Determinant of Household Education Expenditure in Indonesia:

Weather-induced Income Shocks and Household Gender Composition

INTRODUCTION

With education so often viewed as an important agent of long term change in development economics, there is growing interest in studying determinants of investment in education. There are two key players that influence investment in education – the household and the state. This study focuses on the former, and how household expenditure on a child's education is prone to weather variation in rural Indonesia. It also looks at how household demographics – namely gender composition of the children – can predict the household education expenditure behaviour.

Making use of the 2007 Indonesian Family Life Survey (IFLS4) provided by the RAND Corporation, I examine whether similar behaviour can be observed in Indonesia. The effects of weather – specifically rainfall – is of interest because many households in Indonesia rely on farming as primary source of income. Since crop yield is prone to variation in precipitation, rainfall is used as proxy for income shocks.

The study finds that increase in rainfall levels from historic levels causes an increase in education expenditure by Indonesian households. It also finds that such effect is more pronounced during the dry season. However, for the most parts, education expenditure does not vary with household demographics. Only at the high school level does differences between genders exist: having an additional girl of high school age in the household correlates with 40% increase in education expenditure while an an equivalent boy does not make a difference to household education expenditure.

This paper is organized as follows. Section I provides a review of existing literature. Section II explains the keys points in the data construction, and the summary statistics of the resulting dataset. Section III explains the estimation strategy, and Section IV presents the subsequent results. Lastly, Section V concludes. Tables are included in the Appendix.

SECTION I: LITERATURE REVIEW

Several existing literatures use rainfall as an instrument for income shocks in Indonesia, exploiting the fact that the effects of precipitation on crop yield provides an exogenous mechanism for producing variation in household income. Levine and Yang (2014), for example, find that 10% increase in precipitation levels causes a 0.4% increase in average rice output in Indonesia. Given rural Indonesia's reliance on agriculture, particularly rice farming, Levine and Yang (2014) find it "justified in interpreting higher rainfall as a positive contemporaneous shock to local economic conditions in Indonesia." The focus on shocks that are "contemporaneous" – as they define it, being in the same calendar year – appears relevant, as they find no evidence for lagged effects of weather behaviour on Indonesian household income. This appears to counter the work of Newhouse (2005), who finds that income shocks are fairly persistent in Indonesia, with 30% of the effects of income shocks remaining after 4 years. While the time lag and persistence of the income shocks from rainfall is not the focus of this study, rainfall measures from several time periods are considered in order to account for both possibilities.

This study is primarily motivated by, and extends, some of the ideas explored by Cameron and Worswick (2001) and Amoateng et al. (2017). Using the older IFLS survey dataset from 1993, Cameron and Worswick (2001) find that crop yield loss results in decrease in education expenditure in Indonesia. More interestingly, Cameron and Worswick (2001) find that the sensitivity of education expenditure cutback from crops loss is much greater for households with girls. The gender difference in income elasticity of education expenditure is also observed outside of Indonesia. Amoateng et al. (2017) find that increases in income for households in Conakry, Guinea leads to much greater investment in education for girls. Understanding how household education expenditure varies depending on the children's gender is of particular significance. This fits into the broader discussion of gender equality in development economics, whether that be in the workforce, politics, or society. It may provide the grounds for policies that would mitigate the unpredictable jumps in education expenditure, as consistency and stability in education across both genders would be desirable for economic development.

Literature also exist on the effects of education for girls in Indonesia. Samarakoon and Parinduri (2015), for example, find that education for women increases contraceptive use, promotes reproductive health, and reduces the number of live births. More recently, women's education in Indonesia has become a topic of greater interest due to the increasing participation of women in the Indonesian labor force. Gallaway and Bernasek (2004), calling Indonesia one of the "newly industrializing economies", find that greater literacy for women there correlates with improved employment prospects. With the myriad of literature that showing the positive outcomes in economics development coming from female education, it naturally brings focus to gender differences in education expenditure patterns.

While there are some overlaps in the focus between this study and the work done by Cameron and Worswick (2001) and Amoateng et al. (2017), it also differs in the approach in several ways. Firstly, it uses the richer dataset that comes from the more recent IFLS survey waves. Cameron and Worswick (2001) uses the much older 1993 IFLS survey data, which has fewer household observations and fewer variables of measurement. Indonesia has also experienced rapid economic, political, and social changes between 1993 and 2007; this study hopes to see if household education expenditure behaviours have also changed. This study also uses rainfall shocks as proxy for changes to income, where as Amoateng et al. (2017) use aggregated household expenditure and its change as proxy. Using aggregated household expenditure as proxy for income presents issues with its accuracy, given that it is computed by summing various expenditure items. There is potential to observe variation in each of these items, where the source of variation is not just the income. In particular, the influences between various expenditure items is one of such concerns. Another is the issue of deb-financed spending, which distorts its ability to effectively represent household income. With existing literature showing clear evidence of the effectiveness of rainfall as exogenous instrument for income shocks, this paper hopes to take an improved approach.

SECTION II: DATA

The IFLS4 data provides a dataset on various aspects of Indonesian family life – economy, consumption, health, family dynamics, and so forth – at the relevant levels (individual, household, community). While comprehensive, it does not provide information on how much money was invested in each child's education. This makes it difficult to capture the direct relationship between household demographics and its expenditure on education. Therefore, this study uses the aggregated household expenditure on education – that is, aggregated across all children – which can be constructed using the measurements available in the data. For each household h, total education expenditure in 2007 is captured with the variable $educ\_exp\_2007_h$:

$$educ\_exp\_2007_h = tuition\_2007_h + supplies\_2007_h + transport\_2007_h$$

where $tuition\_2007_h$, $supplies\_2007_h$, and $transport\_2007_h$ are the reported total household expenditure on children's tuition, supplies and transportation for school. I denote its logarithmic transformation with $log\_educ\_exp\_2007_h$.

Several variables are then constructed to serve as indicators of household demographics. For a given household h, $num\_boys\_e\_school_h$, $num\_boys\_m\_school_h$, and $num\_boys\_h\_school_h$ represent the number of boys in household h with elementary school age, middle school age, and high school age, respectively. Similarly, variables $num\_girls\_e\_school_h$, $num\_girls\_m\_school_h$, and $num\_girls\_h\_school_h$ are constructed. The age ranges for the three school levels are 6 to 11, 12 to 14, and 15 to 18, respectively.

Data on rainfall levels in Indonesia, broken up by geography, is obtained through the United States National Oceanic and Atmospheric Administration. The data provides historical precipitation readings between the years 1955 and 2007 across 91 weather stations in Indonesia, where, on average, a station recorded roughly 4 days a week. Using the Geocoding API services provided by Google Maps, each of these stations, using their associated latitude and longitude pairing, are then linked to the respective provinces that the station resides in. Precipitation data for a given province is then constructed by taking the mean of all station readings inside that province, and this data is then linked to each household via the province of residence for the household.

This gives a way to construct a drought index for each household. Given that the survey took place at the end of 2007 and beginning of 2008, precipitation in 2006 is examined. The precipitation readings for the previous years were discarded, as preliminary research showed it had no effect on the outcome variables. The drought index for 2006 for a given station s in province p_s is given by $drought\_2006_s$, calculated as:

$$drought\_2006_{s,p_s} = historical\_mean_s - 2006\_mean_s$$

where:

$$historical\_mean_s = \frac{1}{|Y||M|} \sum_{y \in Y} \sum_{m \in M} prcp\_mean_{y,m,s}$$

$$2006\_mean_s = \frac{1}{|M|} \sum_{m \in M} prcp\_mean_{2006,m,s}$$

and $prcp\_mean_{y,m,s}$ is the mean daily precipitation for year y , month m , and station s and Y and M are the set of all years and months, respectively. The drought index in 2006 for a given province p is given by:

$$drought\_2006_p = \frac{1}{|S_p|} \sum_{s \in S_p} drought\_2006_{s,p}$$

where S_p is the set of all stations in province p . For a given household h in province p_h , I let the 2006 drought index for that household be the value of $drought\_2006_{p_h}$.

This approach to link datasets together introduces some measurement error due to the less-than-ideal geographic granularity. For example, consider a case where two households live at the opposite ends of Papua (the most eastern province in Indonesia). Household A lives at the eastern border of Papua, while Household B lives at the western border. Additionally, assume that there are 2 weather stations, Station X at the eastern border and Station Y at the western border. While it would be most accurate to generate precipitation data for Household A only with readings from Station X and similarly for that of Household B with Station Y, this approach would yield in the same precipitin data for both households –the mean of X and Y – because they both reside in the same province. However, there is no reason to suspect any form of bias with this measurement error. In addition, as it will soon be demonstrated, this approach still produces results with high statistical confidence. Thus there is no indication that the findings are compromised in this regard.

Table 1 provides summary statistics of the data. It indicates that the number of boys in households is slightly higher, but this difference is negligible, especially given the relatively small sample size of 1,266 households. The mean total number of children of elementary to high school age in households is 2.63, which compares well to the national average as well.

SECTION III: ESTIMATION STRATEGY

This study considers variations of a simple linear regression model for a given household h :

$$Y_h = \alpha_0 + \alpha_1 drought\_2006_{p_h} + \beta X_h + \gamma Z_h + \epsilon_h$$

where Y_h is an outcome variable and is one of $educ\_exp\_2007_h$ or $log\_educ\_exp\_2007_h$, as previously described. X_h is a vector of the household demographic variables earlier described – $num\_boys\_e\_school_h$, $num\_boys\_m\_school_h$, and so forth. Finally, Z_h is a vector of control variables and ϵ_h is the error term. Of course, given the randomness weather, the following is assumed:

$$E[drought\_2006_h | \epsilon_h] = 0$$

and therefore can infer causality from the coefficient α_1 .

SECTION IV: RESULTS

Rainfall shocks

Table 2 and 3 show the results from running the regression models described above. Controls were added as described previously. Note that the number of schools in community was a control variable with missing observations for 184 households.

I find with 99% statistical significance – except for regression (2) and (3) in Table 2 – that rainfall patterns in 2006 has a clear effect on education expenditure. Namely, a decrease in the 2006 drought index by 1mm leads to a decrease in education expenditure by roughly 600,000 Rupiah to 1,000,000 Rupiah, or 35% to 45%. For those regressions (2) and (3) in Table 2, I observe similar with 95% statistical significance.

Household demographics – gender composition

The relationships between the outcome variables and variables for household demographics aren't observed with similar confidence. Table 2 shows that no statistically significant relationships can be inferred between education expenditure and any of the household demographic variables. However, at the elementary school level, household demographics correlates with log education expenditure. An additional elementary school aged child – regardless of gender – is associated with roughly 40% increase in log education expenditure. A similar correlation can be observed at the high school level, except only for girls.

I now take a more detailed look at coefficients of household demographic variables, and how they differ between boys and girls at each school level. Table 4 and 5 show the coefficient differences for the respective outcome variables. I also perform a Wald test on the equality of the coefficients, the results for which are also included in the tables. For regressions of education expenditure, Table 4 indicates there's a statistically significant difference at the high school only for regression (4). And, for log education expenditure, all of regressions (1) through (4) have statistically significant difference at the high school level. Thus, at the high school age, an additional girl in the household is associated with higher log education expenditure compared to a boy.

Seasonal influences

With clear evidence that education expenditure is susceptible to precipitation shocks, it also brings forth questions of whether season influences the degree of susceptibility. Put it simply, if there is persistent increase in rainfall for a single month, does its effect on education expenditure change depending on which month of the year it is? Given that farming is a seasonally varying profession, it seems reasonable to assume seasonal variability in the effects on income, and therefore, education expenditure. If such variability exists, understanding it will be useful from a policy standpoint in regards to any efforts to mitigate shocks in education expenditure from weather.

I test this empirically with a simple modification to the set of regressions above. Indonesia has two seasons – rainy season, lasting from November to end of March, and dry season, lasting from April to end of October. Given this, I introduce a slightly altered regression model where the drought index is split into two parts, one for each season:

$$Y_h = \alpha_0 + \alpha_1 rainy\_drought\_2006_{p_h} + \alpha_2 dry\_drought\_2006_{p_h} + \beta X_h + \gamma Z_h + \epsilon_h$$

where $rainy\_drought\_2006_{p_h}$ and $dry\_drought\_2006_{p_h}$ are drought indices only for months of rainy season and months of dry season, respectively. The results of the above model are shown in Table 6 and Table 7.

For both outcome variables, across all four regression variations, the results indicate that precipitation changes in the dry season has a greater effect on education spending. The coefficient for dry season is roughly double that of rainy season in both Table 6 and 7. Much like for the gender composition comparison, I test the coefficient differences and show the results in Table 8. The coefficients between rainy and dry season corresponding to regressions (2) and (3) for regular education expenditure are significantly different at the 95% confidence level. For regression (4), it's significant at the 90% level. For regressions (2) through (4) in for log education expenditure, the coefficients are significantly different at the 95% confidence level. This provides evidence that rain patterns during the dry season has a much greater effect on household education expenditure than that during the rainy season.

SECTION V: CONCLUSION

The results show that shocks in rainfall levels leads to changes in household education expenditure, as household income is strongly tied to crop yield, and therefore to weather patterns. From a policy making perspective, it would be desirable to maintain consistency and stability in investment in education within Indonesia. Since weather can't be forecasted long-term, and can't be controlled, it may be in the long-term interest to introduce policy that somehow absorbs said effects of weather shocks. One of such may be a program that covers education costs for households working in farming during times of droughts, where households annually pay into the program almost like an insurance system. Of course, there would need to be state-induced incentives for the households participate. Otherwise, there would be issues with feasibility, as such a complicated program may be too hard to navigate and lead households to choose not to participate. If such a program were to exist, it would prove useful to understand the seasonal variation in weather induced education expenditure shocks. Greater education “insurance payouts” can be scheduled for droughts occurring during the dry season.

Less conclusive were results surrounding the question on the difference in education expenditure based on gender composition of the household. The findings suggest difference only at the high school level. One possible interpretation of this may be that, boys, once they reach age of high school, are old enough to be expected to help out with family business – given the agriculture based economy, most likely helping run farm(s) – while girls continue their education. However, the results on household gender composition merely gives evidence for correlation, not causation. Further examination is needed in order to truly determine if gender-based differences exist, and if so, how and why.

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Table 1: Variable mean and standard deviations

Variables	Mean	Standard Deviation
Total household education expenditure in 2007 (Rupiah, thousands)	3,597	5,824
Log total household education expenditure in 2007 (Rupiah, thousands)	7.419	1.792
Drought index of 2006 (mm)	-0.488	0.401
Number of elementary school age boys in household	0.50	0.60
Number of elementary school age girls in household	0.45	0.58
Number of middle school age boys in household	0.38	0.55
Number of middle school age girls in household	0.37	0.54
Number of high school age boys in household	0.32	0.48
Number of high school age girls in household	0.32	0.48
Total number of boys (of elementary, middle, and high school age) in household	1.36	0.92
Total number of girls (of elementary, middle, and high school age) in household	1.27	0.9
Primary source of income for community that household resides is agriculture (1=Yes)	0.53	0.5
Whether or not current residence is owned by household (1=Yes)	0.84	0.37
Number of schools (elementary, middle, and high) in community	8.37	3.2
Size of household	7.56	2.94
Observations	1,266	

Table 2: Regression results for total household education expenditure in 2007 (Rupiah, thousands)

	(1)	(2)	(3)	(4)
Drought index of 2006 (mm)	-1,015.8***	-793.0**	-779.3**	-631.3***
	(340.7)	(334.7)	(335.5)	(225.3)
Number of elementary school age boys in household	376.8	356.4	349.7	117.6
	(249.2)	(243.7)	(244.0)	(160.1)
Number of elementary school age girls in household	263.6	272.8	271.0	199.3
	(251.5)	(246.0)	(246.1)	(164.0)
Number of middle school age boys in household	24.0	150.3	145.5	211.8
	(302.9)	(296.8)	(297.0)	(194.2)
Number of middle school age girls in household	200.4	310.5	313.7	260.2
	(307.9)	(301.6)	(301.7)	(197.7)
Number of high school age boys in household	-55.9	20.8	22.2	169.5
	(358.0)	(350.3)	(350.4)	(228.9)
Number of high school age girls in household	288.6	386.3	383.8	559.4**
	(351.8)	(344.4)	(344.5)	(229.0)
Primary source of income for community that household resides is agriculture (1=Yes)		-1,889.8***	-1,853.4***	-1,318.4***
		(270.0)	(276.0)	(204.9)
Whether or not current residence is owned by household (1=Yes)			-251.3	644.7**
			(392.9)	(276.9)
Number of schools (elementary middle and high) in community				168.7***
				(28.57)
Constant	2,153.0***	3,166.4***	3,373.9***	854.0*
	(477.1)	(488.5)	(586.6)	(490.8)
Observations	1,066	1,066	1,066	882
R-squared	0.012	0.056	0.056	0.137
* p<0.10 ** p<0.05 *** p<0.01				

Standard errors are in parenthesis

Table 3: Regression results for log total household education expenditure in 2007 (Rupiah, thousands)

	(1)	(2)	(3)	(4)
Drought index of 2006 (mm)	-0.419***	-0.349***	-0.363***	-0.435***
	(0.135)	(0.133)	(0.134)	(0.150)
Number of elementary school age boys in household	0.426***	0.420***	0.427***	0.366***
	(0.099)	(0.097)	(0.097)	(0.106)
Number of elementary school age girls in household	0.421***	0.424***	0.425***	0.406***
	(0.099)	(0.098)	(0.098)	(0.109)
Number of middle school age boys in household	0.154	0.193	0.198*	0.166
	(0.120)	(0.118)	(0.118)	(0.129)
Number of middle school age girls in household	0.065	0.0993	0.0960	0.0757
	(0.122)	(0.120)	(0.120)	(0.131)
Number of high school age boys in household	-0.031	-0.007	-0.008	-0.064
	(0.142)	(0.140)	(0.140)	(0.152)
Number of high school age girls in household	0.406***	0.437***	0.440***	0.374**
	(0.139)	(0.137)	(0.137)	(0.152)
Primary source of income for community that household resides is agriculture (1=Yes)		-0.593***	-0.630***	-0.472***
		(0.108)	(0.110)	(0.136)
Whether or not current residence is owned by household (1=Yes)			0.259*	0.422**
			(0.156)	(0.184)
Number of schools (elementary middle and high) in community				0.067***
				(0.019)
Constant	6.500***	6.817***	6.604***	5.857***
	(0.189)	(0.195)	(0.234)	(0.326)
Observations	1,066	1,066	1,066	882
R-squared	0.045	0.071	0.074	0.085
* p<0.10 ** p<0.05 *** p<0.01				

Standard errors are in parenthesis

Table 4: Wald test results on coefficient differences from Table 2

	(1)			(2)			(3)			(4)		
School level	Coefficient difference	F stat	Prob > F	Coefficient difference	F stat	Prob > F	Coefficient difference	F stat	Prob > F	Coefficient difference	F stat	Prob > F
Elementary school	113.2	0.16	0.69	83.6	0.09	0.76	78.7	0.08	0.77	-81.7	0.20	0.65
Middle school	-176.4	0.32	0.57	-160.2	0.28	0.60	-168.1	0.30	0.58	-48.4	0.06	0.81
High school	-344.5	0.99	0.32	-365.5	1.16	0.28	-361.6	1.14	0.29	-389.9*	3.11	0.08

* p<0.10 ** p<0.05 *** p<0.01
Regression numbers at top correspond to those from Table 2
Coefficient differences are calculated as that of boys minus that of girls

Table 5: Wald test results on coefficient differences from Table 3

	(1)			(2)			(3)			(4)		
School level	Coefficient difference	F stat	Prob > F	Coefficient difference	F stat	Prob > F	Coefficient difference	F stat	Prob > F	Coefficient difference	F stat	Prob > F
Elementary school	0.005	0.00	0.96	-0.004	0.00	0.97	0.001	0.00	0.99	-0.040	0.11	0.74
Middle school	0.089	0.53	0.47	0.094	0.60	0.44	0.102	0.71	0.40	0.091	0.46	0.50
High school	-0.437***	0.20	0.00	-0.444***	0.80	0.00	-0.448***	1.01	0.00	-0.438***	8.88	0.00

* p<0.10 ** p<0.05 *** p<0.01
Regression numbers at top correspond to those from Table 2
Coefficient differences are calculated as that of boys minus that of girls

Table 6: Regression results for total household education expenditure in 2007 with seasonal breakdown (Rupiah, thousands)

	(1)	(2)	(3)	(4)
Drought index of 2006 for months only during rainy season (mm)	-1,083.3**	-837.2**	-807.3*	-808.7***
	(430.6)	(422.2)	(423.7)	(248.1)
Drought index of 2006 for months only during dry season (mm)	-1,879.5***	-2,462.4***	-2,411.5***	-1,767.0***
	(706.6)	(696.3)	(699.0)	(432.3)
Number of elementary school age boys in household	130.7	113.1	101.3	-184.9
	(364.6)	(355.7)	(356.1)	(205.3)
Number of elementary school age girls in household	116.1	128.6	129.0	11.36
	(366.6)	(357.7)	(357.8)	(209.7)
Number of middle school age boys in household	-68.4	124.6	117.0	330.1
	(427.4)	(418.3)	(418.5)	(241.7)
Number of middle school age girls in household	141.5	206.9	213.6	239.3
	(439.8)	(429.2)	(429.4)	(247.2)
Number of high school age boys in household	-428.8	-332.2	-328.7	143.6
	(513.1)	(500.9)	(501.0)	(288.8)
Number of high school age girls in household	11.9	113.1	109.4	567.5**
	(499.2)	(487.4)	(487.5)	(285.8)
Primary source of income for community that household resides is agriculture (1=Yes)		-2,326.0***	-2,254.0***	-1,492.5***
		(392.0)	(401.2)	(261.1)
Whether or not current residence is owned by household (1=Yes)			-485.6	609.0*
			(570.3)	(348.6)
Number of schools (elementary middle and high) in community				169.8***
				(34.47)
Constant	2,103.3***	3,237.4***	3,656.7***	567.0
	(729.3)	(736.8)	(886.3)	(620.8)
Observations	686	686	686	572
R-squared	0.022	0.071	0.072	0.165
* p<0.10 ** p<0.05 *** p<0.01				

Standard errors are in parenthesis

Table 7: Regression results for log total household education expenditure in 2007 with seasonal breakdown (Rupiah, thousands)

	(1)	(2)	(3)	(4)
Drought index of 2006 for months only during rainy season (mm)	-0.518***	-0.446***	-0.466***	-0.537***
	(0.143)	(0.141)	(0.141)	(0.156)
Drought index of 2006 for months only during dry season (mm)	-0.869***	-1.041***	-1.075***	-1.302***
	(0.235)	(0.233)	(0.233)	(0.272)
Number of elementary school age boys in household	0.321***	0.316***	0.324***	0.244*
	(0.121)	(0.119)	(0.119)	(0.129)
Number of elementary school age girls in household	0.351***	0.355***	0.355***	0.309**
	(0.122)	(0.120)	(0.119)	(0.132)
Number of middle school age boys in household	0.198	0.255*	0.260*	0.253*
	(0.142)	(0.140)	(0.140)	(0.152)
Number of middle school age girls in household	0.009	0.028	0.024	0.057
	(0.146)	(0.144)	(0.143)	(0.155)
Number of high school age boys in household	-0.303*	-0.275	-0.277*	-0.259
	(0.171)	(0.167)	(0.167)	(0.181)
Number of high school age girls in household	0.245	0.275*	0.278*	0.240
	(0.166)	(0.163)	(0.163)	(0.180)
Primary source of income for community that household resides is agriculture (1=Yes)		-0.686***	-0.734***	-0.611***
		(0.131)	(0.134)	(0.164)
Whether or not current residence is owned by household (1=Yes)			0.325*	0.607***
			(0.190)	(0.219)
Number of schools (elementary middle and high) in community				0.075***
				(0.022)
Constant	6.415***	6.749***	6.469***	5.476***
	(0.243)	(0.246)	(0.296)	(0.390)
Observations	686	686	686	572
R-squared	0.074	0.110	0.114	0.139
* p<0.10 ** p<0.05 *** p<0.01				

Standard errors are in parenthesis

Table 8: Wald test results on coefficient differences between rainy and dry season from Table 6 and 7

	(1)			(2)			(3)			(4)		
Outcome variable type	Coefficient difference	F stat	Prob > F	Coefficient difference	F stat	Prob > F	Coefficient difference	F stat	Prob > F	Coefficient difference	F stat	Prob > F
Regular (Table 6)	796.2	0.93	0.34	1625.1**	3.94	0.05	1604.1**	3.83	0.05	958.3*	3.67	0.06
Log (Table 7)	0.351	1.63	0.20	0.595**	4.73	0.03	0.609**	4.96	0.03	0.765**	5.92	0.02

* p<0.10 ** p<0.05 *** p<0.01

Regression numbers at top correspond to those from Table 6 and 7

Coefficient differences are calculated as that of rainy season minus that of dry season