Restoring US Prosperity and Some Comments on Brazil

Edward C. Prescott

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Prosperity and Depressions are Relative Concepts

- US is 3,000% more prosperous now than it was in 1800
- US 400% more prosperous than Brazil now
- US 40% more prosperous than Western Europe and Japan
- US is currently depressed 14% relative to its pre-2008 trend
  - Half due to productivity being below trend
  - Half due to market hours per adult being below average
  - Been depressed for 4.5 years – How much longer?

Modern Economic Growth

- Modern economic growth began first in England about 1800
  - And shortly thereafter in its offshoots and Western Europe
- Trend grow in real income per capita is about 1.8% per year
  - Which means doubling ever 39 years
- This trend number is used when detrending time series

Neoclassical Growth Theory

- Aggregate production function
  - Solow (cites Houthakker for underlying aggregation theory)
- Aggregate household that values leisure
  - Rogerson developed the underlying aggregation theory
  - Hansen use it in his business cycle paper
- Theory connects well with the national accounts
  - It permits the use of both micro and macro statistics in selecting the economy to be used to answer the given question

What Do I Mean by Theory?

- Theory is a set of instructions for constructing a model economy to answer a given question (Lucas)
- Neoclassical growth theory, like Newton’s theory of the solar system and Dalton’s atomic theory, is a theory in this sense
- Through the interaction of theory and measurement science progresses
- Measured deviations from theory lead to advancements in the theory
- And better theory leads to better measurement

Using the Theory to Address a Question

- Step 1: Select the model economy
- Step 2: Specify the initial capital stocks
- Step 3: Compute the equilibrium path, given the aggregate production function residuals and policies

Comment:

Incorrectly assuming economic agents have perfect foresight generally has little consequence for the equilibrium path

A Brief History of its Early Successes

- An early finding was that productivity shocks were an important contributor to business cycle fluctuations in the 1954-1980 period in the U.S. (Kydland and Prescott)
- Another finding was that non neutrality of technological change with respect to consumption and investment goods (Greenwood, Hercowitz, and Huffman) was not important
- The finding that in worlds with transaction demand for money, monetary policy had only small real effects (Cooley and Hansen)

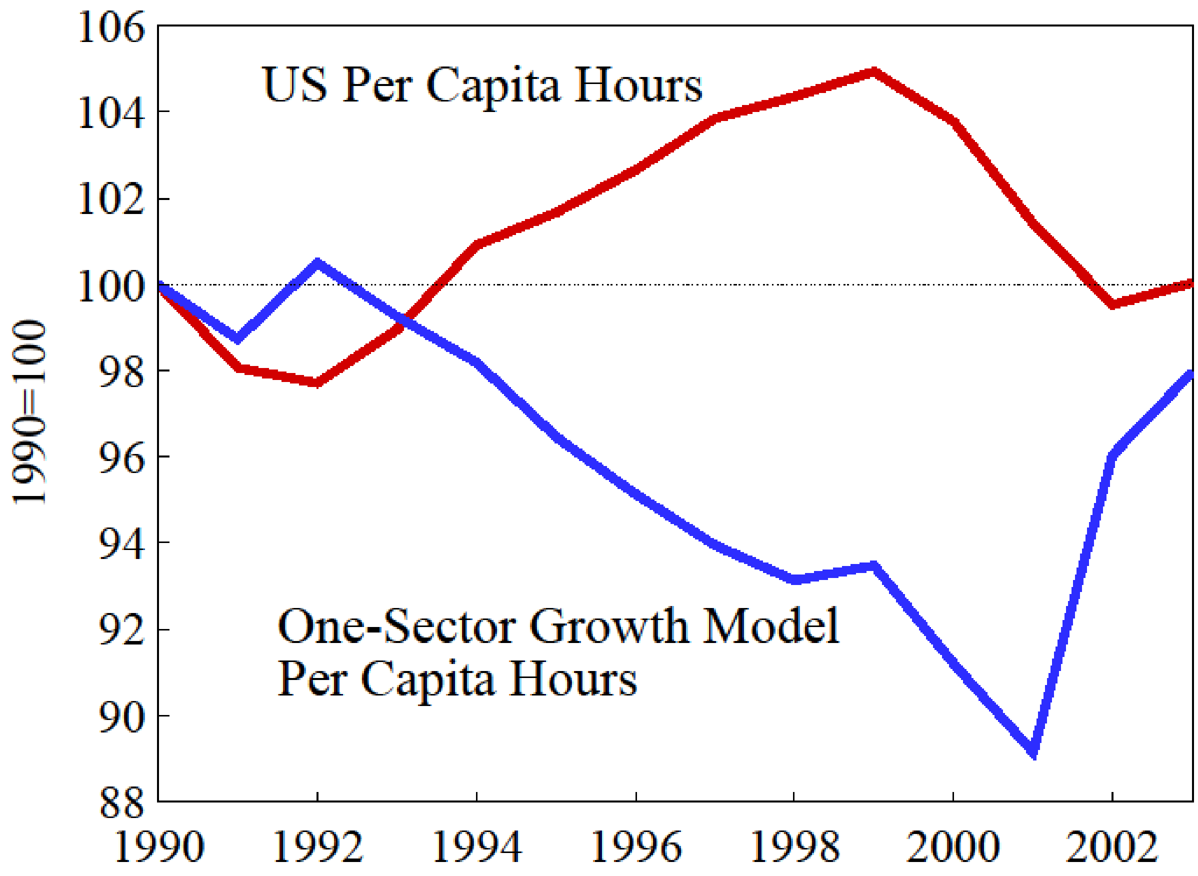
Japan’s Lost Decade of Growth

- In the 1990s Europe and the US experienced healthy growth
- While Japan lost a decade of growth 1992-2002
- Given the fall in Japan’s TFP growth rate, the Japanese economy behaved as predicted by the one-sector growth model
- Their problems were not financial as many claimed
- As soon as Japan shifted to a pro productivity growth, output per working age person again grew 2002-2012 at slightly more than trend

The Puzzling 1990s Boom:
A Big Deviation from Theory

- Aggregate TFP and GDP/hour were low relative to trend
- Labor tax rates were rising
- Then standard theory, predicts a depressed economy

Big Deviation From One-Sector Growth Model



Other Deviations

- Low accounting profits in a boom
- Low GDP/Hour in the boom
- Was it a case of animal spirits?

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NO !

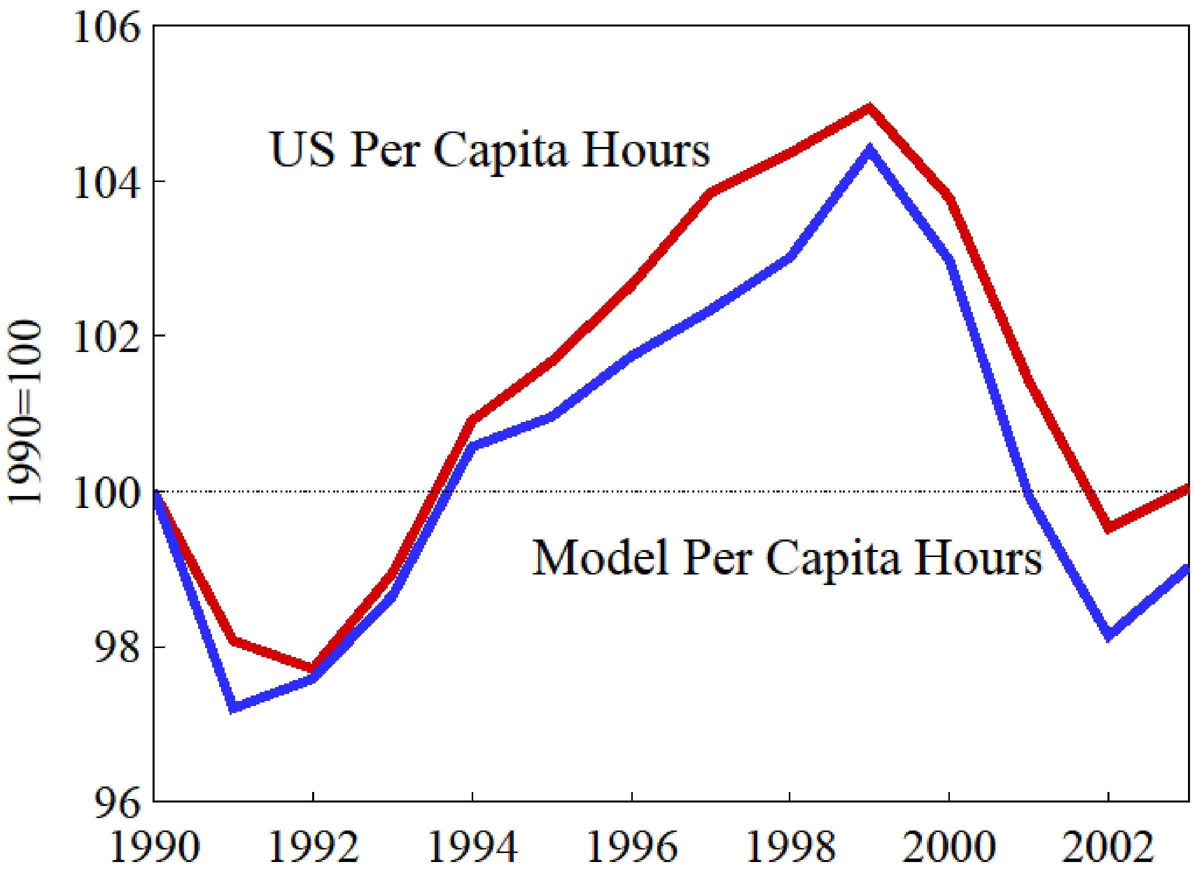
The Resolution of the Puzzle

- With addition of intangible capital, observations in remarkable conformity with theory
- All agree that intangible capital investment, which is not part of measured output, is big as is the intangible capital stock
- The problem is how to incorporate intangible investment and stock in a disciplined way
- McGrattan and I (2010) used the equilibrium condition that businesses equate after-tax returns on investments in measured and unmeasured investments
  - The key observation used are accounting profits, which are not economic profits if there is unmeasured output

"Not everything that counts can be counted, and not everything that can be counted counts."

— Albert Einstein

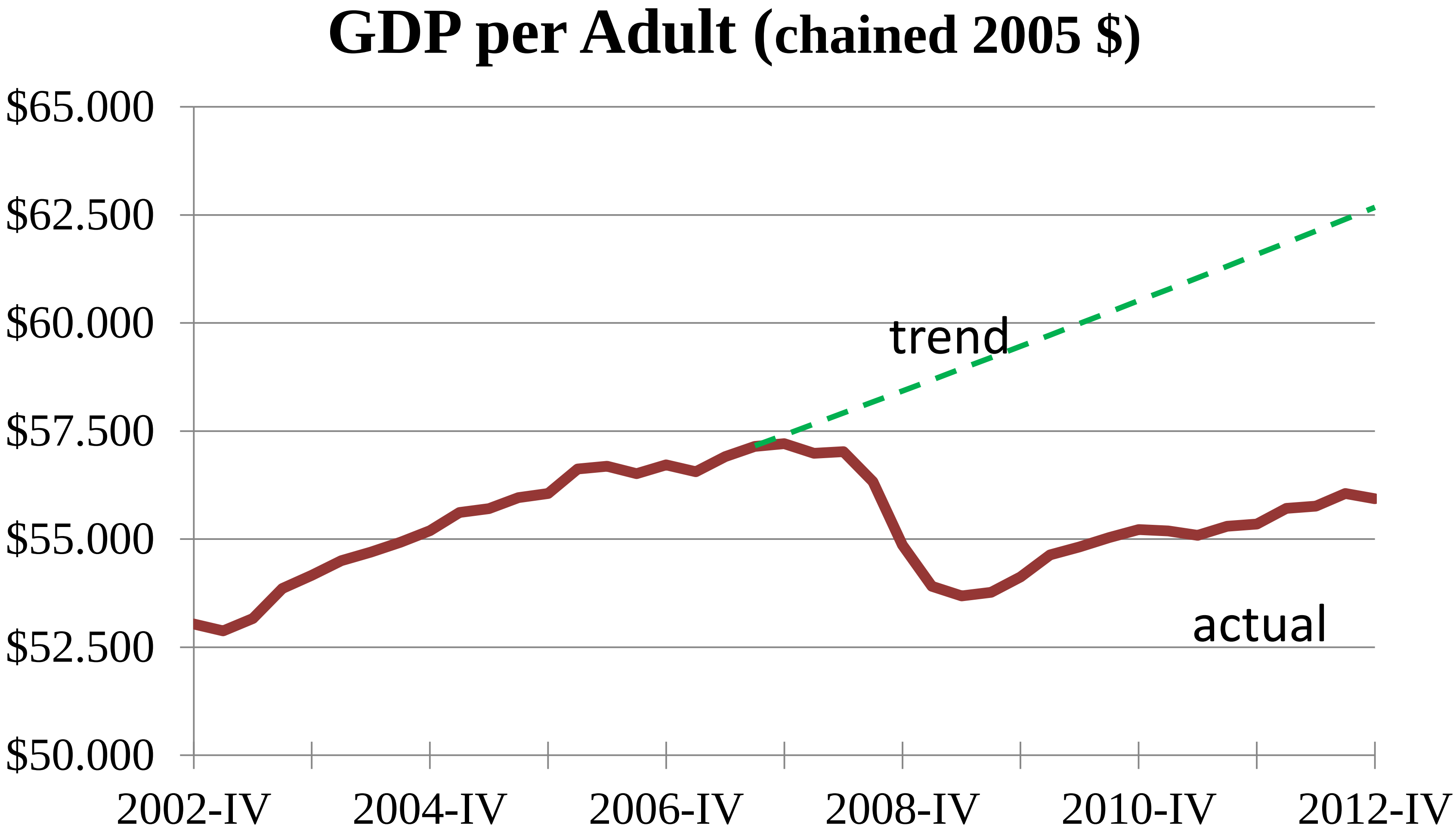
Theory with Intangible Capital Consistent



That Model Economy Also Consistent with Current US Depression

- Technology change was strongly biased towards the production of intangible capital in the 1990s boom
- It was neutral in the 2007-2012 period
- The model says the primary reason for the current depression is below trend productivity growth
- Other factors are of some importance
  – Policy uncertainty (McGrattan, 2012, QJE)
  – Increases in tax rates and hidden subsidies
  – An over-building of residential housing

U.S. Has Been Doing Poorly



Japanese Growth Miracle Puzzle

- It is at variance with the theory
  - Given productivity behavior the theory predicted more rapid growth than observed unless there were more capital, but not too much more
  - Intangible capital is of the right size, neither too big too small
    - Puzzle resolved

Implications for Financial Asset Markets

- The fundamental value of corporations, sum of the value of their debt and equity:

$$V = q_T(\pi)K_T + q_I(\pi)K_I$$

π is policy

K_T is tangible capital (capitalized)

K_I is intangible capital (expensed)

- The *q* functions for value under current US tax system is well below 1, being about 0.6 (From BEA Capital Accounts and Fed's Flow of Funds Accounts)

GNP Equity Value/GNP Varied a Lot

	1929	1962	2000
Actual Value	1.67	.83	1.51
Predicted Value	1.78	.82	1.61

Tax Rates Differed

Taxes	1925-29	1955-62	1987-00
On Distributions to Owners	.10	.45	.17
On corporate profits	.14	.46	.38

Reason for V/GNP Variation

- After-Tax Profits / GNP varied little

- The reason for the big variation in V / GNP is

variations in tax rates

- Intangible capital (including value of brands names, organization capital, patents) was crucial

Equity Premium Puzzle Resolved

- Found 1/3 smaller equity premium for after-tax returns
- Introducing intermediation costs accounted for another 1/3 of premium
- The remaining 1/3, difference between government borrowing rate and household borrowing rate, must be due to the "liquidity" value of short-term government debt

Excess Volatility Puzzle of LeRoy-Porter and Shiller Strengthen

- Capital stocks and tax policies vary smoothly, which implies fundamental values have varied smoothly
- There are large and persistent deviations from fundamentals
- There is strong regression back to fundamentals
- Hope someone resolves this long open puzzle of excess volatility soon

The Great US Depressions of the 1930s

- Cole an Ohanian (2004) introduce cartels which give rise to **insiders and outsiders**
  - Methodologically a major advance
  - Cartelization policy accounts for much of the failure of the US economy to recover in the 1934-39 period
  - McGrattan (2012) established that increases in tax rates were also an important contributor to the US Great Depression
  - Our understanding of the Great Depression has advanced significantly, but is far from complete

There are Many Studies of Other Great Depressions of the 20th Century from the Theory's Perspective

- The Kehoe and Prescott (2007) volume using the one-sector growth model has 16 studies of Great Depressions of the Twentieth Century
- Fisher and Hornstein paper (2002) in that volume shows the setting wages too high led to the Great German depression 1928-1932
- Anyone interested in the Brazilian depression in the 1980s and 1990s should study the Bugarin, Ellery, Gomes, and Teixeira paper in that volume

An Important Development

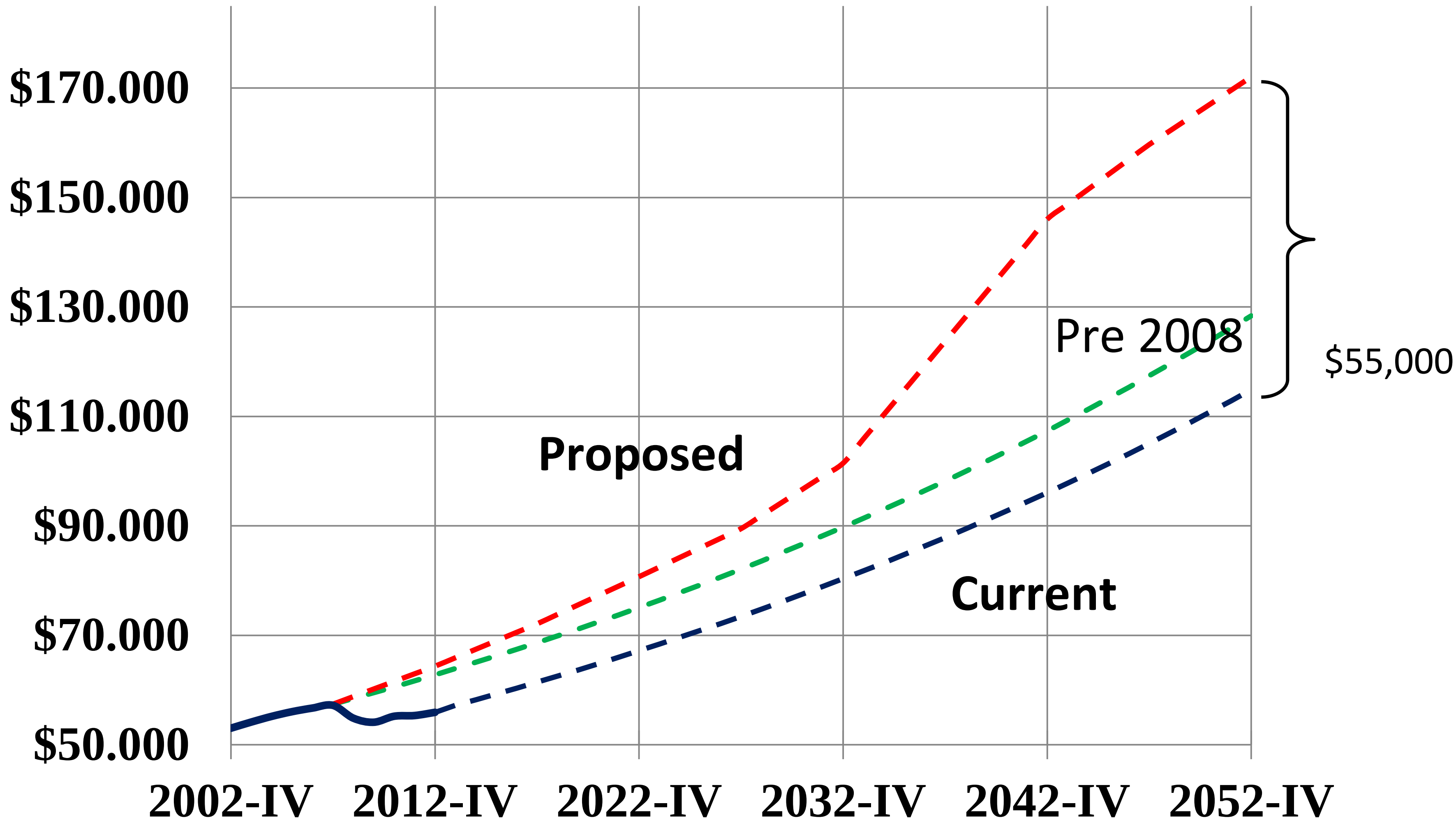
- Joines, Braun & Ikeda (2008) use the theory but with an OLG framework to correctly predict the falling Japanese savings rate well before it happened
- This along with micro studies of Imrohoroğlu, DeNardi, Klein and others were instrumental in the shift from the dynastic family to the OLG framework
- Also instrumental in the shift was the increased computational power needed when using OLG structure
- McGrattan and I used the OLG with an aggregate production set having two output and three inputs

What Should USA do to Restore Prosperity

- Return to pro-productivity growth policies
- Get rid of all capital income tax

What would have happened

What Would Happened Subsequent to 2007-IV for Three Policy Regimes – GDP per Adult (2005$)



Phased in New Policy Regime

- All birth-year cohorts currently alive and future cohorts better off
- Modest size government debt
- Big increase in household sector net worth
  - Some due to larger balanced growth K/Y
  - Most due to increase in q = V/K, where V is the market value of business equity, from about 0.6 to 1.0
- We constraint government debt to be small given limited and variable ability of governments to honor its promises

Phased in New Policy Regime

- Real after tax returns stayed near 4% during the transition
- Key was shifting to mandatory savings for retirement
  - And annuitization of the mandatory saving when retired
- In so far as taxable income is equal to consumption, the US Income Tax System is de facto a consumption tax system

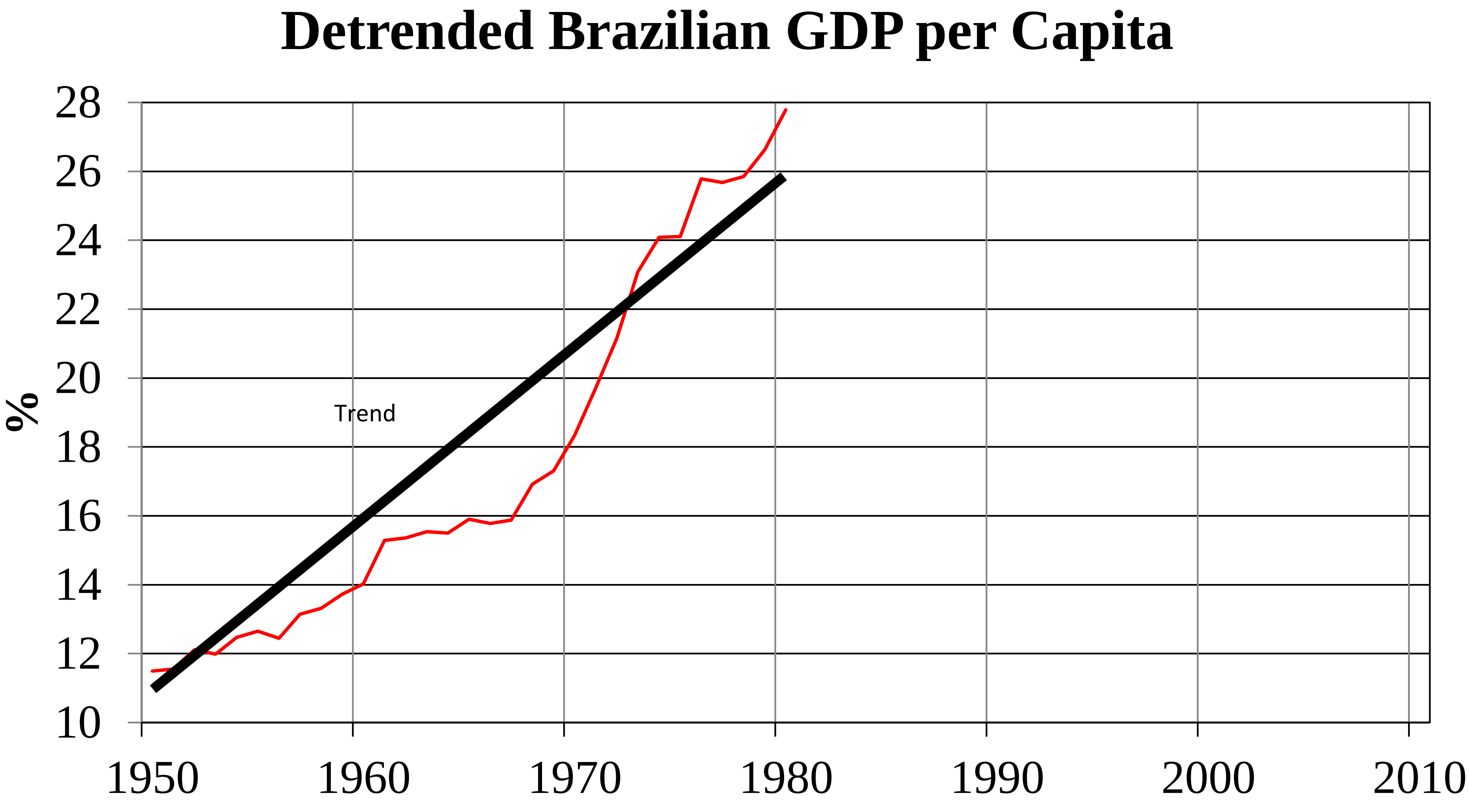
Path to Prosperity

- McGrattan and I use the OLG framework with intangible capital to predict the consequence of a reform in the tax system
- The capital stock including “land”, inventories, consumer durables, intangible capital and publicly owned capital
  - 5.7 times annual GNPs now
  - Would increase 7.1 to GNPs
- Actuarial tables are used
- Equilibrium tansition path computed

How Has Brazil Been Doing?

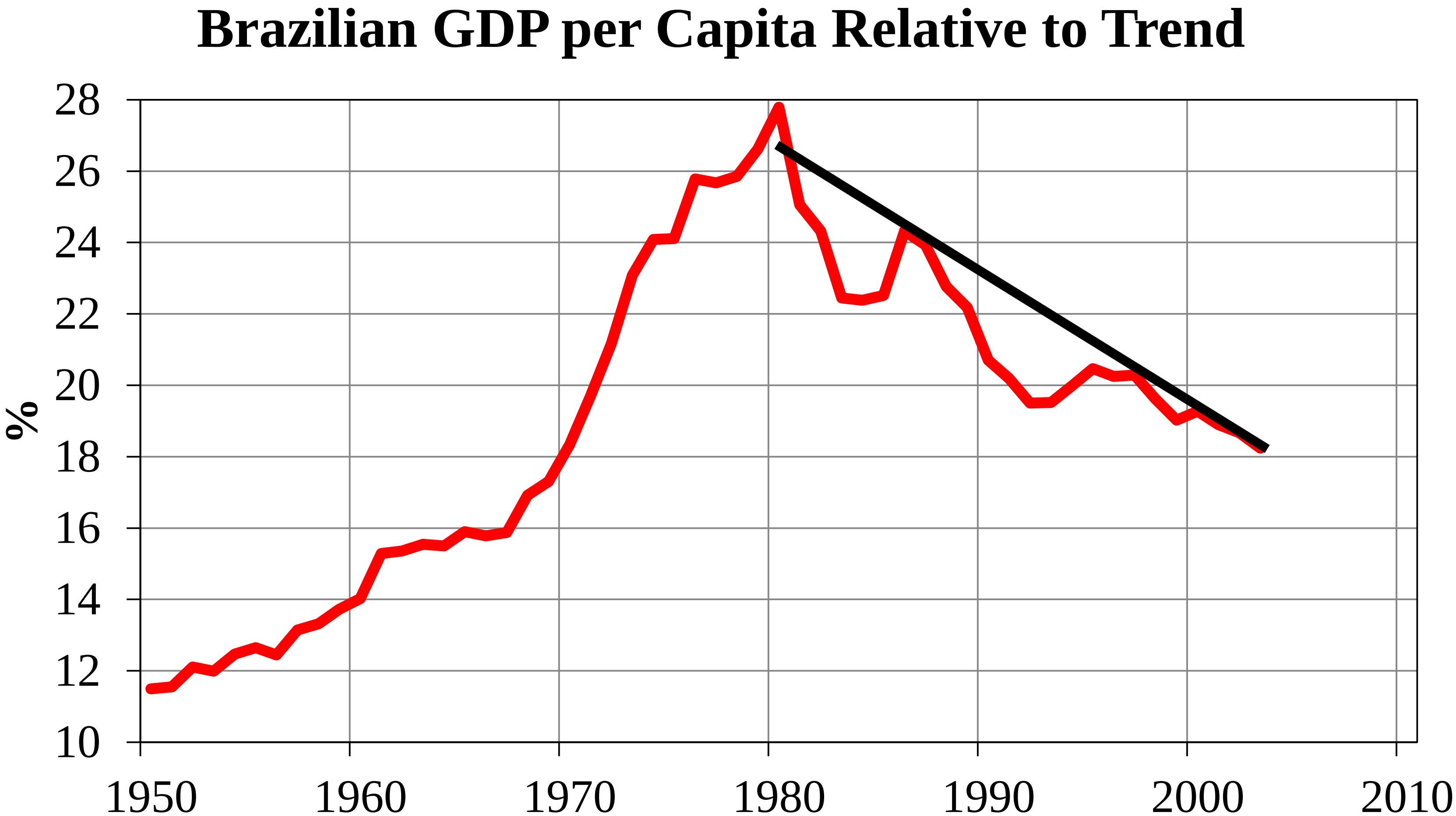
Let’s Look at Brazil’s GDP from 1950-2003 Relative to U.S. Productivity Trend of 1.8%

1950-1980: Rapid Catch Up



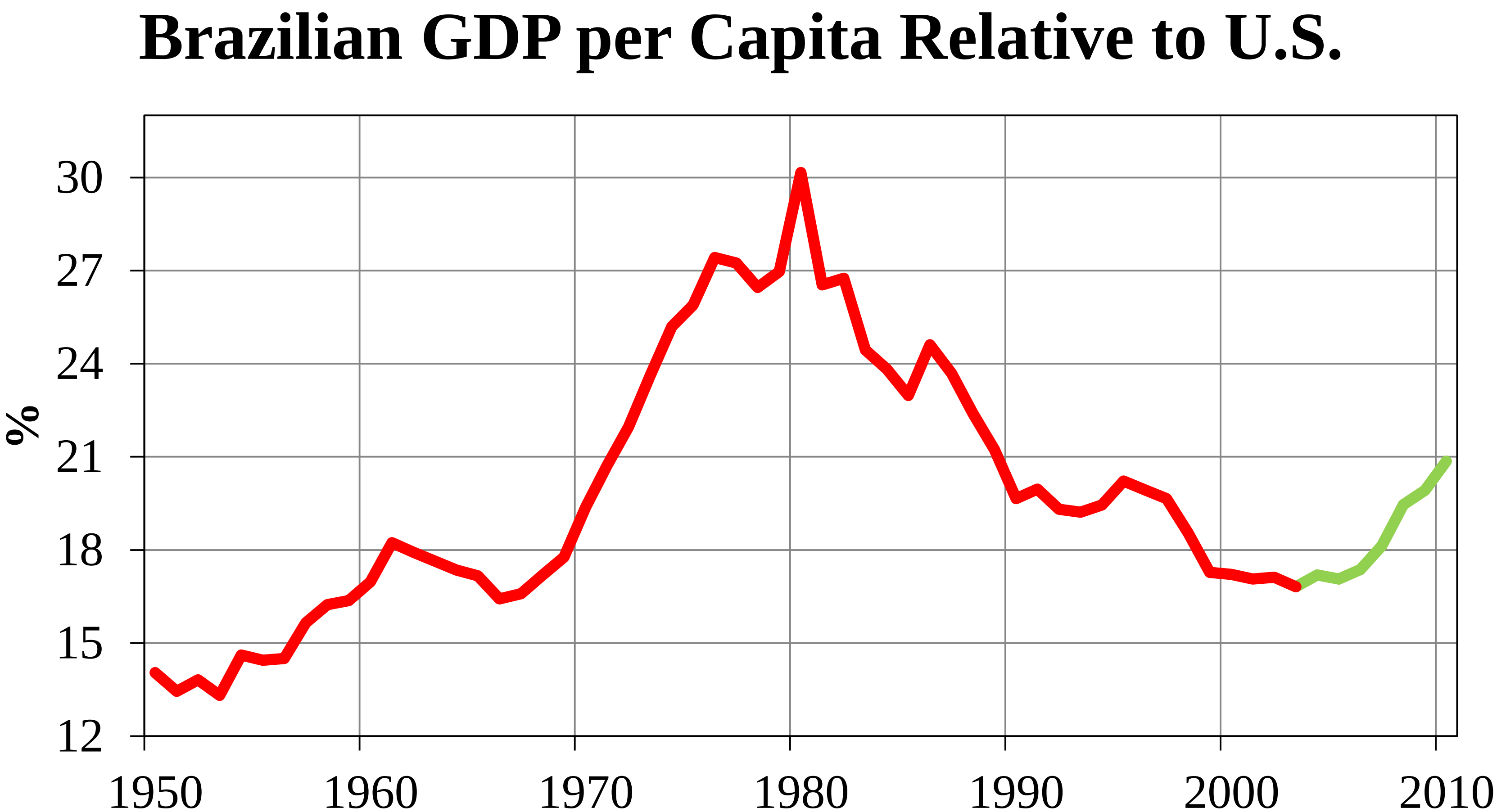
Impressive: Does it Continue?

No: Lost Ground 2008-2003

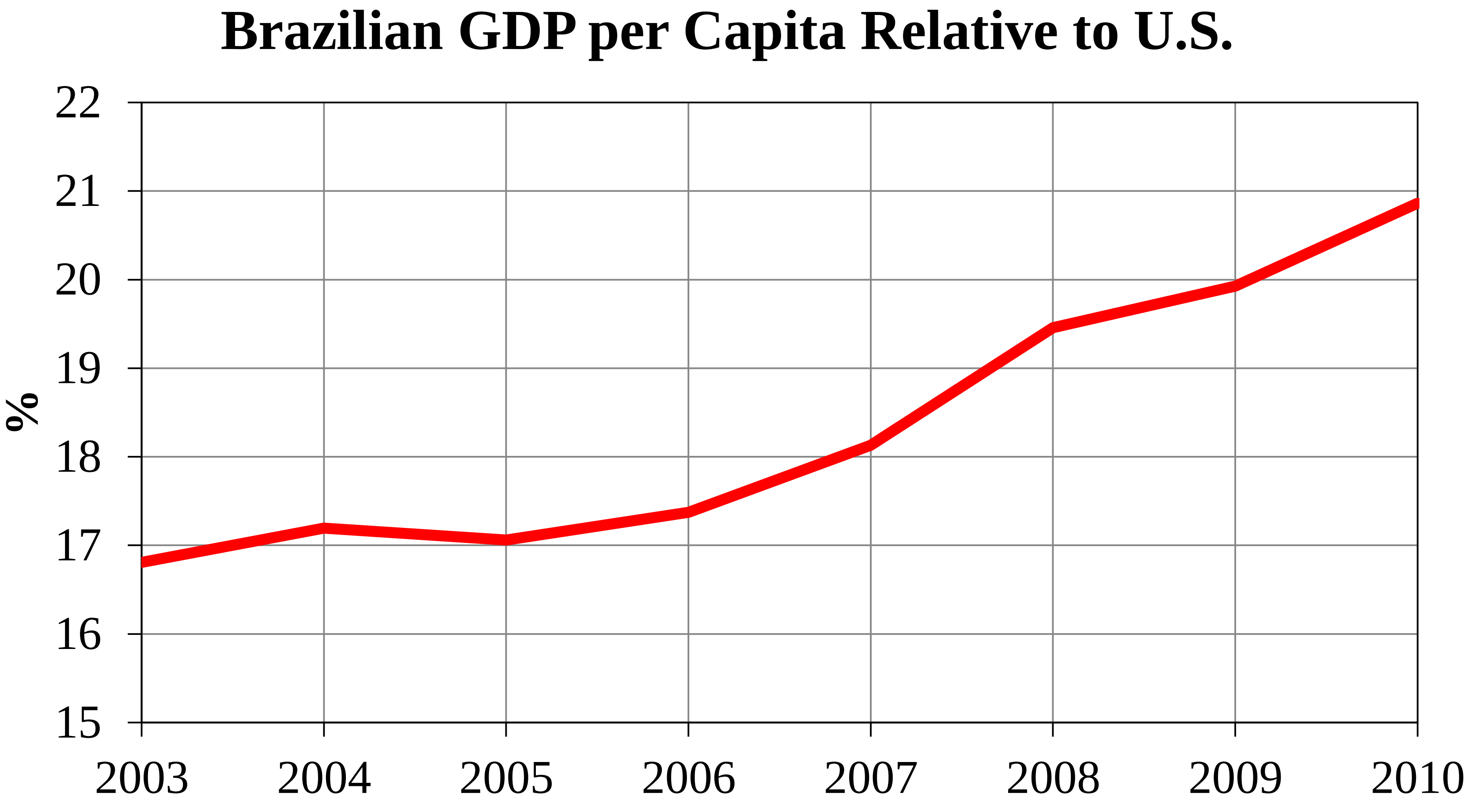


How has Brazil been doing recently?

2003-2010: Catch Up Resumed?

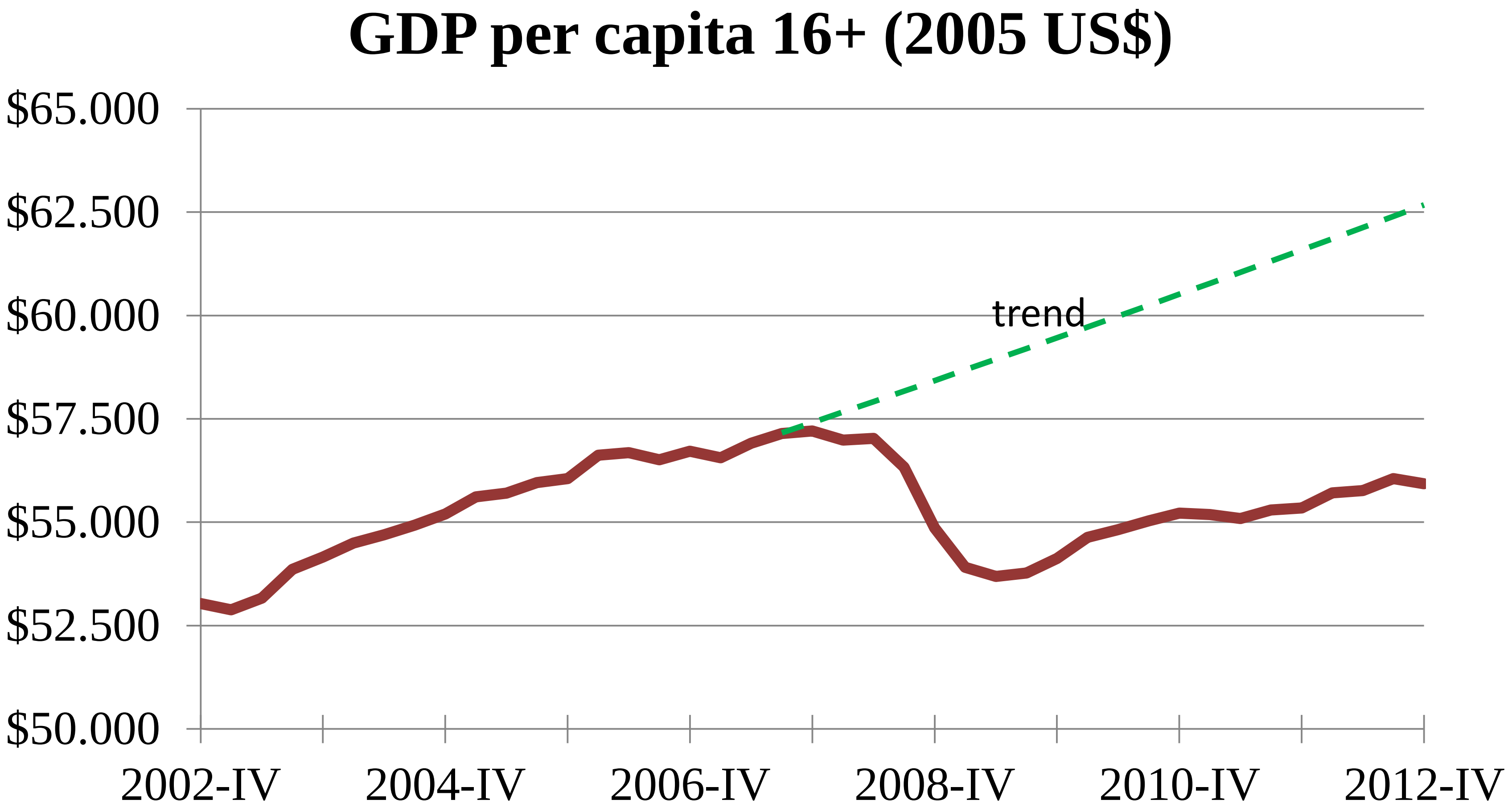


2003-2010: A Closer Look

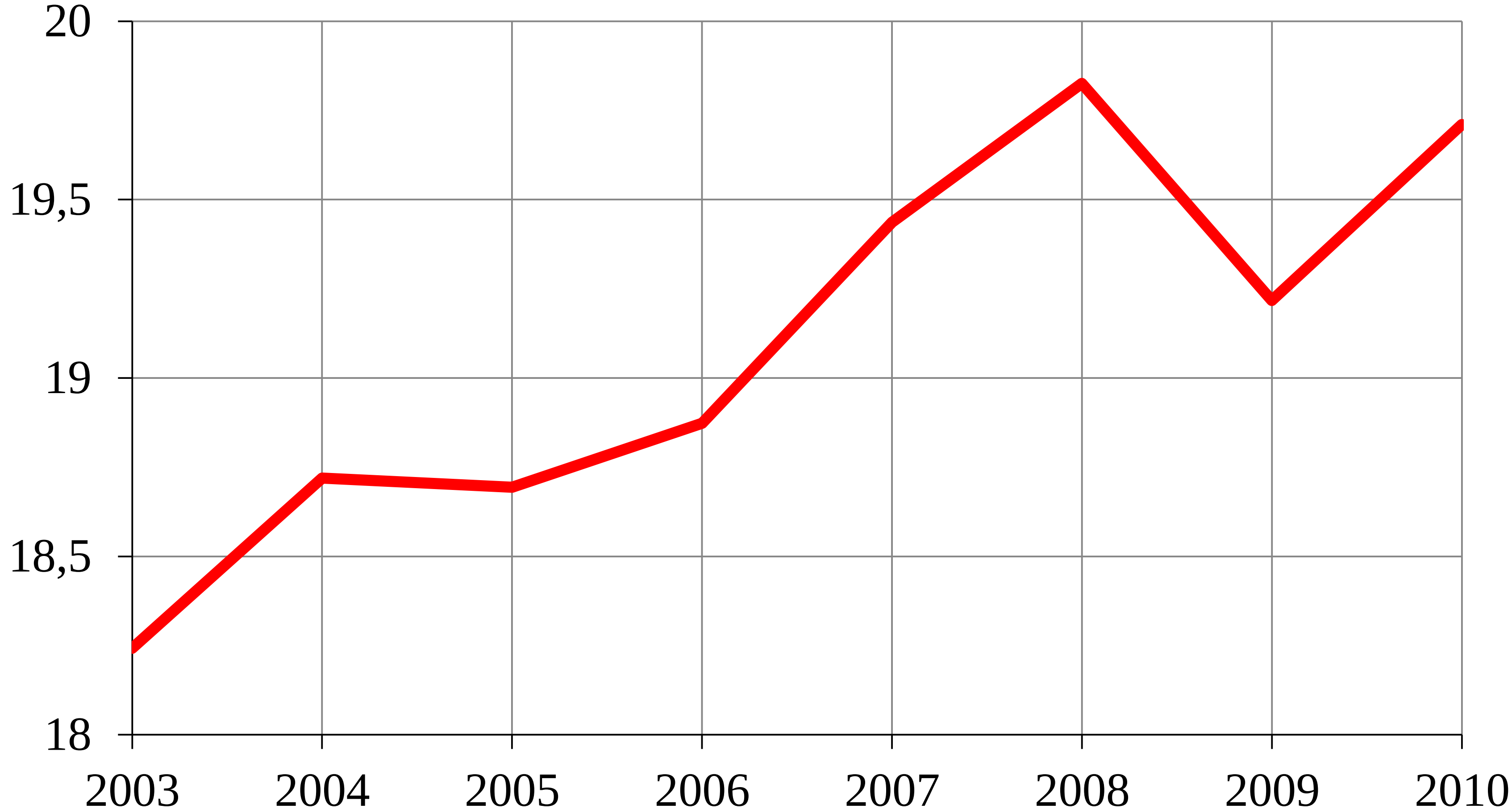


Has Brazil Been Doing Extremely Well or Has The U.S. Been Doing Poorly?

U.S. Has Been Doing Poorly

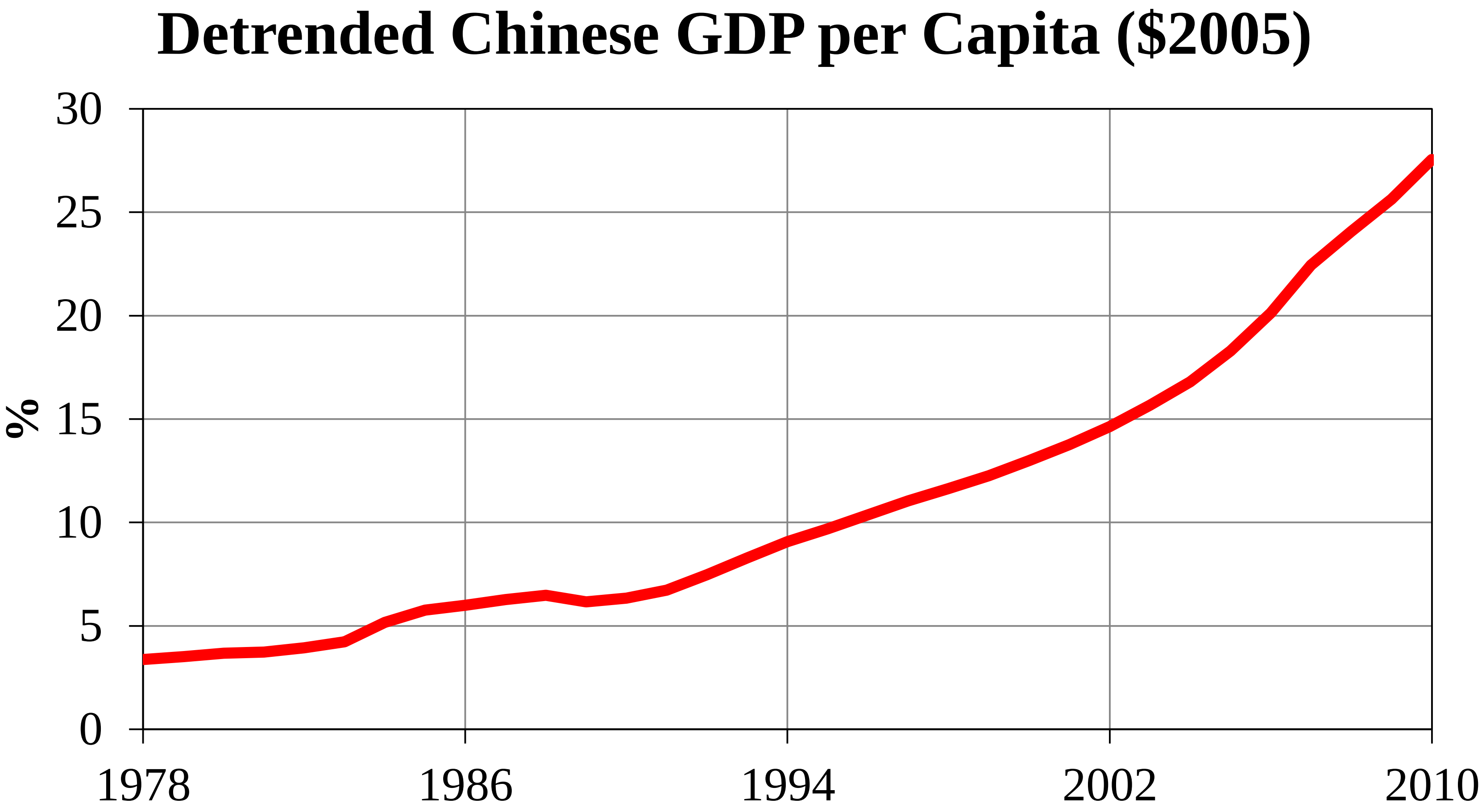


2003-2010: GDP per Capita Relative to US Trend in %



Comparing Brazil to China

China Catches Up To and Overtakes Brazil



What Should Brazil Do?

- Decentralized
  - More state rights for the Brazilian states
- Let the states governments compete to better serve the Brazilian people
- Have more great multinationals like Vale
- Cut expenditure and tax rates
- Get rid of industrial policies
- Set up a better system to finance retirement. Follow Australia with mandatory savings and annuitization upon retirement