

Recovery from Disasters

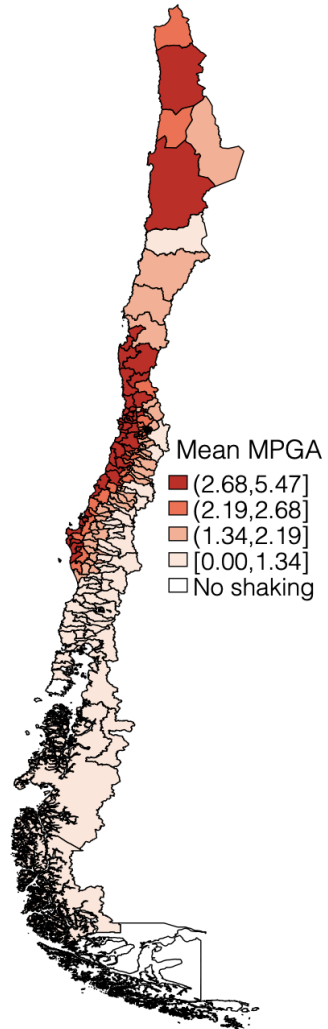
April 24, 2022

Highlights:

1. Vietnam has no strong shaking ($MPGA \geq 10$) for the period of interest (1997-2013)
2. Chile has no tropical cyclones in 200km buffer for the period of interest (1985-2015)
3. Created an appendix on tropical cyclone algorithm
4. Getting back to cyclones regressions in Vietnam: how to define alternative intensity variable for strong winds (analogous to number of strong earthquakes)? For now, I define using Saffir-Simpson by aggregating dummies at grid-level based on max wind annually)

1. Vietnam and Chile: Maps for Shaking Intensity

Mean MPGA for 31 years
(1985-2015)



Mean MPGA for 17 years
(1997-2013)

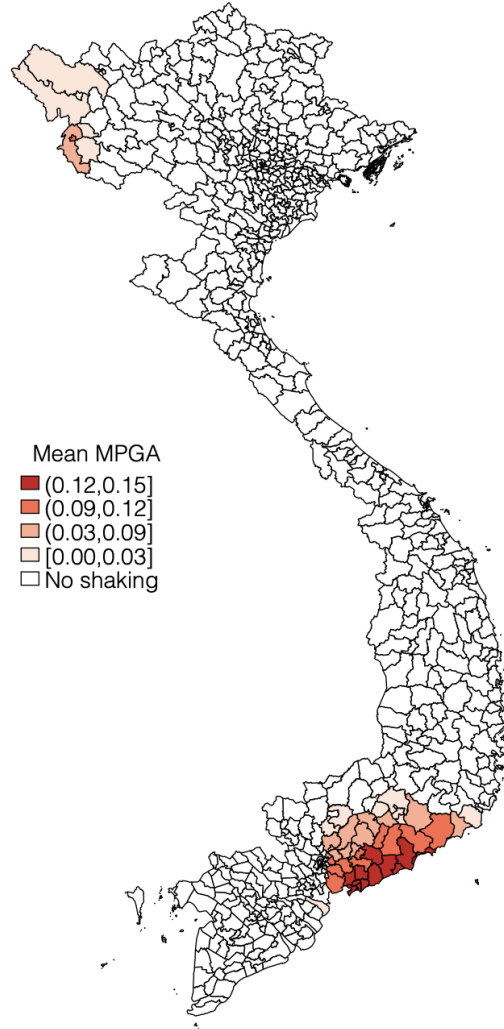


Figure 1: Average Maximum PGA: Chile and Vietnam

Years with earthquakes from
31 years (1985-2015)

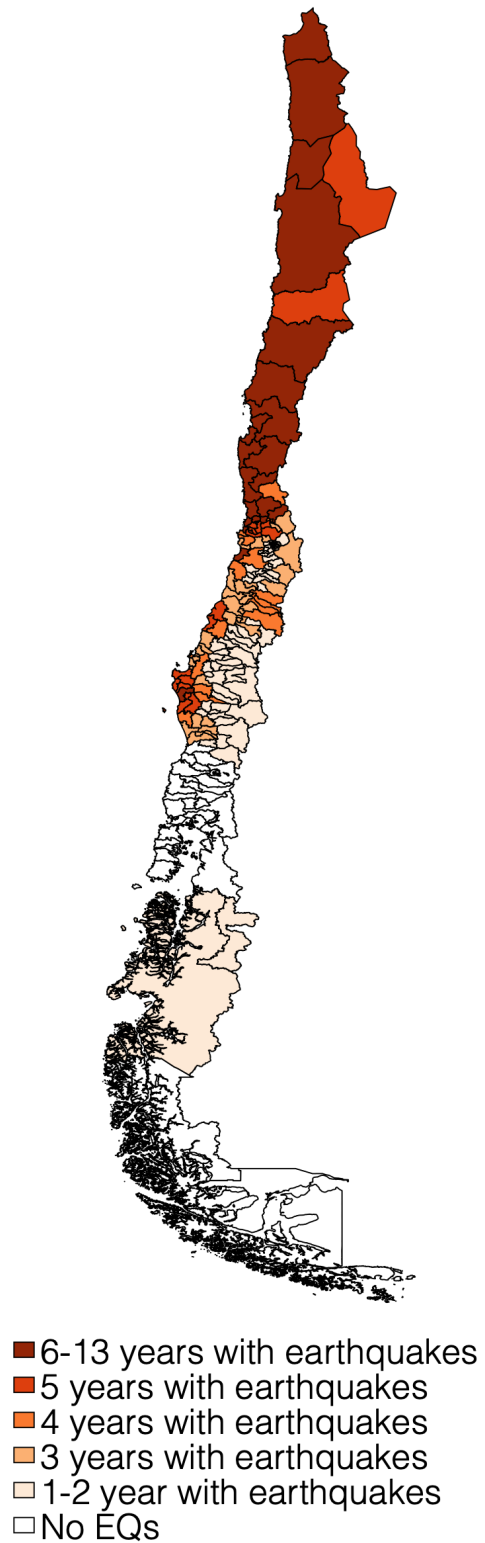


Figure 2: Years with Earthquake: Chile

2. Vietnam: previous regressions with wind speeds

Table 1: 2007-2013 (dropping VA and Inputs since they are not reported in 2007-2009)

	(1) Log(Sales)	(2) Log(Labor Cost)	(3) Log(K)	(4) Log(Avg Wage)	(5) Log(L)	(6) Log(Tot Wage)	(7) Log(Sales/L)
MAXS (m/s)	0.00126*** (0.000337)	0.000108 (0.000177)	0.000582 (0.000430)	0.000389*** (0.0000916)	0.0000612 (0.000115)	0.000450** (0.000147)	0.00120*** (0.000303)
maxs_lag1	0.00206*** (0.000296)	0.00127*** (0.000182)	0.000540 (0.000407)	0.0000482 (0.0000824)	0.000433*** (0.000104)	0.000481*** (0.000120)	0.00163*** (0.000275)
maxs_lag2	0.00106** (0.000351)	0.00160*** (0.000248)	0.00185*** (0.000392)	0.0000101 (0.0000976)	0.000620*** (0.000118)	0.000630*** (0.000142)	0.000441 (0.000335)
maxs_lag3	-0.000618 (0.000358)	0.000614*** (0.000180)	0.000433 (0.000367)	-0.000577*** (0.0000850)	0.000201 (0.000108)	-0.000375*** (0.000114)	-0.000819* (0.000324)
maxs_lag4	-0.000256 (0.000284)	0.000954*** (0.000207)	-0.000201 (0.000451)	-0.000546*** (0.0000934)	0.000511*** (0.000106)	-0.0000347 (0.000108)	-0.000767** (0.000265)
maxs_lag5	0.000314 (0.000250)	0.000947*** (0.000166)	-0.00110* (0.000438)	0.00000985 (0.0000793)	0.000150* (0.0000736)	0.000160 (0.000101)	0.000164 (0.000249)
N	1363767	1363767	1363767	1363767	1363767	1363767	1363767
Plant FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.805	0.778	0.741	0.682	0.875	0.863	0.725

Standard errors in parentheses

Plant and year fixed effects are included in each specification. All variables are real values.

Errors are clustered on both plant-level and region-by-year level.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 2: 2009-2013: subsample of firms that have all the characteristics

	(1) Log(Sales)	(2) Log(Labor Cost)	(3) Log(K)	(4) Log(Avg Wage)	(5) Log(L)	(6) Log(Tot Wage)	(7) Log(Sales/L)
MAXS(m/s)	0.000421 (0.000273)	-0.000400 (0.000224)	0.00183*** (0.000532)	0.000275* (0.000111)	0.0000298 (0.000119)	0.000305* (0.000151)	0.000391 (0.000231)
maxs_lag1	0.000963*** (0.000263)	0.000610** (0.000197)	0.00184*** (0.000387)	-0.000204* (0.000103)	0.000232* (0.000110)	0.0000278 (0.000127)	0.000731** (0.000229)
maxs_lag2	0.000198 (0.000218)	0.00161*** (0.000330)	0.00436*** (0.000559)	-0.000219* (0.000107)	0.000594*** (0.000108)	0.000375** (0.000127)	-0.000396* (0.000182)
maxs_lag3	-0.000663*** (0.000193)	0.000609** (0.000192)	-0.000806* (0.000407)	-0.000657*** (0.0000838)	0.000327*** (0.0000939)	-0.000330*** (0.0000988)	-0.000990*** (0.000178)
maxs_lag4	-0.000404* (0.000192)	0.00127*** (0.000298)	-0.000707 (0.000525)	-0.000721*** (0.0000996)	0.000560*** (0.000109)	-0.000162 (0.000109)	-0.000963*** (0.000193)
maxs_lag5	-0.0000419 (0.000165)	0.00122*** (0.000209)	-0.00270*** (0.000562)	-0.0000189 (0.0000930)	0.0000593 (0.0000807)	0.0000404 (0.000101)	-0.000101 (0.000150)
N	864287	864287	864287	864287	864287	864287	864287
Plant FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.875	0.812	0.773	0.710	0.905	0.894	0.799

Standard errors in parentheses

Plant and year fixed effects are included in each specification. All variables are real values.

Errors are clustered on both plant-level and region-by-year level.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3: 2009-2013: subsample of firms that have all the characteristics

	(1) Log(Input)	(2) Log(VA)	(3) Log(VA/Labor)
MAXS (m/s)	0.000439 (0.000280)	0.00117* (0.000495)	0.00114* (0.000453)
maxs_lag1	0.00108*** (0.000271)	-0.000553 (0.000378)	-0.000784* (0.000354)
maxs_lag2	0.000535* (0.000236)	-0.00134** (0.000518)	-0.00193*** (0.000531)
maxs_lag3	-0.000668*** (0.000200)	-0.00139*** (0.000344)	-0.00172*** (0.000343)
maxs_lag4	-0.000734*** (0.000204)	0.000271 (0.000566)	-0.000288 (0.000586)
maxs_lag5	-0.000179 (0.000171)	0.0000224 (0.000435)	-0.0000369 (0.000429)
N	864287	864287	864287
Plant FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Adjusted R-squared	0.866	0.801	0.656

Standard errors in parentheses

Plant and year fixed effects are included in each specification. All variables are real values.

Errors are clustered on both plant-level and region-by-year level.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

3. Vietnam: regressions with number of cyclones

Table 4: 2007-2013 (dropping VA and Inputs since they are not reported in 2007-2009)

	(1) Log(Sales)	(2) Log(Labor Cost)	(3) Log(K)	(4) Log(Avg Wage)	(5) Log(L)	(6) Log(Tot Wage)	(7) Log(Sales/L)
Storm Dummy	-0.0100 (0.00748)	0.0182*** (0.00423)	-0.0135 (0.00928)	0.00440 (0.00229)	-0.000393 (0.00238)	0.00401 (0.00302)	-0.00963 (0.00728)
storm_lag1	0.0343*** (0.00594)	0.0194*** (0.00386)	0.000652 (0.00799)	0.00268 (0.00185)	0.00907*** (0.00224)	0.0118*** (0.00268)	0.0252*** (0.00549)
storm_lag2	0.0337*** (0.00788)	0.0175*** (0.00402)	-0.00890 (0.00710)	-0.00451* (0.00204)	0.00859*** (0.00245)	0.00408 (0.00319)	0.0251*** (0.00718)
storm_lag3	-0.00998 (0.00744)	0.0196*** (0.00416)	0.0311*** (0.00729)	-0.0120*** (0.00183)	0.00788*** (0.00221)	-0.00408 (0.00229)	-0.0179** (0.00681)
storm_lag4	-0.0112 (0.00602)	0.0327*** (0.00576)	0.00371 (0.00957)	-0.00628*** (0.00183)	0.0123*** (0.00230)	0.00598* (0.00234)	-0.0234*** (0.00586)
storm_lag5	0.00971 (0.00574)	0.0232*** (0.00401)	-0.0719*** (0.0130)	0.00228 (0.00238)	0.00179 (0.00201)	0.00407 (0.00258)	0.00791 (0.00532)
N	1363767	1363767	1363767	1363767	1363767	1363767	1363767
Plant FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.739	0.702	0.653	0.574	0.832	0.816	0.631

Standard errors in parentheses

Plant and year fixed effects are included in each specification. All variables are real values.

Errors are clustered on both plant-level and region-by-year level.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5: 2009-2013: subsample of firms that have all the characteristics

	(1) Log(Sales)	(2) Log(Labor Cost)	(3) Log(K)	(4) Log(Avg Wage)	(5) Log(L)	(6) Log(Tot Wage)	(7) Log(Sales/L)
Storm Dummy	-0.00841 (0.00589)	-0.00439 (0.00428)	-0.0409*** (0.0118)	-0.00239 (0.00301)	-0.00180 (0.00264)	-0.00419 (0.00338)	-0.00660 (0.00555)
storm_lag1	0.00522 (0.00546)	0.00357 (0.00446)	-0.0292** (0.00987)	0.00311 (0.00213)	-0.00266 (0.00238)	0.000451 (0.00292)	0.00789 (0.00495)
storm_lag2	0.0138*** (0.00406)	0.0184*** (0.00426)	0.0184* (0.00811)	-0.00847*** (0.00230)	0.00582** (0.00222)	-0.00265 (0.00229)	0.00798* (0.00365)
storm_lag3	-0.0111** (0.00349)	0.0221*** (0.00459)	0.0216* (0.00922)	-0.0130*** (0.00177)	0.0108*** (0.00188)	-0.00216 (0.00195)	-0.0220*** (0.00327)
storm_lag4	-0.00480 (0.00390)	0.0314*** (0.00653)	-0.00818 (0.00883)	-0.00655*** (0.00181)	0.00752*** (0.00191)	0.000971 (0.00198)	-0.0123*** (0.00371)
storm_lag5	0.000899 (0.00362)	0.0273*** (0.00455)	-0.0764*** (0.0139)	0.00201 (0.00235)	-0.00267 (0.00187)	-0.000667 (0.00233)	0.00357 (0.00340)
N	864287	864287	864287	864287	864287	864287	864287
Plant FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	0.820	0.731	0.673	0.584	0.863	0.847	0.711

Standard errors in parentheses

Plant and year fixed effects are included in each specification. All variables are real values.

Errors are clustered on both plant-level and region-by-year level.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 6: 2009-2013: subsample of firms that have all the characteristics

	(1) Log(Input)	(2) Log(VA)	(3) Log(VA/Labor)
Storm Dummy	-0.00979 (0.00602)	-0.0115 (0.0115)	-0.00968 (0.0106)
storm_lag1	0.0000795 (0.00567)	0.0398*** (0.0107)	0.0425*** (0.0103)
storm_lag2	0.0174*** (0.00428)	-0.0125 (0.00818)	-0.0183* (0.00786)
storm_lag3	-0.00941* (0.00370)	-0.0406*** (0.00864)	-0.0514*** (0.00864)
storm_lag4	-0.0115** (0.00417)	-0.000579 (0.0118)	-0.00810 (0.0121)
storm_lag5	-0.00271 (0.00383)	-0.00668 (0.00972)	-0.00401 (0.00955)
N	864287	864287	864287
Plant FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Adjusted R-squared	0.807	0.714	0.506

Standard errors in parentheses

Plant and year fixed effects are included in each specification. All variables are real values.

Errors are clustered on both plant-level and region-by-year level.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

4. Vietnam: regressions with area sizes

Table 7: Regressions: Subsets by Areas of ADM2

	(1) Log(L)	(2) Log(L)	(3) Log(L)	(4) Log(VA)	(5) Log(VA)	(6) Log(VA)
MAXS(m/s)	0.0000298 (0.000119)	-0.000252 (0.000322)	-0.0000367 (0.000118)	0.00117* (0.000495)	0.00364** (0.00140)	-0.000566 (0.000468)
maxs_lag1	0.000232* (0.000110)	0.000349 (0.000217)	-0.000127 (0.000111)	-0.000553 (0.000378)	0.000423 (0.000777)	0.000132 (0.000406)
maxs_lag2	0.000594*** (0.000108)	0.00106*** (0.000185)	-0.00000749 (0.0000984)	-0.00134** (0.000518)	-0.000119 (0.000794)	-0.00134*** (0.000406)
maxs_lag3	0.000327*** (0.0000939)	0.000619*** (0.000153)	-0.0000546 (0.000114)	-0.00139*** (0.000344)	-0.00168*** (0.000505)	-0.00139*** (0.000355)
maxs_lag4	0.000560*** (0.000109)	0.000960*** (0.000177)	0.000146 (0.000131)	0.000271 (0.000566)	-0.000150 (0.000697)	-0.000401 (0.000430)
maxs_lag5	0.0000593 (0.0000807)	-0.00000235 (0.000167)	0.0000260 (0.0000772)	0.0000224 (0.000435)	-0.000381 (0.000823)	0.000633* (0.000314)
N	864287	487551	374847	864287	487551	374847
Plant FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
All ADM2	Yes	No	No	Yes	No	No
Small ADM2 ($\leq 100km^2$)	No	Yes	No	No	Yes	No
Not Small ADM2	No	No	Yes	No	No	Yes
Adjusted R-squared	0.863	0.852	0.878	0.713	0.710	0.727

Standard errors in parentheses

Plant and year fixed effects are included in each specification. All variables are real values.

Errors are clustered on both plant-level and region-by-year level.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$