and maintenance, and an absence of controls to prevent further deterioration and destruction.

4.72 In addition to strengthening its own in-house capability, the MRJ can play a major role in helping the State and Federal environmental agencies get their act together towards a concerted approach to environmental management.

Evaluation Capacity

4.73 Finally, it is recommended that MRJ invest in the establishment of an unit with an evaluation capacity to monitor performance of service delivery and achievement of services standards/targets.

Annexes: Charts on Overlapping Responsibilities

Annex 4.1

Chart I: "Competências" of Different Levels of Government
As Seen By Municipality Officials

TYPE OF SERVICE	LEVEL		
	MUNICIPAL	STATE	FEDERAL
ROAD NETWORK AND MICRO DRAINAGE	M (1)	S (2)	F (2)
URBAN TRANSPORT			
• Bus	M (1)		
• Metro	M (1)		
• Sub-urban Train (Flumintrens)		S (2)	
• Ferries	M (1)	S (2)	
• Traffic Control	M (1)		
SOLID WASTE MANAGEMENT	M (1)		
WATER AND SEWERAGE			
• Water Catchment/Treatment/Supply	M (1) (3)		
• Distribution	M (1) (3)		
Sewerage/Sanitation	M (1) (3)		
Macro Drainage	M (1) (3)	S (4)	
ELECTRIC ENERGY			
• Production			F (5)
• Distribution			F (5)
• Public Illumination	M (1)		
GAS DISTRIBUTION		S (6)	
HOUSING	M (7)	S (7)	S (7)
PUBLIC SECURITY			
• Police	M (8)	S (8)	
• Fire Fighting and Prevention	M (1) (9)	S (8)	
• Civil Defense	M (9)	S (10)	
LAND USE CONTROL	M (11)		
ENVIRONMENTAL CONTROL	M (12) (13)	S (12)	F (12)

1. Federal Constitution Article. 30, Clause I & V
2. State Constitution Article 239; Federal Constitution Art 21, Clause XII, Line "e"
3. Organic Law Article 30, Clause VI, line "a"; Clause XX, line 'c'; Article 31
4. Federal Constitution Article 26, Clause I (Macrodrainage)
5. Federal Constitution Article 21, Clause XII, line "b"
6. Federal Constitution Article 25, para 2
7. Federal Constitution Article 23, Clause IX - common Competencias
8. State Constitution Article 180 and para 1 - MUNICIPAL: Guarda Municipal
9. Organization Law Article 30, Clause XXXIII
10. State Constitution Article 186
11. Federal Constitution Article 30, Clause VIII
12. Federal Constitution Article 23, Clause VI
13. Consessioning - Federal Constitution Article 30, Clause I & VIII

Source: Municipality of Rio Officials.

Chart II: "Competências" of Different Levels of Government
As Exercised in Practice

TYPE OF SERVICE	LEVEL		
	MUNICIPAL	STATE	FEDERAL
ROAD NETWORK AND MICRO DRAINAGE DRAINAGE	M	S (1)	F (1)
URBAN TRANSPORT			
• Bus	M (2)		
• Metro		S (3)	
• Sub-urban Train (Flumintrens)		S (4)	
• Ferries		S (4)	
• Traffic Control	M (5)	S (5)	
SOLID WASTE MANAGEMENT	M (6)		
WATER AND SEWERAGE			
• Water Catchment/Treatment/Supply		S (7)	
• Distribution		S (7)	
Sewerage/Sanitation	M (8)	S (7)	
Macro Drainage	M (9)	S (9)	
ELECTRIC ENERGY			
• Production			F
• Distribution			F (10)
• Public Illumination	M		
GAS DISTRIBUTION		S (6)	
HOUSING	M	S (7)	S (F)
PUBLIC SECURITY			
• Police	M (11)	S (8)	
• Fire Fighting and Prevention	M	S (8)	
• Civil Defense	M (12)	S (12)	
LAND USE CONTROL	M		
ENVIRONMENTAL CONTROL	M (13)	S (12)	F (13)

1. Only state roads (Linha Vermelha) and federal (BR-101/Rio Santos)
2. Private Concession
3. Exercised by state since the fusion of Rio Municipality and the State of Guanabara
4. Metropolitan level service (serving more than one municipality)
5. Municipality - Plans, Operates and Implements; Traffic Engineering, State-License Motor Vehicles
6. Operates also a Metropolitan Solid Waste land fill through a convenio dating to time of FUNDREM
7. Operates by state law dating to time of fusion (1975). No municipal authorization given.
8. The Municipality of Rio is in the process of executing sewage works (collectors and treatment plant) in the districts of Recreio, Vargem Grande and Vargem Pequena/ Municipal law recently approved authorizing executive to explore water supply and sewage.
9. Municipality- Micro and Macrodrainage. State- Macrodrainage.
10. Concession to private planner.
11. Guardia Municipal - State Military Police, Civil Police
12. Common Competencias
13. Common Competencias. State Concessioning of activities.

Annex 4.3

Chart III: Organizations Responsible at Different Levels of Government

TYPE OF SERVICE	LEVEL		
	MUNICIPALS	STATES	FEDERALS
ROAD NETWORK AND MICRO DRAINAGE	Special Sec. of Transport Sec. Municipal of Works & Public Services (1) DGVU/DGP	Sec. of Works & Public Service (2) DER	Min of Transport (3) DNER
PUBLIC TRANSPORT			
• Bus	Sec. Municipal of Traffic (4) SMTU		
• Metro		Sec. of State, Transport (5) METRO	
• Sub-urban Train (Flumintrens)		Sec. of State, Transport (6) FLUMINTRENS	
• Ferries		Sec. of State, Transport (7) CONERJ	
• Traffic Control	Sec. of Municipal Traffic (8)	Sec. of State, Public Security (9) CETRIO	
SOLID WASTE MANAGEMENT	Cabinet of the Mayor COMLURB		
WATER AND SEWERAGE			
• Water Catchment/Treatment/Supply		Sec. of State, Works & Public Services (11) CEDAE	
• Distribution		Sec. of State, Works & Public Services (11) CEDAE	
Sewerage/Sanitation		Sec. of State, Works & Public Services (11) CEDAE	
Macro Drainage	Sec. Works & Public Services (12) DGVU/DGP	Sec. of State, Environment (13) SERLA	
ELECTRIC ENERGY			
• Production			Min. MinasEnerg
• Distribution			LIGHT
• Public Illumination	Sec. Works & Public Services (14) RIOLUZ		
GAS DISTRIBUTION		Sec. of State Works & Public Services (15) CEG	
HOUSING	Sec. of Housing	Sec of Housing & Funds Asst. (16) CEHAB	Min. of Planning & Budget

TYPE OF SERVICE	LEVEL		
	MUNICIPALS	STATES	FEDERALS
PUBLIC SECURITY			
• Police	Municipal Security Company	State Sec. Public Security (18)	
• Fire Fighting and Prevention		State Sec. Public Security (19)	
• Civil Defense	Sec. of Municipal Government (20)	State Sec. Public Security (21)	
LAND USE CONTROL	Sec. of Urban Development Sec. of Finance		
ENVIRONMENTAL CONTROL	Sec. of Environment	State Sec. Environment (23) FEEMA	Min. of Environment (24) CONAMA

1. General Department of Urban Roads (DGVU) / General Department of Projects (DGP)
2. State Department of Roads (DER)
3. National Department of Roads (DNER)
4. Superintendent, Municipal Urban Transport (SMTU)
5. Metropolitan Company of Rio de Janeiro (METRO)
6. State Company of Sub-urban Trains (FLUMINTRENS)
7. State Company of Navigation of Rio de Janeiro (CONERJ)
8. Engineering Company of Traffic (CETRIO)
9. State Department of Traffic (DETRAN)
10. Municipal Company of Sub-urban Solid Waste Management (COMLURB)
11. State Company of Water and Sewerage (CEDAE)
12. General Department of Urban Roads (DGVU) / General Department of Projects (DGP)
13. Foundation Superintendent of Rivers & Lakes (SERLA)
14. Municipal Company of Energy & Light (RIOLUZ)
15. State Company of Gas (private sector) (CEG)
16. State Company of Housing of Rio de Janeiro (CEHAB)
17. Mayor's Cabinet
18. State Civil Police of Rio de Janeiro/State Military Policy of Rio de Janeiro
19. State Fire Fighters of Rio de Janeiro
20. Coordinator General of Civil Defense System of the City of Rio de Janeiro
21. Coordinator, Civil Defense
22. Coordinator, Licensing and Inspection
23. State Foundation of Engineering of the Environment - (FEEMA) / State Institute of Forests (IEF)
24. National Council of Environment (CONAMA)

Source: Municipality of Rio de Janeiro.