Terms of Trade Booms and Busts and Inequality

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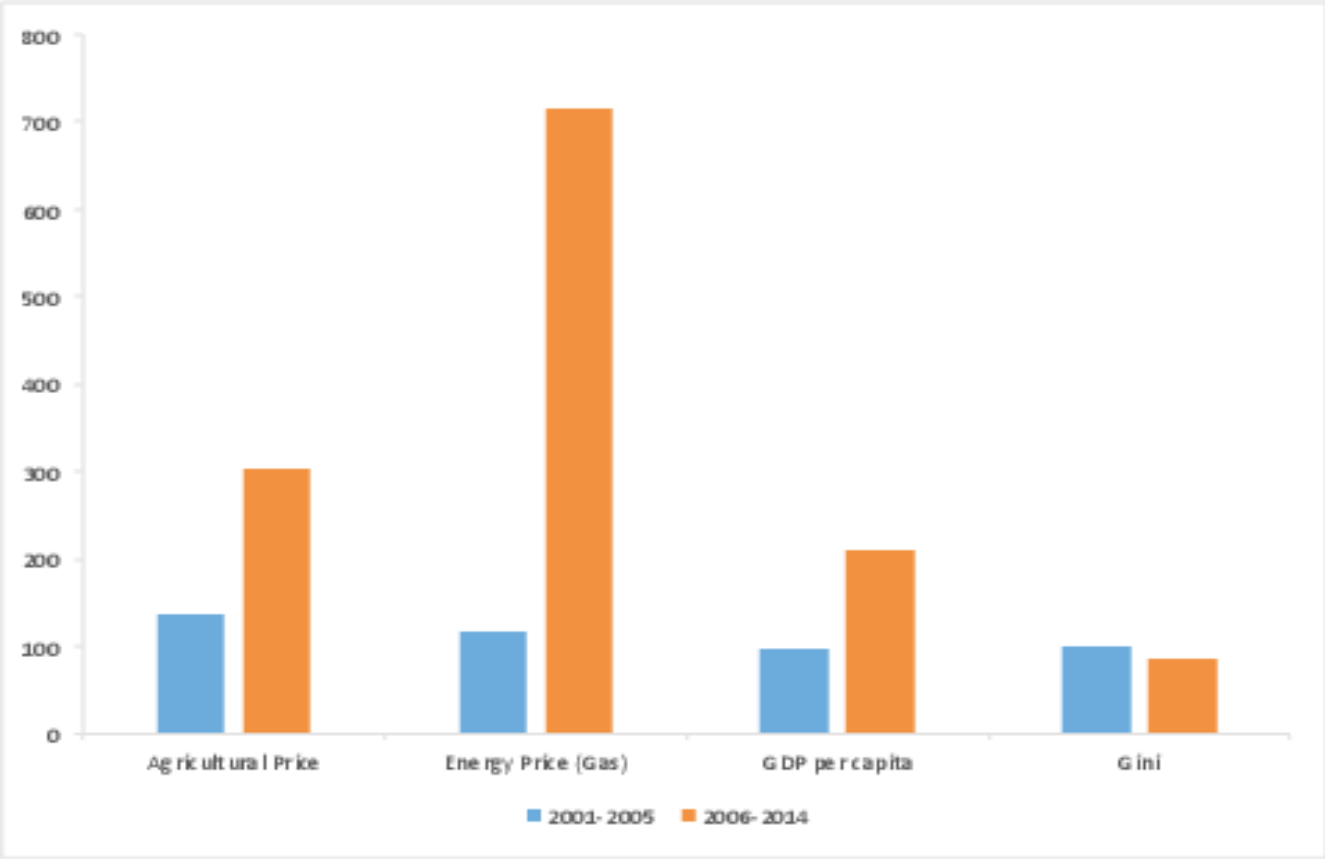
Preliminary

Motivation

- Between 2006 and 2014 energy prices soared.
- Also during this time agricultural commodity prices increased substantially.
- For many developing countries their exports are highly concentrated in the energy and agricultural sectors.
- Between 2006 and 2014 many developing countries experience an acceleration in their economic growth.
- At the same time, many of them saw inequality and poverty decrease.

Bolivia


800
700
600
500
400
300
200
100
0
Agricultural Price
Energy Price (Gas)
GDP per capita
Gini
2001-2005
2006-2014

Other Latin American countries

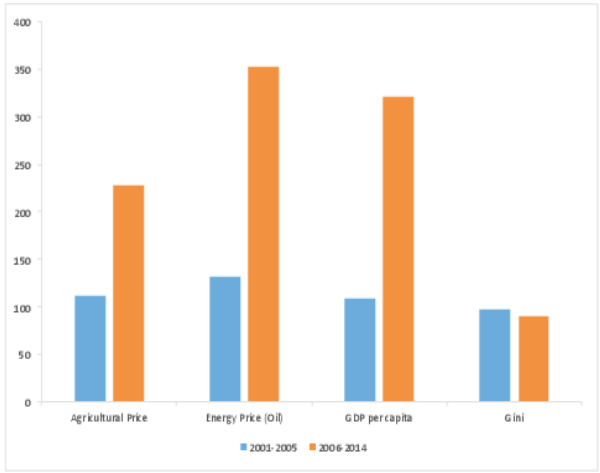


Figure: Brazil

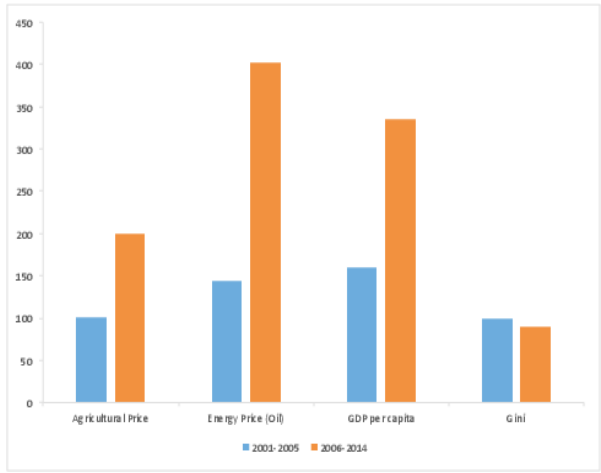


Figure: Ecuador

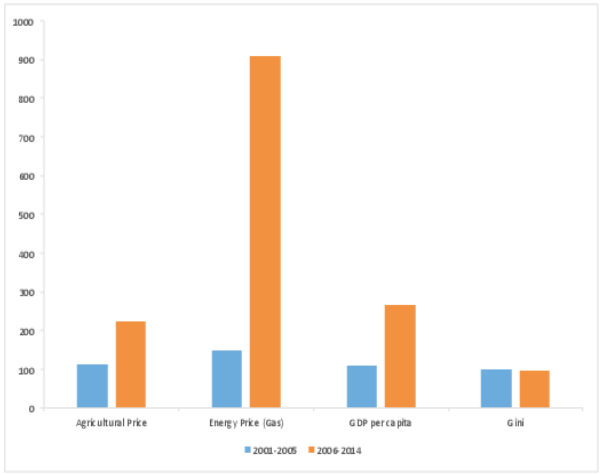


Figure: Colombia

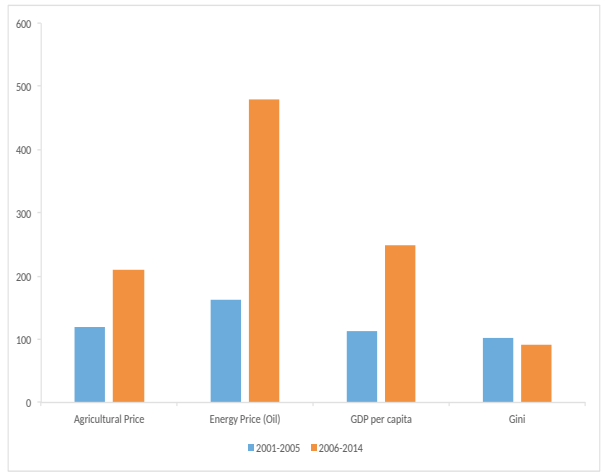


Figure: Peru

Main Questions

- How important is the role of the booms in international prices of energy and agricultural commodities in explaining the reductions in inequality and poverty in the countries that have experienced these booms?
- What is the expected impact of the bust of those prices in inequality and poverty reduction?

This paper

- Develops a multi-sector quantitative general equilibrium model with heterogeneous agents in each sector that incorporates the most salient features of low-income and developing economies (LIDCs).
- Calibrates the model using household-level survey data and macroeconomic data to Bolivia.
- Disentangles the impact in inequality and poverty of international changes in the price of agricultural an energy goods from the impact of government policies and others changes in the economy (migration and changes in skill level).
- Forecasts the impact of the commodity price bust in inequality and poverty.

LIDCs salient features

- Large inter-sectoral productivity gaps
- Wage employment scarce; prevalence of household enterprises
- Limited access to financial markets and welfare system
- Non-diversified export sector
- Limited access to financial markets and welfare system

Why are energy and agricultural international prices role important for LIDCs?

- The share of rural households in LIDCs is large. Households in these areas mainly produce agricultural goods (food).
- Food accounts for a large share of household expenditure in these countries.
- The share of the energy sector in GDP for LIDCs that are energy exporters is large.
- For energy exporters government revenues are highly sensitive to the energy sector developments.

Literature Review

- Terms of Trade Shocks
  - Food prices shocks: Adam (2011), Aksoy and Isik-Dikmelik (2008), Regmi et al. (2001), Rakotoarisoa, Iafrate, and Paschali (2011)
  - Schmitt-Grohe and Uribe (2015), Blattman et al. (2007), Kose and Riezman (2001), Mendoza (1995, 1997), Barro and Sala-i-Marti (1995), Easterly et al. (1993)
- Structural Transformation
  - Adamopoulos and Restuccia (2011), Caselli (2005),
- Heterogenous Agent Models
  - Ayiagari (1994), Krussel and Smith (1998)

Model Structure

- Four Productive Sectors:
  1. Agriculture
  2. Manufacturing
  3. Services
  4. Energy

- Three types of households:
  1. Rural Households
  2. Urban Workers
  3. Entrepreneurs

- Open small economy
  1. Imported goods: Food; manufacturing; agricultural inputs
  2. Exported goods: Process food; manufacturing; energy

- Incomplete asset market model
  1. Aggregate shocks
  2. Idiosyncratic shocks

Model

- Agents in all sectors maximize expected discount utility over the consumption of four goods:
  1. Food (domestic produced c^a and imported c^*)
  2. Tradable goods (manufacturing) c^T
  3. Non-tradable goods (services) c^N
  4. Energy goods c^E
- Agents in all sectors can save and borrow at a risk-free interest rate
- Farms produce food
- Urban workers decide how much to work in:
  1. Formal sector production(manufacturing and services produced by firms) or government
  2. Household enterprises (producing services with a decreasing returns to scale technology)
- Entrepreneurs decide how many tradable, non-tradable, energy and agricultural exports to produce

Model: Entrepreneurs

$$\max E_0 \sum_{t=0}^{\infty} \beta^t u(c_t^{ent,f}, c_t^{ent,o}, c_t^{ent,E})$$

$s.t.$

$$c^{ent,f} = \Omega^f(c^{ent,a}, c^{ent,*}); \qquad c^{ent,o} = \Omega^o(c^{ent,T}, c^{ent,N})$$

$$p^c c^{ent} = (1+\tau^a)p^{a,d}c^{ent,a} + (1+\tau^*)p^* c^{ent,*} + (1+\tau^T)c^{ent,T} + (1+\tau^N)p^N c^{ent,N} + (1+\tau^E)p^{E,d}c^{ent,E}$$

$$p^c c^{ent} + I = \pi^T + \pi^N + \pi^E + \pi^r - T^{ent}(\pi^T, \pi^N, \pi^E, \pi^r)$$

$$K_{+1} = I + (1-\delta)K$$

$$K = K^T + K^N + K^E$$

$$\pi^T = (1-\tau^k)\left[z^T F^T(K^T, L^T, E^T) - wL^T - (1+\tau^E)p^{E,d}E^T\right],$$

$$\pi^N = (1-\tau^k)\left[p^N z^N F^N(K^N, L^N, E^N) - wL^N - (1+\tau^E)p^{E,d}E^N\right],$$

$$\pi^E = (1-\tau^{YE})p^E z^{YE} F^E(K^E),$$

$$\pi^r = (1-\tau^r)p^r z^r F^r(L^r, M) - wL^r - (1+\tau^a)p^a M$$

Model: Private Sector Workers-Low Skill

$$\max \mathbb{E}_0 \sum_t \beta^t u(c^{H1,f}, c_t^{H1,o}, c_t^{H1,E})$$

subject to

$$c^{H1,f} = \Omega^f(c^{H1,a}, c^{H1,*}); \qquad c^{H1,o} = \Omega^o(c^{H1,T}, c^{H1,N})$$

$$p^c c^{H1} = (1+\tau^a)p^{a,d}c^{H1,a} + (1+\tau^*)p^* c^{H1,*} + (1+\tau^T)c^{H1,T} + (1+\tau^N)p^N c^{H1,N} + (1+\tau^E)p^{E,d}c^{H1,E}$$

$$p^c c^{H1} + b_{+1}^{H1} = (1+R)b^{H1} + s^{H1} w \vartheta^{H1} h^{H1} + p^N Y^{H1,N} - T^{H1}(wh^{H1}, p^N Y^{H1,N})$$

$$Y^{H1,N} = z^u F^u[\vartheta^{H1}(1-h^{H1})]$$

$$b_{+1}^{H1} \geq B^{H1}$$

$$s^{H1} = \rho^{H1} s_{-1}^{H1} + \epsilon^{H1}; \qquad \epsilon^{H1} \sim N(0, (\sigma^{H1})^2)$$

Model: Private Sector Workers-High Skill

$$\max \mathbb{E}_0 \sum_t \beta^t u(c^{H2,f}, c_t^{H2,o}, c_t^{H2,E})$$

subject to

$$c^{H2,f} = \Omega^f(c^{H2,a}, c^{H2,*}); \qquad c^{H2,o} = \Omega^o(c^{H2,T}, c^{H2,N})$$

$$p^c c^{H2} = (1+\tau^a)p^{a,d}c^{H2,a} + (1+\tau^*)p^* c^{H2,*} + (1+\tau^T)c^{H2,T} + (1+\tau^N)p^N c^{H2,N} + (1+\tau^E)p^{E,d}c^{H2,E}$$

$$p^c c^{H2} + b_{+1}^{H2} = (1+R)b^{H2} + s^{H2} w \vartheta^{H2} h^{H2} + p^N Y^{H2,N} - T^{H2}(wh^{H2}, p^N Y^{H2,N})$$

$$Y^{H2,N} = z^u F^u[\vartheta^{H2}(1-h^{H2})]$$

$$b_{+1}^{H2} \geq B^{H2}$$

$$s^{H2} = \rho^{H2} s_{-1}^{H2} + \epsilon^{H2}; \qquad \epsilon^{H2} \sim N(0, (\sigma^{H2})^2)$$

Model: Government Workers

$$\max \mathbb{E}_0 \sum_t \beta^t u(c^{HG,f}, c_t^{HG,o}, c_t^{HG,E})$$

subject to

$$c^{HG,f} = \Omega^f(c^{HG,a}, c^{HG,*}); \qquad c^{HG,o} = \Omega^o(c^{HG,T}, c^{HG,N})$$

$$p^c c^{HG} = (1+\tau^a)p^{a,d}c^{HG,a} + (1+\tau^*)p^* c^{HG,*} + (1+\tau^T)c^{HG,T} + (1+\tau^N)p^N c^{HG,N} + (1+\tau^E)p^{E,d}c^{HG,E}$$

$$p^c c^{HG} + b_{+1}^{HG} = (1+R)b^{HG} + s^{HG}w^G h^{HG} + p^N Y^{HG,N} - T^{HG}(w^G h^{HG}, p^N Y^{HG,N})$$

$$Y^{HG,N} = z^u F^u(1-h^{HG})$$

$$h^{HG} \leq \overline{l^g}$$

$$b_{+1}^{HG} \geq B^{HG}$$

$$s^{HG} = \rho^{HG} s_{-1}^{HG} + \epsilon^{HG}; \qquad \epsilon^{HG} \sim N(0, (\sigma^{HG})^2)$$

Model: Farmers

$$\max \mathbb{E}_0 \sum_t \beta^t u(c^{A,f}, c^{A,o}, c_t^{A,E})$$

subject to

$$c^{A,f} = \Omega^f(c^{A,a}, c^{A,*}); \qquad c^{A,o} = \Omega^o(c^{A,T}, c^{A,N})$$

$$p^c c^A = (1+\tau^a)p^{a,d}c^{A,a} + (1+\tau^*)p^* c^{A,*} + (1+\tau^T)c^{A,T} + (1+\tau^N)p^N c^{A,N} + (1+\tau^E)p^{E,d}c^{A,E}$$

$$p^c c^A + b_{+1}^A = (1+R)b^A + p^a Y^{A,a} - (1+\tau^{xa})p^{xa}X^{A,a} - T^A(p^a Y^{A,a})$$

$$Y^{A,a} = s^A z^a F^a(\overline{Q^A}, X^{A,a})$$

$$b_{+1}^A \geq B^A$$

$$s^A = \rho^A s_{-1}^A + \epsilon^A; \qquad \epsilon^A \sim N(0, (\sigma^A)^2)$$

Model: Government

$$w^G L^G + I^G + \Lambda + B^G_{+1} = \Upsilon + T + (1 + r^*)B^G + p^N Y^{G,N}$$

$$K^G_{+1} = \eta I^G + (1 - \delta^G)K^G; \qquad 0 \geq \xi \geq 1$$

$$\Upsilon = \tau^a p^{a,d} C^a + \tau^* p^* C^* + \tau^T C^T + \tau^N p^N C^N + \tau^E p^{E,d} C^E$$
$$+ \tau^w (wL + w^G L^G) + \tau^k \Pi + \tau^r p^r Y^r + \tau^{YE} p^E Y^E$$

$$\Lambda = \zeta^a p^a C^a + \zeta^E p^E (C^E + E^T + E^N)$$

$$T = T^{ent}(\pi^T, \pi^N, \pi^E, \pi^r) + T^H(wh, p^N Y^{H,N})$$
$$+ T^{HG}(w^G h^{HG}, p^N Y^{HG,N}) + T^A(p^a Y^{A,a})$$

$$p^{a,d} = (1 - \zeta^a)p^a \qquad \text{if} \qquad p^a \geq \overline{p^a}$$

$$p^{E,d} = (1 - \zeta^E)p^E \qquad \text{if} \qquad p^E \geq \overline{p^E}$$

Equilibrium

An equilibrium for this economy is a vector of allocations of consumption, investment, time use and bond holding for farmers, urban workers, and entrepreneurs, together with prices $\{p^a, p^N, w, R\}$. Such that given the international interest rates $\{r^*\}$, the price of imported food $\{p^*\}$, public employment limits $\overline{l^g}$ and government wage $\{w^g\}$, a sequence of sectorial productivity shocks, and predetermined tax/transfers functions $\{T^F, T^{H1}, T^{H2}, T^{HG}, T^A\}$, the vector of allocations of consumption, investment, time use and bond holding for farmers, urban workers, and entrepreneurs, together with prices $\{p^a, p^N, w, R\}$, solves the agents optimization problem and market clear.

Equilibrium (cont)

- Labor Markets

$$L^G = \mu^{HG} \int h^{HG} \Gamma(s^{HG}, B^{HG})$$

$$L = L^T + L^N + L^r = \mu^{H1} \int \vartheta^{H1} h^{H1} \Gamma(s^{H1}, B^{H1})$$

$$+ \mu^{H2} \int \vartheta^{H2} h^{H2} \Gamma(s^{H2}, B^{H2})$$

- Food Market

$$C^a + M = \mu^A Y^{A,a}$$

Equilibrium (cont)

- Non-Tradable Market

$$C^N + I^{G,N} = \mu^{ent} z^N F^N(K^N, L^N, E^N) + \mu^{H1} \int Y^{H1,N} \Gamma(s^{H1}, B^{H1})$$
$$+ \mu^{H2} \int Y^{H2,N} \Gamma(s^{H2}, B^{H2}) + \mu^{HG} \int Y^{HG,N} \Gamma(s^{HG}, B^{HG})$$

Equilibrium (cont)

- Trade Balance

$$z^T F^T(K^T, L^T, E^T) + p^r z^r F^r(L^r, M) + p^E z^{YE} F^E(K^E)$$
$$= p^* C^* + C^T + p^E(C^E + E^T + E^N) + p^{xa} X^{A,a}$$

Model Sources of Heterogeneity/Distribution

- Occupational: firms owners, wage-employed (private and public), self-employed.
- Sectoral: agricultural, resource, other.
- Earnings: workers and household enterprises have heterogeneous productivity.
- Income: productivity shock history generates a distribution of wealth $\rightarrow$ financial income.

Frictions and Restricted Model Channels

- There is no movement out of agriculture.
- Good produced by public employees plays no role in economy.
- Segmented asset markets (households access bonds, firms – capital).
- Equal depreciation rates of all capital stocks.

Quantitative Analysis: Methodology

- Steady-state comparisons: Define three different periods
  - Steady-state 1: Pre-boom period
  - Steady-state 2: Boom period
  - Steady-state 3: Bust period
- Calibration of the model to pre-boom period
- Compute steady-state 2 to quantify the impact of the boom, feed the model with changes in:
  - international prices of agricultural and energy exports
  - policy shocks (changes in effective tax rates, price controls, subsidies, transfers, etc.)
  - demographic shocks (changes in skill level, changes in rural and urban shares of population)
- Compute steady-state 3 to forecast the impact of the bust, feed the model with changes in
  - international prices of agricultural and energy exports
  - possible policy responses.

Quantitative Analysis: Specification

- Use a specific version of the model: productivity shocks s^{H1}, s^{H2}, s^{HG} and s^{A} symmetric, and types permanent.

- Functional forms:

$$c^{\cdot,f} = \Omega^f(c^{\cdot,a}, c^{\cdot,*}) = (\lambda^f (c^{\cdot,a})^{\rho^f} + (1-\lambda^f)(c^{\cdot,*})^{\rho^f})^{\frac{1}{\rho^f}}$$

$$c^{\cdot,o} = \Omega^o(c^{\cdot,T}, c^{\cdot,,N}) = (\lambda^o (c^{\cdot,T})^{\rho^o} + (1-\lambda^o)(c^{\cdot,N})^{\rho^o})^{\frac{1}{\rho^o}}$$

$$u(c^{\cdot,f}, c^{\cdot,o}, c^{\cdot,E}) = \mu^f \frac{(c^{\cdot,f} - \overline{c^f})^\sigma}{1-\sigma} + \mu^o \frac{(c^{\cdot,o})^\sigma}{1-\sigma} + \mu^E \frac{(c^{\cdot,E})^\sigma}{1-\sigma}$$

$$F^T(\cdot) = [(K^T)^\epsilon (z^E E^T)^{1-\epsilon}]^{\alpha^T} (H^T)^{1-\alpha^T}$$

$$F^N(\cdot) = [(K^N)^\epsilon (z^E E^N)^{1-\epsilon}]^{\alpha^N} (H^N)^{1-\alpha^N}$$

$$F^E(\cdot) = (K^E)^{\alpha^E}$$

$$F^r(\cdot) = (M)^{\alpha^r} (H^r)^{1-\alpha^r}$$

$$F^u(\cdot) = [\vartheta(1-h)]^\xi$$

$$F^a(\cdot) = (\overline{Q^A})^{\gamma^a} (X^{A,a})^{1-\gamma^a}$$

Data

- Country application: Bolivia
  - 2006-14 Gini coefficient fell an average of 1.10 points per year.
  - 2000-05 Gini coefficient fell an average of 0.76 points per year.
  - 2006-14 Poverty head-Count fell an average of 2.6 p.p per year.
  - 2000-05 Poverty head-Count fell an average of 0.7 p.p per year.

- Bolivia Household Survey Data (Encuesta de Hogares Boliviana): 2005-2013. INE, World Bank.

- Bolivia's macroeconomic variables: GDP by expenditure and by sector. INE, IMF

- Other information: skill levels, rural-urban population, employment shares, government tax revenues and expenditures. SEDLAC, Lustig (2014), World Bank, IMF, Udape.

Parameterization

Parameter	Value	Target
Discount factor β	0.95	Period = 1 year
RRA coeficient σ	1	Standard range
Elast. of substitution, domestic and imported ρ^f	-0.0001	Cobb-Douglas
Elast. of substitution, tradable and non-tradable ρ^o	-0.0001	Cobb-Douglas
Weight of food in utility μ^f	0.405	CPI weight food 0.39
Share of domestic food in utility λ^f	0.7425	CPI weight imported food 0.09
Weight of energy in utility μ^E	0.06	CPI weight energy 0.07
Farmers' production function γ^a	0.49	Literature estimates
Agricultural land size ratio $\frac{Q^{A,Rich}}{Q^{A,Poor}}$	12	Literature estimates
Agricultural exports fn. labor share α^r	0.49	Literature estimates
Household enterprise prod. fn. ξ	0.6	Informal sector employment 0.6
Tradable production fn. labor share $1-\alpha^N$	0.66	Standard range
Tradable production fn. labor share $1-\alpha^T$	0.56	Literature estimates
Energy production fn. capital share α^E	0.325	Standard range
Production share of government capital γ^K	0.17	Literature estimates
Public investment efficiency η	0.7	PIMI Index
Private capital depreciation rate δ	0.055	Colombia estimates
K^G depreciation rate δ^G	0.055	

Parameterization (cont)

Parameter	Value	Target
Imported food price p^*	1.25	
Imported agricultural input price p^{xa}	1	
Export/agricultural price p^r	1.07	
Export/energy price p^E	1.11	
Food price ceiling $p^{a,d}$	1.1x p^a_{SS1}	
Export/energy price p^E	1.11	
Energy price ceiling $p^{E,d}$	1.1x p^E_{SS1}	
Borrowing limit, wage-earners B^H		1x annual income
Borrowing limit, agriculture hh. ent. B^A		1x annual income
Pop. share agriculture μ^A	0.375	Population data, WB
Pop. share wage earners μ^{H1}	0.3185	Skills data, SEDLAC
Pop. share wage earners μ^{H2}	0.1895	Skills data, SEDLAC
Pop. share wage earners μ^{HG}	0.067	Employment data, Udape
Wage ratio high/low skill $\frac{\vartheta^{H2}}{\vartheta^{H1}}$	3.97	Employment data, Udape

- Productivity states: $s^i = (0.4, 1, 1.6)$ with transition matrix resembling the data's.

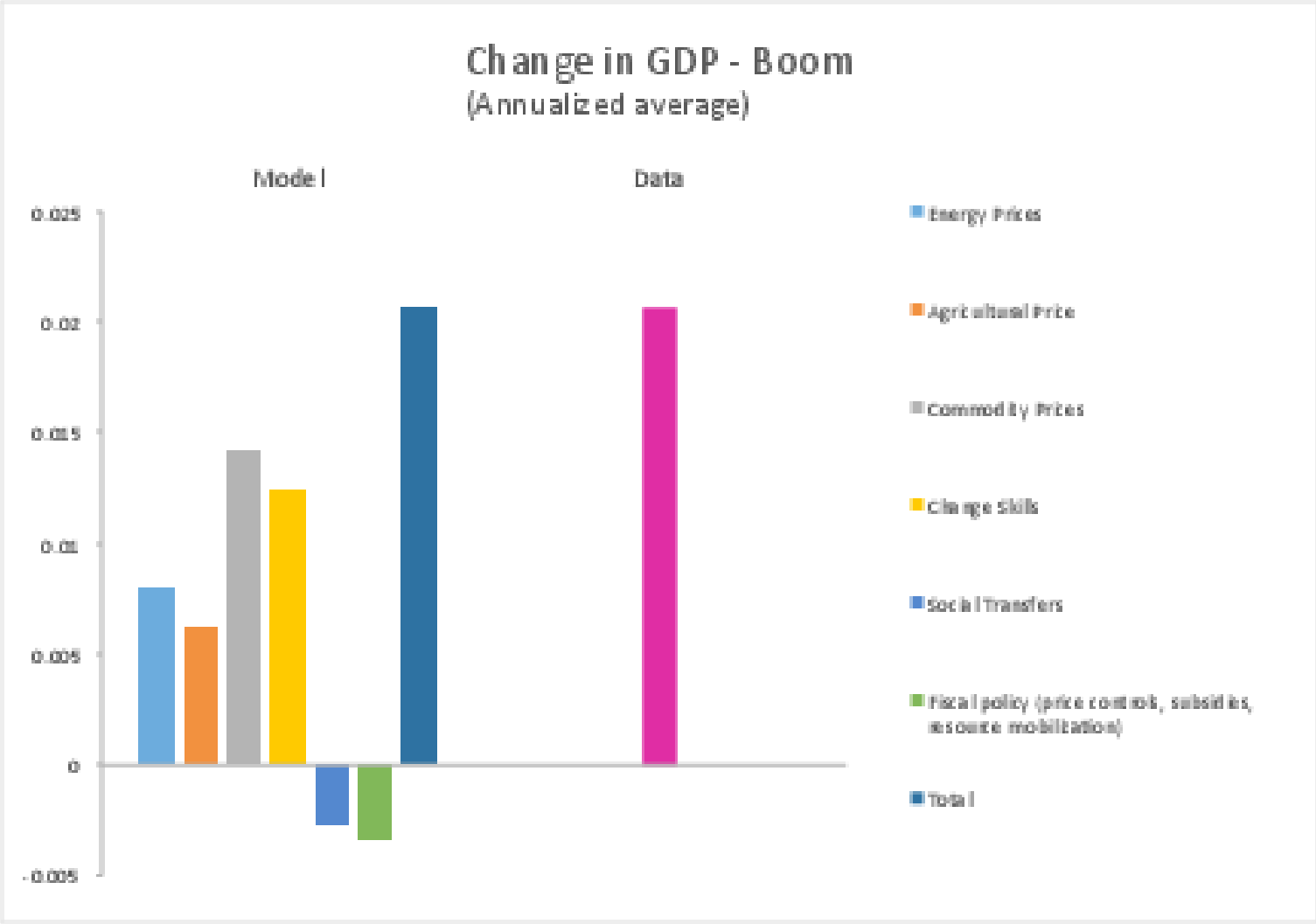
S. S. Comparison: Calibration

	2000-2005 Data	2000-2005 Model	2006-2014 Data	2006-2014 Model
Sectors Shares in GDP				
Share Agriculture	15.86	16.16	14.38	18.18
Share Energy	12.90	13.84	15.71	17.35
Share Manufacturing	18.15	16.80	18.73	18.46
Share Services	53.07	53.20	51.18	45.98
GDP by Expenditures				
Private Consumption	73.74	72.86.03	71.02	72.12
Public Consumption	11.55	12.00	11.19	11.00
Private Investment	8.96	9.28	8.18	7.42
Public Investment	5.47	5.86	9.61	9.46

S. S. Comparison: Calibration(cont.)

	2000-2005 Data	12000-2005 Model	2010-2014 Data	2010-2014 Model
Exports Sectors/ GDP				
Total Exports	25.65	27.39	32.76	26.77
Agricultural Exports	3.84	4.73	3.44	5.09
Energy Exports	17.87	13.48	28.03	17.61
Taxes as share of GDP				
Total Taxes	21.80	21.89	29.70	30.31
Direct Taxes	3.81	3.80	5.10	5.76
Of which: Corporate Tax	2.30	2.23	4.35	4.19
Indirect Taxes	2.30	2.23	4.35	4.19
Of which: VAT	6.51	6.54	7.92	8.91
Royalties	4.65	4.84	9.29	8.85
Public Sector: Other				
Public Wage Bill/GDP	8.80	8.51	9.50	8.82
Social Transfers/GDP	0.00	0.00	2.11	2.06

S.S Comparisons: Change in GDP - Boom



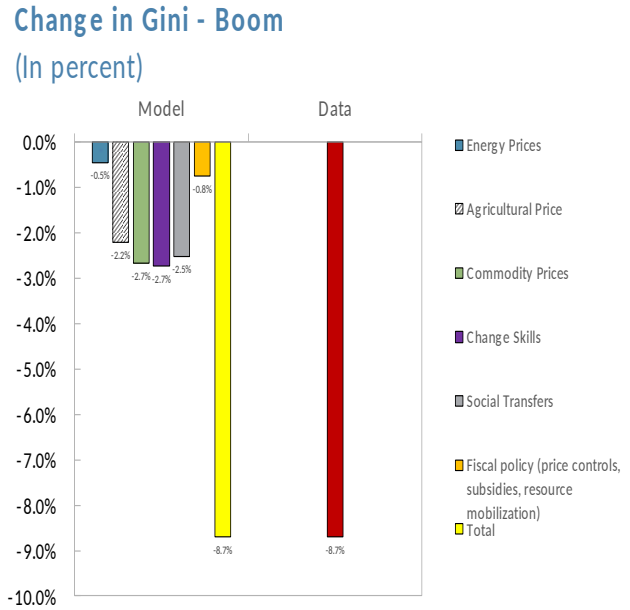
GDP - Boom

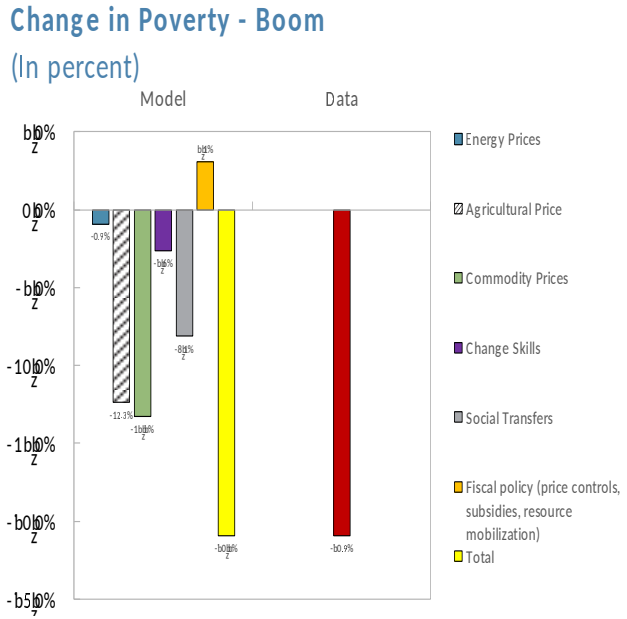
- Energy prices
  - Increase profitability of energy sector.
  - $\uparrow MP_{K^E}$ in energy sector $\rightarrow$ increases K^E: higher demand from entrepreneurs ($\uparrow c^{ent}$,$\uparrow I^E$) as consequence $\uparrow p^N$.
  - More household enterprises and entrepreneurs production of non-tradable goods.
  - higher $p^{E,d}$ increases production costs of tradable and non-tradable sectors: ($\downarrow I^T$,$\downarrow I^N$,$\downarrow w$).
  - more royalties (i.e. $\uparrow \tau^{YE} p^E Y^E$) increase K^G which increases economic sectors' TFPs (i.e. $\uparrow z^a, z^T, z^N, z^r, Z^{YE}, z^u$.
- Agricultural prices
  - Increase profitability of agricultural exports sector
  - $\uparrow MP_M$ in the agricultural exports sector $\rightarrow$ increases M: higher demand from entrepreneurs $\uparrow p^a, p^{a,d}$.
  - More agricultural production and higher incomes for farmers.

GDP - Boom (cont.)

- Rural to Urban Migration
  - Increases urban labor supply allowing an increase in production of tradable, non-tradable goods, and agricultural exports.
  - Because those productions have larger sector-wide productivity per worker than agriculture, the GDP grows.
  - Higher GDP implies more tax revenues that translate in more infrastructure investment.
- Higher labor force skill level
  - Increases labor marginal productivity, and with it the profitability of the tradable, non-tradable, and agricultural exports.
  - Production levels on those sectors increases → GDP grows

S.S Comparisons: Poverty and Distribution - Boom





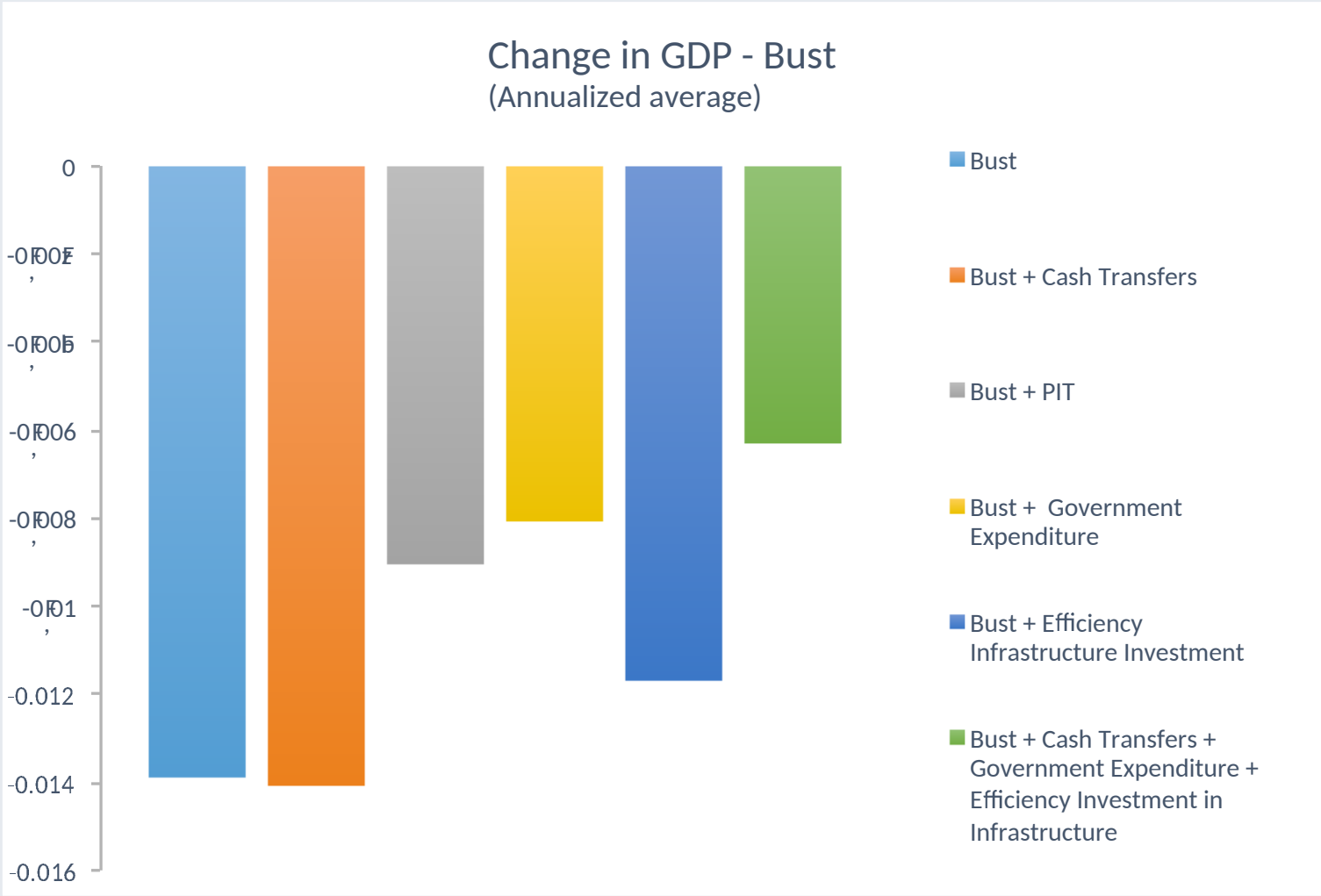
Inequality and Poverty - Boom

- Energy prices
  - Impact on entrepreneur incomes: ambigous (higher profits in energy sector lower profits in tradable and non-tradable sectors)
  - Impact in urban workers: average wage falls → reducing intersectoral inequality
  - Impact in urban workers: revenue from household enterprises increases reducing intrasectoral inequality
  - More infrastructure investment: depending on recipient sectors impact migh differ
  - Poverty falls because of higher income for informal sector households and higher growth
- Agricultural prices
  - Impact on farmers'income: higher farmers' income reduces intersectoral inequality
  - Poverty falls: most poor households are in the rural sector

Inequality and Poverty - Boom (cont.)

- Rural to Urban Migration
  - Reduces intersectoral inequality
  - Reduces poverty: most poor households are in the rural sector
- Higher labor force skill level
  - Reduces skill premium reducing intra sectoral inequality
  - Reduces size of informal sector reducing intra sectoral inequality

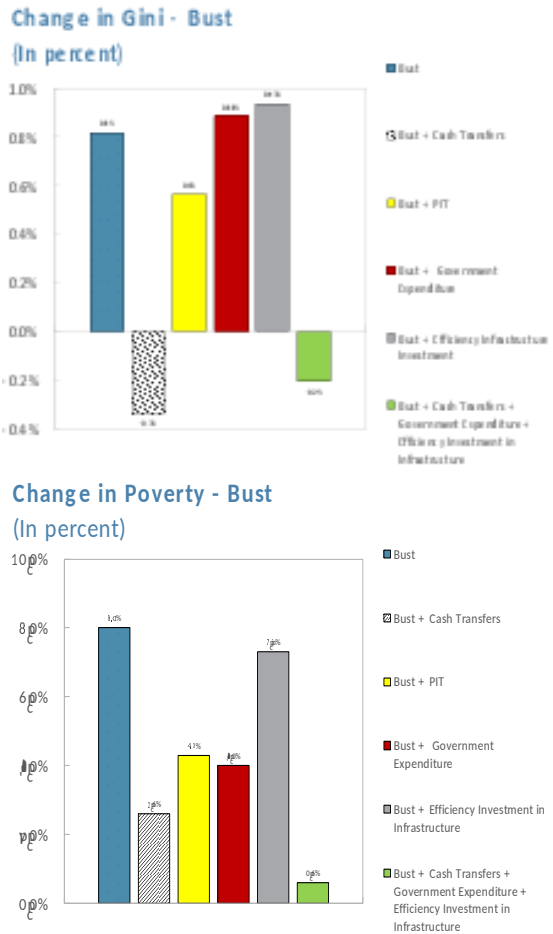
S.S Comparisons: Change in GDP - Bust



GDP - Bust

- Analogous forces to the ones observed during the boom are at play
- Impact is not symmetric because neither changes in rural-urban population or skills are considered in this excersice
- Fiscal consolidation on its own is costly
- Using fiscal space generated by the fiscal consolidation to mantain investment in infrastructure allows to mitigate the impact of the bust. In Bolivia
  - Can reduce the impact of the bust on the GDP (over the long-term) by at least 5 p.p
  - If combined with increase efficiency of public investment the reduction in such impact could be as large as 8p.p

S.S Comparisons: Poverty and Distribution - Bust



Inequality and Poverty - Bust

- Better targeting of social transfers program is a extremely powerful tool to mitigate distributional impact of the bust. In Bolivia:
  - Could reduce Gini coefficient by 1 points w.r.t. to the one that would be observed without changing the targeting
  - Could reduce poverty headcount by 5 p.p w.r.t. to the one that would be observed without changing the targeting

Conclusions

- Terms of trade booms and busts seem to have a predominant role in explaining GDP changes: in Bolivia approx. 2/3 of GDP increases can be attributed to the increase in commodity prices (energy and agriculture)

- Terms of trade booms and bust also are important in explaining changes in inequality and poverty: in Bolivia approx 30% of the fall in inequality between 2006 and 2014, and approx. 60% of the fall in poverty can be attributed to this factor

- Rural-to-urban migration (structural transformation), changes in skill level of the labor force and fiscal policy are also important elements to determine the final economic outcome: In Bolivia
  - Changes in the skill level of the labor force have an impact of similar magnitude to the one of the terms of trade in explaining the observed GDP expansion and the fall in inequality (not as much in poverty reduction)
  - Fiscal policy plays an important role in reducing inequality and poverty but can generate efficiency trade-offs in terms of GDP expansion