What 31 provinces reveal about growth in China?
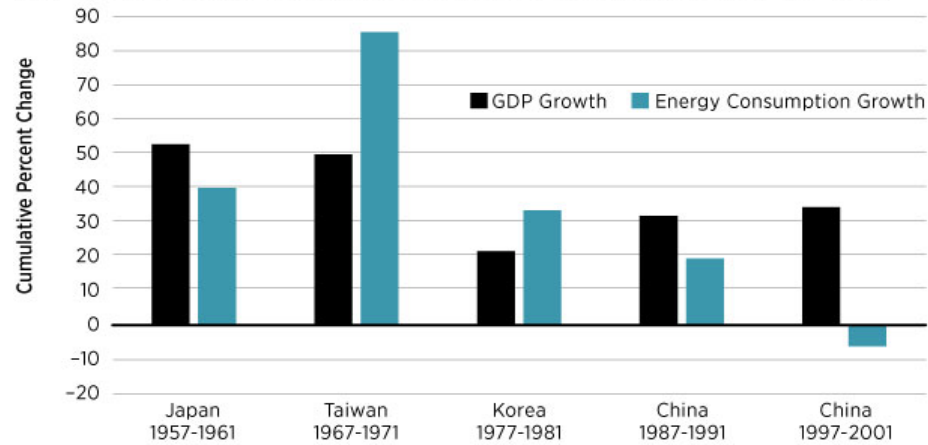
Eeva Kerola and Benoît Mojon

<u>Discussant:</u> Bertrand Candelon

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1- How good is Chinese GDP measured ? Truth or lie

Owyang and Shell (2017) Fed Saint- Louis

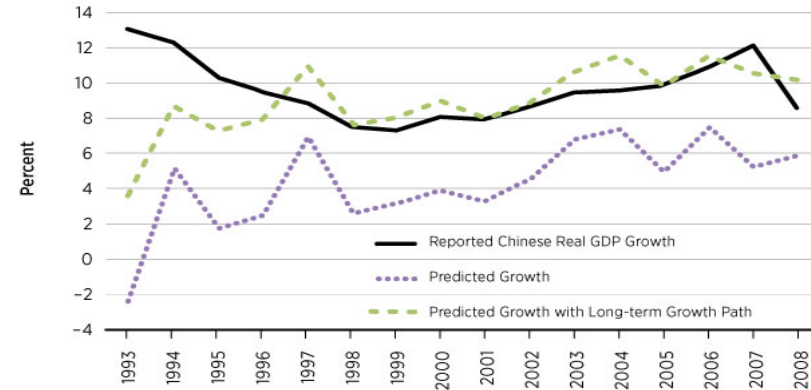Did China's Energy Use Contradict its GDP Growth from 1997 to 2001?

SOURCE: Rawski. See references.
NOTE: This chart compares official gross domestic product (GDP) growth with growth in energy consumption for China and other countries during different growth periods.

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GDP Growth Estimates Using Luminosity Data

SOURCE: Henderson, Storeygard and Weil. See references.
NOTE: The black line represents the official growth rate numbers provided by the Chinese government. The purple line is estimated GDP growth using data on light intensity at night gathered by U.S. Air Force satellites. The green line is estimated GDP growth using night lights data in conjunction with the country's long-term growth path. All are calculated using official data.

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Kerola and Mojon (2020) use of 11 quarterly data at the level of the 31 provinces
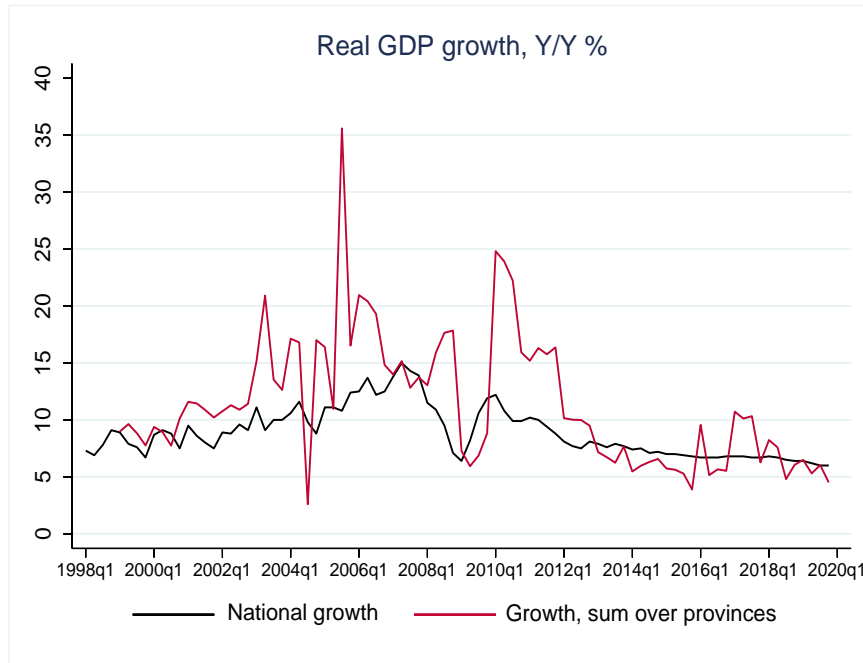
Is GDP subject to revision or definitive   (especially for 2018-2020 and COVID)
Why not mixed frequency data?
Why not electricity/energy consumption/road traffic (google index) data?

Panel and Static Principal Component

Variance explained by:	National nominal GDP	National real GDP
Provincial panel	0.606	0.350
Variable specific principal components	0.878	0.628
Full information principal components	0.893	0.681

Why not dynamic PC?

How many PC (Bai and Ng, 2013) ?

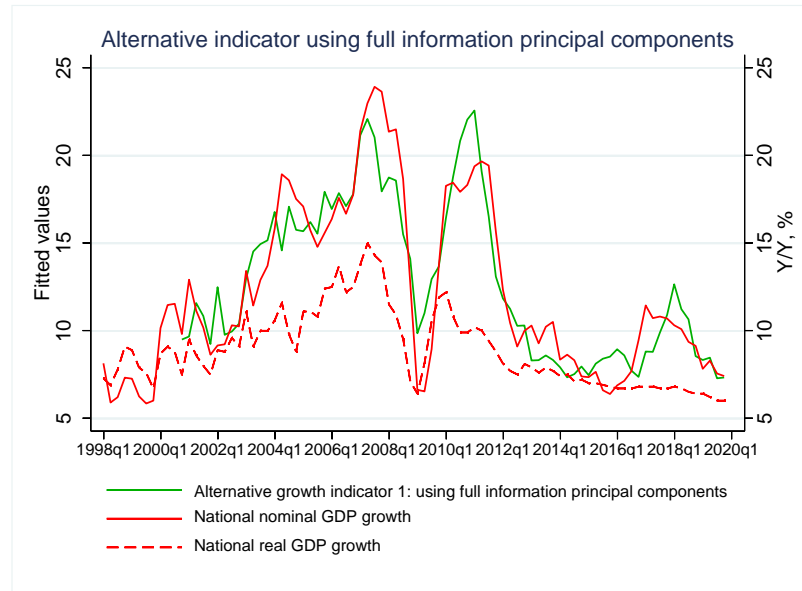What about the stability of the system? Time varying parameters? Not only 2010?

Heterogenous/Homogenous panel ? Which estimation strategy?

Could you propose a test to check which model is the best?

How is taken into account the spill-overs between provinces (Σ) and the cross-sectional dependence (in particular for model 3)

3- Results

There is a difference - Lie

Ex-Post comparison   - What about (in sample) forecast ?
- Nowcasting

Extensions: Regional heterogeneity : Is there a region which provide better leading information for GDP ?
Consequences for potential GDP – structural deficit, exchange rate overevaluation,…

4- Sources of Ggrowth

Granger-Causality in a panel framework

Importance of inflation, credit, investments, productivity and consumption

Provincial panel	Whole time span Overall R2 0.607, # obs: 2310				Variable specific principal components	Whole time span Overall R2 0.840, # obs: 77				Full information principal components	Whole time span Overall R2 0.849			
	Coeff	F-stat	Prob>F	Marginal R2		Coeff	F-stat	Prob>F	Marginal R2		Coeff	F-stat	Prob>F	Marginal R2
Inflation	-1.411	1331.35	0.000	0.228	pc(inflation)		43.83	0.000	0.170	Principal comp 6	-0.437	74.39	0.000	0.115
Credit	0.122	193.10	0.000	0.033	pc(credit)		15.55	0.000	0.025	Principal comp 3	0.486	73.58	0.000	0.267
Investments	0.076	116.70	0.000	0.020	pc(investments)		15.20	0.000	0.025	Principal comp 2	-0.197	26.52	0.000	0.062
Productivity	0.034	16.05	0.000	0.003	pc(consumption)		4.48	0.038	0.009	Principal comp 4	0.170	12.23	0.001	0.023
Consumption	-0.034	10.92	0.001	0.002	pc(productivity)		3.77	0.056	0.007	Principal comp 8	0.237	9.50	0.003	0.029
Gov't expend.	-0.016	3.22	0.073	0.001	pc(population)		2.71	0.105	0.008	Principal comp 5	-0.030	0.32	0.574	0.001
Population	-0.082	3.08	0.080	0.001	pc(gov't exp.)		2.01	0.161	0.004	Principal comp 1	-0.001	0.00	0.990	0.000
Urban empl.	0.006	0.19	0.663	0.000	pc(urban empl.)		0.59	0.447	0.002	Principal comp 7	-0.004	0.00	0.944	0.000
House prices	0.003	0.05	0.823	0.013	pc(house prices)		0.06	0.802	0.001					

Notes: Dependent variable nominal national GDP growth. All explanatory variables lagged by 4 quarters and sorted by their Prob>F-stat. Lagged dependent variable omitted from table.

Panel causality test (heterogenous panel) Dumitrescu and Hurlin (2012)
Granger-causality test with breaks.

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4- Sources of Growth

Figure 6: Correlation between provincial growth model and future aggregate growth, full time span

Role of agriculture/raw commodities
Countryside/rural area