Written Exam for the B.Sc. or M.Sc. in Economics summer 2013

Advanced Development Economics: Micro Aspects

Final Exam

29 May 2013

(3-hour closed book exam)

MODEL ANSWER

Please note that the language used in your exam paper must correspond to the language of the title for which you registered during exam registration. I.e. if you registered for the English title of the course, you must write your exam paper in English. Likewise, if you registered for the Danish title of the course or if you registered for the English title which was followed by "eksamen på dansk" in brackets, you must write your exam paper in Danish.

This exam question consists of 5 pages in total including this page.

Question 1: Risk and Insurance

High income risk is part of life in developing economies. Climatic risks, economic fluctuations, and a large number of individual-specific shocks leave households vulnerable to severe hardship. (Dercon, 2002, p. 141)

a) Describe three different strategies households use to manage and cope with such risk and explain the main weaknesses of each strategy.
b) Explain the special problems of self-insurance through asset holdings.
c) Explain the theory of full-insurance (through informal risk sharing) and the hypothesis tested in Table 2 from Townsend, given below.
d) Is the hypothesis of informal risk sharing rejected or not rejected? Explain.

Table 2
Thai SES: Four tests for full risk sharing

Dependent Variable in regression 1, 2, 3 and 4: Change in average log amphoe consumption

	Kingdom	*North*	*Northeast*	*Central*	*South*	*Bangkok*
1) Independent Variables: Measured changes in region and community type average log consumption (see parenthetical caveat in the text) and change in average log amphoe income						
β (coefficient on average consumption)	.7366[a] (.07749)	.5288[a] (.15501)	.8223[a] (1.1162)	.7063[a] .25647)	.4140 (.30968)	.8468[a] (.22570)
$\varnothing$ (marginal propensity to consume income)	.3443[a] (.1722)	.3507[a] (.03519)	.3553[a] (.03572)	.3324[a] (.03399)	.3455[a] (.03726)	.3715[a] (.08502)
F-test for region and community type effects	.0001	.0008	.0001	.0063	.1827	.0004

Answer to Question 1: Risk and Insurance

a) The answer to the first question can be based on Bardhan and Udry (1999) (B&U) pp. 94-95 and Dercon (2002). The three different strategies are
(1) *Income diversification*, achieved by combining activities with low positive covariance. (Dercon, p. 143). Dercon denotes these strategies as risk management strategies, while B&U classify them as *ex ante* actions.
(2) *Self-insurance* in the form of intertemporal consumption smoothing through saving and credit markets (precautionary savings).
(3) *Group based risk sharing* (informal or formal)

Dercon denotes the two consumption strategies as risk-coping strategies while B&U describe insurance saving and credit transactions as *ex post* mechanisms.

(1) The main weaknesses of the income diversification strategy is partly that diversification often reduces expected income, such that the diversification is actually income skewing (Dercon), and partly that income diversification does not always result in income smoothing. Townsend (1995) shows that risks in ICRISAT villages in India are high and that income diversifying would be beneficial. Yet few households diversify in the villages.

(2) Credit market imperfections implies that self-insurance must mainly be through savings. The main weaknesses of self-insurance in the form of saving by building up assets is that severe crises are not easily insured by private savings when households are impatient because asset holdings are too low. Once the household's wealth falls to near zero, the possibility of further smoothing shrinks and consumption can become quite volatile.

(3) The main weaknesses is of the group based risk sharing are that (i) they can insure only against idiosyncratic shocks and (ii) any risk pooling must overcome the information and enforcement problems associated with insurance contracts.

b) The special problems self-insurance in the form of asset holdings are: (i) when a common negative shock occurs, incomes are low and returns to different assets are also low, often even negative. Consequently, just when assets are needed, net stocks could be low as well. (Dercon, pp. 147-148). (ii) The terms of trade between goods for consumption and assets change as a result of a common shock. If a negative common shock occurs, households would like to sell some of their assets . However, if everyone wants to sell assets at the same time, asset prices will collapse and the amount of consumption that can be purchased with the proceeds will fall. (Dercon p. 148). (iii) Lumpiness of assets (say, in the form of livestock) may partly explain why the poor cannot protect themselves easily by holding assets (Dercon p. 149).

c) This answer can be given either by explaining the model as in Townsend (1995) or by formulating the full risk sharing model in Bardhan and Udry (1999).

Townsend (1995, pp. 89-90) briefly explains the theory of full insurance:
"If households are risk averse, and if actuarially fair insurance is available, then households will choose to buy insurance. Moreover, if the risks are largely idiosyncratic, as the empirical evidence argues, then risk-averse households should group together to share all risks. These risks will include the weather, that is, rainfall, temperature, humidity and the like; shocks associated with incidence of crop disease and human illness; shocks associated with changes in prices outside the group or the

local economy; and random factors helping to determine births, deaths, migration, division of extended families and other endogenous demographic states. If risks are fully pooled, then growth in household consumption should track growth in group average consumption, and nothing else."

B&U (1999, pp 96-97) develops a formal model.
First: a Pareto-efficient allocation of risk within a village can be found by maximizing the weighted sum of utilities of each of the households (assume there are *N*), where the weight of household *i* in the Pareto programme is λ_i, where the weights are all positive and sum to 1. The endowment restriction is that total consumption must be less than or equal to total income for the *N* households. The first order conditions implies that for each pair of households, the ratio of marginal utilities must equal the ratio of the household weights:

$$\frac{u_i'(c_{ist})}{u_j'(c_{jst})} = \frac{\lambda_i}{\lambda_j} \; \forall \; i, j, s, t \tag{1}$$

Where *i, j* indexes the *N* households, *s* denotes states of nature (*s* = 1, …, *S*) and *t* is the time period (*t* = 1, …, *T*). The point to note is that the RHS is constant across states of nature and time.
Next: If the individual utility functions in each period is specified as a constant absolute risk aversion function with a common risk aversion parameter

$$u_i(c_{ist}) = -(1/\sigma)e^{-\sigma c_{ist}} \tag{2}$$

then inserting this into the first order condition and taking logs, one finds

$$c_{ist} = c_{jst} + (1/\sigma)(\ln \lambda_i - \ln \lambda_j). \tag{3}$$

For each individual there are N comparisons (including a self-comparison) so there are N first order conditions and one can sum these (and divide by N)

$$c_{ist} = \frac{1}{N}\sum_{j=1}^{N} c_{jst} + (1/\sigma)\left(\ln \lambda_i - \frac{1}{N}\sum_{j=1}^{N} \lambda_j\right) \tag{4}$$

This shows that consumption for individual I equals average consumption in the village plus a time and state invariant household fixed effect which only depend on the relative weight of the household in the Pareto programme. The equation implies that the change in a household's consumption between any two periods is equal to the change in average community consumption between the two periods.

The model in B&U leads to a simple regression model. Direct application of the result in (4) gives a model formulated in changes:

$$c_{it} - c_{it-1} = \beta(\bar{c}_t - \bar{c}_{t-1}) + \phi(y_{it} - y_{it-1}) + \varepsilon_{it}$$

But Townsend (1995) formulates the model in logs

$$\frac{\ln c_t^i - \ln c_\tau^i}{t-\tau} = \beta\left(\frac{\overline{\ln c_t^g} - \overline{\ln c_\tau^g}}{t-\tau}\right) + \phi\left(\frac{\ln y_t^i - \ln y_\tau^i}{t-\tau}\right) + \xi_{t,\tau}^{i,g} \qquad (5)$$

Both formulations are clearly acceptable answers (and variations over Townsend's formulation are also acceptable as it is rather cumbersome). The main point in the regression formulations is that the theory of full insurance implies

$$H_0 : \beta = 1 \wedge \phi = 0 .$$

d) The hypothesis of full risk sharing is rejected. First of all the marginal propensity to consume out of income is significantly different from zero (and positive) in all six regression. Furthermore the coefficient on average consumption is significantly less than one in all regions, but the Northeast where the estimated standard error is surprisingly high (as this is probably a typing error the answers need not mention this).

Question 2: Migration

Table 6 from Mendola (2008) is given on the next page, it shows regression results for the probability of adopting High Yield Variety (HYV) rice and the probability of migrating; either (i) temporary domestic, (ii) permanent domestic or (iii) international migration. The four equations are linear probability models.

a) Based on a migration model formulated in Bardhan and Udry (1999), explain why you think it is reasonable that "Family chain migration", % temporary migration in the village", "% permanent migration in the village" and "% international migration" are all significant determinants of the three types of migration, respectively.
b) Based on the results in Table 6 on the next page, discuss the relationship between wealth and migration.
c) Based on the results in Table 6 on the next page, explain the relationship between wealth and the adoption of HYV rice.
d) Based on a model of technological progress and learning formulated in Bardhan and Udry (1999) and in Foster and Rosenzweig (1995), can you think of omitted variables in the model for adoption of HYV rice? If so, would you think the omitted variables are related to the migration patterns in some way?

Table 6
3SLS estimate of the impact of different typologies of migration on HYVs adoption

	Dependent variables			
	Adoption of HYVs	Temporary migration	Permanent migration	International migration
Temporary migration	−0.444**			
	(2.04)			
Permanent migration	−0.25**			
	(2.11)			
International migration	0.718***			
	(2.69)			
Number of males in the HH	0.013	0.016***	0.031***	0.02***
	(1.07)	(2.71)	(5.23)	(5.28)
Number of females in the HH	−0.01	−0.009	0.004	0.024***
	(0.76)	(1.23)	(0.55)	(5.17)
Number of children in the HH	0.005	−0.007**	−0.011***	0.006***
	(0.93)	(2.23)	(3.30)	(2.69)
Average years of schooling in the HH	−0.002			
	(0.32)			
Religion (1 if Muslim)	0.053	0.182***	−0.03	0.04***
	(0.92)	(9.36)	(1.53)	(3.33)
% of temple land	−0.026**			
	(2.08)			
% of cash-in land	−0.006			
	(0.09)			
% of mortgaged-out land	−0.07***			
	(3.16)			
Farm equipment owned	0.016			
	(1.46)			
Means of ploughing (1 if power)	0.049***			
	(2.90)			
Self-poor assessment	−0.074***	0.029**	−0.008	−0.037***
	(3.67)	(2.57)	(0.73)	(5.22)
Regional dummy (1 if Madhupur)	0.069	−0.086***	0.053	0.031***
	(1.25)	(3.20)	(1.33)	(2.70)
% of irrigated land	0.273***			
	(11.48)			
Land owned (pae)	0.029	−0.139***	−0.132***	0.058***
	(0.8)	(4.41)	(4.07)	(2.94)
$[\text{Land owned (pae)}]^2$		0.046***	0.028**	−0.021***
		(3.64)	(2.12)	(2.66)
Cattle owned (pae)	0.16***	−0.065**	−0.099***	−0.056***
	(5.65)	(2.25)	(3.27)	(3.08)
$[\text{Cattle owned (pae)}]^2$		0.037**	0.053***	0.015
		(1.96)	(2.66)	(1.31)
Constant	0.129***	0.021	−0.097**	−0.15***
	(2.63)	(0.57)	(2.05)	(7.90)
Instruments:				
Highest education level in the HH		−0.061***	0.048***	0.015***
		(7.67)	(5.96)	(3.10)
Family chain migration		0.001	0.312***	0.091***
		(0.04)	(12.10)	(5.72)
% temporary migrants in the village		0.768***		
		(5.53)		
% permanent migrants in the village			1.018***	
			(5.62)	
% international migrants in the village				1.029***
				(8.73)
Observations	3404	3404	3404	3404
Sargan test:	$\chi^2(2)=3.145$ [p-value=0.21]			
First-stage	F-test (5, 3383)	P-value		
Temporary migration:	10.27	0.0000		
Permanent migration:	38.21	0.0000		
International migration:	19.21	0.0000		

Absolute value of z-statistics in parentheses.
*Significant at 10%.
**Significant at 5%.
***Significant at 1%.

Answer to Question 2: Migration

a) The model in B&U is formulated in Chapter 5, section III:
"[M]igration involves a search for employment. Crucially, both the cost of moving and the difficulty of finding employment in the new location can be mitigated by the presence in the city of previous migrants. These migrants are a vital source of information about housing and job prospects for potential migrants in their communities of origin. They also provide a social environment in the city which eases the transition to a new kind of living for those newly arrived from the countryside. Finally, communities of established migrants in the city often provide introductions to potential employers, landlords, and creditors. Migrants to a city often concentrate within specific areas where they can best take advantage of this support" (B&U, p- 56).

The four regressors in the regression system all represent these effects of previous migrants.

A mathematical model of migration is also specified in B&U (there are many details in the model, so it need not be completely specified: Consider a model in which rural migrants move to the city to find jobs. They get assistance from earlier migrants in their job search. Further, individual attributes (age, education, gender,…) impacts on the search costs. Once a migrant gets a job in the city, he/she keeps the job for ever.

At any time, t, M_t rural workers have chosen to live in the city, while 1- M_t workers live in the rural area. Income in the rural area is from farming (scarce) land with profit generated by

$$\pi_t = \gamma^r(M_t), \quad \partial\pi_t / \partial M_t > 0$$

Income in the city is 0 for unemployed while employed workers get a wage that equals MPL:

$$w_t = \gamma^m(E_t), \quad \partial w_t / \partial E_t < 0$$

where E_t is the number of employed workers, $E_t < M_t$.
Migration involves relocation costs, $c(M_{t-1},h)$. The costs are decreasing in the number of earlier migrants, but increasing in characteristics (for convenience). Migrants search for jobs. In each period unemployed migrants get an everlasting job with probability $p(E_t\text{-}1)$. The probability is increasing in the number of employed migrants. The model has 3 states and thus 3 value functions
The expected income of an employed urban worker is

$$V^m(M_t, E_{t-1}, e) = \gamma^m(E_t) + \delta V^m(M_{t+1}, E_t, e)$$

The expected income of an unemployed urban worker is

$$V^m(M_t, E_{t-1}, u) = p(E_{t-1})V^m(M_t, E_{t-1}, e) + \delta[1 - p(E_{t-1})]V^m(M_{t+1}, E_t, u)$$

The expected income of a rural worker is

$$V^r(M_t, E_{t-1}, h) = \gamma^r(M_t) + \delta Max\{V^m(M_{t+1}, E_t, u) - c(M_t, h), V^r(M_{t+1}, E_t, h)\}$$

A rural worker of type h will migrate if

$$V^m(M_t, E_{t-1}, u) \geq V^r(M_t, E_{t-1}, h) + c(M_{t-1}, h)$$

If the type h worker migrates, then all workers of type $h' < h$ also migrate. The migration decreases the costs for other rural workers and increases the probability of getting an urban job, thereby

increasing the present value of expected migrant earnings. On the other hand, the migration also increases the present value of expected rural earnings. In steady state we have

$$\frac{w^*-\pi^*}{1-\delta} = c(M,H) + \frac{w^*(1-p(M))}{1-\delta(1-p(M))}, \quad or$$

$$\frac{\gamma^m(M)-\gamma^r(M)}{1-\delta} = c(M,H) + \frac{\gamma^m(M)(1-p(M))}{1-\delta(1-p(M))}$$

"This model contains interesting implications for the migration process. Early migrants generate an externality by easing the transition of later migrants from their low productivity rural employment to higher-productivity industrial work. In this model the benefit comes in two distinct forms: reducing the moving costs associated with migration, and reducing the expected loss of income resulting from job search (B&U, p. 58).

b) In the discussion of the impact of wealth on migration it is sufficient to describe the impact of land owned as this is the major asset.

It is discussed in Mendola: "[W]e observe a non-monotonic impact of household landholding on the probability to migrate temporarily, permanently, or abroad, against the option of staying put. …The shape and areas of predicted probability suggest that at low levels of wealth (land owned) farm households participate (at a decreasing rate) in temporary or permanent migration, whilst they do not engage in international migration. At higher levels of wealth, a marginal increase in land holding increases (at a decreasing rate) only the propensity to migrate abroad. This reflects the fact that international migration is costly, but also very remunerative in terms of remittances, and thereby potentially the 'first best' choice for investing households." Mendola (p. 161).

In table 6 we can only read the marginal changes in the probabilities of migration. From the table one can read the partial changes in the probability of migration of changing land:

$$\frac{\partial \hat{\Pr}(T=1|X)}{\partial land} = -0.139 + 0.046land \Leftrightarrow land^* = 3.0$$

$$\frac{\partial \hat{\Pr}(P=1|X)}{\partial land} = -0.132 + 0.028land \Leftrightarrow land^* = 4.7$$

$$\frac{\partial \hat{\Pr}(I=1|X)}{\partial land} = 0.058 - 0.021land \Leftrightarrow land^* = 2.8$$

Where *T*, *P* and *I* denotes temporary domestic, permanent domestic and international migration, respectively. Land size per adult equivalent is less than 1 for all households so the marginal impact of increasing land is negative (at a decreasing rate) for both temporary and permanent domestic migration. In contrast the marginal effect on international migration is positive (at a deceasing rate). Hence, households with small landholdings have a higher probability of temporary and permanent domestic migration and a lower probability of international migration compared to households with large landholdings.

c) The partial effect of land on the probability of adoption of HYV rice is estimated to 0.029, thus the direct partial effect of a change in land size per adult equivalent of 0.1 is an increases in the probability of adopting HYV of 0.29 percent. This partial effect is not statistically significant.

However, as land size also changes the probability of migration there are indirect effects of land size such that the total estimated effect is

$$\frac{\partial \Pr(HVY=1)}{\partial land} = 0.029 - 0.444(-0.139 + 0.046land) - 0.25(-0.132 + 0.028land) + 0.718(0.058 - 0.021land)$$
$$= 0.165 - 0.0425land$$

Thus the total effect of land on the probability of adopting HYV rice is substantial. At land holdings of 0.15 acre an increase of, say 0.1 acres increases the probability of adoption by 1.58 percent, which is almost 5.5 times higher than the direct effect.

d) (This question has no direct source. It requires that the student combines ideas from two different topics in the course).
The technology adoption model in B&U (chapter 12) shows that "If farmers can learn from each others' experience with the new technology, the determination of which farmer will adopt the new technology will depend crucially on the farmer's interactions with everyone else in the village." This effect is not discussed or included in the HYV adoption model in Mendola. Thus, a possible omitted variable is "% farmers in village who have adopted HYV rice (earlier)". It is reasonable to expect that HYV adoption and migration is related as shown in the table. But in this case the instruments may be correlated with "% farmers in village who have adopted HYV rice (earlier)". This is an omitted variable that may thus be correlated with the instruments. In this way the effect of migration may well be overvalued in the regression as it covers both the effect of migration and the effect of technology knowledge.

Question 3: Civil War

a) Based on Table 2 from Humphreys and Weinstein (2008) given below, describe the hypotheses formulated and tested in Humphreys and Weinstein (2008) explaining the roots of individual participation in armed groups.

b) What do Humphreys and Weinstein (2008) have to say about voluntary vs. forcible recruitment?

c) What could be the problem with the result regarding voluntary vs. forcible recruitment?

TABLE 2 Determinants of Participation in Rebellion

	I: RUF	II: RUF		II: CDF
	Logit	Multinomial Probit		Logit
Model	All	Abductees	Volunteers	Volunteers
GRIEVANCES				
H_1 Mud Walls	0.92	0.50	0.57	1.61
	[0.41]**	[0.22]**	[0.26]**	[0.56]***
H_1 Lack of Access to Education: (More than primary 0, Primary 1, No primary 2)	1.09	0.61	0.40	0.80
	[0.30]***	[0.15]***	[0.18]**	[0.30]***
H_2 Supports the SLPP	−0.49	−0.23	−0.90	−0.58
	[0.67]	[0.33]	[0.30]***	[0.58]
H_2 Mende	2.16	1.09	0.60	0.58
	[0.88]**	[0.42]***	[0.450]	[0.65]
H_3 Does Not Support Any Party	1.29	0.50	0.62	1.62
	[0.57]**	[0.25]**	[0.24]**	[0.51]***
SELECTIVE INCENTIVES				
H_4 Offered Money to Join	1.77	1.01	0.78	3.19
	[0.58]***	[0.43]**	[0.46]*	[0.65]***
H_5 Felt Safer Inside Group	−0.56	−0.51	0.99	2.34
	[0.37]	[0.15]***	[0.212]***	[0.30]***
COMMUNITY COHESION				
H_6 Friends as Members of Group	0.25	−3.10	3.09	0.60
	[0.90]	[0.68]***	[0.44]***	[0.50]
H_7 Villages Accessible by Foot or Boat Only	−0.01	−0.002	0.003	0.03
	[0.02]	[0.01]	[0.01]	[0.01]**
CONTROLS				
Farmer	0.32	0.26	−0.64	1.39
	[0.56]	[0.34]	[0.39]*	[0.47]***
Student	0.83	0.38	0.44	1.26
	[0.55]	[0.27]	[0.28]	[0.56]**
Male	2.44	1.05	1.26	4.06
	[0.64]***	[0.31]***	[0.32]***	[0.90]***
Age	1.03	0.03	2.57	3.52
	[1.21]	[0.57]	[0.68]***	[1.22]***
Age-squared	−0.2	−0.047	−0.30	−0.46
	[0.16]	[0.07]	[0.09]***	[0.15]***
Freetown	−0.16	−0.052	−0.87	0.55
	[0.73]	[0.35]	[0.38]**	[0.83]
Infant Mortality	13.52	5.125	9.82	16.85
	[6.75]*	[5.14]	[4.12]**	[6.07]***
Constant	−12.48	−5.50	−15.29	−26.74
	[3.16]***	[1.64]***	[1.60]***	[3.45]***
Observations	515		515	689

Notes: Standard errors in brackets. *Significant at 10%; **significant at 5%; ***significant at 1%.

Answers to Question 3: Civil War

a) The first set of hypotheses are related to "**Greviance and participation**". Scholars of social revolution argue that the depth of an individual's discontent with his or her economic position in society is a major causal factor that differentiates participants in rebellion from nonparticipants. Discontent, when aggregated across individuals in a particular social class or ethnic group, provides the foundation for mobilization and the onset of violence against the state. There are 3 hypothesis related to greed: Individuals are more likely to join a rebellion if:

H1: They are economically deprived.
H2: They are marginalized from political decision making.
H3: They are alienated from mainstream political processes.

Humphreys and Weinstein (2008) p. 445-6 note that:
H1: "Our first hypothesis is that individuals are more likely to join a rebellion if they suffer from economic deprivation. The United Nations Development Program, in constructing its human development index, emphasizes two measures of deprivation that are readily operationalized at the individual level: income and education. We proxy for income with a measure, *Mud Walls*, that captures material well-being, recording the material used in the construction of walls for an individual's house. If they are constructed from mud, among the cheapest but least durable form of wall design used in Sierra Leone, this variable takes a value of 1. Alternatives include burnt brick and cement constructions. Our second measure, *Lack of Education*, records the level of schooling completed by an individual. This variable takes the value of 0 if post primary education was achieved, 1 if only primary education was completed, and 2 if the individual received no formal education at all.

H2: To proxy for political exclusion experienced by individuals in the prewar period, we use a measure of *support* for the major excluded political party, *the SLPP*. Closely related to SLPP support in the political history of Sierra Leone is membership of the *Mende* ethnic group.

H3: Turning to the third hypothesis, it may not matter that individuals are on the losing side politically, but that they may not feel represented by any party on the political stage. This is the indicator "*Does Not Support Any Party*".

The second set of hypotheses are related to "**Selective Incentives**". In particular, individuals are more likely to participate in rebellion if:
H4: They expect to receive selective incentives from the fighting group.
H5: They believe they would be safer inside a fighting faction than outside of it.

(H4:) Our first measure of selective incentives, *Offered Money to Join*, records whether individuals were offered material rewards (money or diamonds) in exchange for their participation. The variable employs data from a survey question that asked respondents what they were told they would receive upon joining a fighting group.

(H5:) To study the extent to which protection offered by fighting factions might serve to motivate participation, we used a proxy, *Felt Safer Inside*, that draws on a survey question that elicited the respondents' assessment (during the war) of whether they felt that "life would be safer" inside or outside of the group.

Social Sanctions: A third school of thought links an individual's decision to participate to the characteristics of the community in which he or she is embedded. The community perspective suggests a number of additional hypotheses. Individuals are more likely to participate in rebellion if:

H6: Members of their community are active in the movement.
H7: Their community is characterized by strong social structures.

Hypothesis 6 suggests that when individuals have community ties that link them to members of a fighting group, they are more likely to join. To create a measure of social ties, we asked both joiners and non-joiners how they first encountered an armed group. In the case of combatants, we asked them how they first encountered the group that they ultimately joined; for noncombatants, we asked them how they first came into contact with the group. Our measure takes a value of one if an individual responded that her first contact came when a *friend or relative joined the group* and zero otherwise.

As a test of the final hypothesis, we employ a measure intended to capture the degree to which communities have strong social structures. We lack a direct measure of this characteristic, however, and rely on a proxy that focuses on the isolation of communities. The measure, *Accessible by Foot or Boat Only*, records features of settlements within the chiefdom in which an individual was based.

b) Humphreys and Weinstein acknowledge that there may be problems in the large fraction of people who report that they were abducted. On page 445 they state: "In evaluating the results that follow, it is critical to keep in mind that voluntary joiners constituted only 12% of total RUF recruits in our sample. Because abduction is self-reported, it is possible that this is an overestimate of the actual rate of abduction. But qualitative evidence suggests that the vast majority of RUF combatants were abducted, with grievances, selective incentives, and social sanctions rendered less important in the individual decision about whether to join."

c) The large number of reported abductees could point to limitations of postwar self-reported data on the rebel participation decision: Respondents have strong incentives to lie about the nature of their recruitment and wartime behaviors, to escape social disapproval or even legal prosecution. The insignificance of the support to the opposition could be caused by this kind of reporting error.