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# Politics of Economics: The Upcoming General Elections

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December 20, 2013  
Growth and Development Conference  
ISI, Delhi

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# Economics - Growth

- India's GDP is estimated to grow at 5% in 2012/13 - lowest growth projection issued by the government & the RBI since 2002
  - Gujarat is one of the few states whose growth has been around double digits over a 10-year period
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# Gujarat vs Other States

- For the 2001 to 2010 period, Gujarat grew at 8.2% p.a. - the fourth fastest growing state
- Will this translate at the National level if Modi is elected PM?



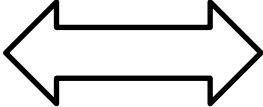
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# Upcoming General Elections: Options

- Modi - Growth, strong governance
  - UPA – Inclusive, pro-poor welfare schemes
  - AAP – Anti-Corruption
  - Left – Anti-Everything...
  - Regional parties – ?
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# Academic/Policy World

- Two paradigms – Bhagwati vs Sen
  - Differences exaggerated – both are concerned about poverty alleviation & recognize that growth is essential
  - Differences over which comes first & causal links
  - Human development  Growth
  - Trickle down, revenue generation
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# Models of Development

- Gujarat model favoured by Bhagwati
  - Kerala/Bihar model favoured by Sen
  - Is there a significant Modi effect in Gujarat relative to the rest of India
  - This seems to be accepted as a fact in the media
  - Lets look at the numbers a bit more carefully
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# Empirical Analysis of State Level Data

- Joint work with Sanchari Roy, Warwick
- Per capita real net state domestic product - annual average growth rates by decade

**Table 1**

	<b>1980s</b>	<b>1990s</b>	<b>2000s</b>
Rest of India	3.0	3.1	5.5
Gujarat	4.4	4.8	7.7
Diff (Gujarat-Rest of India)	1.4	1.7	2.2

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# Discussion

- Table 1 row 3 is the raw first difference between ROI and Gujarat
  - Highlights that Gujarat was always growing faster than ROI, not just under Modi
  - Was there an acceleration in Gujarat after 2002 relative to ROI?
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# Difference in Difference

- Gujarat (G) as treatment, Rest of India (ROI) as control - usual impact evaluation question
  - Both have grown, and both are different
  - Difference in difference
  - Did G grow at a higher rate compared to its own past, and compared to the differential growth performance of ROI
  - Of course, will capture anything else that changed in Gujarat since 2002
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# Difference in Difference, contd.

- Raw calculation from Table 1
- 0.5 percentage points if we compare 1990s and 2000s



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# Data

- Data on per capita real net state domestic product (at constant prices) from the RBI
  - Compute year-on-year growth rate for each state using the formula:  $\frac{y_t - y_{t-1}}{y_{t-1}}$
  - Number of states: 17
  - Number of years: 1981-2011 (31 years)
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# Regression

- Basic regression (Eq. 1)

$$g_{st} = \alpha + \delta_t \cdot Post2002_t * GUJARAT_c + GUJARAT_c + Post2002_t + \epsilon_{st}$$

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- Add state-specific linear time trends (Eq. 3)

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- State-specific time trends control for anything that affects growth *linearly* over time for each state – e.g. government expenditures

# Table 2: Gujarat vs Rest of India, Post 2002

	(1)	(2)	(3)	(4)	(5)	(6)
	Per capita Real NSDP growth rate					
	All years			Excluding 2000		
Gujarat*Post2002	1.2	1.2	2.4	0.7	0.7	0.4
	(2.3)	(2.1)	(3.5)	(2.3)	(2.1)	(3.6)
Gujarat	1.3			1.8		
	(1.2)			(1.2)		
Post2002	3.8***			3.7***		
	(0.5)			(0.5)		
Constant	2.8***			2.9***		
	(0.3)			(0.3)		
State fixed effects	No	Yes	Yes	No	Yes	Yes
Year fixed effects	No	Yes	Yes	No	Yes	Yes
State-specific trends	No	No	Yes	No	No	Yes
Adj. R-sq	0.1	0.2	0.2	0.1	0.2	0.2
N	527	527	527	510	510	510



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# Interpreting the Results

- Without controlling for state or year fixed effects, average annual growth rate in rest of India in 1980-2002 period is 2.8 percentage points (coefficient on the constant  $\alpha$  from Eq. 1 above)
  - In Gujarat, over this same period, the average annual growth rate was an *additional* 1.3 percentage points (coefficient on Gujarat dummy in Eq. 1), but not statistically significant
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# Interpretation

- So from this analysis, we cannot reject the null that real per capita income in Gujarat was growing at the same rate as rest of India in 1980-2002
- Post 2002, rest of India grew at an *additional* average annual rate of 3.8 percentage points (coefficient on Post 2002 dummy in Eq.1) relative to pre 2002
  - So total average annual growth rate for rest of India is 6.6 percentage points in 2002-2011

# Interpretation

- Differential effect in Gujarat (relative to rest of India) post 2002 is 1.2 percentage points
  - Total average annual growth rate for Gujarat is 9.1 percentage points in 2002-2011
- But *not* statistically significant
- Cannot reject the null that Gujarat was growing at the same rate as rest of India in 2002-2011
  - Robust to controlling for state, year fixed effects, also state-specific linear trends (Col 2 and 3)

# Comparison with Bihar

- Is there a Bihar\*post 2005 (Nitish Kumar) Effect ?
- The interaction term Bihar\*post2005 is between 3-4.2 percentage points (much higher than Gujarat's 1-2 percentage points)
- With state trends and new method of clustering by state, it is highly statistically significant ( $p=0.00$ ).

# Table 3: Bihar vs Rest of India, Post 2005

	(1)	(2)	(3)
	Per capita real NSDP growth rate		
Bihar*Post2005	2.9	2.9	4.2
	(2.7)	(2.4)	(3.4)
Bihar	-1.6		
	(1.2)		
Post 2005	3.2***		
	(0.6)		
Constant	3.4***		
	(0.2)		
State fixed effects	No	Yes	Yes
Year fixed effects	No	Yes	Yes
State-specific trends	No	No	Yes
Adj. R-sq	0.1	0.2	0.2
N	527	527	527

# Table 4: Gujarat vs Rest of India, Post 2002 and Bihar vs Rest of India, Post 2005

	(1)	(2)	(3)
	Per capita real NSDP growth rate		
	All years	Excluding 2000	All years
Guj*Post2002	2.4	0.4	
	[p-val(CGL) =0.37]	[p-val(CGL) =0.36]	
Bihar*Post2005			4.2***
			[p-val(CGM)= 0.00]
State fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
State-specific trends	Yes	Yes	Yes
Adj. R-sq	0.20	0.19	0.20
N	527	510	527

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# Take Away Points

- Gujarat in Modi years (2002-2011) has grown at a *modest additional rate of 1-2 %-points* compared to the rest of India (in terms of per capita real net state domestic product), significantly less than the double-digit rates highlighted in popular press
  - More importantly, this additional impact is *not statistically significant*
  - Robust to clustering by state and year
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# Can Gujarat be Scaled Up to India?

- Inter-state heterogeneity makes extrapolating the Gujarat “experience” to all-India problematic
  - Something that worked for a relatively homogeneous population like Gujarat may not work for the significantly more diverse population of India, e.g. political environments for implementing various pro-growth policies may be very different across states
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# Scaling Up?

- The Modi effect on Gujarat's growth has been only an *additional* 1-2 percentage points
  - In theory it is possible he will make a massive difference to the national growth rate, but not on the basis of this evidence.
  - Bihar in comparison has better growth performance under Nitish Kumar, but the same scaling up point holds
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# Non Growth Indicators

- Under Modi, Gujarat's performance on social indicators and inequality considerations (like poverty reduction, education and inclusive growth for minorities and women) has received mixed reviews, compared to other states like Bihar that have performed substantially better (Bhalla, 2012)
  - Very little rigorous econometric evidence on this question – subject of future work
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# Bhuj Earthquake in 2000

- 2000-2001 was a particularly bad year for Gujarat - Bhuj earthquake Jan 2001
  - Growth rate for 2000 was significantly negative.
  - The comparison of the post 2002 period with pre 2002 period for Gujarat will tend to overestimate the impact.
  - Not taken care by year or state-specific trend
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# Bhuj Earthquake

- Re-run Equations 1-3 after excluding the year 2000
  - Results reported in columns 4-6 of Table 1.
  - The simple diff-in-diff coefficient is now substantially smaller at 0.7 percentage point (col 4), and with state-specific linear trends included, it further falls to 0.4
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# Robustness

- Same exercise looking at Gujarat and Maharashtra only, and Gujarat & MP only
  - Similar results – both magnitude, significance
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# Robustness, contd.

- Did an alternative exercise where instead of Gujarat post 2002 we did:
    - Maharashtra \* post 2002
    - MP \* post 2004 (Chauhan) Effect
  - Magnitude of interaction term lower than Gujarat\*post 2002, & insignificant for MP & Maharashtra
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# Bihar

- Clustering by state after correcting for small no. of states using *Cameron-Gellbach-Miller (CGL) in ReStat 2008* method
  - This makes the Bihar\*Post 2005 *highly significant* ( $p=0.00$ ) for col 3, not col 1 or 2
  - Not true for Gujarat for the same specification
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# Discussion

- Standard clustering at state level problematic due to small no. of clusters (N=17).
  - CGM propose a bootstrap methodology that corrects this issue.
  - Interaction term for Bihar is statistically significant at 1 percent level.
  - One potential cause for this could be negative intra-cluster correlation
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## Take away points, contd.

- Such statistical insignificance is robust to clustering of standard errors
    - When standard errors are clustered at the **year** level, results are unchanged
    - When standard errors are clustered at the **state** level using a technique that corrects for the number of clusters being small (in our case,  $N=17$ ), results are unchanged
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