

Is There Rent Sharing In Developing Countries? Matched-Panel Evidence from Brazil

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Introduction

80% of the world's population lives in developing countries, but there is much less evidence than for developed countries.

Turmoil in Latin America...

Is rent sharing “good” or “bad”?



May 20th, 2006

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Brazil

Large developing/emerging country that exhibits one of the highest levels of **income inequality**: *Gini index in 2001 of 59.3*, the 8th in 123 countries (World Bank, 2005) although decreasing moderately since 1993

Probably in part due to informality of labour market (28% of the workforce, when excluding the self-employed)

But inequality is also extremely high inside the formal sector (Arbache and De Negri, 2004)

In this paper, we assess the role of **rent sharing** in explaining income/wage inequality

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Abundant evidence that **the division of rents between employers and employees matters** for wage differentials:

-in *developed countries* (Abowd & Lemieux, QJE 1993; Blanchflower et al, QJE 1996; Van Reenen, QJE 1996; Bronars & Famulari, JPE 2001; Arai, JoLE 2003; Kramarz, mimeo 2003; Martins, IZA 2004; etc)

-and maybe also in *developing countries* (Teal, EJ 1996, Revenga, JoLE 1997, and Bigsten et al, WBER 2003) – but literature much thinner.

Rent sharing is typically also related to other sources of inequality, including *gender and racial discrimination* (Black & Strahan, AER 2001), which are also deemed relevant in the case of Brazil.

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Reasons to expect little RS in developing countries:

- *unions* are typically not strong
- *minimum wages* are low or not enforced;
- *unemployment benefits* do not exist in many countries.
- *informal labour market* may flatten labour supply curves of formal workers

Specific case of Brazil:

- relatively *stringent employment law* may increase formal workers' bargaining power,
- but law's unintended *incentives for worker turnover* (social insurance individual accounts earn below-market rates) may decrease workers bargaining power.

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This research:

- first paper examining case of Brazil with micro data
- particularly *detailed data* (three different individual- and/or firm-level panels covering 1997-2002)
- *identification strategies* (profits are endogenous):
 - instrumental variables – based on Brazil's economic and political history (exchange and interest rates)
 - use of "*gross profits*" (i.e. profits before subtracting the wage bill)
 - control of (time-invariant) *worker and firm heterogeneity* using spell fixed effects

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Data Sets

1. RAIS (“Relatório Anual de Informações Sociais”, Annual Social Information Report)

- Administrative report filed by all tax registered Brazilian establishments (Census of the *formal* Brazilian labor market)
- Firms that do not provide accurate information will be committing an offense sanctioned by law
- Carried out annually; information is collected every year in the first quarter
- Every tax registered enterprise receives a unique tax number, the CNPJ

- Main variables available – at the establishment level: *Geographic location, Activity sector, Establishment Size, Establishment Type*
- At the employee level: *Occupation, Personal Characteristics, Contract Information*

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2. PIA (“Pesquisa Industrial Anual”, Yearly Industrial Research)

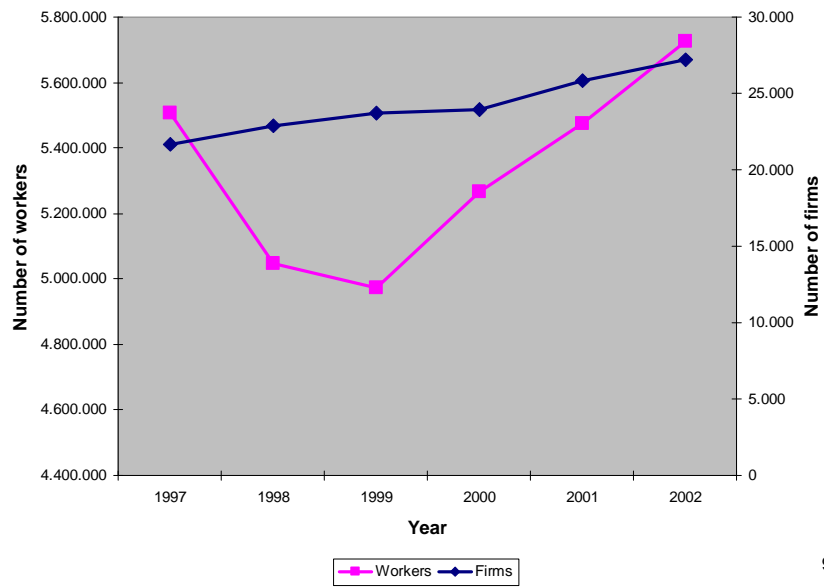
- Yearly establishment survey covering the entire country
- All establishments (census) with 30 or more workers
- 10% sample of manufacturing establishments employing five to 29 workers
- Information on labour inputs, labour costs, turnover, production level and a few other variables

3. “Censo de Capitais Estrangeiros” (Foreign Capital Census)

- Conducted by the Brazilian Central Bank
- All establishments situated in Brazil with 10% or more foreign capital participation
- Establishments’ information (accountability, foreign participation of capital, composition of capital, exports, imports, location, activity sector, number of employees, and establishment type) available for 1995 and 2000
- We assumed that foreign ownership remains unchanged from 1995 to 1999 (1995 data) and from 2000 to 2002 (2000 data)

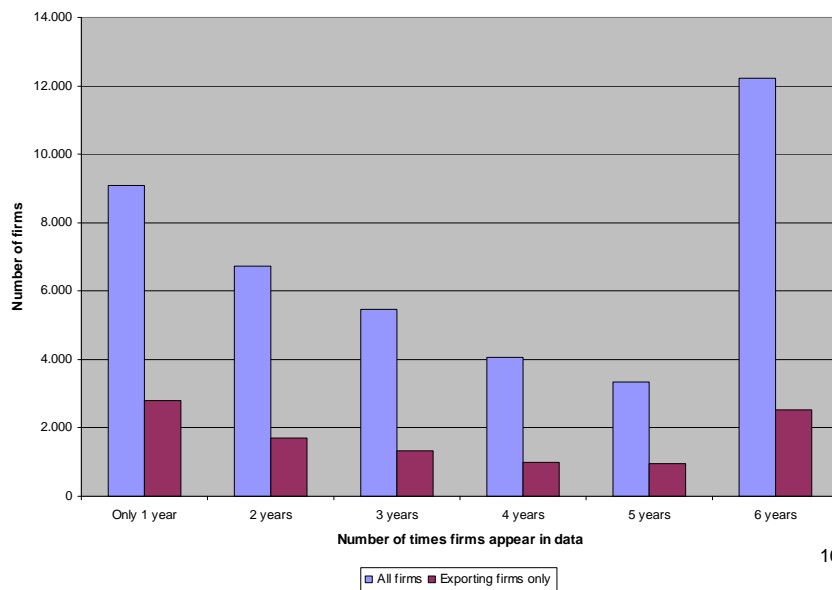
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Figure 1 – Number of workers and firms in data



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Figure 2 - Frequency of firms (all and exporting only) in data



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Descriptive Statistics

	1997	1998	1999	2000	2001	2002
Hourly wage R\$	4,26	4,35	3,9	3,46	3,38	3,13
Schooling	7	7,29	7,57	7,74	7,9	8,04
Percentage male	75,0%	75,0%	74,0%	74,0%	73,0%	74,0%
Experience (years)	18,17	18,13	17,85	17,44	17,35	17,3
Tenure (months)	50,05	51,76	51,63	48,43	47,38	46,88
Share Mercosul exports/sales	2,2%	2,4%	2,7%	2,5%	2,3%	1,8%
Share other exports/sales	10,0%	9,6%	10,6%	10,7%	11,6%	13,6%
Net profits per worker	3.366	1.812	-67	5.351	6.807	-3.212
Wage bill (pw)	29.433	29.407	25.277	23.245	21.864	23.379
Gross profits (pw)	32.798	31.219	25.210	28.595	28.671	20.166

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Regression analysis

Based on model of bargaining between workers and employers (Blanchflower et al, QJE 1996):

$$\max \phi \log \{ [u(w) - u(\bar{w})]n \} + (1 - \phi) \log \Pi$$

and resulting wage equation (run with SAS in Rio):

$$\ln w_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 F_{it} + \beta_3 \frac{\pi_{Lit}}{n_{it}} + u_{it}$$

Also use concept of the “Lester range” (measure of pay dispersion due to profits)

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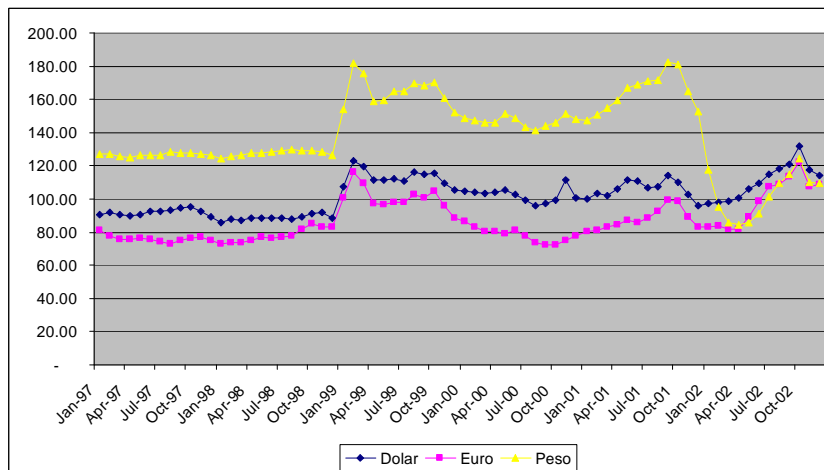
Table 4: OLS Regressions
Dependent variable: log hourly wage

	(2)	(3)	(4)
Schooling	0,0683 (1003,05)	0,0683 (1003,01)	0,0671 (991,03)
Gender	0,1245 (92,79)	0,1241 (92,53)	0,1261 (94,71)
Experience	0,0432 (238,22)	0,0432 (238,49)	0,0430 (239,13)
Tenure	0,35 (397,99)	0,35 (398,02)	0,344 (394,34)
Foreign firm	0,1413 (485,52)	0,1419 (487,52)	0,1209 (415,94)
Log firm size	0,06462 (888,54)	0,06439 (884,32)	0,05781 (792,34)
Net profit (pw)		0,0374 (62,12)	
Gross profit (pw)			0,3490 (653,14)
R ²	0,6444	0,6445	0,6494
adj. R ²	0,6444	0,6445	0,6494
F	326,444	324,554	331,673
Observations	31.995,349	31.995,349	31.995,349
Standard deviation of profit per worker		36,296	35,723
Lester Range		5,43%	49,87%

All regressions include 6 year dummies, 105 industry dummies, 9 job dummies, 27 region dummies, a quartic in experience, a quadratic in tenure and human capital x gender interactions. t-ratios based on robust standard errors, allowing for worker clustering.

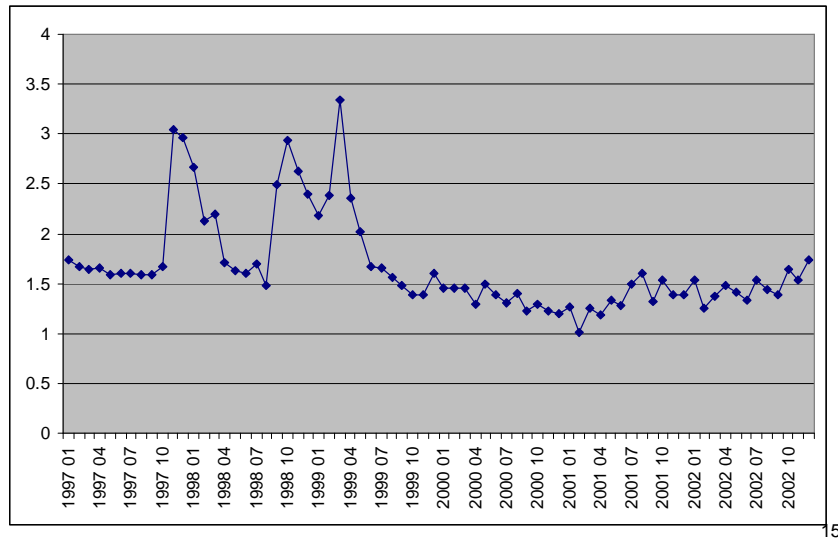
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Figure 3.1: US Dollar, Euro and Argentinean Peso Exchange Rate Indices



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Figure 3.2: Monthly Interest Rate (%; SELIC)



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Table 5a: 2SLS regressions
Dependent variable: log hourly wage

	(2) Financial IV	(3) Financial IV	(4) All IV	(5) All IV
Schooling	0,0665 (891,5)	0,0666 (892,22)	0,0714 (631,86)	0,0716 (632,43)
Gender	0,1532 (105,01)	0,1526 (104,46)	0,1905 (84,75)	0,1899 (84,40)
Experience	0,0431 (224,52)	0,0432 (224,72)	0,0471 (154,83)	0,0472 (155,09)
Tenure	0357 (366,74)	0358 (367,15)	0356 (257,07)	0357 (257,47)
Foreign firm	0,1561 (454,98)	0,1595 (464,16)	0,1377 (324,73)	0,1423 (334,14)
Log firm size	0,0707 (806,10)	0,0707 (803,03)	0,0409 (276,93)	0,0402 (272,43)
Net profit (pw)	-0,0548 (-115,85)		-0,0746 (-79,64)	
Gross profit (pw)		-0,0420 (-80,14)		-0,0504 (-41,46)
R ²	0,6075	0,6069	0,6399	0,6393
adj. R ²	0,6075	0,6069	0,6399	0,6393
F	238,681	238,067	126,646	126,336
Observations	31.995.349	31.995.349	17.233.021	17.233.021
Standard Deviation of profit per worker	36,296	35,723	37,576	37,152
Lester Range	-7,95%	-6,03%	-11,21%	-7,49%

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Table 5b: 2SLS regressions – auxilliary regressions
Dependent variable: profits

	(2)		(3)	
	Beta	Partial R2	Beta	Partial R2
Financial revenues	0,703 (400,33)	0840	1,035 (557,77)	0278
Revenues from other firms	0,423 (262,54)	0068	0,453 (226,23)	0316
Non-operational revenues	0,321 (287,68)	0,0116	0,328 (278,15)	0499
Financial losses	-0,715 (-1.636)	0,19167	-0,422 (-914,29)	0,06960
Losses from other firms	-0,804 (-656,21)	0,02814	-0,789 (-609,04)	0,02680
Non operation losses	-0,486 (-652,71)	0,02814	-0,481 (-612,01)	0,02344
Ratio exports to Mercosu/total sales times	0,188	00004	0,086	0002
Exchange rate peso/real	(24,88)		(10,80)	
Ratio exports to rest of the world/total sales times	0,440	01130	0,263	0209
Exchange rate peso/real	(109,61)		(62,17)	
R ²	0,3181		0,2195	
adj. R ²	0,3181		0,2194	
F	39.790		23.735	

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Control for firm and worker heterogeneity using *spell fixed effects*:

$$\ln w_{it} = \beta_0 + \beta_1 X_{it} + \beta_2 F_{it} + \beta_3 \frac{\pi_{Lit}}{n_{it}} + v_{it} + u_{it}$$

Within-spell estimation controls implicitly for worker and firm heterogeneity (Abowd et al, Ec'trica 1997)

$$\ln w_{it} - \overline{\ln w_s} = (X_{it} - \overline{X_s})\beta_1 + (F_{it} - \overline{F_s})\beta_2 + \beta_3 (\pi_{j(i,t),t} - \overline{\pi_{j(i,t),s}}) + (u_{it} - \overline{u_s})$$

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Table 6: Spell Fixed Effects and Spell Fixed Effects 2SLS Regressions
 Dependent variable: log hourly wage

	(2) No IV	(3) Financial IV	(3) All IV
Schooling	050 (50.84)	056 (50.44)	03 (23.09)
Experience	0,0280 (156.85)	0,0288 (151,90)	0,031 (119,03)
Tenure	018 (194,88)	019 (191,80)	014 (110,59)
Log firm size	0,0155 (90,02)	0,014 (79,35)	0,024 (86,16)
Gross profit per worker	-2,71E-3	-8,92E-3	-5,19E-4 (-18,04)
R ²	0,031	0,030	0,0308
adj. R ²	0,031	0,030	0,0308
F	24.363	23.884	13.049
Standard deviation of profit per worker	108.712	108.712	221.772
Lester Range	-1,1%	-3,8%	-0,44%

Obs: 32m (no IV and Fin IV) and 17.2m (all IV)

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Evidence of NO rent sharing

Robustness analysis:

1. Restricting sample to large firms over period of economic growth
2. Restricting sample to large firms over period of economic growth and increasing profits

Rationale: rent sharing may be *asymmetric* (wages positively related with profits only when profits increase) – difference between rent sharing and *risk sharing*

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**Table 8: Spell Fixed Effects and Spell Fixed Effects 2SLS Regressions
(Large firms present in 1999-2001 period);**

Dependent variable: log hourly wage

	(2) No IV	(3) Financial IV	(4) All IV
Schooling	0,022 (126,74)	0,022 (126,39)	0,023 (93,41)
Experience	0,0433 (119,84)	0,0432 (119,55)	0,0557 (98,56)
Tenure	011 (70,70)	011 (70,87)	004 (22,19)
Log firm size	0,02 (61,70)	0,02 (79,11)	0,03 (67,51)
Gross profit per worker	-0,0208 (-1,18)*	0,0147 (56,59)	0,0124 (48,18)
R ²	0,0249	0,0251	0,0262
adj. R ²	0,0249	0,0251	0,0262
F	8.904	8.988	5.282
Standard deviation of profit per worker	31.011	31.011	63.207
Lester Range	-0,025%	1,82%	3,13%

Obs: 13.4m (no IV and Fin IV) and 7.7m (all IV)

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**Table 10: Spell Fixed Effects and Spell Fixed Effects 2SLS Regressions
(Large firms present in 1999-2001 period, with increasing profits);**

Dependent variable: log hourly wage

	(2) No IV	(3) Financial IV	(4) All IV
Schooling	0,013 (23,72)	0,013 (23,67)	082 (11,37)
Experience	0,042 (34,24)	0,042 (34,18)	0,056 (31,02)
Tenure	014 (28,53)	014 (28,35)	010 (16,92)
Log firm size	0,12 (135,78)	0,12 (137,99)	0,16 (154,53)
Gross profit per worker	0,0147 (59,48)	0,0165 (64,04)	0,022 (80,92)
R ²	0,0464	0,0468	0,0648
adj. R ²	0,0464	0,0468	0,0648
F	1.775	1.791	1.669
Standard deviation of profit per worker	84.118	84.118	152.824
Lester Range	4,94%	5,55%	13,45%

Obs: 1.5m (no IV and Fin IV) and 1m (all IV)

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-no role found for informality (use of PNAD data – no relationship between region-year RS and share of informality)

Future/current robustness analysis:

Separating rent sharing analysis between workers of different types (more or less likely to benefit from RS):

- Men vs women
- Blue-collar vs white-collar
- Low- vs high-tenure (high worker turnover)
- Low- vs high-education
- Car manufacturing in ABC

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Conclusions

Across almost all specifications: precisely estimated parameters indicating **virtually zero rent sharing**

Even when selecting subset of data that would lead to strongest evidence of RS, still find very small results (about one third of the corresponding findings for developed countries).

Possible explanations: **weakness of labour market institutions** (unions, employment law, high turnover) and **macroeconomic instability**; but **not informality**

Explanations/policies concerning income inequality in Brazil:

- racial and gender discrimination may be less likely determinants of inequality;
- more weight on *observable and/or unobservable individual endowments* and in *convexities in the returns to those endowments*

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