

**The Foreclosure-House Price Nexus:
A Panel VAR Model for U.S. States, 1981-2009**

**Supplemental Appendix
Regressions for Non-Judicial Foreclosure Status**

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This supplemental appendix presents the tables and figures from our core PVAR regression model for non-judicial foreclosure states only.

Note: Figure and table names have been matched to those in the body of the text. Thus, Table NJ1 corresponds to Table 1 in the text.

Table NJ1 – Panel VAR Regression Results – Non-Judicial States
(Dependent Variables in Columns)

	Employment	Sales	Permits	Prices	Foreclosures
Employment					
L1	0.487204*** (0.025049)	0.021178 (0.530583)	1.060060 (1.163672)	0.092828 (0.063427)	-2.833393** (0.871024)
L2	0.236850*** (0.025942)	0.154311 (0.537911)	3.040181* (1.328569)	-0.003926 (0.064989)	-0.766522 (1.049947)
L3	0.050438* (0.023390)	-3.153367*** (0.530454)	-4.727075** (1.672884)	-0.000397 (0.064726)	0.374616 (1.058255)
L4	-0.168355*** (0.025217)	0.035095 (0.609909)	-4.920752** (1.792404)	0.123508 (0.068209)	2.013494 (1.167507)
L5	0.092436*** (0.023997)	0.905577 (0.624006)	0.891885 (1.233465)	-0.071314 (0.062090)	0.895952 (1.013789)
L6	0.084199*** (0.024791)	-0.498886 (0.562534)	1.581353 (1.485292)	-0.013056 (0.063747)	0.935945 (1.106914)
L7	0.020008 (0.023602)	-0.196215 (0.552084)	0.171427 (1.380423)	0.122702 (0.063881)	-0.471193 (1.119104)
L8	-0.168662*** (0.025069)	-0.778779 (0.592740)	-1.804468 (0.997213)	-0.070089 (0.071681)	-1.320707 (1.143179)
L9	0.116673*** (0.023713)	0.986049 (0.560152)	1.083151 (1.150554)	-0.014757 (0.062544)	-2.005489 (1.193800)
L10	0.055810* (0.023059)	-0.962166 (0.577644)	0.221960 (1.137330)	-0.188393** (0.071482)	1.620895 (1.134339)
L11	0.006257 (0.021764)	-0.087749 (0.532283)	-0.133424 (1.073227)	0.012232 (0.075219)	-0.933275 (1.018733)
L12	-0.091579*** (0.021269)	0.451853 (0.482853)	0.395507 (0.869707)	0.094866 (0.062531)	-0.822462 (0.914664)

Table NJ1 – Panel VAR Regression Results – Non-Judicial States
(Dependent Variables in Columns)

	Employment	Sales	Permits	Prices	Foreclosures
Sales					
L1	0.002626** (0.000912)	-0.184325*** (0.035704)	0.212874*** (0.050390)	0.005286 (0.002992)	-0.211440*** (0.038326)
L2	0.001187 (0.000992)	-0.034579 (0.027722)	0.127402* (0.049521)	0.010999** (0.003598)	-0.101184* (0.039459)
L3	0.000271 (0.001046)	-0.100277*** (0.029590)	0.040197 (0.054254)	0.005449 (0.003244)	0.004278 (0.040371)
L4	0.002538** (0.000962)	0.082358** (0.028801)	0.091741 (0.046974)	0.003215 (0.002980)	-0.043327 (0.038373)
L5	0.002793** (0.000965)	0.010226 (0.026762)	0.054821 (0.049063)	0.007267* (0.002876)	-0.071265 (0.044859)
L6	0.004274*** (0.000872)	0.077664** (0.026874)	0.049699 (0.049843)	0.005163 (0.002990)	-0.045110 (0.048369)
L7	0.004347*** (0.000873)	-0.024601 (0.028787)	0.077497 (0.058034)	0.006750* (0.002730)	0.094628* (0.043874)
L8	0.002117* (0.000904)	-0.005723 (0.031785)	0.005670 (0.052091)	-0.001399 (0.002948)	0.088260 (0.045554)
L9	-0.000811 (0.000960)	-0.050118 (0.026333)	-0.120964* (0.055782)	0.001959 (0.002726)	0.104914* (0.041586)
L10	-0.001242 (0.000874)	0.076284** (0.025699)	-0.128129* (0.057992)	0.002848 (0.002754)	0.032222 (0.040755)
L11	-0.000642 (0.000845)	0.008233 (0.023320)	-0.138972** (0.052641)	0.000660 (0.002897)	0.085422 (0.045821)
L12	-0.000542 (0.000898)	-0.009167 (0.022258)	-0.137055** (0.042566)	0.002395 (0.002597)	0.090816 (0.046849)

Table NJ1 – Panel VAR Regression Results – Non-Judicial States
(Dependent Variables in Columns)

	Employment	Sales	Permits	Prices	Foreclosures
Permits					
L1	0.003092*** (0.000593)	0.051792*** (0.013355)	-0.374086*** (0.058038)	0.002234 (0.002163)	-0.009152 (0.018550)
L2	0.001871* (0.000840)	0.021526 (0.013513)	-0.180618** (0.057480)	0.001766 (0.001982)	-0.049383* (0.020298)
L3	0.001627** (0.000596)	0.005432 (0.013350)	0.007052 (0.103035)	-0.000636 (0.001535)	-0.082330*** (0.020131)
L4	0.000677 (0.000573)	-0.044738** (0.014023)	-0.105315 (0.091605)	0.000481 (0.002192)	-0.096699*** (0.021362)
L5	0.002050* (0.000813)	-0.016050 (0.014331)	0.128893 (0.068094)	-0.001144 (0.002066)	-0.066399** (0.023844)
L6	0.001606* (0.000700)	0.000074 (0.013676)	0.185599* (0.081988)	-0.000500 (0.001757)	-0.032597 (0.022739)
L7	-0.001143 (0.000624)	-0.024366 (0.015381)	-0.011235 (0.073231)	-0.001258 (0.002032)	-0.058447* (0.026460)
L8	-0.000748 (0.000683)	-0.026065 (0.013928)	-0.032882 (0.081276)	0.002928 (0.002083)	-0.042853 (0.026970)
L9	0.001126 (0.000777)	0.014135 (0.015997)	0.034527 (0.084479)	-0.002909 (0.001940)	-0.035994 (0.024602)
L10	0.001158 (0.000708)	-0.007422 (0.013972)	0.212249** (0.078537)	-0.000948 (0.002015)	0.004500 (0.024155)
L11	0.000273 (0.000759)	-0.000666 (0.013824)	0.251519*** (0.065375)	-0.001411 (0.001887)	-0.030491 (0.023108)
L12	-0.001158 (0.000708)	-0.005286 (0.013963)	0.157165* (0.078428)	0.001129 (0.001826)	-0.002552 (0.022562)

Table NJ1 – Panel VAR Regression Results – Non-Judicial States
(Dependent Variables in Columns)

	Employment	Sales	Permits	Prices	Foreclosures
Prices					
L1	0.013103 (0.008092)	0.866164*** (0.218382)	1.614880** (0.568405)	0.360168*** (0.032522)	-0.680822 (0.349008)
L2	0.001016 (0.008392)	0.263377 (0.224366)	1.010459 (0.803747)	0.082382* (0.032326)	-0.987076** (0.375616)
L3	0.016212* (0.008048)	-0.135586 (0.207170)	-0.155768 (0.449149)	0.253350*** (0.029833)	-1.931457*** (0.384411)
L4	-0.016306* (0.008312)	-0.217548 (0.219119)	-0.897794 (0.760443)	0.135367*** (0.028022)	-0.005101 (0.416236)
L5	-0.019707* (0.008567)	-0.601578** (0.230327)	-0.484334 (0.697282)	0.001849 (0.030380)	0.715414 (0.416408)
L6	0.000537 (0.008651)	-0.040161 (0.227218)	-0.187379 (0.472923)	-0.053152* (0.026941)	-0.317216 (0.458585)
L7	0.014745 (0.008759)	0.604541* (0.236642)	0.390105 (0.585084)	-0.030662 (0.027474)	-0.655195 (0.399716)
L8	-0.001663 (0.008124)	-0.866573*** (0.230770)	-0.797597* (0.404458)	0.053460* (0.024850)	0.258174 (0.384414)
L9	-0.004230 (0.008768)	-0.247487 (0.218058)	-0.558240 (0.390920)	0.046688 (0.025762)	0.742344 (0.402257)
L10	0.003618 (0.007979)	0.067193 (0.213609)	-0.087333 (0.406463)	-0.047640* (0.023794)	0.735819 (0.389110)
L11	-0.007727 (0.008114)	-0.208272 (0.221921)	-0.736676* (0.355762)	-0.027733 (0.023901)	0.561980 (0.391006)
L12	-0.007796 (0.007109)	-0.183785 (0.211814)	-0.221480 (0.319681)	0.009453 (0.021800)	1.070633** (0.360466)

Table NJ1 – Panel VAR Regression Results – Non-Judicial States
(Dependent Variables in Columns)

	Employment	Sales	Permits	Prices	Foreclosures
Foreclosures					
L1	0.000295 (0.000451)	-0.020531 (0.013431)	-0.009808 (0.020104)	-0.002678 * (0.001351)	0.548700 *** (0.028819)
L2	0.000062 (0.000535)	0.014807 (0.012965)	-0.001266 (0.021765)	-0.000874 (0.001491)	0.184870 *** (0.031089)
L3	-0.000694 (0.000515)	0.006444 (0.012900)	-0.035197 (0.020850)	-0.002373 (0.001458)	0.197071 *** (0.028430)
L4	-0.001581 ** (0.000514)	-0.027702 (0.015512)	-0.043117 * (0.021641)	0.000716 (0.001440)	0.053634 (0.032424)
L5	-0.000175 (0.000494)	-0.014908 (0.013529)	0.010919 (0.020616)	0.001516 (0.001417)	-0.003516 (0.027558)
L6	-0.000230 (0.000498)	0.013973 (0.011819)	0.023186 (0.020927)	0.000690 (0.001427)	-0.028293 (0.030279)
L7	0.000115 (0.000505)	0.011848 (0.012028)	-0.011242 (0.019968)	-0.001733 (0.001421)	-0.003018 (0.026931)
L8	0.000599 (0.000561)	0.005114 (0.013184)	0.041281 (0.021310)	0.004434 *** (0.001314)	-0.000066 (0.031853)
L9	0.000236 (0.000545)	0.015163 (0.011769)	0.004756 (0.019338)	0.001613 (0.001464)	-0.056823 * (0.026362)
L10	0.000428 (0.000567)	-0.014558 (0.012037)	-0.017699 (0.018967)	-0.000368 (0.001385)	0.004560 (0.028034)
L11	0.000597 (0.000506)	-0.018981 (0.012603)	-0.021142 (0.018273)	-0.001884 (0.001503)	0.012817 (0.026136)
L12	-0.000764 (0.000431)	-0.011630 (0.009667)	0.014431 (0.016849)	-0.000147 (0.001267)	0.017145 (0.021284)

Notes: Standard errors are presented in parentheses below the regression coefficients.

*** Coefficient significant at the 0.1% level.

** Coefficient significant at the 1% level.

* Coefficient significant at the 5% level.

The variables used in the analysis are as follows:

- **Employment** – Growth rate (log difference) of the quarterly average of seasonally-adjusted monthly total non-farm employment for the state.
- **Sales** – Growth rate (log difference) of the seasonally-adjusted annual rate of existing home sales for the state in the quarter.
- **Permits** – Growth rate (log difference) of the quarterly average of the monthly seasonally-adjusted annual rate of single-family residential building permits for the state.
- **Prices** – Growth rate (log difference) of the quarterly FHFA house price index (all transactions) for the state.
- **Foreclosures** – Log level of the MBA quarterly foreclosures started as a percent of loans serviced for the state.

All regression variables were de-measured using a Helmert transformation, while the actual values of the variables were used as instruments to obtain consistent estimates.

Table NJ2 – Residuals Correlation Matrix – Non-Judicial States

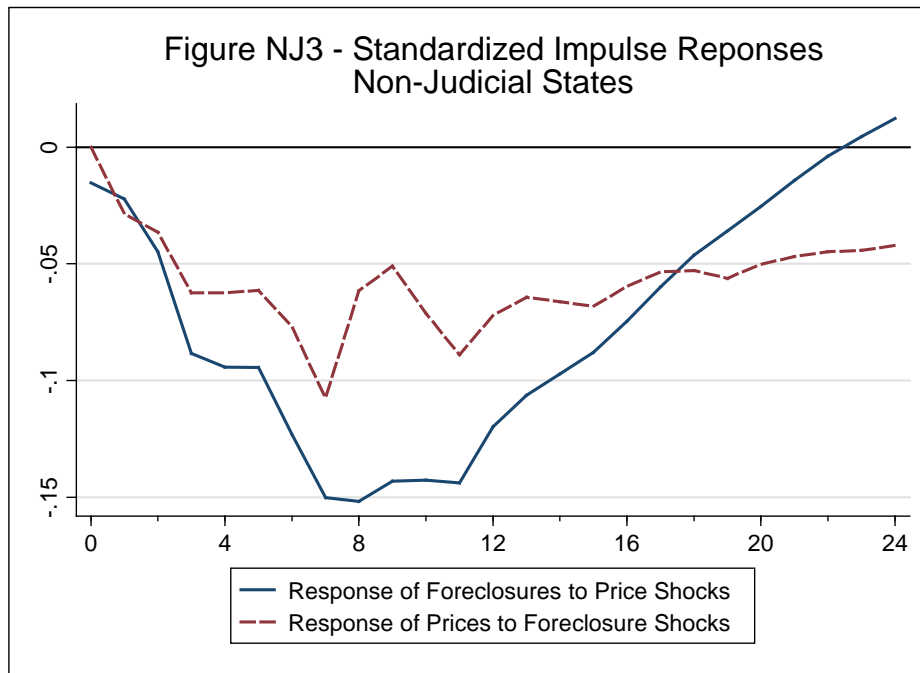
	Employment	Sales	Permits	Prices	Foreclosures
Employment	1				
Sales	0.0935 (0.0000)	1			
Permits	0.1452 (0.0000)	0.1643 (0.0000)	1		
Prices	-0.0766 (0.0001)	0.0482 (0.0122)	-0.0092 (0.6323)	1	
Foreclosures	-0.0190 (0.3269)	-0.0940 (0.0000)	-0.0377 (0.0516)	-0.0483 (0.0126)	1

Notes: All variables are Helmert de-meanded log differences of levels except for foreclosures, which is the (de-meanded) log foreclosure start rate (see the notes on Table 1 and the appendix for a complete description of the variables); p-values are reported in parentheses.

Table NJ3 – Variance Decompositions – Non-Judicial States

	Lag	Employment	Sales	Permits	Prices	Foreclosures
Employment	4	0.9503	0.0131	0.0274	0.0088	0.0004
	8	0.7852	0.1087	0.0490	0.0188	0.0383
	20	0.5620	0.1616	0.0884	0.0491	0.1389
Sales	4	0.0204	0.9581	0.0087	0.0115	0.0013
	8	0.0223	0.9323	0.0183	0.0184	0.0087
	20	0.0265	0.9068	0.0260	0.0306	0.0101
Permits	4	0.0268	0.0237	0.9367	0.0112	0.0016
	8	0.0352	0.0291	0.9156	0.0133	0.0068
	20	0.0376	0.0319	0.9044	0.0178	0.0084
Prices	4	0.0056	0.0317	0.0021	0.9502	0.0104
	8	0.0119	0.0890	0.0045	0.8579	0.0367
	20	0.0134	0.1506	0.0133	0.7491	0.0736
Foreclosures	4	0.0148	0.0462	0.0125	0.0439	0.8826
	8	0.0115	0.0971	0.0389	0.1291	0.7234
	20	0.0116	0.1261	0.1147	0.1465	0.6011

Note: Percent of row variable explained by the column variable at the specified lag.



Note: The standardized responses are calculated by dividing the model impulse responses shown in Figure NJ2 by the sample standard deviations of the response variable.