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Tapping Brazil's labour potential: Trends and insights

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Tapping Brazil's Labour Potential:
Trends and Insights*

by
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Tapping Brazil's Labour Potential: Trends and Insights

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I. Introduction

Examining labour market developments in Brazil, the fastest growing economy in Latin America over the twenty years through 1985, means dealing with the impact and interactions of policies in a multifaceted country the size of a continent, harboring very large differences in population densities and income levels. However, as the title of the paper already implies, no attempt is made to do justice to all the manifold issues engendered within such a complex economy¹. The paper is thus limited to focussing on macroeconomic and sectoral labour market developments - be they on the demand or supply side of labour/human capital - and in this context on the impact of policies within the formal sector. The basic thrust of the evidence presented thereby is aimed at determining to what extent labour market policies in Brazil (especially as they impacted on the manufacturing industry) allowed labour to be efficiently employed.

The paper begins by outlining overall labour market trends and structures as they evolved within general economic developments in Brazil (and other countries) over the two decades through the mid 80's, placing stress thereby on recent events. This is followed in Section III by an overview of factors influencing/shaping the demand for labour, first generally speaking and on a comparative international basis before turning then to policies directly affecting the price of labour in Brazil (e.g. minimum wages and wage indexation). The impact of such policies is further examined in Section IV, moving from the primarily macroeconomic thrust in Section III to a sectoral analysis of two specifically selected industries: the clothing and automobile industry. These industries are prime examples of traditional (i.e. the clothing industry) and non-traditional (i.e. the automobile industry) exporters. But beyond this, they cover quite well a large segment of the spectrum of labour/human-capital intensive production process-

¹ For overviews of Brazil's industrialization policies up through 1980 see Tyler (1976 and 1981); for the period since then see Fasano-Filho, Fischer, Nunnenkamp (1987).

es beginning with the most labour intensive, i.e. the clothing industry. Hence, they should capture equally well the differentiated impact of policies affecting the labour market, particularly in light of the fact that shifts to capital/high-technology intensive production methods are largely given in the automobile but hardly in the clothing industry. Section V then switches to the supply and quality of labour, reviewing the policies enacted/prevailing, examining these vis-à-vis Brazil's development path and its probable future course. In the final Section VI conclusions are drawn as concerns tapping Brazil's labour force potential and recommendations are made regarding a more efficient structuring of labour markets.

II. Labour Market Trends in Brazil

The Period up to the "Second Oil Shock": 1965-1980

On the whole, labour force developments in Brazil through the end of the 70's portrayed an economy capable of absorbing labour faster than the growth rate of the population. Not only were new entrants finding jobs, but labour was also being drawn out of unemployment or underemployment into better paying jobs and - in particular - the female labour force more than doubled in the 15 year period from 1965-1980 (see Macedo, pp. 4-5). As can be seen from Table 1¹, although Brazil was not alone among the developing countries (DCs) increasing its utilization of labour in this time period, it was ranked just behind Taiwan, South Korea and Malaysia in its macro-economic ability to expand the labour force at least as fast as the population was growing (i.e. as can be seen when comparing the

¹ In Tables 1 and 2 developments in Brazil are placed in an international perspective by including data on the average of all middle income developing countries, two other important Latin American countries (Colombia and Mexico) as well as possible competitors in Asia (Malaysia, South Korea and Taiwan). While not all the figures in these two tables are specifically mentioned in the text, the tables provide additional background information to allow readers to draw a more complete picture of economic developments.

Table 1: Development Indicators¹ for Brazil and Selected Latin American/Asian Countries: 1965-1985²

	Middle Income Countries		Brazil		Colombia		Mexico		Malaysia		South Korea		Taiwan	
	1965-1980	1980-1985	1965-1980	1980-1985	1965-1980	1980-1985	1965-1980	1980-1985	1965-1980	1980-1985	1965-1980	1980-1985	1965-1980	1980-1985
GDP/Capita	3.9	0.2	<u>4.7</u>	-0.5	3.2	0.1	3.3	-0.9	<u>4.3</u>	<u>4.2</u>	<u>7.5</u>	<u>6.0</u>	<u>7.2</u>	<u>4.7</u>
GDP by sectors														
Agriculture	3.5	2.1	<u>4.7</u>	<u>3.0</u>	<u>4.3</u>	1.8	3.2	<u>2.3</u>	<u>7.3</u>	<u>3.0</u>	3.0	<u>6.3</u>	1.9	1.0
Industry	7.6	1.2	<u>10.0</u>	<u>0.3</u>	<u>5.5</u>	2.9	7.6	<u>0.3</u>	<u>8.9</u>	<u>6.7</u>	<u>16.6</u>	<u>9.6</u>	<u>13.5</u>	<u>5.9</u>
Services	6.7	1.9	<u>9.4</u>	<u>1.8</u>	6.4	<u>1.6</u>	6.6	0.8	<u>6.0</u>	<u>5.9</u>	<u>9.4</u>	<u>6.7</u>	<u>9.1</u>	<u>6.9</u>
Consumption														
Private	6.3	1.5	<u>9.1</u>	<u>2.2</u>	<u>5.9</u>	2.6	5.9	0.1	6.0	<u>3.8</u>	7.9	<u>5.5</u>	<u>8.3</u>	<u>5.9</u>
Government	7.2	2.9	<u>6.5</u>	<u>0.2</u>	<u>6.7</u>	<u>1.4</u>	<u>8.5</u>	<u>3.3</u>	<u>8.5</u>	<u>3.6</u>	<u>6.7</u>	<u>3.4</u>	<u>7.2</u>	<u>5.6</u>
Investment - gross	8.6	-3.9	<u>10.2</u>	-5.5	5.8	<u>0.6</u>	8.5	-9.1	<u>10.4</u>	<u>5.3</u>	<u>16.5</u>	<u>9.6</u>	<u>15.2</u>	<u>-0.7</u>
Exports	3.2	3.7	<u>9.4</u>	<u>6.6</u>	1.5	1.6	7.7	<u>10.1</u>	<u>4.4</u>	<u>10.7</u>	<u>27.3</u>	<u>13.0</u>	<u>18.4</u>	<u>8.7</u>
Imports	6.0	-1.0	<u>8.3</u>	<u>-9.1</u>	5.3	-1.4	5.7	<u>-11.3</u>	<u>2.2</u>	<u>6.4</u>	<u>15.2</u>	<u>9.8</u>	<u>16.2</u>	<u>3.4</u>
Inflation rate	21.1	57.4	<u>31.6</u>	<u>147.7</u>	17.5	22.5	13.2	<u>62.2</u>	4.9	3.1	18.7	6.0	8.4	3.9
Money Supply ³	26.1	44.3	<u>43.4</u>	<u>175.6</u>	<u>26.5</u>	27.2	21.7	<u>61.4</u>	21.5	15.5	<u>35.5</u>	18.4	24.1	22.3
Population														
Total	2.4	2.3	<u>2.5</u>	<u>2.3</u>	2.2	1.9	3.2	2.6	<u>2.5</u>	<u>2.5</u>	1.9	1.5	2.3	1.6
Urban	4.4	3.5	<u>4.5</u>	<u>4.0</u>	3.5	2.8	<u>4.5</u>	<u>3.6</u>	<u>4.5</u>	<u>4.0</u>	<u>5.7</u>	2.5		
Labour force	2.5	2.5	<u>3.3</u>	<u>2.3</u>	<u>2.6</u>	<u>2.8</u>	<u>3.9</u>	<u>3.2</u>	<u>3.4</u>	<u>2.9</u>	<u>2.8</u>	<u>2.7</u>	<u>3.6</u>	<u>2.9</u>
Potential labour force ⁴	2.5	3.0	<u>3.0</u>	<u>3.0</u>	<u>3.7</u>	1.6	<u>3.5</u>	<u>3.0</u>	<u>3.3</u>	<u>3.6</u>	<u>3.0</u>	2.1	<u>3.6</u>	2.5

Note: The underlined values are equal to or above averages for Middle Income Countries.

¹ Annual growth rates; where relevant only in real terms. - ² While most of the series cover 1985, in some cases only data ending marginally were available. It is assumed that such minor distortions do not noticeably affect the overall picture. - ³ M₂; figures for Middle Income Countries actually for all developing countries. - ⁴ Population between 15 and 64 years.

Source: Excepting Taiwan either drawn or calculated from World Bank (1987) and IMF (1986) data. For Taiwan: CEPD (1986) and Executive Yuan (1986).

ratio between the labour force growth rate between 1965 and 1980 and the population growth rate in the same period). And as a matter of fact, when comparing labour force growth with the more relevant working-age population cohort (i.e. 15-64 years of age) Brazil's ability to create new jobs more rapidly than the potential labour force was expanding, thus increasing labour force participation, was just marginally surpassed by just one other country, namely Mexico, in the initial time period.

Examining Table 1 a little closer, it can be seen that Brazil's labour market performance - even with higher than average inflation rates - was fueled from a broader expansion of supply and/or demand-side factors than in the case of other countries. Thus tapping the large domestic demand potential (derived from a population around 120 million with a per capita income exceeding \$ 2000/yr) plus export markets as well as rapidly increasing investments by a similar rate opened up job opportunities across sectors and - particularly important in a vast country like Brazil - across regions. Jobs in the manufacturing industry in the disadvantaged Northeast region, for instance, increased in the last third of the 15 year period (i.e. 1975-1980) over 50% faster than those of the core region (i.e. the Southeast) around Rio de Janeiro and São Paulo (+36.8% vs. +23.7%: IBGE [1983], p. 483).

It is of course true that such differential regional growth rates caused only a small reduction in the overpowering economic base of the Southeast: its share in manufacturing value added dropped only 4 percentage points from 77% to 73% and in manufacturing employment only 3 from 69% to 66% (IBGE [1983], p. 483). Nonetheless, it is also true that labour market developments in the Northeast reflected the exceptionally strong demand for labour toward the end of the 70's and the attempts to avoid labour shortages as well as large wage increases by moving to disadvantaged areas where the labour market was not as tight and where regional incentives were also offered. It must be stressed, however, that the more rapid increase in

jobs in the Northeast, at least to the extent that they were induced by incentives, also had its price: the cost per job created amounted to \$ 80,000 - \$ 200,000 depending on assumptions made¹. Even if the lower estimate is used, when compared with a per capita income in 1984 of \$ 800 the inefficiency of the incentives packages is quite obvious.

In addition to this locational mobility of firms to create jobs in the Northeast, they also opted (at the same time) across the entire economy more often for new or rather extensive capital equipment to improve productivity and hence reduce the necessity to employ more labour (e.g. see Edwards). This can be evidenced by the notable increases in average productivity in the manufacturing and commerce/services sector in the 70's as opposed to the earlier periods (Macedo, Table 2). Coupled with this increase in the physical capital intensity of production there was no doubt a concomitant upgrading in skill levels through on-the-job-training and through increased an outflow of students from educational facilities beyond primary level (see Table 2).

Nonetheless, with respect to increasing human capital levels Brazil lagged behind most other middle income DCs (see Table 2). Particularly when compared with Asian competitors is the difference quite considerable. As a matter of fact, the higher the level of schooling, the greater the difference between Brazil and countries like South Korea or Taiwan. Just as characteristic of the situation in Brazil is the development of educational expenditures (as % of government expenditures, see Table 2), which have decreased considerably over time. It is actually quite surprising to find out that out of 25 Latin American countries Brazil's central government expenditure on education (as % of GDP) is third from the bottom and less than

¹ Based on unpublished information made available to author.

Table 2: Labour Market, Human Capital and Economic Structure Indicators for Brazil and Selected Latin American/Asian Countries

Indicators	Time period (A+B)		Middle Income Countries		Brazil		Colombia		Mexico		Malaysia		South Korea		Taiwan	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
Wages (real) ¹					3.8		-0.2	3.2	2.9	-4.1			10.0	5.6	8.6	9.4
Investment deflator ²	18.5	45.9	34.3	17.4	18.0	24.2	13.7	64.5	6.8	1.4	16.7			7.3	0.7	
Interest rate (deposits) ³							31.3	29.1	26.2	59.5	6.2	8.6	14.8	6.0	10.3	5.3
Education expenditure (%) ⁴	14.0	11.5	8.3	3.2					16.4	12.4	23.4		15.9	18.4	17.3	19.8
School enrollment (%) ⁵																
Primary	85	104	108	103	84	119	92	116	90	97	101	99	97	100		
Secondary	22	47	16	35	17	49	17	55	28	53	35	91	57	99		
Higher levels	6	13	2	11	3	13	4	15	2	6	6	26	72	82		
Employment structure (%) ⁶																
Agriculture	56	43	49	31	45	34	50	37	59	42	55	36	47	20		
Industry	17	23	20	27	21	24	22	29	13	19	15	27	22	42		
Services	27	34	31	42	34	42	29	35	29	39	30	37	31	38		
Manufacturing structure (%)																
Textiles/clothing			11.1	10.5	21.3	17.2	11.1	9.5	6.6	7.1	24.9	20.1	16.2	17.5		
Machinery/transport			25.2	26.3	11.4	11.9	21.0	22.0	18.0	24.7	17.4	22.5	21.7	22.3		
Basic iron/steel			6.7	6.5	3.6	3.9	7.0	7.6	3.4	2.7	8.1	8.4	5.3	6.4		

¹A = 1970-1980; B = 1980-85. - ²A = 1965-80; B = 1980-85. - ³A = 1980; B = 1985. - ⁴A = 1972; B = 1985. - ⁵A = 1965; B = 1984. - ⁶A = 1965; B = 1980. - ⁷A = 1974; B = 1983.

Source: Excepting Taiwan based on various appendix tables in World Bank (1987), IMF (1986) and UNIDO (1986). For Taiwan: CEPD (1986) and Executive Yuan (1986).

one third the average (see IADB [1987], Table IV-6). To what extent this could prove to be a hindrance in connection with tapping changing comparative advantages up the skill ladder is an open question. It is of course true that policies did exist in Brazil which allowed skills to be acquired and improved on-the-job (on-the-job training: OJT) - a process which was eventually promoted through special tax treatment of training expenditures. Nevertheless, over the years it became apparent not only to firms demanding specific types of skilled labour but also to the government that more effective efforts needed to be taken to match the challenges of the future. Furthermore, technological advances were perceived as emerging at a pace which could only be matched if the necessary foundations for additional knowledge, i.e. beyond mere OJT-acquired skills, had already become part of the human capital of those involved. On top of this, that is in connection with government policies (germinated toward the end of the 70's) to direct resources into the development and manufacturing of technically more sophisticated products, was the additional need for measures aimed at increasing human capital levels.

The degree of urgency for such a program seemed to be more than evident: by the end of the 70's Brazil was already a net exporter of various manufactured items which were relatively high-technology and/or human-capital intensive; among these items were airplanes, electronic equipment, automobiles and military hardware.

The Crisis Years: 1980-1985

Despite the massive increase in the price of oil around the turn of the decade and almost benignly ignoring the first wave of DCs on the brink of heading into a "debt" crisis, Brazil continued to adhere to expansionist policies (see e.g. Meyers,

McCarthy)¹. Overall labour market developments thus initially (i.e. well into 1980) hardly reflected the international difficulties already being foreshadowed elsewhere. However, as inflation rates rapidly soared into the 3-digit range and a greater recourse to foreign sources of capital seemed to be inevitable, highly restrictive fiscal and monetary policies were introduced in late 1980 (see Fasano-Filho, Fischer, Nunnenkamp, 1987). Their impact is only partially apparent in Table 1, as through 1983 GDP/capita actually fell by an average of over 4%/year. On the other hand, the depth of the recession and its impact on employment was felt most definitely in manufacturing, where it dropped across the board, in most cases quite considerably (see Table A1).

In a broader context the severe recession in the early 1980's not only meant that employment levels were reduced, new entrants into the labour force could not find work either. With a labour force of over 43 million in 1980 and growth rates of the potential labour force running around 3%, 1.3 million new entrants (on average) could be expected to offer their services to the market every year in the first half of the 80's. Despite the fact that the manufacturing sector accounted for 27% of the employment increase in the decade of the 70's, services for almost 23% and agriculture actually contributing a negative, albeit small amount (i.e. -3%), the "crisis years" of the early 80's engendered a very different pattern in the economy.

Whereas the increase in employment in the service sector tallied to 29% of the total increase of 4.74 million persons in

¹ GDP, for instance, increased in 1980 at the fastest rate since 1976 (7.2% in real terms) and consumption as percentage of GDP remained in the early 80's at the high level it had jumped to in 1979 (79.8% vs. an average of 74.9% over the previous 10 years [IMF, 1986, Tables 96 and 99]. See also IADB (1980-81), pp. 187-189.

the period 1981-84, the manufacturing industry was able to account for a mere 7%. Agricultural employment on the other hand, commanded over one third (i.e. 35%) of the total increase in employment in this period, reversing thereby a downward trend which could be observed over the last 3 decades¹. Although industrial production recovered rapidly in 1984 and 1985 corresponding changes in employment did not evolve. The question about the reasons for and implications of these recent trends must be posed.

III. Examining the Factors Shaping Labour Demand

Determinants of the Demand for Labour: the Underlying Factors

Despite the fact that production patterns and hence employment changes generally reflect the response of the economy to income-induced changes in demand (or to exogenous shocks), longer term employment developments are determined by other, more fundamental factors. That is, underlying and codetermining the profile as well as the structure of changes in the demand for and supply of labour in a market-oriented economy, in this case Brazil, are basic shifts in the relevant economic parameters.

First of all, there are all those policies which impact upon the demand for labour via measures influencing directly the level of pay (i.e. minimum wages and wage policies), hours/days of work, working conditions, social benefits and job termination. An overview of some of the more important measures prevailing in Brazil in the mid-1980's is presented - together with other countries - in Table 3. Secondly, concomitant to the above were manifold policies enacted and instituted by the Brazilian government to influence the structure

¹ It is perhaps worthwhile to recall and contrast developments after the second oil price shock with the reactions to the first oil shock in 1973, in the course of which employment and output in the industrial sector maintained their above average growth rates. See, e.g. Meyers, McCarthy, pp. 5-8.

of the economy and the structure of the production process (e.g. investment and export incentives). One direct result of these measures or rather of the rapid growth of various non-traditional industries created thereby, was a large and continually expanding demand for specific types of skilled labour¹.

The consequence of the interaction between these two points is quite straightforward in an economy (like Brazil) where the relative prices of the factors of production determine the degree to which these factors are employed in the production process. In the context of the following analysis, which focusses on the impact of labour market policies on the demand for and supply of labour, the price of labour as a factor of production became - due to policies touched on in Table 3 and expounded upon below - relatively more expensive vis-à-vis other factors of production, i.e. human capital and physical capital. Under such conditions (and excluding policies causing prices of the other factors of production to increase by similar amounts) it can be assumed that entrepreneurs will react by increasing investment in more physical capital equipment as well as in more human capital production methods. While the former could well embody deskilling in addition to substituting physical capital for labour, the latter implies more qualified, but fewer employees (probably) coupled with more physical capital².

¹ While this paper only examines the issues on a macro- or sectoral level, the author realizes that the location of many of the new industries in or near the large conurbations tended to amplify the attractiveness of such areas, inducing thereby urban or regional problems not expounded upon in this analysis.

² Further reinforcing policies which tend to promote the substitution of capital for the existence of unions, i.e. at least to the degree to which they succeed in inducing entrepreneurs to effectively remunerate at rates beyond productivity levels. Given the fact that trade unions have become increasingly active or rather even militant in Brazil since the end of the 70's, their impact cannot be overlooked. To deal with them more specifically, however, goes beyond the author's brief or rather the intent of this paper.

Labour Market Interventions: Putting Brazil into International Perspective

Returning now to the issue of specific labour market policies in Brazil, it must be considered as being similar to most other Latin American countries and quite different from Asian countries; this at least is the picture which can be developed from Table 3¹. It is perhaps best characterized as being interventionist². Generally speaking, not only does a highly complex Labour Code (LC) exist to generally structure relationships between employees and employers, but minimum wages and executive decrees directly influence wage levels throughout the economy.

However, before examining in greater detail specific policies in Brazil which influenced the price of labour, a closer analysis of Table 3 helps to place Brazil's international competitive position with respect to tapping its abundant supply of labour into a better perspective.

Minimum wages: While the information contained in this column shows that Brazil has minimum wages and adjusts them quite frequently, it unfortunately does not adequately portray the real impact of wage floors. First of all, it is not known to what extent minimum wage levels are relevant for a significant number of the labour force covered by such legislation. In the case of Brazil, for instance, over 55% of the employed persons in 1984 earned less than two minimum wage rates (IBGE, 1985). Indications are that, when

¹ Table 3 covers other important countries in South America and Asia (either because they are competitors or have effected policies of particular interest here). Since the table is meant to be brief but informative, not all details of certain measures could be presented. See also Salowsky (1985).

² For an overview of developments in labour market law in Brazil see Süssekind (1985); for the prevailing relevant laws see ILO (1985).

Table 3 - Overview of Labor Market Regulations and Conditions in Brazil and Selected Latin American/Asian Countries - around 1985/86

	Minimum wages	Working hrs., overtime	Vacation, bonus	Job Termination		Nonwage labour costs		Normal days work/yr. ^a	Mill operating days/yr. ^a
				Severance	Dismissal	Social security (%)	Total ^a (%)		
Brazil	M. rates, adjusted often	40-48 hrs. (office/ind.) over 5-6 Ds. OT : + 20% S+H: +100%	30 C. days after 1 yr. 1 M. bonus	8 or 30 D.notice + payout of 8% payroll tax collected + interest	Notice necessary + 10% of pay-tax if no cause	25	107	273	284
Argentina	M. rates, adjusted often	48 max. over 6 Ds. OT : + 50% S+H: +100%	14/21/28/35 C. days for 1-5/5-10/10-20/>20 yrs.	1 M/yr. service but not > 3 min. wages	OK, but severance if no serious charge made against employee	24	72	264	267
Colombia	M. rates, adjusted yearly	48 hrs. over 6 Ds. OT : + 25% S+H: +200%	15 working days after 1 year Up to 1 M. bonus	15/30 D.notice for fixed/indefinite; indemnity if no cause	OK, but only if Labor Court agrees	13	80	277	294
Mexico	D. rates, adjusted periodically	40-48 hrs. OT : +100% S+H: +125-200%	6 Ds. after 1 yr. + 2 Ds./yr. thereafter; Bonus: min. 3 W.	30 D.notice 3 M. wages + 20 Ds./yr.	OK, but severance if no cause	10	78	290	315
Peru	M. rates, adjusted often	48 hrs. over 6 Ds. OT : +25-100%	30 Ds. after 260 working days 1-2 M. bonus	After 3 M. almost impossible 1 M./yr. worked	After 3 M. almost impossible	6	70	278	280
Hong Kong	none	48 hrs. over 6 Ds. OT : 75% H : 50%	7 Ds. after 1 yr. + 11 holidays	-	-	-	13	295	339
South Korea	none	48 hrs. over 6 Ds. OT : + 50%	12 Ds. or 1 D./M. worked; after 1 yr. + 1 D./yr. + 16 holidays	30 D.notice	-	4	55	286	308
Taiwan	D. rates, adjusted seldom	44-48 hrs., over 5.5-6 Ds. OT : +14 H : +34	7/10/14 days for 1-3/3-5/5-10 yrs. If >10 yrs. + 1 D./yr. + 14 holidays	1 M./yr. up to 3 yrs. After 3 yrs. 3 M. + 10 Ds./yr.	-	7-10	45	345	355

Abbreviations used: M = month/monthly; hrs. = hours; D(s) = day(s)/daily; OT = overtime; S+H = sundays and holidays; C = calendar; yr. = year

Note: Information in this table was culled from various sources. While every attempt was made to ensure that the information is comparable, conflicting or differing statements meant decisions had to be made in one direction or another without knowing which was correct.

^aAlthough this information applies to the primary textile industry (derived from Werner [1986]) it can be generally assumed to roughly reflect the relative labor market conditions between the countries.

compared with the other Latin American countries, this share for Brazil is relatively high. Thus increasing minimum wages in Brazil will have a greater immediate influence on costs and in the longer run on the demand for labour. Secondly, neither the degree of coverage (i.e. % of employed) is known nor is there an indication of the extent to which the legislation is enforced. In the latter case the importance of the public sector and the organized private sector as well as the strength of unions, the size of firms and distance from administrative centers all play significant roles.

While - generally speaking - countries have been easing up on the application of minimum wages in recent years, in particular through letting inflation erode the relative height of the wage floors, Brazil (as will be shown) actually increased its activities over the last decade in indexing minimum wages/wages to inflation rates. For comparison's sake: Taiwan can be considered as lying on the other end of the spectrum, with minimum wages not being adjusted for periods of many years and their relevance for wage levels (i.e. for a sizeable share of the wage earners) being quite small.

Working hours/overtime: The ability to smoothly adjust production schedules in line with market demand factors is an essential ingredient in remaining competitive in an outward and market-oriented economy. Given the all-encompassing approach of many Latin American labour codes, this has led to large disincentives being created which work against multiple shift operations, as well as overtime, by making them more expensive. For instance, in the case of shift work and overtime regulations have been instituted to "protect" employees (e.g. prohibition of females working at night), but in reality they often lead to increased investment in capital equipment and thus end up causing fewer jobs to be created for those who was supposed to be pro-

tected. Colombia is often considered as being particularly adept among the Latin American countries in imposing such disincentives (e.g. wage premiums must already be paid beginning at 6:00 P.M.), Brazil (in a sample of nine developing countries from around the world) was second to last (India was last) with respect to labour flexibility (see E.M.F. [1986], p. 121).

Perhaps also indicative of the flexibility with which the factors of production (i.e. labour and capital together) can be used is the number of days/year which production lines (i.e. mill operation) can be run. Brazil's position vis-à-vis the other Latin American countries in Table 3 is mid-field, with Argentina and Peru below it but Colombia and Mexico above it. Again, when compared with the Asian competitors, especially Taiwan, the difference is considerable.

Vacation/bonuses: After taking everything into consideration Brazil's normal working days/year amount to 9 more than the lowest number listed (i.e. Argentina), but 17 less than its most industrious Latin American competitor (Mexico) and 72 less than Taiwan. A more characteristic difference between Latin America and Asia is the treatment of bonuses: Whereas in LA they are essentially seen as being part of the wages (as dictated by labour codes), in Asia they are treated as something which must be strived for, i.e. they tend to be paid in accordance with the profitability of the company.

Job termination: Regulations governing the conditions under which employment contracts can be terminated are (probably) as important for employers as those which govern direct wage costs and flexibility. Although definitive cross country information on this topic is missing, substantiation of this claim is drawn from two sources. First of all, in a survey of companies in a country with extremely restrictive termination and wage flexibility regulations (i.e. Panama; see Spinanger [1984], pp. 19 and 20), the conditions surrounding employment contracts were listed as causing the most difficulties for employers in connection with the Labor Code (mentioned by 31% of the 54 firms answering)¹. However, when expressed in terms of costs involved, termination conditions were roughly 200% more costly than those stemming from union or wage flexibility reasons². Secondly in an ongoing study on barriers to entry in the Caribbean Basin, companies expressing interest in certain countries have stressed the importance of employment contract flexibility in making their investment decisions. It can thus hardly be surprising that Panama is one of those countries which has attracted relatively little foreign direct investment.

¹ Union related Labor Code problems accounted for 27% and wage costs/inflexibility for 24%.

² Wage cost reductions were estimated to amount to 32% if employment contract conditions were liberalized. Changes in regulations vis-à-vis unions or wage flexibility would result in wage costs being reduced by only 11% in each case (Spinanger, 1984, p. 20).

Brazil's relative position with respect to job termination in Latin America is one which - when based on Table 3 would seem to be fairly liberal - actually seems to be tending toward being one of the more restrictive countries on the continent. Not only are labour courts and union activities making it more difficult or at least more expensive to terminate contracts (see Macedo, p. 45), the initial proposals for the new constitution incorporate ideas of permanent job security. Should such proposals indeed become law, then Brazil would move up toward a level similar to Peru's (or Panama's), where termination of employment contracts is extremely difficult or rather very expensive. The impact in Brazil, however, would be far more severe than in Peru, as the formal sector in Brazil accounts for roughly two thirds of the labour force (see e.g. IADB [1987], pp. 124-127), but for only 10% in Peru (see Carbonetto [1986], section 2.6)¹.

Relative to the Asian countries none of the Latin American countries can measure up to them with respect to flexible job termination. Although often referred to as "hire and fire" principles, evidence from the Asian countries points in the opposite direction and even reveals a remarkably stable labour force and a long-time attachment to the individual companies (see e.g. Galenson [1979], p. 410 and pp. 434-435) "given satisfactory productivity levels".

¹ It might be noted that in Panama, following the introduction of the Labor Code in 1972, 75% of the employment increases through the mid 1980's were in the government sector. In other words the private sector found it too risky to employ additional workers, who might be very expensive and difficult to release at a later point in time. Needless to say, the informal increased as well, as could be evidenced by a sizeable reduction in labour force participation rates.

Nonwage labour costs: With respect to Brazil's international competitive position the data on nonwage labour costs would seem to be more conclusive than those in the other columns: Brazil leads the Latin American countries listed in Table 3 and is multiples ahead of the Asian countries. In particular the increased activities of unions since the early 80's (see Macedo [1986], p. 45) has resulted in stronger demands being placed on employers for additional fringe benefits. Since there is little evidence that this trend is tapering off and with government bodies tending to support additional social legislation in times of "crisis"-induced difficulties, the pressure to further increase nonwage labour costs would seem quite strong. Among the other Latin American countries perhaps only in Peru would the pressures also seem to be as strong, although - as noted above - they would only affect about 10% of the labour force there.

While these various pieces of information on nonwage labour costs must be evaluated together with specific wage and productivity levels in order to compute and compare actual per unit output costs. They do tend to impact in the same direction as many of the points mentioned earlier. Furthermore, knowing that ratings of vocational training as well as the quality and quantity of skilled labour are very low (EMF [1986], p. 155)¹, the factors working against improving Brazil's competitive position are quite evident.

Labour Market Interventions in Brazil: the Impact of Past and Prevailing Policies

In summarizing the above it can be stated that labour market interventions in Brazil are ubiquitous and in many cases have been expanded upon in recent years. In the most straightfor-

¹ Out of the 9 developing countries in the survey Brazil was ranked 7th in vocational training (tied with India but ahead of Mexico), 8th in quality of skilled labour (tied with Mexico) and 9th in quantity of skilled labour.

ward attempt to influence the price of labour, i.e. in the case of minimum wages, the Brazilian government actually went to great lengths over the 15 years prior to 1980 to refine minimum wage and wage policies, particularly in accordance with price stabilization (see Carvalho, p. 109-110)¹. In 1979, however, basic changes were enacted in these wage policies², which still permeate prevailing policies in the mid 80's. Among other things these led to a differentiated impact on companies disaggregated by size and sector (see Table 4). Since this set-up means that those on the lower end of the pay scale (as measured in multiples of minimum wage levels) receive a far greater compensation for inflation, the implications over a longer period of time are quite clear: it decreases the demand for low-wage workers and leads all the more to capital intensive investment - particularly in the smaller size establishments - the smaller the possibility to pass on the wage increases.

While further changes in the system of adjusting minimum wages and wages were instituted during the early 80's they did nothing to rectify the "advantage" low-wage, i.e. low-skilled, workers were given by being compensated for up to 110% of inflation (i.e. for the cohort up to a wage equivalent to 3

¹ The basic principles up through 1979 stipulated wage adjustments at best yearly, based on real wages two years past, and took productivity increases and projected inflation rates into consideration. The changes made from the mid 60's through 1979 reflected prevailing economic concerns (see Carvalho, p. 113); i.e., during the initial period (i.e. through 1968) coverage was broadened and consolidated; then correction made for underestimating inflation (1968-74), emphasizing income distribution aspects (1974-76) and taking into account more rapidly accelerating inflation (1976-79)

² Base reference period was shortened from 24 to 6 months, wage adjustments tapered off according to multiples of minimum wage rates and differentiated productivity-rate induced wage increases permitted, whereby such increases could not be passed on in higher prices.

Table 4 - Impact of Wage Adjustments on Payrolls by Establishment Size and Sector¹ - Wage Policy Nov. 1979 - Dec. 1980 (I) versus Post Dec. 1980 (II)

Establishment size ²	Industry			Commerce	Services
	Total	Clothing, etc. ³	Motor vehicles		
Wage Policy I (Nov. 1979 - Dec. 1980)					
0 - 5	3.4	1.5	1.8	3.0	4.4
5 - 20	2.9	1.5	3.0	1.7	2.2
20 - 250	1.0	0.3	2.2	-0.7	0.2
250 - 1000	-0.2	-0.7	-0.1	-3.2	-0.9
≥ 1000	-1.3	-1.2	-0.3	-1.2	-1.2
Total (actual)	1.035	1.075	1.022	1.054	1.029
Wage Policy II (Post Dec. 1980) ⁴					
0 - 5	5.9	2.3	2.3	5.2	7.5
5 - 20	5.5	2.7	5.5	3.4	2.6
20 - 250	2.0	0.5	4.0	1.0	0.5
250 - 1000	-0.7	-1.3	-1.1	-7.5	-2.5
≥ 1000	-2.4	-1.7	-0.3	-2.3	-2.0
Total (actual)	0.990	1.060	0.975	1.026	0.985

¹The numbers for an individual sector and establishment size represent the specific change relative to the change for the entire sector. Hence, for Wage Policy I, establishment size 0-5 and Total Industry wages changed by 3.4% more than for the Total, where they actually changed by 1.035 times. - ²Number of employees. - ³Clothing, footwear and softgoods. - ⁴Wage Policy reduced the amount of wage adjustments made to those earning more than 15 times minimum wage; i.e. the wage of this group increased relatively slower when compared with those below it. See text or Carvalho (pp. 116-127) for more detailed explanations.

Source: Own calculations based on Carvalho (Tables 3, 4, 8 and 9).

minimum wages). Since the relative price of low-skilled labour vis-à-vis higher skilled (e.g. wages equivalent to 15-20 times minimum wages were given only a 50% compensation for inflation) increased considerably, rational economic behaviour would dictate that firms restructure production processes to substitute more of the latter for the former. Perhaps because such substitution processes could be observed, but also because stabilization attempts were being virtually destroyed by the impact of large (nominal) exchange rate devaluations quickly working their way through the economy¹, revisions were made in 1983 (November)², 1984 (October) and 1985 (December)³ which finally did eliminate the discriminatory impact on the demand for low-wage labour (see e.g. Baer [1987]. Despite this last change (i.e. the last one prior to the Cruzado Plan in 1986, which is not dealt with here; see Fischer [1986], for a concise and illuminating résumé) it probably came too late for damage (i.e. lower employment levels) to be undone. In order to determine whether the demand for low-wage/low-skilled labour was actually negatively affected by the wage policies within the framework of the other labour market policies mentioned above, two sets of data will be examined - first on a micro-level and then on a macro-level.

¹ From December 1982 to December 1983 the cruzeiro decreased in value by almost 75%.

² Most importantly, the compensation of 110% of inflation for the lowest wage strata was reduced to 80%. For the wage strata between 3 and 15 minimum wage rates a sliding scale down to a 50% compensation for inflation was introduced; beyond 15 minimum wage rates 50% compensation prevailed.

³ Led to a system where the six-month inflation adjustment amounted to 100% for all salaries up to 10 times the minimum wage rate and 80% for all those above this level. Further stipulation for the higher wage strata allow for additional increases (via negotiations between employers and employees) up to 20% of the increase of the official price index. All salary strata are entitled to productivity-based pay increases, determined by job classification but limited to increases of GDP/capita.

Based on the micro-data, provided by one of the major producers of transport equipment in Brazil, precisely such a hypothesized shift can be observed (Table 5), whereby part of the shift is also reflected in the substitution of salary for wage earners (i.e. white collar for blue collar)¹. Looking at the evidence reveals the fact that minimum wages were increasing at an annual rate of 143% over the period 1979-1985, while average wages increased by 135%/year. Furthermore, prices for substitute factors of production, e.g. investment goods, were increasing by 139%/year² (based on price index for machinery, vehicles and equipment) and 124%/year for buildings (in São Paulo). Given negative interest rates and investment incentives (as mentioned above) which cheapened capital investments even more, the economic necessity to replace low-paid/low-skilled workers with higher skilled workers - in order to remain competitive - is quite apparent.

But even on a macro-level (Table 6) it can be seen that in the period 1981-84 - in other words in the recession - employment in higher-paid/higher-skilled jobs increased, as could be expected given the assumed impact of the above measures (ceteris paribus): the changes were inversely correlated with ascending wage strata. That such trends did not show up in the two years during which the above measures were instituted and just leading into the recession (1979-81) cannot only be attributed to above described wage policies not having time to fully "bite"; they were also no doubt counterbalanced partly by buoyant demand, so that wage increases could be easily passed on.

¹ The author does not want to contend that the entire shift is due to policy measures, since an economy in the course of development is always in the process of becoming more skill intensive once surplus labour supplies have been exhausted and more productive labour must be drawn on.

² It might be noted that a yearly increase of 139% over 6 years means a total change by a factor of 186, whereas 143%/year over the same time period results in a total change by a factor of 206.

Table 5 - Structure of Employment¹ by Wage Strata as well as by Wage (w) and Salary (s) Earners: 1970-1985

Wage strata ²	1970		1975		1980		1985	
	w	s	w	s	w	s	w	s
1 - 3	52	13	21	7	24	1	13	0
4 - 9	48	61	79	43	69	30	84	28
10 - 15	-	26	-	35	7	21	3	35
> 15	-	-	-	15	-	48	-	38
Shares w/s in total employment	80	20	80	20	82	18	70	30

¹Distribution of wage and salary earners by wage strata based on multiple of minimum wage levels. - ²Multiples of prevailing minimum wages.

Source: Own calculations based on confidential information from a large transportation equipment manufacturer in Brazil.

Table 6 - Change (%) in Employment and Real Wages by Wage Strata¹: 1979-1981 and 1981-1984

Wage strata ²	Employment share 1979	1979-1981		1981-1984	
		Employment	Wages ³	Employment	Wages ³
1 - 2	15.3	5.93	-2.57	-2.86	-16.38
3	11.0	27.80	-1.52	-0.87	-17.46
4 - 5	15.5	10.66	-0.32	14.93	-18.56
6 - 10	19.4	9.48	-2.81	24.93	-16.99
11 - 20	15.9	6.83	-3.66	28.73	-17.28
> 20	15.1	13.75	-9.13	37.28	-13.55
Total ⁴	-	6.29	0.52	10.50	-10.51

¹% change in employment/real wages over given period for specific wage strata. - ²Multiples of prevailing minimum wages. - ³Deflated by September 1984 prices. - ⁴Total includes data not specifically listed.

Source: Own calculations based on data from IBGE (1986), p. 667.

It is perhaps worthwhile recalling in connection with this negative impact of minimum wages and wage policies on the employment of low-wage/low-skilled workers (i.e. the working poor), that during the 50's in Brazil real minimum wages expanded rapidly, but at the same time employment grew slowly and was concentrated in low-productivity areas. In the 10 year period beginning in the mid-60's, however, real minimum wages decreased noticeably, but were accompanied by strong employment growth rates (see Morley, p. 255-259). As Morley concludes (p. 259): "Over time, economic growth and the governmental policy of holding down the minimum wage have led to a large increase for below-minimum-wage workers in agriculture, and the rapid flow of workers into urban jobs at or above the minimum wage. Both of the tendencies favor the working poor". Although the relevance of Brazil's earlier experience for the labour market in the first half of the 80's can hardly be overlooked, the enactment of the above policies attest to the above mentioned influence of political pressure groups on economic policy prevailing over experience from the recent past or rather over fundamental economic knowledge.

IV. Examining the Specific Impact of Labour Market Policies: the Case of the Clothing and Automobile Industry

Beyond the negative employment impact for low-skilled workers, the question of a misallocation of resources and the evolving damage to Brazil's competitive position has yet to be assessed. After all, the majority of workers employed in the manufacturing industry was earning wages just a few multiples of minimum wage levels. A glance at Appendix-Table A2, which portrays the situation at a time before major shifts were induced by wage policies, underlines this point. Particularly in the highly labour-intensive clothing, footwear, and soft-goods industry is the concentration in the initial wage stratum very high (89%). But even in the motor vehicles industry the wage concentration at the lower end of the scale (i.e. up to 3 minimum wage rates) was almost 50%.

Since it was already shown above that for the automobile industry (at least for large motor vehicle producers) a noticeable shift towards higher wage/skill levels was at least partly the result of increasing the relative price of low-wage/skill labour, it could logically be assumed that the same reaction would occur in a highly labour-intensive industry like clothing. There is, however, a difference: namely in those industries where the production possibility spectrum incorporates but little latitude to accommodate major shifts in the relative utilization of physical and/or human-capital factors of production vis-à-vis labour, changes in relative factor prices can hardly induce the required amount of substitution in order to increase productivity accordingly.

The clothing industry is such a case and a review of technology changes in this industry shows that they have been slow to come about and - as opposed to the textile industry - do not embody recent major shifts to permit wide-scale replacement of labour inputs by capital equipment. As a matter of fact, in the core production process, sewing, techniques do not basically differ from those which prevailed following the integration of the sewing machine into the production process during the course of the last century¹. The basic reason for this is the nature of the production process itself, where two dimensional materials (i.e. cloth) of non-stiff or rather soft/limp nature are subjected to a series of individual labour-intensive handling/assembly steps. While some steps upstream from sewing (e.g. designing and cutting) or rather some particular clothes (e.g. jeans) have been adapted to more capital-intensive methods, basically the entire process has remained disjointed and labour-intensive with over 80% of the

¹ The labour-intensive character of the process back then still dominates and in hardly any other major industry are labour inputs coupled with such small amounts of physical capital equipment as in the clothing industry.

Table 7 - Development of Real Minimum Wages¹ and Export Performance² of the Clothing Industry: 1965-1983

	1965	1973	1980	1983	1985
% Change in real minimum wages	-15.9	12.5	3.7	-4.4	
Rank in world clothing exports	46	25	34	38	40

¹Highest minimum wage rate in São Paulo deflated by consumer price index from Rio de Janeiro. For the years 1980, 1983 and 1985 average of 2 prevailing rates taken. - ²Brazil's ranking in clothing exports among 60 developing and developed countries.

Source: For real minimum wages: Own calculations based on IBGE (1986), Table 1, p. 666 and IBGE (1983), Table 1, p. 706. For trade: Own calculations based on unpublished UNCTAD data.

employees (i.e. those with low-skill levels) concentrated in the sewing process.

Given the above constellation it is understandable that policies which force up the price of low-skilled labour will quite directly induce price increases in final clothing products. The ramifications for world market competitiveness are obvious. It can thus hardly be surprising to determine that Brazil's clothing industry performance in world markets coincides quite well with the degree to which wage policies were strictly or less strictly enforced. This is shown in Table 8, whereby the strictness of enforcement is assumed to be expressed in the change in real minimum wages. That is - generally speaking - when minimum wages were increased by less (more) than inflation rates the ranking in world clothing exports improved (worsened).

As opposed to the clothing industry the production process in the automobile industry is quite adaptable to incorporating more physical and human capital manufacturing techniques. Thus the reaction of the automobile industry to changing relative factor prices (e.g. due to minimum wage policies), increased union militancy and tighter labour code restrictions was steered all the more in the direction of increasing the physical and human capital intensity of production by the onset of microelectronics. Across the entire spectrum of automobile companies in Brazil the incorporation and/or adaptation of microelectronic technology was viewed as essential to remain competitive. In some cases it was also considered necessary in connection with global strategies embodying the concept of a world car and placing demands on production facilities which could only be met by installing automated production/assembly technologies.

Given the intent to remain competitive in world markets the inroads made by microelectronics into the Brazilian automobile industry to date must still be interpreted as representing just a small fraction of what could happen if labour cost parameters were to dramatically increase. Aside from the above mentioned quality-control reasons behind automation, the substitution potential embodied in flexible, automated production processes has hardly been tapped in Brazil¹. Instead, basically dedicated automated equipment together with labour inputs have been opted for. That is, although the equipment and machines are operationally similar to those in ICs, they are only integrated into subproduction processes within specific work areas (e.g. painting, welding, etc.). Given the ability to draw on a relatively large reservoir of unskilled, but trainable labour, selecting this path can be considered as an efficient solution and hence helps maintain a competitive stance in world markets.

¹ This evidence has been gathered from discussions carried out with various automobile firms in Brazil.

Initial steps off this path have no doubt already been taken in connection with the major reequipment and reorganization investments made by VW, Ford and GM in the first half of the 1980's (see Peliano, p. 7). With non-wage labour costs increasing more rapidly than wages and e.g. already amounting to 156% of wages and salaries at VW in 1982 (vis-à-vis 137% in 1978)¹, additional investments are sure to follow². They imply, of course, that the qualification level of employees will

¹ See Doleschal (p. 128). Whereas total wages and salaries at VW do Brasil increased by a factor of 11.8 in the period 1978-1982, non-wage labour costs increased by a factor of 13.5. The largest subgroups therein (legal and voluntary social benefits, 29% of all labour costs in 1982) actually increased by a factor of 14.9.

² As important as labour cost developments are for the analysis of the international competitive position of a given industry, consistent and accurate information on non-wage labour costs across countries are hard to come by. Should the reader be familiar with international comparisons the above mentioned figure for VW will be surprisingly high. However, it is further substantiated by confidential data provided by other major motor vehicle manufacturers in Brazil. In noting what other sources state, Picht (1987, Table A4), for instance, draws on data from the US Bureau of Labor Statistics (BLS) which shows that Brazil's motor vehicle industry incurs non-wage labour costs amounting to an additional 36.7% of average hourly earnings in 1983. This same source shows that this figure holds for 1985 as well and is hardly different than the 35.6% for 1975. As mentioned in the technical notes these figures for average hourly earnings include in many cases additional wage/non-wage costs; the BLS thus specifically states that the ratio of additional non-wage labour costs to hourly wages "should not be used for intercountry comparison of 'fringe benefit' ratios." (underlined in original source; BLS (1986), Appendix, p. 2).

Another example: Werner International, a consulting firm specializing in the textile industry, publishes labour cost information on a continual, consistent and comparable basis. It calculated for the Brazilian textile (together with other countries) ratios of 81% for 1980 (38 countries; spring) and 107% for 1985/86 (51 countries; winter). Both the level and increase of this ratio reflect to a greater degree the automobile industry trends mentioned above. It is assumed that such figures are adequate ballpark estimates of levels and trends of non-wage labour costs in Brazil's manufacturing industry and subsectors therein.

have to increase (deskilling is not assumed to occur) not only as concerns operations, but in particular with respect to attempting to achieve a maximum utilization of the productivity potential such technologies embody (see Section IV on skills). Despite having to pay higher wages for the more skilled workers, these expenses will be considerably less than the labour-input savings induced by the automation. First of all, already within the relatively inflexible set-up prevailing in Brazilian plant labour inputs have been estimated to be reduced by 15-20% (e.g. in the soldering, tinkering and painting areas; see Peliano, p. 13)¹. Secondly, in the case of numerically controlled machine tools it was determined that a new machine replaced (on average) 3-5 conventional ones. On a two shift basis this means that 4-8 workers/machine are replaced (Tauile, p. 22), although additional jobs are created off the production line.

Aside from the negative feedback from the protectionist policies mentioned above (i.e. in the preceding footnote), there is also a certain amount of hesitancy on the part of some firms to invest in new automated equipment imagining how unions will react and knowing how costly releasing employees can be. Nonetheless: the fact that greater efforts have not been made to date to ensure that labour is quickly replaced by more automated techniques would seem to point to utilization of standard methods to reduce labour costs. As a matter of fact, in a survey of 5 Brazilian motor vehicle producers (i.e. 4 automobile assemblers and 1 truck assembler) carried out in

¹ Standing in the way of installing more and better automated equipment are Brazil's own import substitution policies. Thus, to the extent that domestically produced equipment is available it can cost several times the price for a similar piece on world markets. Furthermore, there is a hesitancy to purchase hardware and software from companies, whose experience in the field has been brief. Importing the equipment is another option, but this path is costly due to tariffs and the surtax (i.e. financial operation tax); the latter alone approaches 50% of the imported price.

1984, the reduction of labour costs was not mentioned as a main argument for introducing microelectronic technology (Tauile, p. 12). A caveat would nonetheless seem to be called for in connection with the seemingly straightforward results of this survey: while labour costs may not be explicitly mentioned in the reasons given, they are nonetheless implicit in a number of them¹.

Whatever, the demand for higher skilled employees will be increasing in the coming years all the faster, the greater the labour market has been cleared of unskilled workers or rather the stronger the demand for the non-traditional or the high-tech import substituting/export diversification industries is. As was already seen in the late 70's and even again in 1985 when the economy was rapidly expanding it showed signs of developing bottlenecks vis-à-vis the supply of skilled labour. Having dealt with factors affecting the demand for labour, the supply side now needs to be examined².

¹ The main reasons given in order of importance (Tauile, p. 12):

1. Greater flexibility in production facilities;
2. Better quality and more strict quality control;
3. Better control of production flows;
4. Better working environment including safety.
5. Speed-up of production (productivity).

² Without going any further into the factor intensity impact of Brazilian industrialization and export incentive policies, it must suffice within the context of this paper to note that they have tended to embody a bias towards more capital intensive methods of production. To be specific: subsidies were granted on credit, tax and import duties were reduced or waived on capital equipment and exports actually induced cash payments by the government. As mentioned earlier, regional incentives also existed and they had - at least in the Northeast - an extremely capital intensive impact.

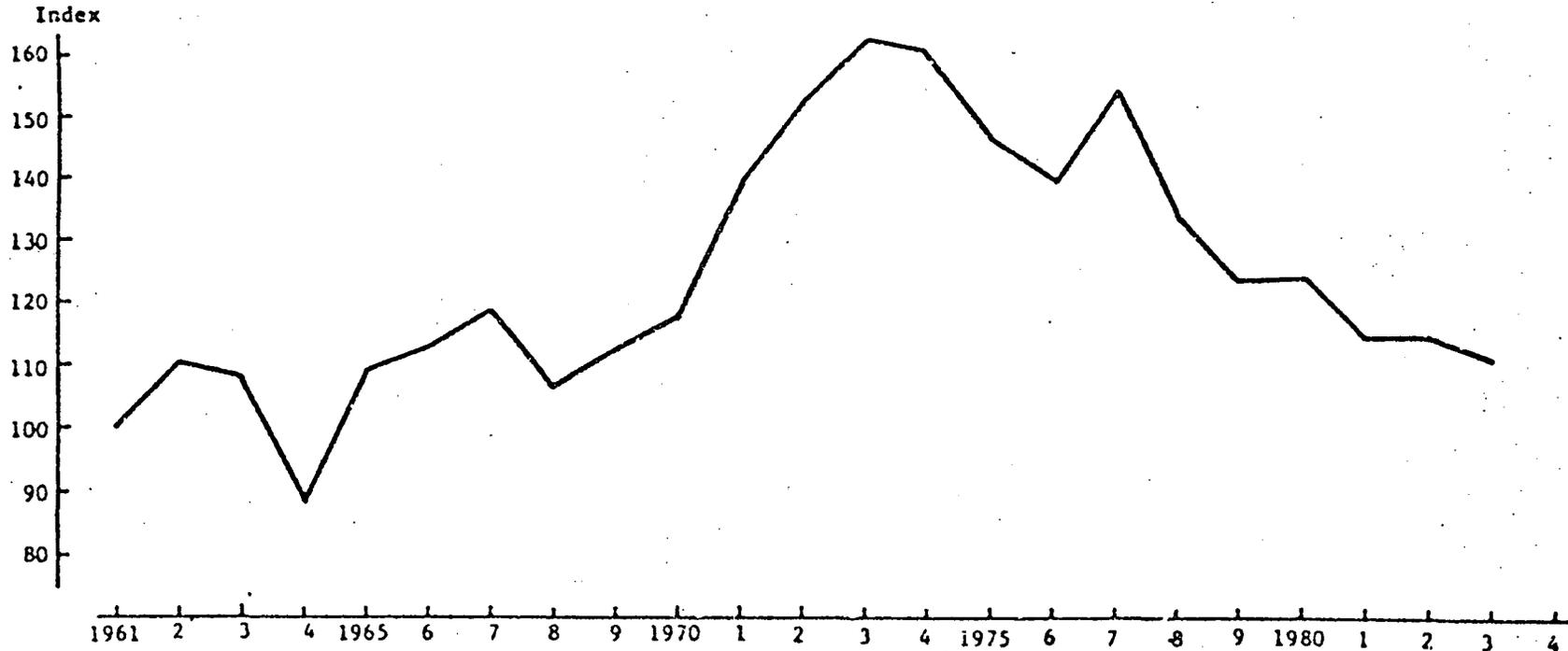
V. Influencing the Quality of Labour in Brazil: an Overview of Vocational and Educational Policies

Despite the fact that - on average - unskilled versus skilled workers have profitted from a more rapid increase in wages since the mid 70's (see Diagram 1), certain, particularly high-skilled occupations continued to command large or even increasing wage differentials. For instance, telecom equipment repairmen received almost 80% more (on average in 1983) than auto mechanics (Ministerio de Trabalho, pp. 205, 235). Such evidence that the supply of key skilled workers was (and still is) below levels in line with the demand evolving from the growing non-traditional industries, was backed up by reports of both personnel managers as well those employment agencies responsible for providing such workers (see also international overview above). Given the future potential demand for skilled personnel derived not only from changing technologies in existing industries, for instance mentioned above in connection with the automobile industry, but especially engendered by the so-called "tecnologias de punta"¹, the skill level of the Brazilian labour force will need considerable upgrading².

¹ See e.g., SENAI, I Plano Nacional de Desenvolvimento da Nova Republica, 1986-1989. With such skilled personnel Brazil expects to be able to expand manufactured exports into new, non-traditional areas, such as digitally controlled machine tools, laser technology, robotics and biogenetics.

² As Morley (p. 219-220) notes that when compared across countries Brazil has fewer technicians and more administrative/managerial personnel than could be expected for a country with its attributes. Although the manufacturing industry appears to be more skill intensive than average, this is due to its sub-sectors being skill intensive, not to skill intensive subsectors being over represented. Reformulated: Brazil approaches international standards of skill intensity only as regards its manufacturing sector, and this is due to owner-operators rather than engineers, scientists and other technicians.

Diagram 1 - Index of Wage Differentials between Skilled and Unskilled Workers¹:
1961-1984 (1961 = 100)



¹ Calculated as ratio of wage index for skilled workers to wage index for unskilled workers.

Source: Excerpted from Macedo, who notes that data was originally drawn from a series of wage surveys (manufacturing sector) carried out by PRIL, a consulting firm in the area of personnel and wage administration in the city of São Paulo. The series were assembled by Domingo Z. Ocio and presented in his Remuneração do Trabalho na Economia Brasileira nas Décadas de Sessenta e Setenta, unpublished Ph.D. dissertation. Getulio Vargas Foundation School of Business Administration, São Paulo (July, 1985).

The task Brazil faces in this respect is formidable, as over 1.2 million persons yearly are entering the labour force in the 1980s looking for jobs, not counting therein those who lost their jobs in the recession lasting through 1984.

Based on the skill structure of the labour force as it evolved during economic growth throughout the 1970's it has been estimated by the World Bank that through the 1980's skilled blue and white collars jobs will grow at rates exceeding the average rate of employment growth by 50% and 100% respectively. Assuming that employment expands in line with the growth rate of the potential labour force this means that about 400,000 additional jobs for skilled workers and technicians will have been created by 1990.

To address the basic issue of technical and vocational education the government of Brazil had undertaken little through 1975. Non-formal training was assumed to be the responsibility of private enterprises or was offered through various publicly supported, semi-autonomous organizations like The National Service for Industrial Apprenticeship (SENAI) and the National Service for Commercial Apprenticeship (SENAC), which were funded by a 1% payroll tax. Formal technical training, on the other hand, was run through the Ministry of Education via secondary and post secondary training at federally supported technical schools. It might be added that general secondary education did not usually incorporate vocationally oriented curricula up to the 70's.

The obvious inadequacies of this hodge-podge of institutions for the type of development Brazil already foresaw back in the 60's had been recognized and in 1971 a major educational reform was effected to attempt to more efficiently and effectively allow for the necessary human-capital to be created. On the organizational side, this first entailed spinning off the Ministry of Labor from the Ministry of Labor and Social Wel-

fare and empowering it to oversee labour relations, wages and employment, including non-formal vocational training. Later, in 1976, the National Vocational Training System (NVTTS) was created as an umbrella institution for all vocational training programs in Brazil and itself placed under the control of the newly created Federal Manpower Council (CFMO).

Moving from this brief organizational overview to the actual policies which evolved therefrom, Brazil enacted a key measure in 1975 aimed at harnessing the potential of the private sector in helping to train the labour force. The measure (still in effect), provides (as noted earlier on p. 5) a financial incentive to firms training their own employees. Specifically, it permits corporate entities - having received explicit approval from the Ministry of Labour - to deduct from pretax income 200% of expenditures made for training employees. Although such deductions cannot exceed 10% of taxable profits in any one year, any excess can be carried forward three years. The fact that by the mid-1980s almost 3400 enterprises were providing training for roughly two million employees annually would seem to attest to the wide acceptance of this scheme.

The immediate impact of this measure on the willingness of entrepreneurs to employ and train more individuals can be considered to straightforward, at least to the extent that a company does not come up against the 10% constraint or is not making profits¹: wage costs during the training period are essentially reduced by the prevailing marginal corporate tax rate. Assuming the highest corporate income tax rate in Brazil to be applicable, then wage costs are reduced by 45% (50% for financial institutions)¹, an amount which could very well act as an incentive to train. This incentive - at least potential-

¹ In a highly inflationary economy like Brazil the carrying forward of expenses from one year (tax period) to the next will produce results equivalent to deductions effected in the current period only if those expenses carried forward can be appropriately inflated and opportunity costs are also accounted for.

ly - can be viewed as covering the time period during which OJT or learning-by-doing means that - given a relatively inflexible, labour-code structured wage system - entrepreneurs may otherwise have to remunerate workers initially with wage rates/salaries in excess to what the workers actually produce. As a consequence the more-experienced may end up receiving less than what they earn if paid according to their performance. The additional 100% deduction of training costs thus could allow firms to compensate for the low output to labour cost ratio of new employees and perhaps also permit pay upgrades to be effected for those whose output to labour cost ratio was considerably greater than 1.

Of course, the actual existence of such seemingly attractive training incentives means little if

- (a) no approval is given by the Ministry of Labour, because it deems that the given project does not fit into Brazil's overall development plans;
- (b) the lack of space and/or infrastructure a firm has to offer is not considered to be adequate for the training purposes.

While (b) could be considered as representing a (desirable) quality control mechanism, (a) implies that the State knows more about what the future holds than private entrepreneurs. Since the latter has never been shown to hold true, such interventions at best dampen the entrepreneurs' willingness to invest (i.e. take risks). Even worse, they could lead to investments being made primarily in areas selected by the State, based on principles removed from those centered around the functioning of the price system (coupled with an entrepreneurial spirit).

¹ See Doing Business in Brazil, p. 104, Section 14.106.

It should also be pointed out, first of all, that the job training measure puts larger firms, i.e. those with sufficient infrastructure facilities and qualified instructors, at a distinct advantage over smaller firms. Although partial rectification of this is achieved by the possibility of contracting with public institutions (e.g. SENAI) or even private contractors to provide the necessary facilities and personnel, the effectiveness of such courses depends on the ability to duplicate outside the company the demands placed on an employee by a firm's individual production parameters.

Secondly, the incentive structure of the training measure (i.e. allowing expenses only to be deducted from pretax profits and limiting these to 10% of pretax profits) obviously meant that the more profitable a company is (at least up to the 10% limit), the greater the amount which can be allocated to improving productivity. Assuming that the training programs actually do lead to higher productivity levels and hence to stronger competitive positions, then this incentive promotes the successful companies. Aside from serving as an accelerator to a Darwinian type of economic selection process, this incentive could be considered as distributing subsidies in a relatively efficient manner.

And what about the overall impact in terms of public vs. private welfare benefits? Since most firms are interested in investing in specific as opposed to general training programs, so they alone can profit from the training efforts invested, the direct welfare gains will accrue more on a private than social level. On the other hand to the extent that international competitive positions are improved and thus more exports sold, higher income levels, ergo higher welfare levels are induced. What is nonetheless quite probably lacking in connection with tapping the private sector's ability to efficiently and effectively provide training service is simply the embedding of vocational training into a better structured, overall

educational system. For sure, through such an interface Brazil would be able to more easily master the faster pace with which technologies are now and will be changing.

Is there any evidence that this subsidization of training programs for 2 million persons a year is generating more productive employees and hence increasing the competitive position of the firms for which they work? With the program in existence for over 10 years and with almost 3,400 enterprises participating in the 1980's, some type of information on the impact must have been forthcoming. Furthermore, knowing that the subsidy equivalent of this measure in 1983 approximately equaled the entire budget of the Ministry of Labour some detectable results should be available¹. Should this not be the case, there could be reason to believe that - for the most part - the subsidies have been accepted without necessarily intending to use them to significantly increase the productivity of the employees beyond levels which would have prevailed anyhow.

Not being able to access microdata from a sample of firms which did and didn't take advantage of this incentive, but rather drawing on calculations (Braga, Table 5.1) made from 4735 firms in 29 industrial subsectors (i.e. 3-4 digit breakdown of Brazilian industrial code), the following can be established: Of five key variables used in subsector correlations with a firm-level productivity indicator (value added/employee) expenditures on training the work force proved to be significant in 7 cases. In 5 of these cases the expenditures variable revealed the highest degree of correlation among the

¹ The subsidy equivalent of this incentive was calculated by multiplying the average nominal monthly wage received by the cohort earning 1-2 minimum wages in 1983 by the number of workers participating in the program. This resulted in a total wage bill which was then multiplied by an assumed marginal tax rate of 40%. The estimated 50000 million cruzeiros calculated thereby compares with roughly the same amount for the budget of the Ministry of Labour in 1983.

selected independent variables (see Appendix Table A3 for a summary of the results). While these results may not seem to be convincing, it has to be remembered that only about 5% of the employed in Brazil are trained annually with the help of this incentive. If the trained were distributed across the sectors in accordance with sectoral employment shares, it would be surprising enough to determine that such a small influence would be sufficient to generate highly significant correlations between the individual firms. However, the distribution surely follows other criteria (e.g. the basic need of sector for more skilled personnel) and thus it is actually all the more surprising to find that expenditures on training were significantly (positively) correlated with productivity levels in almost 25% of the sectors (i.e. 7 out of 29). In other words: the training incentive - as deduced from these results based on expenditures for training employees - does seem to make a significant difference.

These results notwithstanding the demands being placed on improving education and skill levels of the labour force are increasing, not only due to government policies in promoting non-traditional or rather technology-intensive industries (e.g. in the informatics sector), but also given the ever faster pace with which structural changes throughout the world are taking place. In light of the large differences in educational attainment levels between Brazil and its East Asian competitors (see Table 2) as well as the perceived relatively low standing of skilled labour in Brazil vis-à-vis eight other developing countries, efforts to improve programs and infrastructure are needed and have been undertaken. These are basically occurring within the above described framework (e.g. SENAI and SENAC) through expanding and upgrading services offered¹. Since the explicit participation of enterprises and other relevant institutions is being requested, it can be expected that the high degree of end-user control (as noted

¹ One such project involves a US\$ 75 mill. loan from the World Bank.

earlier), which characterizes Brazilian training programs as opposed to those in many other Latin American countries, will continue. In other words, the Brazilian set-up has not been inflicted or rather is evidently less prone to the inefficiencies of solely state-run systems, which develop large bureaucracies¹. Furthermore, the set-up of the system itself, with rather clearly delineated target groups, has meant that duplication of training facilities and thus misallocation of resources has usually been avoided.

If the skill levels can be adequately improved with the above measures, then there still remains the problem of improving the general level of education. With the state currently carrying out policies to reduce government expenditures in order to attempt to abide by IMF conditions it finds itself in a dilemma: By cutting expenditures on educational services or by not increasing them it is trading off a short-term improvement in its debt management problems for a longer term neglect of its human capital potential². Although so far the State has assumed the prime role in attempting to provide the necessary general educational and training facilities and courses, there would seem to be no reason why such areas, particularly as concerns higher level technical and scientific education, should not be subjected to greater competition, i.e. by completely opening up the market for private enterprises, whereby foreign as well as domestic institutions should be permitted. As a matter of fact, it is quite easy to imagine a constellation of productive cooperation and competition between state, corporate and private educational facilities, for instance in the case of the automobile industry in Brazil. Since traditional areas of interests can clearly be delineated, the main areas of activities could be initially established. Whether and to what degree the original division of labour would remain, would - in the longer run - depend upon the capabilities of each group to establish a reputation and seek out

¹ The training programs are financed through a 1% payroll tax which is merely funnelled through the social security system to the respective agencies themselves.

² See for instance Sachs (1987), pp. 38-40.

other areas where educational/training services can be offered. Perhaps the dilemma posed by financial constraints can lead to a more efficient solution than would otherwise have been contemplated.

VI. Summary and Concluding Remarks

It was shown above that Brazil's stellar economic growth and export performance in the decade and a half prior to 1980 was aptly reflected in overall labour market trends (see Table 1). However, since the second oil price increase, the ensuing rapid increase in inflation rates as well as the consequences of the large external debt, weaknesses in Brazil's economic framework have become apparent and their ramifications for the ability to efficiently tap Brazil's labour potential can no longer be overlooked. While it was primarily pointed out that the wide range of labour market interventions (see Table 3) has made it all the more difficult for firms to employ labour in line with its expected productivity (e.g. unskilled labour was crowded out of the formal labour market), other measures (e.g. export incentives or regional incentives for the Northeast) have made it all the more attractive to employ capital or human-capital intensive methods of production (see for instance Tyler [1985], p. 232)¹. As noted in connection with discussing Table 3, Brazil's competitive position in producing labour-intensive products particularly vis-à-vis its Asian rivals, like South Korea and Taiwan, was negatively influenced; the case of the clothing exports could also be pointed out (see Table 8). In the case of the Asian rivals (which were also successful exporters of clothing) the labour markets remained quite free of policies either directly or indirectly increasing the price of labour relative to those of other factors of production. On top of this, these countries also al-

¹ As Tyler (p. 235) notes, the present trade regime is highly repressive and distortionary and substantial allocative gains could be reaped if changes were effected. Specifically: "economic policies have denied the country significant benefits from international trade".

ready possess a labour force with higher education/skill levels, thereby giving them a greater potential to adjust to changes in production/demand patterns.

Where does Brazil stand now as concerns the ability of its entrepreneurs, be they domestic or foreign, to efficiently tap the labour potential with which it is endowed? Without being able to predict the outcome of crucial ongoing deliberations surrounding the new Constitution, which will consequently shape the labour code, it nonetheless does not seem likely that major shifts away from less intervention in the labour market will be occurring. Rather, as pointed out above, there is even discussion about improving on job security conditions. Moves in this direction will no doubt also be supported by the unions, whose activities have been increasing in recent years. However, as experienced in other countries shows, the more such measures are enacted, the greater the increase will be in the size of informal sector, where unregulated labour markets prevail. These in turn can be tapped by those companies still in the formal sector. In a more positive vein the elimination of accelerated indexation of the lowest wage groups as well as an attempt to reduce incentives on capital means that it should become easier to achieve higher employment levels, i.e. effect more efficient methods of production. Likewise the ongoing restructuring of export incentives, to bring them in line with accepted international trade rules and a probable reduction of protection rates will also promote production in labour-intensive areas which were put at a disadvantage by the prevailing trade regime.

Last but not least, the efforts being made to upgrade skill levels in Brazil seem to be structured in an efficient manner and - given the above positive measures - should help ensure that skilled labour shortage difficulties are mitigated in the future. To the extent that future skill demands are thus ade-

quately met, Brazil will find it all the easier to open its market to imports from economies at lower levels of development, producing goods which no longer represent Brazil's comparative advantage. In doing so Brazil will be doing unto other countries as ICs did unto it, by allowing (most) imports to enter rather than erecting prohibitive tariff/non-tariff barriers. While such liberalization steps will help dampen protectionistic threats from abroad, at home they will serve Brazil's own interests by enabling its industries to more efficiently tap world markets for the lowest priced inputs. Ergo, conditions will be engendered which will permit companies in Brazil to maintain or improve their international competitiveness - economic resources could then be directed away from debt-solving to money-making activities.

Table A1: Growth Rates¹ of Exports and Employment in Brazil's Manufacturing Industry: 1976-1983

Manufacturing sector	Exports				Employment			
	Share ²	Growth rates ¹			Share ²	Growth rates ¹		
	1978	1978/76	1980/78	1983/80	1980	1979/78	1981/79	1983/81
Total	85.7 ³	16.7	27.1	2.2	76.6 ³	1.7	-5.5	-5.8
Food	42.4	7.8	19.6	-3.4	12.6	<u>2.8</u>	<u>-0.2</u>	<u>-2.7</u>
Chemicals	8.4	8.9	17.0	<u>7.2</u>	3.3	1.4	<u>-3.7</u>	<u>-3.9</u>
Pharmaceuticals					0.7	-3.2	<u>-3.4</u>	<u>-3.3</u>
Machinery	6.0	<u>43.8</u>	<u>38.8</u>	-5.5	10.9	<u>6.7</u>	-5.7	-12.3
Metallurgical	5.5	<u>42.1</u>	<u>39.0</u>	<u>21.7</u>	10.8	<u>2.7</u>	-7.2	<u>-5.2</u>
Elec. + commun. equip.	4.7	<u>31.0</u>	<u>32.1</u>	-4.2	8.7	0.7	-9.4	-10.4
Textiles	4.7	2.9	22.4	<u>6.0</u>	7.7	-0.9	-7.6	-8.2
Transport equipment	3.2	<u>53.8</u>	<u>30.1</u>	1.5	5.7	<u>4.9</u>	-10.3	<u>-3.3</u>
Rubber products	2.9	<u>39.6</u>	<u>32.4</u>	<u>4.1</u>	1.1	-1.1	-10.9	<u>-1.5</u>
Beverages	2.9	16.4	26.4	<u>8.8</u>	1.2	<u>2.9</u>	-10.4	<u>-4.9</u>
Plastic	2.6	<u>28.2</u>	<u>30.7</u>	<u>6.4</u>	2.4	1.5	-10.9	<u>-2.3</u>
Tobacco products	1.4	<u>21.1</u>	8.3	<u>16.7</u>	0.4	-3.2	-9.8	-9.7
Paper + paper prod.	0.6	<u>50.6</u>	<u>87.5</u>	-0.9	2.2	5.3	-5.9	<u>-3.1</u>
Non-metal. minerals	0.4	<u>38.2</u>	<u>60.4</u>	-13.5	8.9	0.9	<u>-4.7</u>	-10.0
Actual value	-	8.87 ⁴	14.34 ⁴	15.29 ⁴	4.92 ⁵	-	-	-

Note: Ranking determined by export shares in 1978. Underlined values are above respective average in given year.

¹Average annual growth rate. - ²Share in total manufacturing exports (based on ISIC division 3, excluding 353 and 354, i.e. petroleum and petroleum products) or employment. -

³Sum of listed sectors. - ⁴Billion US-\$. - ⁵Million employees.

Source: Own calculations; for exports, based on unpublished UNCTAD data; for employment, growth rate based on EIU (1986), p. 17; shares based on IBGE (1986), p. 402.

Table A2 - Concentration (%)¹ of Employment in Selected Sectors/Industries by Minimum Wage Strata and Establishment Size: 1976

Minimum wage strata ²	Establishment size ³	Industry				
		Total	Clothing ⁴ , etc.	Motor vehicles	Commerce	Services
0 - 3:	0 - 5	89.0	94.3	83.4	92.7	90.1
	5 - 20	84.2	92.4	77.3	85.5	78.7
	20 - 250	77.4	89.0	70.2	74.3	69.3
	250 - 1000	72.2	87.9	62.5	72.0	69.7
	≥ 1000	59.2	86.7	35.5	70.6	56.5
	Total	72.0	89.2	47.3	80.7	69.9
3 - 10:	0 - 5	7.9	3.6	12.5	5.0	6.7
	5 - 20	11.7	4.7	18.3	9.8	14.6
	20 - 250	15.9	6.3	22.7	17.3	20.8
	250 - 1000	19.1	6.1	28.8	16.2	19.4
	≥ 1000	30.7	9.5	52.9	14.7	31.2
	Total	20.1	6.3	42.8	12.7	20.5
≥ 20:	0 - 5	0.3	0.1	0.8	0.1	0.2
	5 - 20	0.4	0.0	0.6	0.2	0.5
	20 - 250	0.9	0.2	1.0	0.8	1.2
	250 - 1000	1.4	0.4	2.2	1.9	1.9
	≥ 1000	2.1	0.4	2.4	1.0	2.1
	Total	1.3	0.2	2.1	0.6	1.4

¹% of employees in a given establishment size and sector/industry earning a certain amount (i.e. multiple of minimum wage level) vis-à-vis all employees in the same breakdown. - ²Multiples of minimum wage rates. - ³By number of employees. - ⁴Clothing, footwear and softgoods.

Source: Adapted from Carvalho (pp. 132 and 138).

Table A3 - Some Determinants of Labour Productivity in Selected Industries: Evidence from a 1980 Micro-Survey¹

	Sales/ cap.assets	Training exp.per empl.	R+D	Cap.util.	Sales
No. of times:					
significant	9	7	5	3	15
most significant	7	5	2	2	11
Size of correlation coefficient					
>.59	1	-	1	-	1
.45-.59	2	3	2		2
.30-.44	3	2	-	1	5
<.30	3	2	2	2	7
<u>Industries ranked by size of correlation coefficient²: code/name</u>					
1.	1020 Lime	1270 Tractors, etc.	1030 Shingles/ bricks	2710 Wine	1030 Shingles/ bricks
2.	2460 Cloth/ yarn	2220 Soaps/ deterg.	2220 Soaps/ deterg.	1231 Mach. tools	1740 Cardboard articles
3.	2698 Food man.	2360 Plastic pipes	1020 Lime	1050 Cement	2220 Soaps/ deterg.
4.	2651 Sugar man.	1740 Cardboard art.	2651 Sugar man.	-	2440 Pleating/ ribbons
5.	2220 Soaps/ deterg.	1030 Shingles/ bricks	2350 Plastic pack.	-	1070 Glas/ crystal
6.	2610 Fruits/ veg.pres.	1070 Glas/ crystal	-	-	2602 Flour mills
7.	1220 Heat./ plumb.eq.	2610 Fruits/ veg.pres.	-	-	1220 Heat./ plumb.eq.
8.	1232 Mach. parts,etc.	-	-	-	2610 Fruits/ veg.pres.
9.	2420 Knit. fabrics	-	-	-	2110 Pharma. prod.
10.	-	-	-	-	1050 Cement

¹Out of original table containing 29 industries only those industries were selected where correlations were significant. - ²Largest correlation coefficient ranked first. In the case of sales/capital assets industry 1020 (lime) has the highest correlation coefficient (0.799). The same industry also exhibited a significant correlation coefficient with R+D expenditures, but here it was only ranked third.

References

- Baer, Werner (1987), "The Resurgence of Inflation in Brazil, 1974-1986". World Development, Vol. 15, No. 8, pp. 1007-1034.
- Braga, Helson C. (1987), "Tecnologia e Produtividade da Indústria Brasileira: Uma Análise Exploratoria". Rio de Janeiro, mimeo.
- Business International, Business Latin America (1986), Aug. 11, pp. 244-245.
- Campbell, Dennis (Editor) (1985), Legal Aspects of Doing Business in Asia and the Pacific. Deventer.
- Carbonetto, Daniel (1986), La problemática del nivel informal de la economía urbana en el Perú. Lima (mimeo).
- Carvalho, Livio (1984), Brazilian Wages Policies 1964/1981, Brazilian Economic Studies, pp. 109-141.
- Council for Economic Planning and Development - CEPD (1986), Taiwan Statistical Data Book. Taipei.
- Deloitte, Haskins and Sells (various issues), International Tax and Business Service. New York.
- Doing Business in Brazil (1986), Looseleaf collection of updated laws/regulations, etc. New York.
- Doleschal, Reinhard (1987), Automobilproduktion und Industriearbeiter in Brasilien. Saarbrücken.
- Economist Intelligence Unit - EIU (1986), Brazil Country Profile. London.
- Edwards, Anthony (1983), "The Structure of Industrial Change: Regional Incentive to the Textile Industry of Northeast Brazil", in: Hamilton, F.E. Ian and G.J.R. Linge (Eds.), Regional Economic and Industrial Systems. New York.
- E.M.F. (1986), The EMF's World Competitiveness Report 1986. Geneva.
- Executive Yuan, Directorate-General of Budget, Accounting and Statistics (1986), National Income of the Republic of China. Taipei.
- Fasano-Filho, Ugo, Bernhard Fischer and Peter Nunnenkamp (1987), On the Determinants of Brazil's Manufactured Exports: An Empirical Analysis. Kieler Studien, No. 212, Tübingen 1987.
- Fischer, Bernhard (1986), Brasilien ohne Inflation? Eine kritische Würdigung des Cruzado-Planes. Kieler Diskussionsbeiträge, No. 124. Kiel.

- Fundação Instituto Brasileiro de Geografia e Estatístico - IBGE (1982, 1983, 1985), Anuario Estatístico Do Brasil, 1982 and 1985. Rio de Janeiro.
- Galenson, Walter (1979), "The Labor Force, Wages and Living Standards", in Galenson, Walter (Ed.), Economic Growth and Structural Change in Taiwan. Ithaca.
- Inter-American Development Bank - IADB (various years), Economic and Social Progress in Latin America. Washington, D.C.
- International Monetary Fund - IMF (1986), International Financial Statistics Yearbook 1986. Washington, D.C.
- International Labour Office (1985), "Brazil - Consolidation of Labour Laws". Legislative Series, Geneva, pp. 17-172.
- Mácedo, Roberto (1986), The Brazilian Labor Market: An Overview. World Bank. Washington (mimeo).
- Meyers, Kenneth and F. Desmond McCarthy (1985), Brazil - Medium-Term Policy Analysis. World Bank Staff Working Papers No. 750. Washington, D.C.
- Ministerio de Trabalho (1985), Configuração Parcial da Forea de Trabalho. Brasilia.
- Morley, Samuel A. (1982), Labor Markets and Inequitable Growth - The Case of Authoritarian Capitalism in Brazil. Cambridge.
- Neundörfer, Konrad, Ernst-Heinrich Stahr (Editors) (1985), Wettbewerbsverhältnisse und Wettbewerbsverzerrungen im Welttextilhandel. Frankfurt.
- Peliano, José Carlos Pereira (1985), "Estudo de Casona Montadora A de Automóveis". Brasilia (mimeo).
- , (1986), "Observations on the Technological Situation of the Brazilian Automobile Industry". Brasilia (mimeo).
- Picht, Hartmut (1987), Labor Costs and Productivity Trends in Selected Brazilian Manufacturing Industries: An International Comparison. Kiel Working Paper No. 294. Kiel.
- Sachs, Jeffrey D. (1987), Trade and Exchange Rate Policies in Growth-oriented Adjustment Programs. NBER Working Paper Series No. 2226. Cambridge.
- Salowsky, Heinz (1985), Arbeitskosten in Fernost. Beiträge zur Wirtschafts- und Sozialpolitik, No. 134. Köln.

- SENAI, Departamento Nacional (1985), I Plano de Desenvolvimento da Nova Republica, 1986-1989. Brasilia.
- Spinanger, Dean (1984), The Labor Market in Panama - an Analysis of the Employment Impact of the Labor Code. Kiel Working Paper No. 221. Kiel.
- Süssekind, Arnaldo (1985), "Origins, Evolutions and Prospects of the Consolidation of Labour Laws of Brazil", in International Labour Office - ILO, Legislative Series, Geneva, 2/85, pp.1-16.
- Tauile, José Ricardo (1985), Employment Effect of Micro-electronic Equipment in the Brazilian Automobile Industry. Geneva, ILO, WEP, WP 2-22/131.
- Tyler, William G. (1976), Manufactured Export Expansion and Industrialization in Brazil. Kieler Studien, No. 134. Tübingen.
- , (1981), The Brazilian Industrial Economy. Lexington.
- , (1985), "Effective Incentives for Domestic Market Sales and Exports". Journal of Development Economics, Vol. 18, pp. 219-242. North-Holland, Amsterdam.
- United Nations Industrial Development Organization - UNIDO (1986), Handbook of Industrial Statistics 1986. Vienna.
- US Bureau of Labor Statistics - BLS (1986), Hourly Compensation Costs for Production Workers - 40 Manufacturing Industries, 34 Countries, 1975-1985. Washington, D.C.
- Werner International (1986), "Spinning and Weaving Labour Cost Comparisons Winter 1985/86". Brussels.
- World Bank (1987), World Development Report. New York.