

Macroeconomics

Methodology

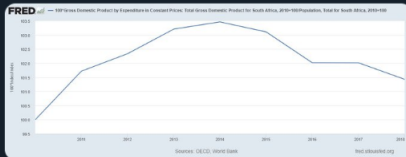
Nicola Viegi

January 2020



Noah Smith @Noahpinion · Jan 16

Wow. South African real per capita GDP has apparently been shrinking since 2014. Are South Africans really getting poorer??



80

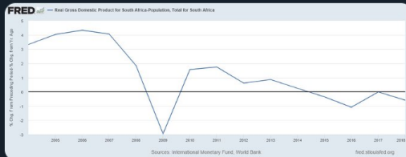
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196



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Alternative measures of GDP seem to agree - South Africans are getting poorer.



8

22

56



Noah Smith @Noahpinion

In fact just eyeballing it, it looks like South Africans actually have lower average standards of living than before the Great Recession. That's beyond "recession", that's a lost decade. What the heck is going on in South Africa??

What is This Course About?

- ▶ Economic Growth
- ▶ Unemployment
- ▶ Fiscal Policy
- ▶ Monetary Policy
- ▶ Crisis

Learning to "Think" Macroeconomics.

Course Plan

1. The Methodology of Macroeconomics - Models and Reality
2. Some Fundamental Relationships - Trend and Cycle in the Macroeconomy
3. Economic Growth Theory and Growth Policies
4. Unemployment - The Long and the Short of It
5. Macroeconomics of the Short Run - Boom, Bust and Back
6. Fiscal Policy
7. Monetary Policy
8. Economic Crisis

How the Module Will Work

- ▶ Lecture notes and readings will be the main course material. There is no textbook.
- ▶ Available at www.nvieggi.net
- ▶ Additional readings: all linked on the website.
- ▶ Assessment: Coursework 50% (Tutorials, Essay, Class Presentations, Class Workshops), Final Exam 50% .
- ▶ Contacting me: Room 2.05, best way to see me - send me an e-mail (nicola.vieggi@up.ac.za)
- ▶ Mostly the course is not too technical, but I will use algebra when I can (better than English!)

Keeping up with current events and economic analysis

Essential for your professional development

News

<http://www.reuters.com/>

<http://www.ft.com/>

<https://www.businesslive.co.za>

Comments and Research

<http://www.voxeu.org>

<http://www.project-syndicate.org>

<http://krugman.blogs.nytimes.com>

<http://www.zaeconomist.com/>

Institutions

<http://www.worldbank.org>

<http://www.imf.org/>

<http://www.bis.org>

<http://www.reservebank.co.za/>

First: Some Methodology

..In a Nutshell

“Economics is a science of thinking in terms of models joined to the art of choosing models which are relevant. . .”
Keynes (1938)

“God put macro-economists on earth not to propose and test elegant theories but to solve practical problems”
Mankiw (2006)

Argument

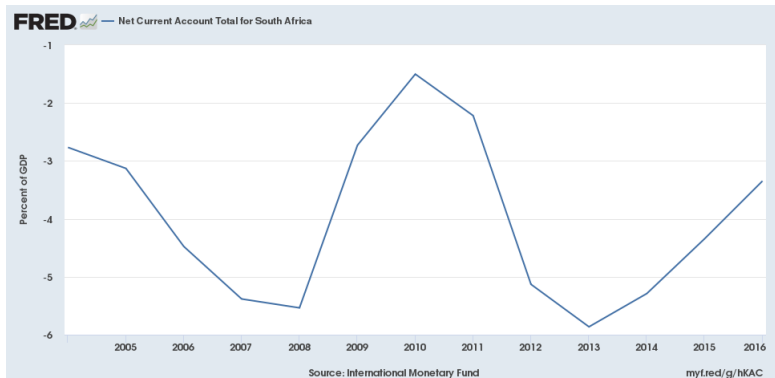
- ▶ Models are key to the “scientific” nature of economics
 - ▶ understand complex social reality by laying bare a very large variety of causal relationships, one at a time
- ▶ Economics advances not by settling on “the model,” but by generating useful collection of models
 - ▶ an inventory of partial explanations
 - ▶ non-universality and context-specificity
- ▶ Models do not require math, in principle
 - ▶ any causal statement contains an implicit model
- ▶ In practice, math often useful to
 - ▶ clarify (and make explicit) the nature of assumptions, relationships, conclusions
 - ▶ ensure conclusions follow logically from assumptions
- ▶ “economists use math not because they are smart, but because they recognize they are not smart enough”

How to figure out the relevant model – the craft of economics

- ▶ Verify critical assumptions
 - ▶ Which assumption really matter for the functioning of the model?
 - ▶ Are other details of reality not considered in the model
Important to understand the mechanism we want to describe?
- ▶ Verify mechanisms
 - ▶ e.g. do firms behave in posited way?
 - ▶ e.g. does exchange rate respond to capital inflows?
- ▶ Verify direct implications
 - ▶ e.g. does employment really respond negatively to (exogenous) increases in wages?
 - ▶ e.g. does investment rise with capital-account liberalization?
- ▶ Verify incidental implications (comparative statics)
 - ▶ e.g., do firms pass on cost increases in full?
 - ▶ e.g., does investment respond to exogenous flows from abroad (aid, remittances)?

A First Model: Inter-temporal Approach to Current Account

Problem: South Africa Has a Persistent Current Account Deficit



How do we model the problem?

A First Model: Inter-temporal Approach to Current Account

Basic Current Account Relation:

$$CA = (S - I) + (T - G)$$

Reasons for Current Account Deficit:

- ▶ High consumption: perhaps temporary fall in output.
- ▶ High Investment - sustainable if produces higher income in the future
- ▶ High government spending (or fall in taxes) - twin deficit hypothesis

Private Sector's Inter-temporal Choices Determine $(S - I)$

Government Inter-temporal Choices Determine $(T - G)$

Expectations of future events play an important role

A Two Periods Model

▶ Assumptions

- ▶ Two periods, Small Open Economy - World Ends after period T
- ▶ Income is "Manna from Heaven"
- ▶ Consumer can Borrow or Lend in International Capital Market
- ▶ Consumer Not Permitted to Die in Debt
- ▶ Interest rate and Subjective Discount Rate Constants
- ▶ Representative Agent (one person per country)
- ▶ No Uncertainty

A Two Periods Model

Consumer Problem

$$\max U(C_1, C_2) = u(C_1) + \beta u(C_2)$$

subjected to the following budget constraint

$$C_1 = Y_1 - S_1$$

$$C_2 = Y_2 + (1 + r)S_1$$

which reduces to the following:

$$C_1 + \frac{C_2}{1 + r} = Y_1 + \frac{Y_2}{1 + r}$$

Solution Using Lagrange Multiplier

$$L(C_1, C_2, \lambda) = u(C_1) + \beta u(C_2) + \lambda \left[Y_1 + \frac{Y_2}{1+r} - C_1 - \frac{C_2}{1+r} \right]$$

First Order Conditions:

$$\frac{\partial L}{\partial C_1} = u'(C_1) - \lambda = 0$$

$$\frac{\partial L}{\partial C_2} = \beta u'(C_2) - \frac{\lambda}{1+r} = 0$$

$$\frac{\partial L}{\partial \lambda} = Y_1 + \frac{Y_2}{1+r} - C_1 - \frac{C_2}{1+r} = 0$$

From which

$$\frac{\frac{\partial L}{\partial C_1}}{\frac{\partial L}{\partial C_2}} = \frac{u'(C_1)}{\beta u'(C_2)} = \frac{\lambda}{\frac{\lambda}{1+r}}$$

$$\frac{u'(C_1)}{u'(C_2)} = \beta(1+r)$$

First Implications of the model

Assuming $u' > 0$ and $u'' < 0$, this result implies:

- ▶ if r increases, $u'(C_1)$ must increase relative to $u'(C_2)$ - C_1 must fall relative to C_2
- ▶ An increase in impatience, a reduction in β , produces the opposite result
- ▶ if $\beta = (1 + r)^{-1}$, $u'(C_1) = u'(C_2)$, hence $C_1 = C_2$ - Consumer tends to smooth consumption

Substituting this last result in the budget constraint we have:

$$C_1 = C_2 = \frac{(1 + r) Y_1 + Y_2}{2 + r}$$

Defining the Current Account

- ▶ Consumer tends to smooth consumption - but income is exogenous. International borrowing and lending to move income intertemporally
- ▶ First period

$$CA_1 = Y_1 - C_1 = B_2$$

- ▶ Second Period

$$CA_2 = Y_2 + rB_2 - C_2$$

$$CA_2 = Y_2 + r(Y_1 - C_1) - C_2$$

$$CA_2 = -(Y_1 - C_1) = -CA_1$$

- ▶ Implications:
 - ▶ if a country run a current account deficit, it is infact borrowing from abroad
 - ▶ A country in current account deficit in period one need to have a current account surplus in the future to pay back the borrowing in period one

Adding Government (Balance Budget)

$$G_1 = T_1, G_2 = T_2$$

$$C_1 + \frac{C_2}{1+r} = Y_1 - G_1 + \frac{Y_2 - G_2}{1+r}$$

$$CA_1 = Y_1 + rB_1 - C_1 - G_1 = B_2 - B_1$$

How does the presence of the Government affect private consumption?

$$C_1 = C_2 = \frac{(1+r)(Y_1 - G_1) + (Y_2 - G_2)}{2+r}$$

for any Y and G (if $\beta = (1+r)^{-1}$)

Temporary increase in public expenditure

$$(G_1 > 0, G_2 = 0)$$

Private sector smoothing behaviour makes very important the distinction between temporary and permanent changes, or shocks.

$$C_1 = C_2 = \frac{(1+r)(Y_1 - G_1) + (Y_2)}{2+r}$$

if $Y_1 = Y_2$, in absence of fiscal expenditure, the current account will be always in equilibrium.

$$CA_1 = Y - C_1$$

$$CA_1 = Y - \frac{(1+r)(Y - G_1) + (Y)}{2+r}$$

$$CA_1 = -\frac{(1+r)G_1}{2+r} < 0 = -CA_2$$

Current Account Deficit in the first period, CA surplus in the second.

Macroeconomic Theory for the Long Run

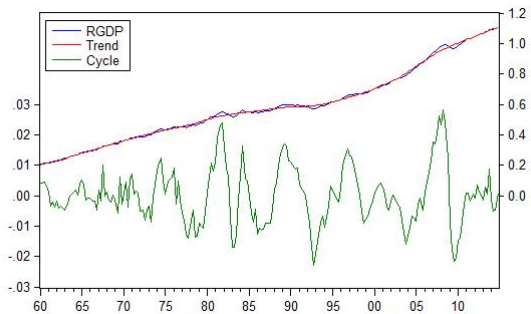
Growth Theory and 'Natural Rate' Theory

- ▶ seeks to explain the underlying long run trends in macroeconomic aggregates and how these trends may be influenced by structural economic policy
- ▶ Key assumptions in long run theory:
 - ▶ all prices are fully adjusted
 - ▶ expectations are correct
 - ▶ there are no (recurrent) exogenous shocks
- ▶ Taken together, these "as if" assumptions imply that employment is at its natural rate, that economic activity is determined solely from the economy's supply side, and that the economy evolves smoothly over time.

Macroeconomic Theory for the Short Run

(Business Cycle, Fiscal and Monetary Policy,

- ▶ seeks to explain the short-run fluctuations in macroeconomic aggregates around the long run trends and how these fluctuations may be dampened by macroeconomic stabilization policy
- ▶ Key assumptions in short run theory:
 - ▶ Exogenous (stochastic) shocks to demand and supply
 - ▶ Nominal rigidities
 - ▶ Expectational errors
- ▶ These assumptions imply that output and employment may (and generally do) deviate from their natural rates and that economic activity is determined by aggregate demand as well as by aggregate supply



Next Time - Economic Growth

READ

Easterly "The Elusive Quest for Growth" Chapters 1
and 2