ECON 6470 Economic Growth and Development Midterm Exam v.3 Spring 2014

The Midterm exam is due Friday March 28th on turnitin.com. Everyone should answer questions 1 and 2 (note that sections in italics are PhD student only). Case study Figures and Tables should be clearly labeled with sources of data. Include Tables, Figures and references you refer to in the text of your answer as a powerpoint or a word file presentation, starting with the growth performance of your country (at least sigma and beta convergence). Check the calendar for information on how to scan your exam if you have hand drawn figures or equations.

B-1.* Convergence vs. endogenous growth:** "Convergence" in per capita income across regions or countries occurs when poor countries grow faster than rich ones. In a sense this is what development economics is about, how can poor economies "catch up" with richer economies. **(a)** Conditional convergence is a robust and widely accepted result of growth empirics (see Sala-i-Martin's" or the Barro and Sala-i-Martin, 2006 (Bsim) Introduction). a) Using the lecture notes and/or evidence presented Acemoglu Chapter 1 ; Sachs and Warner (1996) Fischer (2003) or Dollar (2001) or BSIM Chapter 11 put together some examples of absolute and conditional convergence. Intuitively why is it important from a policy point of view to find absolute opposed to conditional convergence? Why is does finding absolute convergence for an arbitrary geographical region (the world, States or provinces within a country, or continental Europe different for finding convergence among OECD countries? Within the U.S. and China for example we have a free trade and a common currency, is this is what is required to achieve absolute convergence globally? Given the results of Levine and Renelt 1992 for example, or Barro, 1997, what seems to be the minimum necessary precondition for absolute convergence? Distinguish between β and σ convergence. Which implies the other? Find a picture from the lecture notes that (b) During the past 13 years the World has experienced absolute convergence (see Figure C-2 below), offer some explanations of why. Make the case for and against absolute convergence continuing to Acemoglu and Robinson, 2012, Subramanian, 2012 Eclipse and Rodrik, 2013 and perhaps to Shanta D. for Africa. (c) Use the Solow-Swan growth rate diagram levels diagram (as in Sachs, et al. 2004) and two Inada conditions to i) explain why the Solow-Swan model implies absolute convergence; and ii) to rule out poverty traps and iii) to rule out endogenous growth (and create a steady state income level). Is conditional convergence strong evidence for exogenous growth as Sali-i-Martin claims in "15 years of growth theory? That is, is it possible to have both conditional convergence and endogenous growth (give an example)? In terms of policy implications, how is conditional convergence similar to a poverty trap model? ***PhD students: *If not convergence, what fundamentally distinguishes endogenous from exogenous growth models? Use one of the Inada conditions and the CES model (see BSIM chapter 1, page 68) to briefly and clearly explain the fundamental difference between endogenous and exogenous growth model.*

B-2 Case study data, Institutions and Poverty Traps: (a) Identify your peer and comparator case study countries using the case study spreadsheet. If your want to use a more recent base year for your case study, use this spreadsheet, Eastern Europe data for example, starts in 1990. Start a powerpoint presentation by pasting growth rates and a plot of relative per capita incomes for 3-5 of your peer countries (that fit on the same graph—see Figure P-6). (b) Referring to Figure C-2 (Absolute Convergence, big time) and the supporting data file, are your case-study-peer countries above or below the blue line? *Look at the net barter terms of trade from the WDI and/or exports as a share of GDP, did your country benefit or lose from higher commodity prices?* Compare it performance 2000 to 2013 with previous the 1980 to 1990 period, using real per capita GDP or GDP as a % U.S. Did you country share in Africa, Asia and or Latin America's booms? Based on what you know now so far, are there any evident reasons for this change in performance? (c) Steady state or not? Use the data in Appendix C plus Hall and Jones 1999 in this spreadsheet to compute the steady state in 1997 for your country (and also 2008/09 if possible using PWT TFP) (d) Case study part: Gather some evidence on the quality of institutions in your countries. Use the Jones chapter 3 spreadsheet to compute a steady states for a few of your peer group countries. Would an increase in education, savings, institutions or TFP to U.S. levels significantly increase y* for your countries? Are productivity levels (TFP or A) moving in the right direction for your country (see the PWT 8.0 estimates or Hall & Jones, 1999 or Bosworth and Collins or in the World Bank Doing business, or the World Bank's CPIA (ODA countries only) See also Kaufmann

and Kraay (2011), or try the Lagatum Prosperity Index (not sure about this one) or in Africa, in the Mo Ibrahim Foundation Index. **(c)** Is or has your country ever been caught in a poverty trap as indicated by a long period of slow or negative growth? Demand side or supply side? If yes, how was this poverty trap overcome? If your country has not been in a poverty trap, discuss the case of Haiti: referring to the steady state calculations shown in the Jones spreadsheet and the Solow income levels diagram, explain why the steady state calculation for Haiti are consistent with a poverty trap model. Given Danner's history of Haiti, has integration and geography treated these two countries equally? Provide a poverty trap interpretation of Haiti's high steady state compared current output ratio (about 3 see the Jones spreadsheet). What is Collier's "pre quake" plan for Haiti's recovery? Is this plan consistent with the "weak institutions" levers for growth cited by Johnson et al. 2006? **(d)** Based on you preliminary analysis and other studies, what do you think is or will be the binding constraint on growth? For better or worse, El Salvador is a classic case study, see the original 2005 paper, Rodriguez's comment and the recent USAID update. If you have a growth miracle country, go to section next section. *(d) Refer to the arguments of Lucas "Making a Miracle" and McLeod and Mileva (2011) regarding inter-sectoral shifts and growth surges (relating China's green revolution, driven by "institutional change" to migration to the cities, and growth with a large trade surplus. Was your countries growth surge driven by integration, institutions or geography?*

3. Institutions and Economic Policy: Acemoglu, Johnson and Robinson or AJR (2001) reach a discouraging c onclusion: long-lived institutions determine growth some or more in that they remains good predictors of which countries grew rich and which are poor. **(a)** Why do they AJR consider the "reversal of fortune" a "natural experiment? What do Rodrik and Subramanian (2003) or AJR (2004) mean when they claim institutions are the "fundamental" cause of economic growth? Briefly describe Hall and Jones' (1999) measure of institutions or "social infrastructure" and the role it plays in their "augmented Solow" model of income levels (see Jones chapters 6 and 7). **b)** In Second Best Institutions (or see AER version in JSTOR) and "Growth strategies" Rodrik distinguishes between "stimulating" and "sustaining" growth. What policies "stimulate" growth in Chile and Uganda for example? Enlarge this list using the "levers for growth" article by Johnson, Ostroy and Sumbramanian (2006). Use growth Strategies and Hausmann, Hwang and Rodrik (2005) to sketch elements of a broad consensus on trade and growth. How is this consensus consistent with R&R (2000) R&S (2003) and/or Rodrik (2006)? What is the difference between using a weak real exchange rates vs. tariffs in encouraging rapid traded goods growth, for the country (China) and for the world? (c) Poverty traps: The Dominican Republic and Haiti share the same island, given Danner's history of Haiti, has integration and geography treated these two countries equally? Provide a poverty trap interpretation of Haiti's high steady state compared current output ratio (see the Jones spreadsheet). What is Collier's plan for Haiti's recovery? Is his plan consistent with the "weak institutions" levers for growth cited by Johnson et al. 2006?

3. Education and growth: **(a)** Adding human capital or education to the "augmented" Solow model greatly increases explanatory power of the model for income levels fixing what limitation Solow-Swan model emphasized by Lucas, 1988). *How well does the augmented Solow model fit the data on income levels (see* (see Mankiw-Romer-Weil Tables I & II)*?* Jones, 2001 add education in chapter 3, Figure 3.1 but complains the fit is still not good enough? What is missing in Figure 3.1? (b) How does Jones fix this problem in Chapter 7 (see Figure 7.3 and pages 137-38* as in Hall and Jones, 1999 with A for all countries, or the published QJE version). What additional role does education play in Jones' Chapter 6 model? Use the Villanueva model to interpret Jones Chapter 6 model. (c) For your case study countries put together some data on education and growth using Edstats Barro and Lee data. Did Education seem to lead growth or follow growth in your countries? Use the Jones chapter 3 spreadsheet to compute a steady states for a few of your peer group countries. Would an increase in education, savings, institutions or TFP to U.S. levels significantly increase y* for your countries?

Long-run growth chart: See the figure below for India(light blue) China (red) the U.S., the UK, Argentina (small yellow) and Zambia (dark blue) made using gapminder desktop. Then use screen capture to copy/paste into Word 2007 and then crop/adjust using picture tools. Try this for your case study cty or we can save this for the final exam case study. You can make these charts online at http://www.gapminder.org/ or download gapminder desktop so you can make and save charts on your computer (see downloads section of web page)

Figure B-1 Beta convergence per capita growth minus USA rates averaged by decade, 1990 to 2011

(PWT 8.0 per capita Chained expenditure side real GDP growth rates)

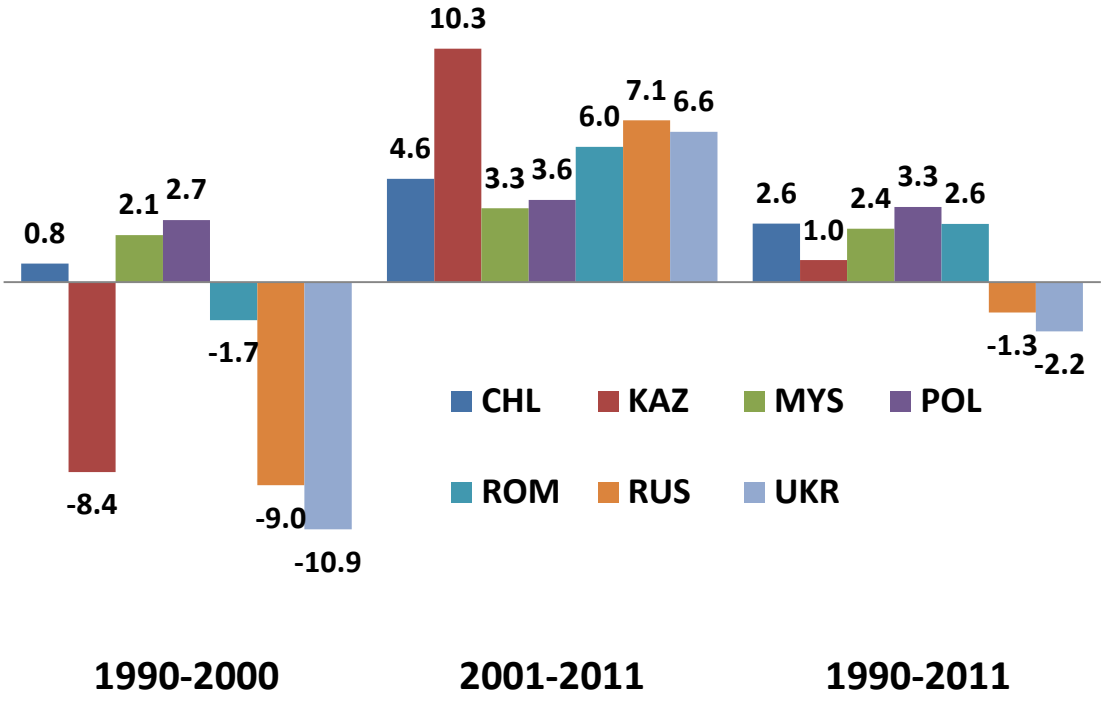
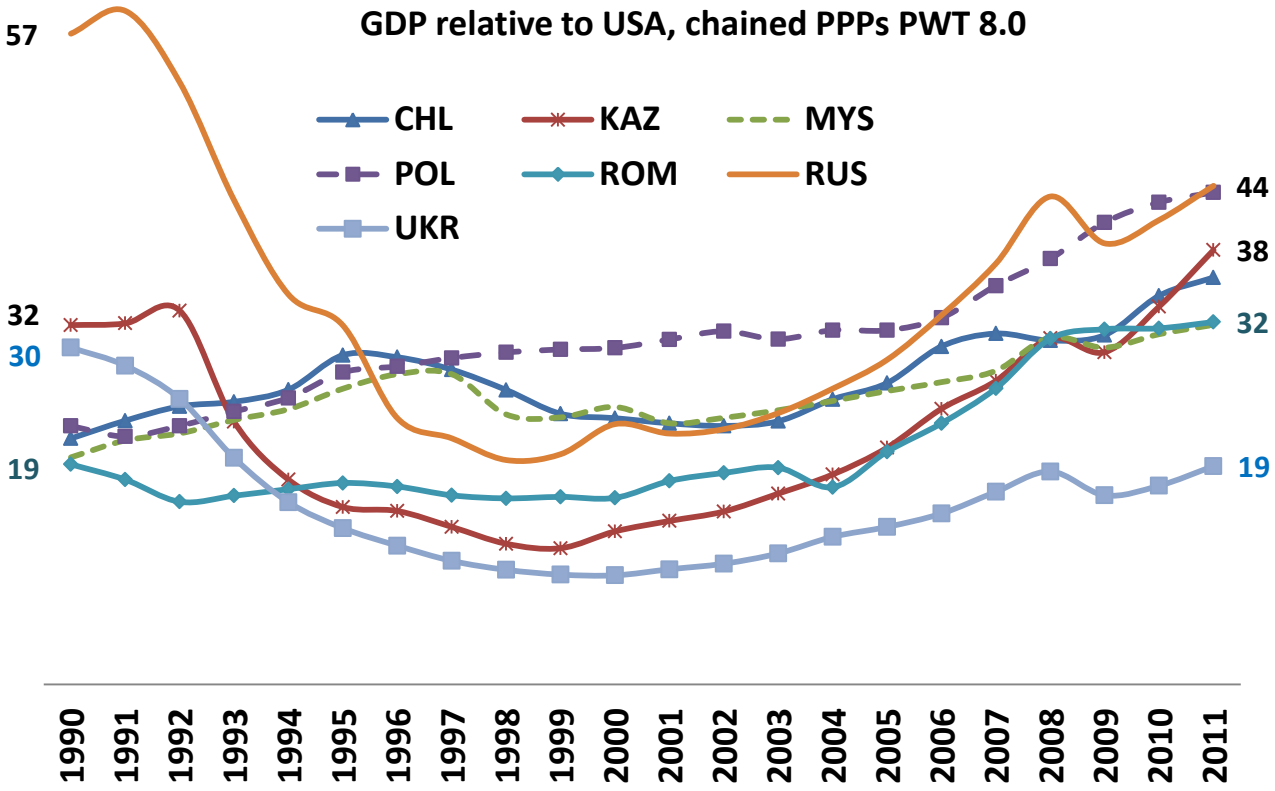
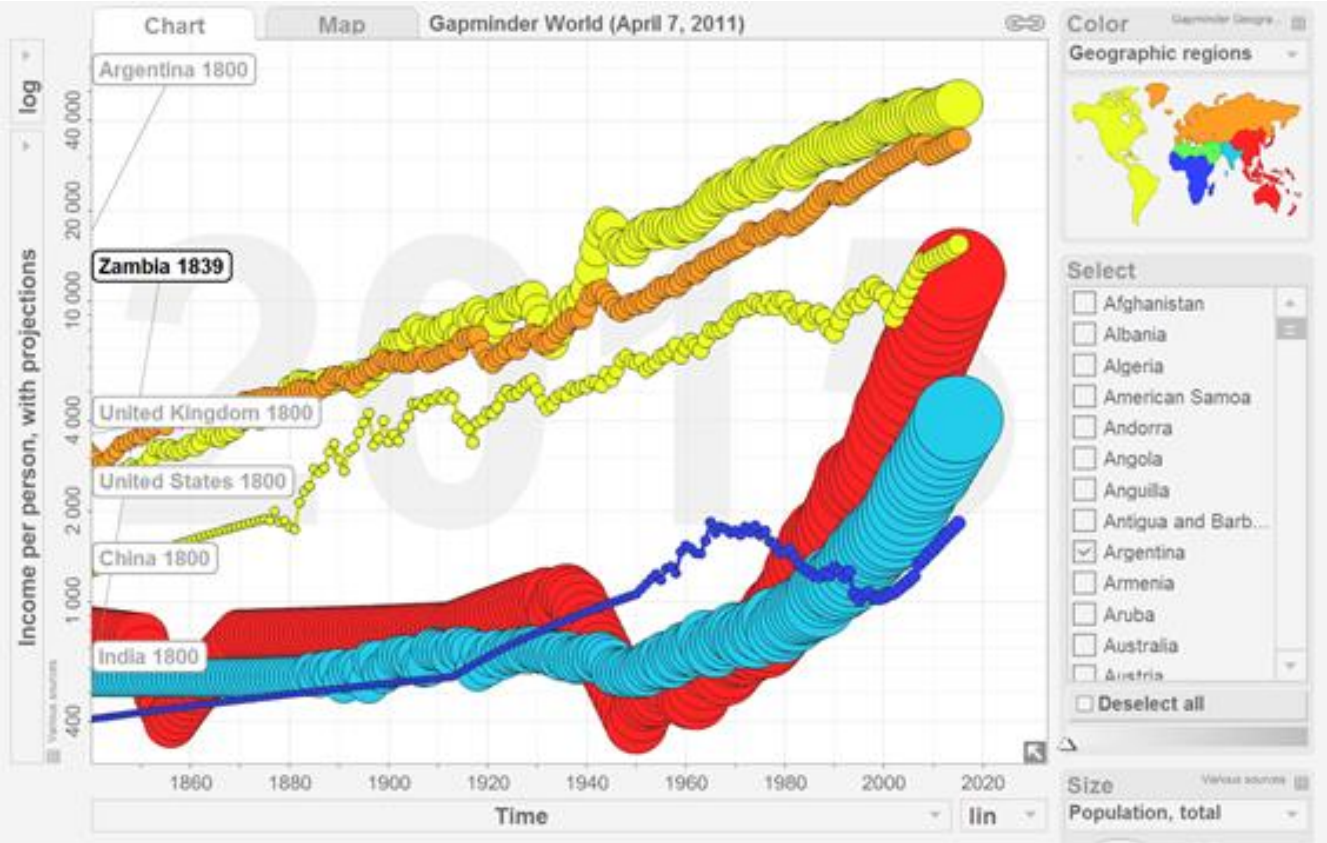


Figure S-2: Sigma Convergence for the Ukraine relative Per capita GDP relative to USA, chained PPPs PWT 8.0





Readings on institutions and growth:
http://dev.wcfia.harvard.edu/sites/default/files/Rodrick_Normalizing.pdf
http://ces.univ-paris1.fr/membre/Cudeville/pdf/pdf%20L3/industrial_dvpt_rodrik2006.pdf

Lecture notes growth strategies Understanding Prosperity and Poverty **(AJR, 2006)** **Rodrik (2008)** Second Best Institutions Rodrik (2003) Growth Strategies Dixit, Avansh (2008) Recipes for Success
Rajan and Zingales (2006) "Persistence of Underdevelopment: Institutions, Human capital or constituencies?" NBER Paper #12093 *Powerpoint summary Johnson et. al. (2006) Levers for Growth, F&D March Glaeser et. al (2004) "Do institutions cause Growth?" NBER IMF, WEO April 2003
Institutions & Growth Chapt. 3 Rodrik Getting institutions right: a primer
Acemoglu, Johnson and Robinson (2001) Colonial Origins of Comparative Development AER
AJR (2004) Institutions as The Fundamental Cause of L-R Growth
Acemoglu and Johnson (2005) Unbundling Institutions Journal of Political Economy
Rodrik, Institutions Rule Finance & Development Issue Institutions Rule: Longer paper
Edison, H. How Strong are the links? Acemoglu (2008) Intro to Modern Econ Growth Chapter 1

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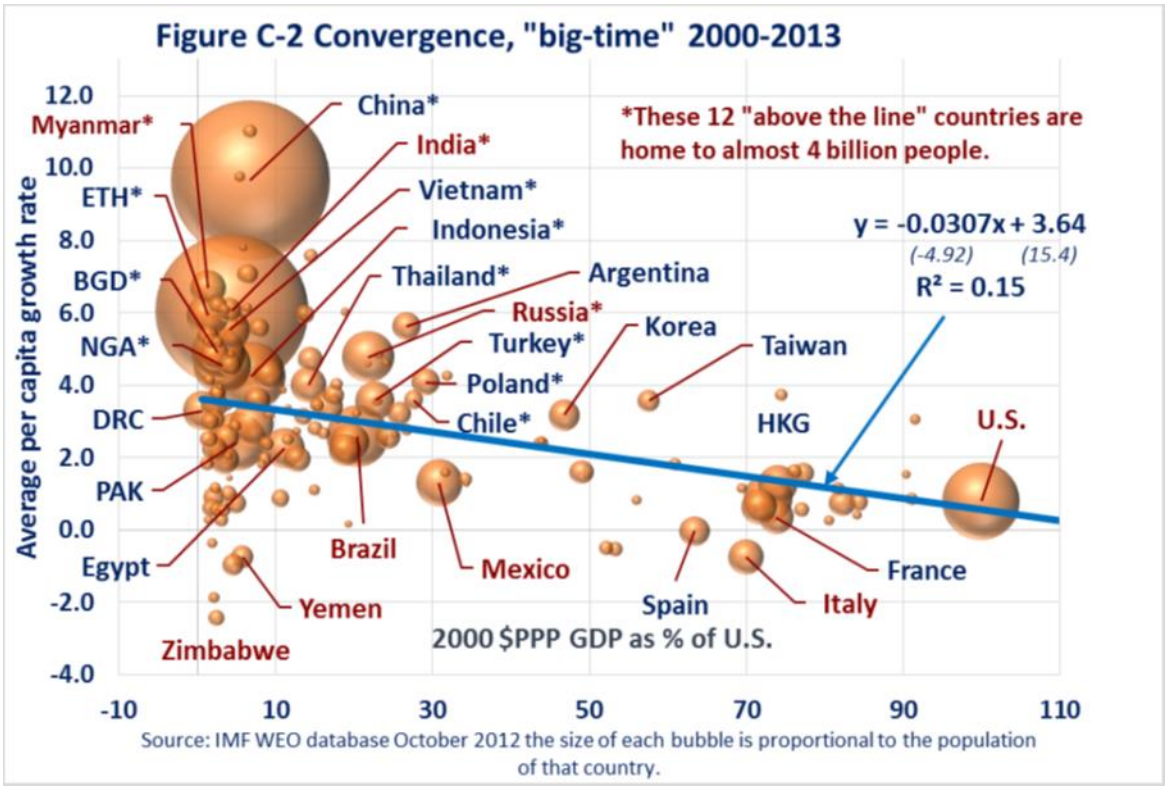
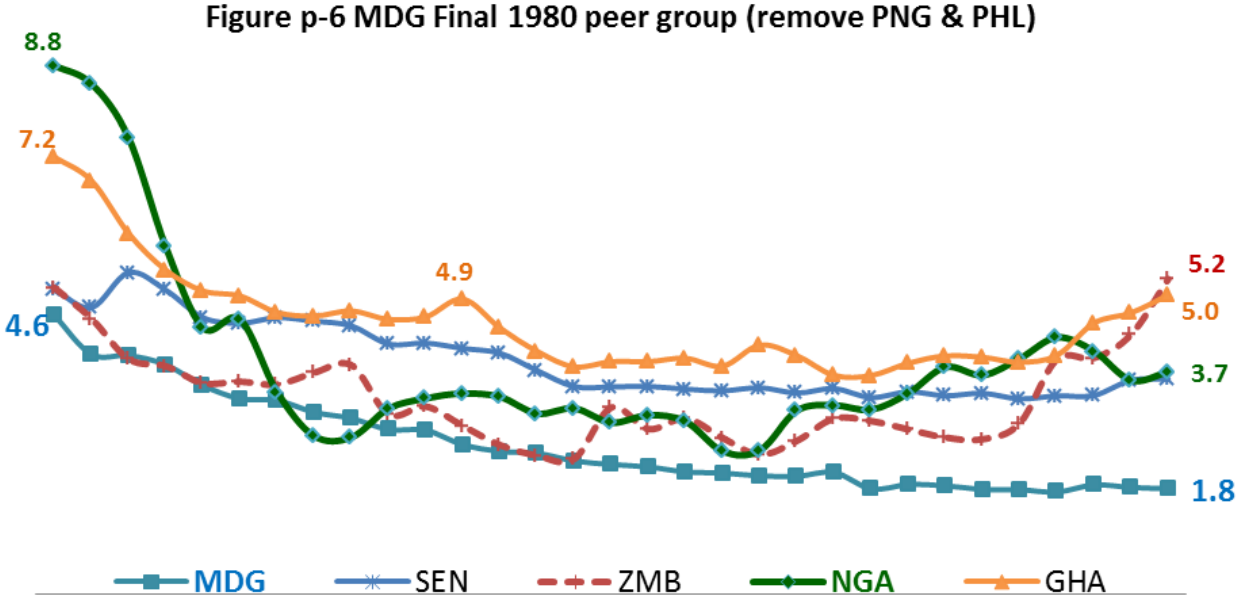


Figure p-6 MDG Final 1980 peer group (remove PNG & PHL)



Source: Heston, Alan, R Summers & B. Aten (2012) PWT v7.1 Center for International Comparisons, Univ of Penn, November, https://pwt.sas.upenn.edu/php_site/pwt_index.php