When conditional transfer is not a novelty

The impact of *Bolsa Família* on Labor Market in Brazil

Rafael P. Ribas[1] Fábio Veras Soares[2]

[1]University of Illinois at Urbana-Champaign (UIUC)

[2]International Policy Centre for Inclusive Growth (IPC-IG)

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- It seems that the answer is NO.

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- However, households' responses might differ when
  - it is self-selective;
  - it becomes better understood by households;
  - it is extended to urban and less poor areas.
- *Bolsa Família* is a widespread means-tested program that have taken place not only in rural and isolated areas, but also in large cities.

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  5. Hourly wage

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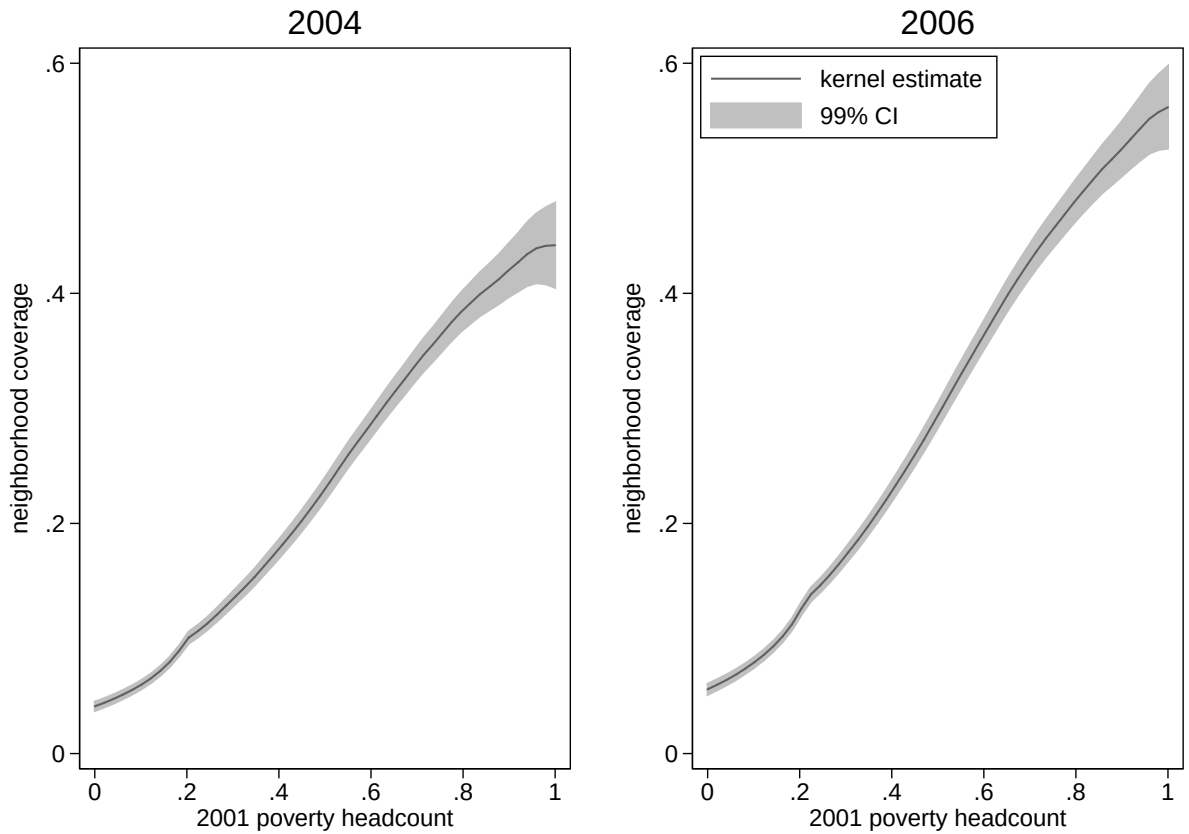
  2. Local government chooses which neighborhoods should be prioritized
  3. National government decides who is going to receive the benefit based on the information declared by the households

Program's Targeting

- Relationship between *Bolsa Família*'s coverage and 2001 poverty headcount at neighborhood level



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    - We have to control for the small coverage of other programs.
    - We use the typical-value method developed by Foguel and Barros (2010).
- Although it is a cross-section survey, it has a panel of census tracks (neighborhoods) for each decade.

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  - It allows to control for selection on unobserved outcomes,
  - and also for exogenous variables collected before the program had started.
  - Furthermore, the expansion at community level was based on the same survey year (2001 PNAD).

Econometric Model

Suppose the labor outcome of individual i living in community c at time t, y_{ict}, is given by the following equation:

$$y_{ict} = \alpha + \beta_1 d_{ict} + \beta_2 \overline{d}_{ct} + \mu_i + \mu_t + u_{ict}, \quad (1)$$

If data is available only at community level, we cannot estimate equation (1) properly. However, we are able to estimate the following equation (Deaton, 1985; Verbeek and Nijman, 1993):

$$\overline{y}_{ct} = \alpha + \tau \overline{d}_{ct} + \mu_c + \mu_t + u_{ct}, \quad (2)$$

and any least square estimator for equation (2) provides the following result:

$$\tau = \beta_1 + \beta_2.$$

Difference-in-Difference Model

- To estimate equation (2), we start with the following DID model:

$$\Delta \overline{y}_c = \mu + \tau \Delta \overline{d}_c + \theta_1 \overline{d}_{c0} + \theta_2 \left(\overline{d}_{c0} \cdot \Delta \overline{d}_c \right) + \Delta u_c. \qquad (3)$$

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- Although it controls for selection in terms of unobserved outcomes, it does not control for selection in terms of unobserved variation in these outcomes. That is, it assumes that:

$$\Delta \overline{y}_c \left(\overline{d}_{c1}, \overline{d}_{c0} \right) \perp \left(\overline{d}_{c1}, \overline{d}_{c0} \right).$$

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- We can weaken this condition assuming the following conditional independence assumption:

$$\Delta \overline{y}_c \left(\overline{d}_{c1}, \overline{d}_{c0} \middle| X_{c0} \right) \perp \left(\overline{d}_{c1}, \overline{d}_{c0} \right).$$

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- But it does not control for heterogeneity in the potential effect of treatment.
- With a high dimension vector X_{c0}, interactions between X_{c0} and $\left(\overline{d}_{c1}, \overline{d}_{c0}\right)$ can be costly.
- The strategy is to reduce the dimensions of X_{c0} by estimating a Generalized Propensity Score (GPS) function (Imbens, 2000; Imai and van Dyk, 2005).

Controlling for the GPS

- Once the GPS function is estimated for each community, it can be represented by the following GPS indices:

$$\kappa_{c0} \equiv X'_{c0}\widehat{\gamma}_0,$$

$$\kappa_{c1} \equiv X'_{c0}\widehat{\gamma}_1,$$

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$$\kappa_{cI} \equiv \kappa_{c0} \cdot \kappa_{c1}.$$

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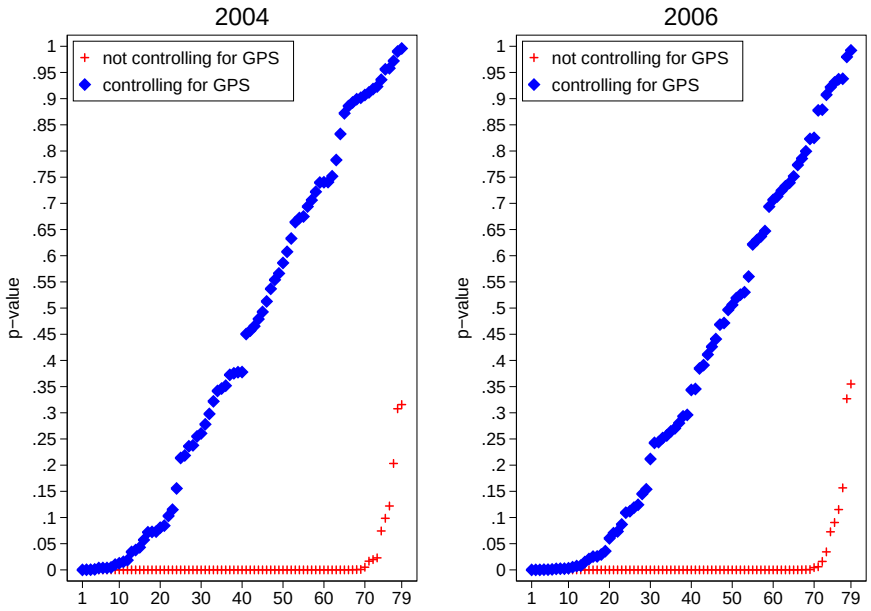
- Then we estimate the following DID model:

$$\begin{aligned}\Delta\overline{y}_c &= \mu + \tau\Delta\overline{d}_c + \theta_1\overline{d}_{c0} + \theta_2\left(\overline{d}_{c0}\cdot\Delta\overline{d}_c\right) + \theta_3\kappa^*_{c0} + \theta_4\left(\kappa^*_{c0}\cdot\Delta\overline{d}_c\right) \\ &\quad + \theta_5\kappa^*_{c1} + \theta_6\left(\kappa^*_{c1}\cdot\Delta\overline{d}_c\right) + \theta_7\kappa^*_{cI} + \theta_8\left(\kappa^*_{cI}\cdot\Delta\overline{d}_c\right) + \Delta u_c \qquad (4)\end{aligned}$$

where $\kappa^*_{cj} = \kappa_{cj} - \overline{\kappa}_{cj}$, for $j = 0, 1, I$.

Balance Property

- For the estimated GPS to control for all variables, it must satisfy the balance property.
- Without controlling, 75 out of 79 variables are unbalanced.
- Controlling for the GPS indices, only 22 remain unbalanced.



The Average Effect of *Bolsa Família*

	DID	GPS
Labor Force Participation		
2004	-0.0368	0.0190
	(0.024)	(0.037)
2006	-0.0018	0.0384
	(0.020)	(0.035)
Unemployment		
2004	0.0062	0.0106
	(0.012)	(0.020)
2006	0.0018	0.0188
	(0.010)	(0.020)
Formal Sector Participation		
2004	-0.0651***	-0.1223***
	(0.018)	(0.037)
2006	-0.0334**	-0.1008***
	(0.016)	(0.034)
Informal Sector Participation		
2004	0.0264	0.1365***
	(0.027)	(0.046)
2006	0.0331	0.1284***
	(0.025)	(0.043)
Weekly Hours Worked		
2004	-0.0792	0.2962
	(1.359)	(1.894)
2006	-2.3637**	-1.9729
	(1.004)	(1.925)
Log of Hourly Wage		
2004	0.0116	-0.3458***
	(0.111)	(0.108)
2006	0.1292*	-0.1452
	(0.072)	(0.098)

The Effect on Male Population

	metropolitan	other urban	rural
Labor Force Participation			
2004	-0.1313	0.0073	0.1047*
	(0.155)	(0.039)	(0.056)
2006	-0.1037	0.0569	0.0298
	(0.083)	(0.037)	(0.041)
Unemployment			
2004	0.4332***	0.0067	-0.0424*
	(0.140)	(0.030)	(0.025)
2006	0.1509*	0.0245	-0.0096
	(0.087)	(0.027)	(0.021)
Formal Sector Participation			
2004	-0.6932***	-0.1552**	-0.0622
	(0.203)	(0.074)	(0.098)
2006	-0.4328***	-0.0539	-0.0037
	(0.139)	(0.052)	(0.112)
Informal Sector Participation			
2004	0.2113	0.1590**	0.2060*
	(0.200)	(0.073)	(0.115)
2006	0.2227*	0.0869	0.0450
	(0.117)	(0.057)	(0.116)
Weekly Hours Worked			
2004	-0.2427	4.1885*	1.4611
	(10.56)	(2.220)	(4.256)
2006	6.1879	-0.2114	-3.8244
	(6.214)	(1.865)	(4.121)
Log of Hourly Wage			
2004	-0.4323	-0.4571***	-0.1542
	(0.383)	(0.134)	(0.242)
2006	-0.2707	-0.2524**	-0.1026
	(0.280)	(0.117)	(0.215)

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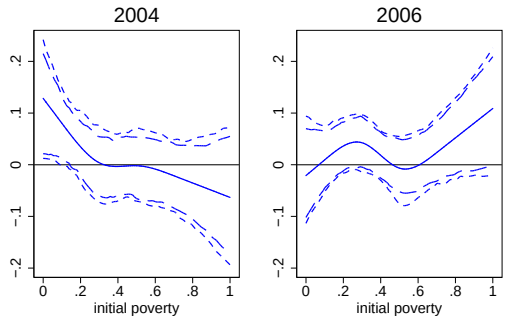
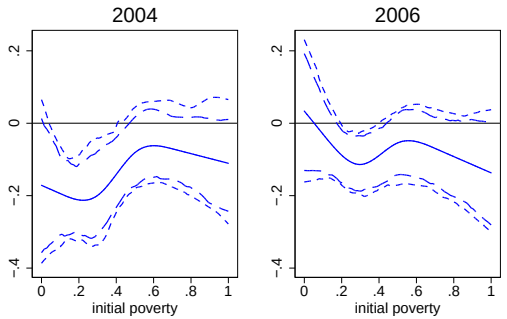


Formal Sector Participation



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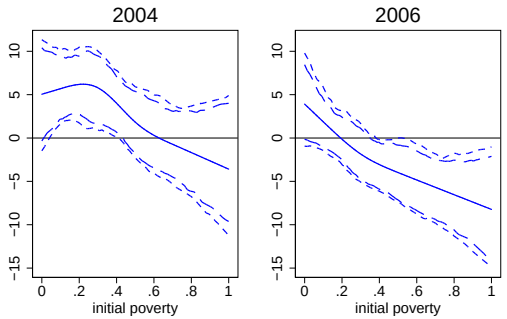

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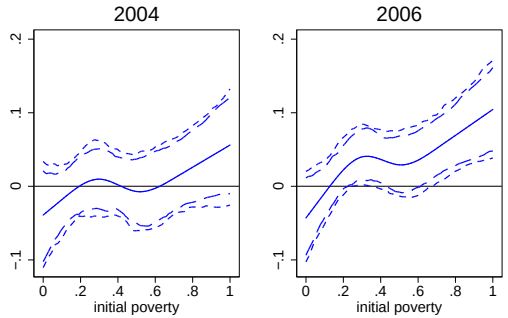
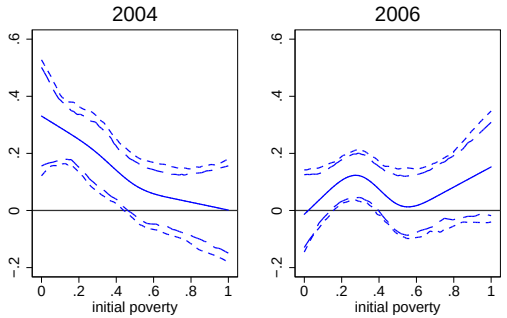
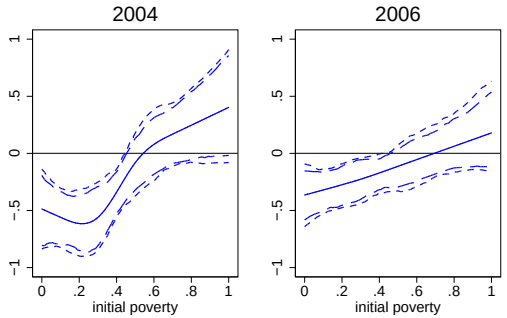


Informal Sector Participation



Log of Hourly Wages



The Effect on Female Population

	metropolitan	other urban	rural
Labor Force Participation			
2004	0.0938	-0.0749	0.1581
	(0.151)	(0.054)	(0.154)
2006	-0.3600**	-0.0141	0.2234*
	(0.145)	(0.053)	(0.122)
Unemployment			
2004	0.1466	0.0516	0.0602
	(0.158)	(0.055)	(0.086)
2006	0.0461	0.0506	-0.0195
	(0.111)	(0.046)	(0.049)
Formal Sector Participation			
2004	-0.1067	-0.0801	-0.1272*
	(0.110)	(0.050)	(0.066)
2006	-0.2547***	-0.1032**	-0.0935
	(0.091)	(0.046)	(0.088)
Informal Sector Participation			
2004	0.1587	-0.0085	0.2589
	(0.122)	(0.059)	(0.162)
2006	-0.0484	0.0691	0.3376**
	(0.113)	(0.054)	(0.132)
Weekly Hours Worked			
2004	-4.4027	0.1511	-9.3119
	(7.717)	(2.652)	(6.266)
2006	0.1705	0.4945	-9.8991
	(6.295)	(2.669)	(6.145)
Log of Hourly Wage			
2004	0.3304	-0.0410	-0.1643
	(0.317)	(0.129)	(0.407)
2006	-0.2142	-0.0682	0.0957
	(0.301)	(0.138)	(0.338)

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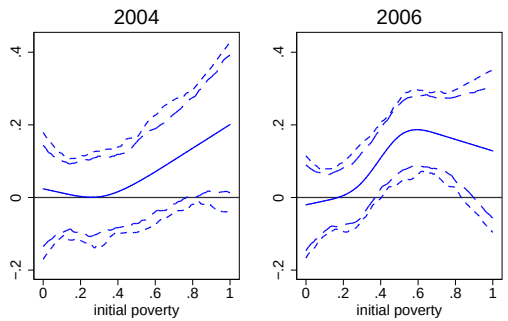
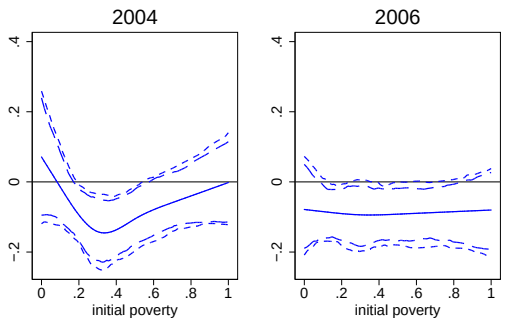
Unemployment			
2004	0.1466	0.0516	0.0602
	(0.158)	(0.055)	(0.086)
2006	0.0461	0.0506	-0.0195
	(0.111)	(0.046)	(0.049)
Formal Sector Participation			
2004	-0.1067	-0.0801	-0.1272*
	(0.110)	(0.050)	(0.066)
2006	-0.2547***	-0.1032**	-0.0935
	(0.091)	(0.046)	(0.088)
Informal Sector Participation			
2004	0.1587	-0.0085	0.2589
	(0.122)	(0.059)	(0.162)
2006	-0.0484	0.0691	0.3376**
	(0.113)	(0.054)	(0.132)
Weekly Hours Worked			
2004	-4.4027	0.1511	-9.3119
	(7.717)	(2.652)	(6.266)
2006	0.1705	0.4945	-9.8991
	(6.295)	(2.669)	(6.145)
Log of Hourly Wage			
2004	0.3304	-0.0410	-0.1643
	(0.317)	(0.129)	(0.407)
2006	-0.2142	-0.0682	0.0957
	(0.301)	(0.138)	(0.338)

The Effect on Female Population by Poverty Rate

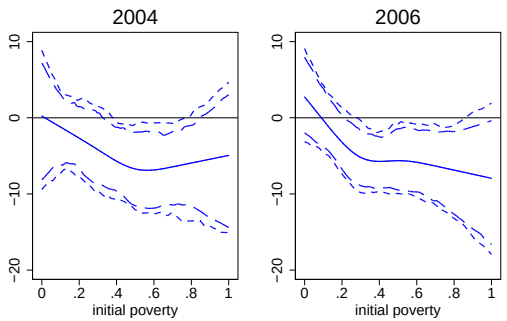
Labor Force Participation



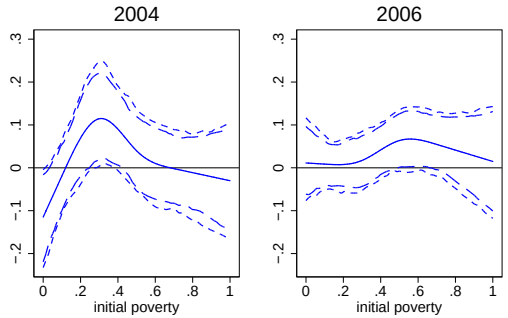
Formal Sector Participation



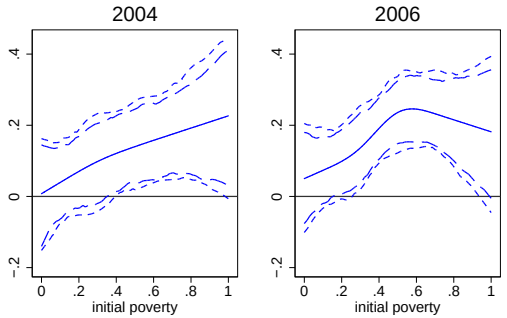
Weekly Hours Worked



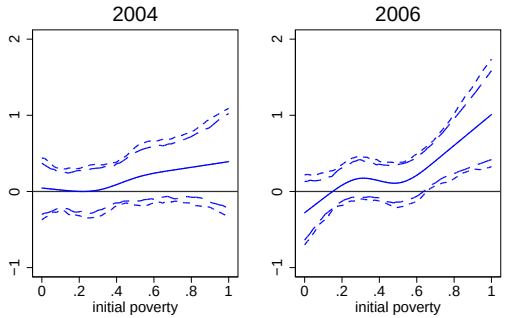
Unemployment



Informal Sector Participation



Log of Hourly Wages

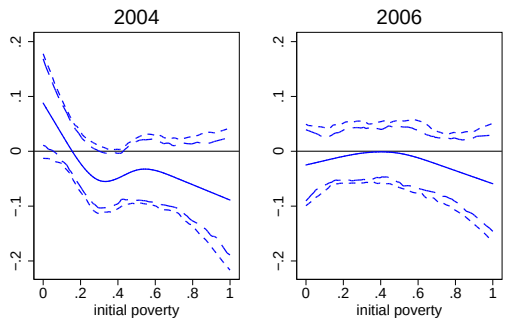


The Effect on the 1st Person in the Household

	metropolitan	other urban	rural
Labor Force Participation			
2004	-0.0167	-0.0619	0.0568
	(0.109)	(0.039)	(0.057)
2006	-0.1887**	-0.0029	0.0698
	(0.076)	(0.035)	(0.044)
Unemployment			
2004	0.2809***	0.0219	-0.0175
	(0.094)	(0.024)	(0.021)
2006	0.2184***	0.0229	-0.0336
	(0.069)	(0.020)	(0.021)
Formal Sector Participation			
2004	-0.6962***	-0.1505**	-0.0447
	(0.194)	(0.074)	(0.114)
2006	-0.5037***	-0.0696	0.0487
	(0.151)	(0.056)	(0.118)
Informal Sector Participation			
2004	0.4285***	0.0710	0.1188
	(0.142)	(0.079)	(0.127)
2006	0.1221	0.0461	0.0522
	(0.145)	(0.061)	(0.130)
Weekly Hours Worked			
2004	1.6797	2.4680	-0.2235
	(8.216)	(2.371)	(4.368)
2006	6.9135	-0.0567	-2.3911
	(5.551)	(2.110)	(3.946)
Log of Hourly Wage			
2004	-0.6951**	-0.4214***	-0.1779
	(0.311)	(0.125)	(0.252)
2006	-0.2585	-0.1671	0.1637
	(0.227)	(0.114)	(0.237)

The Effect on the 1st Person in the Household by Poverty Rate

Labor Force Participation



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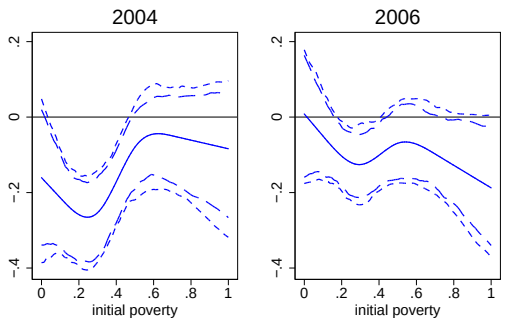

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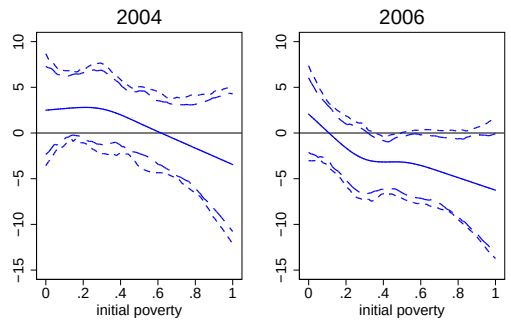

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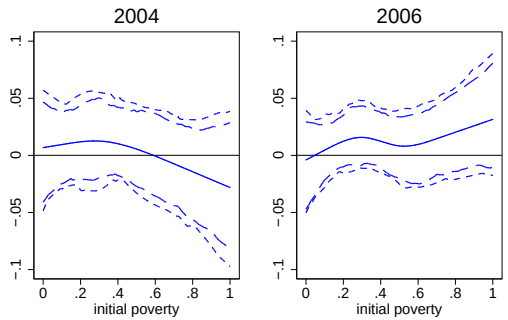

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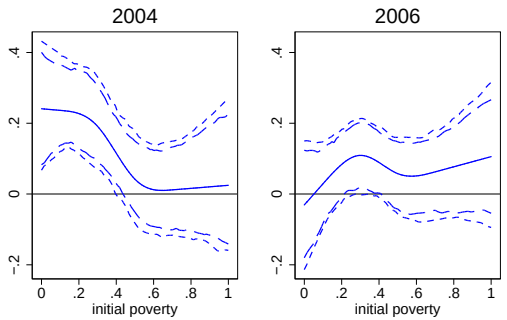
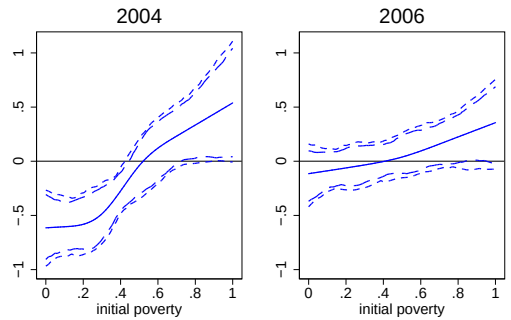


Log of Hourly Wages



The Effect on the 2nd Person in the Household

	metropolitan	other urban	rural
Labor Force Participation			
2004	-0.1162	-0.1205*	0.1681
	(0.169)	(0.065)	(0.130)
2006	-0.1034	-0.0213	0.2964**
	(0.177)	(0.055)	(0.128)
Unemployment			
2004	0.0609	0.0193	-0.0178
	(0.228)	(0.054)	(0.060)
2006	0.0296	0.0467	-0.0494
	(0.136)	(0.049)	(0.048)
Formal Sector Participation			
2004	0.0493	-0.1338**	-0.0693
	(0.148)	(0.057)	(0.087)
2006	-0.1015	-0.1552***	-0.0958
	(0.132)	(0.057)	(0.087)
Informal Sector Participation			
2004	-0.1170	0.0359	0.2454*
	(0.138)	(0.071)	(0.145)
2006	-0.0013	0.1062*	0.4038***
	(0.124)	(0.063)	(0.145)
Weekly Hours Worked			
2004	0.8138	4.5340	-4.3974
	(9.543)	(2.811)	(7.124)
2006	-4.2162	-1.2286	-10.2278
	(6.950)	(2.906)	(6.231)
Log of Hourly Wage			
2004	-0.2560	-0.0762	-0.1800
	(0.364)	(0.183)	(0.394)
2006	-0.1672	-0.0947	-0.1925
	(0.257)	(0.161)	(0.321)

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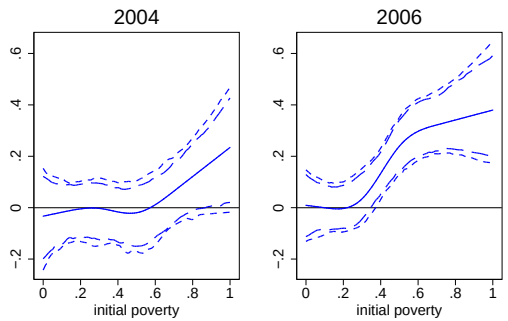
The Effect on the 2nd Person in the Household by Poverty Rate

Labor Force Participation



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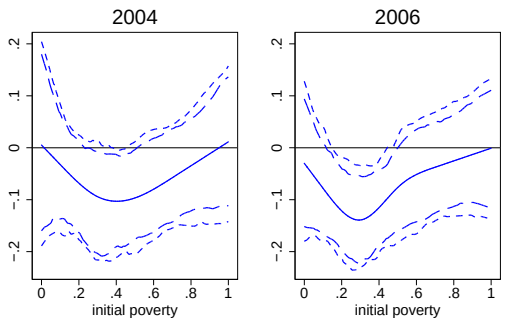

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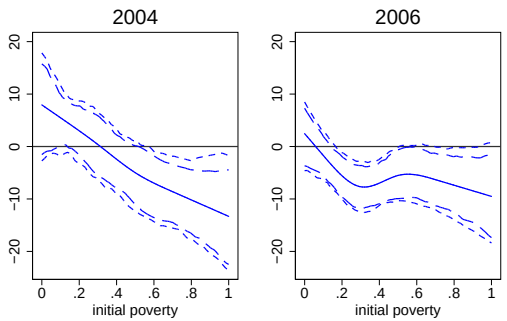
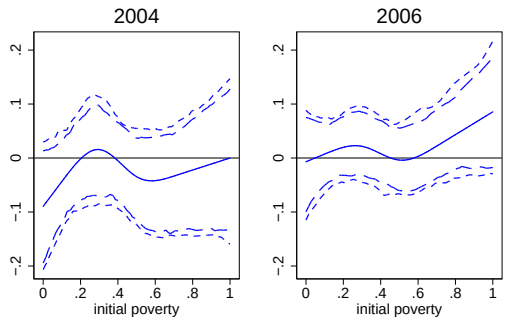


Unemployment



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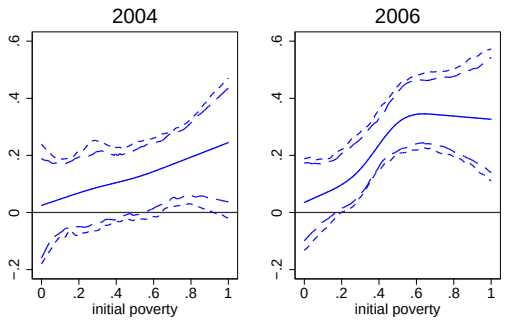

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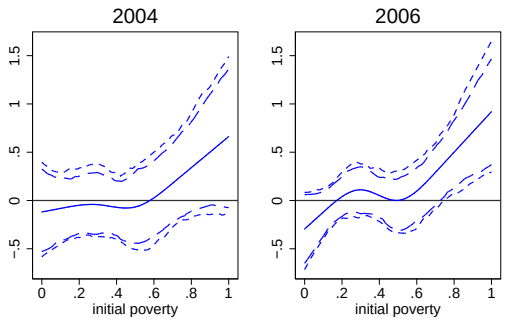

Conclusion Remarks

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  - higher transition to the formal sector,
  - higher reduction in hours worked,
  - and higher increase in wages.

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  - higher transition to the formal sector,
  - higher reduction in hours worked,
  - and higher increase in wages.
- Most of these related to the pro-poor growth experienced in Brazil in the 2000's.
- It is tricky to distinguish which changes are caused by the program itself and which ones are caused by other events related to the pro-poor growth, even using panel data.

Conclusion Remarks

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  3. In poor and rural areas, it increases the labor supply of women and households' additional workers at the extensive margin, but only in the informal sector.

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  2. In metropolitan areas, it increases men's unemployment and reduces women's participation in the labor force to the detriment of their participation in the formal sector.
  3. In poor and rural areas, it increases the labor supply of women and households' additional workers at the extensive margin, but only in the informal sector.
- In general, the reduction in labor supply at extensive margin is only identified in the formal sector, whereas the effect on the informal sector participation is always positive.

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- In large cities, there is a significant reduction in households' labor supply at the extensive margin.
  - Even if the first household's worker stays in the labor force, he or she becomes more patience when looking for a job in those areas.
- Therefore, the potential effect of CCT programs in urban areas may differ from their effect in rural areas.