Appendix to "What drives and stops deforestation, reforestation, and forest degradation? An updated meta-analysis." Jonah Busch and Kalifi Ferretti-Gallon

Table A1. Keywords searched

Subject	**Method**
Afforest*	Binomial
Defor*	Econometric*
Land cover	Logi*
Land use	Matching
LUC	Multinomial
REDD*	Multivariate
	Neural net*
Concept	OLS
Caus*	Ordinary least square*
Determ*	Poisson
Driv*	Probit
Model	Regress*
Spatial	Tobit

Table A2. Studies included (n=320). Studies in blue text are new to this meta-analysis from Busch and Ferretti-Gallon (2017).

Turner et al, Ecol Applic, 1996	Nelson & Hellerstein, Am J Agric Econ, 1997	Wear & Bolstad, Ecosyst, 1998	Rosero-Bixby & Palloni, Pop Env, 1998
de Koning et al, Agric Ecosyst Env, 1998	Pfaff, J Env Econ Manag, 1999	Deininger & Minten, Econ Dev Cult Change, 1999	Cropper et al, Land Econ, 1999
Mertens et al, World Dev, 2000	Mertens & Lambin, Annals Assoc Am Geog, 2000	Helmer, Ecosyst, 2000	Cropper et al, Land Econ, 2001
Nelson et al, Land Econ, 2001	Soares-Filho et al, BioSci, 2001	Walsh et al, Agric Ecosyst Env, 2001	Geoghegan et al, Agric Ecosyst Env, 2001
Place & Otsuka, J Env Econ Manag, 2001	Deininger & Minten, Am J Agric Econ, 2002	Muller & Zeller, Agric Econ, 2002	Mertens et al, Agric Econ, 2002
Munroe et al, Agric Econ, 2002	Vance & Geoghegan, Agric Econ, 2002	Verburg et al, Env Manag, 2002	Tole, GeoJ, 2002
Laurance et al, J BioGeog, 2002	Southworth et al, Agric Ecosyst Env, 2004	Mertens et al, Int Reg Sci Rev, 2004	Munroe et al, Prof Geogr, 2004
Geoghegan et al, GeoJ, 2004	Pfaff & Sanchez-Azofeifa, Res Ener Econ, 2004	Alix-Garcia et al, World Dev, 2004	Bray et al, Land Use Policy, 2004
Agarwal et al, Ecol Modeling, 2005	Zhang et al, Env Mon Assess, 2005	Chowdhury, Appl Geog, 2006	Vagen, Agric Ecosyst Env, 2006
Mena et al, Env Manag, 2006	Vance & Iovanna, Land Use Policy, 2006	Chowdhury, Singapore J Trop Geog, 2006	Etter et al, Agric Ecosyst Env, 2006
Baptista & Rudel, Env Cons, 2006	Andersson & Gibson, J Policy Anal Manag, 2006	Pfaff et al, J Reg Sci, 2007	Sanchez-Azofeifa et al, Cons Biol, 2007
VanWey et al, Pop Env, 2007	Dolisca et al, J Forest Econ, 2007	Pfaff et al, Land Use Policy, 2007	Alix-Garcia, J Env Econ Manag, 2007
Sloan, Glob Env Change, 2008	Ellis & Porter-Bolland, Forest Ecol Manag, 2008	Son & Tu, Electronic Green J, 2008	Alix-Garcia et al, Env Dev Econ, 2008
Bray et al, Ecol Soc, 2008	Blackman et al, Am J Agric Econ, 2008	Weinhold & Reis, Glob Env Change, 2008	Caldas et al, Annals Assoc Am Geog, 2008
Andam et al, Proc Nat Acad Sci, 2008	Agarwal, Ecol Econ, 2009	Perez-Verdin et al, J Env Manag, 2009	Bhattarai et al, J Env Manag, 2009
Araujo et al, Ecol Econ, 2009	Pfaff et al, BEJ Econ Anal Policy, 2009	De Pinto & Nelson, Env Res Econ, 2009	Gaveau et al, Biol Cons, 2009
Gaveau et al, Env Res Lett, 2009	Tachibana & Adhikari, Land Econ, 2009	Jaimes et al, Appl Geog, 2010	Minetos & Polyzos, Forest Policy Econ, 2010
Wyman & Stein, Appl Geog, 2010	Michalski et al, Glob Env Change, 2010	Ellis et al, AgroForest Syst, 2010	Rueda, Reg Env Change, 2010
Lopez et al, Geog Bulletin, 2010	DeFries et al, Nat GeoSci, 2010	Trisurat et al, Env Manag, 2010	Kim, Transactions in GIS, 2010
Soares-Filhoa et al, Proc Nat Acad Sci, 2010	Zambrano et al, Cons Soc, 2010	Armenteras et al, Reg Env Change, 2011	Davalos et al, Env Sci Tech, 2011
Arima et al, Env Res Lett, 2011	Lin et al, Int J Geog Info Sci, 2011	Nakakaawa et al, Mitig Adapt Strat Glob Change, 2011	Busch et al, Proc Nat Acad Sci, 2011
Nelson & Chomitz, PLOS ONE, 2011	Van Dessel et al, Int J Geog Info Sci, 2011	Wendland et al, Glob Env Change, 2011	Zhao et al, Env Res Econ, 2011
Honey-Roses et al, Cons Biol, 2011	Deng et al, J Env Econ Manag, 2011	Hargrave & Kis-Katos, Env Res Econ, 2012	Arekhi & Jafarzadeh, Afr J Agric Res, 2012
Muller et al, Reg Env Change, 2012	Barsimantov & Kendall, J Env Dev, 2012	Vuohelainen et al, Env Manag, 2012	Olaniyi et al, Ocean Coast Manag, 2012
van Asselen & Verburg, Glob Change Biol, 2012	Lopez-Carr et al, Ecol Modeling, 2012	Takahashi & Todo, Env Manag, 2012	Monzon-Alvarado et al, Appl Geog, 2012
Mon et al, Forest Ecol Manag, 2012	de Espindola et al, Appl Geog, 2012	Vaca et al, PLOS ONE, 2012	Blackman et al, Land Econ, 2012
Alix-Garcia et al, Land Econ, 2012	Li et al, Land Econ, 2012	Arriagada et al, Land Econ, 2012	Gaveau et al, Cons Lett, 2012
Htun et al, Env Manag, 2013	Wheeler et al, Ecol Econ, 2013	Ferraro et al, Env Res Lett, 2013	Torahi & Rai, J Indian Soc Remote Sens, 2013
Getahun et al, Forest Ecol Manag, 2013	Gonga et al, Landscape Urban Plann, 2013	Li et al, Land Use Policy, 2013	Schmitt-Harsh, Appl Geog, 2013
Qasim et al, Reg Env Change, 2013	Patarasuk & Fik, Singapore J Trop Geog, 2013	Teferi et al, Agric Ecosyst Env, 2013	Alix-Garcia et al, Rev Econ Stat, 2013
Robalino & Pfaff, Land Econ, 2013	Vergara-Asenjo & Potvin, Glob Env Change, 2014	Holland et al, World Dev, 2014	Pfaff et al, World Dev, 2014
Newman et al, Agric Ecosyst Env, 2014	Brinkmann et al, Agric Ecosyst Env, 2014	Myamoto et al, Forest Policy Econ, 2014	Sims, Env Res Econ, 2014
Haruna et al, Env Res Lett, 2014	Hoang et al, Anthropocene, 2014	Vu et al, Land Use Policy, 2014	Kim et al, Land, 2014
Lin et al, Front Earth Sci, 2014	Wendland et al, Env Res Econ, 2014	Richards et al, Glob Env Change, 2014	Upton et al, J Env Manag, 2014
Takahashi & Todo, Env Impact Assess Rev, 2014	Li et al, Env Res Econ, 2015	Heino et al, PLOS ONE, 2015	Bavaghar, J Forest Sci, 2015
Börner et al, PLOS ONE, 2015	Cisneros et al, PLOS ONE, 2015	Miteva et al PLOS ONE, 2015	Pfaff et al, PLOS ONE, 2015
Shah & Baylis, PLOS ONE, 2015	Van Butsic et al, Biol Cons, 2015	Jones & Lewis, PLOS ONE, 2015	Thomas Clement et al, Sociol Inquiry, 2015
Assunção et al, Env Dev Econ, 2015	Morales-Barquero et al, Land Use Policy, 2015	Boillat et al, Land, 2015	Schneider & Peres, PLOS ONE, 2015
Clement et al, Rural Sociol, 2015	Burgess et al, Env Res Lett, 2015	Alix-Garcia et al, Am Econ J Econ Policy, 2015	Raghavan & Shrimali, Forest Policy Econ, 2015
Indarto et al, Int Forest Rev, 2015	Busch et al, Proc Nat Acad Sci, 2015	Blackman et al, Glob Env Change, 2015	Michinaka et al, Int Forest Rev, 2015
Brandt et al, Biol Cons, 2015	Molowny-Horas et al, Comp Env Urb Syst, 2015	Wendland et al, Land Econ, 2015	Feng et al, Sci Rep, 2015
Jiang et al, Ener, 2015	Corbelle-Rico et al, Land Use Policy, 2015	Blackman, Ecol Econ, 2015	Costedoat et al, PLOS ONE, 2015
Robalino et al, PLOS ONE, 2015	Clements & Milner-Gulland, Cons Biol, 2015	Pfaff et al, Phil Trans Roy Soc B, 2015	Larcom et al, Land Use Policy, 2016
Bax et al, J Nat Cons, 2016	Alix-Garcia et al, Land Use Policy, 2016	Cvitanović et al, Reg Env Change, 2016	Aguiar et al, Glob Change Biol, 2016
Cuenca et al, Env Sci Policy, 2016	Viña et al, Sci Adv, 2016	Pfaff et al, Forests, 2016	Tejada et al, Env Res, 2016
Jusys, Appl Geog, 2016	Wright et al, Proc Nat Acad Sci, 2016	Brown et al, Land Use Policy, 2016	Arima, PLOS ONE, 2016
Hu et al, Sci Total Env, 2016	Heilmayr & Lambin, Proc Nat Acad Sci, 2016	Xue et al, J Res Ecol, 2016	de Marques et al, PeerJ, 2016
Manuschevich & Beier, Land Use Policy, 2016	Sloan, Forests, 2016	Felardo, Env Asia, 2016	Djaenudin et al, Proc Env Sci, 2016

Bernardi et al, Forest Ecol Manag, 2016	Nurwanda et al, Soc Behav Sci, 2016	Djaenudina et al, Int J Sci Basic Appl Res, 2016	Ongsomwang & Boonchoo, S. J Sci Tech, 2016
Arriagada et al, PLOS ONE, 2016	Mohebalian & Aguilar, Forest Policy Econ, 2016	Fehlenberg et al, Glob Env Change, 2017	Cushman et al, Landscape Ecol, 2017
Apan et al, Appl Geog, 2017	Leblois et al, World Dev, 2017	Phompila et al, Landscape Ecol, 2017	Ryan et al, Appl Geog, 2017
Jones et al, Env Cons, 2017	Rudel, Forests, 2017	Call et al, Land Use Policy, 2017	Wang & Qiu, Ecol Econ, 2017
Ellis et al, Land Use Policy, 2017	Holland et al, Glob Env Change, 2017	Ceddia & Zepharovich, Land Use Policy, 2017	Bone et al, S Forests J Forest Sci, 2017
Bowker et al, Cons Biol, 2017	Alix-Garcia & Gibbs, Glob Env Change, 2017	Rubiano et al, Forests, 2017	Cuaresma et al, Sci Rep Nat, 2017
Shi et al, Forest Policy Econ, 2017	Schlesinger et al, J Land Use Sci, 2017	Adhikari et al, Forests, 2017	Sommer, Env Sociol, 2017
Viedma et al, J Env Manag, 2017	Schleicher et al, Sci Rep, 2017	Cuenca & Echeverria, PLOS ONE, 2017	Sellers, Pop Env, 2017
Nzunda & Midtgaard, Forest Tree Liveli, 2017	Le Velly et al, Land Econ, 2017	Sant'anna, Env Dev Econ, 2017	Xie et al, J Cleaner Prod, 2017
Xie et al, J Forest Econ, 2017	Samie et al, Sustain, 2017	Acacio et al, Glob Change Biol, 2017	Kleemann et al, J Env Manag, 2017
Najmuddin et al, Phys Chem Earth, 2017	Blackman et al, Proc Nat Acad Sci, 2017	Sims & Alix-Garcia, J Env Econ Manag, 2017	BinYishay et al, J Env Econ Manag, 2017
Chervier & Costedoat, World Dev, 2017	Robalino et al, J Assoc Env Res Econ, 2017	Piquer-Rodriguez et al, Appl Geog, 2018	Panlasigui et al, Biol Cons, 2018
Yue et al, J Geog Sci, 2018	Simmons et al, Env Sci Policy, 2018	Blackman et al, J Env Econ Manag, 2018	Samndong et al, Land Use Policy, 2018
Damania et al, World Dev, 2018	Pailler, J Env Econ Manag, 2018	Von Thaden et al, Land Use Policy, 2018	Oldekop et al, Glob Env Change, 2018
Beauchamp et al, Land Use Policy, 2018	Marcos-Martinez et al, Forest Policy Econ, 2018	Blackman & Veit, Ecol Econ, 2018	Abadie et al, Landscape Ecol, 2018
Pfaff et al, Econ Open Access E-J, 2018	Lonn et al, Forests, 2018	Desbureaux & Damania, Biol Cons, 2018	Shrestha et al, Peer J, 2018
Ramirez et al, J Latin Am Geog, 2018	Elburz et al, METU J Fac Archit, 2018	Fuller et al, Area, 2018	Keles et al, J Forest Econ, 2018
Jahanifar et al, J Appl Sci Env Manag, 2018	Cho et al, Forest Policy Econ, 2018	Sommer, Int J Soc Sci Stud, 2018	Sommer, Sociol Inquiry, 2018
Zhang et al, Sustain, 2018	Gayen & Saha, Spat Info Res, 2018	Restivo et al, Soc Sci J, 2018	Carvalho et al, Int J Dev Res, 2018
Jung & Polasky, J Env Econ Manag, 2018	Kindu et al, Sci Total Env, 2018	Zhao et al, Sustain, 2018	Aduah et al, S Afr J Geomat, 2018
Carlson et al, Proc Nat Acad Sci, 2018	Abman, Ecol Econ, 2018	Kucsicsa & Dumitrica, J Mountain Sci, 2019	Oldekop et al, Nat Sustain, 2019
Cervera et al, Land Use Policy, 2019	Pujiono et al, J Mountain Sci, 2019	Guerra-Martinez et al, Trop Geog, 2019	Zeb, Appl Geog, 2019
Alesina et al, Economica, 2019	Von Thaden et al, Reg Env Change, 2019	Cuaresma & Heger, Land Use Policy, 2019	Shevade & Loboda, PLOS ONE, 2019
Steenberg et al, Env Plann, 2019	Fan et al, Landscape Urban Plann, 2019	Duan & Tan, Sustain, 2019	Ordway et al, Nat Commun, 2019
Assunção et al, Econ J, 2019	Shandra et al, Rural Sociol, 2019	Lin et al, J Cleaner Prod, 2019	Nguyen, Singapore J Trop Geog, 2019
Higginbottom et al, Biol Cons, 2019	Sommer et al, J Dev Stud, 2019	Zeb et al, Glob Env Change, 2019	Wilson et al, Reg Env Change, 2019
Poor et al, Biol Cons, 2019	Trisurat et al, Sustain, 2019	Li et al, Forests, 2019	Chankrajang, J Dev Econ, 2019
Sommer, Env Policy Gov, 2019	Sommer et al, Sociol Persp, 2019	Amin et al, J Env Econ Manag, 2019	de Barros & Stege, Rev Brasil E Reg Urb, 2019
Bakehe, Econ Bulletin, 2019	Assuncao & Rocha, Env Dev Econ, 2019	Koch et al, Am J Agric Econ, 2019	Ustaoglu & Aydinoglu, Remote Sens, 2019
Wang et al, Sustain, 2019	Silva & Rodrigues, Est Cient, 2019	Peinhardt et al, Glob Env Polit, 2019	Leberger et al, Biol Cons, 2019
Fu et al, J Env Econ Policy, 2019	Torres-Rojo et al, World Dev, 2019	Philippe et al, Am J Geog Info Syst, 2019	Fox et al, J Forest Liveli, 2019
Bonilla-Mejia & Higuera-Mendieta, World Dev, 2019	Grinand et al, Land Degrad Dev, 2019	Abman & Lundberg, J Assoc Env Res Econ, 2019	Herrera et al, Proc Nat Acad Sci, 2019

Table A3. Summary statistics

		1996-2013	2014-2019	1996-2019
	n	121	199	320
Data source	Aerial photographs	15	8	23
	Modis	8	11	19
	All Landsat (incl. Hansen, Prodes)	2	76	78
	Other Landsat	83	73	156
	Hansen/WRI/GFW	0	54	54
	Prodes/INPE	2	22	24
	SPOT	8	8	16
	Other/unspecified	111	115	226
	Data resolution (m)	218.2	61.6	109.4
Study period	First year (median)	1989	2000	1994
	Last year (median)	2000	2011	2008
	Time period (average)	12.8	16.2	14.9
	Number of forest cover snapshots (average)	2.7	6.1	4.8
Study region	Africa	10	23	33
	Asia	28	62	90
	Europe	3	10	13
	Latin America/Caribbean	74	75	149
	Oceania	0	2	2
	North America	2	6	8
	Multi-continental or Global	4	20	24
Income category	Low income	8	14	22
	Lower middle income	18	26	44
	Upper middle income	79	104	183
	High income	8	23	31
	Mulitiple countries	8	32	40
Study area	Study area size (sq km) - average	660,469	1,216,553	988,053
	Study area size (sq km) - median	22,000	138,500	62,908
	% of country w/in study area	25%	36%	32%
	study area <10% country area	64	74	138
	study area >10%, <90% country area	32	52	84
	study area >90% country area	17	38	55
Unit of observation	Point	11	31	42
	Pixel/Grid Cell	77	78	155
	Parcel/Property/Plot	17	14	31
	Polygon	5	8	13
	Administrative Unit	9	36	45
	Country	0	13	13
	Other	2	17	19
Treatment of spatial autocorrelation	Any	53	76	129
	Sampling	20	15	35
	Moran's I	17	22	39
Treatment of leakage/spillover/ displacement of deforestation	Mention only	13	35	48
	Quantitative treatment	9	24	33
Journal title (multiple allowed)	Environment*	40	45	85
	Econ*	33	36	69
	Land*	14	25	39
	Policy*	7	26	33
	Forest*	6	22	28
	Manage*	17	11	28
	Geog*	15	10	25
	Agr*	16	3	19
	Conserv*	6	11	17
Miscellaneous	Variables included in study (median)	10.0	9.0	9.0
	Regression results reported (median)	27.0	28.0	28.0
	Use of matching	8	41	49
	Tested a hypothesis related to a specific driver variable	49	127	176
Author demographics	Female first author	38/118	67/193	105/311
	First author institution outside high-income country	29	66	95
	Number of authors (median)	3	3	3

Table A4. Consistency of associations of driver variables with deforestation. Cells with fewer than 40 observations are not shown. - = negative association with deforestation; ~ = neutral association with deforestation; + = positive association with deforestation. Driver variables in blue text are new to this meta-analysis, compared to Busch and Ferretti-Gallon (2017).

		Regression-level				Study-level			
		-	~	+	Total	-	~	+	Total
Built infra-structure	Distance to roads	456 (49%)	318 (34%)	162 (17%)	936 (100%)	104 (50%)	72 (34%)	34 (16%)	210 (100%)
	Distance to urban area	309 (42%)	281 (38%)	141 (19%)	731 (100%)	90 (43%)	83 (39%)	38 (18%)	211 (100%)
	Clearing activity	20 (11%)	45 (24%)	120 (65%)	185 (100%)	7 (13%)	14 (25%)	34 (62%)	55 (100%)
Market commodities	Agricultural activity	67 (14%)	210 (44%)	205 (43%)	482 (100%)	17 (15%)	52 (46%)	45 (39%)	114 (100%)
	Agricultural price	24 (10%)	82 (34%)	132 (55%)	238 (100%)	4 (10%)	17 (41%)	20 (49%)	41 (100%)
	Distance to agriculture	50 (57%)	17 (20%)	20 (23%)	87 (100%)	12 (52%)	8 (35%)	3 (13%)	23 (100%)
	Timber activity	54 (22%)	85 (35%)	102 (42%)	241 (100%)	7 (22%)	18 (56%)	7 (22%)	32 (100%)
	Timber price	37 (33%)	48 (42%)	28 (25%)	113 (100%)	3 (20%)	7 (47%)	5 (33%)	15 (100%)
	Livestock activity	9 (8%)	28 (24%)	82 (69%)	119 (100%)	5 (15%)	11 (32%)	18 (53%)	34 (100%)
	Livestock price	19 (19%)	64 (63%)	18 (18%)	101 (100%)	2 (18%)	7 (64%)	2 (18%)	11 (100%)
	Energy activity	12 (28%)	19 (44%)	12 (28%)	43 (100%)	2 (29%)	2 (29%)	3 (43%)	7 (100%)
	Agricultural yield	15 (15%)	63 (62%)	23 (23%)	101 (100%)	3 (20%)	10 (67%)	2 (13%)	15 (100%)
	Supply chain initiative	44 (38%)	70 (60%)	2 (2%)	116 (100%)	2 (33%)	4 (67%)	0 (0%)	6 (100%)
	Commodity certification	74 (36%)	115 (56%)	17 (8%)	206 (100%)	3 (15%)	14 (70%)	3 (15%)	20 (100%)
Demographics and socioeconomics	Population	120 (14%)	453 (52%)	290 (34%)	863 (100%)	27 (14%)	105 (54%)	64 (33%)	196 (100%)
	Property size	17 (22%)	42 (53%)	20 (25%)	79 (100%)	8 (35%)	11 (48%)	4 (17%)	23 (100%)
	Age	13 (21%)	45 (74%)	3 (5%)	61 (100%)	6 (23%)	18 (69%)	2 (8%)	26 (100%)
	Education	20 (20%)	57 (57%)	23 (23%)	100 (100%)	9 (22%)	24 (59%)	8 (20%)	41 (100%)
	Poverty	277 (28%)	559 (57%)	147 (15%)	983 (100%)	58 (29%)	112 (55%)	32 (16%)	202 (100%)
	Indigenous people	86 (36%)	143 (60%)	10 (4%)	239 (100%)	13 (42%)	15 (48%)	3 (10%)	31 (100%)
	Female	5 (13%)	23 (58%)	12 (30%)	40 (100%)	1 (6%)	11 (69%)	4 (25%)	16 (100%)
Land management and institutions	Land tenure security	34 (36%)	36 (38%)	25 (26%)	95 (100%)	12 (30%)	19 (48%)	9 (23%)	40 (100%)
	Community forest management	69 (32%)	108 (49%)	42 (19%)	219 (100%)	15 (24%)	34 (55%)	13 (21%)	62 (100%)
	Law enforcement	45 (51%)	37 (42%)	7 (8%)	89 (100%)	5 (50%)	4 (40%)	1 (10%)	10 (100%)
	Protected area	478 (50%)	379 (39%)	105 (11%)	962 (100%)	76 (51%)	54 (36%)	18 (12%)	148 (100%)
	Democracy	6 (8%)	60 (83%)	6 (8%)	72 (100%)	1 (9%)	9 (82%)	1 (9%)	11 (100%)
	Governance	20 (17%)	82 (71%)	14 (12%)	116 (100%)	8 (22%)	23 (62%)	6 (16%)	37 (100%)
	Conflict	6 (13%)	32 (68%)	9 (19%)	47 (100%)	0 (0%)	6 (75%)	2 (25%)	8 (100%)
	Trade openness	0 (8%)	33 (56%)	11 (36%)	44 (100%)	0 (10%)	4 (66%)	1 (24%)	5 (100%)
Policy	Rural income support	11 (8%)	77 (56%)	49 (36%)	137 (100%)	3 (10%)	19 (66%)	7 (24%)	29 (100%)
	Pes	117 (65%)	56 (31%)	6 (3%)	179 (100%)	19 (70%)	8 (30%)	0 (0%)	27 (100%)
	Restrictive policy	38 (54%)	26 (37%)	7 (10%)	71 (100%)	6 (46%)	7 (54%)	0 (0%)	13 (100%)
Biophysical characteristics	Soil suitability	38 (14%)	133 (50%)	93 (35%)	264 (100%)	8 (11%)	36 (51%)	27 (38%)	71 (100%)
	Distance to water	60 (28%)	102 (47%)	53 (25%)	215 (100%)	16 (24%)	33 (50%)	17 (26%)	66 (100%)
	Wetness	179 (30%)	267 (45%)	150 (25%)	596 (100%)	33 (31%)	44 (41%)	30 (28%)	107 (100%)
	Elevation	249 (54%)	144 (31%)	72 (15%)	465 (100%)	64 (50%)	44 (34%)	20 (16%)	128 (100%)
	Slope	297 (48%)	228 (37%)	99 (16%)	624 (100%)	76 (44%)	67 (39%)	29 (17%)	172 (100%)
	Temperature	45 (16%)	131 (47%)	105 (37%)	281 (100%)	11 (26%)	23 (53%)	9 (21%)	43 (100%)
	Forest abundance	80 (30%)	73 (27%)	115 (43%)	268 (100%)	21 (28%)	27 (36%)	27 (36%)	75 (100%)

Figure A1. Growth over time in spatially explicit econometric studies of deforestation, reforestation, and forest degradation, by region.

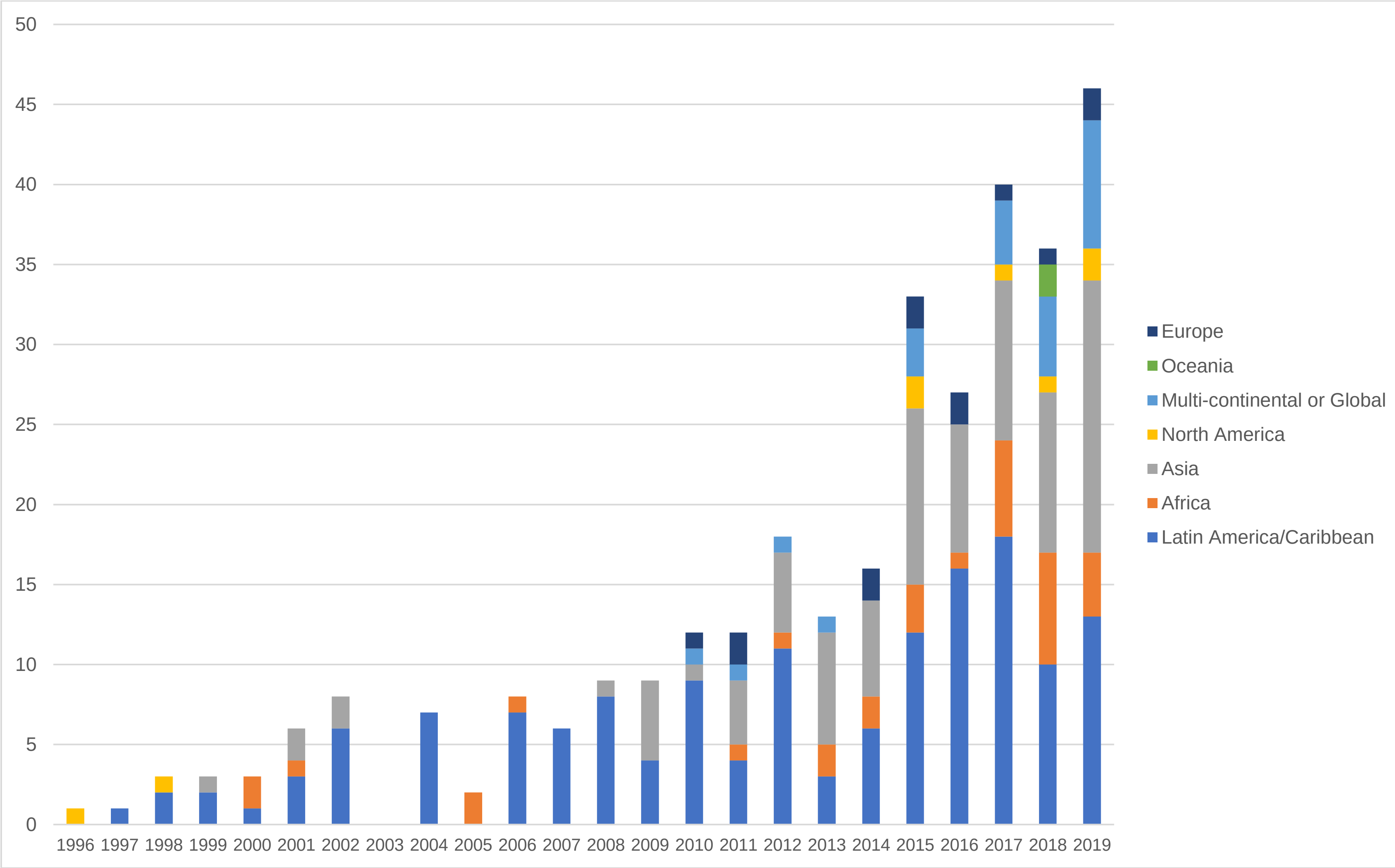


Figure A2. Consistency of association of driver variable with more or less deforestation (regression level). Notes: The color of the bar indicates whether the driver variable is consistently associated with less deforestation (white), more deforestation (black), or neither (grey). The association is considered to be consistent if the fraction (associated with more deforestation)/(associated with less deforestation + associated with more deforestation) is significantly different from 0.5 in a two-tailed t-test at the 95 percent confidence level. Categories containing fewer than 40 observations are not displayed.

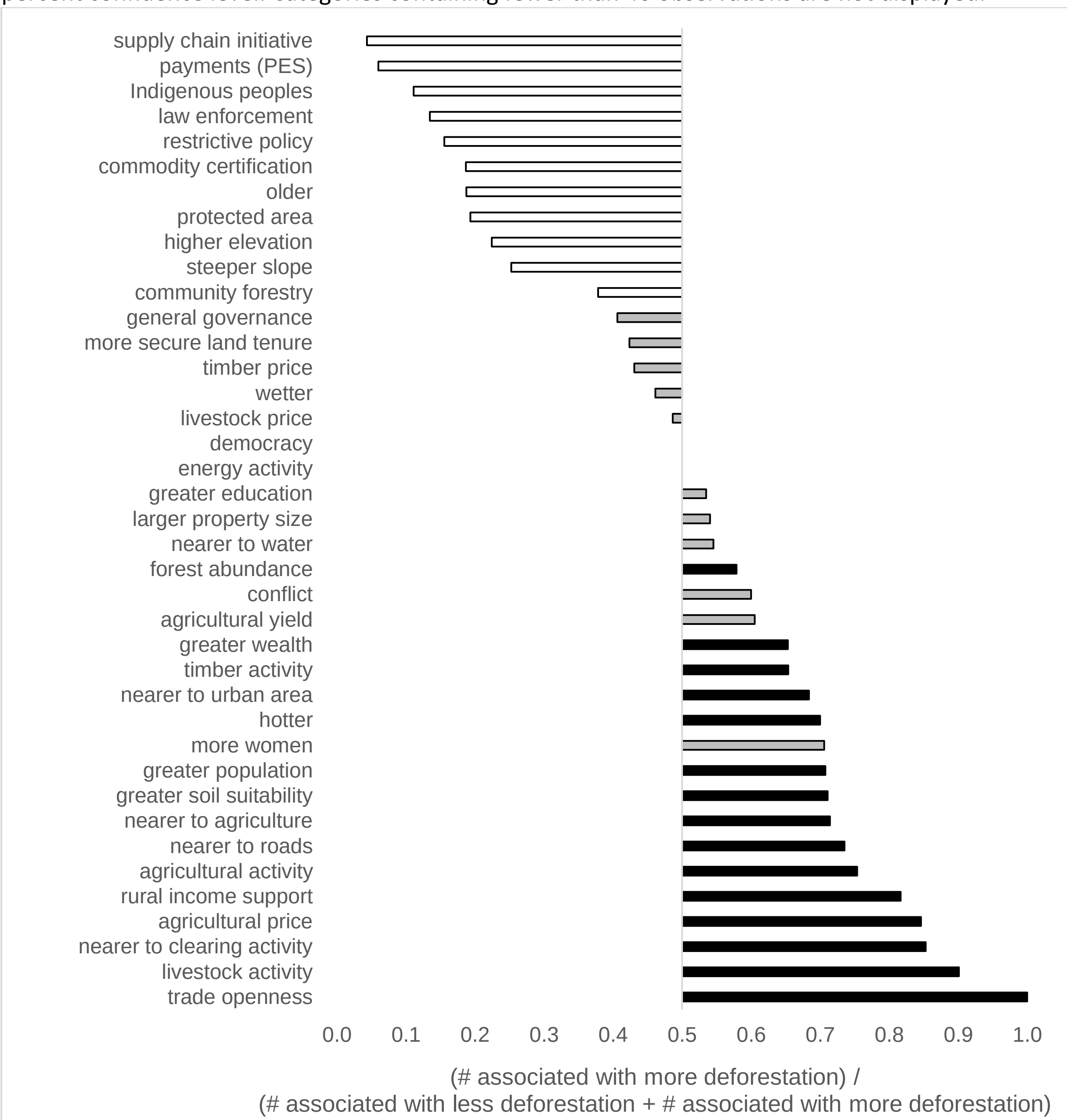
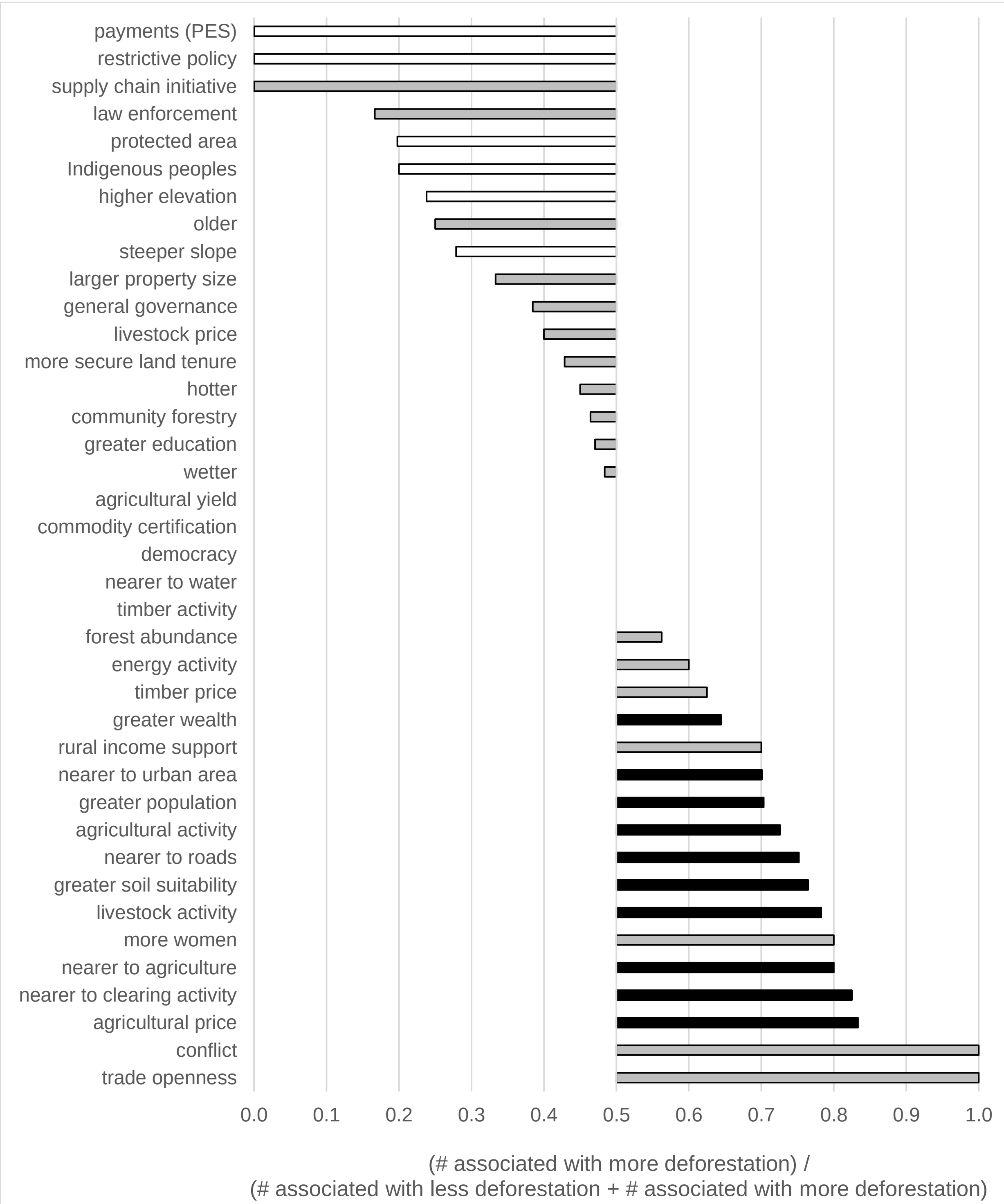


Figure A3. Consistency of association of driver variable with more or less deforestation (study level). Notes: The color of the bar indicates whether the driver variable is consistently associated with less deforestation (white), more deforestation (black), or neither (grey). The association is considered to be consistent if the fraction (associated with more deforestation)/(associated with less deforestation + associated with more deforestation) is significantly different from 0.5 in a two-tailed t-test at the 95 percent confidence level. Categories containing fewer than 40 observations are not displayed.



Annex I. Formulae for sign and significance of association

Regression-level observations

n^{+} : a variable in a multiple regression or matching analysis was coded as "positive and significant" if its coefficient was positive and significantly different from zero at the 95% confidence level
n^{-} : a variable in a multiple regression or matching analysis was coded as "negative and significant" if its coefficient was negative and significantly different from zero at the 95% confidence level
$n^{\sim}$: a variable in a multiple regression or matching analysis was coded as "not significant" if its coefficient was not significantly different from zero at the 95% confidence level

Regression-level statistics

$N^{+} = \sum n^{+}$: the number of regression-level observations that were positive and significant
$N^{-} = \sum n^{-}$: the number of regression-level observations that were negative and significant
$N^{\sim} = \sum n^{\sim}$: the number of regression-level observations that were not significant

Regression-level association

R^{+}: the regression-level association was consistently positive if $\frac{N^{+}}{N^{+}+N^{-}}$ was significantly greater than 0.5 in a two-tailed t-test at the 95 percent confidence level. I.e., if $\frac{N^{+}}{N^{+}+N^{-}} > 0.5 + 1.96 * \sqrt{\frac{0.5*(1-0.5)}{N^{+}+N^{-}}}$
R^{-}: the regression-level association was consistently negative if $\frac{N^{+}}{N^{+}+N^{-}}$ was significantly less than 0.5 in a two-tailed t-test at the 95 percent confidence level. I.e., if $\frac{N^{+}}{N^{+}+N^{-}} < 0.5 - 1.96 * \sqrt{\frac{0.5*(1-0.5)}{N^{+}+N^{-}}}$
$R^{\sim}$: the regression-level association was considered not consistent otherwise

Study-level outcomes

s^{+} : a variable in a study was considered "positive and significant" if the plurality of regression-level observations for that variable were positive and significant. I.e., if for that study $\sum n^{+} > \sum n^{-}$ and $\sum n^{+} > \sum n^{\sim}$
s^{-} : a variable in a study was considered "negative and significant" if the plurality of regression-level observations for that variable were negative and significant. I.e., if for that study $\sum n^{-} > \sum n^{+}$ and $\sum n^{-} > \sum n^{\sim}$
$s^{\sim}$: a variable in a study was considered "not significant" otherwise

Study-level association

S^{+}: the study-level association was considered consistently positive if $\frac{S^{+}}{S^{+}+S^{-}}$ was significantly greater than 0.5 in a two-tailed t-test at the 95 percent confidence level. I.e., if $\frac{S^{+}}{S^{+}+S^{-}} > 0.5 + 1.96 * \sqrt{\frac{0.5*(1-0.5)}{S^{+}+S^{-}}}$
S^{-}: the study-level association was considered consistently negative if $\frac{S^{+}}{S^{+}+S^{-}}$ was significantly less than 0.5 in a two-tailed t-test at the 95 percent confidence level. I.e., if $\frac{S^{+}}{S^{+}+S^{-}} < 0.5 - 1.96 * \sqrt{\frac{0.5*(1-0.5)}{S^{+}+S^{-}}}$
$S^{\sim}$: the study-level association was considered not consistent otherwise

Regression-level association accounting for non-significant results

$R^{+\prime}$: the regression-level association was considered consistently positive if $\frac{N^{+}+0.5*N^{\sim}}{N^{+}+N^{\sim}+N^{-}}$ was significantly greater than 0.5 in a two-tailed t-test at the 95 percent confidence level. I.e., if $\frac{N^{+}+0.5*N^{\sim}}{N^{+}+N^{\sim}+N^{-}} > 0.5 + 1.96 * \sqrt{\frac{0.5*(1-0.5)}{N^{+}+N^{\sim}+N^{-}}}$
$R^{-\prime}$: the regression-level association was considered consistently negative if $\frac{N^{+}+0.5*N^{\sim}}{N^{+}+N^{\sim}+N^{-}}$ was significantly less than 0.5 in a two-tailed t-test at the 95 percent confidence level. I.e., if $\frac{N^{+}+0.5*N^{\sim}}{N^{+}+N^{\sim}+N^{-}} < 0.5 - 1.96 * \sqrt{\frac{0.5*(1-0.5)}{N^{+}+N^{\sim}+N^{-}}}$
$R^{\sim\prime}$: the regression-level association was considered not consistent otherwise