

TABLE 10

Results for simultaneous equations model—urban 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		p-value	Coefficient estimate		p-value	Coefficient estimate		p-value	Coefficient estimate		p-value
Patents dependent variable												
IC	0.071	**	0.029	-	-	-	-	-	-	-	-	-
SET	-	-	-	0.089	**	0.025	-	-	-	-	-	-
CC	-	-	-	-	-	-	0.023	-	0.103	-	-	-
BA	-	-	-	-	-	-	-	-	-	0.021	*	0.066
1975–80 patent stock (PatStock)	-0.067		0.919	0.119		0.824	-0.092		0.918	-0.469		0.628
Population density (PopDens)	-0.312		0.294	-0.223		0.323	-0.794		0.444	-1.629		0.304
Wage-rental ratio (WageRentR)	108.651		0.767	117.404		0.746	224.921		0.595	231.237		0.570
Natural amenity rank (NatAmen)	572.904	**	0.017	675.247	***	0.004	481.491		0.102	397.441		0.216
University research expenditures (UniResExp)	0.507		0.879	1.333		0.678	1.322		0.717	-0.262		0.950
Location quotient for patent-intensive industries (LQPatInd)	1,268.640	***	<0.001	1,381.611	***	<0.001	1,475.747	***	<0.001	1,630.737	***	<0.001
Root mean square error (RMSE)	2,519.018			2,485.737			2,937.586			3,087.723		
Chi-squared	1,142.140			1,121.990			974.000			966.720		
p-value	<0.0001			<0.0001			<0.0001			<0.0001		
Mean variance inflation factor (VIF)	3.618			3.374			3.567			3.749		
Population subset dependent variable												
Patents	14.454	***	<0.001	10.058	***	<0.001	44.844	***	<0.001	62.692	***	<0.001
Unemployment rate (UR)	331.768		0.818	-107.580		0.915	1651.611		0.748	5258.581		0.488
WageRentR	-1,511.598		0.781	-1,417.036		0.706	-11,720.238		0.563	-16,629.983		0.564
NatAmen	-8,179.447	**	0.023	-6,659.816	***	0.008	-21,248.347		0.110	-29,851.854		0.116
Crime	18.125		0.852	22.589		0.715	53.358		0.907	-64.602		0.920
Proximity to urban center (ProxUrbCen)	-0.843		0.973	-4.343		0.795	-2.246		0.981	15.117		0.909
LQPatInd	-18,047.43	***	-1.88E-05	-13,980.73	***	-1.74E-06	-64,623.46	***	-3.06E-05	-95,270.52	***	-1.65E-05
RMSE	36,915.877			25,499.627			137,000.000			194,000.000		
Chi-squared	751.012			759.527			534.444			508.216		
p-value	<0.0001			<0.0001			<0.0001			<0.0001		
Mean VIF	2.354			2.354			2.354			2.354		

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

Structural equation estimates are based on 301 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. 112.