

TEXTO PARA DISCUSSÃO Nº 317

Human Resources in the Adjustment Process

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I. INTRODUCTION

Brazil ended the 1980s facing a great challenge: The necessity of structural reforms required to control the government deficit and to increase efficiency and the degree of international competitiveness. To some extent, these challenges are not new. But to a greater extent they are the result of a decade of economic policies aiming to eliminating trade deficits, and to fight inflation, unemployment and recession. Since 1990 a new set of economic policies have been implemented to reform the government and increase efficiency. These policies are expected to have a structural impact with sizable consequences on the functioning of the labor market. The adjustment cost to these changes, however, are not expected to be small or evenly distributed. Structural reforms have adjustment costs which, to a great extent, fall on the workers. These costs tend to be large and are not evenly distributed across all segments of the labor force. They are a consequence of the fact that structural changes lead necessarily to the destruction and creation of jobs requiring a period of adjustment in which workers are moving between jobs. Therefore, the magnitude of the cost and the speed of the adjustment process are inversely related to the degree of flexibility of the labor market. The degree of flexibility of the labor market by its turn is a function of (a) the level of qualification of the labor force and the availability and cost of retraining programs, (b) institutional constraints related to labor contracts and labor legislation, and (c) structural characteristics of the functioning of the labor market such as the degree of regional integration and the degree of informalization. Complementary to policies to improve the flexibility of the labor market, certain compensatory programs such as the unemployment insurance, are vital in reducing the redistributive consequences of the cost of the adjustment process.

This study has six sections besides this introduction. In the first section, we identify the needs for structural change and we determine to which extent and with respect to which dimensions these structural changes occurred in the 1980s or are now taking place in the 1990s. In Sections III and IV we estimate, respectively, the magnitude and the incidence of the adjustment costs to the economic fluctuations which were occurred during the 1980s. Section V is devoted to describing the level of qualification of the labor force and the nature of the educational system, with particular attention to technical and professional training. In Section VI, we investigate several policies which could affect the functioning of the

labor market. The goal is to identify those capable of reducing the cost of adjusting by increasing the degree of flexibility of the labor market. Finally, in Section VII we summarize our main conclusions.

II. NATURE AND TIMING OF ADJUSTMENT PROCESS IN BRAZIL

Over the last 20 years the Brazilian economy was subjected to four external shocks and some important internal political changes. The external shocks were: (a) the first oil shock in the mid-1970s, (b) the second oil-shock at the end of the 1970s, (c) the increase in international interest rates at the end of the 1970s and beginning of the 1980s, and (d) the interruption of the flow of voluntary funds to highly indebted countries in the beginning of the 1980s.

The major political change in the period was the gradual democratization process which occurred during the 1980s, particularly after 1985. This democratization process brought a greater social concern with inequality and poverty and was accompanied by an increasing strengthening of labor unions. Moreover, during this period, government spending and employment in government increased substantially.

In response to these changes in the external and internal environments, several economic policies were implemented. These policies profoundly influenced the macroeconomic performance of the Brazilian economy and the behavior of the labor market. An evaluation of the success of these policies produces mixed results. On the one hand, these policies were successful in eliminating most of the external imbalances. But, on the other hand, these policies were both (a) themselves a source of internal imbalances and (b) incapable of eliminating the internal imbalances generated by the changes in the internal and external environments.

In this section we briefly describe the major economic policies implemented in the period and evaluate their success in eliminating the internal and external imbalances generated by the shocks which have hit the Brazilian economy in the last 20 years. We begin, however, describing the economic scenario at the beginning of the 1970s.

At the beginning of the 1970s the Brazilian economy was in a path of fast economic growth (GDP growth rates between 10% and 12% per year) with moderate inflation

(15-20% per year)¹ and moderate trade deficit (never above 2% of GDP) leading to a slowly increasing external debt (less than one billion US\$ per year).²

II.A. The First Oil Shock: 1973-78

The first oil shock in 1974 induced the immediate appearance of a large trade deficit (5.6% of GDP) with imports jumping from 9.0% of GDP in 1973 to 13.3% of GDP in 1974, and exports remaining at approximately 8% of GDP. As a consequence, the external net debt increased from 4% of GDP in 1973 to 7% of GDP in 1974.

The Brazilian economic policy response was twofold. On the one hand, thanks to the abundant availability of credit and low interest rates in international markets, the adjustment of the trade account was delayed, no real devaluation of the cruzeiro was done, and a growth-cum-debt strategy was promoted. On the other hand, a structural adjustment program was implemented. The program consisted of a bold investment plan intended to reduce the dependency of the economy on imports of capital and intermediary goods and to promote manufactured exports.

As a result of these policies, it was possible to reduce gradually the trade deficit from 5.6% of GDP in 1974 to 1.2% of GDP in 1978. This reduction in the trade deficit occurred mainly at the import side: Imports decreased from 13.3% to 7.9% of GDP mainly due to a decline in the importation of raw material and capital goods. Actually, the overall relative level of exports remained almost constant at 7% of GDP, but the composition changed dramatically: Manufactured goods increased their participation in the total exported from 25% in 1973 to 40% in 1978.

The undesirable consequence of this strategy of growth-cum-debt was a threefold increase in the foreign debt from US\$ 13 billion (8% of GDP) in 1973 to US\$ 44 billion (21% of GDP) in 1978. Moreover, despite the absence of any real devaluation of the cruzeiro, the increase in oil prices coupled with a high degree of price indexation led to a threefold increase in the annual inflation rate from 15% in 1973 to 43% in 1978.

¹Inflation has traditionally been large in Brazil. It has been above 10% per year, at least since the end of WW-II.

²All figures cited in this section are from Tables 2.1, 2.2 and 2.3.

Table 2.1

National accounts

Year	G.D.P. 1980 Prices (Cr\$ 1000) (1)	Growth Rate (%) (1)	G.D.P. per capita (1)	Growth Rate (%) (1)	Imports (% of GDP) (2)	Exports (% of GDP) (2)	Investment (% of GDP) (1)
1970	5,419	-	0,057	-	7,4	7,0	18,83
1971	6,037	11,41	0,061	8,71	8,2	6,5	19,91
1972	6,758	11,95	0,067	9,28	8,9	7,3	20,33
1973	7,700	13,94	0,075	11,26	9,0	7,8	20,37
1974	8,336	8,25	0,079	5,72	13,3	7,7	21,84
1975	8,763	5,12	0,081	2,67	11,0	7,2	23,33
1976	9,654	10,17	0,087	7,62	9,4	7,0	22,41
1977	10,130	4,93	0,089	2,51	7,9	7,2	21,32
1978	10,629	4,93	0,092	2,53	7,9	6,7	22,26
1979	11,348	6,77	0,096	4,34	9,3	7,2	23,35
1980	12,382	9,11	0,102	6,65	11,3	9,1	22,90
1981	11,838	-4,39	0,095	-6,54	9,8	9,4	22,94
1982	11,906	0,57	0,094	-1,67	8,5	7,6	21,44
1983	11,500	-3,41	0,089	-5,54	9,0	11,4	18,13
1984	12,107	5,28	0,091	2,98	7,9	13,5	16,89
1985	13,069	7,95	0,096	5,63	7,1	12,2	16,95
1986	14,060	7,58	0,102	5,31	6,4	8,8	19,09
1987	14,569	3,62	0,103	1,45	6,2	9,5	22,30
1988	14,557	-0,08	0,101	-2,14	5,7	10,9	22,81
1989	15,037	3,30	0,102	1,21	5,0	8,3	24,86
1990	14,430	-4,04	0,096	-5,93	5,5	7,2	21,67

(Continue)

External Debt (US\$ B)	Net	Interest on External Debt (US\$ Mi)	Public Savings (% of the GDP)	Private Savings (% of the GDP)	Aggregate Savings (% of the GDP)
Gross		(2)	(1)	(1)	
5,30	4	234,00	8,12	11,11	20,54
6,62	4,90	302,00	7,57	11,03	21,26
9,52	5,34	359,00	8,69	9,98	21,21
12,57	6,16	514,00	8,70	11,34	22,04
17,17	11,90	652,40	6,91	10,95	24,31
21,17	17,13	1498,00	6,34	14,20	25,70
25,99	19,44	1809,50	7,35	11,78	23,03
32,04	24,78	2103,50	7,60	12,15	22,03
43,51	31,62	2696,40	5,06	14,49	23,03
49,90	40,22	4185,50	3,47	14,85	23,13
53,85	46,94	6311,10	4,67	13,22	23,34
61,41	53,90	9161,00	4,28	14,36	23,08
70,20	66,20	11353,30	1,40	13,90	21,09
81,32	76,76	9555,40	0,46	12,86	16,68
90,09	79,10	10202,70	0,26	15,50	15,74
95,86	84,25	9659,40	-0,22	19,31	19,20
101,76	95,00	9327,00	2,78	14,35	19,09
107,51	100,06	8792,20	2,72	19,10	22,30
102,56	93,41	9831,90	1,80	22,29	22,81
99,29	89,61	9632,90	-1,31	26,40	24,86
96,55	86,57	9009,00		21	21,67

Source: (1) IBGE-National Account Department
(2) BACEN (Central bank) bulletins

Table 2.2

Year	Real Exchange	Inflation	Inflation	Interest	Terms of	US Prime	Real Wage
	Rate	IPA-DI	IPC-FIPE	Rate	Exchange	Rate	(Industrial Wage/ Exchange Rate)
		(%)	(%)	(%)			
	(*) (1)	(2)	(3)	(**) (4)	(4)		(5)
1970	86,48	18,50	-	-	100,00	-	-
1971	84,85	21,40	-	-	92,82	5,67	-
1972	85,15	15,90	-	-	98,37	5,33	-
1973	85,54	15,50	-	-	107,03	8,21	-
1974	87,25	35,40	-	17,32	87,98	10,83	-
1975	89,28	29,30	-	21,84	85,17	7,85	-
1976	87,50	44,90	38,01	41,09	96,32	6,85	100,00
1977	87,50	35,50	41,18	41,91	112,77	6,90	131,80
1978	86,73	43,00	39,93	46,44	96,96	9,21	165,30
1979	93,69	80,10	67,14	42,58	88,98	12,73	143,60
1980	100,00	121,40	84,77	46,44	73,57	15,46	181,40
1981	90,45	94,30	90,86	89,26	62,58	18,69	210,10
1982	91,67	97,70	94,63	119,48	60,87	14,60	234,10
1983	112,62	234,00	164,06	200,09	60,10	10,75	143,50
1984	111,00	230,30	178,58	255,56	64,95	12,00	136,40
1985	114,61	225,70	228,21	276,85	65,09	9,88	155,80
1986	102,65	62,60	68,08	68,81	87,92	8,25	197,10
1987	96,61	407,20	367,12	358,00	80,42	8,21	206,30
1988	84,42	1050,00	900,78	1067,91	80,78	9,35	253,60
1989	68,56	1748,80	1635,85	2617,93	73,70	10,91	356,50
1990	60,37	1449,52	1639,08	1412,06	70,21	-	295,25

(*) (Cr\$/US\$)*(USPrice/Brasil's Price)

Sources: (1) Carneiro & Werneck (1992)

(**) Overnight Interest Rate (annual)

(2) FGV - Getulio Vargas Foundation

(3) FIPE - University of Sao Paulo

(4) BACEN (Central Bank) Buletin

(5) Wages - PIM (IBGE)

(6) Exchange Rate - FVG

Table 2.3

Year			Public Sector (*)				
	Public	Savings	Public	Public	Public	Fiscal	Debt
	Primary	Operational	Investment	Investment	Expenditure	Primary	Operational
			(**)	(***)			
1970	8.69	8.12	4.42	7.26	11.34	-1.43	-0.86
1971	8.04	7.57	4.28	8.52	11.24	0.48	0.95
1972	9.15	8.69	3.88	7.53	10.66	-1.62	-1.16
1973	9.19	8.70	3.71	5.90	9.96	-3.29	-2.80
1974	7.40	6.91	3.86	7.97	9.40	0.57	1.06
1975	6.91	6.34	3.95	8.61	10.19	1.70	2.27
1976	8.02	7.35	4.03	10.59	10.47	2.57	3.24
1977	8.24	7.60	3.29	9.49	9.43	1.25	1.89
1978	5.72	5.06	3.15	11.17	9.68	5.45	6.11
1979	4.31	3.47	2.47	11.37	9.90	7.06	7.90
1980	5.80	4.67	2.37	6.67	9.20	0.87	2.00
1981	5.65	4.28	2.60	7.20	9.32	1.55	2.92
1982	3.71	1.40	2.35	6.95	10.01	3.24	5.55
1983	3.57	0.46	1.83	5.63	9.66	2.06	5.17
1984	4.10	0.26	1.90	4.70	8.28	0.60	4.44
1985	3.59	-0.22	2.32	4.82	9.87	1.23	5.04
1986	5.32	2.78	3.08	5.28	10.67	-0.04	2.50
1987	5.15	2.72	3.21	5.95	12.16	0.80	3.23
1988	5.10	1.80	3.17	5.74	12.61	0.64	3.94
1989	2.16	-1.31	2.93	5.14	14.32	2.98	6.45
1990			3.50		15.63		

Source: Carneiro & Werneck (1992)
(*) As % of GDP
(**) Excluding public enterprises
(***) Including public enterprises

However, despite the increase in inflation, generalized indexation schemes were able to inhibit any significant increase in uncertainty, so that, the level of investment remained constant at 22% of GDP and high growth rates were sustained over the entire period (GDP grew 6.7% per year between 1974 and 1979).

II.B. The Second Oil Shock and the Increase in Interest Rates: 1979/82

The second oil shock at the end of the 1970s led to a new increase in the trade deficit with imports increasing from 7.9% of GDP in 1978 to 11.3% in 1980. At almost the same time, a continuous increase in international interest rates from 1978 to 1982 coupled with a concomitant increase in the debt caused a fourfold increase in the service of the debt (from US\$ 2.7 billion in 1978 to US\$ 11.3 billion in 1982). These facts considerably challenged the feasibility of the Brazilian strategy of growth-cum-debt.

The new environment required a faster solution to the current account deficit. The policy response was an attempt of real devaluation of the cruzeiro. The real devaluation was an important factor leading to an increase in exports from 6.7% of GDP in 1978 to 9.4% of GDP in 1981. This devaluation, however, did not persist in real terms and, as a result, exports returned in 1982 to their level in 1979.

As a consequence of the second oil shock and the attempt to devalue the cruzeiro in an indexed economy, inflation increased threefold going from 43% in 1978 to 121% in 1980. By 1980, despite the devaluation and the increase in exports the trade account was still showing a deficit of 2% of GDP. Despite the new increase in inflation growth was sustained.

By 1981 the persistent large deficit in the current account and the unattractive international interest rates demanded policies aimed to reduce imports. At this point a recessionary policy pursued by a sharp cut in domestic credit and a severe import rationing led to both (a) the end of the period of sustained growth which characterized the 1970s and (b) a sharp reduction in imports (imports declined from 11.3% of GDP in 1980 to 8.3% of GDP in 1982). Despite the appreciation of the cruzeiro and subsequent decline in exports in the period, a balanced trade account was almost obtained due to the sharp decline in imports.

II.C. The Debt Crisis: 1982/84

In the early 1980s, the Mexican moratorium led private banks to interrupt the flow of voluntary funds to highly indebted countries. For instance, by 1984 the flow of foreign capital to Brazil had completely stopped. The lack of foreign credit imposed restrictions on growth and required an immediate solution for the deficit in the current account.

The policy responses were a new attempt of real devaluation of the cruzeiro and a continuous policy of credit rationing and import repression. From the trade balance standpoint, there is no doubt that the response of the Brazilian economy to these policies were outstanding. As a result of the increase in exports and the decrease in imports, by 1984 the trade surplus was large enough to clear the current account. In fact, on the hand, the import repression - through heavy tariff and non-tariff protection -, the reduction in absorption during the 1981/83 recession, and the maturation of the import-substitution process of the late 1970s led to a dramatic decline in imports from 11.3% of GDP in 1980 to 7.9% of GDP in 1984.

On the other hand, the real devaluation of the cruzeiro and a series of fiscal incentives had an important impact on exports, which increased from 7.6% of GDP in 1982 to 13.5% of GDP in 1984. This increase in exports was obtained mainly from the growing contribution of manufacturing goods. Since a large fraction of the increase in exports were obtained by decreasing internal absorption, the increase in export required little inter-sectoral allocation of labor.

The internal consequences of this adjustment in the current account were severe: GDP declined by more than 7% during the 1981/83 recession. Inflation increased twofold with the devaluation of the cruzeiro jumping from 98% in 1982 to 230% in 1984. Moreover, since approximately 80% of the Brazilian external debt is public,³ the impossibility of borrowing abroad forced the government to buy hard currency from the export sector to service the external debt leading to either an increase in inflation or an increase in the internal debt. Since a tight monetary policy was followed, a

³The increase of the public external debt resulted from the borrowing of the state enterprises and the state governments, and from the absorption of private debt by the Central Bank.

considerable increase in the internal public debt resulted.

II.D. Democratization and Inflation: 1985/90

II.D.1. External account and internal debt

From 1985 to 1990 the cruzeiro went through a process of considerable appreciation leading to a sharp decline in exports from 12.2% of GDP in 1985 to 7.2% of GDP in 1990. At the same time a systematic policy of import repression and substitution reduced imports from 7.1% of GDP in 1985 to 5.5% in 1990. The average net result for the period was a considerable surplus in the trade account leading to a balanced current account. There exist, however, a recent trend toward an increasing current account deficit.

As mentioned above, the use of trade surpluses to service the foreign debt led to an increasing internal debt, since the monetary policy remained tight over the entire period. In addition, during this period the internal debt was also affected by a substantial increase in government spending (from 9.9% of GDP in 1985 to 15.6% in 1990) in particular due to a widespread expansion of subsidies and an increase of employment at all levels of government, but in particular at the State and Municipal levels.

II.D.2. Inflation and growth

By 1984 the economy had already regained its growth path but the inflation rate after two oil shocks and two attempts of real devaluation of the cruzeiro was at 230% per year. Since this inflation rate was perceived as being too high for being compatible with a sustainable growth path, several attempts were made to reduce inflation. Growth survived to the early stabilization programs up to 1987, but all programs failed in reducing inflation. Inflation doubled from 1984/85 to 1987, doubled again from 1987 to 1988, and again from 1988 to 1989. By 1989, inflation was almost 2000% per year.

II.E. Summary and Perspectives

Over the last 20 years the Brazilian economy was subjected to severe external shocks which required the generation of substantial trade surplus. Even though the required surplus had, to a large extent, been generated, it results more from the decline in imports (imports were 13.3% of GDP in 1973 and only 5.5% of GDP in 1990) than the result of growth in exports (exports represented 7.8% of GDP in 1973 and 7.2% in 1990). It

is important to emphasize, though, that the composition of exports changed considerably over the period: In 1973 manufactured goods represented less than 25% of total exports, whereas in 1990 they represented almost 60% of total exports. Despite this important qualitative change in the composition of exported goods, the Brazilian economy became closer over this two decades: The sum of imports and exports in 1990 (12.7% of GDP) is not only very low but also almost 2 percentage points smaller than in 1970 (14.4% of GDP).

The declining degree of openness of the Brazilian economy associated to the increasing government direct participation in production is considered to have induced a decline in economic efficiency and international competitiveness. Motivated by this question, a program of privatization and trade and financial liberalization is in progress. The results, however, are mediocre, at least up to now.

The internal and external deficits have also substantially increased over the last decade. For instance the external debt increased from 5% of GDP in 1970 to 35% of GDP in 1990. Since 1990, important cuts in government expenditures have been implemented and some main public enterprises have been privatized. However, the necessary fiscal reform is still lagging behind.

The inflation rate reached 80% per month at the end of 1989. Despite several reforms since 1990 with the prohibition of formal indexation, a very restrictive monetary policy, and important cuts in government expenditures, the annual inflation rate in 1990 was still 80 times greater than in 1970.

In terms of growth, the performance of the Brazilian economy during the 1980s was the weakest in all the post WW-II period. The rate of growth of GDP was not only very small but also very unstable with the current recession being even deeper than the one at the beginning of the 1980s. In summary the Brazilian economy was able to eliminate the current account deficit generated by both oil shocks and the increase in the international interest rates. The problems were the domestic consequences of the strategies used in both occasions. As we have shown, these strategies led initially to a large external debt, and then, when the flow of foreign capital stopped, to large and increasing inflation rates, increasing government deficits and increasing economic inefficiency. These consequences of the strategy used to cope with these external shocks have not allowed the Brazilian economy to retake a sustainable growth path. Hence, despite the

capacity of generating trade surplus very effectively, the trajectory of Brazil since the mid-1970s can probably be better characterized as being an example of lack of adjustment than one of adjustment.

As a consequence, the most pressing challenges of economic policy in the beginning of the 1990s are the solution of the fiscal deficit, the fight against inflation and the search for economic efficiency and international competitiveness. The Brazilian economic policy in the beginning of the 1990s has focused on all these three issues. To fight simultaneously inflation and the public deficit the new policy emphasized not only a very restrictive monetary policy but also important cuts in government expenditures. However, the necessary fiscal reform has been lagging behind. To improve efficiency and regain international competitiveness some structural economic reforms like the privatization of some of the main public enterprises and trade and financial liberalization are in progress. The results up to now are mediocre.

III. MAGNITUDE OF THE COST OF ADJUSTMENT

Structural changes or cyclical fluctuations necessarily lead to a process of destruction and creation of jobs. Therefore, the process of adjustment to these changes or fluctuations requires time and monetary costs as workers move between jobs, acquire new skills, and adapt their old one. Overall, the cost of a process of adjustment can assume the form of (a) loss of output during the transition, (b) increments in the unemployment rate above the pure frictional level of equilibrium, (c) reduction in wages probably due to loss of firm-specific or sector-specific human capital, and (d) an increase in the level of wage inequality due to disequilibrium in the labor market during the adjustment period.

Since 1980 Brazil has been through two recessionary periods and has successfully balanced the current account without requiring much sectoral reallocation of labor. This process of eliminating external imbalances with, at the same time, generating increasing internal imbalances imposed severe costs on workers. In this section we investigate four dimensions of the adjustment cost in Brazil in the 1980s: (a) losses in output, (b) increments in unemployment, (c) wage losses, and (d) increments in inequality. In the following section we investigate the distribution between social-economic groups of the costs in terms of unemployment and wages cuts.

Although all types of structural changes and cyclical fluctuations impose adjustment costs on the labor force, the nature of the cost of adjustment and, in particular, its incidence can be dramatically different depending on the type of structural change or cyclical fluctuation. For example, while the adjustment process to a pure cyclical aggregated fluctuation is likely to favor workers with substantial firm-specific human capital, the adjustment process to a structural change requiring some sectoral re-allocation of the labor force will impose greater costs precisely on the displaced workers with considerable firm-specific human capital.

Therefore, knowledge about the magnitude and incidence of the cost of adjustment from a given episode may or may not be applicable to economic changes of different nature. This warning is particularly important for Brazil. While all information available clearly demonstrates that the cost to workers of the economic fluctuations and balancing of the current account in the 1980s were enormous, it is not clear that the magnitude and incidence of these costs will be the same as Brazil opens the economy to foreign competition and reduces the participation of government in production.

III.A. Gross Domestic Product

The average annual growth rate of the GDP in the 1980s was very small in both absolute terms and relative to the previous decades: GDP was growing on average at 7.2% per year in the 1950s, 6.1% per year in the 1960s, and 8.6% per year in the 1970s but only at 1.5% per year in the 1980s (see table 2.1). In the 1980s, the rate of growth of GDP was not only small but also very unstable: It varied from almost 8% in 1985 and 1986 to -4% in 1981 and 1990. Overall growth was faster at the middle of the decade (1984/87) and negative at the two extremes.

One measure of the cost in terms of output of the slower growth in the 1980s is the difference between the potential and the effective GDP. A simple estimate for the potential GDP in the 1980s can be obtained by projecting the 1951/80 average growth rate to the period 1981/90. Based on this projection, the output loss over the 1980s is equivalent to 3,58 times the 1980 GDP. As a matter of fact, growth in the 1980s in Brazil was not only unusually weak in terms of its magnitude but also qualitatively: for instance, since 1940 only in the 1980s has the share of the industrial sector in total GDP declined.

Since, the Brazilian population increased in the 1980s at a rate of 2.1% per year, the per capita GDP had an average negative growth rate of -0.6% per year over the decade. Since the population growth rate remained almost constant over the decade, the time profile of the per capita GDP growth rates is a simple translation (-2.1%) of the profile of the GDP growth rates. More precisely, per capita GDP growth rates varied from negative values at the beginning and end of the decade (-6.5% in 1981 and -5.9% in 1990) to highly positive values at the middle (+5.6% for 1985 and +5.3% in 1986) (see Table 2.1).

III.B. Employment and Unemployment

Surprisingly, despite a very small rate of growth in the 1980s, job creation was not an important problem during the period. The level of employment grew continually over the decade as more than 15 million new jobs were created (see Table 3.1).

The labor force participation rate increased almost continuously from 1979 to 1987; being 3.5 percentage points greater in 1987 than in 1979. However, since 1987 the labor force participation has declined slightly (0.5 percentage points) (see Table 3.1).

The open unemployment rate fluctuated over the decade, increasing during recessions and decreasing with growth, but it never surpassed 5%. During the 1981/83 recession, unemployment reached only 4.9% of the labor force in 1983 and decline very fast to 2.5% during the Cruzado Plan in 1986. After 1986 the unemployment rate increased slightly to level off at around 3.5% between 1987 and 1990. Relative to the magnitude of the oscillations in the GDP rate of growth, the rate of unemployment remained very low and stable even during the recessions of 1981/83 and 1990/92 (see Table 3.1).

The absence of any shortage of jobs during the decade, despite the very slow and unstable growth, may indicate that the employment problem was related to the quality, instead to the quantity, of jobs being offered. In fact, in a competitive labor market, increments of labor supply which are not matched by similar increments in labor demand lead to lower wages not to unemployment. To further investigate the magnitude of the adjustment cost and to which extent the Brazilian labor market can be characterized as a competitive market, we consider in the next two sub-sections the evolution of the sectoral composition of employment and the evolution of wages over the period.

Table 3.1

Year	Economic	Participation	Unemployment
	Population	Rate	Rate
	(millions)	(%)	(%)
1979	43,90	53,60	*
1980	*	*	*
1981	47,50	53,40	4,30
1982	49,90	54,90	3,90
1983	50,90	54,80	4,90
1984	52,40	54,80	4,30
1985	55,50	56,00	3,40
1986	56,80	55,80	2,40
1987	59,50	57,10	3,60
1988	61,00	56,80	3,80
1989	62,50	56,70	3,00
1990	64,50	56,70	3,70

Source : PNADs and Demographic Census 1980.

III.C. Sectoral Structure of Employment

In this section we consider the evolution in the 1980s of the distribution of workers by sectors of economic activity (manufacturing, agriculture, etc...) and by kind of working relation (self-employed, public servants, formal employees, informal employees and non-paid family members). With respect to sector of economic activity, Table 3.2 reveals that from 1981 to 1989 the proportion of employment in Services and Trade increased 6 percentage points, while the proportion of employment in Agriculture decline by approximately the same amount. In absolute terms that means that employment in Services and Trade increased by more than 50% between 1981 and 1989 generating more than 9 million new jobs. In absolute terms, employment in Agriculture increase by 6%.

50% between 1981 and 1989 generating more than 9 million new jobs. In absolute terms, employment in Agriculture increase by 6%.

The share of employment in Manufacturing remained almost constant over the 1980s, leading to a 30% increase in absolute terms. The employment share in public administration and defense increased 0.7 percentage points from 1981 to 1989, with most of the increase concentrated in the 1984-88 period. In absolute terms, this increase corresponds to the creation of 1.1 million new government jobs or a 53% increase in government employment from 1981 to 1989.

This change in the composition of employment show a clear shift from tradeables to non-tradeables. The direction of this sectoral shift contrasts sharply with the fact that, during this period, Brazil was substituting imports and promoting exports. This contrast indicates that the Brazilian effort to generate trade surplus was accomplished without requiring any significant inter-sectorial reallocation of labor. As a matter of fact, the major change in exports in the last 20 years has been the increasing participation of manufacturing goods, which increased from less than 25% in 1973 to almost 60% in 1990. This change, however, occurred mainly in the 1970s. From 1981 to 1989 the contribution of manufacturing to exports increased by less than 10 percentage points. This increase in manufacturing exports represented only 3% of total manufacturing production. Since employment in manufacturing increased 30% in the 1980s, it is not surprising that no sectoral reallocation of labor was required to adjust the Brazilian current account. In summary, the Brazilian economy is still too close for the elimination of trade deficits to require significant inter-sectorial allocation of labor. In summary, the balancing of the current was accomplished without requiring any substantial inter-sectorial allocation of labor, while the generation of employment without significant growth was possible by a sharp increase of employment in the Tertiary sector, in particular in Trade and Services and Government.

Table 3.2

The temporal evolution of the sectorial employment structure

(percent)

Sector	1981	1982	1983	1984	1985	1986	1987	1988	1989
Non-Tradables	55,6	55,6	58,3	55,4	56,4	57,4	58,8	59,7	60,2
Construction	8,40	7,50	9,70	6,10	6,10	6,70	6,90	6,60	6,50
Trade	10,9	10,8	11,1	11,2	11,5	11,9	12,1	12,1	12,8
Transportation	3,90	3,80	3,60	3,60	3,60	3,60	3,70	3,80	3,80
Credit & Insurance	2,20	2,20	2,40	2,40	2,60	2,20	2,20	2,20	2,20
Services	26,0	26,9	27,1	27,6	27,9	28,1	29,1	29,9	30,0
Pub, Adm, & Defense	4,30	4,50	4,40	4,50	4,60	4,90	4,90	5,10	5,00
Agriculture & Extraction	27,9	28,2	26,3	28,9	27,2	25,0	23,7	23,5	22,4
Manufacturing	15,4	15,2	14,4	14,6	15,2	16,5	16,1	15,6	16,2

Source: Barros and Ramos (1991), PNADs. All individuals 15 or more years old.

With respect to the distribution of the labor force by kind of working relations, Table 3.3 reveals a considerable stability over the period. The proportion of the labor force which is self-employed remained constant at approximately 26%. There was, however, a small reduction (one percentage point) of the labor force in jobs without formal labor contracts and non-paid family members, with a concomitant small increase in the proportion of employees with formal contracts and public servants. In summary, Table 3.3 indicates an increasing formalization of the working relations.

Table 3.3

The temporal evolution of employment by kind
of working relation Brazil

(percent)

Sector	1981	1982	1983	1984	1985	1986	1987	1988	1989
Self Employed	26,60	27,30	26,20	27,00	26,40	26,70	26,30	26,80	26,60
Formal	32,90	31,90	30,20	30,50	31,90	33,00	33,20	33,20	34,00
Public Servants	10,30	10,40	10,50	10,70	10,90	11,30	11,30	11,90	11,70
Informal (*)	21,60	21,60	24,90	23,30	22,30	21,90	21,70	21,10	20,50
Non-Paid	7,50	7,70	7,10	7,40	7,30	5,90	6,10	5,80	6,00
Others	1,10	1,00	1,00	1,10	1,20	1,10	1,40	1,20	1,10

Source: Barros and Ramos (1991), PNADs. All individuals 15 or more years old.

(*) The employees without formal labor contracts.

These patterns, however, are clearly dominated by the reduction in the proportion of employment in Agriculture, since agricultural workers are more likely to be non-paid family members or employees without a formal contract. As a matter of fact, if we constrain the analysis to the urban areas we obtain the reverse results, i.e., a considerable informalization of the labor force. As a matter of fact, as Cacciamali (1991: Quadro 12) showed the proportion of the urban labor force which is employed with a formal labor contract declined by more than one percentage points over the 1980s.

In summary, we conclude that including the shift from agriculture to urban activities the quality of jobs (degree of formalization of the working relations) has improved over the 1980s. But, if we restrict the analysis to the urban areas, there was a deterioration of job quality since the degree of formalization of labor relation was declining and jobs offering formal

labor contracts tend to offer better working conditions and salaries.

Therefore, we have reached two conclusions. On the one hand, the economic program devoted to balance the current account did not have any clearly noticeable effect on the structure of employment. On the other hand, the failure to sustain a reasonable growth rate led to a deterioration of job quality in urban areas with an increase in the proportion of employment in Services and in the proportion of the urban labor force employed in informal activities (self-employed and employees without a formal labor contract).

III.D. Real Labor Income

From 1980 to 1990, GDP increased by 17% while the labor force increased by 40%, implying a decrease of 17% in average productivity. Therefore, if the labor market behaved competitively, wages must have declined to permit this large increment in the labor force to be absorbed. As a matter of fact, the average labor income per worker did decrease over the period, being 11% lower in 1990 than in 1980.

However, the decline in labor income in the 1980s was not monotonic at all. It closely followed the sharp oscillations in growth over the decade, but with considerably greater amplitude. Wages decline sharply during the 1981/83 recession to increase considerably during the recovering period in the middle of the decade in particular in 1985 and 1986. At the peak in 1986 wages were 60% higher than at the trough in 1983/84. Since 1987 wages have been declining monotonically except for an ephemeral recovery in 1989. By 1990 the average labor income of the labor force was 27% lower than at the peak in 1986 (see Table 3.4). In summary, the temporal evolution of average labor income followed the oscillations in GDP plus a negative trend necessary to accommodate an increasing labor force in a period marked by slow growth.

Table 3.4 also presents the evolution of the wages in manufacturing in São Paulo. This table reveals that manufacturing wages followed a temporal pattern completely different from the overall average labor income. Manufacturing wages did not decline as much as the average labor income of the labor force during the 1981/83 recession. They increased as fast as the average labor income with the growth at the middle of the decade, but did not decrease from 1986 to 1989. The results that the manufacturing wages in 1990 was 43% greater than in 1980 despite the slow growth of manufacturing in the 1980s. As matter of fact

manufacturing production increased only 10% over the 1980s whereas manufacturing employment increased more than 30%. So, the fact that wages in manufacturing were 43% greater despite of average productivity having decline by at least 15% indicates that wage determination in manufacturing does not followed a competitive model. The increasing strengthening of labor unions seems to have played an important rol.

Table 3.4

Year	Real	(Sao Paulo)	Income
	Income	Manufacturing Real	Inequality
		Wages	(GINI)
1979	1,00	100,00	0,58
1980	1,21	108	0,59
1981	1,09	113,00	0,57
1982	1,07	116,00	0,58
1983	0,81	102,00	0,59
1984	0,80	105,00	0,59
1985	0,95	130,00	0,60
1986	1,48	163,00	0,59
1987	1,02	155,00	0,60
1988	0,88	165,00	0,62
1989	0,96	179,00	0,63
1990	0,94	154,00	0,61

Source: Conjuntura Economia (Dec/1979,12 Encarte salarios); PNADs and Demographic Census 1980; Deflated by INPC-R.

III.E. Income Inequality

The degree of income inequality in Brazil is one of the highest in the world (see Table 3.4). As a result, in no other country has the academic debate on growth versus equity been more heated. As a matter of fact, during the period of fast growth (1968/80) inequality increased considerably up to mid-1970s. Langoni (1973) has argued that this increase in inequality was one of the necessary costs of a process of fast growth with profound structural changes. However, from the mid-1970s to the beginning of the 1980s inequality began a moderate decline.

In this section we describe the evolution of the degree of inequality in Brazil in the 1980s, a period characterized by economic instability with little and unstable growth and an increasing inflationary process. As we have mention, one of the costs of economic fluctuations is an increase in wage inequality. Since inequality is expected to decline as the economy reaches a stable growth path, evidence of growing inequality can be considered as extra indication of economic instability and absence of economic adjustment.

The inequality, measured by the Gini coefficient for the economically active population with positive income (including all sources of income) is presented in Table 3.4. This table reveals that the degree of inequality has increased substantially in the 1980s particularly from 1986 to 1989. During the 1981/83 recession, inequality experienced a continuous but moderate increase. In 1984 the inequality level remained constant, to raise again in 1985. The Cruzado Plan in 1986 generated a modest decline in inequality. This reverse tendency, however, was ephemeral. With the failure of this economic plan and the acceleration of inflation, income inequality begun to increase again but now at a very fast pace. In 1989 the Gini coefficient reached 0.63, a historical record for Brazil. After 1989 it begin to decline very rapidly going back to 0.61 in 1990. The reasons for this sharp decline in inequality at the end of 1980s and beginning of the 1990s are still unknown.

In summary, the 1980s was a decade in which average labor earnings declined and income inequality increased. The result was an increasing level of poverty, with a disproportional fraction of the cost of the economic fluctuations been borne by the low income groups. Accordingly, in the next section we investigate how unemployment and wage cuts were distributed between social-economic groups over the 1980s.

IV. THE INCIDENCE OF THE COST OF ADJUSTMENT

In the previous section we demonstrated that, at least for the labor force as a whole, the main cost of the economic fluctuations in the 1980s was not related to high unemployment rates, but to losses in job quality (increasing informality) and reductions in real wages.

In this section we investigate whether the same is true when each social-economic group is considered in separate. In addition, we also investigate the extent to which the magnitude of the costs, in terms of both unemployment and wage losses, varied considerably between social-economic groups.

The section is divided into two subsections: The first subsection considers the incidence of unemployment. In particular, the subsection investigates whether the unemployment rate indeed remained low for all groups during the recessions at the beginning and end of the decade. The second subsection investigates the relative wage losses of each group during these two recessions. Overall, this section permits to identify which groups suffer the most from cyclical fluctuations in output.

IV.A. Unemployment

Table 4.1 presents the unemployment rate from 1981 to 1990 disaggregated by gender, region of residence, age group, and educational level. Table 4.3 compares these disaggregated unemployment rates for 1986, a year with very low levels of unemployment, with the corresponding rates at the two main recessionary years at the beginning (1983) and end (1990) of the decade. Table 4.2 presents the labor force participation rate also disaggregated by the same social-economic groups.

Gender: On the one hand, Table 4.1 reveals that in the 1980s the unemployment rate for men and women remained low. This table also reveals that, on average, men have a lower unemployment rate than women. On the other hand, Table 4.3 reveals that during recessions the rate of unemployment is slightly smaller for women than for men, with the opposite holding in recovery periods. In other words, the unemployment rate for men is more sensitive to economic fluctuations. A more sensitive unemployment rate for men either reveals that the costs of a recession are higher for men than for women or it simply indicates that women are more likely to dropout

Table 4.1

Unemployment rate

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Men	4,2	3,9	4,9	4,1	3,2	2,3	3,4	3,6	3,1	3,8
Women	4,4	4,1	4,8	4,6	3,8	2,7	4,0	4,3	3,0	3,5
Region:										
SO	2,9	2,7	3,9	3,4	2,7	1,7	2,7	3,4	2,4	3,0
SE	5,4	5,0	6,1	5,4	4,3	2,8	4,2	4,1	3,2	4,3
CW	3,4	2,9	3,3	3,0	2,4	2,1	2,9	3,1	2,5	3,0
NE	3,5	3,1	3,8	3,3	2,5	2,3	3,5	3,8	3,3	3,4
NO	3,6	4,3	4,4	3,9	3,1	2,8	3,0	4,5	3,1	3,7
Age:										
<25	7,5	6,9	8,1	7,6	6,0	4,4	6,4	6,8	5,3	6,4
25 to 34	3,6	3,5	4,6	3,9	3,1	2,2	3,3	3,6	3,0	3,8
35 to 44	2,1	1,8	2,6	1,9	1,6	1,1	1,8	1,9	1,6	2,1
45 to 54	1,7	1,3	2,0	1,5	1,2	0,7	1,3	1,4	1,0	1,4
55 and +	1,0	0,9	1,0	0,9	0,7	0,4	0,6	0,7	0,6	0,8
Education:										
0 years	2,0	1,9	2,3	1,7	1,2	1,0	1,5	1,7	1,5	1,6
1 to 4	4,0	3,6	4,2	3,6	2,8	2,0	3,1	3,3	2,6	3,2
5 to 8	7,1	6,6	8,0	7,2	5,8	3,9	5,6	6,2	4,8	5,8
9 to 11	5,8	5,4	7,1	6,4	5,1	3,5	4,9	5,2	3,8	4,7
12 and +	2,7	2,6	3,4	2,9	2,1	1,7	2,1	1,9	1,5	2,1

Source: PNADs.

Region: Tables 4.1 and 4.3 reveal that the Southeast region, the most industrialized region in Brazil, has the highest and the more sensitive unemployment rate among all regions. But, these tables also reveal that the regional disparities in unemployment rate are not very large. Even in the

of the labor force during recessions (the discouraged worker effect). Table 4.2, however, clearly indicates that the labor force participation of women is absolutely non-cyclical. Therefore, we can conclude that, at least as far as unemployment is concerned, economic fluctuations impose higher costs on men than on women.

Region: Table 4.1 and 4.3 reveal that the Southeast region, the most industrialized region in Brazil, has the highest and the more sensitive unemployment rate among all regions. But, these tables also reveal that the regional disparities in unemployment rate are not very large. Even in the Southeast the unemployment rate only surpasses 5.5% in 1983 when it reaches 6.1%. Table 4.2 reveals that the regional specific labor force participation rates are not cyclical, confirming that, in fact, cyclical unemployment is a greater problem in the Southeast than in the other regions.

Age Groups: Table 4.1 clearly reveals that unemployment in Brazil hits particularly the youngest segment of the labor force. In fact, Tables 4.1 and 4.3 reveal that the unemployment rate of workers 25 years old and older are considerably smaller and much less sensitive to economic fluctuations. In fact, Table 4.3 reveals that the unemployment rate of workers 24 years old and younger surpass 8% in 1983 and fluctuates considerably over the 1980s. The lower sensitivity of the unemployment rate of older workers could be an artifact of their cyclical labor force participation. But, as Table 4.2 reveals the labor force participation rate of this particular age group, as well as of all others, is not cyclical.

Educational level: Table 4.1 and Table 4.3 reveal that across educational levels, the unemployment rate follows an inverted U-shaped curve. The unemployment rate increases from illiterate workers to those having from 5 to 8 years of schooling, to decrease again towards workers with college education. As these tables indicate, during recession periods, these differences in unemployment rate between educational groups tend to increase substantially. For instance, in 1983 the unemployment rate for workers with 5 to 11 years of education was between 7 and 8% while, at the same year, the unemployment rates for all other groups were below 4.5%. In summary, there is evidence that workers with 5 to 11 years of education have unemployment rates which are both higher and more sensitive to cyclical fluctuations.

Table 4.2

Labor force participation rate (percent)										
	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Men	0,75	0,76	0,75	0,75	0,76	0,76	0,77	0,76	0,76	0,75
Women	0,33	0,35	0,36	0,36	0,37	0,37	0,39	0,39	0,39	0,39
Region:										
SO	0,59	0,59	0,59	0,59	0,60	0,59	0,62	0,61	0,61	0,62
SE	0,54	0,55	0,55	0,55	0,56	0,57	0,57	0,57	0,57	0,57
CW	0,53	0,55	0,54	0,54	0,55	0,55	0,57	0,58	0,58	0,58
NE	0,51	0,53	0,53	0,53	0,54	0,53	0,54	0,55	0,54	0,55
NO	0,47	0,50	0,48	0,50	0,51	0,51	0,53	0,53	0,54	0,53
Age:										
10 to 14	0,19	0,21	0,18	0,18	0,19	0,19	0,19	0,18	0,19	0,17
15 to 19	0,54	0,56	0,55	0,55	0,57	0,57	0,58	0,57	0,57	0,57
20 to 24	0,69	0,69	0,70	0,70	0,71	0,72	0,73	0,72	0,72	0,72
25 to 29	0,69	0,70	0,71	0,71	0,72	0,72	0,72	0,73	0,73	0,73
30 to 39	0,69	0,71	0,72	0,72	0,73	0,73	0,74	0,74	0,75	0,75
40 to 49	0,66	0,67	0,68	0,68	0,68	0,69	0,71	0,71	0,71	0,71
50 to 59	0,55	0,56	0,55	0,54	0,55	0,55	0,57	0,57	0,57	0,58
60 and +	0,27	0,28	0,27	0,26	0,27	0,26	0,28	0,28	0,27	0,27
Education:										
0 years	0,48	0,51	0,50	0,50	0,51	0,49	0,50	0,50	0,50	0,50
1 to 2	0,45	0,46	0,47	0,46	0,47	0,46	0,47	0,47	0,47	0,46
3 to 4	0,54	0,54	0,54	0,54	0,54	0,53	0,55	0,54	0,53	0,53
5 to 8	0,54	0,56	0,55	0,55	0,56	0,58	0,59	0,58	0,58	0,58
9 and +	0,71	0,73	0,73	0,73	0,74	0,75	0,75	0,76	0,75	0,75

Source: Barros and Ramos (1991), PNADs. All individuals 15 or more years old.

Table 4.3

Unemployment rate

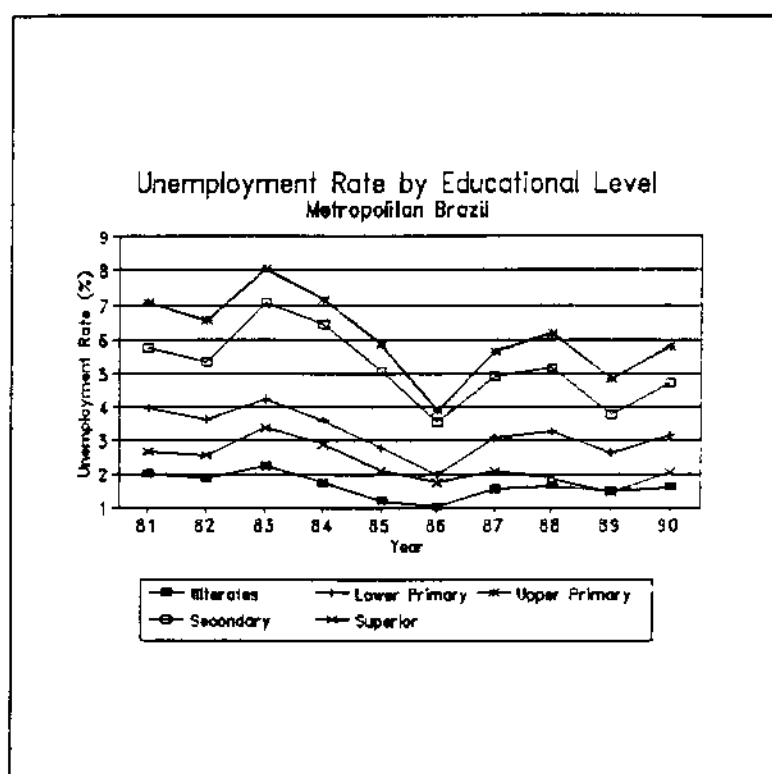
(percent)

	1983	1986	1990	$((1)+(3))/2-(2)$
	(1)	(2)	(3)	
Men	4,9	2,3	3,8	2,10
Women	4,8	2,7	3,5	1,38
Region:				
SO	3,9	1,7	3,0	1,72
SE	6,1	2,8	4,3	2,41
NE	3,8	2,3	3,4	1,27
Age:				
<25	8,14	4,37	6,43	2,91
25 to 54	3,42	1,52	2,68	1,53
55 and +	1,02	0,39	0,84	0,53
Education:				
0 years	2,26	1,00	1,62	0,93
1 to 4	4,23	1,99	3,15	1,70
5 to 8	8,04	3,88	5,81	3,04
9 to 11	7,05	3,55	4,73	2,34
12 and +	3,39	1,74	2,05	0,98

Source: PNADs

The finding that workers with lower levels of education are not the ones with higher and more sensitive unemployment rates is so central to this study that we decided to search for further evidence. The estimates in Table 4.1 have two problems: (a) They are based on annual household surveys collected on September of each year. Therefore, they represent only the unemployment around this month and not the average for the entire year. (b) Since less educated workers tend also to be older and to live outside the Southeast, they in part have lower unemployment rates simply because unemployment rates are smaller among older workers and outside the Southeast. To handle these two problems, we use a monthly employment survey (PME) to estimate the unemployment rate by educational level controlling for regional of residence, gender and age. Monthly estimates of the unemployment rate in metropolitan Brazil after gender, region of residence and age have been controlled for are presented in Figure 1.

Figure 1 Unemployment rate by educational level
Metropolitan Brazil



Source: Pesquisa Mensal de Emprego (PME).

Figure 1 reveals that once controls for region, gender and age are introduced and the universe is limited to metropolitan Brazil, the unemployment rate of workers with less than 4 years of schooling (illiterates and lower primary) became higher and more sensitive to economic fluctuations than what is revealed by Table 4.3. As a matter of fact, Figure 1 reveals that in the 1981/83 recession the unemployment rate of the less educated workers was higher than for all other educational groups. In summary, Figure 1 confirms that the unemployment rate of workers with college education is lower and less sensitive to economic fluctuations than the unemployment rate of moderated educated (5-11 years of schooling) workers. Nonetheless, the previous finding that the unemployment rate of workers with up to 4 years of schooling has the same properties has not been confirmed. It is true, however, that the unemployment rate of illiterates is from 1986 to 1991 the second lowest, being only larger than the unemployment rate for workers with college education.

In summary, Tables 4.1 and 4.3 revealed that the incidence of unemployment was not evenly distributed across social-economic groups in the 1980s. The unemployment rate was considerably higher and more sensitive to economic conditions for younger workers (24 years old and less) moderate educated worker (5 to 11 years of schooling) and workers living in the Southeast region. As a result, in the 1980s unemployment did not fall disproportionately on women, nor on the least educated, nor on the older, nor on workers in the less developed Northeast. Hence, during the two recessions in the 1980s, unemployment did not hit mostly the poorest groups of the society.

IV.B. Wage Structure

Tabela 4.4 presents the evolution of the wage structure of the Brazilian labor force over the 1980s. Table 4.5 presents this same structure for selected points in the decade. All figures in these tables are wage differentials measured as a percentage of the average wage of the group with the highest average wage. A comparison of the wage structure in recessionary years (1983 and 1990) with the structure in 1986, a year with a very tight labor market, permits to identify which groups suffered the most with the recessions. To identify the cyclical movements and to remove the trend component, the last column of Table 4.5 contrasts the wage structure for 1986 with the average for 1990 and 1983.

Gender: The evidence on the cyclical behavior of the male-female wage differential from Tables 4.4 and 4.5 is mixed. On the one hand, in the 1981/83 recession the gender gap increased with women suffering greater wage losses than men. On the other hand, during the 1990/92 recession the gender gap declined with men suffering greater wage losses than women.

Region: Tables 4.4 and 4.5 reveal that wages in the Southeast, the most industrialized region in the country, are slightly less sensitive to economic fluctuations than wages in the South and Northeast regions.⁴ Moreover, given that the amplitude of the economic fluctuations tends to be much larger in the Southeast than in the Northeast and South regions, the evidence in Table 4.5 indicates that holding the amplitude of the economic fluctuation constant the wage fluctuations in the Northeast and the South regions could be considerably greater than in the Southeast. The greater wage sensitivity of wages in the South and Northeast regions may be indicating that labor markets

⁴The Northeast is the poorest region in the country.

in these regions behave more competitively than in the Southeast.

Age Group: Table 4.5 reveals that the wage of young workers tends to be slightly more sensitive to economic fluctuations than the wage of prime-age workers, whereas the wage of old workers tend to be considerably more sensitive.

Educational Level: Tables 4.4 and 4.5 also reveal that the wages of the least educated (i.e., illiterates and workers with up to four years of schooling) are more sensitive to economic fluctuations than the wages of better educated workers.

In summary, Tables 4.4 and 4.5 presents evidence that workers with lower wages more sensitive to economic fluctuations. In fact, the wage sensitivity of the younger, the older and the less educated workers is distinctively greater than that for the overall labor force.

Table 4.4

Wage differentials over 1980s

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Women/Men	0,46	0,46	0,48	0,46	0,47	0,46	0,44	0,44	0,44	0,40
Region:										
SO/SE	0,16	0,15	0,13	0,05	0,05	0,12	0,13	0,20	0,14	0,13
CV/SE	0,16	0,15	0,12	0,05	0,05	-0,06	0,04	0,10	0,04	0,03
NE/SE	0,51	0,51	0,51	0,48	0,49	0,50	0,49	0,52	0,52	0,51
NO/SE	0,15	0,10	0,06	0,01	0,00	0,06	0,08	0,18	0,05	-0,0
Age:										
<25/35 to 44	0,62	0,63	0,66	0,66	0,67	0,66	0,65	0,68	0,67	0,67
25 to 34/35 to 44	0,10	0,13	0,16	0,18	0,18	0,20	0,18	0,21	0,21	0,22
45 to 54/35 to 44	0,01	0,04	0,05	0,07	0,08	0,08	0,10	0,10	0,01	0,07
55 and +/35 to 44	0,23	0,27	0,22	0,29	0,26	0,22	0,24	0,36	0,22	0,25
Education:										
0 years/12 and +	0,88	0,89	0,89	0,88	0,89	0,88	0,89	0,90	0,90	0,90
1 to 4/12 and +	0,80	0,81	0,80	0,80	0,80	0,79	0,81	0,82	0,81	0,81
5 to 8/12 and +	0,73	0,74	0,74	0,74	0,74	0,75	0,75	0,77	0,77	0,76
9 to 11/12 and +	0,58	0,58	0,58	0,58	0,59	0,61	0,59	0,61	0,60	0,60

Source: PNADs.

Table 4.5

Wage differentials over 1980s

	1983	1986	1990	$((1)+(3))/2-(2)$
	(1)	(2)	(3)	
Women/Men	0,48	0,46	0,40	0,98
Region				
SO/SE	0,13	0,12	0,13	1,01
NE/SE	0,51	0,50	0,51	1,02
Age				
<25/25 to 54	0,63	0,62	0,63	1,01
55 and +/25 to 54	0,15	0,12	0,16	1,03
Education				
0 years/12 and +	0,89	0,88	0,90	1,01
1 to 4/12 and +	0,80	0,79	0,81	1,01
5 to 8/12 and +	0,74	0,75	0,76	1,00
9 to 11/12 and +	0,58	0,61	0,60	0,98

Source: PNADs.

V. THE BRAZILIAN EDUCATIONAL SYSTEM

V.A. The Structure of the Educational System: Formal Education

As in most other countries, the Brazilian formal educational system is composed of three levels: Primary, Secondary and Post-Secondary levels.

The primary level known as "Primeiro Grau" is since the 1972 Educational Reform composed of 8 grades. Before 1972 primary education in Brazil was divided into two parts: lower primary or elementary known as Primário composed of the first 4 grades, and a upper primary known as Ginásio composed of the subsequent four grades.

The Brazilian Constitution establishes that the government is required to provide free primary education to all children and that parents must keep children in school from age 7 when they are supposed to begin the first grade until they have completed 15 years of age. Without repetition children are expected to complete primary education in the year of their 14th anniversary.

The secondary level is composed of three grades, each requiring a year of schooling. The post-secondary or

Superior education has a duration which varies from 2 to 6 years depending on the nature of the course. Medical Schools requires 6 years, Engineering or Law Schools can be completed in 5 years, while a B.A. degree in Economics or Mathematics requires only four years in college.

In addition to the formal system two types of supplementary education are or were available. First, there are two educational programs known as Supletivo Primeiro Grau and Supletivo Segundo Grau. These programs provide primary and secondary education to youths and adults. The programs offer courses which are compressed in much shorter periods of time than their formal counterparts. Their objective is to facilitate young adults to catch up. These programs are restricted to persons which are 15 and 18 years old, respectively.

Secondly, given the considerable prevalence of illiteracy among adults in Brazil (currently more than 20% of the adult population is illiterate), a series of programs have been in operation since 1960 aiming to eradicate adult illiteracy. Some examples are the MEB - Movimento de Educação de Base (1961), FEPLAM - Fundação Nacional Padre Landell de Moura (1967), FPA - Fundação Padre Anchieta (1967) and IRDEB - Instituto de Radiodifusão Educativa da Bahia (1969). In 1967 the Ministry of Education launched a much more ambitious program aimed to reach all regions in the country. The program was named - MOBREAL - Movimento Brasileiro de Alfabetização and despite all efforts had insignificant results. In 1980 only 4% of the illiteracy population with 15 years and more were reached [see Borba (1976)].

The responsibility for the provision of public education in Brazil is shared by all three levels of government: Federal, State and Municipal government. The main responsibility of the Federal Government is to provide post-secondary education. Public secondary education is the major responsibility of States. Public primary education is mainly a responsibility of local governments, with States having the obligation of supplementing when municipalities do not have sufficient resources or capabilities.

V.A.1. Public expenditure on education

Table 5.1 compares Brazil with other Latin American countries based on their expenditures on education as a percentage of GNP. The results indicate that Brazil is similar to Chile, Mexico and Venezuela i.e., expenditures on education in Brazil are not lower than those of Latin American countries with similar levels of per capita income.

Table 5.1

Public expenditures on education
(Federal, State and Municipal)

Country	GNP per capita (US\$)	Public expenditures on education
Argentina	2,160	3,10
Brazil	2,540	3,70
Chile	1,770	3,60
Costa Rica	1,780	4,40
Mexico	2,010	3,80
Uruguay	2,620	3,10
Venezuela	2,450	4,20

Source: United Nations (1990).

Table 5.2 presents the evolution of the Brazilian public expenditures on education as a percentage of GDP over the last 30 years. This table reveals that public expenditures on education increased from less than 2% in 1960 to more than 4% in 1988.

Most problems with the provision of public education in Brazil are located at the primary level. So, it is important to investigate the provision of public primary education in separate. Since expenditures on education may be poorly distributed between educational levels, aggregated estimates of government expenditure on education may be a misleading indicator of actual public expenditure on primary education. Hence, it becomes essential to breakdown total expenditure by educational level and/or level of government. Table 5.3 presents the distribution of public expenditures on education in Brazil in 1988 by level of education and by level of government. The distribution by level of education indicates that primary education represents 50% of the total expenditure with 10% and 40% going to post-secondary and secondary education, respectively. Table 5.4 presents the distribution of enrollments in public schools by level of education and government. This table reveal that 88% of all students are enrolled at the primary level with 8.3% and 3.5% at the secondary and post-secondary levels, respectively. The result of this distribution of expenditures in education is a huge concentration of expenditures at the post-secondary level with the cost per student at

Table 5.2

Temporal evolution of public expenditures on education
(percent)

Year	Total expenditure/GDP
1960	1,62
1961	1,69
1962	1,87
1963	1,73
1964	1,50
1965	2,30
1966	2,42
1967	2,43
1968	2,57
1969	2,78
1970	2,62
1971	2,64
1972	2,92
1973	2,81
1974	2,72
1975	2,74
1976	2,83
1977	2,83
1978	3,02
1979	2,85
1980	2,55
1981	3,10
1982	3,10
1986	4,40
1987	4,60
1988	4,40

Source: 1960-69-Mello e Souza (1979:table II.12)
1970-80-Mello e Souza (1981:table 2).
1981-82-Ministerio da Fazenda.
1986-88-Marques (1991:table 3.2 and 6.0).

Table 5.3

Distribution of public expenditure on education
according to educational and government level - 1988

(percent)

	Primary	Secondary	Post-secondary	Total
Federal	0,09	0,04	0,31	0,43
State	0,32	0,05	0,08	0,44
Municipal	0,12	0,00	0,00	0,12
Total	0,52	0,09	0,39	1,00

Source: Marques (1991:tables 2.1, 4.1 and 5.1).

Table 5.4

Distribution of enrolments according to educational
and government level - 1988

	Primary	Secondary	Post-Secondary	Total
Federal	0,00	0,00	0,02	0,03
State	0,57	0,07	0,01	0,66
Municipal	0,31	0,01	0,00	0,32
Total	0,88	0,08	0,03	1,00

Source: IBGE (1990, chapter 15).

the post-secondary level being approximately 20 times the cost per student at the primary level.

The distribution of educational expenditures according to the level of government reveals that public expenditures by local governments represent less than 15% of the total public spending in education. Since almost 90% of enrollments and 50% of public expenditures are at the primary level, we conclude that local governments are not capable of fulfilling their attribution as main providers of universal public primary education. As a matter of fact, 2/3 of all supply of public primary education is provide by State public schools.

In summary, the Brazilian overall level of expenditure as a percentage of GDP is in line with that of other Latin American countries, but the distribution of these expenditures by educational level is probably at odds with the constitutional priority given to universal access to public primary education. Local governments clearly do not have enough resources to provide universal public primary education. If public primary education of minimal quality is to become universal extra public resources will be needed. These extra resources may come from reductions in public expenditures on post-secondary education or by increasing the overall public expenditure on education.

V.A.2. Regional disparities

As important as the level of public spending in public education is the regional distribution of these expenditures. Table 5.5 presents two indices of per capita expenditure on education: expenditures per pupil in state and municipal primary schools. This table reveals extremely large levels of regional inequality: the cost per pupil in the State of Rio de Janeiro is close to 10 times greater than the level in the State of Piauí. Similar results were found by Souza (1979) who also encountered evidence that regional disparities in expenditures in education were decreasing over time.

Table 5.5 also presents an indicator of the state per capita income - the average income of the economically active population. This indicator permits us to test whether the level of per capita public spending on education is correlated with the level of per capita income across states. A simple correlation analysis indicates a correlation coefficient of more than 0.8 between per capita expenditure and per capita income.⁵

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⁵Similar results were also found by Souza (1979).

Table 5.5

Regional disparities in public expenditures on education
by level of government

State	Cost per pupil (1)		GDP per capita	Per Capita
	(US\$ 1988)	(US\$ 1988)	(US\$ 1988)	transfers (2)
State	State	Municipal	(2)	(%)
Brazil	146,3	52,2	2241	na
North	62,6	34,5	1401	na
Acre	48,6	49,2	na	1,05
Amazonas	81,3	44,1	2035	0,27
Amapa	98,3	31,7	na	1,64
Roraima	143,7	na	na	2,40
Rondonia	207,8	na	na	0,34
Para	53,1	27,4	1199	0,16
Northeast	67,3	28,6	918	na
Maranhao	33,2	22,6	564	0,15
Piaui	32,6	22,4	472	0,19
Ceara	67,2	21,6	778	0,13
R.G.do Norte	97,7	42,0	585	0,20
Paraiba	74,3	36,4	628	0,17
Pernambuco	76,5	36,9	1102	0,12
Alagoas	66,9	21,2	895	0,18
Sergipe	56,7	32,0	943	0,30
Bahia	62,0	27,5	1226	0,11
Southeast	194,1	209,8	3271	na
Minas Gerais	na	na	1850	0,08
Espirito Santo	89,1	106,6	1914	0,10
Rio de Janeiro	306,1	266,1	3352	0,04
Sao Paulo	202,7	138,0	3993	0,03
South	142,8	109,0	2382	na
Parana	106,7	62,7	2037	0,05
Santa Catarina	106,1	139,4	2344	0,06
R.G.do Sul	227,2	138,3	2738	0,05
Center-west	83,7	39,7	1949	na
Mato Grosso	91,4	39,4	1788	0,18
Mato G. do Sul	74,7	44,5	na	0,11
Gofas	84,0	37,5	1277	0,09
Distrito Federal	308,2	na	4498	0,05

Source: (1) Ministerio da Educacao (1990:76,77,80,81).
 (2) Albuquerque and Villela (1991:table 1).
 (3) Ministerio da Fazenda.

This high correlation reveals that regional disparities in per capita expenditures on education in Brazil, in addition to being very large, are also strongly correlated with the level of per capita income of each state.

These table also permits a comparison between state and municipal primary schools. The table reveals that state public schools spend almost three times as much per student than municipal public schools. Since a larger proportion of children are in municipal schools in the Northeast than in the Southeast, a comparison of the cost per pupil in state or municipal school between these two regions tends to underestimate the magnitude of the disparity between the two regions.

Another important question is the extent to which the central government is reinforcing or reducing regional disparities in public expenditures in education through its transfers of resources to states and municipalities. Since a substantial portion of states and municipalities revenues are from transfers from the central government, such transfers could be used by the central government to reduce regional disparities. If the central government were engaged in such a redistributive policy, per capita transfers from the central government, would be negatively correlated with state per capita income. Table 5.5, however, presents estimates of these per capita transfers and shows that they are actually positively instead of negatively correlated with state per capita income. Souza (1979) reached a similar conclusion. He, however, observed that if the analysis were limited to transfers which are required to be used in education then the correlation between per capita transfers and per capita income across states would vanish.

V.A.3. Educational attainment

To evaluate the Brazilian performance in education we perform two comparisons. First, we compare the levels of several educational outcomes for Brazil with the average level of these outcomes for the seven Latin America countries with the highest per capita income.⁶ Secondly, we estimate, among all Latin American countries, a series of relationships between educational outcomes and per capita GDP. Based on each of these estimated relationships we compare the actual value of each educational outcome for Brazil with the value predicted by each of these relationships given

⁶These countries are: Argentina, Chile, Colombia, Costa Rica, Mexico, Uruguay and Venezuela.

the Brazilian level of GDP per capita. These estimates are presented in Table 5.6 and Figures 5.1 to 5.5.

V.A.3.a. Adult population

Illiteracy rate: as Table 5.6 and Figure 5.1 reveal, the illiteracy rate for the population 15 or more years old in Brazil was close to 20% in 1990. This level is close to 10 percentage points above the level for the other high-income Latin American countries and the level which would be predicted for Brazil by the Latin American regression line. Therefore, these results clearly indicate a much weaker performance for Brazil as compared to similar Latin American countries. In fact, the illiteracy rate is higher for Brazil than for all other high-income and middle-income Latin American countries, except Guatemala.⁷

Table 5.6

Educational outcomes for Brazil and comparison groups

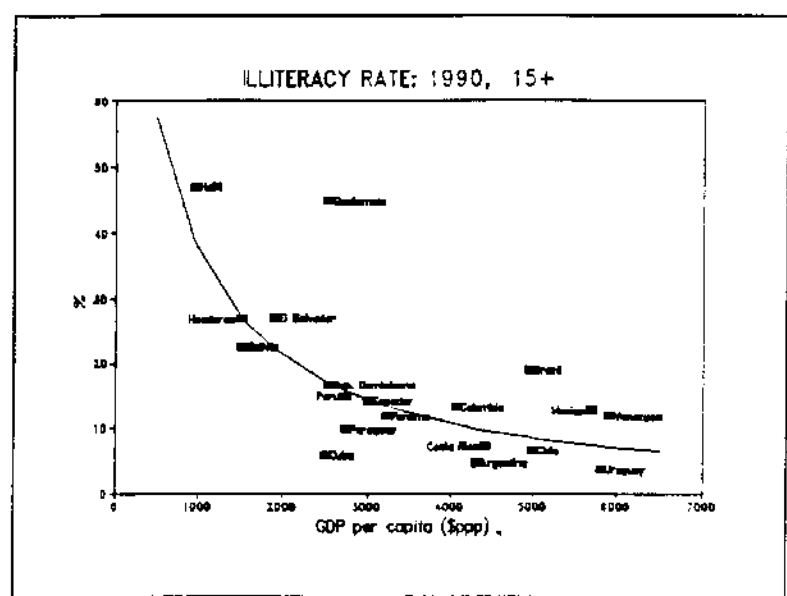
Outcome	Brazil	Latin American Countries	by Regression
Adult Population			
Illiteracy Rate (15+)	18,90	8,60	8,60
Years of Schooling	3,90	6,80	6,60
Population in School Age			
pct. in school (6-11)	74,30	88,70	91,40
pct. repeaters in:			
Primary level	20,00	6,1	11,70
First Grade	29,00	18,20	19,50

Source: United Nations (1992), Statistical Yearbook (1991), Lockheed (1991).

⁷The middle-income countries are those with GDP per capita between US\$ 2.500 and 3.500 and include, besides Guatemala: Cuba, The Dominican Republic, Ecuador, Panama and Peru.

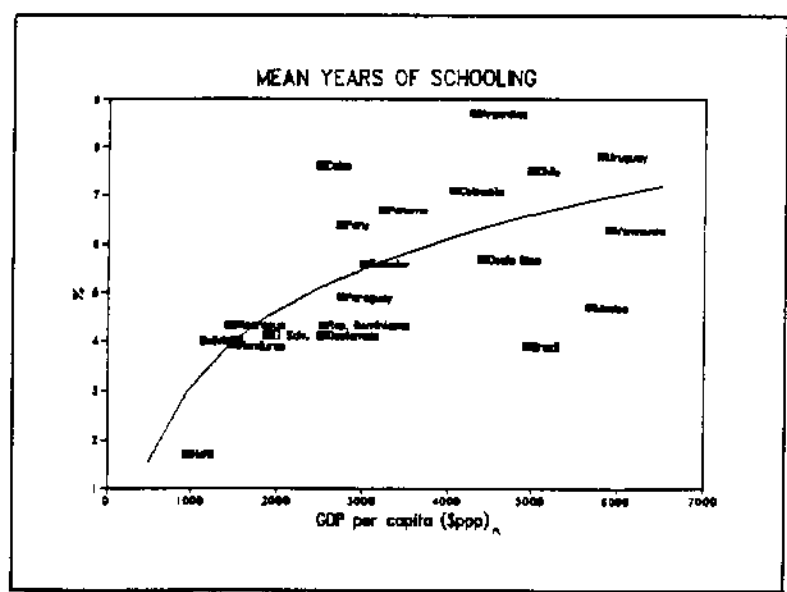
Figure 5.1 and 5.2

Illiteracy rate: 1990, 15+



Source: Table 5.20 (appendix).

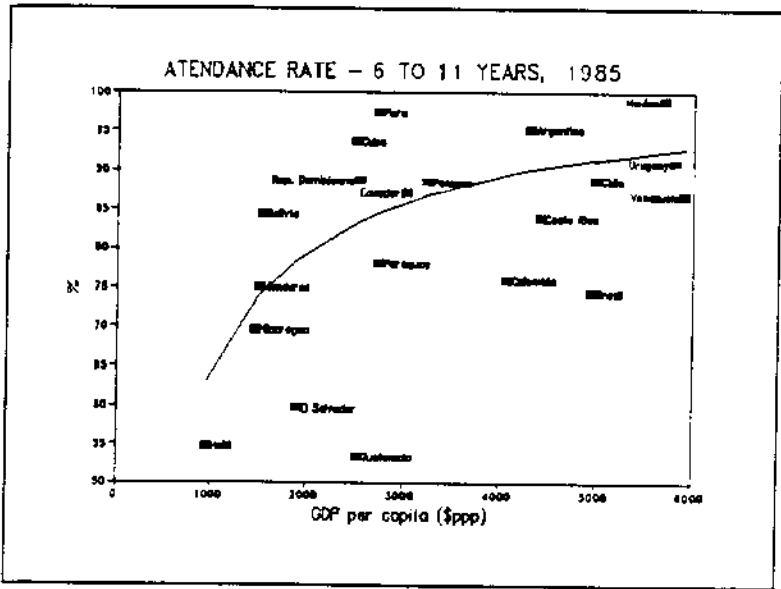
Mean years of schooling



Source: Table 5.20 (appendix).

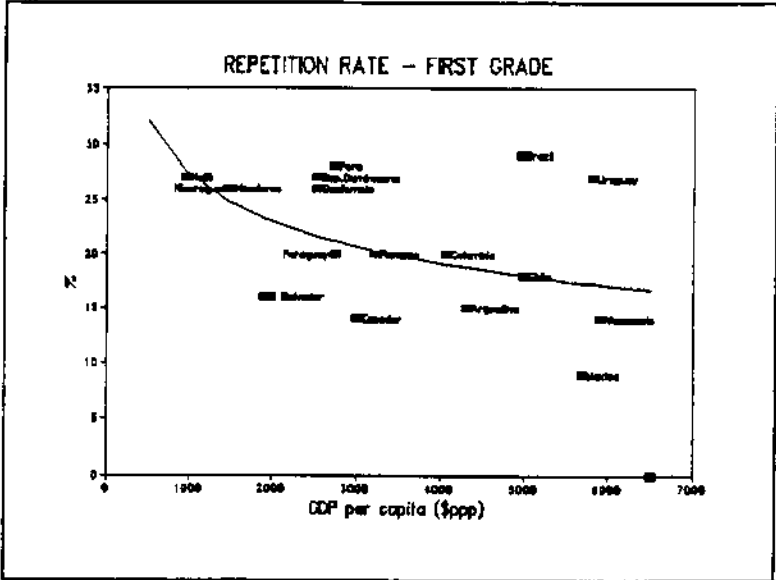
Figure 5.3 and 5.4

Attendance rate - 6 to 11 years, 1985



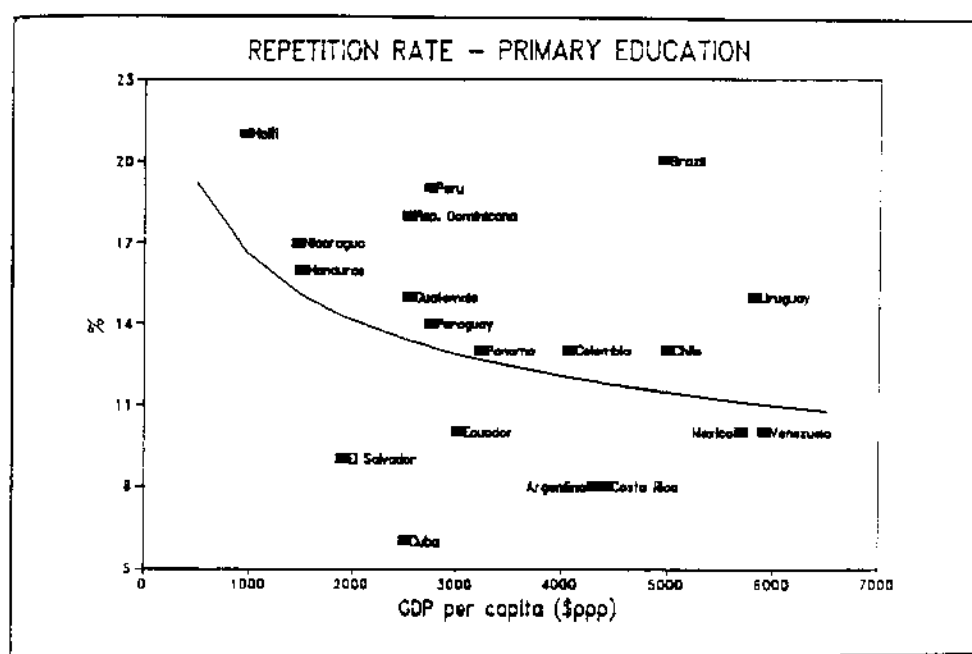
Source: Table 5.20 (appendix).

Repetition rate - first grade



Source: Table 5.20 (appendix).

Figure 5.5



Source: Table 5.20 (appendix)

Years of schooling: The average number of completed years of schooling for the population 25 or more years old in Brazil is close to four (see Figure 5.2). This level is approximately 3 schooling years below the average level for the group of high-income Latin American countries and the level predicted by the regression line for Brazil. In fact, the average number of completed schooling years for Brazil is below the level for all other high-income and middle-income Latin American countries.

These two results strongly corroborate the hypothesis that historically Brazil has clearly under-invest in education. To investigate to each extent this under-investment continues to the present, we turn to indicators of education for the school-age population.

V.A.3.b. School-age population

To evaluate the current level of investment in education we need to consider educational outcomes for the school-age population. In Table 5.6 and Figures 5.3 to 5.5 we present comparative estimates for attendance and repetition rates.

Attendance rates: Less than 75% of the Brazilian population aged 6 to 11 years is currently in school. This attendance rate is almost 15 percentage points

below the average level for the other seven high-income Latin American countries. The attendance rate for Brazil is also 17 percentage points below the level predicted for Brazil by the Latin American regression line. Moreover, as Figure 5.3 reveals, the attendance rate for Brazil is lower than for all other high and middle-income countries in Latin America except Guatemala. These results strongly indicate that Brazil is currently under-investing in education considerably.

Repetition rates: Indicators of attendance can be misleading indicators of actual investments in education when repetition rates are high. In the presence of non-trivial rates of repetition, attendance rates indicate only attempts to invest (rather than final realized levels of investment). In particular, Brazil could be compensating its lower attendance rates with a concomitant lower rate of repetition. To clarify this question we present in Table 5.6 and Figures 5.4 and 5.5 a comparison among Latin America of estimates for the percentage of students who are repeaters, for the first grade and for all grades of the primary level.

Table 5.6 reveals that close to 30% of students in the first grade in Brazil are repeaters. This rate is 10 percentage points above the average level for the other seven high income Latin America countries which is similar to the level predicted for Brazil by the corresponding regression line. Actually, the percentage of repeaters among students in the first grade is higher in Brazil than in any other Latin American countries. This fact indicates that attendance rates for Brazil strongly over-estimate the level of investment in education being actually realized. Hence, since we have found that Brazil has simultaneously lower attendance rates and a higher percentage of repeaters, we have strong evidence that Brazil is currently under-investing in education considerably.

The results for all grades of the primary level are similar. The proportion of repeaters among students in all grades of the primary level in Brazil is 20%. This proportion is 4 percentage points above the rate for the other seven high-income Latin American countries and more than 8 percentage points above the level predicted by the regression line for Brazil. In fact, Brazil has a percentage of repeaters for all grades of the primary level close to the level for Haiti and above the level for all other Latin American countries.

In summary, all educational indicators we have considered for the adult and for the school-age population have clearly identify a considerable under-

investment in education in Brazil relative to other Latin American countries with similar levels of per capita income. In addition, this weak performance in formal education has serious consequences upon the capacity of the current and future labor force of acquiring technical training. For instance, while important training institutions, like SENAI, requires an entrance requirement of 4 years of schooling, the mean years of schooling for the Brazilian population is 3.9 years. Moreover, since, in 1990, 36% of the Brazilian labor force age 25 years and older had less than 4 years of schooling, we reach the conclusion that more than 1/3 of the Brazilian labor force never had the opportunity to acquire technical training in any major public training institution.

Finally, the educational gap between Brazil and other Latin American countries with similar per capita income seems to be greater for the school-age population than for the adult population. This result indicates that the gap in investment in education between Brazil and other Latin American countries may be larger today than in the past. As a consequence, Brazil may be diverging from Latin American standards instead of converging to them. Moreover, since the demand for educated workers is likely to increase rapidly as technology advance, the shortage of educated workers in Brazil may become even more severe in the future than it is today.

V.A.3.c. The quality of educational services

As we have shown in the preceding sections, Brazil has a very weak performance in education. One of the reasons pointed to explain this weak performance is the low quality of educational services publicly provided. But, as important as the level of quality is its variability. Identifying where this variability is concentrated is essential for formulating any policy concerned with the distribution and allocation of public expenditures on education.

This section is based on the 1982 PNAD (Pesquisa Nacional por Amostra de Domicílios) which has a supplement about education with some questions about the nature of school services. We use as a measure of quality of public schools the time spent in school. We consider the lower and upper primary levels separately.

As Table 5.7 indicates, Brazilian students in public primary schools spend on average less than 4 hours per day in school. This estimated time in school is only slightly greater for students in urban areas than for students in rural areas. Analyzing the average time in school in urban and rural areas by state we can observe

that except in the Northeast it seems to make no difference whether the student is in an urban or a rural area (see Figures 5.6a-d).

Table 5.7

Time in school

Area	lower primary	Upper primary
Urban	3,89	3,96
Rural	3,70	3,87

Source: PNAD-82 - Authors' own tabulations.
Note: North region is excluded.

To locate the variability of the time spent in school, we decompose its total variance into four components: (1) the variability between urban and rural areas; (2) the variability between states; (3) the variability between neighborhoods within states and, (4) the variability within neighborhoods.^{8,9}

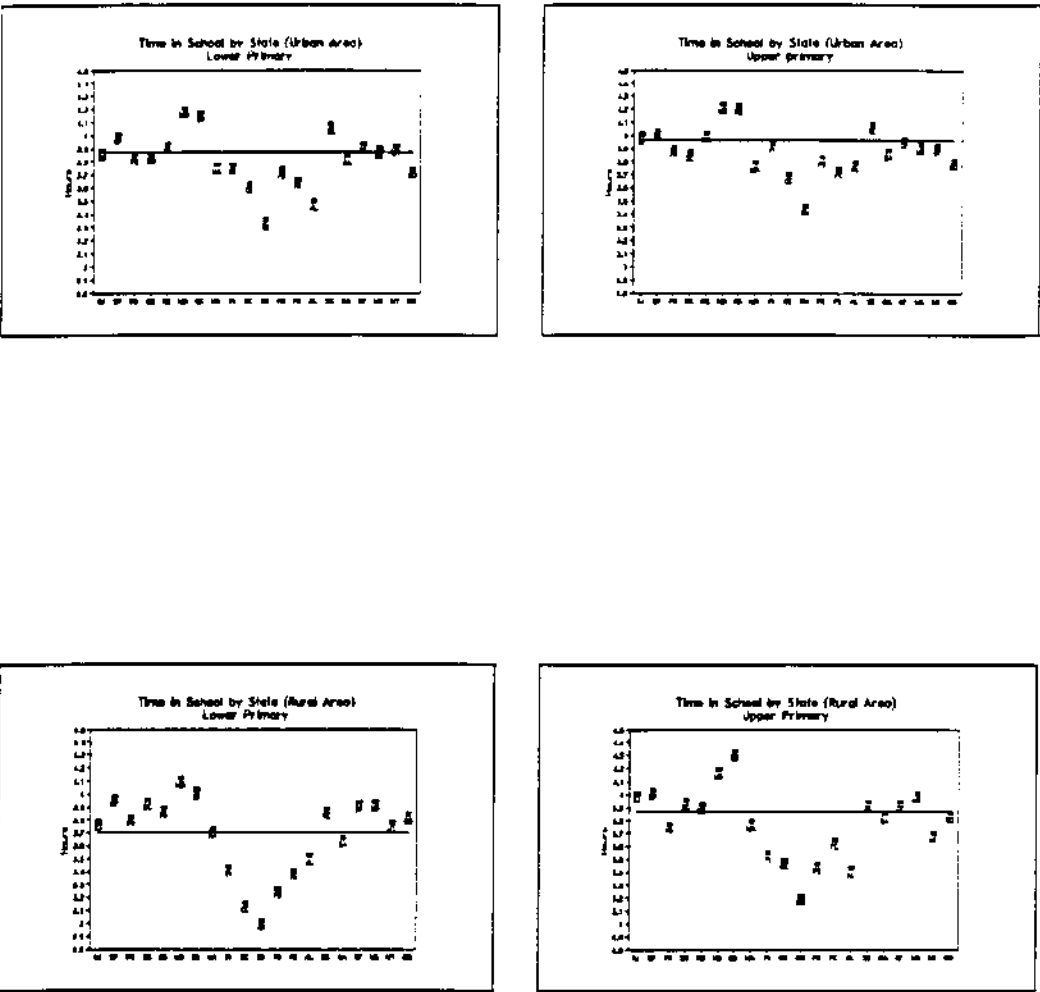
The decomposition of the variance of time in school (see Table 5.8) shows that for both levels of education - lower and upper primary - most of the variance is within neighborhoods. So, despite all inequality between states and between neighborhoods inside a given state, the inequality within neighborhoods represents the larger fraction of the total inequality. This fact indicates that policies aimed to reduce the inequality between states or municipalities in resources available for education is not like to be sufficient to eliminate most of the inequality in educational opportunities in Brazil.

⁸Empirical neighborhoods are defined by census tracks.

⁹Formally, let T , S and N denote respectively time spent in school, state, and neighborhood. Moreover, let A denote a indicator for urban areas. Then,
$$\text{Var}[T] = \text{Var}[E[T|A]] + E[\text{Var}[T|S|A]] + E[\text{Var}[T|N|S]] + E[\text{Var}[T|N]]$$

The first term, $\text{Var}[E[T|A]]$, measures the variability of the average time spent inschool between urban and rural areas. The second term, $E[\text{Var}[T|S|A]]$, measures the variability between states. The third term, $E[\text{Var}[T|N|S]]$, measures the variability between neighborhoods within states. Finally, the fourth term, $E[\text{Var}[T|N]]$, measures the variability within neighborhoods.

Figures 5.6a-d



Source: PNAD-1982.

RN:Rio Grande do Sul	MA:Maranhão	RJ:Rio de Janeiro
PB:Paraíba	PI:Piauí	SP:São Paulo
PE:Pernambuco	CE:Ceará	PR:Paraná
AL:Alagoas	BA:Bahia	SC:Santa Catarina
SE:Sergipe	DF:Distrito Federal	RS:Rio Grande do Sul
MG:Minas Gerais	MS:Mato Grosso do Sul	
ES:Espírito Santo	MT:Mato Grosso	

Table 5.8

Decomposition of the variance of time in school

Decomposition	Lower	Upper
Terms	Primary	Primary
Var (Q)	0,30	0,25
(1) Between	0,01	0,00
(2) Between States	0,05	0,03
(3) Within States	0,08	0,06
(4) Within Tracks	0,17	0,16
(1)/Var(Q)	0,03	0,00
(2)/Var(Q)	0,15	0,10
(3)/Var(Q)	0,26	0,24
(4)/Var(Q)	0,57	0,65

Source: PNAD-82 - Authors' own tabulations.
 Note: the North region is excluded.

V.B. Vocational Education in Brazil

Training is certainly an important element in providing flexibility to the labor force besides increasing its productivity. In this particular sense, flexibility has in fact two dimensions. One associated with the workers' ability to learn and adapt to a changing environment, and another associated with the mastering of specific skills. A competent training system must tackle both dimensions.

Training takes place both at a supra-firm level as well as within the firm. Training institutions are supposed to provide both general education and vocational training which, in principle, are meant to fit the demands of a broad set of firms. In a sense, general and formative vocational education is a good which, in principle, firms do not have the incentives to provide or finance. On-the-job training, within the firms themselves, is a vital complement to the effort of the training institutions and can be seen as a private good which firms have a greater interest in providing and financing.

This section takes as starting points the following principles and notions derived from the experience of other countries and deductive reasoning:

(a) The success and costs of vocational training are importantly affected by the quality of basic education. The "educated" worker or trainee has greater facility to learn and to communicate. Dougherty [in Tuijnman (1992, p. 559)] notes that "the better the quality of basic education... the more trainable is the employee, and hence the more quickly he or she can be taught specific skill, or the better will be the transfer of the training. In either case, the greater will be the cost-effectiveness of continuing education and training for the employer and accordingly the greater will be the incentive to provide it."

(b) Within the sphere of vocational education, there exists a difference between the goals to be attained with long and formative courses and short and specific training courses. Specific courses are usually firm-specific, and for this reason more efficient in the case of employed workers whose tasks demand specific abilities. Like basic education, formative courses provide the worker with general abilities thus enhancing his/her capacity to learn and communicate.

(c) Formative courses are like public services which benefits all firms whereas specific training is more like a private good benefiting specific firms. As a result, given that firms do not have the incentives to reveal their preferences concerning the provision of formative courses, these should be provided by public agencies. Specific training, on the other hand, should be the responsibility of firms.

(d) Unemployed workers tend to have their human capital depreciated and usually have difficulties in self-financing the up-grading of their qualification. On the other hand, employed workers are usually trained by the firms for which they work for. Hence, it makes sense to provide unemployed workers with training to compensate for the natural decay of their abilities. However, especially when the uncertainties concerning the tendencies of the structure of employment are great, it is unwise to provide specific training courses to the unemployed. On the contrary, they should be exposed to materials which can strengthen their general capability.

In this bloc we study the two major vocational education and training institutions in Brazil, namely, SENAI and SENAC.

Table 5.8

Decomposition of the variance of time in school

Decomposition	Lower	Upper
Terms	Primary	Primary
Var(Q)	0,30	0,25
(1) Between	0,01	0,00
(2) Between States	0,05	0,03
(3) Within States	0,08	0,06
(4) Within Tracks	0,17	0,16
(1)/Var(Q)	0,03	0,00
(2)/Var(Q)	0,15	0,10
(3)/Var(Q)	0,26	0,24
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V.B.1. An evaluation of SENAI

V.B.1.a. Introduction

This section is dedicated to the description of the Serviço Nacional de Aprendizagem Industrial (SENAI), responsible for providing vocational education and training for the Brazilian industry. SENAI was created in the early 1940s and since then has had a prominent role in the formation of qualified workers in Brazil.

SENAI maintains very close ties with firms and employers associations. Some of the courses offered are taught within firms and part of them are firm-specific. The management of SENAI is under the responsibility of the National Confederation of Industries (CNI) and the Federations of Industries in each state.

The main source of SENAI's funding is a 1% tax on the payroll of all firms; enterprises having more than 500 workers pay 1.2% over the payroll. Firms can be exempted from paying the tax if they sign agreements to have SENAI providing specific training services - the so-called "acordos de isenção and cooperação".

Most of the systematic information available on the characteristics of SENAI students and their performance in the labor market comes from surveys with graduates in Sao Paulo where more than 50% of SENAI's activities take place. The majority of courses taught by SENAI falls within one of the following categories:

CAI (Curso de Aprendizagem Industrial):

- apprenticeship
- for 14-18 years old students
- the minimum educational requirement is 4th grade/primary and in some schools even higher
- general education
- long course - 880 hours/year long during approximately one and a half year.

HP (Habilitação Profissional):

- qualification in particular skills

-
- mostly for employed young workers
 - primary education (complete)
 - general education
 - long courses - 960/year hours during one to two years.

CEP (Curso de Especialização Profissional):

- specialization
- for 14-18 years old students in general
- 4 th grade/primary education or more in general
- no general education
- very short courses - around 45 hours.

CQP-I (Curso de Qualificação Profissional)

- qualification in particular skills
- for employed adults
- 4th to 7th grade/primary in general
- no general education
- short courses taught at night -- around 100 hours.

CQP-IV (Curso de Qualificação Profissional):

- qualification in particular skills
- for employed adults sent by firms
- primary education (complete)
- no general education
- sort courses during the day -- 180 hours.

The important difference between these courses is that CAI and HP are long courses and formative, including general education, whereas the three others are shorter

courses specifically designed to enhance the qualification of the worker in a specific occupation.

The nomenclature used in the above description of courses is based on the classification used by SENAI in São Paulo since most of the information available comes from the documents produced in the São Paulo branch.¹⁰ The national administration of SENAI uses a different terminology but there is a correspondence between the two systems. The relation between the two classifications is, grosso modo, as follows:

Sao Paulo	Brazil
CAI	Apprenticeship
HP	Qualification
CPQ-IV	Qualification/
	Habilitation
CEP and CPQ-I	Training

V.B.1.b. The students of SENAI

In what follows, based on the data resulting from surveys with graduates in SENAI-São Paulo, we examine the basic characteristics of SENAI students and their performance in the labor market.

Employed workers. Except for the CAI and HP students, the great majority of the SENAI students are employed workers. CPQ-IV students are sent to SENAI by the firms for which they work. CPQ-I students are usually self-enrolled students -- 90% of whom are employed -- who are trying to enhance their capabilities or to learn a new occupation. The admission of CAI and HP students is demand driven in the sense that SENAI tries to calibrate the enrollment of new students based on the

¹⁰The information for the period 1975/85 is based on the work of Leite (1986 which summarizes surveys with graduates of different courses and occupations in São Paulo. After 1985-86 SENAI-São Paulo introduced a system of regular surveys for all courses. The results of the surveys for graduates in 1985 (or 1986 depending on the course) are already available. This is certainly the most systematic and reliable set of information obtainable at the moment.

demand for trainees. Only 35% of CAI students are employed at the beginning of the course but the majority (around 70%) work as trainees during the course.

Education of parents. As shown in Tables 5.9 and 5.10, the parents of SENAI students in general have had greater access to formal education than the average population. The only important exception are the parents of CQP-I students which have approximately the same level of education of the population.

Table 5.9

Education of parents (S. Paulo, 1975-85)

	CAI	HP	CQP IV	Population (1)
Illiterate	7	3	10	25
Primary (incomplete)	27	15	34	28
Primary (compl.) and				
Secondary (incompl.)	61	57	49	41
Secondary (compl.) or More	5	25	7	6

Source: SENAI.

(1) Male population 40 years old or more, S. Paulo, 1985.

Education of students. The level of education of SENAI students is very high compared with the relevant populations. In Brazil, the average number of years in school for the age group of 15-19 years old is 5.2, and only 22% of those who enter the first grade reach the 7th grade. Tables 5.11 and 5.12 show quite clearly that SENAI trains the "educated", not the "non-educated".

Continuation of studies. The systematic surveys conducted in São Paulo after 1985 provide important information on the extent to which SENAI students continue their studies after finishing the courses. The proportion of CAI 1985 graduates studying one year after they finish the course is 70%. In the case of the HP graduates, the proportion of students who continue their studies is around 40%. Among those studying, the proportion of the graduates attending preparatory courses for entering college and already in college is 72%. These figures imply that two years after graduation in the HP course, roughly 30% of the graduates are either in college or preparing to enter college.

In the CPQ-IV group the figures are also very impressive. The share of graduates studying one year after finishing the course in SENAI is 31%. Among these, 49.1% attend preparatory courses for entering college or are already in college. Again, these figures show that the proportion of SENAI CQP-IV students in college or preparing for entering college after two years of graduation is around 25%.

Table 5.10

Education of parents (S.Paulo, 1975-85)

(percent)

	CEP	CQP-I	Population (1)
Illiterate	5	26	25
0-4 years	26	31	28
4-8 years	63	42	41
8 + years	4	1	6

Source: SENAI.

(1) Male population 40 years old or more, S. Paulo, 1985.

Table 5.11

Education of students entering SENAI, S. Paulo

(percent)

	CAI (75-CAI 85-CAI)		CEP	CQP-I
Primary (until 4th grd)	26	0.7	1	30
5th to 7th grd	65	84	27	36
Primary (complete)	13	15	48	21
Secondary (incompl.)	4	0	20	8
Secondary (compl.)	0	0	5	4

Source: SENAI.

Level of employment of graduates. As seen in Table 5.14, SENAI's graduates have approximately the same level of employment as the average population in the work force between 19 and 24 years old. The only exception are the CAI students whose level of

employment is below the average probably because they are doing the military service.

Occupational evolution. The figures resulting from the surveys conducted between 1975 and 1985 indicate that in all courses the proportion of students occupying higher positions (officer or master) when the survey took place was greater than their positions in the first job after the course. The evolution is specially good in the case of CAI and CEP (day) students. The exceptions are the students of CEP courses taken at night.

Table 5.12

Education of students entering SENAI, S.Paulo

(percent)

	HP	CQP-IV
Primary (complete)	90	50
Secondary (incompl.)	10	22
Secondary (compl.)	0	22
College (incompl.)	0	4

Source: SENAI.

Wage Evolution. Table 5.15 provides information on the wage evolution of CAI (1985), HP (1986), CQP-IV (1986) and CQP-I (1987) graduates in São Paulo. The Table shows that the proportion of workers earning higher wages increases between the first and the third year after graduation.

Use of skills learned in SENAI. Among the CAI students working one month after the course (1975/85), 60% were using the skills they learned in SENAI; when the survey was made some time after the first month, this percentage had fallen to 42%. In the HP group, 55% were using skills when survey was made. Among the CQP-IV students (1975/85), 66% were using the skills they had learned. This is a very good performance compared with the other groups. The worst performance is certainly that of the short courses: In the CEP group, one month after the end of the course, 50% were using the skills they learned, and when survey was made, percentage had fallen to 35%. Among CQP-I graduates, 18% were using skills after one month and only 15% when survey was made.

Table 5.13

Continuation of studies (first, second and third
years after graduation), S. Paulo, 1986-89

(percent)

	1st year	2nd year	3rd year
CAI	70	66	58
HP	40	58	63
Of which in College	28	45	50
CQP-IV	31	51	53
Of which in College	31	37	30

Source: SENAI.

Table 5.14

Level of employment of graduates (one, two and tree years
after graduation), S. Paulo

(percent)

	One Year	Two Years	Three Years
CAI	83,50	76,40	76,10
HP	80,40	83,10	87,50
CQP-IV	91,80	95,00	94,60
CQP-I	93,30	96,20	92,20
Market (18-24 years)	87,30	87,10	88,10

Source: SENAI.

There are two possible interpretations for the reduction in the extent to which the skills are used: one is that the course is not very useful and another, more benevolent interpretation is that, after a while, the students are able to use their general education to perform different tasks. The information on occupational and wage evolution seems to confirm the latter hypothesis.

Table 5.15

Wage evolution, in minimum wages (MW), (one, two and three years after graduation), S. Paulo

(percent)

		1st year	2nd year	3rd year
	1-3 MW	69	63	51
CAI	3-5 MW	17	24	28
	5 + MW	3	5	10
	2-5 MW	52	48	21
HP	5-7 MW	15	24	23
	7 + MW	9	19	49
	3-5 MW	29	26	9
CQP-IV	5-7 MW	21	16	13
	7 + MW	42	47	66

Source: SENAI.

V.B.1.c. Industries and firms employing SENAI's students

Table 5.16 shows the industries in São Paulo which attract the majority of SENAI graduates. In the case of the CAI students, 60% of the graduates are employed in three industries, namely, metallurgy, mechanics & transport equipment and electronics. These industries together employ 32% of the industrial labor force in Brazil. The other industries employ 68% of the labor force but absorb 19% of CAI graduates.¹¹ The mechanics and transport material industries employ more than 30% of SENAI's graduates in HP, CQP-IV and CQP-I courses and no more than 16% of the total labor force.

¹¹The other 23% of CAI graduates work on other sectors (services, commerce, agriculture).

Table 5.16

Sectors attracting SENAI's graduates, S. Paulo (1986-8),
one year after graduation

(percent)

	CAI	HP	CQP-IV	CQP-I	Labor Force
Metalurgy	48	0	0	29	10
Mechanics & Transport	8	44	40	34	16
Electronics	4	5	6	8	6

Source: SENAI.

Table 5.17 shows that 61% of CAI graduates, 81% of HP graduates and 92% of CQP-IV graduates are employed in medium and large small firms with more than 99 employees. The porportion of all industrial workers employed in medium and large firms in around 58% which obviously implies that SENAI's graduates (specially the more qualified) tend to work for the large firms.

Table 5.17

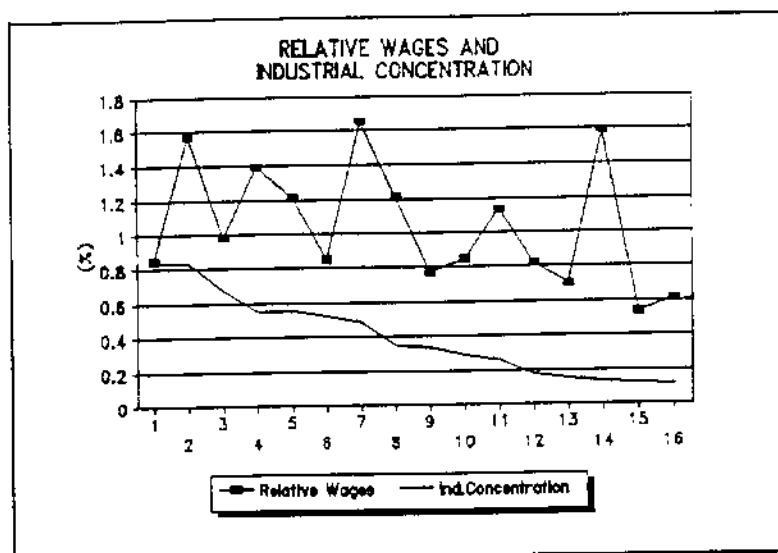
Employment of SENAI's graduates by size of firms, S. Paulo
(1986-8), one year after graduation

	Small	Medium & Large
HP	19	81
CQP-IV	8	92
CAI	39	61
CQP-I	29	48

Source: SENAI.

Figure 5.7 shows very clearly that there exists a positive correlation between the degree of industrial concentration and relative wages. Those industries in which large firms dominate the market (that is, where the market structure is essentially oligopolist) are the same which pay higher wages. The industries which attract SENAI graduates (mechanics, metallurgy, electronic and transport material) are among those which pay better salaries, and except for mechanics, are also among the industries with greater degree of industrial concentration.

Figure 5.7



Source: SENAI.

Notes: 1-Tobacco; 2-Rubber; 3-Transport; 4-Eletronics; 5-Perfume, wax, etc.; 6-Chemical; 7-Metalurgy; 8-Liquors; 9-Paper; 10-Pharmaceutical; 11-Plastic; 12-Textiles; 13-Mechanics; 14-Clothing; 15-Foodstuff.

V.B.1.d. The structure of the courses

There has been dramatic changes in the structure of courses in SENAI/Brazil over the last ten to twenty years. As seen in Figures 5.8 to 5.10, the total number of enrollments, graduates and hours dedicated to courses in short term courses (training) has grown considerably between 1970 and 1990. The share of enrollments in training (the equivalent of CEP and CQP-I courses in São Paulo) over the total number of enrollments grew from 38% in 1970 to 85% in 1990. The share of graduates increased from 49% to 90% and the share of hours dedicated to these courses increased from 11% to 31%. Meanwhile, the proportion of hours in the apprenticeship course fell from 75% to 49%.

V.B.1.e. Funding and the course structure

Firms can be exempted from paying the 1% tax over the payroll if they establish a cooperation agreement with SENAI (acordos de isenção e cooperação), and as part of the agreement, they contract direct training services from SENAI. With the resources they save with the exemption, firms, have shown a consistent preference for contracting SENAI to provide short term courses with very specific contents. In a way therefore, a tax meant to finance the provision of a public service, namely, general vocational education, is turned into a tariff to finance the provision of a private service, namely, specific training.

Between 1986 and 1990, the total number of enrolled students in SENAI grew 52%. Direct action (that is, SENAI's activities with its own resources) grew 24% and indirect actions (through cooperation agreements with firms) grew 88%. Total number of hours dedicated to courses increased 4% between 1986 and 1990. The number of hours in direct action grew 11% whereas the number of hours in indirect action fell 12%.

In sum, the number of enrollments in indirect activities grew three times more than the number of enrollments in direct activities and the reduction in the ratio of the number of hours to enrollments was essentially due to the reduction in the number of hours in indirect activities through cooperation agreement between firms and SENAI.

Figures 5.8 e 5.9

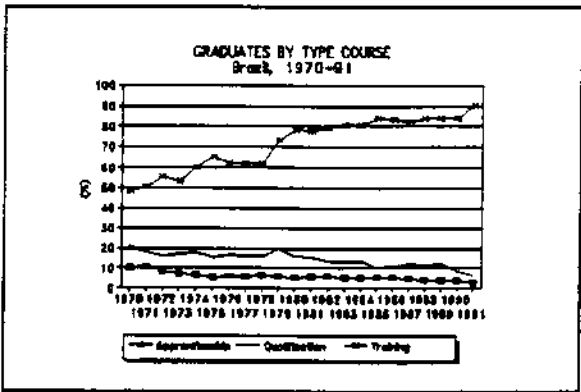
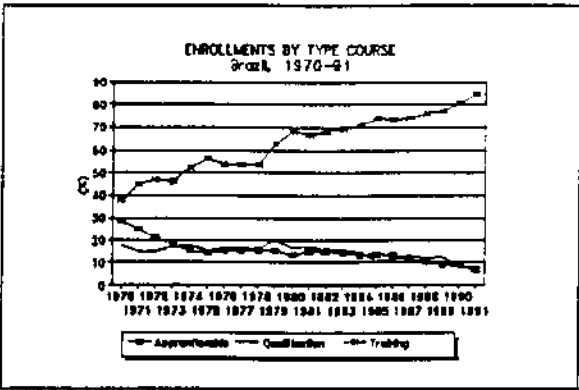
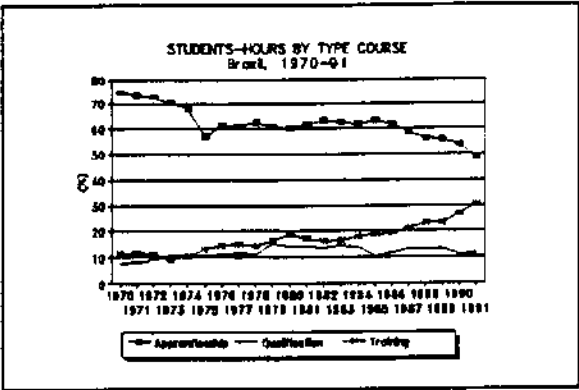


Figure5.10



Source: SENAI.

Table 5.18

Structure of courses, enrollments by type of course, Brazil

	1986	1987	1988	1989	1990	1991
Apprenticeship:						
Total*	5,40	4,70	4,10	3,90	4,00	2,70
SENAI Resources	13,70	12,10	11,80	12,20	12,70	-
Training:						
Total*	83,40	82,50	84,00	84,00	87,00	90,00
SENAI Resources	70,50	71,10	72,50	71,00	71,30	-

Source: SENAI.
* Total includes enrollments with SENAI resources plus acordos de insencao and cooperacao.

Table 5.19

Indirect action (acordos) as % of enrollments

	1986	1987	1988	1989	1990
Indirect Action	42	48	45	48	53

Source: SENAI.

V.B.2. An evaluation of SENAC

V.B.2.a. Introduction

SENAC is the analog of SENAI for the service and commerce sectors. The information available on SENAC is not comparable to that available in the case of SENAI. On the one hand, the information is very scarce and, on the other, it is not reliable. The data is not dependable especially because the information coming from the local agencies is not uniform. That is, the terminologies used by the agencies are not comparable which makes the aggregate of the information rather unreliable. For these reasons, the evaluation of SENAC is much less complete than that of SENAI, and the interpretation of the data should be taken with caution. For these reasons it is very difficult to take any reliable conclusions from the information available.

The funding of SENAC is based on a 1% taxa on the payroll of firms operating in the services sector. Differently of the case of SENAI, tax exemption schemes are not common in the SENAC system. The relationship between the local agencies and the federations of commerce is very strong -- in particular, the administration of the agencies are totally under the control of the federations -- but the relation with the firms is very weak. As a result, the clients of SENAC are not the firms and their respective employees, but the students themselves.

SENAC provides many types of courses, but four concentrate 93% of the enrollments:

Iniciação. Initiation of young students to very primitive skills directed to specific occupation. In 1990, 22.2% of SENAC's enrollments and 15% of the hours dedicated to courses were associated to this type of courses. The majority of these courses last between 30 and 120 hours but the variance is not insignificant.

Qualificação. This is the type of course which usually provides the student with a general formation and specific training to an occupation. In 1990, 34% of the enrollments and 62% of the hours were dedicated to these courses. The typical course ranges between 40 and 250 hours.

Aperfeiçoamento. This is an extension type of course designed to improve the abilities of the students in occupation in which they already have some expertise. In 1990, 25% of the enrollments and 12% of the hours

were dedicated to these courses. These are short courses (between 15 and 60 hours long).

Instrumentação. These are formative courses in Portuguese, Mathematics, English, design, etc. In 1990, 11% of SENAC's enrollments and 6% of the hours dedicated to courses were associated to this type of courses.

V.B.2.b. A profile of the SENAC student

The picture of the SENAC student provided in the following paragraph is based on a few surveys conducted at the national level in 1984 and 1989.

1. In 1984, 61% of the SENAC enrolled students were female; the great majority of the students in the 1984 survey (56%) had less than 20 years of age, and only 3.3% had more than 40 years of age.

2. The level of education of the students was surprisingly high. More than 60% had completed primary education and 23% had completed secondary education. In 1989, 88% had completed primary education and 54% had completed secondary education. Given that the majority of the students are very young, it would be reasonable to assume that a relevant proportion will continue their formal education.

3. Differently from the case of SENAI, in which most of the students were employed, in SENAC only 29% (in 1984) and 46% (in 1989) were working during the course. The percentage of students who had never worked in 1984 was 47%. This is an evidence that firms are not the typical clients of SENAC.

4. Among those students who were not working in 1984, 29% were looking for their first job, 28% could find a job, 25% decided to continue studying. Among those who were not working (70% in 1984) 65% had never worked before. Among those who had worked before, 11% were unemployed for less than 3 months, 22% between 3 and 6 months, 14% between 6 and 11 months, 21% between 1 and 2 years and 22% more than 2 years.

5. Among the graduates in 1984, 69% were wage earners working in the regulated (legal) sector, 15% in the unregulated (or illegal) sector and 9% were self-employed.

6. The wages of graduates were relatively low considering the high levels of education for Brazilian standards. Only 23% received more than three minimum

wages.¹² Among the wage earners working in the unregulated sector, 55% received less than one minimum wage and among the self-employed, 32% received less than one minimum wage.

V.B.2.c. The structure of courses

Among the major courses, the number of enrollments in aperfeiçoamento remained practically stable over the 1980s whereas the number of enrollments in qualificação and iniciação increased. As for the total number of hours, they increased substantially in the case of the qualification courses, exactly those with a formative content. In this respect, it seems that SENAI and SENAC are moving in different directions: while in the former the number of hours dedicated to formative course is falling, in the latter it is increasing. The number of hours per enrolled student is also increasing in the qualification courses. This is also a positive sign.

VI. AN EVOLUTION OF POLICIES TO REDUCE THE COST OF ADJUSTMENT

The main goal of this section is to evaluate (a) the educational system, (b) the public programs offering technical and professional training, with special attention to the SENAI and SENAC systems, and (c) the connections between the formal and technical educational systems. In addition, in this section, we also discuss the role of policies which may influence the functioning of the labor market and, as a consequence, may be used to reduce the cost of adjustment.

We begin, in Section VI.A, by investigating the relationship between the level of general qualification of the labor force and the degree of labor market flexibility and consequently the magnitude of the costs of adjustment. We then evaluate the two main bottlenecks of the public educational system at the primary level. We emphasize the lack of quality of the publicly provided education services and the perverse regional distribution of resources between regions and between levels of education. Finally, we discuss policies aimed to improve the performance of the educational system. In section VI.B we evaluate and give some recommendations based on the analysis of vocational education and training in Brazil.

In Section VI.C and VI.D we evaluate two characteristics of the functioning of the labor market which have important impacts on the degree of labor

¹²The minimum wage in 1984 was around US\$ 80 a month.

market flexibility and, therefore, on the magnitude of the cost of adjustment: the degree of regional integration of the Brazilian labor market and the degree of informality in the labor market. In Section VI.E we evaluate some features of the labor legislation which are particularly relevant to the degree of flexibility of labor relations, affecting the freedom of firms to dismiss workers and the resulting cost.

VI.A. An Evaluation of Educational System

VI.A.1. The role of formal education in reducing the cost of adjustment

It is convenient to assume that each worker has two types of human capital: general human capital and specific human capital. Specific human capital is the form human capital most directly related to enhancing productivity in a given activity. Since workers' specific human capital may be lost during the adjustment process, the cost of adjustment will be increasing with the amount of specific human capital workers possess.

Although it may be less expensive and quicker to train a better educated worker than a less educated worker, the amount of retraining required for a better educated worker to recover his original level of specific human capital and productivity may be considerably larger, requiring a longer period of retraining and consequently leading to a higher cost of adjustment.

The relation between general human capital and the cost of adjustment works through three channels:

- Capacity to adjust under disequilibrium: During periods of adjustment, the conditions in the labor market are likely to be changing at a very fast pace and be to predict. Hence, to the extent that workers with more general human capital are more able to perceive and correctly interpret economic changes [Schultz (1975)], they will not only experience the shortest period of adjustment but also will be the group that, *caeteris paribus*, will profit the most by the creation of new opportunities.

- Learning to learn: General human capital may enlarge the learning capacity of workers, allowing them to learn new techniques quicker and so reduce their training cost, i.e., workers with more general human capital are not only more productive but, more importantly, are able to learn new techniques at a lower cost. Therefore, to the extent that firms pay at least part of the training costs, they will prefer to

give training to better educated workers. As a result, workers with a greater amount of general human capital will also tend to have a greater amount of specific human capital. These facts have conflicting impacts on the cost of adjustment. On the one hand, the fact that they face lower training costs reduce the cost of rebuilding their specific human capital when necessary. On the other hand, the amount of retraining required for a better educated worker to recover his original level of specific human capital and productivity would be considerably larger, requiring a longer period of retraining and consequently leading to a higher cost of adjustment.

In addition, the fact that better educated workers have greater amounts of specific training give them a higher degree of job security during periods with changes and uncertainty. This is the case because if firms cannot perfectly predict changes, they will delay adjustment in order to avoid extra training cost which occur if they mistakenly dismiss trained workers.

- Priority in receiving training: Since workers with more general human capital can be retrained quicker and at a lowest cost, they will be the first to receive retraining, therefore, further reducing their period of adjustment and their the costs.

In sumary, the cost of adjustment is increasing with the amount of specific human capital and decreasing on the amount of general human capital, at least when the amount of specific human capital is hold constant. In addition, workers with a greater amount of general human capital will tend to have also a greater amount of specific human capital. Workers who have small quantities of both kinds of human capital will face smaller costs of adjustment since they lose little specific human capital with the adjustment process. On the other extreme, workers with a large amount of both kinds of human capital will also face lower costs. Because, although they may loose a large amount of specific human capital their cost for replenishing their specific human capital is low because of their large amount of general human capital.

Consequently, the relationship between general human capital and the cost of adjustment is not necessarily inverse and monotonic. Workers with a greater amounts of general human capital would not necessarily face a lower cost and a quicker period of adjustment. Everything will depend on their amount of specific human capital relative to the amount of general human capital. The larger the gap between specific and general human capital, the larger will be the

retraining cost required to regain productivity after a structural change. However, holding specific human capital constant, increments in general human capital will always reduce the gap, and therefore, will contribute to reduce the adjustment cost.

VI.A.2. Policies to increase the level of formal education

In Section VI.A.1 we describe several channels through which increments to the educational level of the labor force can reduce the cost of adjustment. In this section we identify the major bottlenecks of the Brazilian education system and consider policies which could improve the performance of the system. The design of such policies has been a constant challenge faced by the Brazilian society.

Shortage of schools was a traditional problem of the educational system in Brazil. Nowadays, however, this great obstacle has been considerably removed. By the end of the 1980s, at least 90% of children in each generation had access to public primary education in Brazil [see Fletcher and Ribeiro (1989)]. Therefore, the current problem is not any more a widespread lack of schools or vacancies in school but excessively high repetition and dropout rates. High repetition rates seems to be the most serious and ubiquitous problem of the Brazilian educational system. High rates of repetition increase the demand for vacancies in school and so makes the goal of universal access to primary education much more expensive. In addition, high repetition rates contribute to increase the dropout rate and the educational costs to students and schools. Finally, it may be considered an indicator of the inferior quality of education.

Two educational policies seem to be particularly suitable to reduce repetition and dropout rates: (a) improvements in the quality of education and (b) better distribution of the resources devoted education. With respect to the quality of education, it is important to point out that not all improvements would led to reductions in repetition and dropout rates. The appropriate changes in quality of education are those increasing school attractively and decreasing the cost of education to families. An increase in the quality of educational services will decrease the cost of education perceived by families, to the extent that changes in the quality of educational services substitutes families resources previously required to keep children in school. For example, providing free transportation for all children to go to and return from school or providing free school materials are two

examples of improvements in the quality of school services which are substitute for family resources and so should lead to improvements in educational attainment.

As we have shown in Section V.I, the problem with the public spending in education is not with the overall level but with its distribution. Repetition and dropout rates could be reduced if public resources devoted to education were redistributed from rich to poor neighborhoods and from the secondary and post-secondary levels to the primary level, in particular to the first two grades. To maximize the impact the resources being reallocated should be used to increase the productivity of the time of poor children.

VI.B. Vocational Education in Brazil: Evaluation and Recommendations

VI.B.1. SENAI

Before turning to the recommendations we re-state the most important factual findings described above:

1. The education of parents and students of SENAI. The parents of SENAI's students and the students themselves have greater access to formal education than the average population. The level of education of SENAI students is high compared with the relevant populations or, put in other words, SENAI trains the relatively "educated", not the "non-educated".

2. Continuation of education. A significant proportion of SENAI students continue their studies and, among HP and CQP-IV students, more than one third of those continuing their studies go to colleges. This is a strong indication that instead of attending academic schools in preparation for college, these students prefer to take SENAI courses. The reason for this is that, in general, SENAI offers a better education than most public schools in Brazil.

3. Training the unemployed. SENAI forms and trains employed workers or young students and does not have any special program for the unemployed.

4. The inefficiency of short term courses. As for the efficiency of the SENAI courses, the performance of the formative courses (apprenticeship and general abilitation) and qualification for students with primary education is very good; the performance of short courses providing specific training and designed to self-enrolled students is clearly poorer. There are evidences that short and specific training courses

might be useful to employed workers sent to SENAI by their firms, but are not useful to self-enrolled students.

5. Training for the small enterprises. A few industries (mechanics, transport equipment, electronics and metallurgy), where the wages paid are among the highest in industry and where the large enterprises prevail employ the majority of SENAI's graduates. The problem with this finding is that medium and smaller firms can also profit from more qualified and better trained workers. However, smaller firms cannot establish in-house training facilities. This obviously reduces their competitiveness and reduces their chances of success and survival.

6. The structure of courses. There has been an increasing emphasis on short and specific training courses in detriment of the long and formative courses. This tendency goes against the stream. It seems clear that, in face of the uncertainties concerning changes in the occupational structure in the future and the introduction of methods of production which require the adaptability of labor, vocational education and training should emphasize courses which provide general and formative education rather than specific training.

7. Funding. There has been dramatic changes in the structure of courses in SENAI over the last ten to twenty years. The total number of enrollments, graduates and hours dedicated to short term courses has grown considerably between 1970 and 1990. Meanwhile the same figures for the apprenticeship course experimented insignificant increases. As a result the proportion of hours dedicated to the short courses increased dramatically and the proportion of hours in the apprenticeship courses fell from 75% to 49%. There has been an increasing emphasis on short and specific training courses in detriment of the long and formative courses.

These seven points provide a picture of SENAI. Training is certainly a very polemical issue and that is why even in face of relatively abundant information, it is not very easy to draw definite conclusions let alone to make policy recommendations.

Some of the conclusions and recommendations are independent from the two points of view or interpretations discussed below. First of all, the fact that SENAI does not have any special program for the unemployed is an evidence that the institution is not really prepared to facilitate adjustment processes which demand the reallocation of labor. Clearly enough,

providing the unemployed with specific training does not make much sense especially if there is uncertainty concerning the pattern of sectoral realignment of employment. Specific training is something that the firm which will eventually hire the unemployed should be responsible for. However, it should be the responsibility of SENAI and the Ministry of Labor to provide general education to the unemployed workers who meet certain standards in order to enhance their ability to learn new specific tasks and to lower the costs of providing them with specific training. This should be specially the case in a period of adjustment in which the vocational education system can play an important role in increasing the mobility of labor. It is also an important contribution in the spring of a new technological environment in which the flexibility and adaptability of labor is so critical.

As noted above, firms can be exempted from paying the 1% tax over the payroll. With the resources they save with the exemption, firms have shown a sound preference for contracting SENAI to provide short term courses with very specific contents. Therefore, a tax meant to finance the provision of a public service, namely, general vocational education, is turned into a tariff to finance the provision of a private service, namely, specific training. The tax exemption program should be revised in order to restore the emphasis on long and formative courses.

Turning to more polemical issues, the first, more benevolent, interpretation of the role of SENAI is that there is enough supply of "educated" students applying to vocational schools, and that it would be expensive to form and train the "non-educated". The cost of providing professional education and training to the non-educated is clearly greater than the cost associated with the formation of the educated. SENAI minimizes its costs given the demand for qualification of the labor force. It should only lower the admission standards if the supply of candidates were smaller than the demand for qualified students. According to this interpretation, SENAI should not perform the role of the academic schools in providing academic education to the less educated. Academic public schools should provide good education in order to provide the poor with equal opportunities to compete with the rich in entrance exams in SENAI or the labor market. Increasing equity should not be seen as an obligation of a very specifically oriented institution such as SENAI.

The fact that small enterprises do not employ SENAI graduates can be seen as an evidence that small entrepreneurs do not value qualified workers as much as

large firms do. Large firms, on the other hand do not complain from the lack of qualified workers.

The other interpretation is not very favorable to SENAI. It says that SENAI performs the role of academic schools to those students whose parents are better educated than the average population, and hence probably richer. These students continue their studies after graduating in SENAI, and a significant number end up in colleges. The goal of these students is becoming engineers, not technicians.

As for the lack of attraction of SENAI students by small firms, the reason might be that their reservation wage is too high compared with the wages small firms are able to pay. There are evidences that SENAI graduates are attracted by industries which pay higher wages.

The central recommendation which derives from this interpretation is that the funding of SENAI should be revised. Not only large firms which can afford to establish in-house training systems should not be exempted from paying their contribution, but those students who are able to pay for an education should start paying. The latter recommendation has been made by the World Bank in its study on secondary education in Brazil. The extra funding should be used to increase the share of general and formative courses, on the one hand, and on the other to expand the opportunities to the less educated. At the end the result would be an increase in the supply of qualified workers with general education which hopefully would reduce the wage gap between qualified and non qualified workers and the ability of small firms to up-grade the quality of their human resources.

VI.B.2. SENAC

As noted in the introduction, the information on SENAC is both scanty and not very reliable. This makes generalizations, conclusions or comparisons with SENAI rather irrelevant. Given this proviso, a few concluding remarks and comparisons can be made. First, SENAC trains and forms young and unemployed students whereas SENAI trains and forms employed students. Second, the level of education of students in both institutions is high given the Brazilian standards although it seems that it is even higher in SENAC than in SENAI. Three, the level of wages of SENAC's graduates is rather low given their levels of education but this can be explained by their age and inexperience. Four, although very little can be said based on the aggregate information on the structure of SENAC courses, it seems

that neither the total number of hours nor the average number of hours per enrolled student in the formative courses has fallen over the 1980s.

VI.C. Regional Integration of Labor Markets

There exist in Brazil large regional disparities in the composition of production and employment. In the Northeast and in the South, agriculture is still the largest economic sector. The majority of manufacturing production is still located in the Southeast. Moreover, while in the Northeast, agriculture for subsistence is the largest source of employment, in the South most of the labor force in agriculture is employed in the production of goods to be exported.

As a consequence, any structural change in production in Brazil and especially those derived from changes in trade policy are expected to have important differential regional effects. Hence, rapid spatial reallocation of the labor force is going to be an essential requirement to reduce the cost of adjustment. How fast the allocation of the labor force will respond to regional changes will depend on how well integrated are regional labor markets.

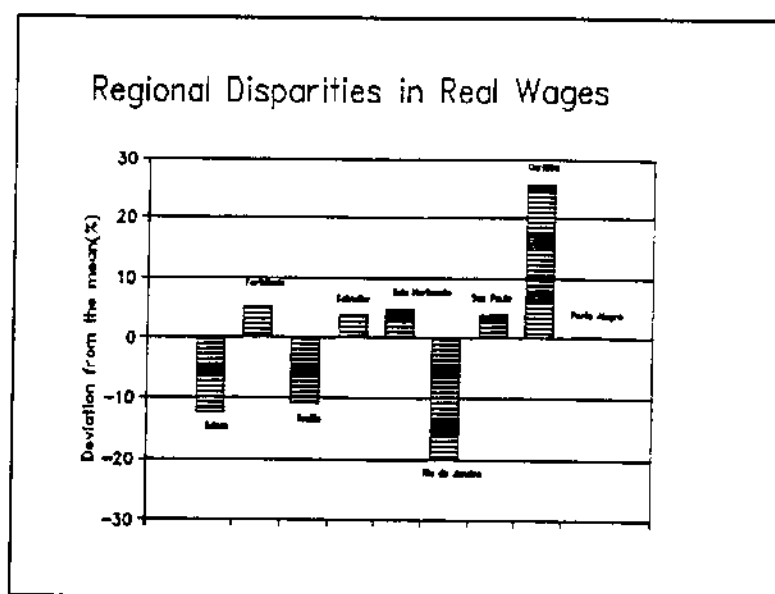
Regional integration has been a continuous goal and policy target of the Brazilian government. Measures of the success of this effort are not simple or unquestionable. In Figure 6.1, we present one of these measures: the degree of regional disparities in wages for Metropolitan Brazil. These wage differentials are taken from Savedoff (1991). The figures are corrected for regional differences in cost-of-living and refer to workers with identical observable personal characteristics and working in the same occupations and sectors. This figure reveals a substantial degree of regional disparities in wages, putting considerable doubt on the success of the long history of policies devoted to regional integration.

In summary, all expected structural changes should have differential regional impacts. The cost of adjust to these structural changes will depend on the degree of integration of the regional labor markets and the degree of spatial mobility of the population. As we have shown, there still persist substantial regional disparities in real wages among equally productive workers. Therefore, the labor markets are still far from perfectly integrated and policies to accelerate this integration will be vital in reducing the costs of adjusting to structural changes, in particular, to those deriving from reductions in trade barriers.

VI.D. Informality and the Cost of Adjustment

The Brazilian labor market is characterized by a low rate of unemployment (the urban unemployment rate seldom exceeds 5%), and a high degree of informality: Approximately 60% of the labor force works either as employees without formal labor contracts or as self-employed workers. Under certain circumstances, informality may considerably reduce the cost of adjustment. In this section, we describe precisely which circumstances are required and whether they are present in Brazilian Metropolitan labor markets. For simplicity we refer to employees without formal contract as informal workers.

Figure 6.1



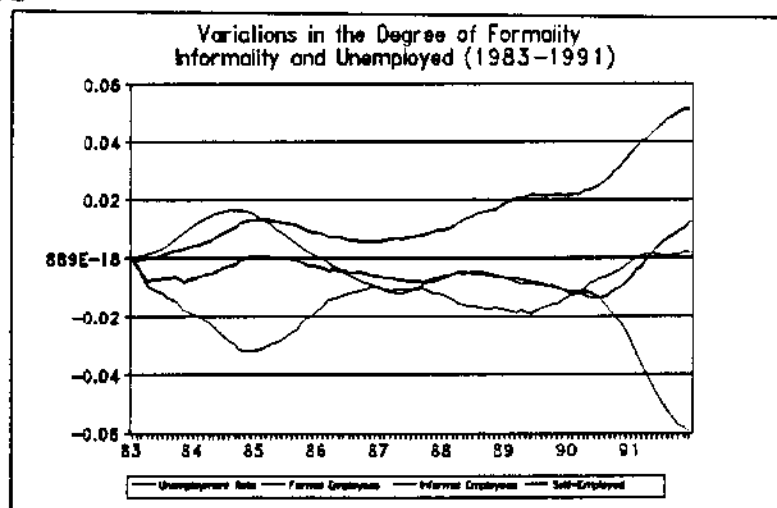
Source: Savedoff (1991)

The first condition required for informality to reduce the cost of adjustment is that the degree of informality should be counter-cyclical, i.e., informal employment should function as a buffer. As the rate of unemployment increases, the proportion of workers in jobs without formal contracts and the proportion of self-employed workers should increase. When this is the case, as the economy begins to function below its potential capacity, a considerable percentage of workers who lose their jobs with formal labor contract avoid unemployment by either taking jobs as informal employees or by becoming self-employed, thus reducing the adjustment cost. To investigate the validity of this hypothesis we estimate for Metropolitan Brazil the monthly evolution of the unemployment rate and the

proportions of the labor force represented by formal employees, informal employees, and self-employed workers. If informality works as a buffer, the proportion of informal and self-employed workers should increase as the unemployment rate increases. These estimates are presented in Figure 6.2 as deviations from their levels at the beginning of the period. Annual estimates of these proportions are presented in Table 6.1, Figure 6.2 and Table 6.1 reveal that the unemployment rate increased over two periods: (a) from 1983 to 1984 and (b) from 1989 to 1991. In the first period, the increase in the degree of informality was very small relative to the increased in unemployment, bringing, therefore, very weak evidence in favor of the buffer hypothesis. On the other hand, in the latter period, informality increases well beyond the increase in the unemployment rate, providing an extremely neat example of the phenomenon of informal employment working as a buffer in periods of declining levels of economic activity.

Informality would not play an important role in reducing the cost of adjustment if the income losses due to the transition from formal to informal jobs or to the condition of being self-employed were very large. Hence, a second condition required for informality to reduce the cost of adjustment is that the wage gap between equally productive workers in formal and informal activities should not too large. Notice that this condition must hold primarily in periods of high or increasing rates of unemployment and for those groups of workers in the formal sector most prone to lose their jobs. To investigate this question, we compute the wage differential between formal and informal workers and between formal and self-employed

Figure 6.2



Source: Pesquisa Mensal de Emprego (PME)

Table 6.1

Temporal evolution of the unemployment rate. Proportion of employees with formal labor contract and self-employers workers for the metropolitan

Periods	Unemployment	Degree of	Degree of Informali	
	Rate	Formality	Informal	Self-Emple
1982	3,80	57,70	14,20	17,70
1983	4,80	55,70	13,40	18,00
1984	5,40	54,30	14,20	19,00
1985	4,00	55,60	13,90	18,60
1986	2,90	56,50	13,50	18,20
1987	3,10	56,30	13,40	18,60
1988	3,20	55,80	13,50	19,50
1989	2,80	56,10	13,00	19,80
1990	3,60	55,10	13,30	21,10
1991	4,10	51,60	15,40	22,80
Mean	3,77	55,47	13,78	19,33
STD	0,008	0,015	0,007	0,015

Source: Pesquisa Mensal de Emprego (PME).

workers controlling for the level of education, age, and gender and region of residence for the periods 1983/84 and 1990/91. The results are presented in Table 6.2. This table reveals that both alternatives to formal employment are costly, with informal jobs being less attractive than self-employment. The log income loss associated to a transition from formal employment to informal jobs is on average 0.50 for the first period and 0.36 for the second period. With respect to the transition from formal to self-employment we estimate average log income losses of 0.5 and 0.26 for the first and second periods, respectively. It is important to observe that the income losses are smaller precisely for the second period, which was the period when informal employment did function as a buffer. In Table 6.2, we also compute the wage gap by educational level, gender, and region of residence. The table reveals that in relative terms, the income losses are higher in the lower income groups. Actually, the income losses tend to be higher for the groups with higher income.

To function properly as a buffer, the set of informal activities should absorb labor when the unemployment

rate is increasing and release labor when the unemployment rate is decreasing. In this case, informality would be an attractive alternative to unemployment and the income losses due to the transition from formal to informal activities would be temporary instead of permanent. Hence, a third condition required for informality to have an important contribution in reducing the cost of adjustment would be the presence of an intense flow of workers out of informal activities during periods of decreasing unemployment. It is important to demonstrate that workers in informal activities do not have any disadvantage, relative to those who are unemployed, in finding formal jobs when the economy resumes its growth pattern.

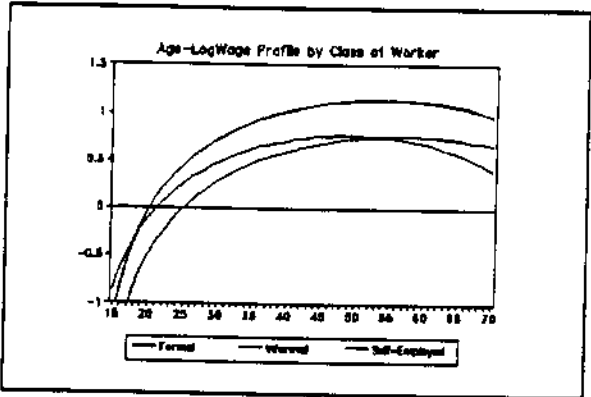
Finally, it should be noticed that the cost to a worker of not being in the formal sector for a period of time is not just the wage loss over this period of absence from the formal sector. If experience is accumulated at a faster pace in formal activities or if experience accumulated in informal activities is not transferable to formal jobs, workers who are forced into informal activities for a period will have lower rates of growth in wages and therefore will have lower present values of income streams. We refer to this loss as the dynamic loss in income due to a period of stay in the informal sector. Hence, a fourth condition required for informality to have an important contribution to reduce the cost of adjustment is that these dynamic income losses should be small. The magnitude of this dynamic loss depends on two factors: (a) The differential between the rate of accumulation of experience between formal and informal activities; (b) The extent to which the experience accumulated in informal activities is transferable to formal activities. To investigate the magnitude of this first factor we compare the age-wage profile between formal and informal activities. Figure 6.3 presents the age-log wage profile for formal and informal employees and self-employed workers. These profiles are for Metropolitan Brazil and include controls for education level, gender, and region of residence. The figure reveals that formal and informal employees have nearly parallel age-log wage profiles, whereas the profile for self-employed workers is considerably flatter. As a consequence, self-employment offers an alternative with a smaller immediate income loss but with a loss which is increasing with the duration of the stay. Taking a job as an informal employee, on the other hand, implies a larger immediate income loss but no dynamic loss, at least as long as the working experience accumulated in informal jobs is transferable to formal activities.

Table 6.2

	PERIOD 1983-84			PERIOD 1990-91		
	Wage	Gap	Average Formal	Wage	Gap	Average Formal
	Formal - Informal	Formal - Self Empl.	Wages	Formal - Informal	Formal - Self Empl.	Wages
Average	0,50	0,51	1,00	0,36	0,26	1,00
Illiterate	0,52	0,39	0,29	0,26	0,06	0,30
Lower Primary	0,51	0,39	0,46	0,29	0,05	0,43
Upper Primary	0,47	0,48	0,79	0,28	0,12	0,65
Secondary	0,55	0,59	1,34	0,32	0,33	1,12
Superior	0,49	0,55	2,45	0,44	0,37	2,68
Correlation	0	0,80		0,99	0,86	
Belo Horizonte	0,60	0,59	1,01	0,40	0,36	1,01
Porto Alegre	0,31	0,44	1,01	0,28	0,21	0,98
Recife	0,51	0,63	0,75	0,32	0,27	0,80
Rio de Janeiro	0,51	0,48	0,95	0,38	0,25	0,87
Salvador	0,56	0,44	0,99	0,45	0,26	0,98
Sao Paulo	0,56	0,56	1,28	0,37	0,26	1,36
Correlation	0	0		0	0	
Women	0,45	0,62	0,63	0,31	0,19	0,70
Men	0,52	0,48	1,25	0,38	0,30	1,19
Correlation	1,00	-1,00		1,00	1,00	

Source: Pesquisa Mensal de Emprego (PME).

Figure 6.3



Source: Pesquisa Mensal de Emprego (PME)

In summary, the supply of informal jobs and opportunities for self-employment is counter-cyclical or at least less pro-cyclical than formal employment. Hence, informal jobs and self-employment are feasible alternatives to unemployment for workers displaced from formal activities in periods of recession. This alternative, however, is not costless. Workers who move to informal activities face severe income losses which tend to be transitory since the transition to informal activities is not permanent. There is a high rate of return of workers to their original occupations when economic conditions improve. Finally, the dynamic income loss due to reductions in the accumulation of experience during the withdrawal from formal activities seems to be small for those who temporarily worked as informal employees and sizable for those turned to self-employment. Most of these characteristics of informal activities lead to the conclusion that the high degree of informality of the Brazilian labor market contributes to the alleviation of the cost of adjustment to structural changes. Therefore, labor conditions in the informal sector during periods of adjustment must be carefully monitored and policies towards encouraging informal activities during these periods should be carefully considered.

VI.E. Brazilian Labor Market Legislation and Assistance Programs

One important characteristic of the Brazilian labor market is the complex set of institutional rules which affect its behavior. First, there is the labor code (the "Consolidação das Leis do Trabalho" - CLT), which is a comprehensive set of laws dealing with individual and collective rights and duties of workers and employers. Second, there is a compensation fund for dismissed workers. Third, there is an unemployment insurance law. Finally, there is the wage adjustment clauses, linked to the rate of inflation, which is written in the law.

In this section, we will analyze the compensation fund for dismissed workers and the unemployment insurance program. These institutions are fundamentally related to the flexibility of the labor market and to the distribution of the costs of adjustment.

VI.E.1. FGTS

The costs to dismiss workers in Brazil has two components, the "aviso prévio" and a fine on the dismissal compensation fund. By the "aviso prévio" (or previous notification of firing) any enterprise have to notify the worker one month before he or she will be

fired. During this month, the worker is allowed, by law, to take 2 hours a day to look for another job. This will mean a minimum cost of 25% the workers wage, since the normal work week have 44 hours. The cost is, in reality, higher than that, as during this period the workers productivity will decline. In the limit, if the firm notify the worker, pay his wage and fire him immediately, which is a normal procedure in most Brazilian enterprises, the cost is the monthly wage of the worker. Thus, this cost varies from 25% to 100% of the monthly worker wage.

The second component of the cost of dismissals is the fine on the dismissal compensation fund. This fund (called "Fundo de Garantia por Tempo de Serviço" - FGTS), is a capitalization fund which is formed by all firms to their workers. Each month the firm have to deposit in a banking account in name of the worker 8% of his or her wage. These resources are adjusted by inflation and earns a fixed 3% rate of interest a year. This fund can not be utilized freely. It can be used when the worker is fired for non-justified reasons, to buy a house and when retiring. When the worker is fired, besides the amount accumulated in the fund, the firm will have to pay the worker a 40% fine on the amount of the fund deposited during the period the person worked in the enterprise.

Thus, the amount of the fine will depend on the time he was employed in the firm. In general, this amount can be represented by the equation: $f = 100 \times 0.08 \times 0.40 \times n = (3.2 \times n)\%$ of the average wage where: f = amount of the fine 100 = average wage during the time the person was employed in the firm n = number of months he or she stayed employed in the firm.

Table 6.3 shows the costs to dismiss a worker for different length of the work contract, in months, if the firm pays the "aviso prévio" (previous notification) and fire the worker immediately and the wage is 100 and constant during the time of the contract.

The table shows that if a worker stays three years in the firm and receives the previous notification and is fired immediately, the cost of his or her dismissal is 2.15 wages. If the time in the firm was 10 years, the cost of dismissal would be 4,84 wages.

Table 6.3

Time of employment	6	12	24	36	48	120	240	360
Previous notification	100	100	100	100	100	100	100	100
FGTS fine	19	38	77	115	154	384	768	1152
Total cost	119	138	177	215	254	484	868	1253

The second important institution which affect employment flexibility in the Brazilian labor market is the dismissal compensation fund, the FGTS. As it was described above, all enterprises have to open a banking account to each of its registered worker and deposit, each month, 8% of the workers wage. In case the worker is dismissed with no justified reason, he or she is eligible to withdraw the fund accumulated in his name and the firm has to pay him a 40% fine on the value of the fund which was accumulated during the period he or she was employed in the enterprise. Therefore, when the worker is dismissed, besides the one month wage due to the "aviso prévio", he have access to the amount accumulated in the FGTS, which corresponds to one wage a year of employment in the firm, plus the 40% fine. The value of the fine increases as the time of employment in a given firm increases.

Table 6.4 shows how much money, as a percentage of his wage the worker receives if he is fired for non-justified reason, for different number of months he is employed in the same firm.

Thus, if the worker is dismissed after 6 months employed in the firm, he will receive 1,67 wages. If he was 4 years employed at the same firm, he would receive, 6,38 wages. Note that, if the worker stays in the enterprise, he is only eligible to withdraw the fund when he retires or to buy a house, and he will never receive the 40% fine on the FGTS nor the "aviso prévio". This mechanism was introduced in 1966 and was considered an important mechanism to increase labor market flexibility in Brazil.

Table 6.4

	6	12	36	48	120	240	360
Accumulated FGTS	48	96	288	384	960	1920	2880
Fine on FGTS	19	38	115	154	384	768	1152
"Aviso previo"	100	100	100	100	100	100	100
Total	167	234	503	638	1444	2788	4132

The problem is that, for a non-qualified worker, which receives a low wage and with no clear possibility to increase his remuneration in the firm this mechanism can create an important incentive for him or her to force his dismissal, when the economy is growing and the labor market is tight. As the wage is low, the workers rate of discount is very high and the incentive to try to anticipate the withdrawal of the money from the FGTS is also high. One year employment in the firm will give him more 2,34 wages, or a real gain of 18% (since all registered workers have 13 wages a year) over his or her yearly wage income. Actually, the optimum strategy for this worker is to make on the job search and try to get a new job while still employed. This is so if he or her do not perceive a clear possibility of improvement in the firm. This will mean a reduction in productivity.

As a result, these workers will have no incentive to invest in their jobs. If that is so, the firms will have little incentives to invest in their training and qualification, since the probability of losing the investment is very high. Only specific human capital investment will be made in the labor force. This effect is the more important, the less qualified is the worker, the less opportunities he can perceive for him in the firm and the lower is his wage. For the firm, the optimal strategy is to get the most possible from the worker while he is employed and not to invest in his future. If this incentive structure is important, so as to counterbalance the costs of dismissal, as calculated above, we should expect short run labor relations, little investment in training and qualification by workers and firms, and a high rotation of the labor force among jobs. On the other hand, it will also result in a low unemployment rate and a short

period of unemployment. Table 6.3 shows the evolution of the rate of open unemployment for Brazil, during the 1980s. Note that this is a period when there was no growth in per capita income and there was a recession during 1981/84.

Table 6.5

Unemployment rate - Brazil: 1981/1990

Year	Unemployment rate
1981	6,9
1982	6,0
1983	8,3
1984	6,9
1985	5,1
1986	3,2
1987	5,0
1988	5,1
1989	4,8
1990	na

Source: PNAD, IBGE .

Actually, unemployment is really very low in the Brazilian economy, as can be seen from the table. The highest rate of unemployment during the 1980s, was 8.3% in 1983, and it declined fast after that year, although growth was not very fast during this period, except in 1986.

Frequency and duration of unemployment is also very short in Brazil. It can be seen from the Table 6.6,¹³ if these variables for the Brazilian labor market is

¹³These information is actually only for the state of São Paulo.

Table 6.6

Frequency and duration of unemployment - 1988

Country	Frequency of Unemployment	Duration of Unemployment
Belgium	0,2	50
France	0,6	21
Germany	0,4	16
Ireland	0,7	30
Italy	0,2	36
Holand	0,4	25
Sapain	0,2	105
United Kingdon	0,9	10
Canada	2,6	3
United Sates of America	2,2	3
Finland	1,1	5
Japan	0,5	3
Norway	1,1	3
Sweden	0,5	3
Brazil	2,5	1,6

Source: Bivar (1992, p.86).

Note: the data for Brazil is for the state os Sao Paulo.

compared with the same variables for some other countries that there is this statistics. The frequency of unemployment is the number of times a worker stays unemployed, on the average, during the year, and the duration of unemployment is the number of months he or she becomes unemployed, on the average, each time unemployment occurs. The table shows that Brazil has the shortest duration of unemployment, 1.6 months on the average, and one of the highest frequency of unemployment, 2.5 times a year, on the average. Of the countries represented in the table, it is below only to Canada. Thus, not only Brazil have a low unemployment rate, but also, but also, a high frequency and a low duration of unemployment, a clear indication of employment flexibility. Thus if the costs to dismiss workers in Brazil is high, it is largely compensated by

the incentives created by the FGTS. The net effect is a very flexible labor market on the employment dimension.

VI.E.2. The unemployment insurance program

The Brazilian unemployment insurance program was created in February 1986, as part of the Cruzado Plan. Initially very small and without a secure source of resources, the program was substantially changed in 1990 (Law 7990, January 1990). These changes reduce the eligibility requirements leading to a sharp increase in proportion of the labor force being covered by the program. Moreover, these changes also provided a secure mechanism to guarantee the long-term financing of the program. This mechanism was based on the creation of a specific Fund named Fundo de Amparo ao Trabalhador - FAT, which is financed with taxes on the revenue of firms.

To become eligible to receive unemployment insurance a worker must meet the following criteria: (a) to have been dismissed without a just case, (b) to have had a formal labor contract ("carteira assinada") during the last six months or to have been legally self-employed for at least 15 months, (c) to be unemployed for at least 7 days, (d) must not be receiving any other pension or insurance, and (e) must not have any other source of income sufficient to guarantee his own subsistence and of his family.

The unemployment insurance program offers partial coverage for up to 4 months of unemployment. The value of the benefit can not be lower than the value of one minimum wage, is monthly adjusted for inflation, and is related to the average wage received by the worker in the last three months in the previous job: For workers who earned on average between 1 and 3.5 minimum wages in the previous occupation, the benefit was fixed in 80% of the average previous earnings; For workers who earned on average between 3.5 and 6.0 minimum wages in the previous occupation, the benefit was fixed in 2.8 MW (80% of 3.5) plus 50% of the difference between their average earnings and 3.5 MW; Finally worker who earned on average more than 6.0 minimum wages in the previous occupation, the benefit was fixed in 4.05 MW. The average value of the benefits, in terms of multiples of the minimum wage (MW), declined until 1988 (from 1.14 MW in 1986 to 0.82 MW in 1988), but increased after this year reaching 1.81 MW in 1991.

Data from the Ministry of Labor indicates that the program's coverage increased sharply since the program started in 1986, mainly after 1990, when the eligibility requirements were relaxed. From 282

thousand in 1988, the number of workers covered by the unemployment insurance program increased to 1,392 thousand in 1989 and to 2,939 thousand in 1991. The coverage rate increased from 5.1% of the dismissed workers in 1986, to 19.1% in 1989, 36.8% in 1990 and to 31.4% in 1991 [see Azeredo and Chahad (1992)]. From the total number of workers which applied for the insurance, the number of those which effectively received the benefit also increased from 66% in 1986 and 94% in 1991. This sharp increase in the program coverage was the natural consequence of an increasing awareness of workers about the program existence and rules as well as a result of the relaxation of some of the eligibility requirements.

Although a complete analysis of the effects of the unemployment insurance program on the behavior of the Brazilian labor market was not undertaken in this project, there is clear evidence that the implementation of such a program did not lead to an increase in the rate of unemployment or a reduction in the degree of informality, as most labor market theories would predict.

Despite of a small increase in the rate of open unemployment from 1986 to 1987 (from 2.5% to 3.5% of the economically active population), the unemployment rate stayed constant at this new level until 1990. More importantly, despite of the 1990/92 recession being more severe, in terms of the reduction in industrial output, than the one between 1981 and 1983, the rate of open unemployment was considerably smaller in the 1990/92 period than in the 1981/83 period.

With respect to the degree of informalization, the Brazilian urban labor market has experienced a mild increase in informality since 1986. This fact goes against the hypothesis that the informal sector works as a buffer employing at low wages workers unable to survive to even brief periods of unemployment. If this hypothesis were correct, the introduction of unemployment insurance would have reduced the importance of the informal segment of the labor market. These results point to the importance of a careful analysis of the impact of the introduction of the unemployment insurance program in Brazil on the functioning of the labor market.

In summary, the second half of the 1980s saw the creation and growth of an increasingly solid unemployment insurance program in Brazil. Given that almost universal coverage has already been achieved, the current debate has focused on whether or not the duration generosity of the benefits should be

increased. In the 1990s, this program will certainly be an important tool available for reducing the distributive consequences of any process of adjustment.

VII. CONCLUSIONS

This paper shows that there is an important relation between human resources and the costs of economic adjustment process in a country. As any adjustment process implies changes in employment positions of an important share of the labor force, if the degree of flexibility of the labor force to changes in employment or occupational structure is very small, the costs of the adjustment will be high. The costs can be born on the form of unemployment or wages loss due to rigidities in human capital investments or to segmentation in the labor market.

In general, the degree of flexibility of the labor market will depend on the degree of flexibility of the labor force, which will be a function of the kind of human capital investment which was made in the past. Workers with more general human capital are more able to perceive and correctly interpret economic changes, have an enlarged capacity to learn, which reduces the costs of specific training and thus, gains priority in acquiring training as firms find profitable to increase their trained labor force. On the other hand, workers with little general human capital and high levels of investment in specific human capital have a large loss when occupational and employment structures change over the adjustment process. Finally, workers with little human capital investment of any kind will have a small cost of adjustment since they loose little specific human capital during the process. Thus, the cost of the adjustment tends to increase with the increase in the gap between general and specific human capital investment.

The paper shows that Brazil is far behind others Latin American countries with similar per capita income, in terms of the quality of its general human capital resources. Illiteracy rate is high, average years of schooling of the labor force is small and currently there is under-investment in general human capital as revealed by very high dropout and repetition rates in the country are very high. On the other hand, regional disparities in educational performance and on the degree of investment in education are large. Moreover, this regional disparities are not being compensated by Federal transfers to the education system of the poorest regions.

The paper also shows the importance of the vocational educational system in Brazil, the SENAI and SENAC, to reduce the under-investment in general and specific human capital investment in the country. Given the good quality of the services of these two institutions, it was possible for the industrial and service sectors to, at least in part, avoid the problems originating in the very poor quality of the human resources coming from the formal educational system.

One important question which is analyzed in the paper is the evolution of these vocational schools, mainly SENAI, in the direction of more specific and less general education. This trend will tend to reduce flexibility of the labor force and thus increase the costs of adjustment.

The paper also analyzes the relation between the formal and the informal segments of the Brazilian labor market. It is shown that during the 1990/91 recession, the informal segment behave as a buffer, i.e., during this period the informal segment was able to avoid the unemployment of workers displaced from the formal segment. The same phenomenon, however, was not observed during the 1981/83 recession. Even when the informal sector works as a buffer the cost of adjustment can still be very high due to the loss in wages a worker suffers when they have to transit from one segment to another. However, since there is high mobility between these two segments of the labor market in Brazil, these wage losses are temporary further reducing the cost of adjustment for the labor force.

Finally, the paper analyzes the degree of labor market flexibility and how different institutional arrangements affect flexibility in the Brazilian labor market. It is shown that the rate and the duration of unemployment in Brazil is relatively small, as compared to other countries, which is a result of the low cost to dismiss workers and to the incentives created by the FGTS to the labor force. Thus, Brazilian labor legislation is not an important source of rigidity and so can not be considered an important source of cost of adjustment in Brazil.

APPENDIX

TABLE 5.20

Countries	GDP/PPP (1989)	Attendance Rate (1990)	Years of Schooling(1990)	Attendance Rate (1985)	Repetition First Grade (around 1980)	Repetition Primary Education (1980)
	(1)	(2)	(3)	(4)	(5)	(6)
Haiti	962	47	2	0.55	16 (**)	21 (a)
Nicaragua	1463		4	0.70	26	17
Honduras	1504	27	4	0.75	26	16
Bolivia	1531	23	4	0.84		
El Salvador	1897	27	4	0.60	16 (*)	9 (b)
Cuba	2500	6	8	0.94		6
Guatemala	2531	45	4	0.53	26	15
Rep. Dominicana	2537	17	4	0.89	27	18
Peru	2731	15	6	0.97	28	19
Paraguay	2742	10	5	0.78	20	14
Ecuador	3012	14	6	0.87	14	10
Panama	3231	12	7	0.89	20	13
Colombia	4068	13	7	0.76	20	
Argentina	4310	5	9	0.95	15	
Costa Rica	4413	7	6	0.84		8
Brazil	4951	19	4	0.74	29	20
Chile	4987	7	8	0.89	12	
Mexico	5691	13	5	0.99	19	10
Uruguay	5805	4	8	0.91	27 (***)	15
Venezuela	5908	12	6	0.87	14	10

Source: (1) United Nations (1992).

(2) Anuario Estadístico de América Latina y el Caribe (1991, primera parte, N.1, tabla 30, p.54).

(3) Desarrollo Humano: Informe 1992, tabla 1, pp.292-299.

(4) Improving Primary Education in Developing Countries (1991, Tables A3 and A1, pp.253 to 258 and pp.240 to 246).

(5) Statistical Yearbook (1991, pp.3-137 to 3-140 and 3-147, except Argentina, 1987, pp.3-136).

(6) Improving Primary Education in Developing Countries (1991, Table A11 pp.301 to 306).

Notes: (*) Include night schools.

(**) The primary education includes children classes.

(***) The data are concerning to public education.

(a) The data are concerning to 1979.

(b) The data are concerning to 1981.

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