

TABLE 9

Results for simultaneous equations model—rural commuting zones

(Estimated regression coefficients on patents and population subset)

Variable	Population subset											
	Inventive class (IC)			Science, engineering, and technical (SET) employment			Creative class (CC)			At least 4-year college degree (BA)		
	Coefficient estimate	<i>p</i> -value		Coefficient estimate	<i>p</i> -value		Coefficient estimate	<i>p</i> -value		Coefficient estimate	<i>p</i> -value	
Patents dependent variable												
IC	0.050	***	<0.001	-	-	-	-	-	-	-	-	-
SET	-	-	-	0.089	***	<0.001	-	-	-	-	-	-
CC	-	-	-	-	-	-	0.020	***	0.003	-	-	-
BA	-	-	-	-	-	-	-	-	-	0.016	**	0.011
1975–80 patent stock (PatStock)	0.082	**	0.035	0.040		0.392	0.054		0.259	0.026		0.673
Population density (PopDens)	0.057		0.759	0.037		0.842	-0.058		0.852	-0.063		0.858
Wage-rental ratio (WageRentR)	2.961		0.245	3.926		0.163	7.060	*	0.052	8.093	*	0.066
Natural amenity rank (NatAmen)	2.392		0.372	2.084		0.467	-0.634		0.853	-3.421		0.421
University research expenditures (UniResExp)	0.498	**	0.046	0.227		0.569	0.261		0.533	0.067		0.913
Location quotient for patent-intensive industries (LQPatInd)	-3.091		0.518	1.980		0.635	4.279		0.292	9.962	**	0.012
Root mean square error (RMSE)	33.334			35.753			45.747			52.211		
Chi-squared	722.450			700.830			557.750			546.140		
<i>p</i> -value	<0.0001			<0.0001			<0.0001			<0.0001		
Mean variance inflation factor (VIF)	3.613			3.622			3.579			3.599		
Population subset dependent variable												
Patents	13.088	***	<0.001	9.366	***	<0.001	40.221	***	<0.001	59.599	***	<0.001
Unemployment rate (UR)	-8.340		0.377	-2.705		0.520	-20.520		0.466	-13.743		0.697
WageRentR	-96.384	*	0.060	-54.985	*	0.090	-438.359	**	0.024	-579.159	**	0.044
NatAmen	-51.772		0.309	-24.166		0.452	26.575		0.891	215.555		0.450
Crime	-2.630		0.325	-0.741		0.661	-2.581		0.798	-0.594		0.968
Proximity to urban center (ProxUrbCen)	-0.235		0.329	-0.033		0.713	-0.335		0.609	-0.165		0.808
LQPatInd	158.979	***	0.004	3.505		0.919	-57.902		0.780	-554.310	*	0.070
RMSE	593.498			377.385			2,266.630			3,348.046		
Chi-squared	920.386			876.182			751.696			718.792		
<i>p</i> -value	<0.0001			<0.0001			<0.0001			<0.0001		
Mean VIF	3.357			3.357			3.357			3.357		

* $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$.**Note(s):**

Structural equation estimates are based on 358 observations. Controls for Census region and Rural-Urban Continuum Code are included in each regression.

Source(s):Dotzel K, 2017, *Three Essays on Human Capital and Innovation in the United States*, PhD Dissertation, Graduate School of The Ohio State University, p. 108.