ECON 6470 Final Exam Review Questions Spring 2017 v 1 Spring 2017

In class final Exam: May 10th at 7:30pm: Answer and F-2 in class using supplemental materials turned in before or prior to the exam (Figures, Tables, lists of equations or references, no sentences or text please). To save time, please turn in your topic review or case study slides with Figures, Tables and references. Presentations will be graded on format and content, always list cast study or topic review references in standard format at the end of your presentation (see supplemental materials below). Check back here for examples of case study and topic presentations after May 6th. Let me know if you need references for the questions below before you take the final exam.

Question FE-1 Population growth, migration and Economic growth; A) in the standard Solow-Swan model rising population growth leads to lower growth, show this and explain the intuition behind this result. Contrast this result with that of Kremer (2003) or the GMR (2016) population growth dividend. Low population growth can also lead to secular stagnation, explain with reference to Summers and Alvin Hansen (look for formal models0 of this. B) What does **Deaton 2013** argue was the greatest intellectual error of the 20th century? Use the 2016 World Bank GMR Chapter 5 and models from one of our texts to argue that an increase/decrease in population growth will slow or increase economic growth. Which story fits the standards Solow-Swan model best, illustrate this story using standard growth Solow diagram (be sure to distinguish between long term and transitional growth). How might these results differ **(C) PhD students:** use B&S, 2004 (2nd ed) in the CD reader or Aghion and Howitt, 2006 or Jones and Volmort (2013) 3rd edition to present the key equations* of a model where population growth increases economic growth. How does this take place? Does speed of converge or gender play a role? Compare migration with a "natural" increase or decrease in population growth. *as long as they are in word format, submitted before the exam, you can bring numbered equations printed the exam and refer to them in the text of your answer (do prepare text in advance). D) **Masters Students:** Find your case study country or countries in WB-IMF, 2016 Table C.3 Economies by World Bank Group classification and demographic typology (page 216). Discuss the potential effect of population growth on growth in your country over the next 30 years (see Bloom and Canning or see the Appendix of WB-IMF, 2016. Discuss the role of remittances or migration in your country's growth (if any). See for example the debate over guest workers and aid to Haiti and discuss the wisdom of the Turkey/Australia solution to the refugee crisis.

Question FE-2 (PhD students) Growth, convergence and poverty traps answer parts a-c and part d or e. part F is optional: The idea of "convergence" or that poor countries grow faster than wealthier countries important implications for development policy**. (a)** Use the Solow-swan ***growth rate diagram*** to illustrate absolute vs. conditional convergence. Briefly summarize the empirical evidence absolute vs. condition convergence since 1960 and 2000. *In this context, explain how the augmented Solow model solves many of empirical limitations of the Solow model raised in Lucas, 1988.* **(b)** Sachs et al. 2004 outline three poverty trap models involving savings, population growth and minimum thresholds capital per worker. Draw these poverty traps using the standard Solow-Swan Diagram. Show briefly how the Inada conditions rule out at least one of these poverty traps. Write down some Inada like conditions that give rise to poverty traps (multiple steady states) e.g. $y \rightarrow 0$ $s(y)$ $y \rightarrow 0$. *Write down or illustrate graphically one demand side poverty trap used to make a case for NAFTA and other free trade agreements? How does trade liberalization lead to higher productivity in this framework? Who pays the cost of trade liberalization?* **(c)** Discuss the implications of poverty traps and conditional convergence for development policy using Absolute convergence as your benchmark. **(d)** Outline in equations and diagrams a hybrid "CES" and a two sector model that leads to both convergence and endogenous growth. Use the Inada conditions to show that both of these models are violate basic assumptions of the Solow-swan model. (e) Briefly show graphically now an increase in the savings rates affect long and short-run

growth in the Solow model. Write down a learning by doing model in which savings affects long term and short term as in Villanueva, 1994. Use the Inada conditions to show this is still an exogenous growth model. Briefly then what distinguished exogenous from endogenous growth models. ***F) Optional EC: Secular stagnation:*** Show that given golden rule growth rate g* and when consumers maximize $U(C) = \frac{(C^{1-\theta}-1)}{1-\theta}$ and ρ is rate of discount assume that 1/θ = 2 and ρ = 3 and g = 1 show that r must be greater than 1 (recall the optimal/modified golden rule growth rate for the AK model where A = r). If this is just an efficiency condition, why is Piketty worried about r > g? What secular trends drive g down and r according to Summers or Piketty, why does this have negative implications for inequality and society? Why are Mankiw, 2015 and Weil, 2015 less concerned with increases in β = K/Y?

Population & Growth References (see also texts from Syllabus):

Bloom, D., and D. Canning. 2004. "Global Demographic Change: Dimensions and Economic Significance." In Global Demographic Change: Economic Impacts and Policy Challenges, proceedings of a symposium, sponsored by the Federal Reserve Bank of Kansas City, Jackson Hole, Wyoming, August 26–28, 9–56.
http://www.populationmedia.org/wp-content/uploads/2008/07/david-bloom-population-and-economics.pdf

Kremer, Michael (1993) "Population growth and technological change: one million BC to 1990." *The Quarterly Journal of Economics* 108, no. 3 (1993): 681-716.

World Bank/IMF (2016) Global Monitoring Report 2015/2016 (pdf) Development Goals in an Era of Demographic Change. Washington, DC: World Bank. License: CC BY 3.0 IGO

FE-3 Foreign capital, growth and convergence is a point of debate for globalization and finance (foreign aid) skeptics. The impact of international foreign exchange flows of all types, from private lending to FDI to aid inflows are subjects of intense debate. FE3A) Use the Solow model Figure 4 below (from Blair Henry, 2007) to discuss how financial liberalization (banks and stock markets) and/or capital account openness affects growth and income per capita (see Henry's 2007 JEL survey). Do we know whether financial development and capital inflows causes rather than follow economic growth? Why are why not*? Optional Please briefly summarize the evidence presented in the "meta-analyses" of private capital flows Cline (2010).* FE-3B) Phd Students: review the econometric evidence on the direction of causality of financial development or capital inflows (or ODA) see Roodman, 2008)? *See Aghion & Howitt Chapt 11, p. 239 and/or the growth econometrics handout, & Roodman, 2008)*. Use Lucas Lectures Chapter 2 page 68 to derive the MPK = r*/α point on the Figure 4 below. *How can specific models of finance or capital inflows and growth help us identify the direction of growth (recall the Levine lectures, and of course the Roodman critique of the Levine Studies…). What other approaches help us identify the direction of causality (see the growth econometrics handout). C) Masters students:Discuss and provide evidence regarding aid or capital inflows and growth in your country or countries. How did aid or capital inflows contribute to growth (look at the contribution of TFP, capital investment and labor/human capital if possible). Can you separate out the effects of capital inflows or outflows and trade? D)* **Aid and growth (optional):** For at least sixty years Peter Thomas Bauer and new Angus Deaton and Bill Easterly have argued ODA does not help and indeed impairs the development prospects of poor countries. D-2 Use the Galiani et al. 2014 or 2016 to update the meta study by Mekasha and Tarp (2013) and the Mozambique case study to discuss the role of aid in economic growth. What are the risks for foreign aid inflows? Use the recent paper by Galiani et al 2016 to update the "meta" literature review by Mekasha and Tarp (2016). Why has it been so difficult to show aid affects growth? Relate the Dutch Disease to the negative effects of aid on growth. Has this been a problem in Africa since Gleneagles in

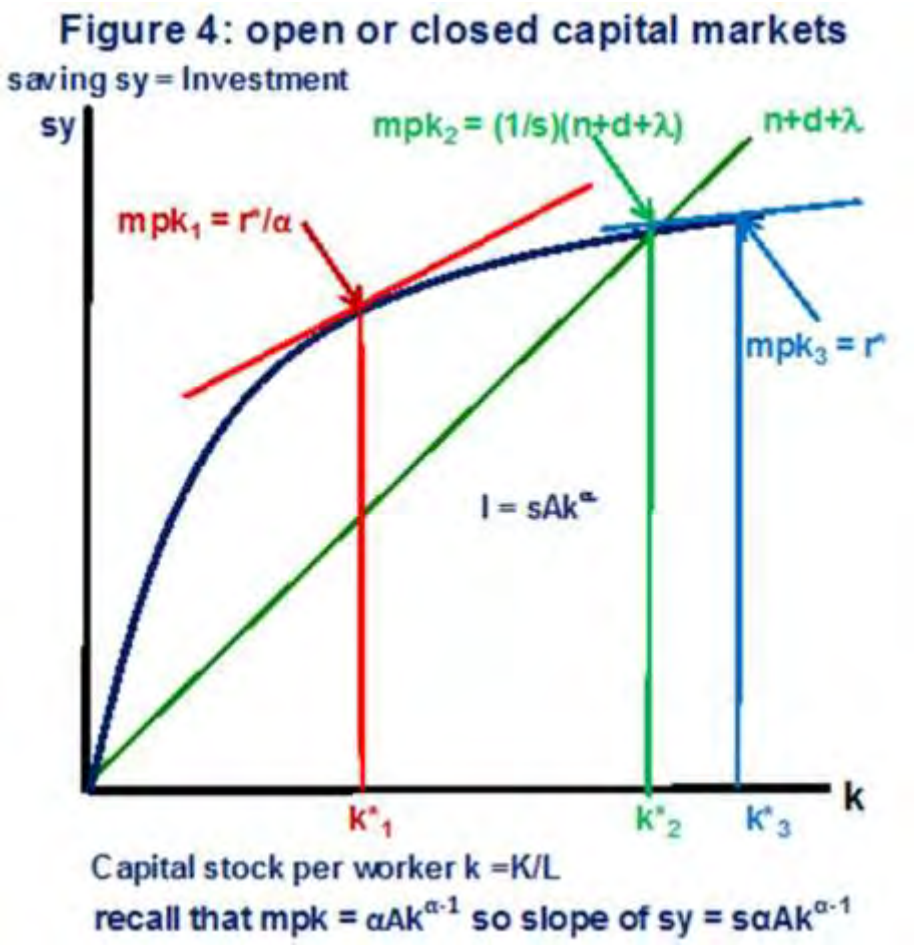
2008 (Live Aid 2008). D-3 What role have capital inflows or outflows or ODA flows played in your case study countries growth (or lack of growth).

F-3 Aid References:

Galiani, Sebastian; Knack, Stephen; Xu, Lixin Colin; Zou, Ben. 2014. *The effect of aid on growth : evidence from a quasi-experiment*. Policy Research working paper ; no. WPS 6865; Impact Evaluation series ; no. IE 125. Washington, DC: World Bank Group.

Jemaneh, Mekasha, Tseday Jemaneh & Finn Tarp (2013) Aid and Growth: What Meta-Analysis Reveals, *The Journal of Development Studies,* 49:4, 564-583, DOI: 10.1080/00220388.2012.709621

Agenor, 2004 2nd Edition, Adjustment and growth: Chapter 16: Aid Adjustment and External Growth



FE-4. Empirical Evidence on* Growth and convergence** "Convergence" in per capita income across regions or countries occurs when and if poor countries grow faster than rich ones. Globally and nationally this is what development economics is about: how can poor economies "catch up" with richer economies. A) Summarize Baldwin;s argument regarding convergence. Can you use PWT 9.1 to confirm his result? Is TFP converging too? **(B) *Conditional convergence is a robust and widely accepted result of growth empirics (see Sala-i-Martin's or Barro and Sala-i-Martin, 2006 (Bsim) Introduction). Use old lecture notes and/or evidence presented Acemoglu

Chapter 1 ; Sachs and Warner (1996) Fischer (2003) or Dollar (2001) or BSIM Chapter 11 to list three different examples of absolute and conditional convergence (six in total). *Clearly number your growth rate and initial income figures. Why is finding absolute convergence for a more geographical region (the world, States or provinces within a country, or continental Europe) different than finding convergence among OECD countries for example?* C) Briefly mention why conditional vs. absolute convergence have different implications ofr development policy? Given the results of all of the above authors Levine and Renelt 1992 for example, or Barro, 1997, what seems to be the minimum necessary precondition for absolute convergence? (hint: the augmented Solow model or Lucas, 1988). Is conditional convergence strong evidence for Solow-Swan exogenous growth as Sali-i-Martin claims in "15 years of growth theory? Hint: can we have both conditional convergence and endogenous growth? **PhD students** Use one of the Inada conditions and the CES model to illustrate the fundamental difference between endogenous and exogenous growth models (see BSIM chapter 1, page 68*).* D) PhD students only: Use Figures C-2 and C-3 below or here to distinguish between β (beta) and σ (sigma) convergence, which implies the other? Galton's Fallacy makes it necessary to check both beta and sigma convergence, explain clearly and briefly? *The difference between Masters and PhD students? Answer: Masters actually have to read/listen to Piketty*[1]*… Masters students: Piketty takes absolute convergence as a given, using the reversal of fortune and post WWII Europe as examples, provide some quotes demonstrating his view. Does he think foreign aid will be necessary to achieve convergence? Please use brief quotes with page numbers… PhD students: include the formal definition of both types of convergence, review Danny Quah's 1993 divergence big time argument. Was he wrong? How do we know or not know? MA Students only: show sigma vs. beta convergence for your case study country or countries in a figure if possible. Explain briefly why Figures B-1 and S-2 here also illustrate beta and sigma convergence?* E) EC *PhD students: use and econometrics package (Eviews, Stata, what else?) and the Jones Appendix C data set 2nd or 3rd edition to determine what is necessary to obtain conditional convergence circa 1960. 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).*

FE-5 Credit, inequality and growth: The potentially growth reducing impacts of inequality can in principle be mitigated by credit or redistribution: poor nations/households can in principle borrow from rich nations house/households. However, credit markets have been disappointing and inherently inefficient since they involve a promise of future payment leading to incentive problems (moral hazard and adverse selection). The good news is that redistribution via transfers/taxes seems be less problematic than thought (witness falling inequality with higher growth in Latin America). (a) Use the Solow model diagram for two households to demonstrate and provide an intuitive explanation of why transfers to the poor increase both the *growth rate* and the *level of income* in the model with imperfect credit markets as presented in see also Garcia Peñalosa Aghion, Chapter 1 of Aghion and Williamson, 1999. Anticipate (explain) the empirical evidence on inequality and redistribution presented in Ostry et al. 2014 with reference to Barro (2008), Aghion et al., 1999 and other articles reviewed in the lecture notes Why is redistribution redundant with perfect credit markets? Why don't credit markets work well in developing countries, including Nogales Mexico? *Relate this to the Debt Overhang (lecture notes) and see part D of F-4 below. B)* PhD students only present a model using equations to explain why credit markets are imperfect, and why debt relief can help developing countries, see Aghion and Williamson, 1999 or the debt overhang notes above. C) Masters students only: Find a growth incidence curve that illustrates your countries experience with inequality, keep this inequality data a growth incidence curve, or a Gini coefficient for your case study. *You can find inequality data in povcalnet.org.* D) *Optional: In honor of*

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1 This is actually not true, Capital is too long, Piketty says so in the Boston AEA web cast… use reviews of Capital and the first chapter and Piketty's own presentations and summary here the Kindle version is very handy, I am sure capital is also online as a pdf someplace… no need to feel sorry for Piketty, his both editions of his book are still quite expensive on Amazon… though there are used copies now…

the Sen lecture, present some evidence regarding Gender bias in your country. For this you can use the WDR, 2012 gender, Gender Stats Edstats or Barro and Lee (education is one of main indicators of mass participation in economic progress, unfortunately coverage and indicators are uneven, let me know if you help with this one, send me an email with your key countries). The 2013 GFDR (not 2014) suggests an expansion of private credit as share of GDP reduces inequality (see Figure 1.1 page 20). Is there any evidence of this in your case study countries? Private credit data in the WDI or World Bank Global Development Finance data base.

FE-6 Trade, FDI and Growth: See the updated Trade and Growth Lecture notes and the fixed Open Economies handout. Even skeptics of trade's ability to increase economic growth such as Rodrik admit that export processing zones and a weak RER has been "levers for growth" for many countries, including China and Vietnam. A) Despite a strong correlation it has been surprisingly difficult to demonstrate a causal link between trade and growth.[2] Briefly, why might trade stimulate growth (hint: demand side poverty traps). Masters students briefly describe a model in which trade reduces or increases growth (we discussed several models in class, including the classic Sachs and Warner paper, as updated by *while PhD students write down equations for two growth* models one in which higher tariffs raise growth and one in which higher tariffs increase growth, providing an intuitive explanation of both outcomes (see Rodriguez & Rodrik 2000 (R&R) or Sachs and Gallup, 1999 or Basu and McLeod, 1992 or Mileva and McLeod 2011). What is the difference between tariffs and a weak RER? In your view does the success of Asian exporters validate low inequality and industrial policy? Recall the consensus view of integration presented by Rodrik in Growth Strategies. How did Asian economies capture the best of free trade and self discovery (industrial policy). *B) Briefly summarize this 2nd & 3rd round evidence in response to such as Warner, 2003 R&R's (2001) argument that trade does not increase growth.* (C) **Masters students only:** Use the MIT Observatory of Economic complexity (or the WDI or PWT 8.1) plot trade/export growth for your case study country. *(D) Optional: PhD students only: do what you can with the Challenge question in the Growth in Open Economies handout*. (E) *Optional anyone if you have time: did an increase in trade or openness to FDI boost growth in your country or countries? If possible plot the net barter terms of trade from the WDI online and/or the real exchange rate from the WDI-IMF REER series or the USDA ERS Macro database). Has your country used the RER as a lever for growth longer term? Should it or can it? Explain.*

FE-7: Document the African growth miracle. How do we know growth accelerated in Africa? In particular, mention night time lights and DHS wealth measures and see comparable HHS data below.

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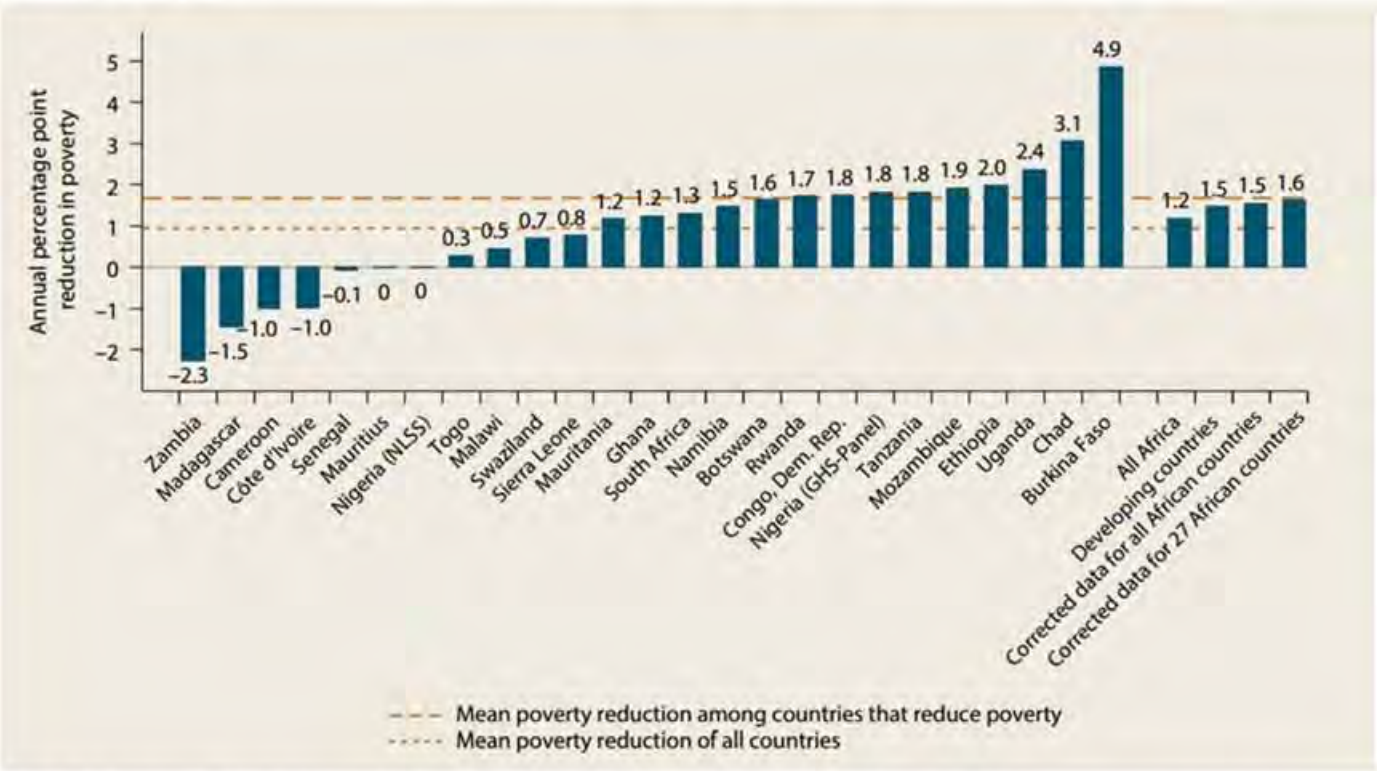
[2] Meaning how and why trade can be a "policy lever for growth" (or not) sometimes. Why does reducing barriers to trade increase growth and lead to convergence in some models, while in other models reducing trade barriers reduces growth. Why? Link your discussion to one of the models reviewed in class (R&R, 2000 or Sachs and Gallup or Basu and McLeod, the handout version, or McLeod and Mileva, 2011). For example, Sachs and Warner (1995) test four barriers to trade. Sachs and Gallup (2001) and Frankel & Romer, 1999 look at distance as a barrier to trade. Later Warner uses tariffs only. Basu and McLeod (1992) add a tariff to an endogenous growth model. McLeod and Mileva, 2011 at focus on the real exchange rate as barrier to trade... Describe a trade and growth model where barriers to trade reduce growth and one where it increases LR growth. Give an intuitive description or a model discussing/showing why barriers to trade increase or reduce growth in each case.

***Please check to make sure your African country is in this chart. Otherwise the quality of HH income data, inequality etc. is questionable… hopefully one of your peer or comparator countries is here.

FIGURE 2.2 Analysis based only on comparable surveys suggests that poverty reduction in Africa was faster than previously thought



Source: Data for individual African countries are from World Bank Africa Poverty Database. Developing country data are from PovcalNet.
Note: Positive values denote a reduction in poverty, while negative values denote an increase. The survey years are as follows: Botswana (2002 and 2009), Burkina Faso (1998 and

https://openknowledge.worldbank.org/handle/10986/22575

F-5 Bonus Question (answer online or in class if you can) The World Bank-IMF 2016 Global Monitoring Report *Development Goals in an Era of Demographic Change* identifies two potential demographic dividends. The first has to do with the share of working age population and is transitory and positive and negative. In contrast according to the GMR as summarized on page 14, "*As changes in the age structure expand production and resources, a second demographic dividend may arise as savings build up and greater investment is possible in human and physical capital. The bonus provided by the first dividend is transitory, while the second dividend produces lasting benefits in the form of greater productivity growth and enhanced sustainable development. Yet, these outcomes are not automatic—they depend on effective policies. The two demographic dividends thus represent an opportunity—and not a guarantee— of greater prosperity and improved living standards."* (a) Focusing on the 2nd dividend use the growth theory we have studied in this class to discuss how even a permanent increase in savings may have only transitory effects on growth rates (unless we believe in endogenous growth models). Can increased savings or human capital investment have permanent effects on long term growth in an exogenous growth model? Explain (hint: one of hybrid models discussed on the midterm and in the Agenor chapter on Human capital and economic growth). Why does economic growth increase permanently in this case? Suppose this effect works in receiving countries, but we see the opposite effect in sending countries (a brain drain?). What would the effect of migration be on convergence in this case? Contrast with the textbook case where n rises in rich countries and falls in the migrant sending country? What can skilled migrant exporting countries do to reverse this effect (China, India and South Africa are doing this). Finally discuss how return migration of skilled migrants is can accelerate convergence and global growth… (b) If you have not already, discuss how the 1st Demographic dividend relates to modern migration and asylum policies, why might this be more important to Germany or Japan than the U.S., UK or Italy? Briefly explain why immigration tends to increase TFP and native wages whereas greater exchange of goods as opposed to people, may not (see Hausmann or Peri and Shih on this). Discuss how the 1st Demographic dividend could in fact contribute to long term growth and global convergence.

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Collier, Paul (2013) Exodus: How Migration Is Changing Our World, Oxford: Oxford University Press, 2013.

Cortés, Patricia and José Tessada (2011)"Low-Skilled Immigration and the Labor Supply of Highly Skilled Women," *American Economic Journal: Applied Economics*, 3 (3), 88–123.

Table 2A: NYU Law School report on ICE Apprehensions

New York City[1/] 2006 to 2010[2/]

	# of Appre-hensions	Share Apprended	Share FB Share	Excess Share deported	2012 FB share[3/]
Mexico	6795	20	5.8	14	5.7
El Salvador	3375	9.8	0.9	8.9	1.2
Dominican Rep	3038	8.8	12	-3.1	13
Ecuador	2590	7.5	4.5	3.0	4.0
Guatemala	2229	6.5	0.7	5.8	0.9
Honduras	2219	6.5	1.1	5.4	1.0
Jamaica	1900	5.5	5.6	-0.1	5.6
Colombia	1028	3.0	2.4	0.6	2.5
China	940	2.7	8.9	-6.2	9.4
Guyana	715	2.0	4.5	-2.5	4.4
Cuba	707	2.0	0.6	1.4	0.5
Trinidad & Tobago	697	2.0	3.0	-1.0	2.9
Haiti	490	1.4	3.1	-1.7	3.1
Peru	429	1.2	1.1	0.1	0.9
Pakistan	389	1.1	1.2	-0.1	1.3

1/ By borough: Queens 34%;Brooklyn 29%; the Bronx 19%, Manhattan 14%

2/ Reported apprehensions from October 2005 to December 2010.

3/ Source: Occhiogrosso-Schwartz Joshua (2012) page 7.

http://immigrantdefenseproject.org/wp-content/uploads/2012/07/NYC-FOIA-Report-2012-FINAL.pdf

Please correct this reference: Angrist, Joshua D.and Pischke, (2014). Mastering 'Metrics: The Path from Cause to Effect (p. iv). Princeton University Press. Kindle Edition. “Applied econometrics, known to aficionados as ’metrics, is the original data science. ’Metrics encompasses the statistical methods economists use to untangle cause and effect in human affairs. Through accessible discussion and with a dose of kung fu-themed humor, Mastering ’Metrics presents the essential tools of econometric research

F-6 Dutch Disease, Middle income Traps and Growth (not a question this year, but let me know if you are interested)

Frankel, J. A. (2010). The natural resource curse: a survey (No. w15836). National Bureau of Economic Research.

Collier, P., & Goderis, B. (2009). Commodity Prices, Growth, and the Natural Resource Curse: Reconciling a Conundrum. http://users.ox.ac.uk/~econpco/research/pdfs/CommodityPricesGrowthV1-1.pdf

Sachs, Jeffrey, 2007, "How to Handle the Macroeconomics of Oil Wealth," Ch. 7 in Escaping the Resource Curse, edited by M.Humphreys, J.Sachs and J.Stiglitz (Columbia University Press: NY), pp.173-193.

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Sarraf, Maria, and Moortaza Jiwanji. October 2001. "Beating the Resource Curse: The Case of Botswana." Environmental Economics Series Paper No. 83. T

Galiani, Sebastian, Stephen Knack, Ben Zou, Lixin Colin Xu The Effect of Aid on Growth: Evidence from a Quasi-Experiment NBER Working Paper No. 22164 Issued in April 2016 NBER [3]

3 The literature on aid and growth has not found a convincing instrumental variable to identify the causal effects of aid. This paper exploits an instrumental variable based on the fact that since 1987, eligibility for aid from the International Development Association (IDA) has been based partly on whether or not a country is below a certain threshold of per capita income. The paper finds evidence that other donors tend to reinforce rather than compensate for reductions in IDA aid following threshold crossings. Overall, aid as a share of gross national income (GNI) drops about 59 percent on average after countries cross the threshold. Focusing on the 35 countries that have crossed the income threshold from below between 1987 and 2010, a positive, statistically significant, and economically sizable effect of aid on growth is found. A one percentage point increase in the aid to GNI ratio from the sample mean raises annual real per capita growth in gross domestic product by approximately 0.35 percentage points.

TABLE 3: GROSS OFFICIAL DEVELOPMENT ASSISTANCE IN 2015
Preliminary data for 2015 Source OECD

	ODA USD million current		ODA USD million current			ODA USD million	Percent change
						At 2014 prices & Fx rates	2014 to 2015
	2 014		2 015	Share	Cumm	2015	Change
United States	**31 793**		**33 864**	**22**	**22**	**31 475**	-7.1
Germany	**19 641**		**19 347**	**13**	**35**	23 038	19.1
United Kingdom	**18 809**		**19 917**	**13**	**48**	20 036	0.6
Japan	**15 146**		**15 708**	**10**	**59**	16 930	7.8
France	**11 132**		**12 540**	**8.3**	**67**	13 175	5.1
Sweden	**7 102**		**6 309**	**4.2**	**71**	8 538	35.3
Netherlands	**5 821**		**5 726**	**3.8**	**75**	6 942	21.2
Norway	**4 294**		**5 110**	**3.4**	**79**	5 548	8.6
Canada	**4 330**		**4 286**	**2.8**	**81**	5 015	17.0
Italy	**3 897**		**4 096**	**2.7**	**84**	4 639	13.3
Australia	**3 222**		**4 405**	**2.9**	**87**	3 897	-11.5
Switzerland	**3 575**		**3 603**	**2.4**	**89**	3 799	5.4
Denmark	**2 655**		**3 151**	**2.1**	**92**	3 133	-0.6
Belgium	**1 935**		**2 495**	**1.7**	**93**	2 306	-7.6
Spain	**1 769**		**2 118**	**1.4**	**95**	2 101	-0.8
Korea	**1 993**		**1 938**	**1.3**	**96**	2 097	8.2
Finland	**1 312**		**1 635**	**1.1**	**97**	1 565	-4.3
Austria	**1 215**		**1 239**	**.8**	**98**	1 433	15.6
Ireland	**718**		**816**	**.5**	**98**	831	1.9
Poland	**467**		**473**	**.3**	**99**	557	17.8

References for Final Exam: Spring 2016 Growth and Economic Development F-1 Population Growth Dividends

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http://www.neweconomynyc.org/wp-content/uploads/2014/11/BX3.pdf
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