

Drivers of Tree Cover Change in Indonesia - *Linkages between Poverty and Palm Oil*

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Disclaimer

Please note that the discussion and results that follow represent correlations and not strictly causal estimates. While a good attempt has been made to account for common year trends and unobserved time-invariant heterogeneity, it would not be appropriate to think of the figures as strict causal estimates.

Guide to Tables

In each of the tables, we provide results for Sumatera and Kalimantan only, including both Kabupaten (districts) and Kota (cities). Tables 1-3 cover the 2000-2010 period and focus on small holders only (full sample). Tables 4-16 cover 2005, 2007-2010, the only time period for which we have data for small holders as well as large holders, i.e. private estates and SOEs (restricted sample).

Tables 1 – 3 compare the poverty variables of interest, including the poverty rate, Gini, quintiles of real per capita expenditure and population percentage below multiples of the poverty line. The specifications used for Tables 1 - 3 are noted in the titles of the tables. Note that Table 1 is comparable to the work of Bill Wallace and Jon Jellema (“original specification”). In Table 2, we further add national palm oil price trends as an additional control. In Table 3 we include district and year fixed effects and cluster the standard errors at the district level. This econometrically augmented specification is possible, since we have more years of observations than the previous analysis carried out under Bill Wallace and Jon Jellema.

Tables 4-14 take a specific poverty measure (e.g. Poverty Rate or Gini) and make comparisons across different sizes (total, small holders, large holders) and across specifications (original, econometrically augmented). The columns match according to the left hand side variables. We limit total (small holders + large holders) and small holders specifications only to years for which we have data on SOEs and Private holdings.

Tables 15-16 examine the effect of combined land use and combined production (small holder and large holder) on per capita expenditure by quintiles and population percentage below multiples of the poverty lines to isolate which ownership is driving the results.

Finally, note that we use abbreviations for left hand side variables to allow tables to fit - dpov_rate (First difference in Poverty Rate), dGini_real (First difference in the real Gini Coefficient), dpcexp2_q`j' (First difference in real per capita expenditure – spatially and temporally adjusted - for quintiles j) and dPL`j' (first difference in population percentage below the jth multiple of the poverty line).

Key Findings:

1. Sliced and diced from many directions; no significant and robust findings
2. Can reproduce results of Jon and Bill for poverty rate from 2009 (using 2005, 2007-2010), where a one-unit increase in total land under palm oil production decreases the poverty rate by 3 percentage points. BUT...
 - a. If fixed effects are added, significance goes away
 - b. If 10 years of data are used, only marginally significant (with national palm oil prices or year FE) AND do not find similar result with any of the other poverty measures, including the percentage of population below poverty line, which is directly comparable (need to further clarify with Matt!).
 - c. Adding kotas makes no difference
 - d. Adding national palm oil prices makes no difference
3. Results for Gini coefficient are weak. Find negative and significant effect of the production of large holders on the Gini (using 2005, 2007-2010), where a one-unit increase in production of large holders, increases the Gini 0.016 percentage points), BUT..
 - a. If fixed effects are added, significance goes away
 - b. If 10 years of data are used, only marginally significant (with national palm oil prices)
4. Results are insignificant for the lowest two income quintiles and the multiples of the poverty line, which are in themselves consistent. However, the fact that we find insignificant results for the percentage of the population below the poverty line is concerning, as this variable should be directly comparable to the poverty rate. – need to follow up with Matt.
5. Results for quintile 3-4 indicate that per capita expenditure decreases for quintiles 3-5 for higher production in palm oil by large holders, where a hectare increase in large production lowers per capita expenditure by Rp. 1,222, Rp 3,179, Rp. 26,592 respectively. BUT...
 - a. If fixed effects are added, significance goes away
 - b. If 10 years of data are used, significance goes away
 - c. If combine small and large holder land or production, significance goes away

Table 1: **Original Specification comparable to Bill's and Jon's work** (Initial Trends with No Year, District FE) – 2000-2010

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	dpo _v _rate	dGini_real	dp _c exp ₂ _q1	dp _c exp ₂ _q2	dp _c exp ₂ _q3	dp _c exp ₂ _q4	dp _c exp ₂ _q5	dPL10	dPL12	dPL15	dPL20
Change in Land Under P.O (Small)	-2.139 (1.353)	0.0147* (0.00873)	1,858 (2,505)	3,050 (3,431)	4,186 (4,414)	5,934 (6,003)	20,759 (12,748)	0.481 (0.632)	0.967 (1.386)	1.705 (2.278)	1.547 (2.577)
Change in Production of P.O (Small)	0.995 (0.756)	-0.00846 (0.00543)	-1,090 (1,557)	-1,769 (2,133)	-2,484 (2,744)	-3,820 (3,731)	-8,805 (7,925)	-0.0286 (0.393)	0.0755 (0.862)	-0.0800 (1.416)	0.180 (1.601)
Constant	-3.197*** (0.789)	-0.0114 (0.00923)	-2,677 (2,536)	-4,024 (3,498)	-5,208 (4,501)	-6,783 (6,118)	-15,153 (13,269)	0.0704 (0.448)	-0.366 (1.078)	-0.793 (1.929)	-1.757 (2.362)
Observations	635	659	659	659	659	659	659	659	659	659	659
R-squared	0.005	0.014	0.016	0.018	0.019	0.019	0.019	0.016	0.004	0.002	0.001

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 2: **Original Specification + National Price Movements** (Initial Trends + National Price Movements with No Year, District FE) – 2000-2010

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	dпов_rate	dGini_real	dpсexp2_q1	dpсexp2_q2	dpсexp2_q3	dpсexp2_q4	dpсexp2_q5	dPL10	dPL12	dPL15	dPL20
Change in Land Under P.O (Small)	-2.559* (1.513)	0.0199 (0.0152)	5,396 (4,524)	8,246 (6,213)	10,739 (7,995)	15,220 (10,875)	36,862 (22,655)	0.750 (1.139)	1.281 (2.268)	2.498 (3.598)	4.083 (4.243)
Change in Production of P.O (Small)	1.325 (0.857)	-0.0162* (0.00903)	-2,749 (2,696)	-4,259 (3,701)	-5,820 (4,763)	-8,605 (6,479)	-20,561 (13,473)	-0.102 (0.675)	0.419 (1.345)	0.326 (2.136)	-0.561 (2.522)
Constant	-6.421*** (1.266)	-0.0110 (0.0126)	-4,322 (3,594)	-6,359 (4,977)	-8,190 (6,405)	-10,519 (8,707)	-16,746 (18,467)	0.929 (0.789)	2.304 (1.581)	2.226 (2.552)	-1.152 (3.118)
Observations	545	463	463	463	463	463	463	463	463	463	463
R-squared	0.022	0.017	0.023	0.025	0.025	0.025	0.017	0.018	0.043	0.055	0.043

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 3: **Original Specification + Year & District FE, District Clustered Standard Errors - 2000-2010**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	dpov_rate	dGini_real	dpcexp2_q1	dpcexp2_q2	dpcexp2_q3	dpcexp2_q4	dpcexp2_q5	dPL10	dPL12	dPL15	dPL20
Change in Land Under P.O (Small)	-1.834* (0.939)	0.00537 (0.00952)	682.9 (2,279)	1,033 (3,202)	862.1 (3,952)	791.7 (5,259)	10,405 (12,240)	0.119 (0.537)	0.116 (1.257)	0.593 (1.860)	0.596 (2.280)
Change in Production of P.O (Small)	0.795 (1.095)	-0.000293 (0.00662)	9.421 (1,902)	258.1 (2,561)	502.2 (3,231)	602.1 (4,304)	2,225 (8,995)	0.113 (0.450)	0.223 (0.943)	0.0842 (1.441)	0.689 (1.689)
Constant	-0.173 (1.802)	0.0314** (0.0125)	13,052*** (4,378)	19,583*** (6,044)	-17,062* (10,277)	34,405*** (9,971)	53,577*** (18,118)	0.507 (0.759)	0.0544 (1.251)	1.775 (1.999)	6.096** (2.839)
Observations	635	659	659	659	659	659	659	659	659	659	659
R-squared	0.500	0.301	0.149	0.164	0.191	0.238	0.323	0.166	0.189	0.223	0.213

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4: Poverty Rate: Columns 1-3 are **original specification** (improved specifications are unavailable for this variable) and Columns 4-5 are **original specification + Year & District FE, District Clustered Standard Errors** – 2005, 2007-2010

VARIABLES	(1) dpov_rate	(2) dpov_rate	(3) dpov_rate	(4) dpov_rate	(5) dpov_rate
Change in Land Under P.O (Total)	-2.965*** (1.101)			-0.555 (0.815)	
Change in Production of P.O (Total)	-0.285 (0.706)			0.438 (0.592)	
Change in Land Under P.O (Small)		-2.462 (2.161)			-1.460 (0.924)
Change in Production of P.O (Small)		0.755 (1.355)			0.988 (0.791)
Change in Land Under P.O (Large)			-0.00123 (0.00344)		
Change in Production of P.O (Large)			0.00192 (0.00322)		
Constant	-0.688 (1.790)	-0.816 (1.850)	0.00516** (0.00227)	-19.74*** (1.165)	-19.70*** (1.024)
Observations	349	335	71	359	348
R-squared	0.110	0.037	0.652	0.805	0.803

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note: There are not enough observations to run the econometrically augmented specification for large holders.

Table 5: Real Gini Coefficient: Columns 1-3 are **original specification** and Columns 4-6 are **original specification + Year & District FE, District Clustered**
Standard Errors – 2005, 2007-2010

VARIABLES	(1) dGini_real	(2) dGini_real	(3) dGini_real	(4) dGini_real	(5) dGini_real	(6) dGini_real
Change in Land Under P.O (Total)	0.00200 (0.00773)			-0.00914 (0.00738)		
Change in Production of P.O (Total)	-0.00355 (0.00454)			0.000298 (0.00344)		
Change in Land Under P.O (Small)		0.00772 (0.0119)			-0.00789 (0.0146)	
Change in Production of P.O (Small)		-0.00706 (0.00860)			-0.000817 (0.00639)	
Change in Land Under P.O (Large)			-0.00564 (0.0197)			-0.0175 (0.0376)
Change in Production of P.O (Large)			-0.0163** (0.00781)			-0.00137 (0.00616)
Constant	-0.0147 (0.0153)	-0.0148 (0.0154)	-0.0107 (0.0149)	0.104*** (0.0154)	0.0973*** (0.0137)	0.00498 (0.00655)
Observations	432	413	141	457	446	141
R-squared	0.039	0.039	0.065	0.454	0.452	0.606

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 6: Per Capita Income Q1 (Spatially & Temporally Adjusted): Columns 1-3 are **original specification** and Columns 4-6 are **original specification + Year & District FE, District Clustered Standard Errors** – 2005, 2007-2010

VARIABLES	(1) dpcep2_q1	(2) dpcep2_q1	(3) dpcep2_q1	(4) dpcep2_q1	(5) dpcep2_q1	(6) dpcep2_q1
Change in Land Under P.O (Total)	2,690 (1,989)			-1,081 (2,353)		
Change in Production of P.O (Total)	-451.3 (1,168)			-426.2 (744.2)		
Change in Land Under P.O (Small)		1,357 (3,094)			-223.2 (2,971)	
Change in Production of P.O (Small)		-1,032 (2,241)			-432.2 (1,593)	
Change in Land Under P.O (Large)			1,563 (1,801)			4,905 (3,467)
Change in Production of P.O (Large)			-10.07 (713.6)			-1,068 (1,245)
Constant	-5,404 (3,853)	-5,619 (3,966)	1,892 (1,341)	24,844*** (6,448)	23,712*** (5,472)	1,534** (721.8)
Observations	432	413	141	457	446	141
R-squared	0.087	0.080	0.086	0.323	0.324	0.597

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 7: Per Capita Income Q2 (Spatially & Temporally Adjusted): Columns 1-3 are **original specification** and Columns 4-6 are **original specification + Year & District FE, District Clustered Standard Errors** – 2005, 2007-2010

VARIABLES	(1) dpcexp2_q2	(2) dpcexp2_q2	(3) dpcexp2_q2	(4) dpcexp2_q2	(5) dpcexp2_q2	(6) dpcexp2_q2
Change in Land Under P.O (Total)	4,131 (2,712)			-1,070 (2,888)		
Change in Production of P.O (Total)	-1,017 (1,593)			-1,025 (1,079)		
Change in Land Under P.O (Small)		2,694 (4,221)			-136.9 (3,790)	
Change in Production of P.O (Small)		-1,873 (3,057)			-683.7 (2,238)	
Change in Land Under P.O (Large)			908.1 (745.3)			92.86 (982.8)
Change in Production of P.O (Large)			-149.0 (295.4)			209.9 (308.6)
Constant	-6,611 (5,242)	-7,455 (5,401)	667.1 (554.4)	36,168*** (8,667)	34,315*** (7,418)	4,050*** (283.8)
Observations	432	413	141	457	446	141
R-squared	0.093	0.085	0.331	0.344	0.343	0.669

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 8: Per Capita Income Q3 (Spatially & Temporally Adjusted): Columns 1-3 are **original specification** and Columns 4-6 are **original specification + Year & District FE, District Clustered Standard Errors** – 2005, 2007-2010

VARIABLES	(1) dpcep2_q3	(2) dpcep2_q3	(3) dpcep2_q3	(4) dpcep2_q3	(5) dpcep2_q3	(6) dpcep2_q3
Change in Land Under P.O (Total)	5,607 (3,530)			-1,828 (3,677)		
Change in Production of P.O (Total)	-1,337 (2,073)			-1,160 (1,342)		
Change in Land Under P.O (Small)		3,538 (5,496)			-1,518 (4,867)	
Change in Production of P.O (Small)		-2,363 (3,980)			-738.9 (2,856)	
Change in Land Under P.O (Large)			1,813** (895.6)			845.2 (1,397)
Change in Production of P.O (Large)			-1,222*** (355.0)			-87.38 (310.8)
Constant	-8,706 (6,833)	-9,607 (7,041)	-819.7 (667.0)	51,189*** (11,072)	48,740*** (9,494)	4,829*** (272.9)
Observations	432	413	141	457	446	141
R-squared	0.095	0.086	0.423	0.368	0.367	0.782

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 9: Per Capita Income Q4 (Spatially & Temporally Adjusted): Columns 1-3 are **original specification** and Columns 4-6 are **original specification + Year & District FE, District Clustered Standard Errors** – 2005, 2007-2010

VARIABLES	(1) dpcexp2_q4	(2) dpcexp2_q4	(3) dpcexp2_q4	(4) dpcexp2_q4	(5) dpcexp2_q4	(6) dpcexp2_q4
Change in Land Under P.O (Total)	8,095* (4,890)			-2,514 (5,025)		
Change in Production of P.O (Total)	-1,888 (2,872)			-1,648 (1,824)		
Change in Land Under P.O (Small)		4,342 (7,616)			-2,076 (6,891)	
Change in Production of P.O (Small)		-3,332 (5,516)			-1,013 (3,828)	
Change in Land Under P.O (Large)			800.4 (2,511)			-864.7 (3,569)
Change in Production of P.O (Large)			-3,179*** (995.4)			-287.5 (696.0)
Constant	-9,578 (9,449)	-10,808 (9,741)	66.96 (1,869)	79,554*** (14,737)	76,072*** (12,632)	7,913*** (678.1)
Observations	432	413	141	457	446	141
R-squared	0.094	0.084	0.125	0.417	0.415	0.715

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 10: Per Capita Income Q5 (Spatially & Temporally Adjusted): Columns 1-3 are **original specification** and Columns 4-6 are **original specification + Year & District FE, District Clustered Standard Errors** – 2005, 2007-2010

VARIABLES	(1) dpcep2_q5	(2) dpcep2_q5	(3) dpcep2_q5	(4) dpcep2_q5	(5) dpcep2_q5	(6) dpcep2_q5
Change in Land Under P.O (Total)	3,581 (10,466)			-12,422 (8,619)		
Change in Production of P.O (Total)	-3,257 (6,147)			640.0 (3,667)		
Change in Land Under P.O (Small)		14,250 (16,159)			-5,995 (12,821)	
Change in Production of P.O (Small)		-8,224 (11,697)			-1,058 (7,868)	
Change in Land Under P.O (Large)			1,853 (25,949)			-9,898 (44,662)
Change in Production of P.O (Large)			-26,592** (10,279)			-222.3 (6,227)
Constant	-24,388 (20,550)	-24,523 (20,892)	-8,020 (19,556)	180,752*** (23,557)	171,873*** (20,983)	19,877** (8,078)
Observations	432	413	141	457	446	141
R-squared	0.072	0.073	0.063	0.539	0.538	0.640

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 11: Population Percentage Below Poverty Line: Columns 1-3 are **original specification** and Columns 4-6 are **original specification + Year & District FE, District Clustered Standard Errors** – 2005, 2007-2010

VARIABLES	(1) dPL10	(2) dPL10	(3) dPL10	(4) dPL10	(5) dPL10	(6) dPL10
Change in Land Under P.O (Total)	0.309 (0.565)			-0.576 (0.478)		
Change in Production of P.O (Total)	0.235 (0.332)			0.0189 (0.169)		
Change in Land Under P.O (Small)		0.281 (0.880)			-0.256 (0.679)	
Change in Production of P.O (Small)		0.143 (0.637)			0.0349 (0.404)	
Change in Land Under P.O (Large)			-0.495 (0.594)			-0.707 (1.198)
Change in Production of P.O (Large)			-0.379 (0.236)			0.266 (0.275)
Constant	0.595 (0.995)	0.498 (1.005)	0.132 (0.418)	4.297** (1.783)	3.851*** (1.462)	-0.699*** (0.222)
Observations	432	413	141	457	446	141
R-squared	0.016	0.008	0.385	0.256	0.253	0.622

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 12: Population Percentage Below 1.2 x Poverty Line: Columns 1-3 are **original specification** and Columns 4-6 are **original specification + Year & District FE, District Clustered Standard Errors** – 2005, 2007-2010

VARIABLES	(1) dPL12	(2) dPL12	(3) dPL12	(4) dPL12	(5) dPL12	(6) dPL12
Change in Land Under P.O (Total)	-0.442 (1.398)			-1.800 (1.166)		
Change in Production of P.O (Total)	0.932 (0.822)			0.543 (0.513)		
Change in Land Under P.O (Small)		1.137 (2.173)			-0.000223 (2.171)	
Change in Production of P.O (Small)		0.0543 (1.573)			0.153 (1.090)	
Change in Land Under P.O (Large)			-2.283 (1.836)			-1.152 (4.842)
Change in Production of P.O (Large)			-0.505 (0.729)			0.290 (0.938)
Constant	0.203 (2.504)	0.00471 (2.535)	-0.458 (1.300)	8.033*** (2.999)	7.101*** (2.440)	-1.536** (0.704)
Observations	432	413	141	457	446	141
R-squared	0.009	0.005	0.043	0.239	0.244	0.507

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 13: Population Percentage Below 1.5 x Poverty Line: Columns 1-3 are **original specification** and Columns 4-6 are **original specification + Year & District FE, District Clustered Standard Errors** – 2005, 2007-2010

VARIABLES	(1) dPL15	(2) dPL15	(3) dPL15	(4) dPL15	(5) dPL15	(6) dPL15
Change in Land Under P.O (Total)	-0.651 (2.334)			-2.563 (1.699)		
Change in Production of P.O (Total)	1.241 (1.371)			0.580 (0.778)		
Change in Land Under P.O (Small)		2.774 (3.620)			0.707 (2.930)	
Change in Production of P.O (Small)		-0.596 (2.622)			-0.147 (1.755)	
Change in Land Under P.O (Large)			-1.848 (3.019)			1.419 (7.101)
Change in Production of P.O (Large)			0.371 (1.198)			1.131 (1.290)
Constant	0.0328 (4.227)	-0.540 (4.299)	1.690 (2.146)	11.12** (4.312)	9.548*** (3.561)	-1.924* (1.102)
Observations	432	413	141	457	446	141
R-squared	0.008	0.007	0.032	0.274	0.281	0.582

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 14: Population Percentage Below 2.0 x Poverty Line: Columns 1-3 are **original specification** and Columns 4-6 are **original specification + Year & District FE, District Clustered Standard Errors** – 2005, 2007-2010

VARIABLES	(1) dPL20	(2) dPL20	(3) dPL20	(4) dPL20	(5) dPL20	(6) dPL20
Change in Land Under P.O (Total)	0.829 (2.452)			-1.960 (2.091)		
Change in Production of P.O (Total)	0.779 (1.440)			0.176 (0.810)		
Change in Land Under P.O (Small)		2.665 (3.796)			0.863 (2.933)	
Change in Production of P.O (Small)		-0.141 (2.749)			0.334 (1.677)	
Change in Land Under P.O (Large)			-0.124 (3.190)			4.501 (5.730)
Change in Production of P.O (Large)			1.385 (1.265)			1.216 (1.260)
Constant	-2.634 (4.530)	-3.091 (4.618)	1.290 (2.292)	13.68** (5.476)	12.14*** (4.584)	-2.217** (1.074)
Observations	432	413	141	457	446	141
R-squared	0.018	0.015	0.020	0.283	0.287	0.613

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 15: Comparisons across variables with both large and small holders (Spatially & Temporally Adjusted): **original specification + Year & District FE, District Clustered Standard Errors – 2005, 2007-2010**

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	dpcexp2_q1	dpcexp2_q1	dpcexp2_q2	dpcexp2_q2	dpcexp2_q3	dpcexp2_q3	dpcexp2_q4	dpcexp2_q4	dpcexp2_q5	dpcexp2_q5
Change in Land Under P.O (Small)	-1,319 (2,503)		1,428 (1,207)		1,495 (1,139)		469.7 (2,333)		1,539 (20,300)	
Change in Land Under P.O (Large)	4,181 (3,226)		102.2 (874.5)		1,313 (1,538)		-1,117 (3,163)		-17,334 (41,038)	
Change in Production of P.O (Small)		-952.4 (1,564)		917.5 (634.4)		794.5 (595.5)		-181.9 (1,789)		-9,692 (13,954)
Change in Production of P.O (Large)		538.4 (1,912)		267.7 (705.8)		158.4 (750.5)		-615.6 (2,459)		-1,308 (18,870)
Constant	1,916*** (702.2)	2,383*** (847.8)	3,768*** (261.8)	3,872*** (371.5)	4,561*** (286.6)	4,767*** (381.7)	7,957*** (677.0)	7,889*** (993.4)	23,105*** (6,940)	21,145* (10,910)
Observations	143	136	143	136	143	136	143	136	143	136
R-squared	0.608	0.589	0.700	0.693	0.784	0.786	0.733	0.710	0.685	0.640

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 16: Comparisons across variables with both large and small holders (Poverty Lines): **original specification + Year & District FE, District Clustered**
Standard Errors – 2005, 2007-2010

VARIABLES	(1) dPL10	(2) dPL10	(3) dPL12	(4) dPL12	(5) dPL15	(6) dPL15	(7) dPL20	(8) dPL20
Change in Land Under P.O (Small)	-0.164 (0.913)		-2.777 (2.917)		-0.857 (4.814)		4.272 (5.583)	
Change in Land Under P.O (Large)	-0.112 (1.117)		-0.419 (3.868)		1.472 (6.414)		3.762 (6.058)	
Change in Production of P.O (Small)		-1.038 (0.684)		-3.662* (1.948)		-3.024 (2.763)		0.0451 (3.389)
Change in Production of P.O (Large)		0.611 (0.738)		-0.0355 (2.177)		1.137 (3.190)		1.646 (3.372)
Constant	-0.772*** (0.227)	-0.375 (0.334)	-1.242 (0.846)	-0.681 (0.947)	-2.335* (1.233)	-1.061 (1.442)	-3.566*** (1.198)	-1.987 (1.456)
Observations	143	136	143	136	143	136	143	136
R-squared	0.626	0.655	0.536	0.574	0.608	0.603	0.681	0.602

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1