ADVANCED DEVELOPMENT ECONOMICS FINAL EXAM, WINTER 2002/3

SHORT ANSWER QUESTIONS (worth 7 points each):

Please answer *all* of 4 short answer questions, restricting your answer to *at most* 6 lines each.

1. *Purchasing Power Parity* (PPP) is often used instead of official exchange rates in making inter-country comparisons of per capita income.

(a) Why is it believed that official exchange rates give misleading results? (3 pts)

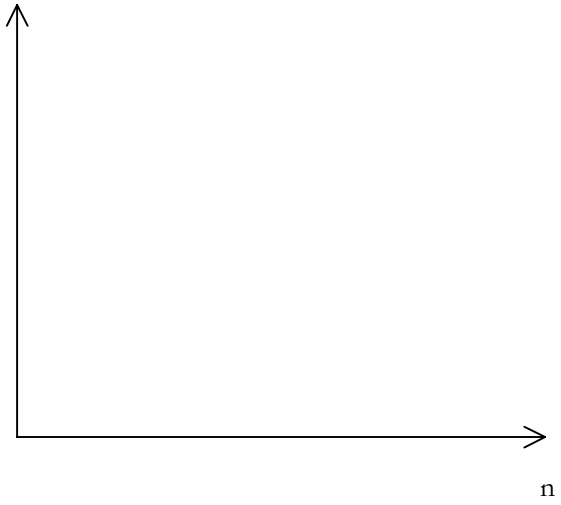
(b) Describe one main criticism of the World Bank's use of PPP in poverty calculations (for example, as described in Reddy and Pogge (2002).) (4 pts)

2. The government of Kenya believes that the country will not modernise unless more people have access to the internet. (Suppose the only way an individual can come online is by having a computer with internet access in their own home.) The Kenyan government therefore introduces a scheme whereby individuals can obtain a home computer and internet connection for a cost of $c>0$. An individual's benefit of obtaining internet access is bn, where $b>0$, n is the number of other individuals who have an internet connection, M is the population of Kenya, and $c<b(M-1)$.

(a) Graph the individual cost and benefit of purchasing a computer as a function of n in the graph below. (2 pts)

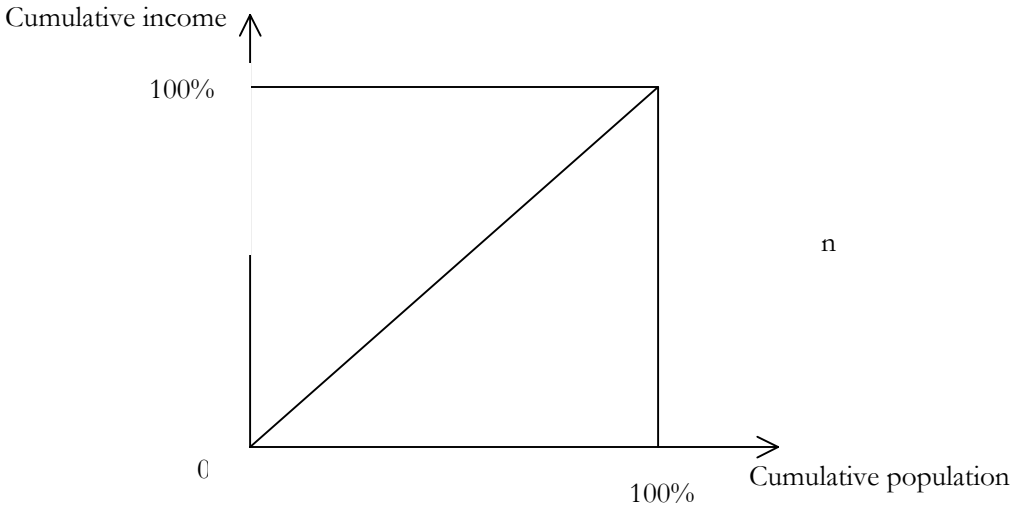
(b) There are two equilibria to this game. What are they? (i.e. how many people purchase computers under the government scheme in each of these equilibria?) There is a critical value of n (call it n^*) above which the economy ends up in one equilibrium, and below which it ends up at the other. Describe this algebraically and label it on the graph. (3 pts)

(c) What policy options exist for the government to get to the 'good' equilibrium? Name at least two possible measures (2 pts).



3. Three people live in the kingdom of Lilliput. All four inhabitants work in the traditional sector, earning □ 100 each.

(a) Draw the Lorenz curve for this economy in the following graph and calculate the Gini-coefficient (2 pts)



(b) Now there a modern sector emerges and one of the inhabitants migrates to this high-wage modern sector, earning □ 500 there while all others remain at □ 100 in the traditional sector. Draw the new Lorenz curve. What can you say about inequality in this economy? (2 pts)

(c) How is your answer to part (b) related to the Kuznet's curve hypothesis? (3 pts)

4. Individuals in a given village have incomes described by the following equation:

$$y = A + \varepsilon + \theta$$

where A denotes risk-free income, ε denotes an idiosyncratic (individual-level) shock and θ denotes a village-level shock.

(a) Suppose full insurance were possible *within* this village. How would this affect individual income? (3 pts)

(b) Name two advantages and two disadvantages of limiting insurance to (within) the village. (4 pts)

LONG ANSWER QUESTIONS (worth 16 points each)

Please choose one question from Part 1 and one question from Part 2.

Part 1

1. Population, growth and gender

The questions in this section refer columns (1) and (5) in Table 2 below.

Table 2: Gender Inequality in Education and Economic Growth

	(1)	(2)	(3)	(4)	(5)
Depn. Variable	Growth	INV	POPGRO	LFG	Growth
Constant	6.33***	3.23	3.74***	4.16***	7.50***
	(3.4)	(0.5)	(4.5)	(4.6)	(4.7)
LNINC60	-1.13***	-0.10	-0.13	-0.18*	-1.21***
	(-5.0)	(-0.1)	(-1.1)	(-1.4)	(-5.3)
POPGRO	-0.55*	-.081			
	(-1.4)	(-0.8)			
LFG	0.62*	2.60**			
	(1.5)	(2.2)			
OPEN	0.007**	0.026**			0.009***
	(1.9)	(1.9)			(2.6)
INV	0.056**				
	(1.7)				
ED60	0.19**	0.64**	-0.03	-0.02	0.23***
	(2.3)	(1.9)	(-0.5)	(-0.6)	(2.5)
GED	12.61***	14.10	-0.86	0.78	14.38***
	(3.8)	(0.9)	(-0.6)	(0.5)	(3.7)
RED60	0.90*	7.44***	-0.29	0.19	1.64**
	(1.3)	(2.7)	(-1.1)	(0.8)	(2.3)
RGED	0.69***	1.28	-0.22***	-0.13*	0.75***
	(3.0)	(1.2)	(-2.4)	(-1.4)	(2.8)
SSA	-1.42**	-5.53***	0.27	-0.10	-1.95***
	(-2.1)	(-2.8)	(1.1)	(-0.5)	(-3.0)
LAC	-1.31**	-4.12**	-0.01	-0.12	-1.58**
	(-1.8)	(-2.1)	(-0.1)	(-0.5)	(-2.2)
SA	-0.46	-5.35**	-0.20	-0.25	-0.78
	(-0.7)	(-2.4)	(-0.9)	(-1.1)	(-1.1)
OECD	0.49	7.89***	-1.23***	-1.64***	0.46
	(0.7)	(3.6)	(-6.1)	(7.5)	(0.6)
MNA	-0.15	-0.44	0.50**	0.25	-0.25
	(-0.2)	(-0.2)	(2.2)	(1.1)	(-0.4)
ECA	-0.77	14.82***	-1.56***	-2.12***	-0.57
	(-0.9)	(5.5)	(-7.1)	(-10.4)	(-0.8)
Adj. R^2	0.61	0.74	0.65	0.71	0.57
Omitted Var. Test	Passed*	Passed	Passed	Passed	Passed
N	109	109	109	109	109

*denotes significance at the 90% level, **at the 95% level, and *** at the 99% level (one-tailed test). Heteroscedasticity adjusted t-ratios in parentheses. Ramsey Reset test is used to test for omitted variables. In the first and sixth regression, the Ramsey Reset test for omitted variables is only passed when powers of the right-hand side variables are considered (not when powers of the fitted values for the

dependent variable, as in all other regressions). In regressions 1 through 5 ED60 and GED refers to the total years of schooling in 1960 and annual growth in total years of schooling of the *male* population 15 and older, respectively. In regressions 6 and 7, it refers to the *average* total years of schooling of the population 15 and above and the growth thereof, respectively. Omitted region is East Asia. LNINC60 refers to the log of PPP-adjusted income per capita in 1960.
Source: Klasen, WBER (forthcoming)

The description of the variables in the table are as follows:

Growth: Average annual (compounded) rate of growth of GDP per capita 1960-1992

LNINC60:	Log of GDP per capita income in 1960.
POPGRO:	Average annual (compounded) rate of population growth, 1960-1992
LFG:	Average annual (compounded) rate of labor force growth (15-64 years), 1960-1992
OPEN:	Average ratio of exports plus imports to GDP, 1960-92
INV:	Average investment rate 1960-1992
ED60:	Total years of schooling in 1960
GED:	Annual (absolute) growth in total years of schooling 1960-1990
RED60:	Female-Male ratio of total years of schooling 1960
RGED:	Female-Male ratio of annual growth in total years of schooling 1960-1990
SSA:	Sub-Saharan Africa
LAC:	Latin America and Caribbean
SA:	South Asia
OECD:	industrialized countries (OECD members as of 1990)
MNA:	Middle East and North Africa
ECA:	Eastern Europe

Please answer the following questions, referring to columns (1) and (5) above.

(a) Is there evidence of convergence? How so? (5 pts)
(b) What is the impact of population dynamics on growth? (5 pts)
(c) What is the impact of gender inequality in education on growth? (6 pts)

When answering these questions, please not only comment on the empirical findings but also relate them to the likely causes of these effects as discussed in the literature.

2. Aid

(a) Using Table 4 and Table 6 below (from Burnside and Dollar (2000), discuss the empirical linkage between aid, policies, and growth. What is the policy implication from these findings for aid growth-enhancing aid allocation.(9 pts)

Table 2. OLS Panel Growth Regressions (including Middle Income Countries)

Time dimension: six four-year periods, 1970-73 to 1990-93
Countries: 56 aid recipients
Dependent variable: Growth rate of per capita GDP

Regression No.	(1)	(2)	(3)	(4)	(5)
Observations	284	287	272	272	267
Constant	2.53	2.62	1.60	.56	.92
	(.65)	(.71)	(.35)	(.12)	(.19)
Initial GDP per capita	-.60	-.60	-.48	-.39	-.44
	(1.04)	(1.15)	(.75)	(.60)	(.65)
Ethnic fractionalization	-.007	-.006	-.006	-.005	-.005
	(.90)	(.81)	(.78)	(.67)	(.66)
Assassinations	-.42	-.45	-.40	-.42	-.43
	(1.50)	(1.63)	(1.45)	(1.54)	(1.58)
Ethnic x assassin	.008	.008	.007	.007	.007
	(1.63)	(1.74)	(1.53)	(1.54)	(1.60)
Institutional quality	.66	.65	.66	.67	.71
	(3.75)	(3.75)	(3.70)	(3.76)	(3.95)
M2/GDP (lagged)	.012	.008	.021	.028	.022
	(.95)	(.62)	(1.37)	(1.65)	(1.27)
Sub-Saharan Africa	-1.43	-1.58	-1.33	-1.42	-1.47
	(1.68)	(2.18)	(1.54)	(1.63)	(1.68)
East Asia	.81	.86	.89	1.12	1.26
	(1.43)	(1.52)	(1.53)	(1.83)	(2.05)
Budget surplus	4.07	5.35	4.39	2.27	.90
	(1.03)	(1.68)	(1.08)	(.50)	(.18)
Inflation	-1.56	-1.41	-1.58	-1.21	-1.19
	(3.92)	(3.46)	(3.94)	(2.51)	(2.16)
Openness	2.11	2.07	2.17	1.83	1.61
	(4.11)	(4.07)	(4.13)	(3.32)	(2.76)
Gov consumption	-2.53	--	-7.35	-9.14	-8.25
	(.55)		(1.41)	(1.77)	(1.43)
Aid/GDP	--	--	.09	.08	-.05
			(.82)	(.58)	(.27)
Aid x Policy	--	--	--	.19	.24
				(1.63)	(2.87)
Aid^2 x Policy	--	--	--	-.02	--
				(1.68)	
R^2	.41	.41	.40	.40	.40
Adjusted R^2	.38	.38	.35	.35	.35

Note: *t*-statistics (in parentheses) have been calculated with White's heteroskedasticity–consistent standard errors, for all regressions in the paper.

Source: Burnside and Dollar (1997)

Table 6. TSLS Aid Allocation Regressions

Time dimension: six four-year periods, 1970-73 to 1990-93
Countries: 40 aid recipients
Dependent variable: Aid as a percent of GDP

Type of Aid **Mean** **Observations**	**Total** **2.16** **191**	**Bilateral** **1.47** **191**	**Multilateral** **.69** **191**	**World Bank** **.16** **191**
Constant	35.8 (7.25)	19.8 (8.67)	15.9 (5.20)	4.57 (5.46)
Initial GDP per capita	-2.67 (6.90)	-1.44 (6.72)	-1.23 (5.50)	-0.43 (6.56)
Population	-.85 (6.57)	-0.49 (7.75)	-.36 (4.76)	-0.07 (3.52)
Policy	.44 (3.63)	.28 (3.54)	.15 (2.89)	0.05 (3.00)
Sub-Saharan Africa	-0.03 (0.06)	0.32 (1.59)	-0.34 (1.32)	-.10 (1.36)
Egypt	1.71 (4.11)	1.55 (4.28)	0.16 (1.10)	0.09 (1.62)
Franc Zone	.52 (1.46)	.30 (1.16)	.22 (1.66)	.04 (0.53)
Central America	0.73 (1.64)	.84 (2.58)	-0.11 (0.54)	-0.03 (0.46)
Arms imports (lagged)	.0.01 (0.88)	0.01 (0.94)	0.001 (0.44)	-0.002 (2.11)
R^2	.62	.56	.57	.51
Adjusted R^2	.59	.52	.54	.47

Instruments: Ethnic, assassinations, ethnic x assassin, institutional quality, M2/GDP (lagged), East

Source: Burnside and Dollar (1997)

(c) Using Table 1.1 below from Hansen and Tarp (2001) to critically review the findings of Dollar and Burnside regarding the importance of policy for a growth impact of aid. (7 pts)

Table 1
Growth regressions with polynomial effects of aid and policy

Dependent variable	Annual growth rate in GDP per capita					
Sample	56 countries, five periods (1974–1977 to 1990–1993)					
Regression	1.1	1.2	1.3	1.4	1.5	1.6
Aid	0.238 (2.28)	0.241 (2.34)	0.044 (1.08)	0.262 (2.56)	0.274 (2.64)	0.134 (2.49)
Aid^2	−0.754 (2.31)	−0.763 (2.38)		−0.570 (2.02)	−0.699 (2.52)	
Aid×policy	−0.006 (0.22)		−0.004 (0.15)	0.052 (1.26)		0.097 (2.22)
Policy^2	0.0002 (0.26)			0.002 (2.22)		
Budget surplus	0.096 (2.36)	0.091 (2.49)	0.077 (1.89)	0.114 (2.63)	0.103 (2.56)	0.081 (1.95)
Inflation	−0.013 (2.22)	−0.011 (2.30)	−0.013 (2.86)	−0.016 (2.44)	−0.007 (1.46)	−0.015 (2.35)
Openness	0.016 (2.67)	0.017 (3.36)	0.019 (3.66)	0.015 (2.62)	0.018 (3.56)	0.025 (5.10)
Financial depth	0.010 (0.54)	0.010 (0.55)	0.018 (1.12)	0.012 (0.62)	0.010 (0.50)	0.018 (0.98)
Ethnic fractionalization	0.002 (0.18)	0.001 (0.12)	−0.002 (0.21)	0.002 (0.25)	0.003 (0.33)	−0.001 (0.12)
Assassinations	−0.454 (1.98)	−0.460 (2.02)	−0.418 (1.86)	−0.458 (1.99)	−0.485 (2.16)	−0.427 (1.89)
Ethnic×assassination	0.911 (2.15)	0.919 (2.17)	0.775 (1.89)	0.899 (2.11)	0.959 (2.30)	0.783 (1.87)
Institutional quality	0.811 (4.57)	0.810 (4.57)	0.676 (4.26)	0.836 (4.82)	0.824 (4.60)	0.762 (4.66)
Initial GDP per capita	0.001 (0.13)	0.001 (0.14)	−0.002 (0.33)	0.001 (0.10)	0.002 (0.26)	−0.001 (0.19)
Effect of aid at median	0.289 (2.31)	0.291 (2.37)	0.045 (1.14)	0.287 (2.37)	0.320 (2.64)	0.110 (2.24)
Degrees of freedom	211	213	213	206	208	208
DWH test[a]	0.22	0.11	0.3	0.15	0.05	0.14
Sargan test[b]	0.47	0.65	0.1	0.87	0.75	0.38
$\hat{\sigma}_\varepsilon \times 100$	3.0	2.99	2.97	2.97	2.99	2.95

[a]The p-value of the Durbin–Wu–Hausman test for equality of the OLS and the IV estimates.

[b]The p-value of Sargan's test for overidentifying restrictions. Heteroskedasticity-consistent t-values in parenthesis. Time dummies and dummies for Sub-Saharan Africa and East Asia are included in all regressions. Regressions (1.4), (1.5), and (1.6) exclude five observations as discussed in the main text. The five observations are: Nicaragua (1986–1989, 1990–1993), Gambia (1986–1989, 1990–1993) and Guyana (1990–1993). Instruments: Dummy for Egypt, Arms imports $(t-1)$, Policy $(t-1)$, Policy^2 $(t, t-1)$, Policy×ln(population), Policy×Initial GDP per capita, Policy×(Initial GDP per capita)^2, Policy×aid $(t-1)$, Policy×aid^2 $(t-1)$, aid $(t-1)$, aid^2 $(t-1)$. The reduced form partial R^2 measures for the endogenous regressors, Aid, Aid^2 and Aid×policy, are 0.30 (0.30), 0.38 (0.33), and 0.38 (0.39) in regression 1.1 (1.4), respectively.

Source: Hansen and Tarp (2001)