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REGULATIONS AND FLEXIBILITY OF THE LABOR
MARKET IN BRAZIL

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Abstract:

The paper deals with four questions associated with the flexibility of the labor market in Brazil, namely: (1) To what extent is the real wage rigid in Brazil and therefore impedes job creation or worsens the unemployment and informality record? (2) Compared to other countries, to what extent are payroll taxes and mandated benefits too big thus implying a level of the hourly compensation which would impose an hindrance to the competitiveness of the Brazilian industry? (3) To what extent the levels of the minimum wage and mandated benefits determine or affect the level of informality? (4) To what extent the costs of dismissal and other types of impediments to the dismissal of workers in Brazil (compared to other countries) affects employment flexibility?

Resumo:

O trabalho lida com quatro questões relativas à flexibilidade do mercado de trabalho no Brasil, a saber: (1) Até que ponto o salário real é rígido no Brasil e portanto impede a criação de empregos e aumenta a informalidade? (2) Comparado com outros países, até que ponto os encargos sobre a folha são grandes e implicam um nível de compensação salarial horária que imponha uma restrição à competitividade da indústria brasileira? (3) Até que ponto os níveis de salário mínimo e encargos afetam ou explicam a informalidade? (4) Até que ponto os custos de demissão e outros tipos de impedimentos à demissão de trabalhadores no Brasil em comparação com outros países afetam a flexibilidade do emprego?

1. Introduction

This paper deals with two basic sets of questions. First, to what extent is the Brazilian labor market flexible? Second, to what extent labor market regulations (such as the minimum wage, mandated benefits and costs of dismissal) are an impediment to employment creation, the formalization of labor contracts and the flexibility of the labor market? The answer to the first question is simply an attempt to measure the level of labor market flexibility. The answer to the second question is much more complex since it associates these measures with the regulatory apparatus.

These two questions can be detailed as follows:

(1) To what extent is the real wage rigid in Brazil and therefore impedes job creation or worsens the unemployment and informality record?

(2) Compared to other countries, to what extent are payroll taxes and mandated benefits too big thus implying a level of the hourly compensation which would impose an hindrance to the competitiveness of the Brazilian industry?

(3) To what extent the levels of the minimum wage and mandated benefits determine or affect the level of informality?

(4) To what extent the costs of dismissal and other types of impediments to the dismissal of workers in Brazil (compared to other countries) affects employment flexibility?

The answers to the questions are obviously not clear cut and take different forms depending on the available data and previous theoretical and empirical work available on the subject. Where other contributions have provided reliable information they are used. Where not, an attempt to collect the relevant data is

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made. The theoretical discussion is more elaborated in question 3 than in the others since the theme seems central for the examination of the causes of the large size of the informal sector in Brazil.

2. Real wage flexibility

Real wage flexibility is widely interpreted as the best measure of labor market flexibility. In face of a macroeconomic shock, the extent to which real wages adjust will determine the cost of adjustment as measured by unemployment and output losses.\[1]

The work of Blanchflower and Oswald (1990, 1994) can be seen as the most sophisticated measure of real wage flexibility. In theoretical terms, the "wage curve" developed in their work answers the following question: given a shock, what is the necessary reduction in real wages to maintain the rate of unemployment stable? The assumption is that there exists a level of wage flexibility which eliminates losses in employment and output. Of course, if there is some rigidity, the wage will fall less than necessary, and unemployment will increase.

Empirically, the work of Blanchflower and Oswald tries to estimate the slope of the wage curve, asking the following question: what is the reduction in real wages associated with a one percentage point increase in the rate of unemployment, when unemployment is around 5%? The greater the reduction in the wage, the greater the level of flexibility since the adjustment in the wage reduces the effect on employment. In the limit, wages would fully adjust, the rate of unemployment would remain constant and the wage curve would be flat.

The estimates for the wage curve in various countries shows a remarkable uniformity around -2 implying that a one percent increase in unemployment is associated with a 2% reduction in the real wage.

Turning to the Brazilian case, it is important to start by providing a brief account of the nature and magnitude of the macroeconomic shocks since the early 1980's. In this period there were two major negative shocks and one positive

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[1] The shock can either be exogenous to the economy (a change in terms of trade or international interest rates) or a policy shock (an induced recession to curb inflation).

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shock. The first negative shock in 1981-3 was a response to the oil and interest rate shocks and the Mexican moratorium. A policy induced recession and a devaluation of the currency took place with the objective of reducing the current account deficit.

The positive shock was induced by the Cruzado stabilization plan in 1986. The plan can be seen as a shock in the sense that it changed the workings of the goods and labor markets --essentially because of the price freeze and an accommodative aggregate demand policy-- and triggered important behavioral changes. There was a significant increase in the propensities to consume and invest, leading to a situation of excess demand with obvious effects on the labor market.

The second negative shock came in 1990 with the Collor stabilization plan. In this case the price freeze was followed by a major recession. Besides the short run effects of the recessionary measures, a change in the trade regime with the opening of the economy also affected the behavior of agents leading to a major microeconomic restructuring effort which resulted in a 20 to 25% reduction in industrial employment between 1989 and 1992.

How did the labor market responded to these shocks? The work of Barros and Mendonça (1994) uses the same methodology of Blanchflower and Oswald to estimate wage curves for the Brazilian urban labor market. The slope of the wage curve varies in time. In the 1982-84 period, during the first negative shock, the slope of the wage curve is - 6. Between 1985 and 1987, that is the period which encompasses the Cruzado plan, the slope of the curve is - 8. The slope then falls to - 3 between 1988 and 1990 and increases to - 5 in 1989-91 and 1990-93 when the second negative shock took place. The average slope over the period 1982-94 is - 5 which shows that the degree of wage flexibility in the Brazilian labor market is significantly greater than the average flexibility in those economies studied by Blanchflower and Oswald.

There are other ways to look at the degree of wage flexibility. Figure 1 shows the behavior of real wages (12 months moving averages) in industry, in the urban formal and informal sectors. Coming out from the 1981-83 recession wages in the industrial sector increased around 35%, in the formal sector increased 25%

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and in the informal sector increased 45%. In the 1990-92 recession, wages in industry fell around 15% and then recovered, in the formal and informal sectors wages fell, respectively, around 25% and 30%.

These figures show that wages are very flexible. In comparing the three segments, it is noticeable that wages in the industrial sector showed smaller flexibility in the recent recession. This results, first of all, from a statistical bias (the wage of the core workers, who remained employed, is higher than the average) and from a very significant increase in labor productivity which compensates for the effect of the increase in wages on the unit labor cost.

Wages in the informal sector are more flexible than in the formal sector, but only very mildly so. Indeed, in the recent recession, wages in the formal sector fell almost as much as in the informal sector.

The rate of open unemployment increased from around 4% in 1989 to around 6.5% in 1992-93. Together with the figures on wages, in principle the behavior of the rate of unemployment could be seen as an indication of impressive flexibility. Indeed, mimicking the calculation of the wage curve in the recent recession would lead to a slope of - 10 (the ratio of the reduction in real wages to the increase in percentage points in unemployment, - 25%/2.5 = - 10).

However, the growth of the informal sector hides an increase in the rate of unemployment. Indeed, as shown in Figure 2, the share of unemployed and informally employed workers increased from 21.5% in 1989 to 27.5%, an increase of 6 (six) percentage points. Meanwhile, the average urban income fell roughly 27%. In this case, the mimic of the wage curve would imply a slope of - 4.5 (-27% divided by 6).

The comparison with some OECD countries which have experienced an increase in the rate of unemployment recently can be illustrative. If we apply the same index of wage response to the increase in unemployment and the informal market in Brazil (the - 4.5 estimated in the previous paragraph) to a country like Finland where unemployment went from 13.1% in 1992 to 18.5 in 1994, the wage reduction would be of the order of 24%, which would seem unbearable to a Finish worker. The same figure between 1992 and 1994 for Germany is 10% and for Sweden is 12%.

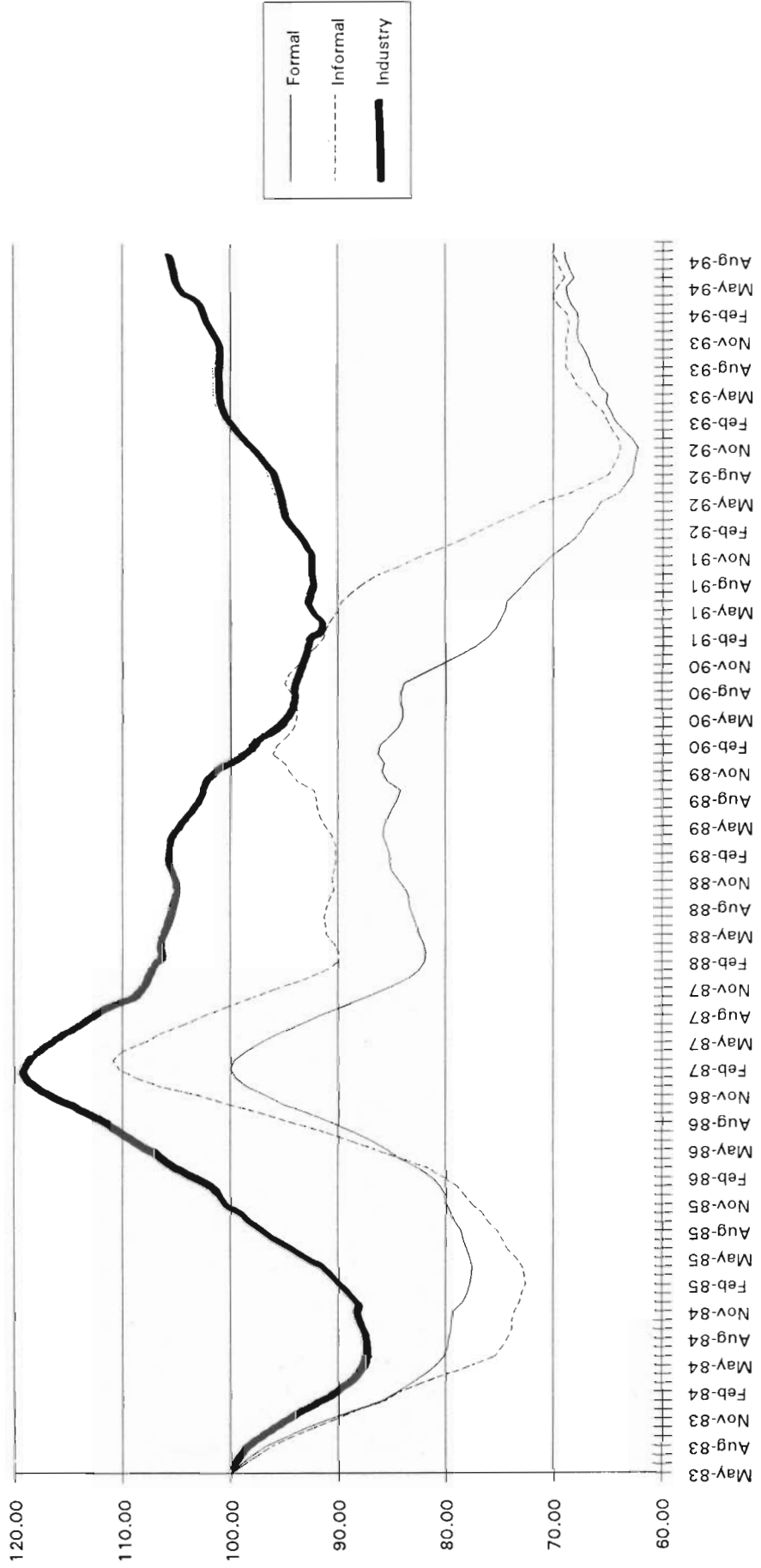Figure 1: Real wages in the formal and informal urban sectors and in industry
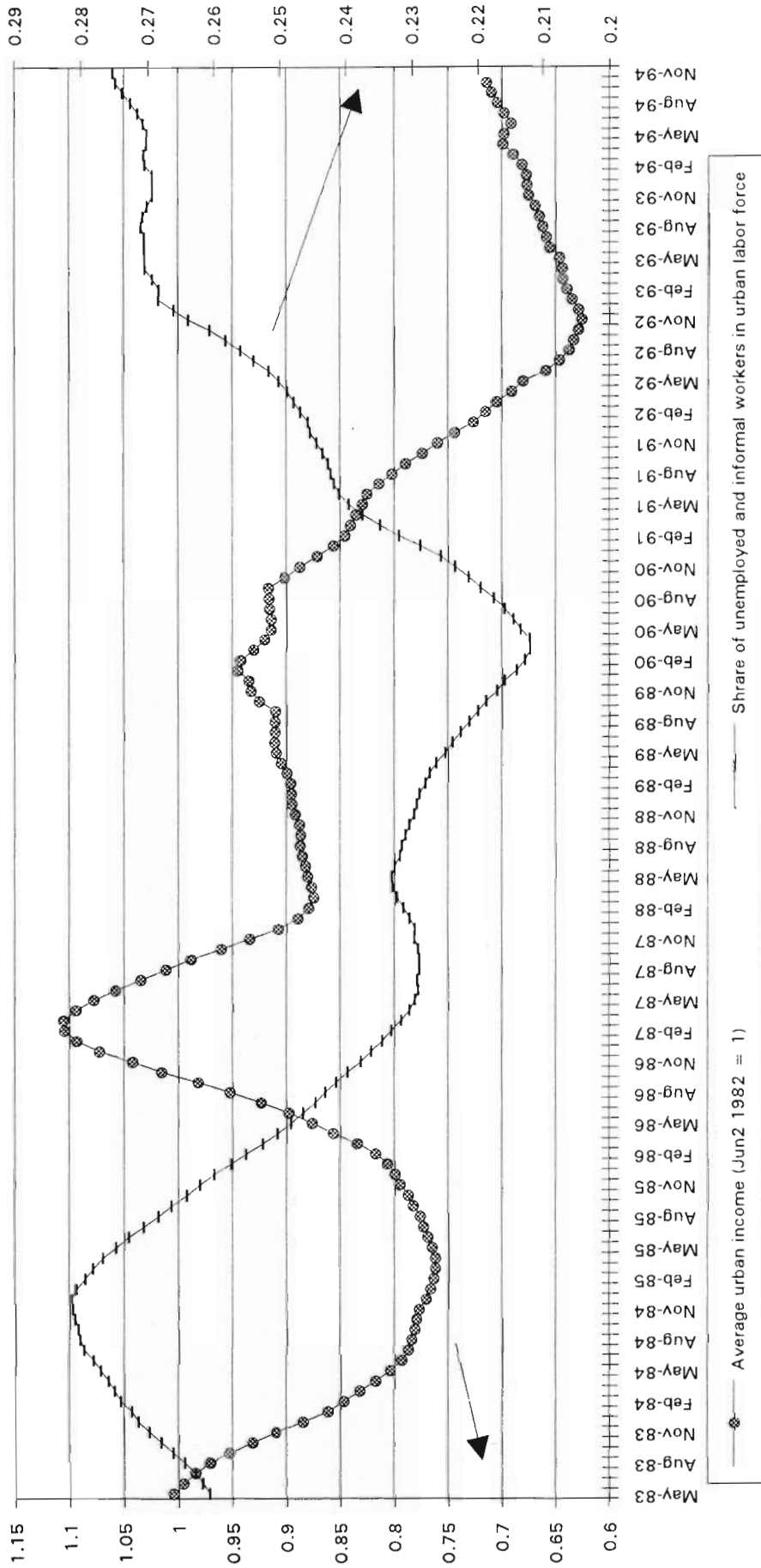
PME.XLS Chart 4

Figure 2: Average urban income and the share of unemployed and informal workers in the urban labor force

Average urban income (Jun2 1982 = 1)

Shrare of unemployed and informal workers in urban labor force

3. Social benefits, payroll taxes and the cost of labor

High payroll taxes are usually seen as an hindrance to employment creation or at least an hindrance to employment creation in the formal sector. Given the technology and the level of protection against foreign competition, there exists a certain level of the unit labor cost which makes a sector or a firm non competitive. The unit labor cost depends on the exchange rate, the hourly compensation and the productivity of labor. The hourly compensation, in turn, depends on the hourly pay to workers and the size of payroll taxes and mandatory social benefits. In this section we deal with the size and composition of the *hourly compensation* in Brazil.

The hourly compensation in Brazil can be decomposed in four parts:

a) the basic wage (including extra hours) plus some supplementary pay such as an annual one month bonus, a contribution to the worker's capitalization fund (FGTS), a contribution paid by firms to finance an worker's assistance service (SESI) and other forms of direct pay (family allowances, pregnancy leaves, transport subsidies, etc.);

b) hours paid but not effectively worked, due to vacations and holidays.

c) the contribution to social security and to fund educational services (salário educação) and an on-the-job accident insurance fee which is mandatory for all firms and proportional to the payroll;

d) the contribution to the official training system (SENAI and SENAC) and to finance an institution which assist small enterprises (SEBRAE). These financial resources and institutions are managed by the employers federations and confederations.

The first component of the hourly compensation is, in principle, appropriated by the workers, directly or through a capitalization fund, or indirectly through the use of the facilities of SESI. Workers only have access to the capitalization fund in very particular situations such as to finance the purchase of a home, when fired without a just cause and when retiring. The access to the social services provided by SESI is not the same to all workers since it depends on certain idiosyncracies of the federations of trade and industry which manage the facilities in each state.

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Paid vacations and holidays benefit directly the individual worker.

The third group goes to the federal government, to finance the social security system, work accident insurance and education. Although, in principle, the workers are the final beneficiaries of these contributions, the quality of these services is so low that the perception is that they are not worth financing.

The contribution to the official training system, SENAI and SENAC, is difficult to be appropriated. On the one hand, it benefits the worker, because through these systems they can increase their degree of qualification an thus obtain occupational and wage improvements. The fact that the financial resources coming from these contributions and the training institutions are managed by the employers federations and confederations suggests that employers are more directly favored by this contribution than workers. Actually, part of these contributions are used to finance other activities of the federations and confederations.

Table 1 shows the composition of the hourly labor cost in Brazil whereas Table 2 provides estimates for the absolute value of the hourly compensation and its composition in Brazil and a few OECD countries.

In Brazil, workers appropriate approximately 77% of the hourly compensation. This is roughly the same share found in the other countries mentioned in Table 2. The exception is Italy where the share is around 70%. The share of social security contributions and other taxes on the payroll is also of the same level of the other countries with the exceptions of Japan and Korea. As for the division of the share of workers in the total hourly compensation between the pay for time worked and other forms of direct pay, it is roughly the same as in Germany and Japan. In the US, the share of other forms of pay is smaller than in the other countries. Hence, the division of the total hourly compensation is not really different from the average OECD.

Where the difference between Brazil and the OECD countries is remarkable is on the absolute value of the hourly compensation. Table 2 has two estimates for the hourly compensation in industry in Brazil. The first comes from the Monthly Industrial Survey (Pesquisa Industrial Mensal, PIM) of IBGE and covers a sample of

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industries in the whole country. \[2] The second comes from a household survey performed by DIEESE in great S. Paulo.\[3] In the case of PIM, the average annual hourly compensation in 1992 (the year for which the data for the other countries is reported) was US$ 2.52. In great S. Paulo, where the core of the Brazilian industry is concentrated, the hourly compensation was around US$ 3.4. Figure 3 shows that in great S. Paulo, the hourly compensation increased from approximately US$ 2 in 1985 to US$ 4.3 in 1994.

The hourly compensation in 1992 in Brazil was roughly the same as in Mexico, half of the compensation in Korea, 15% of that in Japan and the US and 10% of that in Germany.

In sum, the evidences available are that neither the absolute value of the hourly compensation in Brazil is high nor are the shares of other forms of pay (which include social benefits and hours paid and not worked) and of contributions to social security and other taxes on the payroll.

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[2] This data set provides the total wage bill (except for the contributions for FGTS, contributions to the social security and other contributions, SENAI, SESI and SEBRAE), the number of hours paid and the share of extra hours in the wage bill. In our calculations, it is assumed that 90% of the hours payed are effectively worked. This is approximately the ratio of the number of hours in vacation (plus a mandated 10 days bonus pay)and holidays to the total number of hours worked.

[3] In the case of the DIEESE data, since it is furnished by the worker --the worker simply says what was his wage in that month-- and does not say anything about the number of hours worked or contributions, the following assumptions are made:

- First, it is assumed a 45 hours working week which, according to the Brazilian labor code, corresponds to the maximum regular working day plus an extra hour a week.

- Second, that to the amount paid to the worker, the firm has to pay FGTS (8%), contributions to the social security and other contributions (24.5%), SENAI (1%), SESI (1.5%) and SEBRAE (0.4%), totaling 34.5%.

- It is assumed that 90% of the hours pay are effectively worked.

Hence, given the monthly information provided by the workers surveyed, say US$ x, the hourly compensation is given by:

$$(x/202)* (1.345) * (1.11)$$

Table 1: Worker's Pay and Labor Cost
(Monthly with normal number of hours = 44 weekly)

	percentage	total
Basic Wage (incl extra time)		100
annual bonus	0.083	
FGTS	0.080	
SESI	0.015	
others*	0.10 to 0.20	
total pay to workers - monthly		131 to 142
Paid leisure	0.12	
Paid to worker plus leisure		147 to 160
SENAI/SEBRAE	0.016	
INSS + Accid. insur. + educat.	0.245	
Total labor cost		185 to 202

* These include benefits which can not be calculated for all workers, since they depend on sex, kind of work done, economic sector and the like. These include family allowances, pregnancy leaves, transport subsidies, etc.

Table 2
The Composition of the Hourly Compensation Costs
for Production Workers in Manufacture (1992)

	Brazil	US	Germany	Japan	Italy	Mexico	Korea
Hourly compen-sation (HC) (US $)	2.52 (Brazil) 3.4 (S.Paulo)	16.17	25.94	16.16	19.41	2.35	4.93
Pay for time worked as % of HC	50	70.8	55.8	58.4	51.4	(...)	(...)
Other direct pay as % of HC	27	6.6	21.4	28.1	18	(...)	(...)
Social insuran-ce and other labor taxes as % of HC	23 (*)	22.6	22.8	13.1	30.6	(...)	11.1

Sources: Brazil (calculations of the author based on the Pesquisa Industrial Mensal, IBGE) and S. Paulo (calculations of the author based on the DIEESE survey). All other countries: US Bureau of Labor Statistics," International Comparisons of Hourly Compensation Costs for Production Workers in Manufacturing", 1992.
* Includes INSS + Accid. insur. + educat. + SEBRAE/SENAI.

DIEESE.XLS Chart 5

Figure 3: Hourly compensation (US$, Great s. Paulo)

(12 months moving average)

US $
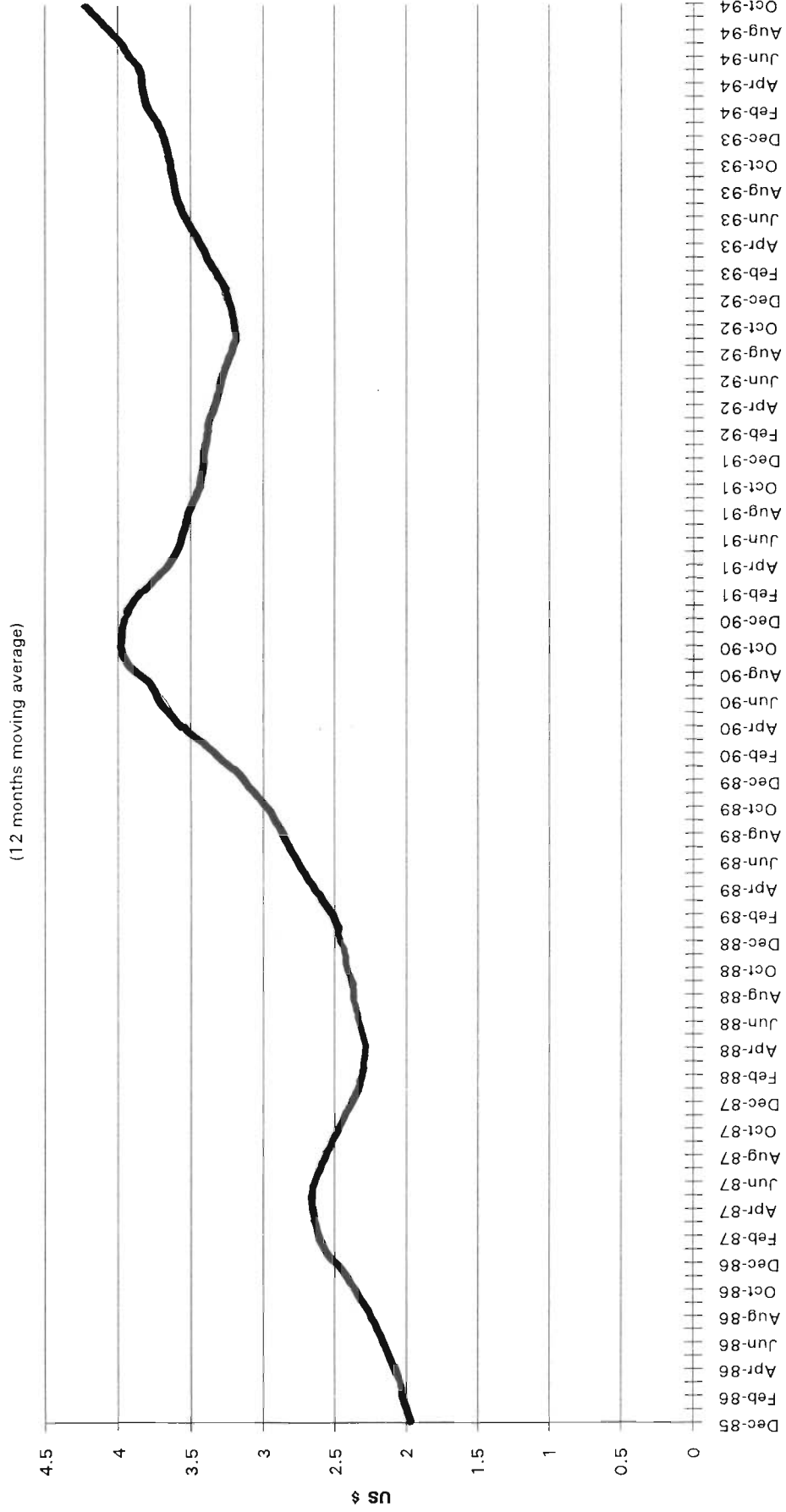
4. MInimum wage, payroll taxes and the informal sector

It is usually thought that the presence of minimum wages and payroll taxes reduces employment or increases the size of the informal sector. Besides payroll taxes, firms have to pay mandatory benefits like annual bonuses and contributions to forced savings funds.

4.1 Competitive labor markets

The argument behind the conclusion that the presence of minimum wages and payroll taxes reduces employment or increases informality is straightforward: mandatory benefits and the minimum wage reduce the level of profit maximizing employment of firms operating in a competitive labor market if the law is enforced or leads firms to establish informal labor relations if the law is not enforced.

Consider initially the case in which workers see both the mandatory benefits and the contributions to social security as part of their wage. That is, consider the case in which the utility for workers of each $ paid in the form of direct pay, mandatory benefits and contribution to social security is the same.\[4] In other words, assume that it does not matter to the worker *when* in his life time he/she receives the payment.

Let S be the hourly direct wage paid by a firm, W be the legal minimum hourly wage and F be rate of payroll taxes and mandated benefits. Hence, in a formal wage contract, F*W is the *minimum hourly compensation*.

Let Z_f be the equilibrium hourly compensation in the competitive labor market for workers with certain characteristics. In a competitive labor market firms take the wage Z_f as given and set the level of employment by equating the wage to the marginal revenue product (MRP). In such market, labor contracts will be formal if the minimum hourly compensation is smaller than the equilibrium wage, that is, if $Z_f >$ F*W.

Under these conditions firms will not have reasons to evade taxes and mandatory benefits. Since the wage is equal to or greater than F*W, and workers do not care about the composition of the total hourly compensation between instantaneous and deferred payments, the firm can always set the direct payment for

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[4] Three assumptions would make this hypothesis plausible: life cycling behavior on the part of workers, absence of credit constraints and a negligible rate of intertemporal preference.

hours worked (S) such that $F*S = Z_f \geq F*W$. This case is shown in Graph 1a.

Graph 1b depicts the case of another competitive market, in which the equilibrium wage Z_i is smaller than the minimum hourly compensation. In such case, firms will evade and engage in informal contracts. Hence, the condition for evasion under these conditions is:

$$Z_i < F*W$$

Now consider the case in which, even if $Z_f > F*W$, workers have a non negligible rate of intertemporal preference. That is, workers have a preference for instantaneous payments in comparison with deferred payments. In such case, workers might be prepared not to enforce the total payment of the benefits and the contributions to social security if, in exchange, the firm is willing to increase the direct pay. Depending on the cost of evasion, the firm may be willing to agree with the bargain. Hence, even if $Z_f > F*W$, the condition for evasion is given by:

$$S' + C < F*W < Z_f$$

where S' is the instantaneous hourly wage acceptable to workers and C is a measure of the cost of evasion. This case is illustrated in Graph 1a. Workers get $S < S' < F*W$ and firms save F*W - S' per hour worked. The cost of evasion is given by the probability of being caught when evading which in turn depends on the level of enforcement of the law.

Notice that if part of the firms and their workers chose to evade there will be an increase in aggregate employment ($H_i^* > H_f^*$ in figure 1a) and an increase in the degree of informality of employment.

In sum, in competitive labor markets, firms will have incentives to evade if the equilibrium wage is smaller than the minimum hourly compensation or, even if the equilibrium wage is greater than the minimum hourly compensation, if workers have a strong preference for instantaneous payments and the cost of evasion is low.
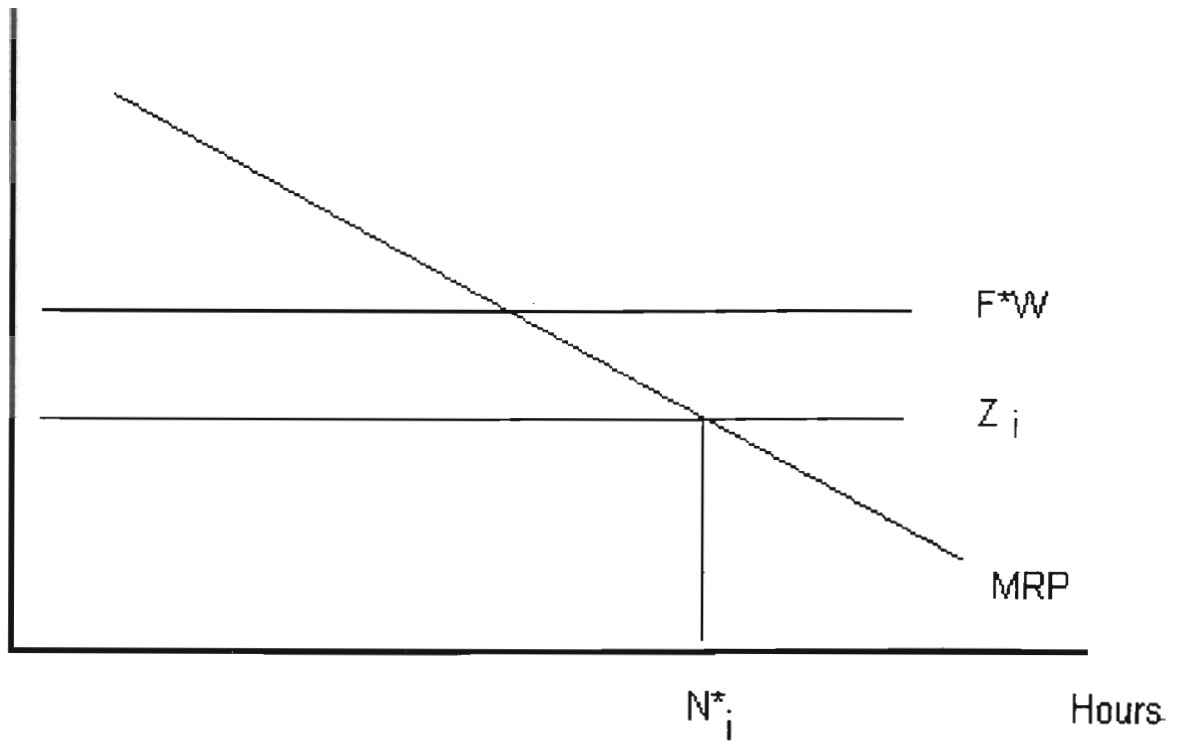
Graph 1a

Hourly
compensation (Z)

$Z_f = F^*S$

F^*W

S'

MRP

H^*_f

Hours (H)
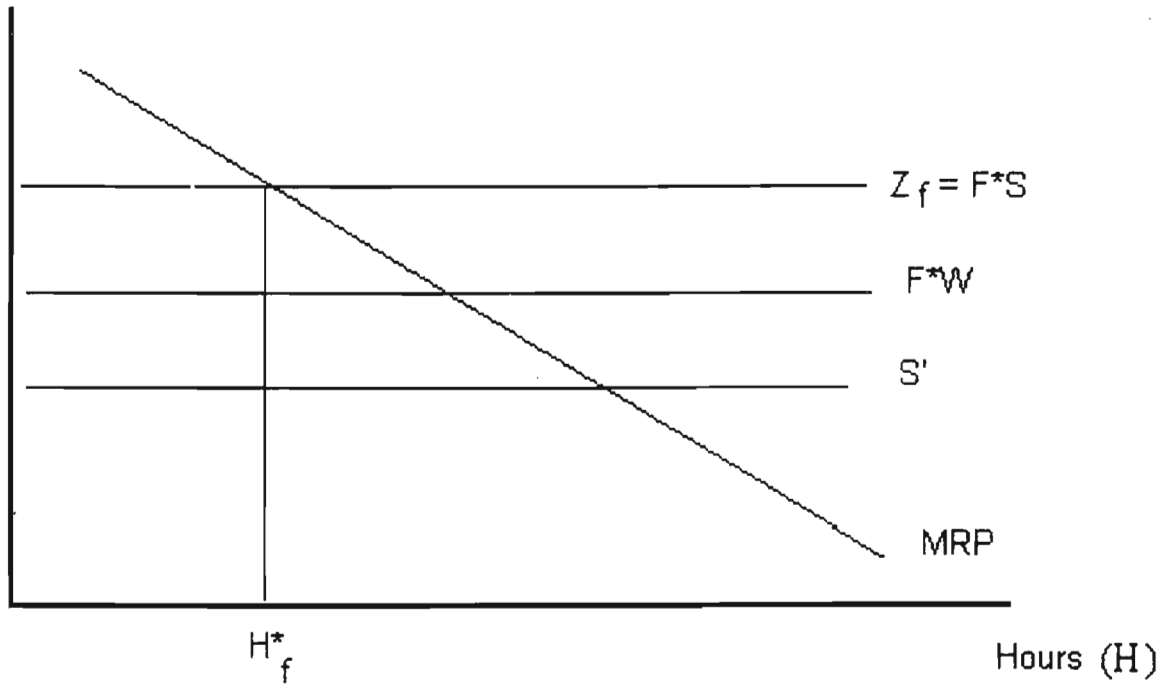
Graph 1b

Hourly
compensation (Z)

F*W

Z $_i$

MRP

N* $_i$

Hours

4.2 The "damage potential" of workers

The previous analysis considers cases in which firms do not distinguish between workers. Workers can be different in two different ways. They can be different because of differences in their background (as measured by education and experience for example). But even if they have the same background, in face of differences in the characteristics of the firms in which they work, they become "different".

The efficiency wage literature argue that two workers with the same human capital characteristics earn different wages because of differences in the technologies used by the firms in which they work. The wages paid by firms depends on the costs of shirking and monitoring workers. In firms in which monitoring is difficult and costly and shirking is costly, firms will be prepared to pay higher wages in order to reduce shirking. Shirking in the literature can be defined as the deliberate decision on the part of the worker of reducing effort.

Ramaswamy & Rowthorn (1991) have introduced the notion of "damage potential" of workers. The greater the costs of shirking for a firm, the greater the damage potential. But even in case of firms in which the costs of shirking are the same, wages could be different if the damage potential of workers depended on what Ramaswamy & Rowthorn call "performance". Performance encompasses "a wide array of attributes which determine the effectiveness of work ... For instance, performance can depend upon how intensely workers concentrate on their jobs (and) upon factor such as the willingness of workers to take initiative and function flexibly."(p. 509)

The model developed by Ramaswamy & Rowthorn to explore the notion of damage potential is a generalization of Solow's classical model of efficiency wages. They propose a production function in which "standard labor input" (hours of work) and "effort" (or "performance") are not multiplicative. Instead, they enter the function separately which implies that hours of work and effort (or performance) are not perfect substitutes. The function proposed is the following:

$$y = f(H, e(Z)) \quad \text{with } e' > 0, \ e'' < 0, \ f_H > 0 \text{ and } F_e > 0$$

where H = hours of work, e = effort (or performance), Z = real hourly compensation and y = output. Profits are defined as $\Pi = y - ZH$. Profit maximization give rise to the

following equations:

$$\delta\Pi/\delta Z = f_e \, e(Z) - L = 0$$

$$\delta\Pi/\delta H = f_H - Z = 0$$

Solving these equations, the following effort-wage elasticity is obtained:

$$E_z = [e'(Z^*) \, Z^*]/e(Z^*) = \varepsilon_H/\varepsilon_e$$

where $\varepsilon_H = (H/y)/(\delta y/\delta H)$ e $\varepsilon_e = (e/y)/(\delta y/\delta e)$

The size of E_z depends on the characteristics of the firm. Firms in which hours of work and effort or performance are substitutes, ε_H and ε_e are more or less of the same size. Firms in which hours of work cannot replace performance, $\varepsilon_e > \varepsilon_H$. Hence, E_z will be lower in the latter case than in the former case.

The first conclusion then is that E_z is inversely related to the damage potential of workers as determined by the importance attributed to performance by different firms. The second point to note is that in the classical efficiency wage models --based on production functions in which H and e are multiplicative-- the following condition applies:

$$E_z = 1$$

What the Ramaswamy & Rowthorn models shows is that when H and e enter the production function separately, E_z can be smaller than 1. Hence, the so-called Solow condition ($E_z = 1$) becomes a special case.

Finally, first and second order conditions of profit maximization imply that, if E_z can vary across firms, then

$$\delta E_z/\delta Z^* < 0$$

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that is, workers employed in firms with the greater damage potential (smaller E_z), receive the highest wage.

Graph 2 depicts the determination of the equilibrium wage (Z^*) and the equilibrium demand for labor (H^*) are determined. Notice that, the smaller E_z, the greater the equilibrium wage and the smaller the equilibrium demand for labor (H^*).
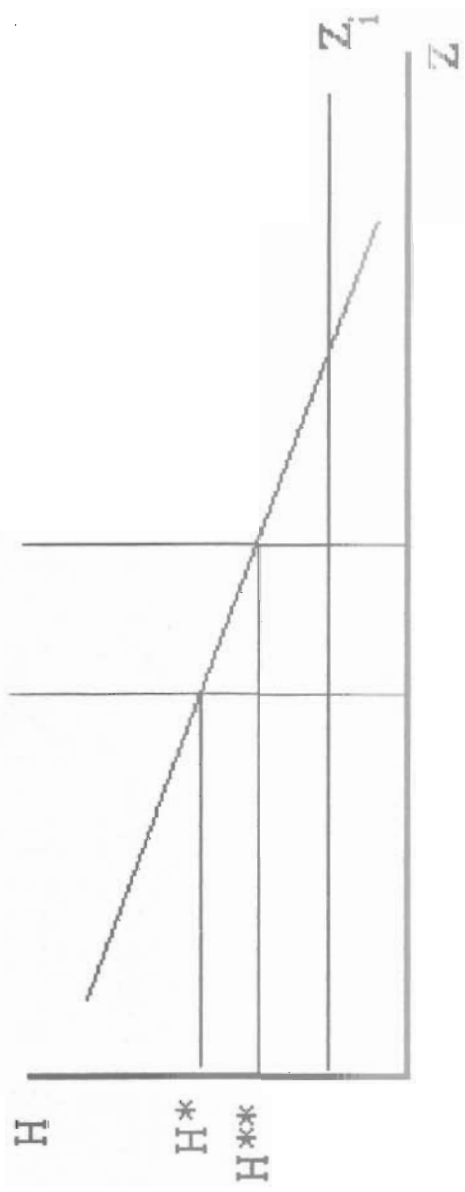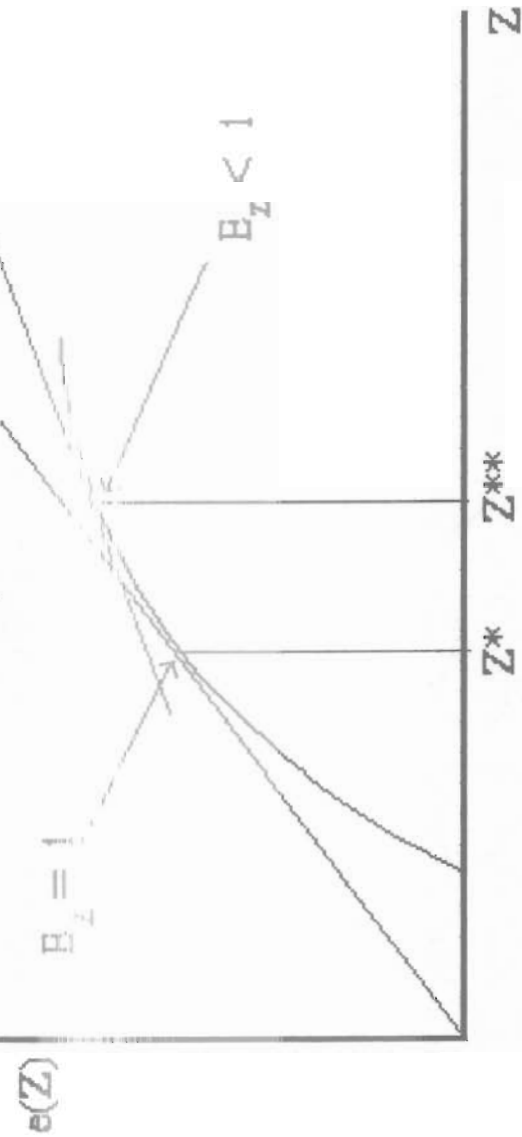
4.3 Damage potential, minimum wage and informality

We can now compare two representative firms demanding undistinguishable workers from a human capital point of view. In firm 1 (on the right in **graph 3**), ε_e is close to zero (damage potential is negligible) which implies that E_z is very high. Abstaining from possibility of shirking, this firm hires "hours of work" of workers with a given set of human capital characteristics. The firm takes the hourly wage of these workers as given by supply and demand at the industry level (Z_i) and fixes the level of employment by equating Z_i to the marginal revenue of labor (H_i).
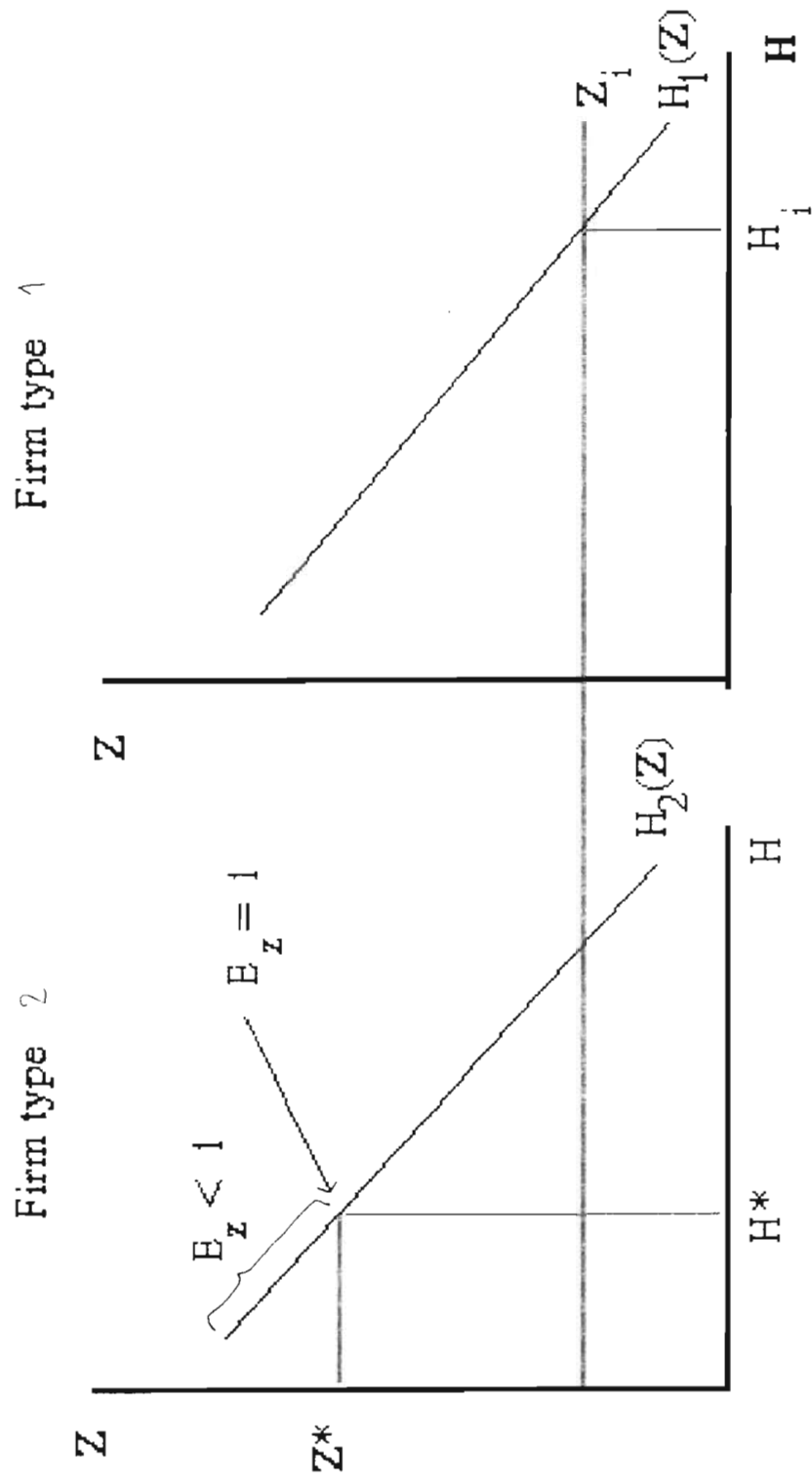
In the second representative firm (on the left of **graph 3**), ε_e is positive and therefore E_z is small. The greater ε_e, the smaller E_z. The wage decreases in E_z.

Assume that these are the only two types of firms in the economy, namely, firms type 1 (as represented by the panel on the right side of **graph 3**) and firms type 2 (panel on the left side of **graph 3**). For the sake of analysis, assume that the minimum hourly compensation is between Zi and Z^* ($Z_i < F^*Z < Z^*$) so that workers in firms type 1 have informal contracts and workers in firms type 2 have formal contracts.

Graph 2

$E_z = 1$

$E_z < 1$

$e(Z)$

Z^* Z^{**} Z

H

H^*

H^{**}

Z_1

Z

Graph 3

Firm type 2

$E_z < 1$

$E_z = 1$

$H_2(Z)$

Z

Z*

H*

H

Firm type 1

Z_i

$H_1(Z)$

H_i

Z

H

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Let the level of aggregate employment (as measured by the total number of hours) be given at $\underline{H}$. Once the equilibrium wage in firms type 2 is determined according to the profit maximization procedure described above, the level of employment (H_f) is determined. It is assumed that the level of employment in firms type 1 is determined as a residual between the aggregate level of employment and employment in firms type 2:

$$H_i = \underline{H} - H_f$$

so that the smaller the level of employment in firms type 2, the greater the level of employment in firms type 1. Since we assume full employment, the equilibrium wage in firms type 1 must accommodate to the level of excess supply of labor, given the level of employment in firms type 2:

$$Z_i = \alpha_o - \alpha_1 [\underline{H} - H_f(Z^*)] \qquad \text{where } H_f' < 0$$

so that $\partial Z_i / \partial Z^* < 0$, that is, the greater the wage in firms type 2 the smaller the wage in firms type 1. Hence, the wage differential between workers in the two types of firms is given by:

$$Z^*/Z_i = Z^*/[\alpha_o - \alpha_1 [\underline{H} - H_f(Z^*)]$$

so that $\partial(Z^*/Z_i)/\partial Z^* > 0$.

Finally, the degree of formality is given by

$$h_f = H_f/\underline{H}$$

so that $\partial h_f / \partial Z^* < 0$.

With this simple model it can be seen that for a given level of the minimum hourly compensation (as long as $Z_i < F^*Z < Z^*$), the level of formality will depend on the determinants of Z^*. If for some technological reason --say, the introduction of

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numerical control-- the damage potential of workers increase so that there is a reduction in E_z, the equilibrium wage in firms type 2 will increase. As a consequence, employment in firms type 2 will fall, there will be excess supply of labor for firms type 1 thus leading to a reduction in wages, a widening of the wage differential and a reduction in the level of formality. Note that the degree of formality changed given the minimum hourly compensation. Hence, the degree of formality depends on both the level of the minimum hourly compensation and the determinants of Z^*.

Demand did not play any role in this model yet. Assume that firms have a given size as measured by the level of output. In particular, firms type 2 produce $y_2^* = f[H^*(Z^*), e(Z^*)]$. The number of firms type 2 producing y_2^* will depend on the demand for the goods produced by these firms. The same is true for firms type 1, that is, each produce $y_1^* = g(H_i)$.

The level of per capita income and preferences can affect the sectoral distribution of demand. In a very poor society the demand for goods type 2 might be zero in which case these goods will not be produced. As the level of per capita income increases --assuming that the income elasticity of demand for goods type 1 is smaller than one-- the demand for goods type 2 will emerge. Assuming that $F^*Z > Zi$, so that employment in firms type 1 is informal, the emergence of the demand for goods type 2 will give rise to a "formal sector" and wage differentials.

To consider the effect of preferences, assume that there are 10 people in the economy: five employed in firms type 1 (earning \$1 each) and five employed in firms type 2 (earning \$2 each). The wage bills are, respectively, \$ 5 and \$ 10. Aggregate income is \$15. The productivity of labor in both sectors is 1, that is, $y/H = 1$ in both sectors. Hence the output of firms in both sectors is 5 units. Assume that profits are zero so that the price of each good is equal to the unit labor cost. Producers consume only the types of goods they produce. Table 3 summarizes these assumptions.

Now assume there is a change in preferences and that the rich (who earn \$2 and work for firms type 2) decide to demand greater quality of the goods produced in firms type 2. The demand for greater quality will increase the damage potential of workers in firms type 2. This will increase the wage in these firms and reduce employment. Now four people employed in firms type 2 each earning \$2.5 would demand four units of good type 2 --now with better quality. There will be excess

supply of labor thus increasing employment in firms type 1 and reducing wages. Workers employed in firms type 1 became less productive and poorer. Table 3 summarizes a possible outcome.

Firm type:	Employment	Wage	Wage bill	Output	Price = ULC
Situation 1					
Firm 1	5	$1	$5	5	$ 1
Firm 2	5	$2	$10	5	$ 2
Situation 2					
Firm 1	6	$0.83	$5	5	$1
Firm 2	4	$2.5	$10	4	$2.5

In this example a change in preferences --represented by an increase in the demand for the quality of goods produced in firms type 2-- led to an increase in informality and a widening of the wage differential. Again, the minimum hourly compensation was taken as a parameter in the exercise.

4.4 The case of Brazil

For the reasons mentioned above, it is very difficult to identify the determinants of informality. The degree of Informality depends on the minimum hourly compensation (minimum wage and mandatory benefits) but also depends on the technology, preferences, per capita income and the distribution of income. The following analysis is based on different data sets and has the objective of identifying the likely determinants of changes in the level of informality in Brazil.

The first data set is taken from the household survey of DIEESE in great S. Paulo. It provides the average real wage of workers in the informal sector. Figure 4 compares the such wage with the minimum wage using the same deflator. The Figure shows that the average wage in the informal sector between 1985 and 1994 is, with rare exceptions in the beginning of the period, at least two times as great as the minimum wage. In principle this is an evidence that firms in the informal sector could

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pay a smaller direct wage and establish formal labor contracts. If they do not, according to the previous analysis, it is either because workers have strong reasons to prefer informal contracts or because the law is not enforced. Indeed, both reasons could act simultaneously.

However, the fact that the data refers to the average wage in the informal sector reduces the relevance of the conclusions. Depending on the quality of the sample, the average wage could be biased towards the higher wages in which case the average is not really very relevant. Hence, the results should be interpreted with caution.

Based on a household survey (PNAD, 1990), Table 3 shows that 30% of the informal workers in the Brazilian labor force (wage earners without a formal contract) earn more than 2 minimum wages. Based on the Monthly Employment Survey of metropolitan workers (PME), Table 4 shows that, on average, almost 50% of the metropolitan wage earners without a formal contract earn more than 2 minimum wages. In the most developed metropolitan areas such as S. Paulo, the proportion reaches 54%.

Recall that the contribution to social security plus mandated benefits amount to approximately 100% of the direct wage. Hence, the minimum hourly compensation is around 2 minimum wages. As a result, firms which pay more than 2 minimum wages to their employees could afford to formalize the labor contract. If they do not it is either because the cost of evasion is low or because in many cases the workers themselves have a preference for informal relations.

The previous figures show very clearly that the level minimum hourly compensation in Brazil cannot be seen as the sole determinant of the degree of informality. In the urban areas --where 75% of the active population lives-- on almost 50% of the cases, the minimum hourly compensation is not a binding constraint to the formalization of labor relations and thus cannot be interpreted as the only determinant of informality.

Figure 4: Minimum wage and the "market equilibrium wage" (wage in the informal sector)
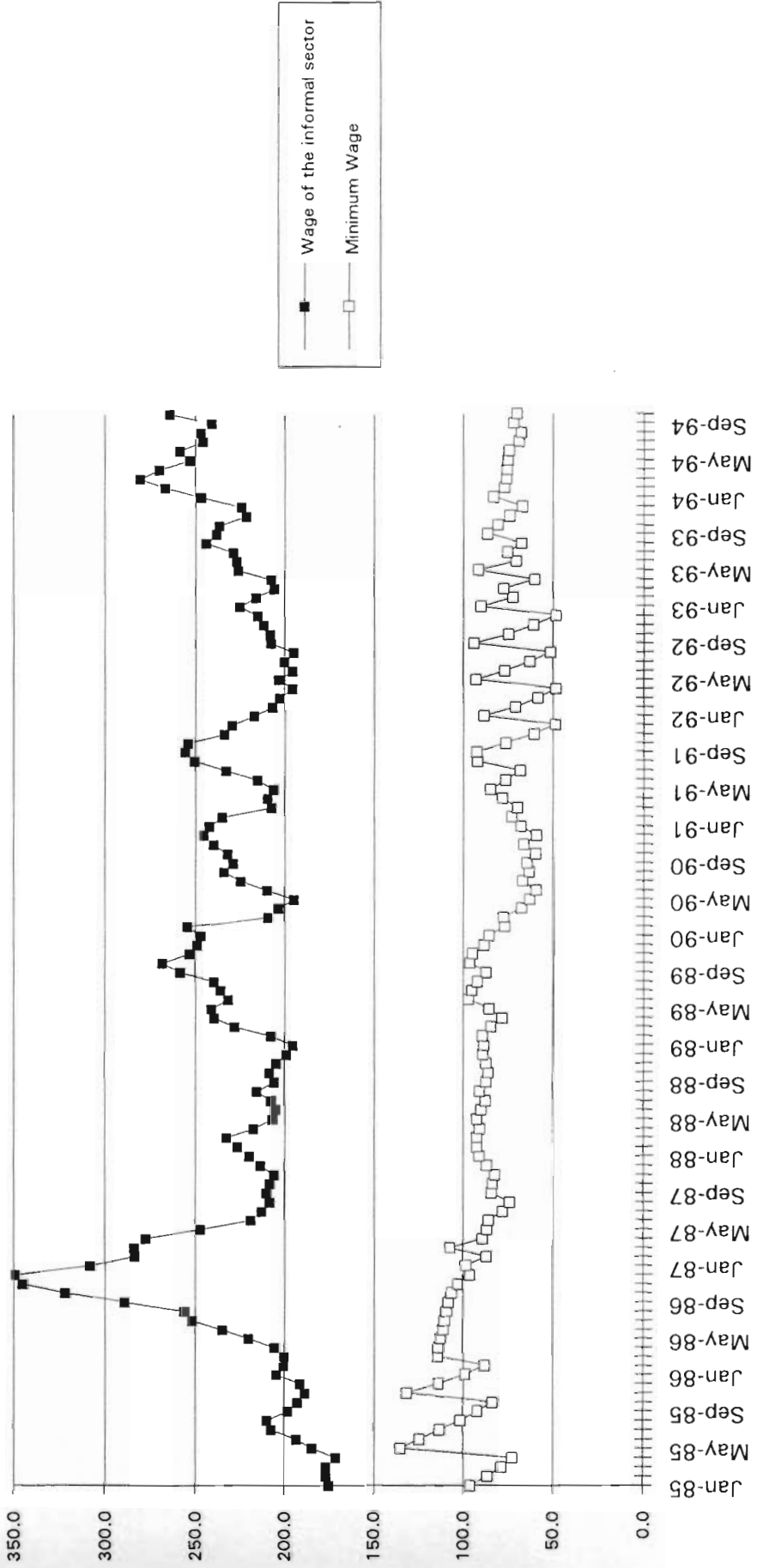
(S. Paulo, in constant R$ of Oct 1994)

Table 3
Distribution of Workers by wage brackets in the formal and informal sectors (%)

	Formal	Informal
Less than 0.5 MW	0	7
Between 0.5 and 1 MW	16	29
Between 1 and 2 MW	24	25
Between 2 and 3 MW	14	10
Between 3 and 5 MW	18	9
Between 5 and 10 MW	15	9
Between 10 and 20 MW	7	3
More than 20 MW	5	2

Source: PNAD, 1990

Table 4
Distribution of Informal Wage Earners (%) in Main Metropolitan Areas

Metropolitan Area	Up to 2 minimum wages	More than 2 minimum wages
Belo Horizonte	61.78	38.22
Porto Alegre	45.11	54.89
Recife	75.18	24.82
Rio de Janeiro	57.57	42.43
Salvador	76.16	23.84
São Paulo	45.78	54.22
Total (average)	53.09	46.91

Source: PME, 1992.

Barros, Mello and Pero (1993) using PNAD find that identical workers in the formal sector have wages 45% greater than workers in the informal sector. This means that firms in the formal sector not only pay a higher direct wage but pay the contribution to social security and all the mandated benefits (which together amount to 100% of the direct wage). Hence, assuming that there is no significant difference in the number of hours worked by workers in the formal and informal segments of the market, the hourly compensation in the formal sector would be, on average, 2.9 greater than in the informal sector.

If there were no differences in the structure of markets in which formal and informal firms operate, the hourly compensation would have to be the same in the two markets. Since firms in the formal market pay approximately 100% in the form of mandated benefits and contributions to social security, the equalization of pay between firms in the two markets would imply a direct wage 50% lower in the formal market than in the informal market and not 45% higher. Hence, the difference in direct pay is a clear evidence that firms in the two sectors operate in markets with different structures. As a consequence, all the conclusions discussed above concerning the effects of fixing a minimum wage or increasing the minimum wage apply. In particular, the effect of an increase in the minimum wage on the degree of informality becomes in principle ambiguous.

Finally, it is important to look at the relative movements of the minimum wage and the wage in the informal sector over time. Unfortunately, a reliable series of absolute values of the wage in the informal sector is not available. What is available is the evolution over time of an index number. Figure 5 shows the evolution of the real minimum wage, the real wage in the informal sector and the share of informal plus unemployed workers in the labor force. The following table summarizes the evolution of the series.

Table 5
Wages and Informality
(% change of 12 months moving average over relevant period)

Period	Cycle	Wage in the informal sector	Real minimum wage	Share of informal and unemployed workers
1984-1987	Boom	49%	15%	-18%
1987-1989	Down turn and stagnation	-14%	-30%	-6%
1989-1993	Recession	-32%	-22%	25%
1983-1994	Whole period	-30%	-45%	5%

Source: Pesquisa Mensal do Emprego, IBGE, various numbers.

The first point to notice is that the real minimum wage has shown enormous flexibility since the early 1980's. The second point is that over the whole period (1983-1994) the minimum wage has fallen 45% reaching in 1994 its lowest value (around US$ 65). The third point is that in the 1984-87 boom and in the 1989-94 recession, the minimum wage was less flexible than the wage in the informal sector. The latter increased 49% in the boom and fell 32% in the recession, while the minimum wage increased 15% and fell 22% respectively.

Figure 5 shows very clearly that both the share of informal and unemployed workers and the level of informality fall continuously in the 1986-1989 period while the wage in the informal sector falls initially and then remains stable. It is very clear that the relation between the minimum wage and the wage in the informal sector decreases which can be seen as a factor in explaining the reduction in the levels of informality and unemployment.

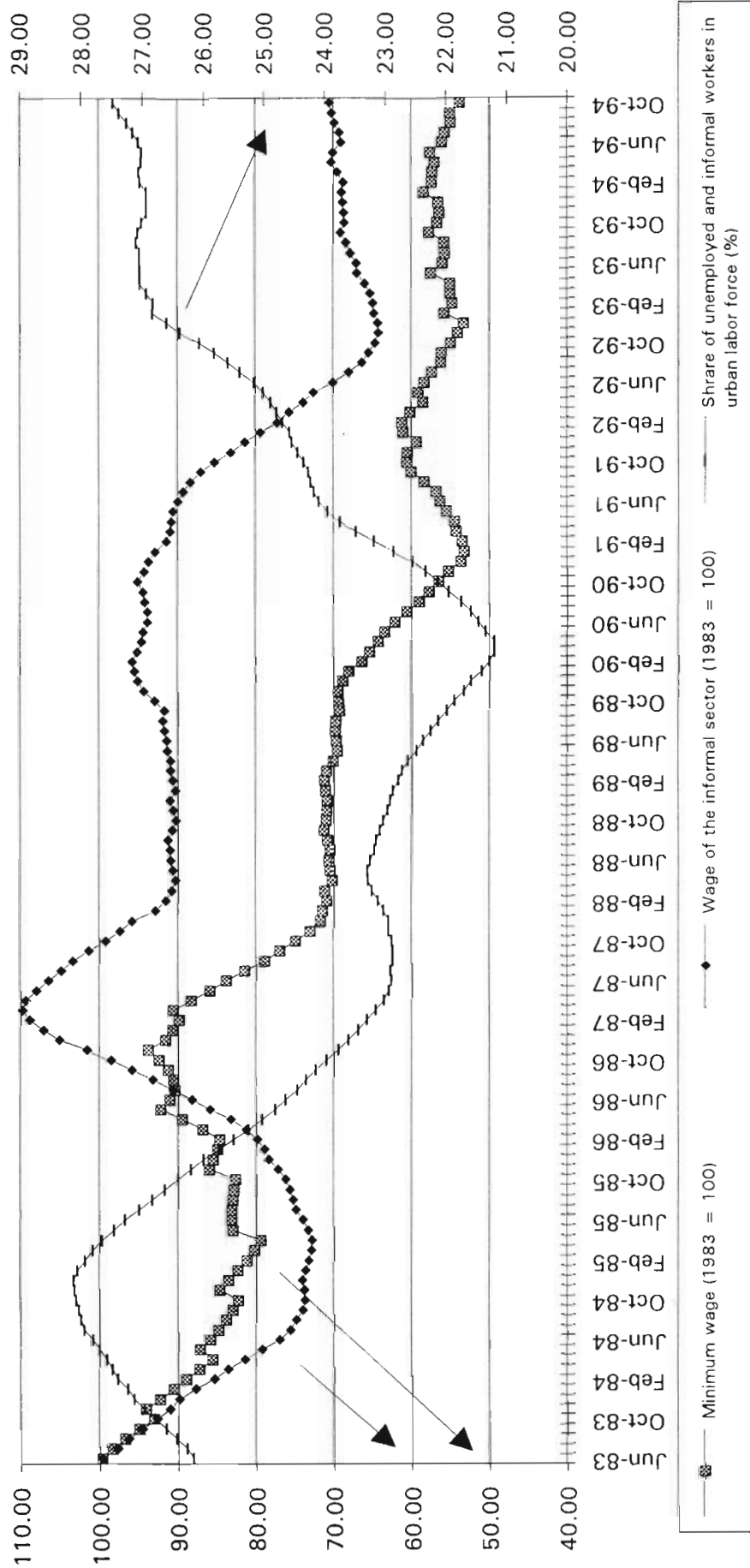Figure 5: Minimum Wage and the Informal Sector

Legend:
- Minimum wage (1983 = 100)
- Wage of the informal sector (1983 = 100)
- Shrare of unemployed and informal workers in urban labor force (%)

DIEESE.XLS Chart 8

Figure 5: Minimum Wage and the Informal Sector

Legend:
- Minimum wage (1983 = 100)
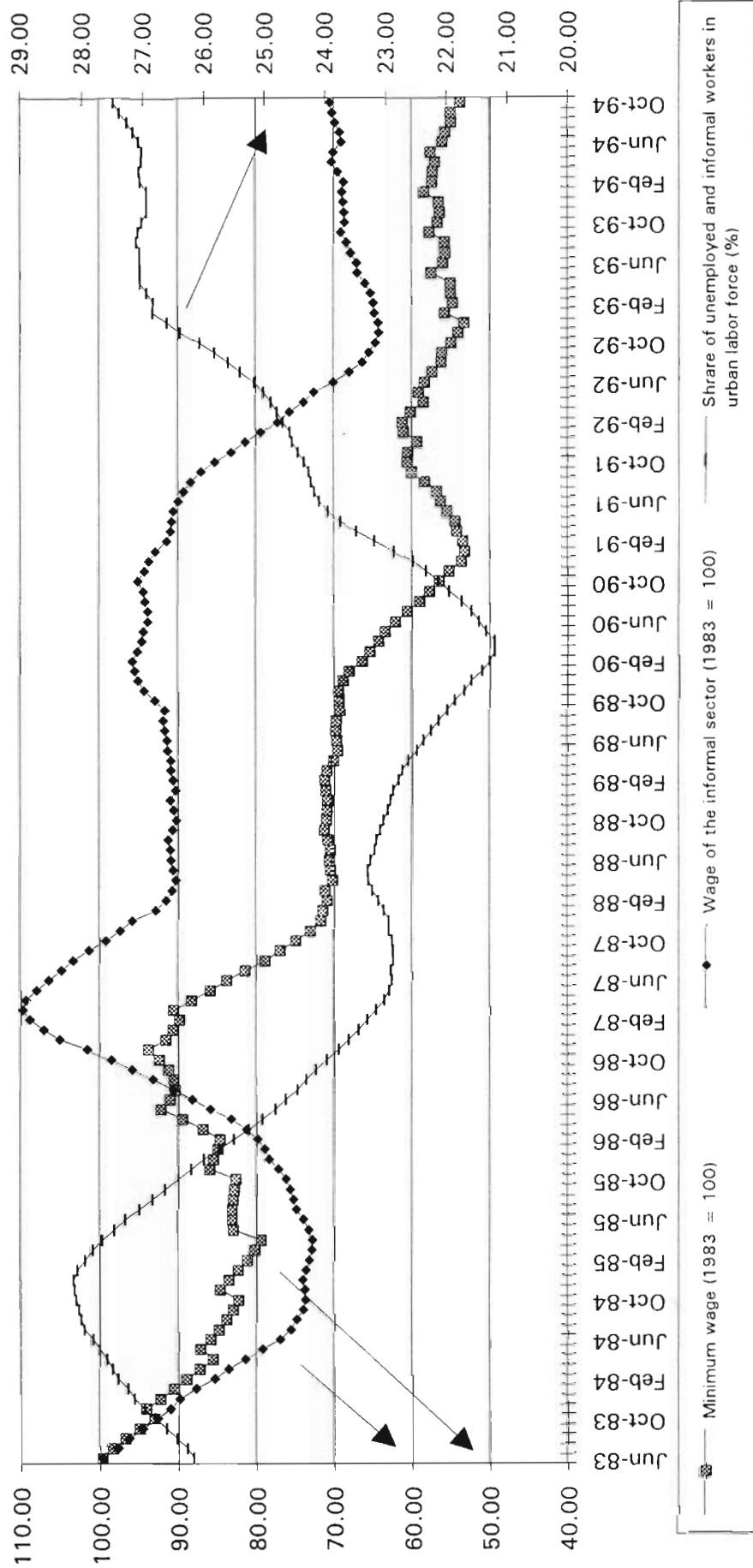- Shrare of unemployed and informal workers in urban labor force (%)
- Wage of the informal sector (1983 = 100)

In the recession of 1989-93, the minimum wage falls less than the wage in the informal sector which, again, can be seen as a factor in explaining the growth in the share of unemployed and informal workers.\[5] In addition, the new Constitution of 1988 increased the level of mandated benefits thus increasing the value of the minimum hourly compensation.

But there are probably other reasons for the increase in the informal sector. Among these, the reduction in the level of employment in the industrial sector -- around 25%-- is certainly very important. The level of informality in the industrial sector is considerably smaller than in the services, trade and construction sectors. It could be argued that the reason for this is that, due to technological reasons, the share of firms in the industrial sector operating according to the imperfectly competitive labor market discussed above is greater than in the other sectors. Hence, the reduction in the level of employment in the industrial sector would be associated with a reduction in the share of workers employed in high wage firms thus explaining in part the increase in informality.

Another reason for the growth of informality has to do with the reduction in per capita income and the impoverishment of the population. According to the discussion in section 4.4 this could lead to a reduction in the demand for quality which, in turn, would reduce the share of firms operating in the imperfectly competitive segment of the labor market.

As expected, therefore, it is not possible to provide a definite account of the reasons for the growth in the level of informality. There are different plausible reasons, none of them being able to explain alone the phenomenon.

5. The cost of dismissal and employment flexibility

The conventional view is that high firing costs prevents employment flexibility and reduces employment creation. If the costs to fire workers is high, in face of shocks which alter the sectoral distribution of employment, the transition to a new equilibrium

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[5] The share of informal and unemployed workers increased 6 percentage points between 1989 and 1994, going from 21.5% of the labor force to 27.5%. For each one percentage reduction, the minimum wage fell 3.7%.

will be slow and the costs of the transition will be large. In face of such shocks, firms should not be constrained in their decision to fire and hire workers. The freedom to fire and hire allows the constant flows of workers from stagnant to more dynamic sectors. This is basically the notion of *employment flexibility*. Countries with large employment flexibility will be characterized by a high frequency of unemployment (workers become unemployed more frequently) but also a low rate of long term unemployment (the unemployed find jobs faster).

High costs of dismissal is also seen as an hindrance to job creation. For two reasons. One is that it increases the bargaining power of employed workers thus implying rigidity of the real wage. In face of technological or negative demand shocks, downward wage rigidity will reduce the level of employment. The other reason is associated with the effects of firing costs on the cost of labor. Given the average level of labor turn-over in a firm, the greater the cost of dismissal, the greater the average labor cost. For the firm, an increase in the volatility of the business cycle implies greater labor turn-over which, given the cost of dismissal, implies a larger average labor cost. Hence, the combination of high costs of dismissal in face of a more volatile business cycle --due to greater international competition and fast technological innovations-- implies an increase in the cost of labor. This seems to be the reason why employers all over the world demand a reduction in the costs of dismissals.

Hence, there are good reasons to believe that reducing the costs of dismissal will increase employment flexibility --thus contributing to greater labor market flexibility-- and will increase job creation.

Looking the problem from another angle, it is true also that greater job stability enhances functional flexibility and labor productivity growth. The attitudes of firms and workers are not independent from their perception as for the stability or duration of the employment relation. From the point of view of firms, durable relations induces them to invest in training and up-grading of the work force. From the point of view of workers, durable relations increase their commitment with the long term objectives of the firm.

These attitudes, in turn, enhance the capacity of workers to adapt their skills to changes in technology and lines of production --if they are better qualified they can learn and adapt faster-- and have a positive effect on productivity growth. Also, if the

employment relation is perceived as durable, workers and firms tend to negotiate wage rates which are compatible with job stability in face of shocks.

The notion underlying the negative effects of costs of dismissal is that, if they did not exist, firms would hire and fire workers more frequently, hence increasing employment flexibility, wage flexibility, and ultimately reducing long term unemployment. Where firing costs are high, in face of changes in the environment, firms are required to adjust the use of labor through changes in the number of hours or the abilities of workers rather than through changes in the level of employment. Since job stability has positive effects on functional flexibility and productivity growth, it is not clear whether the net effect of inhibiting employment flexibility is positive or negative. Indeed, the extent to which job security regulations have positive or negative effects should remain a matter of continuous scrutiny.

Table 6 provides a summary of the provisions for individual and collective dismissals in France, Germany and Brazil. There is one important difference between Brazil and the other two countries as far as individual dismissals are concerned: in Brazil firms do not have to justify the dismissal either to workers' representatives or to public officials whereas in the other two cases firms must provide a justification. In the three countries firms must inform workers in advance that they will be dismissed (advanced notice). In Germany the advance notice for workers with less than five years of services is smaller than in the other two countries. Compensation for the dismissed workers is greater in Brazil than in France and does not exist in Germany.

Unemployment benefits exist in all three countries and are much more benevolent in France and Germany than in Brazil.

As far as collective dismissals are concerned, the differences between Brazil and the other two countries are considerably greater than in the case of individual dismissals. The legal definition of collective dismissal does not exist in Brazil. Indeed, except for cases in which the conditions for collective dismissals are negotiated between firms and unions, they are treated like individual dismissals which means that the same conditions apply. In particular, there are not consultation requirements to workers representatives or government officials. In Germany, unlike in Brazil and France, social plans are negotiated between the firm and the work councils.

The two main differences between Brazil and the two European countries are

the following: (1) in Brazil a firm may dismiss an individual worker without a justification whereas in the two other countries the dismissal must be justified; (2) Collective dismissals in Brazil do not suffer any type of constraints and, in particular, the law does not give the workers' representatives any right to negotiate the terms of the dismissals or compensation plans. As a result, in Brazil, the capacity of workers' representatives to influence and negotiate the process of dismissal is insignificant and the costs of collective dismissals are much smaller than in the other two countries.

The comparison between the US and other developed countries, including France and Germany, is notable. Firms in the US do not have to justify individual or collective dismissals, do not have to provide advance notice to workers and do not have to pay severance pay to permanently laid off workers. Differently from Germany, for example, the US unemployment insurance system is experience rated which implies that layoffs lead to an increase in the unemployment insurance tax liability of firms.

Compared to Brazil, as far as the compensation system is concerned, the US system is probably more efficient since the tax liability of firms to finance the unemployment insurance system inhibits firms to layoff workers. Whereas in Brazil the system is funded through an uniform tax on firms' revenues. Also, in the US the firm can layoff a worker temporarily thus establishing a long term relation between the firm and the unemployed worker. In Brazil such relation does not exist since the dismissed worker does not have any advantages over other workers when the firm decides to hire again.

Except for the funding of the unemployment insurance system and the payment of severance payments, the conditions of dismissals are very similar in Brazil and the US. Certainly much closer than between Brazil and Europe. Brazil and the US share the following characteristics: the absence of any obligation to justify individual dismissals, the negligible role of negotiations with workers' representatives or government officials and the absence of any particular constraints to collective dismissals.

More important than the constraints to dismissals themselves is the fact that since workers' representatives do not have the legal right to negotiate dismissals, the scope for a negotiated bargain over reductions in hours versus reductions in

employment becomes very small. As a consequence, the incidence of layoffs is much greater in the US than in Germany and France where firms tend to adapt the use of labor through changes in the number of hours worked.

Abraham & Housman (1993) show that "although the adjustment of employment to changes in output is much slower in the German French and Belgium manufacturing sectors than in the US manufacturing sector, the adjustment of hours worked appears much more similar (...) Compared to the US, then, labor market institutions in the European countries (studies, ie, Germany, France and Belgium) seem to have encouraged relatively greater reliance on hours adjustment and correspondingly reduced reliance on hiring and firing to alter the level of employment". (p. 24-5) As a consequence, it could be argued that in European countries employment flexibility has been in part replaced by functional flexibility.

Table 6
Selected Provisions for Dismissal

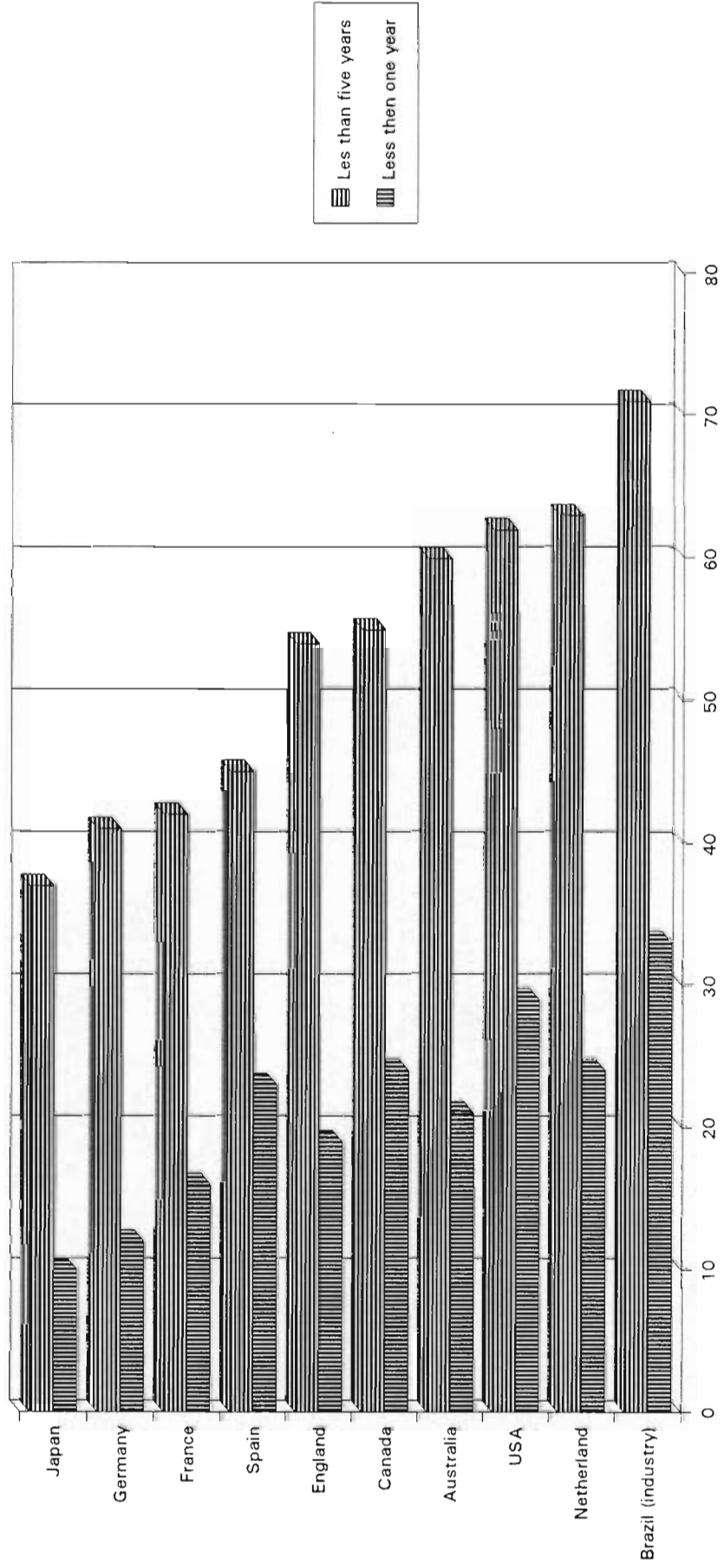|	France	Germany	Brazil
Individual dismissal			
- Justification for dismissal required	Yes	Yes	No
- Period of advance notice	One month for workers with less than six months in the job and two months for workers with more than two years	Two weeks for workers with less than 5 years in the job, one month for workers with more than 5 years and 3 months for workers with more than 20 years	One month
- Compensation	1/10th of months's pay per year of service plus 1/15 of month's pay for each year over 10 years of service	None	1/2 of monthly pay plus 40% of FGTS which is equivalent to 40% of a monthly wage for each year in service
Collective dismissal			
- Definition of collective dismissal	2 or more employees over 30-day period	20% of labor force or more than 60 workers	Does not exist. Collective dismissal is treated the same way of individual dismissal
- Additional notice and consultation requirements	Obligation to inform and consult with worker representative and labor inspector must be informed of dismissal of 10 or more workers	Obligation to inform and consult with worker representative and employment office must be informed	None
- Additional compensation to affected individual	None	Social plan negotiated between work consils and management. The median settlements was about 15 to 25 weeks pay for a person with average blue-collar industrial earning	None
Compensation system			

- Unemployment benefit insurance	Yes	Yes	Yes
- Benefit amount	Public payment of 65% of minimum wage for reduction in hours of work. Employer payment to raise short-time benefit to 50% of wages for reductions below 36 hours per week	63-68% of net pay for hours not worked	Value of the benefit cannot be lower than one minimum wage, is monthly adjusted to inflation, and is related to the average wage received by the worker in the last three months in the previous job.
- Period of benefit	Up to a maximum of 500 hours per year	6 to 24 months	4 months
- Funding	General revenues	Non-experience-rated payroll tax	General revenues

Source for Germany and France: Abraham & Housman (1993)

The data on the Brazilian labor market shows a very significant level of employment flexibility. Figure 6 presents measures of job security in a selected group of countries. It shows for example that the share of workers with less than one year in service is 10% in Japan, 12% in Germany, 15% in France, 28% in the US and 33% in the Brazilian manufacture. As for workers with less than five years of service, their share of the labor force is 37% in Japan, 41% in Germany, 42% in France, 62% in the US and 71% in Brazil. Hence job tenure is greater in Japan, Germany and France than in the US and Brazil.

Figure 7 presents data on the frequency and duration of unemployment. Workers become frequently unemployed in Brazil and the US and very infrequently in Germany and other European countries. In contrast, the duration of unemployment is very small in Brazil and the US and considerably higher in Germany and European countries. In Japan the frequency and duration of unemployment were both relatively low in 1988.

INTLCOMP.XLS Chart 1

Figure 6: Time in the same job (as % of total employees)

Legend: ▦ Les than five years ▦ Less then one year

Categories: Japan, Germany, France, Spain, England, Canada, Australia, USA, Netherland, Brazil (industry)

Axis: 0, 10, 20, 30, 40, 50, 60, 70, 80

Source: Economist e PNAD/FIBGE

Figure 7: Frequency and Duration of Unemployment

Legend:
- Duration (in 0.1 * months)
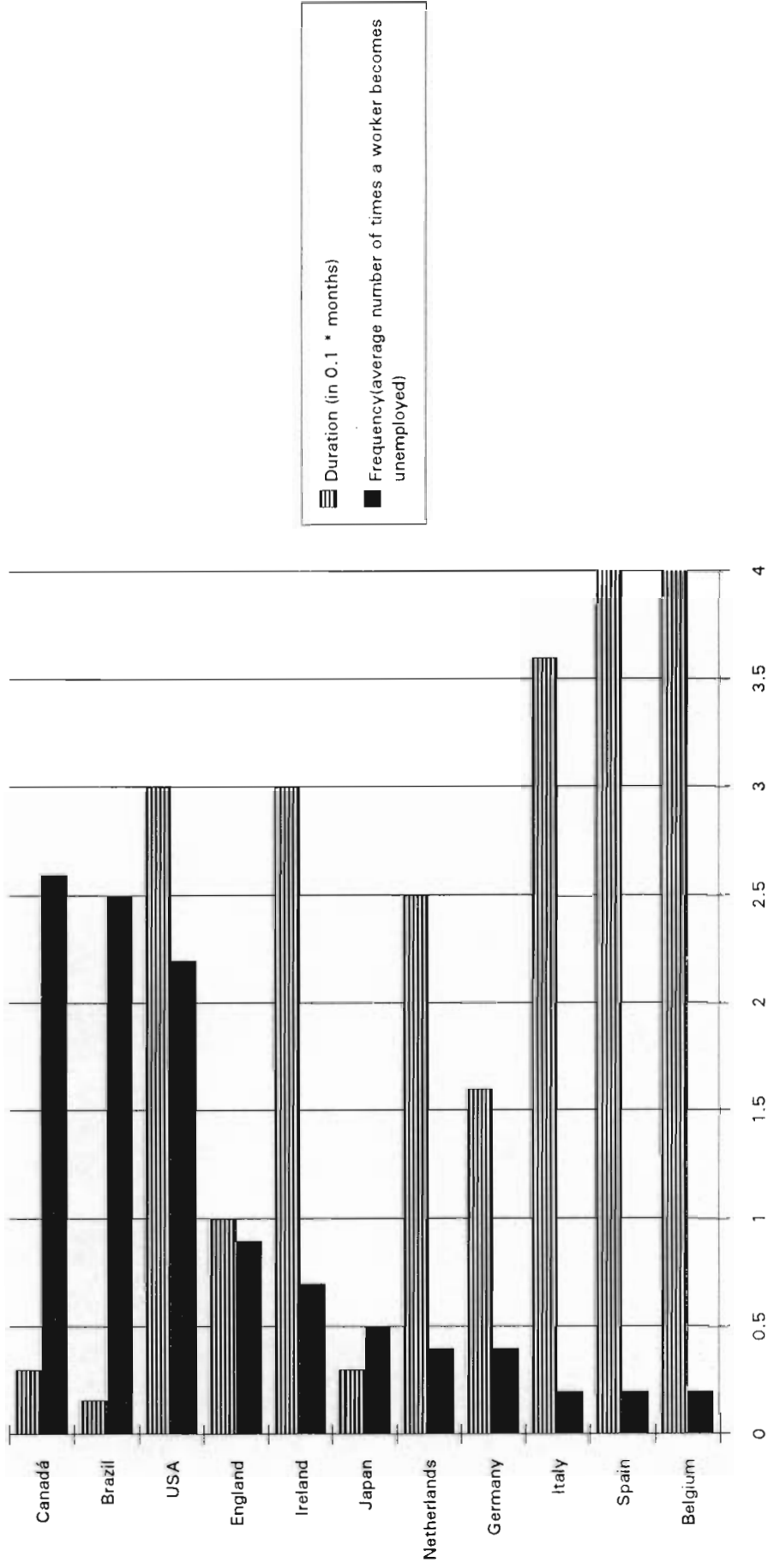- Frequency(average number of times a worker becomes unemployed)

Ta[...] [pre]sents data on labor turn-over in the Brazilian formal sec[...] The data should b[...] [as] follows. In 1985, on the average, 2.80% of the jobs o[...] Brazilian legally re[...] [f]irms with more than five employees changed its worke[...] [th]e period of one m[...] 1989, 39.66% of the jobs changed its worker in this y[...] Thus, in the perio[...] 1993, 28% or more of the legally registered firms job[...] [ch]anged its occupan[...] [pe]riod of one year.

Th[...] Figures 6 and 7 and Table 6 show very clearly that [the] [d]egree of employm[...] [ta]bility in Brazil and the US are remarkable compa[...] with the Europea[...] [on]es.

Table 7: Labor Turnover Rates
Brazilian Formal Labor Market
1985/1993

	labor turnover monthly average	labor turnover annual
	2.80	n.a.**
	3.67	n.a.
	3.72	n.a.
	3.80	n.a.
	3.49	39.66
	3.26	38.20
	2.69	35.75
	2.26	28.05
	2.73	32.81

[...] Ministry of Labor - Law 4923. Calculations by Amadeo et al (19[...]
[...] january-october, 1993
[...] not available

As [...] [ab]ove, firms in Brazil have to pay severance payments [...] [di]smissed workers [...] some cases creates the incentives for workers to p[...] [ta]ke their dismissal [...] [c]ertainly a negative incentive since it tends to shorten [...] [d]uration

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of labor contracts with negative effects on the attitudes of both firms and workers. Amadeo et al (1994) have argued that part of the high levels of labor turn-over in Brazil in Brazil results from the incentives of workers to provoke their dismissal in order to get the severance pay. Hence, it is reasonable to argue that in the Brazilian case, there is excessive employment flexibility.

6. Concluding remarks

The analysis in the previous sections has provided evidences that the Brazilian labor market is very flexible. The degree of wage flexibility is considerably greater than in all OECD countries considered in the Blanchflower & Oswald study. The conditions for firing workers are not at all important hindrances to employment flexibility, as measured by labor turn-over and the frequency and duration of unemployment. Indeed, compared to OECD countries employment flexibility is also significant. As for the structure of the hourly compensation, it does not differ from the structure in OECD countries and the absolute value of the hourly compensation is smaller than 20% of that in Japan, the US and Germany. Finally, it seems that apart from the likely effect of the minimum wage and mandated benefits on the degree of informality, other factors affect the creation of formal jobs in Brazil.

The evidences are all in the direction of characterizing the Brazilian labor market as flexible. Maybe too flexible (for the wrong reasons) as noted in the analysis of employment flexibility.

One aspect of the Brazilian labor market which is worth commenting further is the large size of the informal labor market segment. About 30% of the workers in the informal sector in 1990 earned more than two minimum wages implying that if the law was enforceable, the firms employing these workers would be able to formalize the labor contract. For the other 70%, it was argued that the size of the minimum wage and mandated benefits explains at best only part of the high degree of informality. It was even argued that, under certain conditions, an increase in the minimum wage would lead to greater formality.

However, for a group of firms and respective workers, whose productivity is very low, the size of the minimum wage and mandated benefits is an impediment to the

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formalization of labor relations. Two questions arise concerning this group of workers and firms.

The first question is to what extent informality is bad or undesirable? It is undesirable because these firms and workers do not contribute for the social security system thus creating fiscal imbalances and the deterioration of the quality of the services provided by the system. Apart from that it is possible to argue that the existence of the informal sector is not really socially undesirable. If the workers employed in the informal sector were not there, they would be unemployed and demanding unemployment compensation from the government.

It can always be argued that if the minimum wage and mandated benefits were lower, these firms and workers would formalize the labor relation and, pending on the level of enforceability, start contributing to the social security system. One solution would be to let employers and employees negotiate the level of benefits --given minimum standards to be established also through negotiations at the industry level-- such that they become in accordance with the market conditions faced by the firms.

Indeed, what is probably lacking in the Brazilian labor market is greater incentives to transparent negotiations between employers and employees. This would imply making the labor code less encompassing, on the one hand, and creating institutions which would give workers' representatives greater capacity to negotiate over wages and employment, on the other hand.

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