Pro-Poor Growth, Social Policies and Labour Market Linkages

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Social Welfare Function

- Money-metric social welfare function is derived as:

$$W = u(x^*) = \int_0^\infty u(x)w(x)f(x)dx$$

where

- x^* is the equally distributed equivalent level of income
- $u(x)$ is the utility function, increasing in x and concave
- $w(x)$ is the weight given to the utility of individual with income x
  - *captures the relative deprivation suffered by individuals (decreasing function of x)*
  - *should satisfy:* $\int_0^\infty w(x)\, f(x)dx = 1$

- Define $w(x) = 2[1 - F(x)]$ and $u(x) = log(x)$

- Social Welfare Function used in this paper is thus

$$log(x^*) = 2\int_0^\infty [1 - F(x)] log(x) f(x) dx$$

where x^* is the money-metric social welfare.

- $\mu = \int_0^\infty x f(x) dx$ is the mean income

- (μ - x^*) is a loss of social welfare caused by inequality.

Inequality Measure

Decomposition a la Atkinson (1970)

$$log\left(x^{*}\right)=log\left(\mu\right)-log\left(I\right)$$

Derived Inequality Measure) has a log utility a la Theil (Atikinson) and Weights a la Gini = Thini (Gikinson) - a new inequality measure

$$\log(I)=2\int_{0}^{\infty}[1-F(x)][\log(\mu)-\log(x)]\,f(x)dx$$

Pro-Poor Growth

- Growth rate of mean income:

$$\gamma = \Delta Ln(\mu)$$

- Growth rate of social welfare:

$$\gamma^{*} = \Delta \log\left(x^{*}\right)$$

- Growth rate of inequality:

$$g = \Delta \log\left(I\right)$$

where g has a direct intuitive interpretation

- Pro-poor growth rate: $\gamma^{*} = \gamma - g$

Interpretation of Pro-Poor Growth

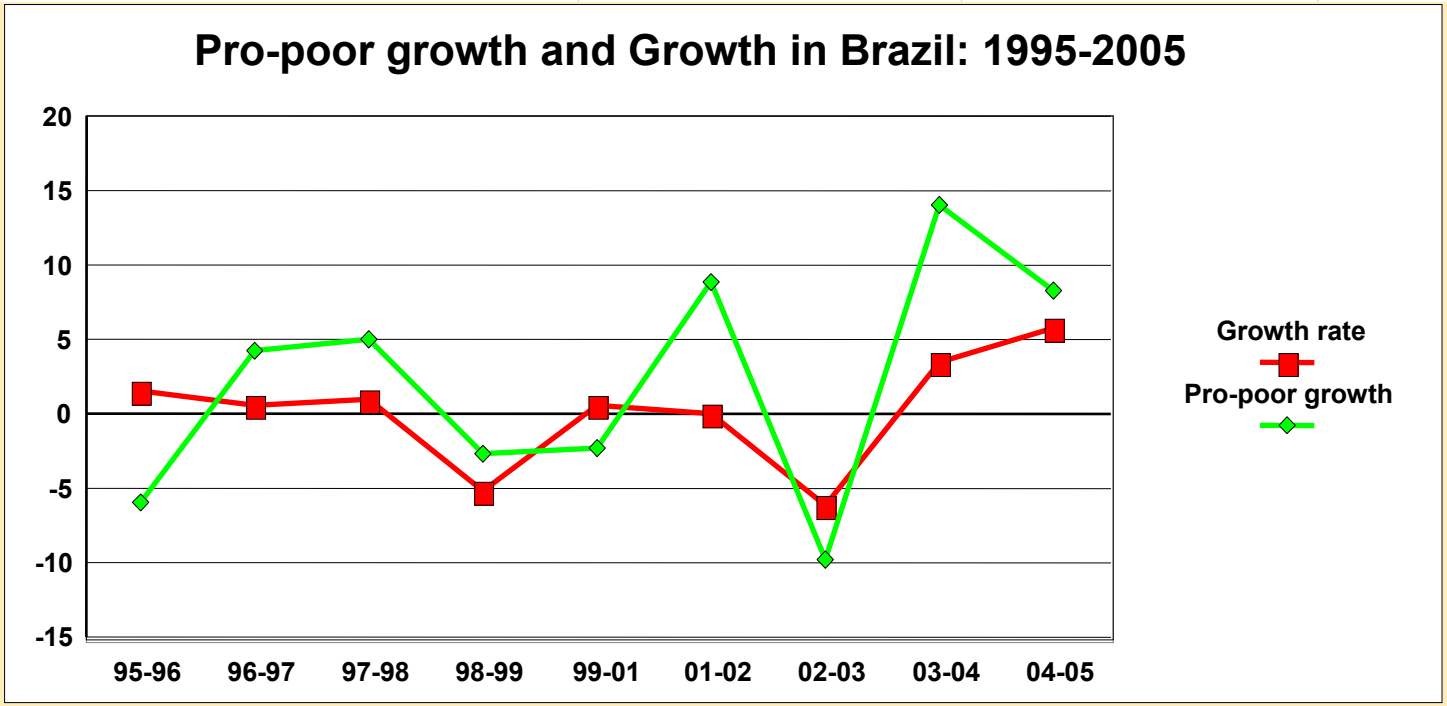
- $\gamma^* - \gamma$ is a gain (or loss) of social welfare growth rate due to an increase (or decrease) in inequality.
- It measures inequality changes using the social welfare changes as its numeraire – convenient.
- *For example*, if actual growth rate is 5% but the pro-poor growth rate is 3%, 2% growth rate is lost due to an increase in inequality. Similarly, if the pro-poor growth rate is 7% with actual growth rate of 5%, 2% will be the gains in growth rate due to a fall in inequality.

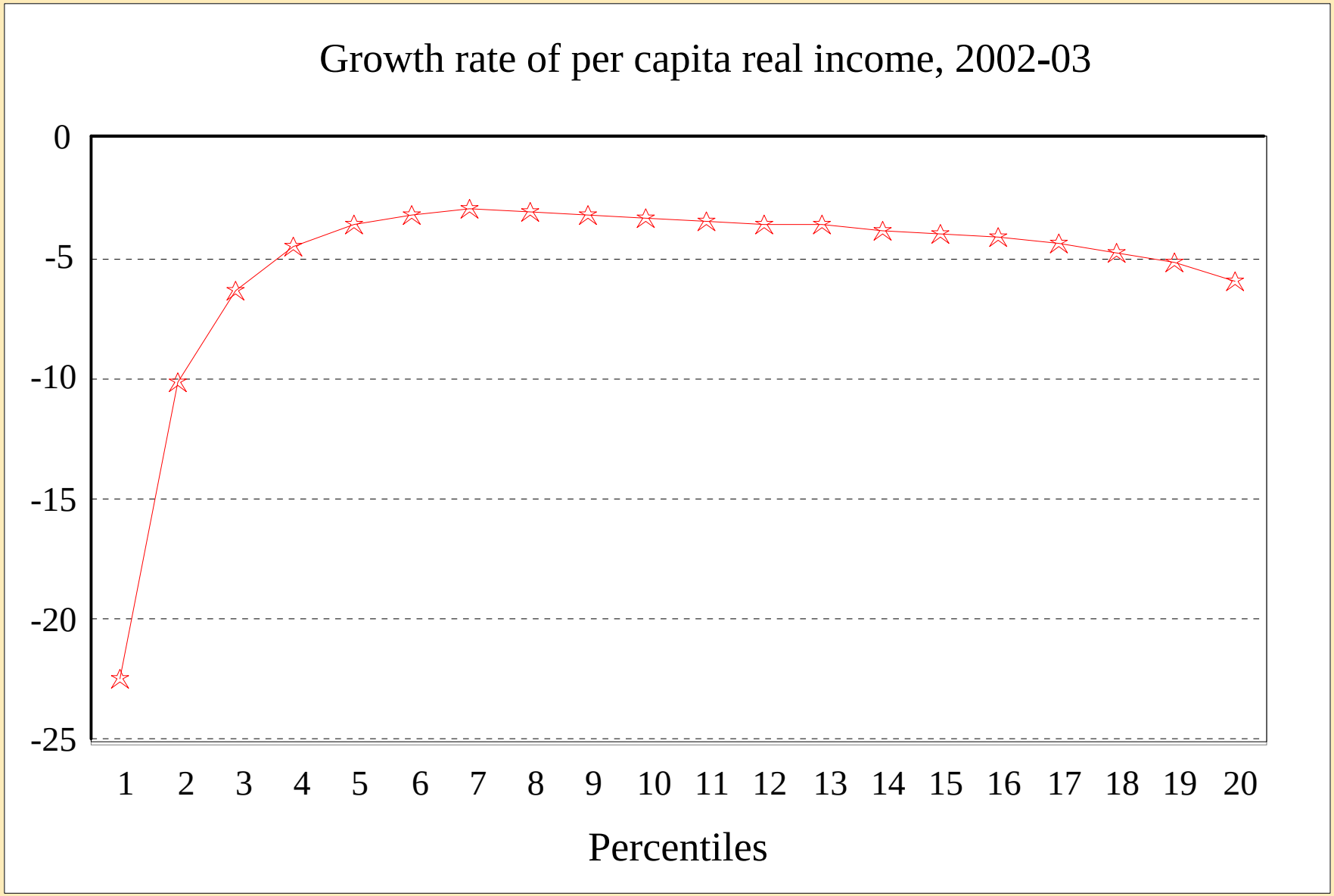
Growth rates of per capita real income and social welfare

Period	Actual growth rate	Pro-poor growth rate	Gain/loss of growth
1995-2005	**-0.31**	**1.85**	**2.16**
1995-2001	**-0.30**	**0.10**	**0.40**
2001-2005	**0.44**	**6.99**	**6.55**

Pro-poor growth in Brazil: 1995-2005

	Growth rate	Pro-poor growth	Gain/loss
95-96	1.59	-5.95	-7.54
96-97	0.65	4.42	3.77
97-98	0.97	5.07	4.10
98-99	-5.15	-2.53	2.63
99-01	0.76	-2.17	-2.94
01-02	0.11	8.98	8.87
02-03	-6.12	-9.64	-3.52
03-04	3.56	14.11	10.55
04-05	5.93	8.37	2.44




Growth rate of per capita real income, 2002-03
0
-5
-10
-15
-20
-25
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
Percentiles

Growth rate of per capita labor and non-labor income

Period	Actual growth rate	Pro-poor growth rate	Gain/loss of growth
Per capita labor income			
1995-2005	**-1.13**	**0.45**	**1.58**
1995-2001	**-1.30**	**-0.97**	**0.32**
2001-2005	**-0.22**	**5.49**	**5.71**
Per capita non-labor income			
1995-2005	**2.80**	**6.90**	**4.10**
1995-2001	**3.69**	**5.20**	**1.51**
2001-2005	**2.63**	**10.46**	**7.83**

Linking Pro-Poor Growth with the Labour Market

From the individual information, we can calculate the following variables at household level.

- Per capita real labour income (y_l)
- Per capita non-labour income (y_{nl})
- Per capita employed persons in the household (e)
- Per capita labour force participation rate (ℓ)
- Per capita hours of work in the labour market (h)
- Per capita years of schooling in the household (s)

Using these variables we calculate the following variables of interest:

- Employment rate: $e_r = e/\ell$
- Hours worked per employed person: $h_e = h/e$
- Productivity: $\xi = y_l / h$

- Identity linking labour income with labour market characteristics:

$$\ln(y_l) = \ln(\ell) + \ln(e_r) + \ln(h_e) + + \ln(\xi)$$

- Growth rate linkages:

$$\gamma(y_l) = \gamma(\ell) + \gamma(e_r) + \gamma(h_e) + \gamma(\xi)$$

- Pro-poor growth linkages:

$$\gamma^*(y_l) = \gamma^*(\ell) + \gamma^*(e_r) + \gamma^*(h_e) + \gamma^*(\xi)$$

- Inequality linkages:

$$g^*(y_l) = g^*(\ell) + g^*(e_r) + g^*(h_e) + g^*(\xi)$$

- If $g^*(y_l)$ is greater (less) than 0, labour income is pro-poor (anti-poor).
- If $g^*(e_r)$ is greater (less) than 0, employment is pro-poor (anti-poor).

Growth Explanatory Factors	1995-2005	1995-2001	2001-2005	2003-2004	2004-2005
Participation rate	0,82	0,48	1,42	1,06	2,26
Occupation rate	-0,3	-0,66	0,01	0,79	-0,46
Working Hours occupied	-0,31	-0,07	-0,77	-0,43	-1,18
Productivity	-1,35	-1,05	-0,88	1,86	4,68
Total Growth	-1,13	-1,3	-0,22	3,28	5,3

Pro-Poor Growth Explanatory Factors	1995-2005	1995-2001	2001-2005	2003-2004	2004-2005
Participation rate	0,57	0,19	1,6	2,69	2,7
Occupation rate	-0,56	-1,14	0,24	2,35	-0,11
Working Hours occupied	-0,46	-0,21	-0,93	0,44	-1,25
Productivity	0,42	0,18	2,5	10,76	6,89
Total Pro-Poor Growth	-0,02	-0,98	3,41	16,25	8,24

Equality Growth Explanatory Factors	1995-2005	1995-2001	2001-2005	2003-2004	2004-2005
Participation rate	-0,25	-0,29	0,18	1,63	0,44
Ocupation rate	-0,26	-0,48	0,23	1,56	0,35
Working Hours occupied	-0,15	-0,14	-0,16	0,87	-0,07
Productivity	1,77	1,23	3,38	8,9	2,21
Inequality Growth Explanatory Factors	1,11	0,32	3,63	12,97	2,94

Productivity Linkage with Schooling

- Productivity of jth household is given by

$$\xi^{j} = y_{l}^{j} / h^{j}$$

which can also be written as

$$\xi^{j} = s^{j}\bar{r}\left(\bar{r}^{j} / \bar{r}\right)$$

- $\bar{r}$ is the average returns from per year of schooling of all households.
- $\bar{r}^{j} = \xi^{j} / s^{j}$ is the average returns from per years of schooling of jth household.
- Identity linking productivity with schooling:

$$log\left(\xi^{j}\right) = log\left(s^{j}\right) + log\left(\bar{r}\right) + log\left(\bar{r}^{j} / \bar{r}\right)$$

- Productivity growth rates:

$$\gamma(\xi) = \gamma(s) + \gamma(\bar{r})$$

- Productivity pro-poor growth rates:

$$\gamma^*(\xi) = \gamma^*(s) + \gamma^*(\bar{r}) + \gamma^*(\bar{r}^j / \bar{r})$$

- Inequality in productivity:

$$g^*(\xi) = g^*(s) + g^*(\bar{r}) + g^*(\bar{r}^j / \bar{r})$$

- If $g^*(\bar{r}^j / \bar{r})$ is greater (or less) than 0, changes in the rates of returns from schooling favour poor (or non-poor) households more than non-poor (or poor) households.

Labor Productivity - Brazil

Productivity Explanatory Factors	1995-2005	1995-2001	2001-2005	2003-2004	2004-2005
Years of Schooling	3,1	2,34	3,97	4,49	3,64
Rate of return to schooling	-4,45	-3,38	-4,85	-2,63	-4,85
Relative return to schooling	0	0	0	0	0
Productivity Growth Explanatory Factors	-1,35	-1,05	-0,88	1,86	4,68

Pro-Poor Productivity Growth Explanatory Factors	1995-2005	1995-2001	2001-2005	2003-2004	2004-2005
Years of Schooling	4,2	2,8	6,28	7,54	5,4
Rate of return to schooling	-4,45	-3,38	-4,85	-2,63	-4,85
Relative return to schooling	0,68	0,77	1,03	5,85	0,45
Total Pro-Poor Productivity Growth	0,42	0,18	2,5	10,76	6,89

Equality Growth Explanatory Factors	1995-2005	1995-2001	2001-2005	2003-2004	2004-2005
Years of Schooling	1,1	0,46	2,31	3,05	1,76
Rate of return to schooling	0	0	0	0	0
Relative return to schooling	0,68	0,77	1,03	5,85	0,45
Inequality of Productivity Growth Explanatory Factors	1,77	1,23	3,38	8,9	2,21

Table10 : Explaining growth rates of per capita real labour income					
Explanatory factors	1995-2005	1995-2001	2001-2005	2003-04	2004-05
Labor force participation rate	**0.82**	**0.48**	**1.42**	1.06	2.26
Employment rate	**-0.30**	**-0.66**	**0.01**	0.79	-0.46
Hours of work per person employed	**-0.31**	**-0.07**	**-0.77**	-0.43	-1.18
Productivity	**-1.35**	**-1.05**	**-0.88**	1.86	4.68
- years of schooling	**3.10**	**2.34**	**3.97**	4.49	3.64
Average rate of return per year of schooling	**-4.45**	**-3.38**	**-4.85**	-2.63	1.03
Relative rates of return per year of schooling	**0.00**	**0.00**	**0.00**	0.00	0.00
Total labour income	**-1.13**	**-1.30**	**-0.22**	**3.28**	**5.30**

Table12 : Explaining gains and losses in growth rate of labour income					
Explanatory factors	1995-2005	1995-2001	2001-2005	2003-04	2004-05
Labor force participation rate	**-0.25**	**-0.29**	**0.18**	**1.63**	**0.44**
Employment rate	**-0.26**	**-0.48**	**0.23**	**1.56**	**0.35**
Hours of work per person employed	**-0.15**	**-0.14**	**-0.16**	**0.87**	**-0.07**
Productivity	**1.77**	**1.23**	**3.38**	**8.90**	**2.21**
- years of schooling	**1.10**	**0.46**	**2.31**	**3.05**	**1.76**
Average rate of return per year of schooling	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**
Relative rates of return per year of schooling	**0.68**	**0.77**	**1.06**	**5.85**	**0.45**
Total labour income	**1.11**	**0.32**	**3.63**	**12.97**	**2.94**

Contribution to growth by various income components

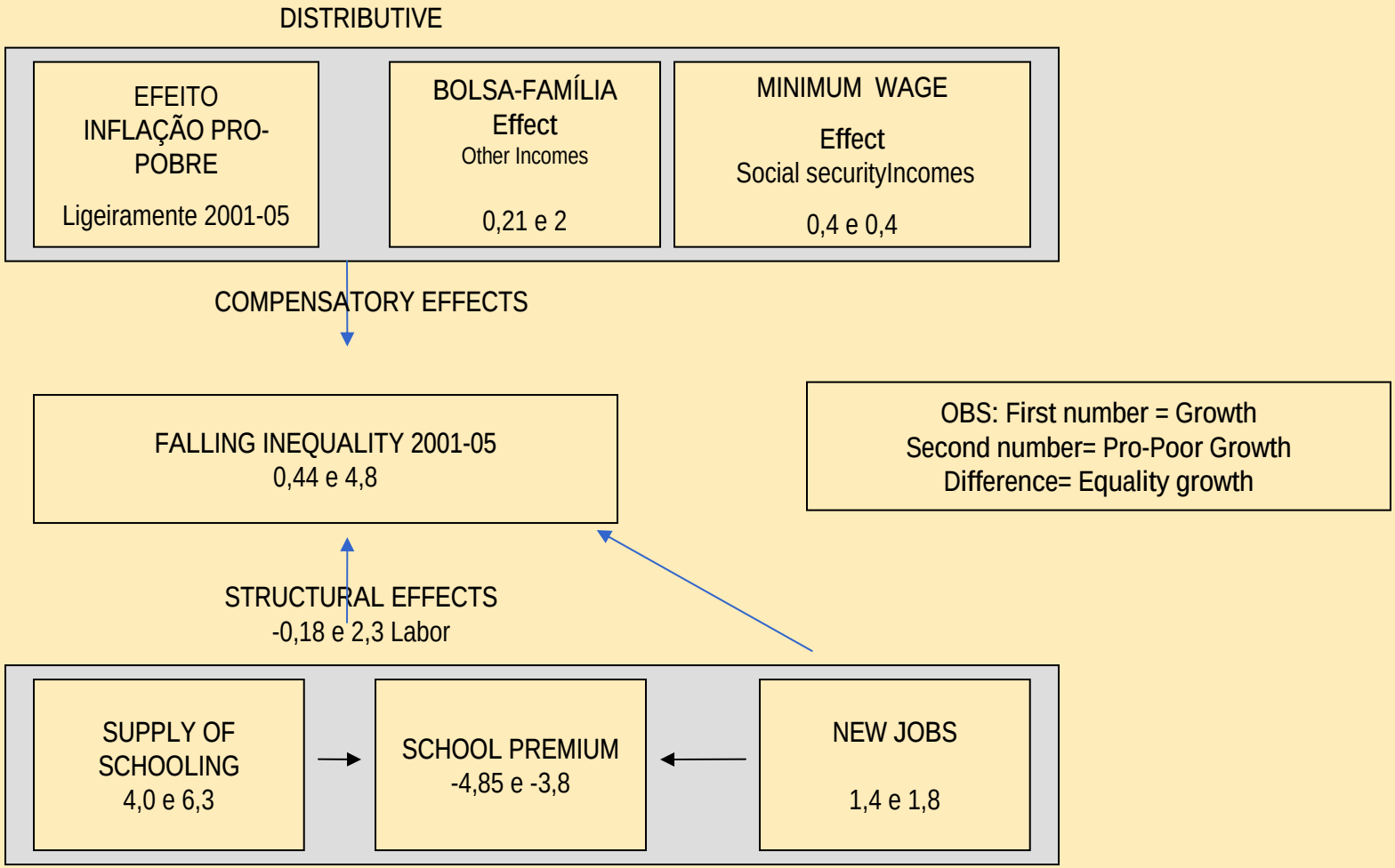
	1995-2005	1995-2001	2001-2005	2003-04	2004-05
Labour income	**-0.89**	**-1.02**	**-0.18**	2.51	4.03
Social security	**0.55**	**0.75**	**0.43**	0.38	1.42
Social transfers	**0.09**	**0.01**	**0.21**	0.56	0.28
Non-social income	**-0.06**	**-0.04**	**-0.03**	0.11	0.20
Total income	**-0.31**	**-0.30**	**0.44**	3.56	5.93

Contribution to pro-poor growth

	1995-2005	1995-2001	2001-2005	2003-04	2004-05
Labour income	**-0.11**	**-0.74**	**2.29**	10.12	5.97
Social security	**0.40**	**0.34**	**0.43**	-2.21	1.32
Social transfers	**1.01**	**0.38**	**2.02**	6.01	0.65
Non-social income	**0.05**	**0.12**	**0.07**	0.18	0.43
Total income	**1.36**	**0.10**	**4.81**	14.10	8.37

Contribution to gain and loss of growth rate

	1995-2005	1995-2001	2001-2005	2003-04	2004-05
Labour income	**0.78**	**0.28**	**2.47**	7.62	1.93
Social security	**-0.16**	**-0.41**	**-0.00**	-2.59	-0.10
Social transfers	**0.93**	**0.37**	**1.81**	5.45	0.37
Non-social income	**0.11**	**0.16**	**0.09**	0.08	0.24
Total income	**1.66**	**0.40**	**4.37**	10.55	2.44

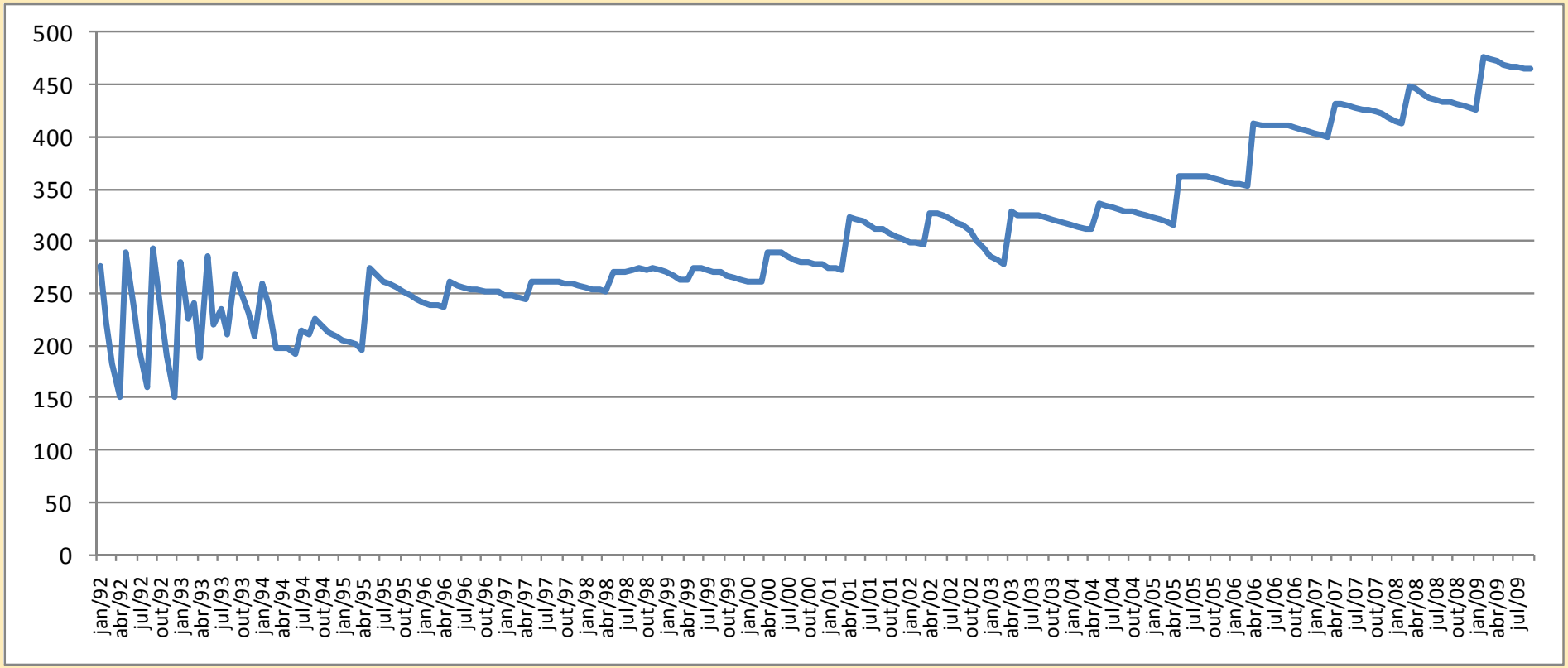


* com efeito adverso sobre emprego formal e pobreza trabalhista **vide** Neri (2007)

Demographic Trends

	Averages		
	Crianças Per capita	Adultos Per capita	Idosos Per capita
Level 1995	0.347	0.596	0.057
*Pro-Poor**	*0.39*	*0.54*	*0.04*
∆1995-2004	-1.960	0.830	1.660
*Pro-Poor**	*-1.64*	*0.96*	*-0.67*

Real Minimum Wages Trends Since 1992



Objectives of this study

- To explain the recent Brazilian experience of sluggish growth, falling inequality along with poverty reduction
- To understand the overall relationship between growth, poverty and inequality (i.e. pro-poor growth)
- To explore linkages between three dimensions (later):
  - growth patterns
  - labour market performance
  - social policies

Macroeconomic and social policies

- Macroeconomic stabilization policies (1999)
  - Floating of exchange rate
  - Inflation targets
  - Fiscal responsibility law

- Minimum wage has increased in real terms by more than 100% percent during 1995-2006.

- Expansion of targeted Conditional Cash Transfers (*Bolsa Familia*)