The impact of payroll taxation on employment in a third world setting: personal services in Brazilian nonamazonian states 1940–1980

Samuel Cohn*

Abstract – The effect of payroll tax burdens on employment in three Brazilian personal service industries between 1940 and 1980 is examined. The examination of individual personal service industries permits the inclusion of detailed controls for non-tax determinants of employment, such as consumer demand, in a setting where such measures are free from spatial contamination. Generally, payroll tax burdens were low in Brazil although they rose to noticeable levels by the end of the period. This notwithstanding, payments for social charges had little relation to employment in Brazil, even in periods where such payments were high. This applies both in large sample regression models and smaller detrended analyses.

Keywords – Non-Wage Labor Costs. Wages and Compensation. Demand for Labor. Taxation. Business Taxation.

JEL Codes – J32, J3, J23, H2, H25

There has been substantial debate in the recent decade on the capacity of neoliberal reforms and the flexibilization of labor markets to raise overall levels of employment[1]. In this context, the effect of payroll taxation on the demand for labor has obtained new relevance, since lowering payroll taxes is one method of reducing the impact of the state in the labor market. Employers and employers associations are long standing critics of payroll taxation, claiming that social charges raise the cost of hiring workers and lower rates of job creation[2]. They sometimes have

---

* Professor of Sociology, Department of Sociology, Texas A & M University. E-mail: profcohn@hotmail.com.

support from anti-statist members of the academic community such as Hernando de Soto, and Rabushka and Bartlett. Of particular note, in the Brazilian context is José Pastore who has published a highly visible series of books linking reduction of government mandated payroll taxes to a substantial potential increase in employment[3] . This claim is frequently echoed in the Brazilian business press. In Europe, Gosta Esping-Anderson, customarily a strong Marxist critic of neoliberal reform, has provided empirical evidence that social charges have had a substantial effect on inhibiting employment particularly for youth[4] .

However, many writers on payroll taxation have been skeptical of the claim that such payments have had any adverse effect. Within the field of labor economics, discussions of the incidence of payroll taxation typically downplay the employment effects of social charges – although there is both theoretical and empirical disagreement on this question. Given that the statistical evidence has not provided a preponderant body of evidence for either side, a reconsideration of this question would seem appropriate.

This paper is an analysis of the effect of the ratio of payroll taxation to salaries on employment in three Brazilian personal service industries between 1940 and 1980: restaurants, hotels and barber/beauty shops. The limitation of the sample to three particular industries permits the inclusion of a more highly developed set of controls than are available to traditional economy wide studies. The methodology used here is novel; however, the findings support the traditional claims that have been made by many labor economists and by critics of neoliberal reform: that the ratio of payroll taxes to salaries has little effect, positive or negative on employment.

1. Review of the Literature

Although there has been substantial dispute on the effect and incidence of payroll taxation, the majority of writing on this question suggests that the effect on employment should be low. The arguments made supporting this proposition are as follow:

1) *If labor demand is inelastic, then employers can counteract the effect of payroll taxation by reducing wages, maintaining a fixed relationship between total labor*

costs and marginal productivity. The majority of writing on social charges has concerned itself with their incidence: whether the costs are borne by employers or employees. The question of the incidence of payroll taxes is of direct relevance to the study of public finance[5]. The link to employment is more indirect. The most common theoretical claim is the effect of social security payments on employment is mediated by the extent to which such charges are borne by employers or workers. Taxes that are borne by employers reduce employment, while a taxes borne by workers have few employment consequences. Analyses therefore focus on the incidence of payroll taxation.

The seminal discussion of the incidence of payroll taxation is that of Brittain. Using static analysis, Brittain claimed that in principle, a payroll tax would reduce both wages and employment[6]. However, in practice, most of the tax is passed on to workers in the form of lower base salaries. This transfer of the burden of payroll taxation to workers is due to high observed levels of labor supply inelasticity. Most payroll taxes do not push salary levels below worker's reservation wages, and therefore most workers are forced to accept the adjusted wages predicated by the existence of payroll taxes.

Most empirical analyses of the incidence of social charges show some percentage of those taxes being recouped in the form of lower wages. However, this does not rule out the existence of an employment effect. The range of estimates of the percentage of these charges that are absorbed by workers vary wildly from 0% to 100% of the tax. The median estimate is approximately 30%[7]. The employment interpretations of a 30% incidence are ambiguous and subject to differential interpretation. Without explicit estimation of employment effects per se, any conclusion concerning employment by a pure analysis of incidence alone is necessarily speculative[8].

It is worth noting however, that given the shifting of the payroll tax on to workers minimizes the employment effects of social charges, such shifting is particularly likely to occur in third world settings. The relative scarcity of employment combined with high levels of poverty in these nations reduce the elasticity of labor supply, because workers are simply desperate for work. Furthermore, the economies in the developed world tend to have institutional forces that restrict the ability of employers to

reduce wage rates at will. These include such labor market rigidities, such as union contracts and minimum wage laws[9]. Because poorer nations are characterized by flexible labor markets, weak unions and uneven enforcement of labor laws, it should be particularly easy in these settings to preserve employment by lowering wages[10]. Gruber, for example, in a study of Chile found payroll taxation had large negative effects on base wages but almost no effects on employment[11].

2) *Even if employers do not reduce wages, they can adjust to payroll taxes in other manners, such as raising prices and reducing margins, that reduce the employment consequences of taxation.* Vroman found that employers react to increased social charges by raising product prices. In situations where demand for the product is price-inelastic, such cost increases may not reduce sales or employment[12]. In other cases, employers simply tolerate lower profit margins. This can occur as a result of lags in the adjustment process due to employer caution or labor market inflexibilities[13]. Neoliberal reforms in Morocco had negligible effects on employment, due to oligopolistic employers reducing margins and reorganizing production to raise productivity[14].

3) *Regardless of any effect payroll taxation may have on employment, joblessness rates may be determined by fundamental questions of macroeconomic policy and international competitiveness.* A fundamental problem with nearly all analyses of the effect of payroll taxation on employment is that these arguments are cetibus paribus. For analytical purposes, it is often useful to assume everything else is equal to determine the pure effect of the variable under consideration, However, in real life, small effects are routinely overwhelmed by larger effects. The impacts of fiscal or monetary policy, or the competency of execution of state-led development programs may dwarf any effects of social security payments per se[15]. In the case of payroll taxes, these are linked to income support programs that themselves may have sizable effects on consumption, and therefore on demand. Brazilian critics of neoliberal reform have made forceful arguments that the lowering of income produced by the scaling down of payroll-tax-linked welfare benefits could destroy many more jobs than would be created by reducing employers' contributions[16].

4) *The burden of payroll taxation may be too small to make a substantive impact on employment.* Opponents of social charges often attempt to demonstrate the financial burden of such payments on employers is enormous. José Pastore, for example, argues that contemporary Brazilian payroll taxes represent fully 102% of base salaries. Such calculations are made by reading the law for every employer obligation in the statutes and assuming neither legal exemptions nor substantive evasion[17]. However, de facto obligations can be substantially smaller than de jure obligations. Formal enterprises often find a number of ways to evade paying their full share of taxes, both payroll and otherwise. Informal enterprises pay no taxes at all; such enterprises can represent a very substantial share of third world employment[18].

Advocates of a strong employment effect of payroll taxation would make the opposite arguments: that the costs of such payments can be shifted neither on to workers nor to consumers, that the employment disincentives from such taxation are sizable enough to be comparable to those that stem from other sources such as changes in consumer demand, that the effects of such exogenous factors often cancel each other out leaving the payroll taxation effect in place, and that financial burdens of social charges are sufficiently large to economically reward employers who alter their employment behavior appropriately

2. Methodolology

The present study examines the relationship between the ratio of payroll taxes to salaries on employment in three industries in Brazil: restaurants/food service, barber/beauty shops and hotels/lodging. To increase the N, the unit of analysis is the state rather than the nation as a whole. There are six panels in the dataset (1940, 1950, 1960, 1970, 1975 and 1980) allowing for a cross-section time-series design[19].

The data come from the Brazilian Service Census. These data represent an enormous opportunity because;

a) they provide explicit information on how much money employers actually pay in social charges. All payroll taxes are combined regardless of

source, rather than just considering one social charge in isolation. The reported tax payments also adjust for legitimate deductions and exemptions. More importantly, data on actual payments implicitly adjust for variations in enforcement of the laws. If employers are routinely evading their social security obligations, the actual payment data will measure the *de facto* rather than *de jure* obligations; it is the former rather than the latter which should have an effect on employment[20].

b) the limitation of the sample to a small number of unified industries allows for the systematic modeling of demand for the products of the industry. An important determinant of employment is consumer demand. This is difficult to model at the economy-wide level, but substantially easier to model for single isolated industries. Employment is highly likely to vary in reaction to variance opportunities for sales –even in the face of constant prices for factor imputs. Controlling for changes in the potential size of the market for output, whether these be due to cyclical or secular effects, allows for a better specified model of employment than is customarily found in studies of this type. Such fully developed models are more easily constructed at the industry level.

c) the restriction of the analysis to personal services allows for a regional contrast of employment determinants that is not subject to spatial contamination. The geographical non-independence of cases is a particular problem in manufacturing where there is typically a national market for an industry's products. This means that one state with a distinctive advantage – say superior access to raw materials or an educated labor force – can overwhelm producers in other regions and dominate sales nationally. In such a setting, low employment in the remaining states may have nothing to do with tax policies or any other local variables at all, but be the result of instead of the existence of a dominant competitor[21].

In contrast, in personal services, there is no spatial contamination, because all production is both produced and consumed locally. A barber in Bahia can not cut the hair of a customer in Parana – and barber employment in Parana is therefore likely to be the result of purely local economic conditions. This makes personal services an ideal case to use in multivariate econometric studies involving regional contrasts within unified markets.

d) Brazil is an ideal nation to study in regional contrasts of economic activity because of its size and its marked geographical diversity. There are a large number of developed provinces and multiple metropoles – reducing the collinearity problems associated with regional studies of countries with single dominant capital cities. Tax collection efforts also varied substantially by state, introducing desirable variance into the key independent variable[22].

e) The forty year time frame allows an examination of far greater historical scope than is customary in studies of payroll tax incidence. As in the case of Gruber's study of Chile, effective tax rates changed dramatically over the period of study. In 1940, the de facto payroll tax to salary ratio was 4.6%. This increased steadily throughout the period up to a maximum rate of 36% in 1980. This very sizable substantive change in social charges should be linked, in principle, with an observable employment outcome.

Amazonian states have been excluded from the analysis[23]. The Amazon is problematic due to its low level of economic development. Levels of service activity are very low and subject to measurement and rounding error; furthermore, the quality of the demographic data used for the control variables is very poor in Amazonian rural areas due to the practical difficulties associated with data collection.

All data from the Brazilian service census are published aggregated at the state level.

The data for the control variables is drawn from the Brazilian demographic censuses or where appropriate, from Brazilian vital statistics. State borders have been standardized to prevent geographical changes in boundaries from providing artifactual changes in state scores[24].

3. Variables

The Dependent Variable. The dependent variable, employment, is defined as the proportion of each state's population employed in each of the three service sectors, restaurants, hotels and barber/beauty.

The Payroll Taxation Variable. The Service Census provides estimates of the total amount of payroll taxes that are reported as being paid by

reporting firms. All social charges are included in this measure, including social security, unemployment insurance, contributions to vocational education, and workmen's compensation.

A reasonable objection can be made that payroll tax payments are misreported in survey data; many employers may make false claims about their social security payments as a strategy for concealing tax evasion. While undoubtedly self-interested misrepresentation occurs, this does not invalidate the use of these data for our purposes. Firstly, the direction of any bias stemming from mis-representation is known: estimates of tax payments will be too high. No one claims to pay *less* tax than they actually paid. This means that any reported levels of tax payments will be maxima, and true levels will be lower than those reported here. Furthermore, the propensity to misrepresent tax payments is probably somewhat constant across the population and can be treated as random noise. While individuals may vary in their relative honesty, it seems less likely that the over-reportage of taxes varies systematically by date or by region.

Social security tax payments are divided through by one of three monetary measures, either total expenditures on salaries, total receipts or an index described below called total standardized costs. All three of these denominators have two desirable effects. Firstly, they rid the tax data of scale effects. Secondly, they purge changes in price levels from the data. From 1940 to 1980, Brazil suffered one of the world's worst inflationary periods, with the cost of living increasing 44,000-fold during that interval. Using an indicator which puts current monetary units in both the numerator and denominator eliminates any distortions due to differences between real and nominal prices.

Control Variables for Size of Market. In this analysis, we attempt to estimate market demand for personal services, as an indicator of exogenous determinants of employment in that sector. The model of demand for services used in this analysis uses data on urbanization, infant mortality, female labor force participation, and time. Urbanization is used as a measure of modernization to predict volume of business activity. Urbanization has been found to be a key predictor of service sector activity in both developed nations and Brazil itself. Urban areas consume more services than rural areas for two reasons. Firstly, rural areas contain farms,

which are often economically semi-sufficient. Secondly, the population density of cities reduces the distance that must be traveled for a customer to reach a service establishment[25]. Urbanization is calculated as the percentage of a state's residents who live in cities with populations exceeding 100,000.

We use the infant mortality rate (IMR) as a proxy indicator of income. States with higher incomes consume more services because they can afford to pay other people to do things they could do for themselves. IMR is used as a proxy for income because it is a measure that is not sensitive to changes in the value of money. The 44,000 fold depreciation in currency that occurred between 1940 and 1980 makes monetary indicators of variables unacceptably sensitive to minor changes in the construction of price indices[26]. The infant mortality rate is influenced by availability of adequate nutrition, access to medical care and public sanitation – all factors that are reasonably correlated with financial well-being. Thus infant mortality is an indicator of income, which is independent of monetary measures. The IMR data is from the Brazilian Demographic Census.

Female labor force participation was used as a predictor of service sector activity because female labor force participation increases family income, which increases the size of the market. Furthermore, working women are more likely to tradeoff domestic labor for domestic services purchased on the market. We defined this variable as the population of women who are economically active divided by the total population of females 10 years of age or older[27]. The data is from the Demographic Census.

Time is included in the model as a general indicator of modernization.

Although the dataset is in the form of a cross section time series, we have chosen to analyze it using OLS regression. The fact that we have only six panels precludes the use of a dedicated CSTS technique such as Parks or Beck-Katz models, since these require a minimum of ten time observations per case[28].

4. Findings

Table 1 – Estimates of the Burden of Payroll Taxation and Other Costs: Personal
Service Industries in Brazilian Non–Amazonian States 1940 – 1980

	Restaurants	Hotels	Barber/Beauty
Payroll Tax/Salaries	.231	.214	.205
Payroll Tax/Receipts	.012	.028	.020
Payroll Tax/Total Standard Costs	.018	.064	.071
Raw Materials/Total Standard Costs	.830	.576	.298
Salaries/Total Standard Costs	.076	.220	.374
Rent/Total Standard Costs	.050	.107	.230
Non-Payroll Taxes/Total Standard Costs	.026	.037	.027

Total Standard Costs = Materials + Salaries + Rent + Payroll Taxes + Non–Payroll Taxes

The Burden of Payroll Taxation. Table 1 presents three different esti-
mates of the burden of payroll taxation in Brazilian personal services,
along with supporting material on the burden of costs other than payroll
taxation. The top line of the table shows the ratio of payroll tax payments
to salaries. This is the traditional indicator of the burden of payroll taxes
used in most studies. This top line shows a tax-induced increases in labor
costs that are moderate but non-trivial. The ratio of payroll tax payments
to salaries was between 20 and 23%. These figures are dramatically less
than the 103% burden cited by Pastore for all social charges in Brazil. 20-
23% is greater than the 15% reported by Hart for OECD employer wel-
fare payments It is between the figures given by Gruber for pre-tax reform
Chile (30%) and post-tax-reform (8.5%)[29].

However, other indicators of the burden of the payroll tax modify
this general impression. The second line of the table shows that payroll
tax payments only represented between 1% and 3% of total receipts. While
in principle businesses may attempt to minimize all costs, one may ask if
an expense that represents only 2% of receipts is likely to be a dominant
factor in firm decisions concerning employment levels.

Furthermore, payroll taxes represented only 2% to 7% of total stan-
dard costs. Total standard costs are the sum of payments for materials,

salaries, rents, payroll taxes and non-payroll taxes; items which comprise a substantial majority of total firm expenses. Payroll taxes represented a small percentage of costs because other costs were simply more important. In restaurants, 83% of all total standardized costs were for raw materials. In hotels, 58% of total standardized costs were for materials as well. In barber and beauty shops, costs were more evenly distributed among categories with salaries, raw materials and rent representing important categories. Even here, however, where the burden of payroll taxation was maximized, such payments represented only 7% of total costs.

Table 2 – Estimates of the Burden of Brazilian Payroll Taxation At Its Highest Level: Personal Service Industries 1980

	Restaurants	Hotels	Barber/Beauty
Payroll Tax/Salaries	.418	.356	.304
Payroll Tax/Receipts	.022	.052	.029
Payroll Tax/Total Standard Costs	.029	.098	.073

The fact that payroll tax burdens were low during the period in general does not imply that these burdens never became significant. Payroll tax payments rose substantially between 1940 and 1980, with noticeable ratchets in the 1960's and again in the early 1970's. By 1980, payroll tax payment to salary ratios had become fairly large. Table 2 reports figures comparable to Table 1 but for 1980, the year of the highest observed payroll tax burdens. In 1980, the ratios of payroll tax payments to salaries were truly high. No industry paid less than 30% of its salary bill, and restaurants paid almost 42% of their salary bill in social charges. Other indicators show more modest burdens. The ratio of tax payments to receipts was generally around 2%, with hotels being somewhat higher at 5%. Social charges were only 3% of total costs in restaurants but did approach 10% in hotels.

The overall implication of this analysis is that payroll tax burdens in Brazil during this period were generally moderate; by some measures they were objectively low. However, there were exceptions to this pattern. One would want to pay attention both to the effect of payroll taxes overall and to their effects at their highest level in 1980 to make a full assessment of their impact on employment.

Table 3 – OLS Regressions of the Percentage of Population Employed in Personal Services on the Ratio of Payroll Tax Payments to Salaries and Selected Economic Control Variables: Brazilian Non–Amazonian States 1940–80

(Each cell lists the unstandardized regression coefficient, the t-statistic, and the level of significance.)

	Restaurants			Hotels			Barber/Beauty Parlors		
	Payroll Taxes Only	Controls Only	Controls & Payroll Taxes	Payroll Taxes Only	Controls Only	Controls & Payroll Taxes	Payroll Taxes Only	Controls Only	Controls & Payroll Taxes
Intercept		-3814 / 6.74 / <.001	938 / 6.89 / <.001		2821 / 1.04 / <.001	2253 / 1.11 / <.001		2600 / 1.81 / <.001	2609 / 1.82
Urbanization		9.71 / <.001	10.2 / <.001		4.71 / <.001	4.81 / <.001		12.6 / <.001	12.4 / <.001
Infant Mortality Rate		-.985 / -3.61 / .001	-.900 / -3.37 / <.001		-.754 / -8.72 / <.001	-.729 / -8.11 / <.001		-.006 / -0.10 / .920-ns	-.005 / -0.08 / .937-ns
Female Labor Force Participation Rate		4.42 / 2.36 / .020	3.34 / 1.79 / .076-ns		-.890 / -1.50 / .138-ns	-.792 / -1.31 / .191-ns		-.026 / -0.07 / .947-ns	-.034 / -0.08 / .933-ns
Time		1.95 / 2.41 / .018	-.505 / 1.20 / <.001		-1.36 / -5.29 / .005	-1.07 / -2.84 / <.001		-1.33 / -7.87 / <.001	-1.33 / -7.35
Payroll Tax Payments/Salaries	.690-ns		294 / 2.68 / .009-wd	.299-ns		-40.5 / -1.05 / <.001	.941-ns		.652 / 0.07
R²	.58	.84	.85	.58	.58	.58	.71	.71	.71
N	111	111	111	111	111	111	111	111	111

Top figures are unstandardized regression coefficients. Middle figures are t-statistics. Bottom figures are levels of significance. All coefficients are significant at .05 unless indicated otherwise. ns = not significant. wd = significant but in the wrong direction from theoretical predictions

The Effect of Control Variables on Employment. Table 3 shows ordinary least squares regressions of the percentage of population employed in personal services on the variables measuring potential demand and on the ratio of payroll tax payments to salaries. Results are presented separately for each of the three industries, with the control equations being presented on the left. We consider the control models first.

In general, the market-size measures perform very well. The R^2 for all of the equations are .58 in the worst performing case, hotels, and .71 and. 84 for barbers and restaurants respectively. This is relatively impressive goodness of fit. Urbanization is consistently positive, as predicted, and is always highly significant. The infant mortality rate, a proxy for income, is always negative as predicted. The effects are quite strong in restaurants and hotels, but are insignificant in barber/beauty. The effect of the female labor force participation rate is more inconsistent. Consistent with theoretical predictions, it has a strong and positive relation to employment in restaurants. The effects are insignificant in the other two sectors. Time trends were significant in all industries. These were positive in restaurants and negative in hotels and barber/beauty.

Overall, the control model worked perfectly for restaurants where all variables were in the predicted direction, and highly significant; the R^2 in this sector is a very impressive .84. In hotels, everything worked as expected with the exception of female labor force partiticipation. This is consistent with the claim that as Brazilian women obtained greater income working out of the home, they were more likely to purchase services from restaurants than they were from hotels. Given the gendered nature of some uses of hotels in Brazil, this is a generally plausible finding. The control model had imperfect but acceptable fit to barber/beauty parlors. The R^2 in this sector was high (.71) but only urbanization and time had significant impacts. Essentially, the expansion of the hair care sector was driven by early urbanization, and the substitution of market for domestic services in the management of personal appearances. This transformation was probably completed by 1960 or 1970 after which further changes seemed to have little effect.

The Effects of Payroll Taxes. Table 3 shows to the right of the control equations, equations that include the market model variables plus the ratio

of payroll tax payments to salaries. The performance of this variable in all three equations is very poor. In the hotel and barber/beauty equations, the ratio of payroll taxes to salaries has no significant effect on salaries. It does have a significant effect in the restaurant sector. However, this effect is wrong directioned; the effect of payroll taxation is positive, implying that higher tax burdens are associated with *raising* rather than lowering employment.

The findings for the control variables in these models is roughly similar to those presented in Table 3. All of the controls are significant and in the correct direction in restaurants; the same is true in hotels, except for an insignificant R^2 female labor force participation. Only urbanization and time are significant for barber/beauty.

All of the equations with the ratio of payroll tax payments to receipts show insignificant results for that variable. The same is true for the ratio of payroll tax payments to total standardized costs in restaurants and barber/beauty. In contrast, the hotel sector does have a slightly significant negative coefficient for the ratio of payroll tax payments to total standardized costs. The coefficient is insignificant at the .05 level but significant at .10 Thus, this equation, by itself, provides some slight evidence that payroll tax burdens lowered employment. However, given the poor performance of the other burden measures in the hotel sector and the poor performance of taxes divided by costs in the other sectors, there is little support for a negative relation between payroll taxes and employment in these equations overall.

Detrended Analyses. The persistent tendency for payroll tax burdens provides a methodological challenge to the previous analysis. The tax burden measures are highly correlated with time. While various corrections for multicollinearity exist, it is often best with small samples to use simple and intuitive technology. In the present study, we can "remove" time-based effects by looking at the relationship between payroll tax burdens and employment within single-year single-industry subsamples (i.e. 1940 restaurants, 1940 hotels, 1950 restaurants etc.). Because each of these subsamples are cross-sections, the trending of the data over time becomes irrelevant.

This technique also allows for an examination of effect of tax burdens over time. Because tax burdens were relatively small in 1940 through

1960, it could be argued that they were of too low a magnitude to have a substantive effect. This argument would not hold after 1970 when social charges were more sizable or in 1980 when burdens reached their maximum. In principle, all of the later years and particularly 1980 should show particularly strong negative relationships between payroll burdens and employment.

Within each subsample, two statistics are calculated. The first is the bivariate correlation between payroll tax burdens and observed employment/population ratios. This tests whether there is a crude relationship between employment in services and payroll taxes. The second is the bivariate correlation between tax burdens and employment/population ratios residualized for urbanization, infant mortality and female labor force participation. These three variables are the remaining variables in the model of market potentials used in Tables 3 and 4. Because there are only 18 or 19 cases in each subsample, data attrition prevents running regression models predicting employment from tax burdens and three control variables. However, it is possible to run a regression model predicting employment from the three control variables for the entire industry sample of 111, calculate the residuals from that model and correlate the residuals with measures of payroll tax burdens. This allows for an estimate of the degree to which burdens predict employment net of the other variables in the full model.

Because there are three industries * six years * three measures of the independent variable * two measures of the dependent variable, there are fully 96 separate coefficients to examine, after empty cells have been eliminated[30]. To abbreviate an otherwise lengthy and tedious discussion, we provide summaries of these analyses rather than the full set of 96 correlation coefficients[31].

Table 4 – OLS Regressions of the Percentage of Population Employed in Personal Services on the Ratio of Payroll Tax Payments to Receipts and to Total Standard Costs with Selected Economic Control Variables: Brazilian Non–Amazonian States 1940–80

	Restaurants		Hotels		Barber/Beauty Parlors	
	Payroll Taxes/ Receipts	Payroll Taxes/ Costs*	Payroll Taxes/ Receipts	Payroll Taxes/ Costs*	Payroll Taxes/ Receipts	Payroll Taxes/ Costs*
Intercept	-3715	4947	2368	2365	2572	3309
	6.70	6.20	1.26	1.41	1.94	1.49
	<.001	<.001	<.001	<.001	<.001	<.001
Urbanization	-.973	-988	-.757	-.868	-.026	.034
	-3.43	-2.30	-8.80	-7.62	-0.45	-0.55
	.024	<.001	<.001	.654-ns	.585-ns	.175-ns
Infant Mortality	4.29	7.67	-.643	-.586	091	-.679
	2.07	2.16	-1.05	-0.69	0.23	1.37
	<.001	.297-ns	.491-ns	.819-ns		
Female Labor Force Participation Rate						
	.041					
Time	1.90	2.51	-1.13	-1.12	-1.31	-1.69
	2.17	2.13	-3.80	-3.38	-7.81	-7.73
	.037	<.001	.001	<.001	<.001	<.001
Payroll Receipts/Receipts	307		-375		-224	
	0.16					
	.874-ns		.071		.850-ns	
Payroll Tax Payments/ Total Standard Costs		-476		-313		-10.8
		-0.20		-1.84		-0.19
		-1.50 / .137-ns		-1.38 / .170-ns		.850-ns
R²	.84	.82	.58	.63	.71	.78
N	111	75	111	75	111	75

Top figures are unstandardized regression coefficients. Middle figures are t-statistics. Bottom figures are levels of significance. All coefficients are significant at .10 unless indicated otherwise. ns = not significant, wd = significant but in the wrong direction from theoretical predictions.
* Cost equations include for Restaurants and Hotels only the years 1940 and 1970–80. For Barbers, the included years are 1950 and 1970–80. As such, the N's for two equations presented for each sector are different and for this reason, statistics as R2 should not be compared with each other.

Table 5 – Summary of the Results of 96 Single Year Single Industry Pearson Correla-
tions of Payroll Tax Burden Measures and Percentage of Population Employed in
Personal Services: Brazilian Non–Amazonian States 1940–1980

	Payroll Tax Payments/ Salaries				Payroll Tax Payments/ Receipts				Payroll Tax Payments/ Total Standardized Costs			
	Corr. GE 30	Corr. -.30 to .30	Corr. LE .30	Total	Corr. GE .30	Corr. -.30 to .30	Corr. LE .30	Total	Corr. GE .30	Corr. -.30 to .30	Corr. LE .30	Total
Observed Employment	6	9	3	18	15	3	0	18	10	2	0	12
Residualized Employment	2	13	3	18	4	10	4	18	2	8	2	12
Total	8	22	6	36	19	13	4	36	12	10	2	24

Table 5 reports the results of the single year single industry analyses.
For each type of test using each kind of dependent and independent vari-
able, it reports the number of correlations that are greater than .30, be-
tween .30 and -.30 and less than -.30. The cutoff of .30 was relatively arbi-
trary, but was designed to reflect common intuitions among social scien-
tists as to what is a "noticeable" or "not noticeable" correlation. The pat-
terns in the table are sufficiently strong that changing the threshold to
.20 or .40 or to other levels has almost no effect on the interpretation of
the findings.

An adverse effect of payroll taxation on employment would suggest
that there would be a negative correlation between tax burdens and
employment. As such, any finding of no correlation or of a positive cor-
relation should be seen as disconfirming that claim.

Out of 96 tests, only 12 or 12.5% show a negative correlation between
an indicator of tax burden and an indicator of employment at an abso-
lute value of .30 or higher. That implies that 87.5% of the tests fail to
confirm the theory. 46.9% of the tests show correlations with absolute
values of less than .30. 40.6% of the tests show strong *positive* correlations
between tax burdens and employment – with higher tax burdens leading

to *greater* employment. There were more than three times as many tests that showed a positive correlation as showed a negative correlation.

Generally results were slightly better for residualized tests rather than observed correlations. 18.8% of residualized tests showed a negative correlation while only 6.3% of tests with observed data showed the expected negative result. Results for the payroll tax/salary measure also were slightly more favorable with 16.7% of those tests showing a negative correlations, as opposed to 11.1% for payroll tax/receipts and 8.3% for payroll/total standardized costs. Among the industries, 17.8% of restaurant tests showed a negative correlation, as opposed to 11.1% of hotel tests and 8.9% of barber/beauty tests.

Table 6 – Summary By Year of the Results of 96 Single Year Single Industry Pearson Correlations of Payroll Tax Burden Measures and Percentage of Population Employed in Personal Services: Brazilian Non–Amazonian States 1940–80

	Correlations	Correlations GE .30	Correlations Between -.30 and .30	Total LE -.30
1940	8	8	0	16
	1950	7	7	014
	1960	2	8	212
	1970	7	8	318
	1975	7	7	418
	1980	8	7	318
	Total	39	45	12

96

Table 6 shows the results of the tests displayed in Table 5 broken out by year. Because payroll tax burdens were at their lowest in 1940 and then rose consistently, one might be expect greater effects of burdens over time, with the most dramatic results being observed for 1980. No such pattern emerges in the data. There is no year for which even 25% of the cases have negative correlations. In 1980, there were over twice as many positive correlations than negative correlations, and negative correlations represented only 16.7% of the test results. In the remaining years, test results either split evenly between positive and zero correlations, or as the

case in 1960, the majority of cases show correlations of zero. Overall, there is a slight trend in the data for the percentage of negative cases to increase over time, but they still never represent the majority or even a substantial plurality of cases. Numerous strong wrong direction correlations exist in every year of the data.

These analyses suggest that the conclusions of the regression analyses of Tables 3 and 4 are fundamentally correct. They are not artifactual byproducts of the correlation of tax burdens and time. Nor are they entirely the product of Brazilian social charges being low, although this may have contributed to the absence of correlations in the early years of the study. However, even in years when social charges were high, no strong relationship exists between tax burdens and employment, either at the bivariate or multivariate level.

Conclusion

This analysis of the burden of payroll taxes showed that social charges had little effect on reducing employment in Brazilian personal services between 1940 and 1980. We can not say with certainty why this occurred. We do not know if payroll taxes were shifted backwards on to workers, or shifted forwards to consumers in the form of higher prices. We can not rule out that payroll taxes had some form of net effect that was suppressed by some larger and unmeasured determinant of employment.

We can say that for much of the period payroll tax burdens were small. Overall, they represented 20% of the salary bill – a level consistent with findings in other studies. However, they represented a significantly smaller proportion of receipts and costs. These small percentages raise the possibility that the factor of social charges may have been disregarded by many managers, when they made employment decisions motivated by other more pressing factors. Such a logic might be consistent with institutionalist and decision-theory perspectives on the theory of the firm, in which single high priority issues receive full managerial attention, while considerations that are less central to the survival of the firm are relatively neglected, even at the risk of suboptimal profit maximization[32].

This analysis has been silent upon the effects on employment of the government programs financed by payroll taxation. A strong claim by Brazilian writers on this issue is that the reduction of public expenditure associated with a de-statification of the economy has a significant adverse Keynesian effect on employment that may dwarf any positive effects of workers becoming relatively less expensive. (Tavares 1999, Pochmann 2001) This position is difficult to assess in this analysis, since in Brazil, the number of programs financed by payroll taxation is large, and assessing the contribution to employment of each of them would be a formidable proposition. However, because there is some credibility to the claim that the Keynesian use of the state to maintain purchasing power increases employment, the arguments of those who would want to radically reduce taxes to produce growth should be looked at with some skepticism. While this study only provides an examination of one kind of tax in one third world setting, the findings from this study suggest that the effects of tax cuts on employment might be, at best, very modest.

O impacto de encargos sociais no emprego no Terceiro Mundo: Serviços pessoais nos estados brasileiros não amazônicos entre 1940 e 1980

Resumo – Este estudo visa analisar o impacto dos encargos sociais sobre o emprego em três tipos de serviços pessoais brasileiros no período 1940-1980. A análise desses serviços permite o uso de variáveis de controle dos determinantes do emprego, que não os impostos, tais como demanda de consumo, em um ambiente onde tais medidas são livres de contaminação espacial. De modo geral os encargos sociais foram baixos no Brasil, embora eles tivessem alcançado níveis consideráveis no final do período em estudo. Observou-se também que os encargos sociais tiveram pouca relação com o nível de emprego no Brasil, mesmo em períodos em que tais pagamentos foram considerados altos. Isto se verifica tanto em análises de modelos de regressão de grandes amostras, quanto em modelos com poucas observações e variáveis previamente depuradas de tendências.

Palavras-chave – Encargos sociais. Custo de mão-de-obra. Demanda por mão-de-obra. Impostos. Impostos sobre serviços.

Endnotes

[1] Gosta Esping-Anderson and Marino Regini (2000a); Sebastian Edwards, and Nora Claudia Lustig (1997); José Márcio Camargo (1996); Barbara Stallings and Wilson Peres (2000).

[2] André Lahóz and José Roberto Caetano (2001); Charles Whalen (2001); Robert Walker (2003).

[3] Hernando de Soto (1989); Alvin Rabushka and Bruce Bartlett (1985); José Pastore (1998).

[4] Esping-Anderson (2000a).

[5] For an excellent intellectual history of this debate, see John Brittain (1972).

[6] Brittain, op. cit.

[7] An extended review of these empirical findings can be found in Daniel Hamermesh (1993).

[8] Robert Hart (1984).

[9] Esping-Anderson (2000a).

[10] Camargo (1996); Ann Harrison and Edward Leamer (1997); Ricardo Paes de Barros and Rosane Silva Pinto de Mendonça (1996).

[11] Jonathan Gruber (1997).

[12] Wayne Vroman (1967).

[13] Hamermesh (1993).

[14] Janet Currie and Ann Harrison. (1997).

[15] Paulo Gonzaga Carvalho, and Carmem Aparecida Feijó (1999). Unintended support for this position can also be found in the work of Anderson and Meyer (1997) where an attempt to show an empirical effect of payroll taxes on wages shows coefficients in the predicted directions, but explained variance of virtually zero – a consequence of the presence of unmeasured external determinants of umemployment.

[16] Everaldo Gaspar Lopes de Andrade and Jorge Jatobá (1993); Márcio Pochmann (2001); Maria da Conceição Tavares (1999).

[17] Pastore (1998).

[18] Richard Bird (1992); Robin Burgess and Nicholas Stern (1993); Cathy Rakowski (1994).

[19] These are all the years for which a complete high quality service sector census are available. There was a 1985 Service Census that used a restricted sampling frame to identify the population of respondents. Systematic contrasts of results of the 1980 and 1985 show substantial inconsistencies that seem to be due primarily to methodological incompatibility.

[20] Gruber (1997) uses a similar source for Chile.

[21] This argument particularly holds true when there are economies of scale or agglomeration.

[22] These geographical differences in tax collection were not linked to the traditional divisions associated with other aspects of Brazilian economic life: South and Southeast vs. Northeast and North. Both high and low tax states existed within each region.

[23] These include Acre, Amapa, Amazonas, Para, Roraima and Rondonia.

[24] The geographical boundaries of states were redefined frequently throughout the period. To standardize state boundaries. Mato Grosso and Mato Grosso do Sul are always combined into Mato Grosso. Rio de Janeiro and Guanabara are always combined into Rio de Janeiro. Brasilia however, is maintained as a separate case due to its extreme dissimilarity from neighboring Goias. Serra dos Aimores is divided between Minas Gerais and Espiritu Santu following the relevant legal adjudications.

[25] Harley BROWNING and Joachim SINGELMANN (1975); Sadi DAL-ROSSO (1978).

[26] There is a further issue that price indices for this period are methodologically suspect. Most of these are dependent on government price surveys that saw politically motivated distortions during the years of the military government (1964-85). For a discussion of these distortions, see IBGE (1990).

[27] The age of labor market entry in Brazil is 10, particularly among the undeducated poor.

[28] R. W. PARKS (1967); Nathaniel BECK and Jonathan KATZ (1995).

[29] PASTORE (1998); HART (1984); GRUBER (1997).

[30] Not all years have data for tax burdens/total standardized costs.

[31] The complete set of coefficients is available from the author.

[32] Richard CYERT and James MARCH (1992); Herbert SIMON (1957).

Bibliography

ADAM, P.; CANZINI, P. *Partial Deregulation: Fixed Term Contracts in Italy and Spain.* London: Center for Economic Performance, 1998. Discussion Paper n. 386. Cited in: ESPING-ANDERSON, G. Who Is Harmed By Labor Market Regulation? Quantitative Evidence. In: ESPING-ANDERSON, G.; REGINI, M. (eds.) *Why Deregulate Labour Markets?* New York: Oxford, 2000.

ANDERSON, P.; MEYER, B. Effects of Firm Specific Taxes and Government Mandates with an Application to the U.S. Unemployment Insurance Program. *Journal of Public Economics*, v. 65, n. 2, Aug. 1997, p. 119-145.

Andrade, E.G.L. de; Jatobá, J. A desregulamentação do mercado e das relações de trabalho no Brasil: Potencial e limitações. Brasília: IPEA, 1993. Texto para discussão n. 312.

Barros, R.P. de; Mendonça, R.S.P. de. Flexibilidade do mercado de trabalho no Brasil: Uma avaliação empírica. In: Camargo, J.M. (ed.) *Flexibilidade do mercado de trabalho no Brasil.* Rio de Janeiro: FGV, 1996, p. 157-202.

Beach, C.; Balfour, F. Estimated Payroll Tax Incidence and Aggregate Demand for Labour in the United Kingdom. *Economica*, v. 50, n. 197, 1983, p. 35-48.

Beck, N.; Katz, J. What to Do (and Not to Do) With Time Series Cross Section Data. *American Political Science Review,* v. 89, 1995, p. 634-47.

Bell, D. Labour Utilization and Statutory Non-Wage Costs. *Economica,* v. 49, 1982, p. 335-43.

Bell, L. Impact of Minimum Wages in Mexico and Colombia. *Journal of Labor Economics,* v. 15, 1997, S102-S135.

Bird, R. *Tax Policy and Economic Development.* Baltimore: Johns Hopkins, 1992.

Brittain, J. *The Payroll Tax for Social Security.* Washington, D.C: Brookings, 1972.

Brown, H.G. *Economics of Taxation.* London: Lucas, 1924.

Browning, H.; Singelmann, J. Emergence of a Service Society: Demographic and Sociological Aspects of the Sectoral Transformation of the Labor Force in the USA. (*Report Prepared for the Manpower Administration*, U.S. Department of Labor. Document PB-254 B52) Washington, D. C.: U.S. Department of Commerce, 1975.

Burgess, R.; Stern, N. Taxation and Development. *Journal of Economic Literature,* v. 31, 1993, p. 762-830.

Camargo, J.M. Flexibilidade e produtividade do mercado de trabalho brasileiro. In: Camargo, J.M. (ed.) *Flexibilidade do mercado de trabalho no Brasil.* Rio de Janeiro: FGV, 1996, p. 11-46.

CARVALHO, P.G.; FEIJÓ, C.A. Desemprego nos países da OCDE: Posições em debate. *Econômica* : revista da Pós-Graduação em Economia da UFF, Rio de Janeiro, v.1, n. 2, dez. 1999, p. 57-78.

CASTILLO-FREEMAN, A.; FREEMAN, R. When the Minimum Wage Really Bites: The Effect of the U.S. Level Minimum Wage on Puerto Rico. In: BORJAS, G.; FREEMAN, R. (eds.) *Immigration and the Workforce.* Chicago: Chicago, 1992, p. 177-211.

CERASANI, G. Labour On-Costs: Who Bears the Burden? *Labour Economics and Productivity,* n. 2, 1990, p. 27-45.

CURRIE, J.; Harrison, A. Sharing the Costs: Impact of Trade Reform on Capital and Labor in Morocco. *Journal of Labor Economics,* v. 15, n. 3, July 1997, S44-S71.

CYERT, R.; MARCH, J. *Behavioral Theory of the Firm.* Cambridge, Mass.: Blackwell Business, 1992.

DAL-ROSSO, S. *Growth of Capitalism and the Transformation of the Labor Force in Brazil.* Austin: University of Texas at Austin, 1978. Ph.D. Dissertation, Sociology.

DE SOTO, H. *Other Path: Invisible Revolution in the Third World.* New York: Harper and Row, 1989.

EDWARDS, S.; LUSTIG, N.C. (eds.) *Labor Markets in Latin America: Combining Social Protection With Market Flexibility.* Washington, D.C.: Brookings, 1997.

ESPING-ANDERSON, G. Who Is Harmed By Labor Market Regulation? Quantitative Evidence. In: ESPING-ANDERSON, G.; REGINI, M. (eds.) *Why Deregulate Labour Markets?* New York: Oxford, 2000a, p. 66-98.

_____. Regulation and Context: Reconsidering the Correlates of Unemployment. In: ESPING-ANDERSON, G.; REGINI, M. (eds.) *Why Deregulate Labour Markets?* New York: Oxford, 2000b, p. 99-112.

GORDON, R. Wage Price Controls and the Shifting Philips Curve. *Brookings Papers on Economic Activity,* Washington, DC, 1972, p. 385-421.

GRUBER, J. Incidence of Payroll Taxation: Evidence From Chile. *Journal of Labor Economics,* n. 15, 1997, S72-S101.

HALD, M. Social Charges in the EEC Countries: Some Economic Estimates. *Economia Internazionale*, v. 12, 1959, p. 683-7.

HAMERMESH, D. New Estimates of the Estimate of the Incidence of the Payroll Tax. *Southern Economic Journal*, v. 45, 1979, p. 1208-19.

_____. Factor Market Dynamics and the Incidence of Taxes and Subsidies. *Quarterly Journal of Economics,* v. 95, 1980, p. 751-764.

_____. *Labor Demand.* Princeton: Princeton, 1993.

HARRIS, S. *Economics of Social Security: Relation of the American Program to Consumption, Savings, Output and Finance.* New York: McGraw-Hill, 1941.

HARRISON, A.; LEAMER E. Labor Markets in Developing Countries: an Agenda For Research. *Journal of Labor Economics,* n. 15, 1997, S1-S19.

HART, R. *Economics of Non-Wage Labor Costs.* Boston: Allen and Unwin, 1984.

IBGE. Instituto Brasileiro de Geografia e Estatística. *Estatísticas Históricas do Brasil.* Rio de Janeiro: IBGE, 1990.

LAHÓZ, A.; CAETANO, J.R. O imposto que esmaga. *Exame,* n. 748, 5 set. 2001, p. 40-53.

LEUTHOLD, J. Incidence of Payroll Tax in the United States. *Public Finance Quarterly,* n. 3, 1975, p. 3-13.

MABRY, B. Economics of Fringe Benefits. *Industrial Relations*, n. 12, p. 95-106.

MACISAAC, D.; RAMA, M. Determinant of Hourly Earnings in Ecuador: Role of Labor Market Regulations. *Journal of Labor Economics*, n. 15, 1997, S136-S165.

ORGANIZATION FOR ECONOMIC COOPERATION AND DEVELOPMENT. *Employment Outlook.* Paris: OECD, 1994.

PARKS, R.W. Efficient Estimation of Regression Equations When Disturbances Are Both Serially and Regionally Correlated. *Journal of the American Statistical Association*, v. 62, 1967, p. 500-9.

PASTORE, J. *Encargos sociais.* São Paulo: LTR, 1997.

_____. *O desemprego tem cura?* São Paulo: Makron, 1998.

POCHMANN, M. *O emprego na globalização.* São Paulo: Boitempo, 2001.

RABUSHKA, A.; BARTLETT, B. *Tax Policy and Economic Growth in Developing Nations*. Washington: USAID Bureau for Program and Policy Coordination, Office of Economic Affairs, 1985

RAKOWSKI, C. *Contrapunto: Informal Sector Debate in Latin America.* Albany: SUNY, 1994.

REID, G.L. Supplementary Labour Costs in Europe and Great Britain. In: REID, G.L.; ROBERTSON, D.J. (eds.) *Fringe Benefits, Labour Costs and Social Security.* Boston: Allen and Unwin, 1965, p. 103-115.

SANDERS, T. Brazil's Microbusiness Law. *USFI Reports,* n. 26, 1985, p. 1-6.

SIMON, H. *Administrative Behavior.* New York: Macmillan, 1957.

STALLINGS, B.; PERES, W. *Growth Employment and Equity: Impact of the Economic Reforms in Latin America and the Caribbean.* Washington, D.C.: Brookings, 2000.

TAVARES, M. da C. *Destruição não criadora.* Rio de Janeiro: Record, 1999.

VROMAN, W. *Macroeconomic Effects of Social Insurance.* University of Michigan, Department of Economics, 1967. Ph.D. Dissertation.

WALKER, R. Payroll Taxes Stifle Economic Growth. *Chicago Sun Times,* Jan. 31, 2003, p. 36.

WEITENBERG, J. Incidence of Social Security Taxes. *Public Finance* , n. 24, 1969, p. 193-208.

WHALEN, C. Why Not a Payroll Tax Cut? *Business Week,* n. 3719, Feb. 12, 2001, p. 28-30.

WORLD BANK. *Workers in an Integrating World.* Washington: World Development Report, 1995