Growth and Distribution

Theory and recent Brazilian Experience

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FOUR TOPICS

1. **Growth and Distribution from a Structuralist theoretical perspective**
2. Fiscal policy and the personal distribution of income (theory and evidence from Brazil)
3. Recent evolution and perspectives for the Brazilian economy
4. Real exchange rate, economic growth and real-wage growth in Brazil

Growth and Distribution

- Growth and distribution were two key topics in classical political economy (capital accumulation and the rate of profit)
- But in neoclassical theory income distribution became a non-issue on the assumption that factor prices equal their marginal productivities
- The classical tradition has been developed by heterodox economists (post-Keynesians, Sraffians, structuralists, etc)
- And more recently even mainstream economists have been emphasizing the relationship between economic growth and income inequality (for the US, check: www.inequality.org)

The basic Structuralist model

The usual structuralist one-sector "flow" model analyses the evolution of five state variables

- The price level: $P = M(W/\xi)$
- The wageshare of income: $\psi = (W/P)/\xi = \omega/\xi$
- The employment rate: $\lambda = L/N$
- The income-capital ratio (capacity): $u = Y/K$
- The investment income ratio (saving): $s = I/Y$

Starting from accounting identities (macroeconomic fundamentals), there are many ways to "close" the system of equations

Accounting Identities

Inflation: $\hat{P} = \hat{M} + \hat{W} - \hat{\xi}$

Economic growth: $\hat{Y} = s\hat{I} + (1-s)\hat{A}$

Capital growth: $\hat{K} = su - \delta$

Labor-productivity growth: $\hat{\xi} = \hat{Y} - \hat{L}$

Wageshare dynamics: $\dot{\psi} = \psi\left(\hat{W} - \hat{P} - \hat{\xi}\right) = \psi(\hat{\omega} - \hat{\xi})$

Employment dynamics: $\dot{\lambda} = \lambda\left(\hat{L} - \hat{N}\right) = \lambda(\hat{Y} - \hat{\xi} - \hat{N})$

Capacity dynamics: $\dot{u} = \lambda\left(\hat{Y} - \hat{K}\right) = \lambda(\hat{Y} - su + \delta)$

Saving-rate dynamics: $\dot{s} = s(1-s)(\hat{I} - \hat{A})$

Theoretical Assumptions

The rate of capital depreciation (δ) and the growth rate of population ($\widehat{N}$) are usually exogenous variables. So, to close the system, we need to specify five functions:

1. The growth rate of markup: $\widehat{M}$
2. Wage inflation: $\widehat{W}$
3. Labor-productivity growth: $\hat{\xi}$
4. The growth rate of investment: $\hat{I}$
5. The growth rate of non-investment expenditure: $\hat{A}$

Steady State and Alternative Closures

The steady-state conditions and some additional usual assumptions can be used to describe alternative visions (closures) of how the economy works

1. Stable wageshare: $\widehat{\omega} = \hat{\xi}$
2. Stable employment rate: $\widehat{Y} = \hat{\xi} + \widehat{N}$
3. Stable capacity utilization: $\widehat{Y} = su - \delta$
4. Stable saving rate: $\hat{I} = \hat{A}$
5. Rate of profit: $r = (1 - \psi)u$
6. Wage curve: $\psi = \psi(\lambda)$

What About Growth Accounting?

The usual growth accounting used in mainstream theory can be obtained from the factor decomposition of income

$$Y = \omega L + rK$$

$$\hat{Y} = \psi\left(\hat{\omega} + \hat{L}\right) + (1 - \psi)(\hat{r} + \hat{K})$$

$$\hat{Y} = [\psi\hat{\omega} + (1 - \psi)\hat{r}] + \psi\hat{L} + (1 - \psi)\hat{K}$$

$$\hat{Y} = \hat{\mu} + \psi\hat{L} + (1 - \psi)\hat{K}$$

And the growth rate of multi-factor productivity (μ) comes residually from the change in the real wage, or labor productivity, because the rate of profit is also stable in the long run

The Kalecki-Goodwin model

Consider only the wageshare and capacity utilization

$$\dot{\psi} = \psi\left(\hat{\omega} - \hat{\xi}\right)$$

$$\dot{u} = \lambda(\hat{Y} - su + \delta)$$

$$\hat{\omega} = \omega_0 + \omega_\psi \psi + \omega_u u$$

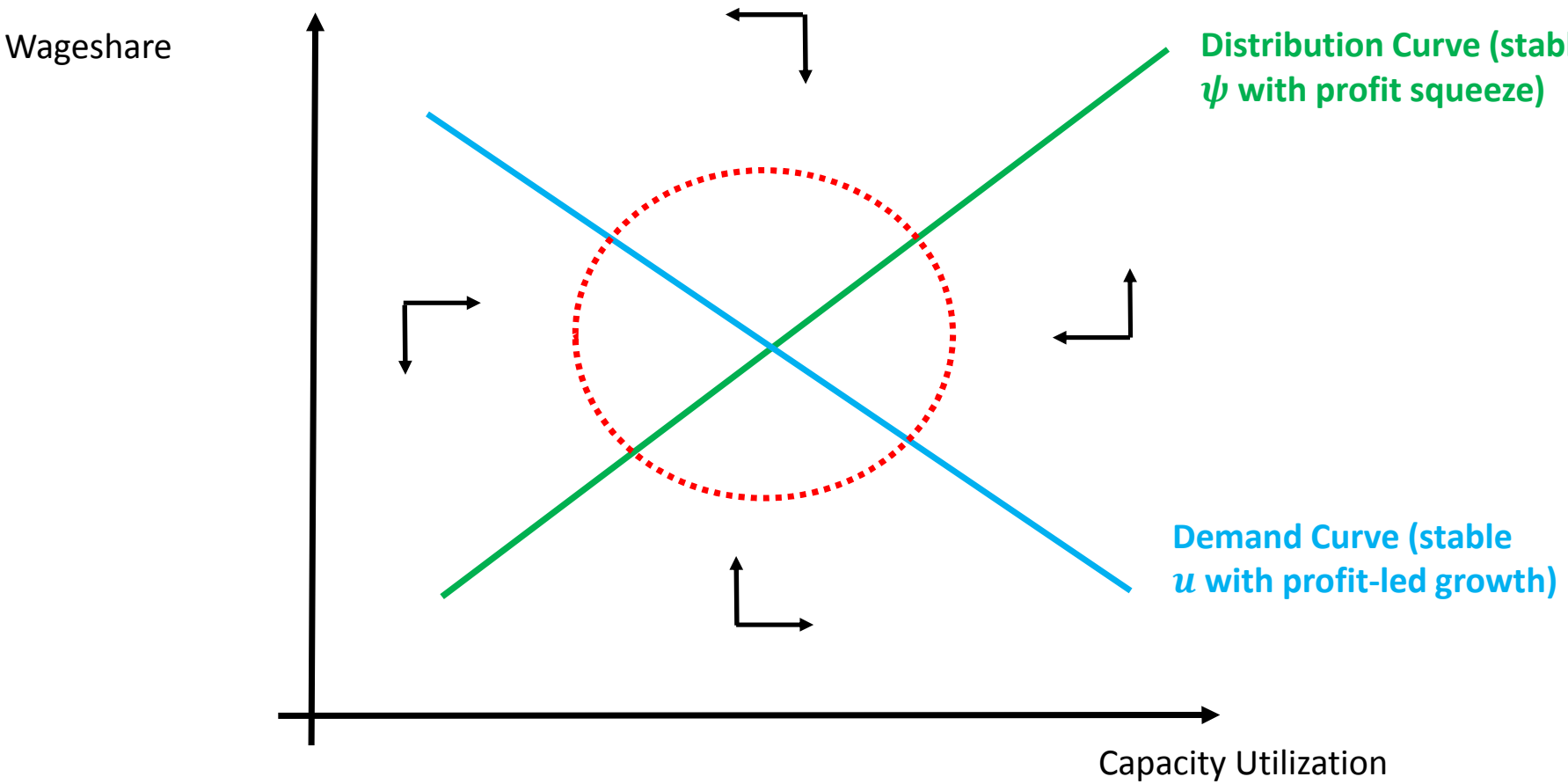
$$\hat{\xi} = \xi_0 + \xi_\psi \psi + \xi_u u$$

$$\hat{Y} = Y_0 + Y_\psi \psi + Y_u u$$

$$s = s_0 + s_\psi \psi$$

Reference: Barbosa-Filho, N. and Taylor, L. (2006) "Distributive and Demand Cycles in the US Economy – A structuralist Goodwin model," Metroeconomica, Vol. 7 (3), pp. 389-411.

The Kalecki-Goodwin Model: Phase Diagram



Empirical Results and Research Perspectives

- Applied studies point to a profit-led demand with profit squeeze
- This result is consistent with the “predator-prey” dynamics between the wageshare and capacity utilization (or the employment rate) that one sees in most economies
- But the functional distribution of income is not a good guide for the personal distribution of income because fiscal policy (taxes and transfers) can alter the later substantially
- Models of growth and distribution have been moving from the explicit labor-capital conflict to the implicit conflict labor-capital built in macroeconomic policy, especially fiscal policy (macroeconomics of the 21st century)

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NIPA and Personal Distribution

From the income decomposition of GDP

$$PY_{GDP} = rPK + wL + T_{ind}$$

To obtain the national income, just subtract the net income and transfers sent abroad from both sides

$$PY_{GNP} = PY_{GDP} - PY_{row}$$

And to obtain the gross available income for final expenditures, we have to include direct taxes and current transfers in the analysis (the “tax transfer” matrix), so that:

$$PY_{GNP} = PY_{fam} + PY_{bus} + PY_{gov} + PY_{row}$$

The Tax-Transfer Matrix

	Families	Business	Government	Row Total
Wages	WL			**WL**
Profits		rPK		**rPK**
Indirect taxes			Tind	**Tind**
Foreign transfers	**-Hfam,row**	**-Hbus,row**	**-Hgov,row**	**-Hrow**
Direct taxes	-Tdir,fam	-Tdir,bus	**Tdir**	**0**
Family dom transfers	**-Hfam,dom**	+Hfam,bus	+Hfam,gov	**0**
Business transfers	+Hbus,fam	**-Hbus,dom**	+Hbus,gov	**0**
Government transfers	+Hgov,fam	+Hgov,bus	**-Hgov,dom**	**0**
Colunm Total	**Yfam**	**Ybus**	**Ygov**	**Ygnp**

Example: Brazil in 2009 (in thousands of BRL)

	Families and NPF	Business	Government	Row Total
Wages	1,412,999			1,412,999
Profits and proprietors' income		1,336,268		1,336,268
Indirect taxes			490,137	490,137
Taxes and current transfers	678,051	(880,009)	144,564	(57,394)
National disposable income	2,091,050	456,259	634,701	3,182,010

GDP: BRL 3,239 billion

Fiscal Policy and Distribution

- In most advanced democracies of the world, the State has an important role in reducing income inequality through taxes and transfers ("the great redistributor")
- The bulk of fiscal policy is done through this way (social contract), which means that the government has an important role in determining private disposable income and consumption
- So, in addition to wage-led vs profit-led growth regimes, we also have to analyze **"poor-led"** vs **"rich-led"** growth regimes (wage repression or secular stagnation)
- And the degree in which an economy is "poor-led" depends on its income inequality, the more unequal, the higher the growth impact of an increase in the government transfers to the poor

The Expanded Tax-Transfer Matrix

	Low income families	Middle income families	High income families	Business	Government	Row Total
Wages	WlowLlow	WmidLmid	WhigLhig			**WL**
Profits				rPK		**rPK**
Indirect taxes					Tind	**Tind**
Foreign transfers	**-Hlow,row**	**-Hmid,row**	**-Hhig,row**	**-Hbus,row**	**-Hgov,row**	**-Hrow**
Direct taxes	-Tdir,low	-Tdir,mid	-Tdir,hig	-Tdir,bus	**Tdir**	**0**
Family dom transfers	**-Hfam,low**	**-Hfam,mid**	**-Hfam,hig**	+Hfam,bus	+Hfam,gov	**0**
Business dom transfers	+Hbus,low	+Hbus,mid	+Hbus,hig	**-Hbus,dom**	+Hbus,gov	**0**
Government dom transfers	+Hgov,low	+Hgov,mid	+Hgov,fam	+Hgov,bus	**-Hgov,dom**	**0**
Colunm Total	**Ylow**	**Ymiddle**	**Yhigh**	**Ybus**	**Ygov**	**Ynat**

What is the pattern?

- Low-income families depend more on income transfers from the government than middle and high-income families
- High income families receive most of capital income and pay most of direct taxes
- The distribution of labor income is not clear a priori, since middle and high income families can also concentrate most of it because of their higher relative wages
- Structural reforms usually mean a regressive change in income transfers and tax policy (the neoliberal war on the Welfare State), but there is no evidence that a balanced expansion of social spending development harms development (check: Peter Lindert's "Growing Public" book)

Recent evidence from Brazil: composition of disposable income by income group, in units of the minimum wage (MW)

	Total	Up to 2 MW	From 2 to 3 MW	From 3 to 6 MW	From 6 to 10 MW	From 10 to 15 MW	From 15 to 25 MW	More than 25 MW
Total disposable icome	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Labor income	**63.9%**	**46.6%**	**52.0%**	**60.5%**	**65.1%**	**67.4%**	**69.2%**	**67.2%**
Employee	45.2%	31.7%	38.0%	45.3%	48.0%	48.0%	49.0%	43.5%
Employer	5.8%	0.2%	0.5%	1.5%	3.5%	5.4%	8.0%	12.7%
Self-employed	12.9%	14.7%	13.5%	13.8%	13.6%	14.0%	12.2%	10.9%
Income transfers	**19.4%**	**26.9%**	**26.3%**	**20.3%**	**17.9%**	**17.0%**	**16.8%**	**19.2%**
Social security (INSS)	10.7%	15.7%	18.9%	14.7%	11.5%	10.0%	7.7%	5.6%
Social security (RPPS)	4.9%	0.9%	1.2%	2.0%	3.4%	4.0%	6.3%	10.0%
Pensions - private funds	0.7%	0.0%	0.1%	0.0%	0.2%	0.7%	1.1%	1.9%
Federal social programs	0.7%	6.3%	2.9%	1.0%	0.2%	0.1%	0.0%	0.0%
Alimony and donations	1.5%	2.9%	2.1%	1.5%	1.6%	1.4%	0.9%	1.6%
Other transfers	0.7%	1.0%	1.1%	1.0%	0.9%	0.7%	0.8%	0.2%
Rent	**1.8%**	**0.3%**	**0.5%**	**0.8%**	**1.3%**	**1.8%**	**1.9%**	**3.5%**
Other income	**1.6%**	**0.3%**	**0.3%**	**0.6%**	**1.3%**	**2.0%**	**2.5%**	**2.7%**
Non-monetary income	**13.4%**	**25.9%**	**21.0%**	**17.9%**	**14.5%**	**11.8%**	**9.6%**	**7.5%**
% of population	**100.0%**	**20.1%**	**16.8%**	**30.1%**	**15.9%**	**7.6%**	**5.4%**	**3.8%**

Source: POF 2008-09, table 2.1

The Recent Brazilian Experience

- The increase in the government's primary revenue has been channeled to income transfers to low income families.
- The mains instruments to do this have been the federal anti-poverty program (Bolsa Familia) and the new minimum-wage law (real growth tied to GDP growth)
- The government initiative has been successful in reducing poverty and income inequality (poor-led growth)
- But many financial analysts have doubt that the current situation is fiscally sustainable
- It is sustainable, but the changes in the international and domestic scenarios require an adaptation of macroeconomic policy

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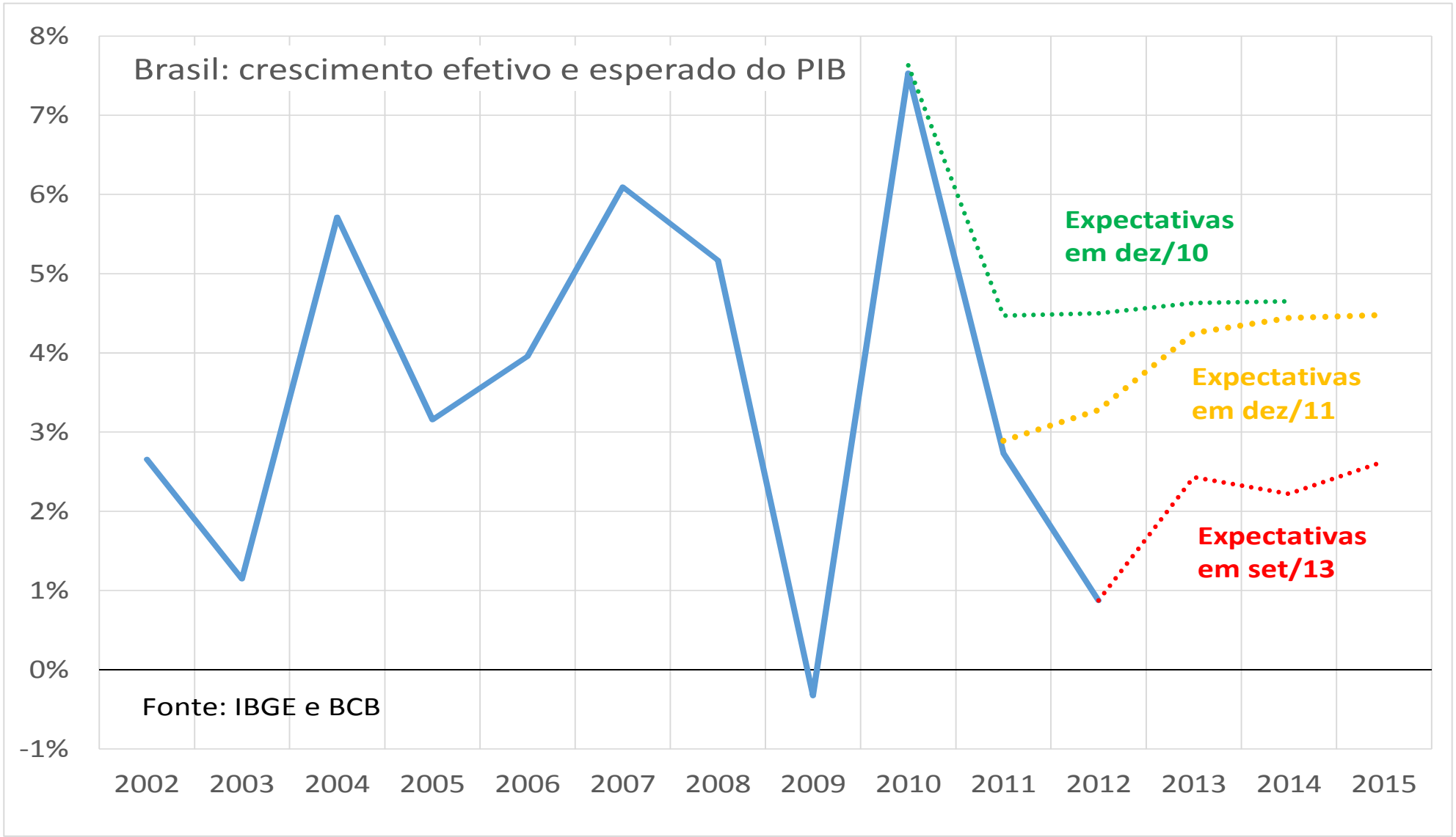
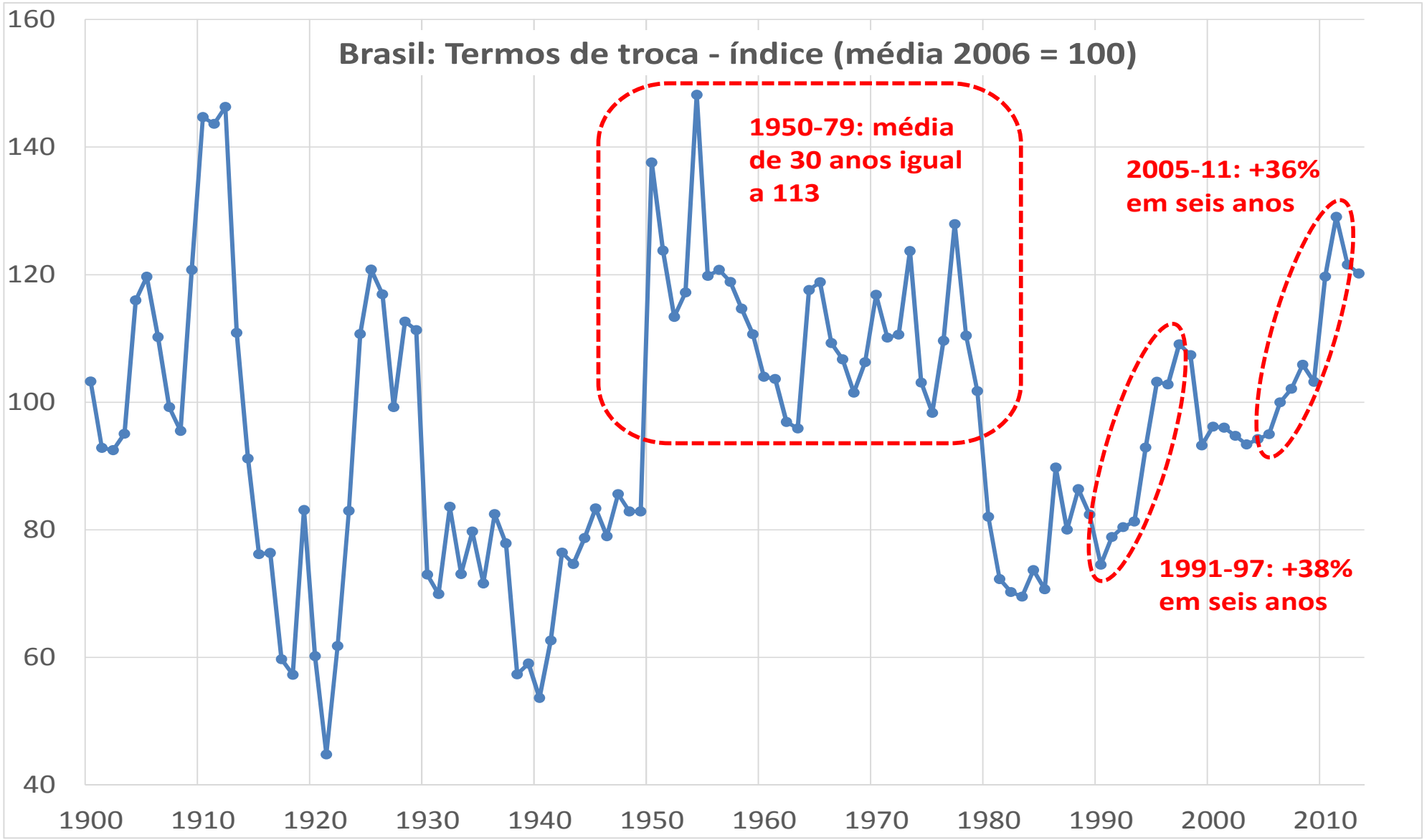
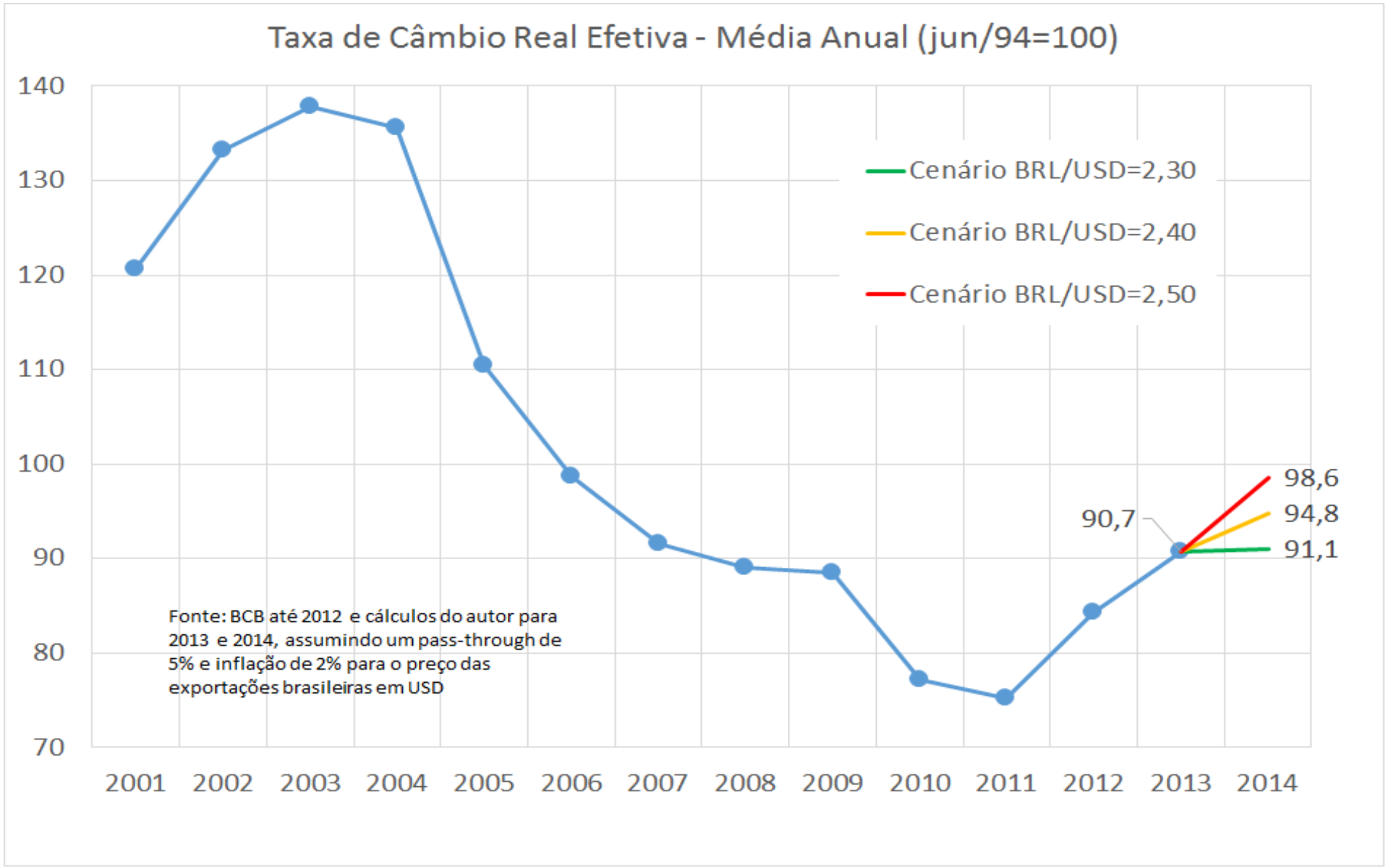
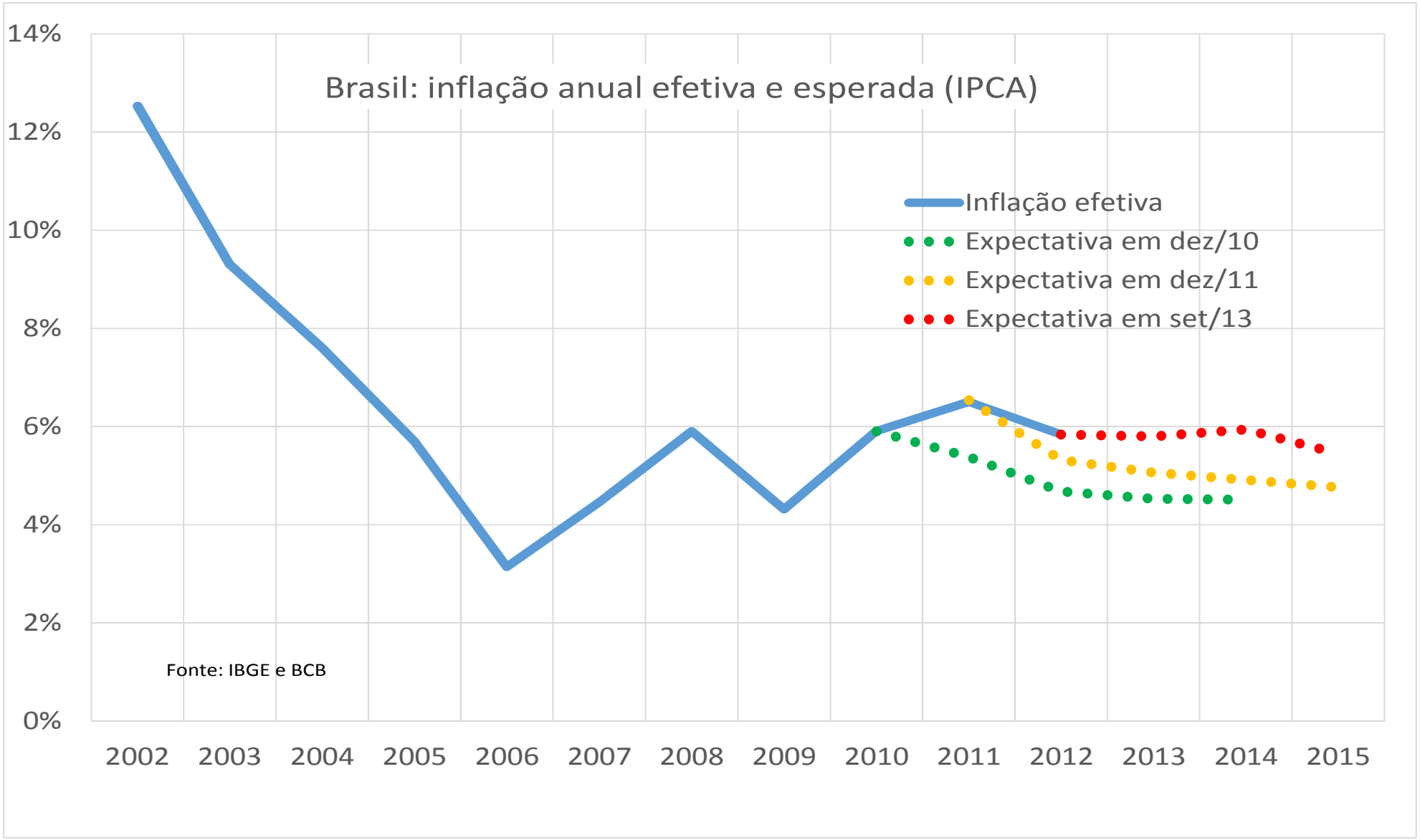
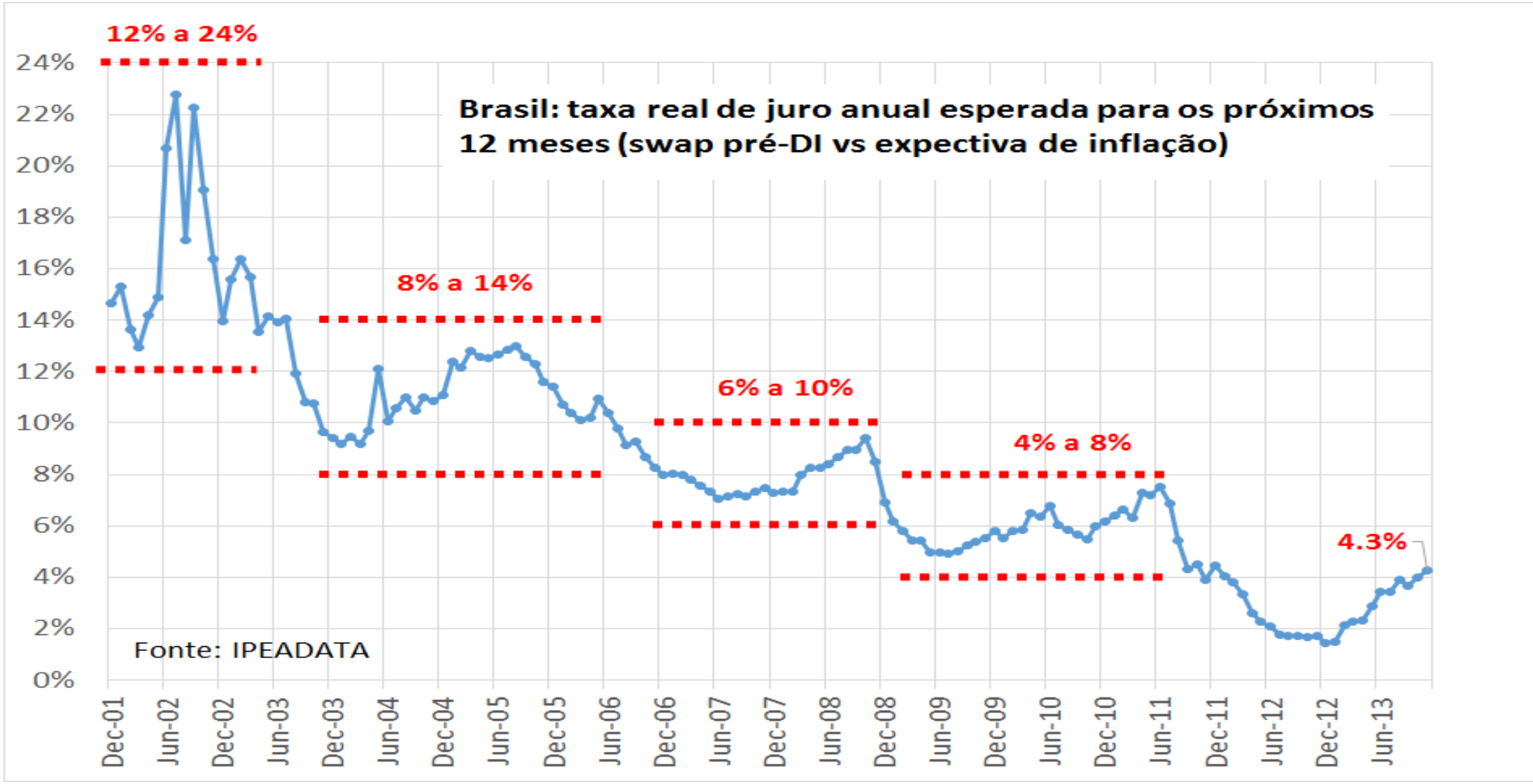

Brasil: crescimento efetivo e esperado do PIB
8%
7%
6%
5%
4%
3%
2%
1%
0%
-1%
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
Expectativas em dez/10
Expectativas em dez/11
Expectativas em set/13
Fonte: IBGE e BCB


Brasil: Termos de troca - índice (média 2006 = 100)
1950-79: média de 30 anos igual a 113
2005-11: +36% em seis anos
1991-97: +38% em seis anos
160
140
120
100
80
60
40
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010


Taxa de Câmbio Real Efetiva - Média Anual (jun/94=100)
140
130
120
110
100
90
80
70
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Cenário BRL/USD=2,30
Cenário BRL/USD=2,40
Cenário BRL/USD=2,50
90,7
98,6
94,8
91,1
Fonte: BCB até 2012 e cálculos do autor para 2013 e 2014, assumindo um pass-through de 5% e inflação de 2% para o preço das exportações brasileiras em USD


Brasil: inflação anual efetiva e esperada (IPCA)
14%
12%
10%
8%
6%
4%
2%
0%
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
Inflação efetiva
Expectativa em dez/10
Expectativa em dez/11
Expectativa em set/13
Fonte: IBGE e BCB


Brasil: taxa real de juro anual esperada para os próximos 12 meses (swap pré-DI vs expectiva de inflação)
12% a 24%
8% a 14%
6% a 10%
4% a 8%
4.3%
Fonte: IPEADATA
24%
22%
20%
18%
16%
14%
12%
10%
8%
6%
4%
2%
0%
Dec-01
Jun-02
Dec-02
Jun-03
Dec-03
Jun-04
Dec-04
Jun-05
Dec-05
Jun-06
Dec-06
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Dec-07
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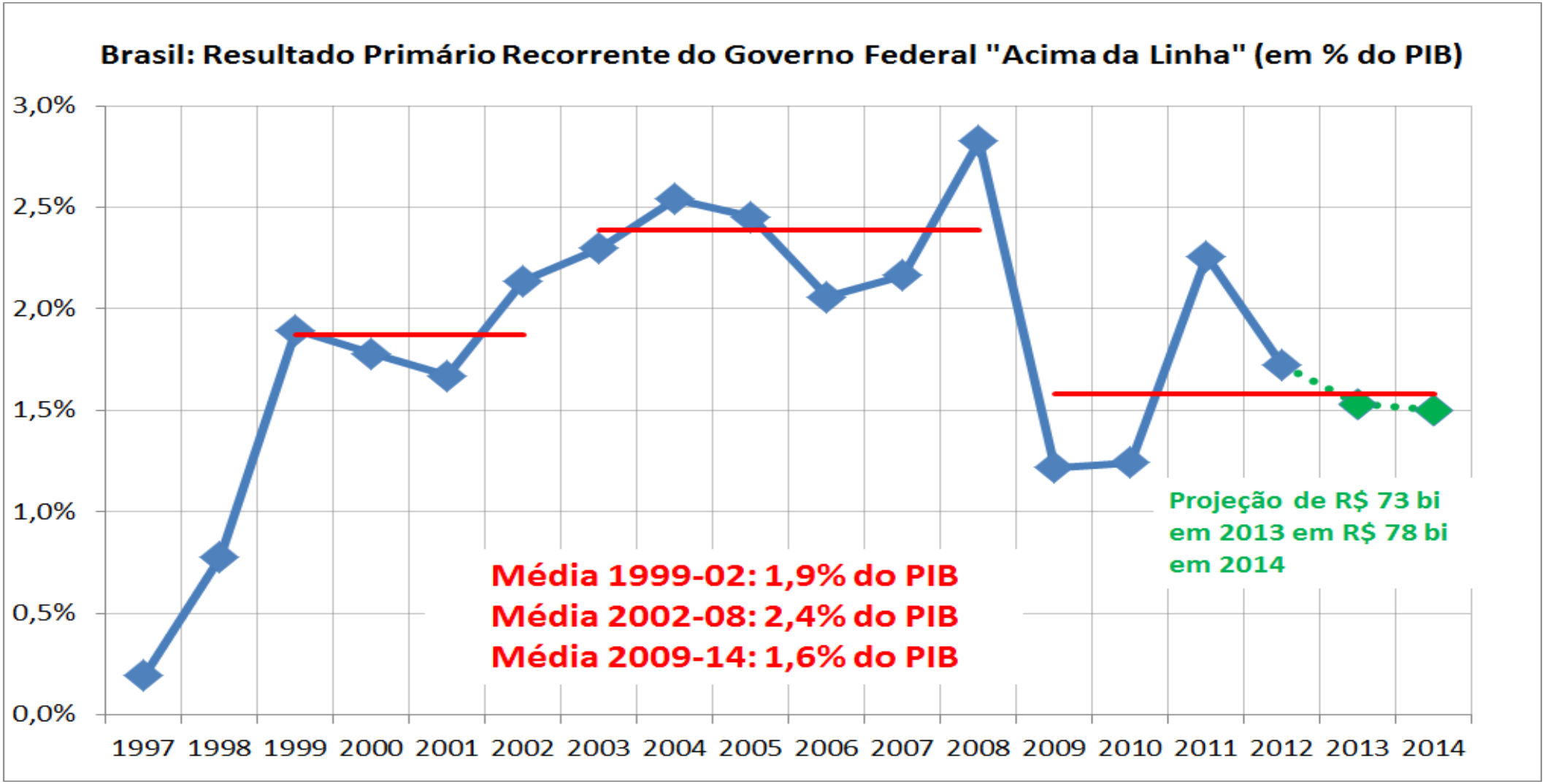
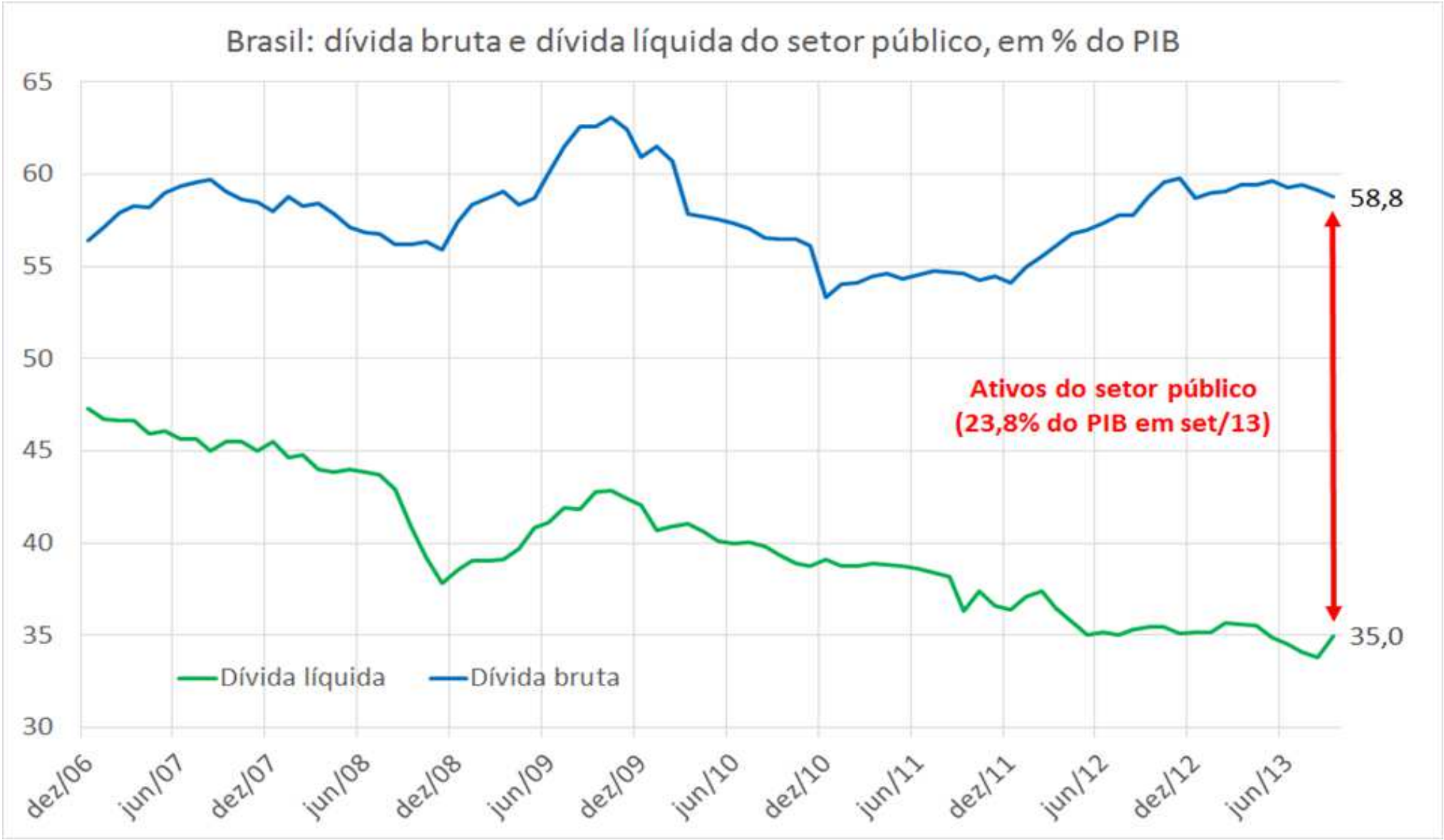
Jun-13

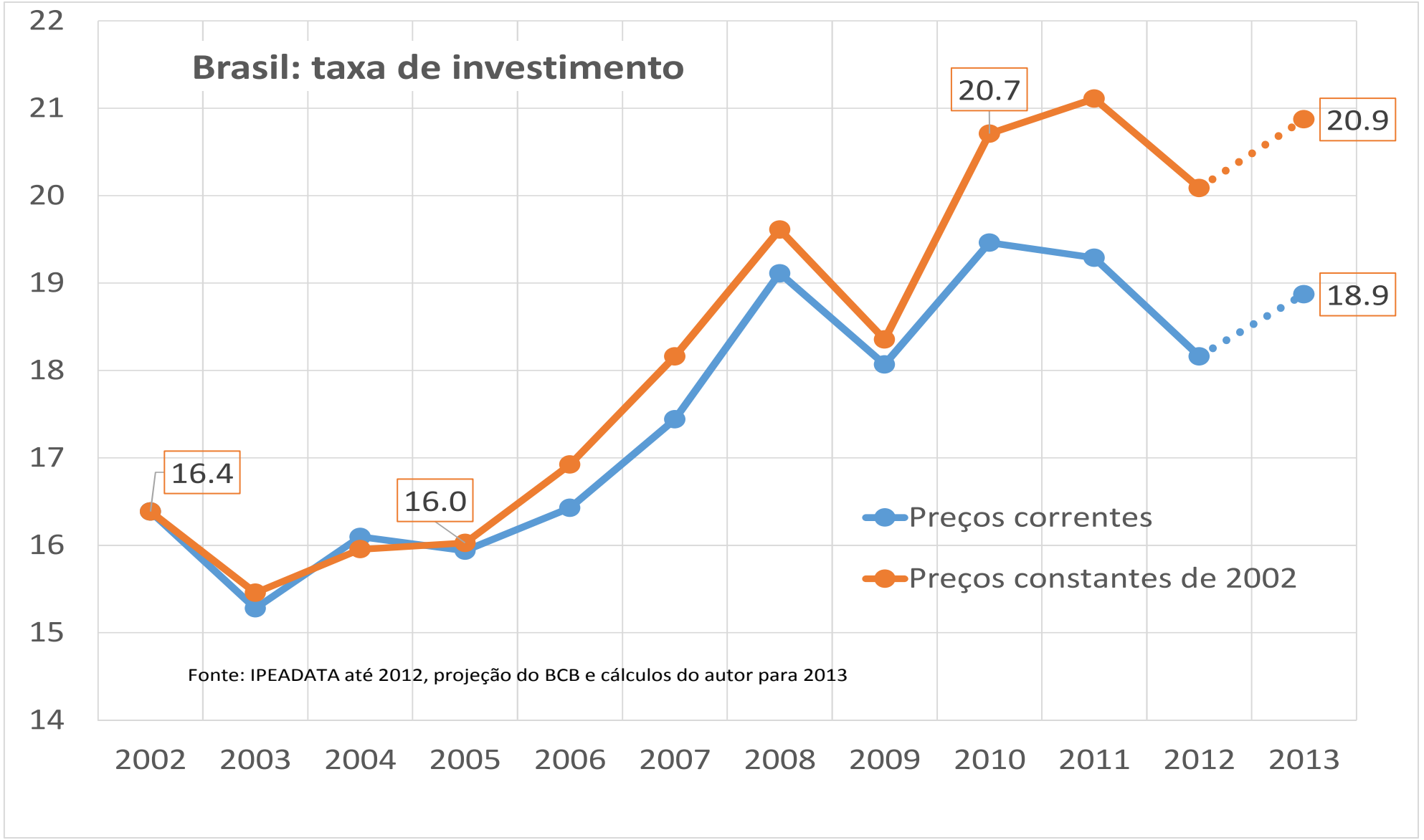


Obs: o resultado recorrente exclui o impacto fiscal da cessão onerosa de petróleo e da capitalização da Petrobrás, em 2010, e das operações com o Fundo Soberano, em 2008 e 2012. Fonte: MF/STN para 1997-2012 e projeções do autor para 2013 e 2014.

Inflation and Primary Surplus

- Part of the recent reduction in Brazil's primary surplus is a result of the fiscal impact of price smoothing (fuels and electricity)
- Reduction of CIDE on fuels to zero: BRL 11 billion (0.23% of GDP)
- Subsidies to electricity through CDE: BRL 9 billion (0.19% of GDP)
- Impact of Petrobras's negative result in refining and distribution on the government's primary revenue (less IRPJ, CSLL and dividends) : BRL 4 billion (0.08% of GDP)
- Total direct impact: less 0.5% of GDP of primary surplus in exchange for lower inflation


Brasil: dívida bruta e dívida líquida do setor público, em % do PIB
65
60
55
50
45
40
35
30
58,8
35,0
Ativos do setor público
(23,8% do PIB em set/13)
Dívida líquida
Dívida bruta
dez/06
jun/07
dez/07
jun/08
dez/08
jun/09
dez/09
jun/10
dez/10
jun/11
dez/11
jun/12
dez/12
jun/13


Brasil: taxa de investimento
22
21
20
19
18
17
16
15
14
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
16.4
16.0
20.7
20.9
18.9
Preços correntes
Preços constantes de 2002
Fonte: IPEADATA até 2012, projeção do BCB e cálculos do autor para 2013

What is the challenge?

- The change in the international situation reduced the space of macroeconomic policy in a context of growing demands on the government
- The very own success of the government's social policy increased the demand for its expansions to other areas (health, education, public security, urban transportation, etc)
- At the same time, the reduction in the country's competitiveness raised the business' demands for tax cuts, fiscal and financial subsidies, tariff protection, etc
- The challenge is to move forward without abandoning the recent social improvements (low unemployment and lower income inequality)

The Welfare State vs The Developmental State

- There is no fiscal space to attend to the social and competitive claims on fiscal policy
- And fiscal policy cannot neutralize the adverse impact of “wrong” relative prices on competitiveness
- The fiscal space should, therefore, be channeled **to stabilize the social safety net in terms of GDP and expand universal public services**
- While the relative prices, especially the exchange rate, should be let **free to adjust to the new domestic and international situation**
- But what would be the impact of the realignment of the exchange rate on growth and income distribution?

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Should Countries Devalue to Grow?

- A competitive RER can be an important instrument to accelerate the growth rate of the “modern” tradable sector of the economy
- Which in its turn tends to raise the labor productivity of the whole economy and avoid BoP problems (liquidity constraints)

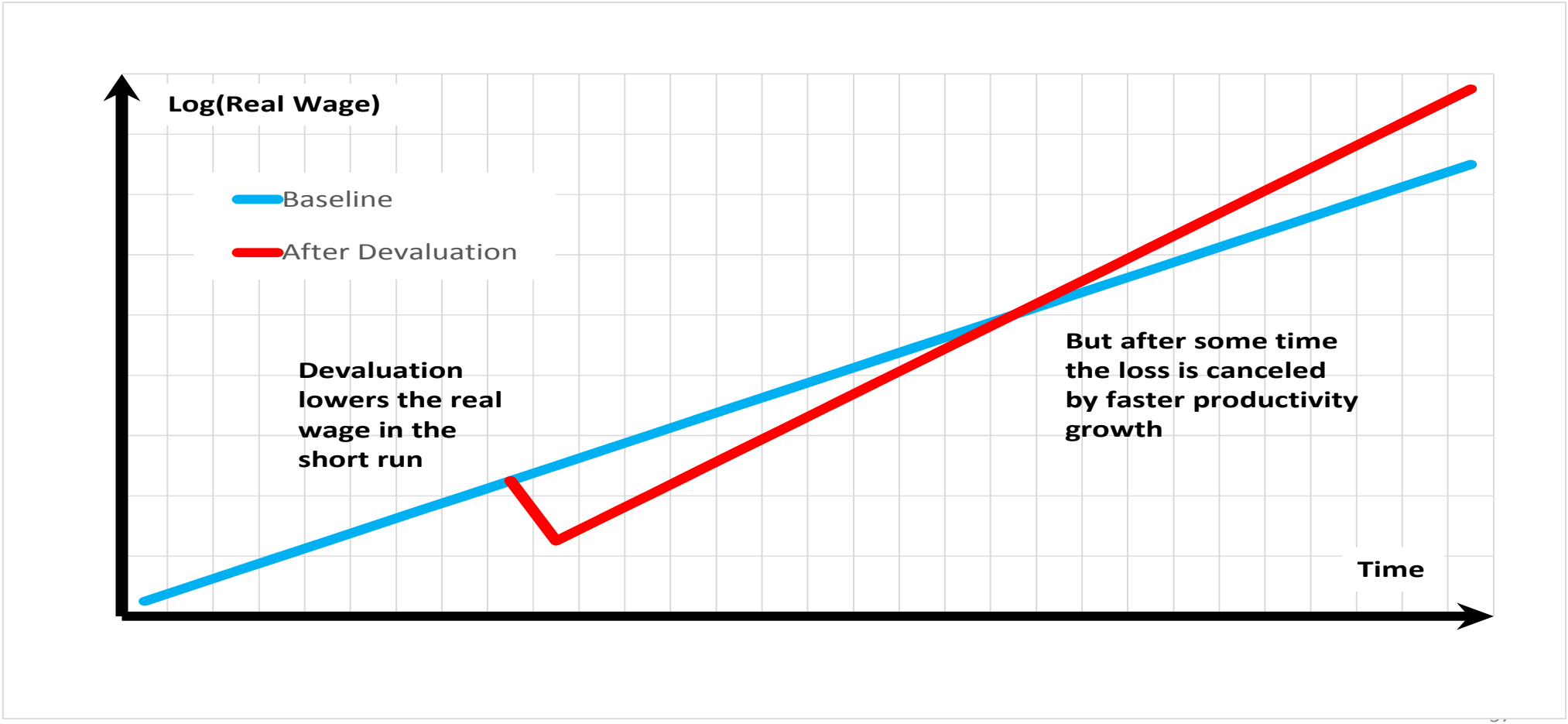
The Political Economy of Devaluation

- In theory workers can benefit from a devaluation if this makes labor productivity grow faster and the productivity gains get transmitted to the real wage
- But the short-run impact is recessive because of the negative income and wealth effects of devaluation

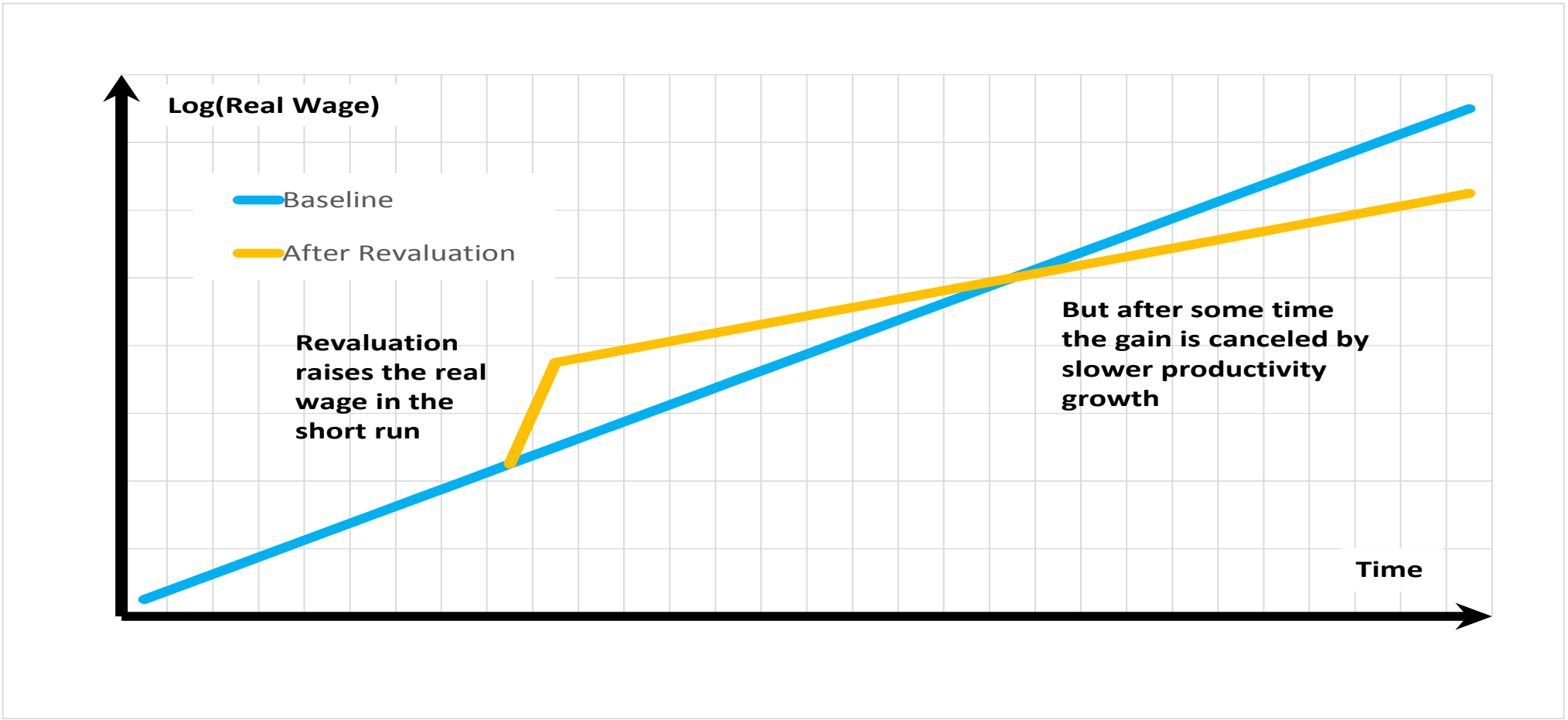
Three Important Questions about Devaluations in a Democracy

1. Would labor productivity really accelerate?
2. Would the productivity gains be shared with workers?
3. How long would it take for devaluation to pay off for workers?

Yes, there is a “desenvolvimentista” case for devaluations

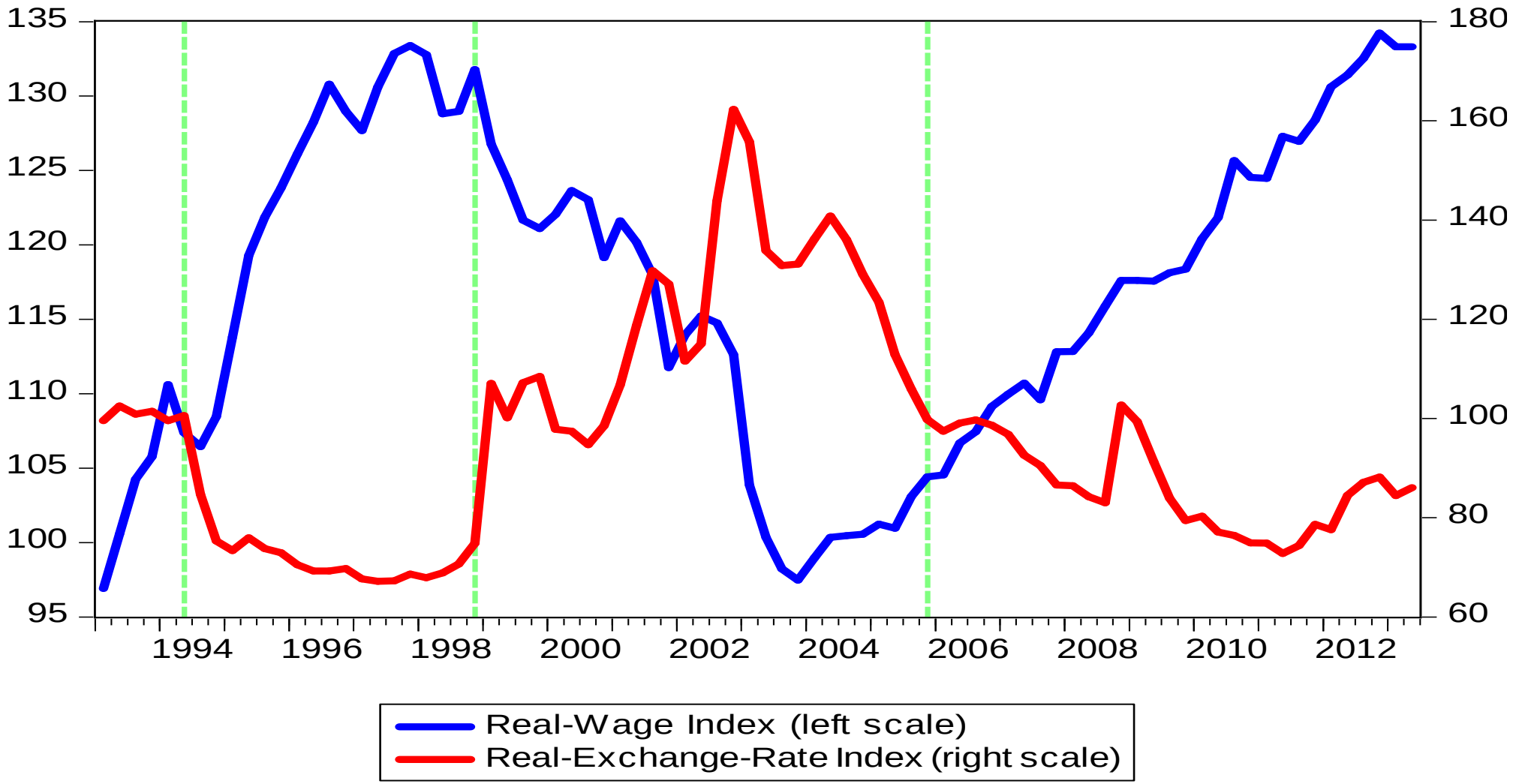


But there may also be a “populista” case for revaluations

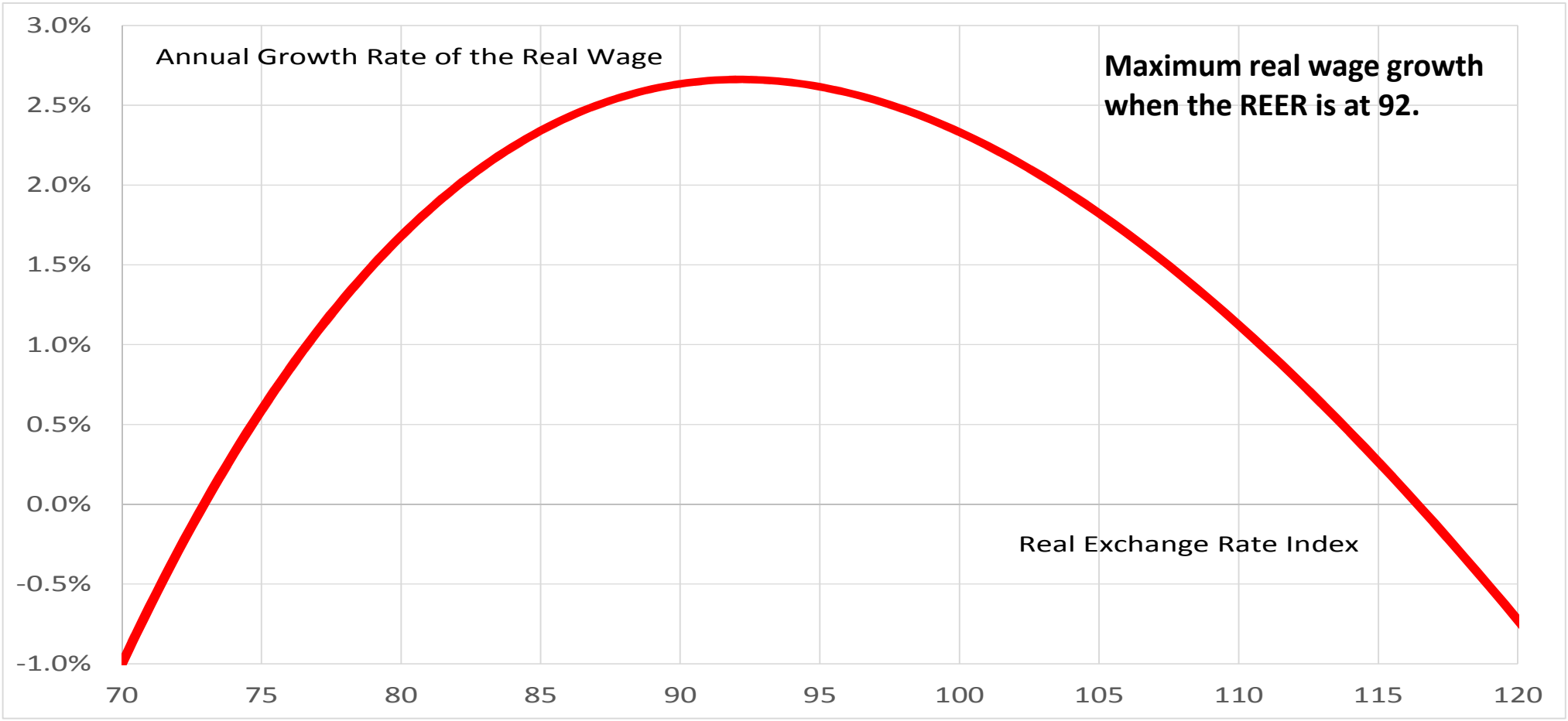


Some Recent Evidence From Brazil

- In the short-run appreciations were usually followed by an expansion, whereas depreciations were followed by a recession
- But in the long-run there seems to be an inverted “u” curve linking both economic growth and real-wage growth to the level of the RER


135
130
125
120
115
110
105
100
95
180
160
140
120
100
80
60
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
Real-Wage Index (left scale)
Real-Exchange-Rate Index (right scale)

Brazil: real-wage growth and RER (long-run result for 1998-13)



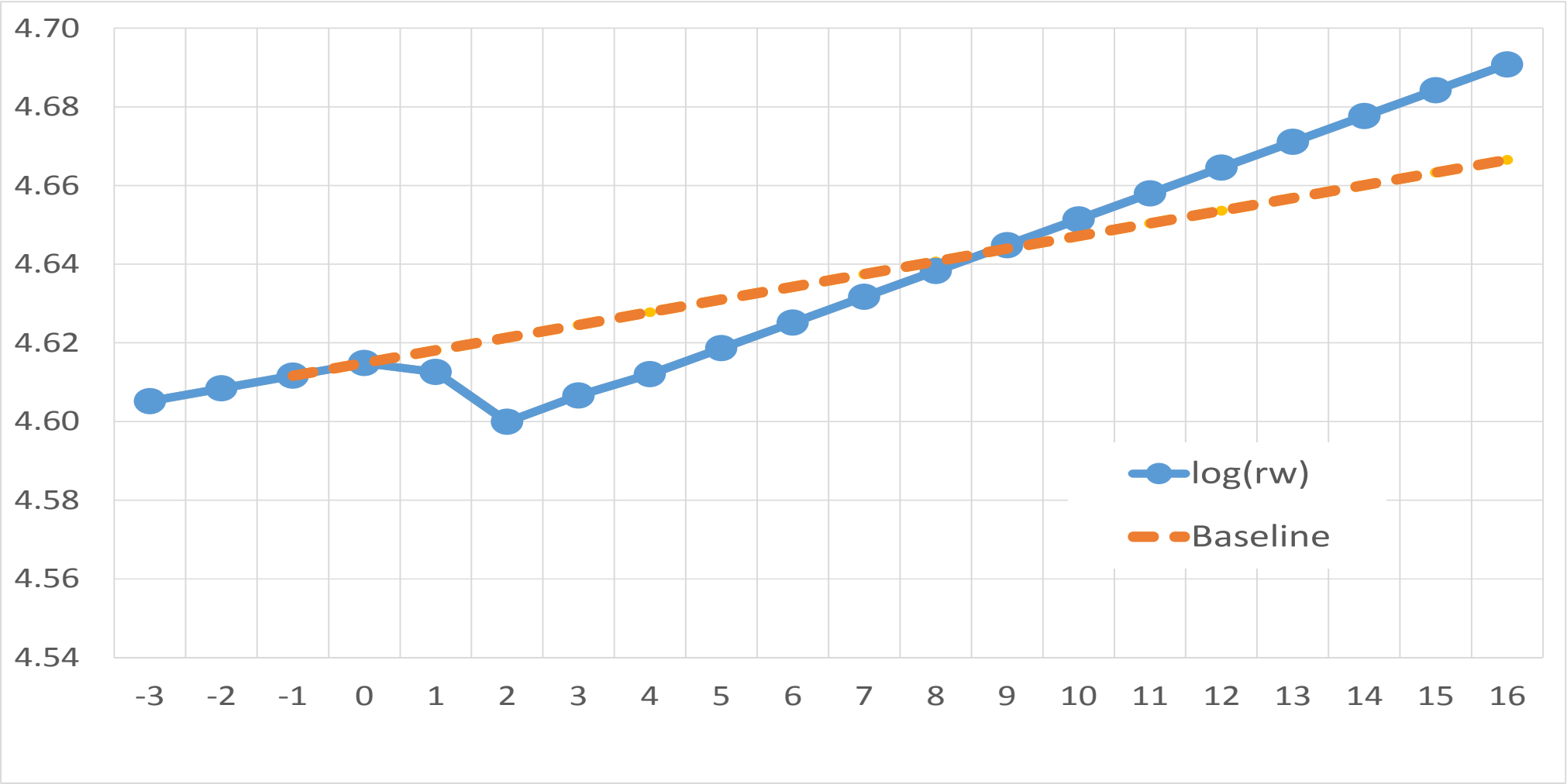
Why is there an inverted “u” curve?

- The investment-GDP ratio (in real terms) is a positive function of the profit share of nominal income and a negative function of the relative price of capital
- The profit share of nominal income is a positive function of the real exchange rate
- And the relative price of capital is a negative function of the real exchange rate
- These two opposing factors result in the nonlinearity displayed in the data

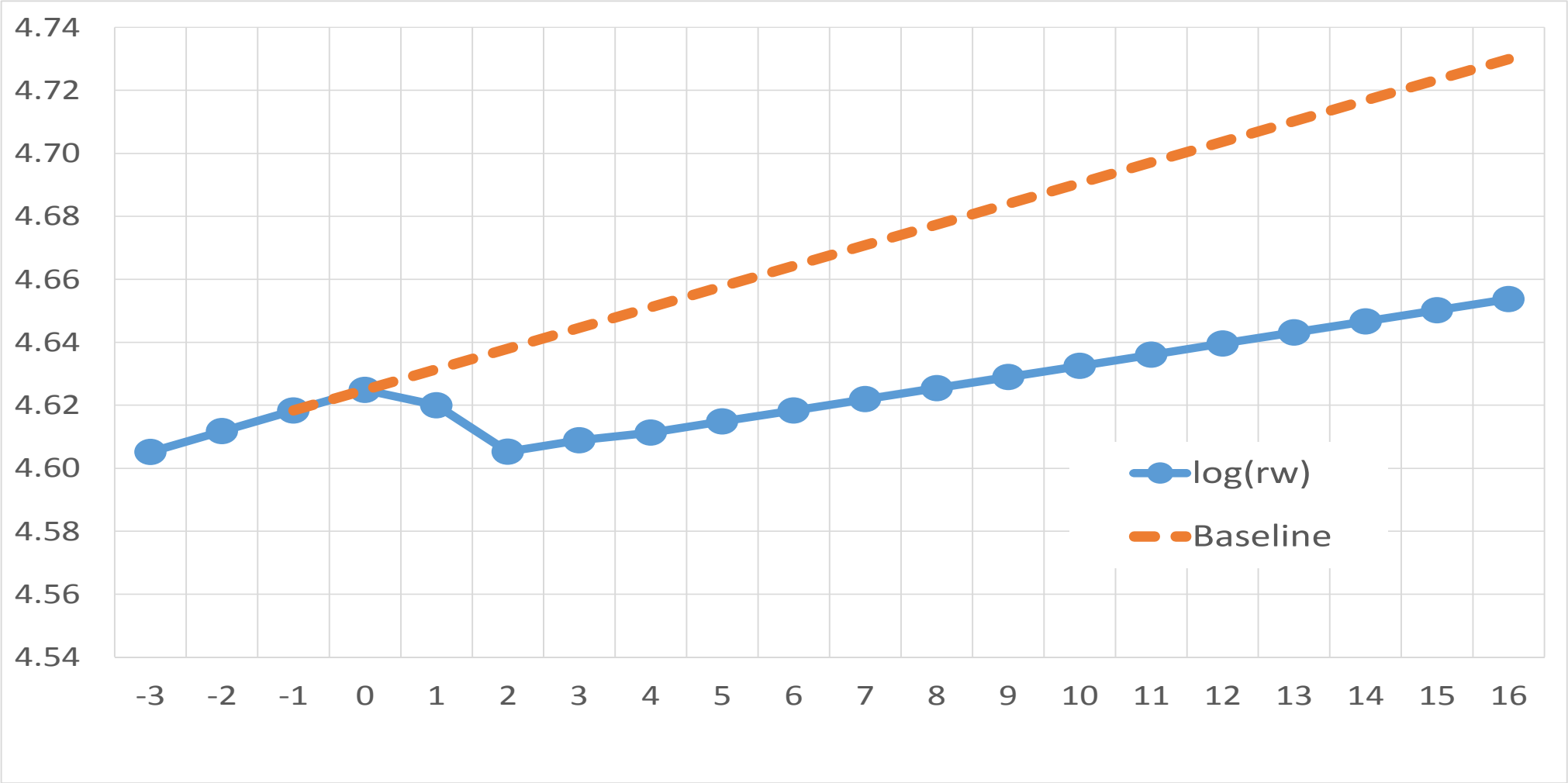
What is the impact of devaluation on the real wage?

- The short-run impact is negative because inflation accelerates and income growth decelerates
- The long-run impact depends on the initial condition
- Raising the exchange rate from an low level (appreciated domestic currency) benefits workers in the long run
- Lowering the exchange rate from a high level (depreciated domestic currency) also benefits workers in the long run
- How long is the long run? It depends on how far the economy is from the real exchange rate that maximizes real-wage growth

Simulation 1: Raise the REER index from 78 to 92



Simulation 2: Raise the REER index from 92 to 108



Disclaimer

(or why economists should not try to play God in the real-world)

- The parameters change through time
- So one cannot know for sure what level of the RER maximizes real-wage growth
- It is also very difficult, maybe impossible, to control the RER
- The second-best solution is to avoid either too much appreciation or too much depreciation around the market trend
- The best recommendation is, therefore, a floating ER with government interventions to curb volatility (the Brazilian policy since 2006)