

Estimation Results of Aspatial Models

A Supplementary Note to
"A Spatial Multivariate Count Model for Firm Location Decisions"

by

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Table 1: Estimation Results of the IFC Model

Sector	Agriculture	Construction	Manufacturing	Trade	Transportation	Services	Finance	Health	Hospitality	Arts	Administration
Variables	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)
Demand Intensity Variables											
<i>Agglomeration Economies/Diseconomies</i>											
Total number of existing businesses per sq. mile	--	--	0.980 (6.126)	--	0.676 (7.589)	--	2.266 (20.331)	2.118 (23.630)	1.498 (26.167)	--	--
Square of the number of existing businesses per square mile	-0.003 (-0.835)	-0.023 (-4.419)	-0.061 (-5.500)	-0.022 (-5.001)	-0.034 (-5.610)	-0.031 (-9.426)	-0.274 (-20.639)	-0.248 (-24.020)	-0.192 (-29.402)	0.007 (8.635)	-0.179 (-9.015)
Number of existing trade businesses per sq. mile	--	1.534 (5.297)	--	--	--	2.131 (11.850)	--	--	--	--	--
Number of existing trade employees per sq. mile/10	--	--	--	--	--	--	--	0.099 (5.374)	--	--	--
Sector-specific number of existing businesses per sq. mile	--	--	--	1.189 (4.315)	--	--	--	--	--	--	6.194 (8.343)
<i>Specialization Indices and Firm Size</i>											
Location Quotient of businesses / 10	0.172 (1.631)	11.016 (7.505)	10.076 (6.269)	13.044 (4.656)	2.855 (4.201)	16.402 (6.990)	7.521 (4.997)	13.081 (13.681)	--	1.430 (4.836)	--
Herfindahl-Hirschman Index of businesses	-4.971 (-1.827)	-8.793 (-3.536)	--	-15.073 (-7.792)	-7.821 (-4.408)	-11.964 (-8.676)	-8.024 (-6.812)	-15.298 (-10.554)	-8.023 (-8.566)	-10.178 (-9.680)	--
Average size of businesses / 10	--	--	--	0.947 (5.365)	--	--	--	--	--	--	--

Table 1 (Contd.): Estimation Results of the IFC Model

Sector	Agriculture	Construction	Manufacturing	Trade	Transportation	Services	Finance	Health	Hospitality	Arts	Administration
Variables	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)
<i>Human Capital</i>											
Education (Base Case: % of persons 25 years or above with educational attainment less than high school)	--	--	--	--	--	--	--	--	--	--	--
% of persons 25 years or above with high school degree /100	--	--	-1.421 (-2.049)	--	-2.092 (-3.294)	--	--	-2.411 (-6.253)	--	-3.134 (-11.545)	--
% of persons 25 years or above with bachelor's degree or higher /100	-3.383 (-2.559)	--	--	--	-3.652 (-4.359)	--	--	--	2.432 (6.349)	6.224 (14.919)	2.503 (1.964)
Rate of unemployment /100	-30.207 (-2.979)	-15.946 (-3.148)	--	-9.559 (-1.740)	--	-19.481 (-4.733)	--	--	--	--	--
Average wage per job (in 10,000s of dollars)	0.297 (2.574)	--	--	--	0.312 (4.857)	--	--	--	--	--	--
<i>Fiscal Conditions</i>											
Property tax rates	-1.237 (-2.447)	-1.393 (-3.693)	-1.921 (-4.391)	-1.418 (-4.686)	-1.952 (-7.192)	-1.459 (-5.869)	-1.989 (-11.688)	-0.622 (-3.663)	-1.365 (-10.163)	--	-2.122 (-5.463)
<i>County-Specific Factors</i>											
Dummy Variable; 1 if region is Harris county, 0 otherwise	--	--	-3.011 (-5.250)	--	--	4.721 (7.229)	--	--	--	--	--
Dummy Variable; 1 if region is Dallas county, 0 otherwise	--	5.781 (7.379)	--	--	--	7.331 (10.978)	--	--	--	--	--
Dummy Variable; 1 if region is Tarrant county, 0 otherwise	--	4.642 (9.386)	--	3.500 (6.890)	2.698 (4.817)	7.406 (12.303)	--	3.701 (16.041)	2.549 (5.654)	3.393 (9.330)	--
Dummy Variable; 1 if region is Bexar county, 0 otherwise	--	--	--	--	--	--	-1.341 (-6.946)	--	--	--	--
Dummy Variable; 1 if region is Travis county, 0 otherwise	--	--	--	--	--	--	--	--	--	--	-1.784 (-4.144)

Table 1 (Contd.): Estimation Results of the IFC Model

Sector	Agriculture	Construction	Manufacturing	Trade	Transportation	Services	Finance	Health	Hospitality	Arts	Administration
Variables	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)
Supply Tipping Point (Threshold) Effects											
α Vector Elements											
α_1	--	--	-0.343 (-3.250)	--	--	0.363 (8.729)	--	--	--	--	-0.296 (-2.696)
α_2	-0.172 (-1.963)	--	--	--	--	--	--	--	--	--	--
α_3	--	--	--	-0.289 (-6.412)	--	--	--	--	--	--	--
α_4	-0.409 (-3.145)	-0.132 (-1.790)	--	--	--	0.124 (3.174)	--	--	--	--	-0.539 (-3.891)
α_5	--	-0.246 (-2.273)	-0.534 (-3.642)	-0.494 (-7.648)	--	--	-0.136 (-4.081)	-0.095 (-3.804)	--	--	--
α_6	--	-0.447 (-3.421)	--	--	--	--	--	--	--	--	-0.830 (-5.327)
α_7	-0.666 (-4.484)	--	-0.707 (-3.800)	-0.767 (-9.527)	--	--	-0.448 (-11.537)	--	--	--	--
α_8	-0.802 (-4.100)	--	-0.902 (-4.195)	--	--	--	-0.549 (-10.760)	--	--	--	--
α_9	-1.154 (-5.551)	-0.721 (-5.224)	--	-1.010 (-10.937)	-0.221 (-6.361)	-0.234 (-13.030)	--	--	--	--	-1.112 (-6.628)
α_{10}	--	-0.854 (-5.265)	--	--	--	--	--	-0.163 (-3.175)	--	--	-1.334 (-7.240)
α_{11}	--	--	--	--	-0.443 (-8.633)	--	--	--	--	--	--
α_{12}	--	-0.964 (-5.231)	--	--	--	-0.408 (-6.771)	--	--	--	--	-1.529 (-7.487)
α_{13}	--	-1.157 (-5.863)	--	-1.244 (-11.378)	--	--	--	--	--	--	--
α_{14}	-3.821 (-10.977)	--	--	--	--	-0.555 (-7.548)	--	--	--	--	--

Table 1 (Contd.): Estimation Results of the IFC Model

Sector	Agriculture	Construction	Manufacturing	Trade	Transportation	Services	Finance	Health	Hospitality	Arts	Administration
Variables	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)
γ Vector Elements											
Constant	-3.802 (-3.601)	-4.071 (-6.120)	-9.325 (-5.137)	-4.641 (-8.323)	-2.763 (-5.120)	-3.815 (-9.489)	-6.652 (-12.825)	-3.755 (-7.781)	-5.280 (-15.295)	-7.746 (-19.647)	-7.241 (-8.588)
<i>Agglomeration Economies/Diseconomies</i>											
Residential population per sq. mile / 100	-0.030 (-2.189)	-0.060 (-3.079)	--	--	--	-0.074 (-5.750)	--	--	-0.046 (-2.364)	--	--
Residential population change between 2000 and 2007 (in 10,000s)	--	--	--	-0.021 (-4.011)	--	--	-0.013 (-5.027)	-0.032 (-8.642)	-0.023 (-3.855)	--	-0.038 (-8.012)
<i>Fiscal Conditions</i>											
Natural logarithmic of government expenditure (in dollars)	0.307 (6.513)	0.289 (9.856)	0.247 (7.297)	0.326 (14.341)	0.208 (8.382)	0.306 (15.114)	0.278 (13.262)	0.145 (7.827)	0.328 (20.013)	0.453 (27.746)	0.400 (11.869)
<i>Transportation Infrastructure and Land Development Characteristics</i>											
Natural logarithmic of length (in miles) of roadway network	--	0.1233 (2.5751)	0.217 (4.248)	0.064 (1.657)	0.146 (4.112)	0.073 (2.942)	0.095 (2.995)	0.211 (7.674)	--	0.116 (6.925)	0.221 (5.799)
Dummy Variable; 1 if Interstate roadway passes through the county, 0 otherwise	--	--	0.275 (2.665)	--	--	--	--	--	--	--	--
Number of airports in each county /10	--	0.067 (2.542)	--	0.053 (2.722)	--	--	--	0.081 (5.331)	0.117 (8.657)	--	--
Metropolitan status (Base Case: County is a non-metropolitan area and also non-adjacent to metropolitan county)	--	--	--	--	--	--	--	--	--	--	--
Dummy Variable; 1 if county is metropolitan, 0 otherwise	--	--	0.465 (3.500)	--	--	--	--	--	--	--	--
Dummy Variable; 1 if county is a non-metropolitan but adjacent to a metropolitan county, 0 otherwise	0.052 (0.644)	--	0.233 (1.909)	0.112 (2.767)	--	--	0.217 (6.767)	--	--	--	--
Natural logarithmic of land area (in sq. miles)	--	--	0.504 (2.864)	--	--	--	0.323 (5.228)	0.223 (5.185)	0.159 (3.924)	--	--

Table 2a: Estimation Results of the JFC Model

Sector	Agriculture	Construction	Manufacturing	Trade	Transportation	Services	Finance	Health	Hospitality	Arts	Administration
Variables	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)
Demand Intensity Variables											
<i>Agglomeration Economies/Diseconomies</i>											
Total number of existing businesses per sq. mile	--	--	1.002 (6.285)	--	0.671 (7.536)	--	2.283 (20.604)	2.096 (24.118)	1.500 (25.880)	--	--
Square of the number of existing businesses per square mile	-0.002 (-0.699)	-0.023 (-4.381)	-0.062 (-5.624)	-0.024 (-5.720)	-0.034 (-5.479)	-0.029 (-9.248)	-0.275 (-20.904)	-0.246 (-24.474)	-0.193 (-29.548)	0.006 (7.978)	-0.192 (-9.064)
Number of existing trade businesses per sq. mile	--	1.543 (5.361)	--	--	--	2.025 (11.592)	--	--	--	--	--
Number of existing trade employees per sq. mile/10	--	--	--	--	--	--	--	0.097 (5.236)	--	--	--
Sector-specific number of existing businesses per sq. mile	--	--	--	1.320 (4.920)	--	--	--	--	--	--	6.774 (8.698)
<i>Specialization Indices and Firm Size</i>											
Location Quotient of businesses / 10	0.187 (1.897)	12.265 (8.141)	10.906 (6.654)	12.743 (4.578)	2.993 (4.226)	16.887 (7.291)	7.125 (4.779)	12.897 (13.636)	--	1.433 (4.679)	--
Herfindahl-Hirschman Index of businesses	-3.095 (-1.580)	-8.419 (-3.657)	--	-14.814 (-7.672)	-7.099 (-4.059)	-12.497 (-8.925)	-7.700 (-6.604)	-15.361 (-10.555)	-8.465 (-8.221)	-10.347 (-9.416)	--
Average size of businesses / 10	--	--	--	0.917 (5.257)	--	--	--	--	--	--	--

Table 2a (Contd.): Estimation Results of the JFC Model

Sector	Agriculture	Construction	Manufacturing	Trade	Transportation	Services	Finance	Health	Hospitality	Arts	Administration
Variables	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)
<i>Human Capital</i>											
Education (Base Case: % of persons 25 years or above with educational attainment less than high school)	--	--	--	--	--	--	--	--	--	--	--
% of persons 25 years or above with high school degree /100	--	--	-1.558 (-2.254)	--	-2.072 (-3.299)	--	--	-2.776 (-7.280)	--	-2.978 (-11.243)	--
% of persons 25 years or above with bachelor's degree or higher /100	-3.610 (-2.757)	--	--	--	-3.526 (-4.251)	--	--	--	2.599 (6.687)	7.873 (19.122)	2.315 (1.804)
Rate of unemployment /100	-30.779 (-3.082)	-16.344 (-3.277)	--	-9.671 (-1.772)	--	-19.470 (-4.768)	--	--	--	--	--
Average wage per job (in 10,000s of dollars)	0.247 (2.169)	--	--	--	0.289 (4.503)	--	--	--	--	--	--
<i>Fiscal Conditions</i>											
Property tax rates	-1.345 (-2.756)	-1.178 (-3.139)	-1.956 (-4.418)	-1.376 (-4.558)	-2.026 (-7.449)	-1.474 (-5.911)	-1.960 (-11.524)	-0.620 (-3.673)	-1.257 (-9.152)	--	-2.096 (-5.289)
<i>County-Specific Factors</i>											
Dummy Variable; 1 if region is Harris county, 0 otherwise	--	--	-2.789 (-5.201)	--	--	4.901 (7.837)	--	--	--	--	--
Dummy Variable; 1 if region is Dallas county, 0 otherwise	--	5.898 (7.988)	--	--	--	7.161 (10.572)	--	--	--	--	--
Dummy Variable; 1 if region is Tarrant county, 0 otherwise	--	4.694 (9.380)	--	3.376 (6.643)	2.675 (4.887)	7.477 (12.486)	--	3.840 (16.407)	2.868 (5.353)	3.343 (8.837)	--
Dummy Variable; 1 if region is Bexar county, 0 otherwise	--	--	--	--	--	--	-1.379 (-7.171)	--	--	--	--
Dummy Variable; 1 if region is Travis county, 0 otherwise	--	--	--	--	--	--	--	--	--	--	-1.496 (-3.492)

Table 2a (Contd.): Estimation Results of the JFC Model

Sector	Agriculture	Construction	Manufacturing	Trade	Transportation	Services	Finance	Health	Hospitality	Arts	Administration
Variables	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)
Supply Tipping Point (Threshold) Effects											
α Vector Elements											
α_1	--	--	-0.326 (-3.062)	--	--	0.355 (8.519)	--	--	--	--	-0.269 (-2.333)
α_2	-0.164 (-1.856)	--	--	--	--	--	--	--	--	--	--
α_3	--	--	--	-0.285 (-6.294)	--	--	--	--	--	--	--
α_4	-0.403 (-3.078)	-0.146 (-2.019)	--	--	--	0.119 (3.053)	--	--	--	--	-0.516 (-3.587)
α_5	--	-0.269 (-2.532)	-0.507 (-3.427)	-0.488 (-7.519)	--	--	-0.136 (-4.081)	-0.071 (-2.708)	--	--	--
α_6	--	-0.480 (-3.766)	--	--	--	--	--	--	--	--	-0.799 (-4.912)
α_7	-0.663 (-4.483)	--	-0.678 (-3.619)	-0.760 (-9.465)	--	--	-0.447(- 11.517)	--	--	--	--
α_8	-0.796 (-4.040)	--	-0.873 (-4.037)	--	--	--	-0.545(- 10.618)	--	--	--	--
α_9	-1.152 (-5.535)	-0.756 (-5.614)	--	-0.999 (-10.811)	-0.225 (-6.625)	-0.234 (-13.284)	--	--	--	--	-1.085 (-6.222)
α_{10}	--	-0.899 (-5.709)	--	--	--	--	--	-0.144 (-2.867)	--	--	-1.305 (-6.822)
α_{11}	--	--	--	--	-0.446 (-8.690)	--	--	--	--	--	--
α_{12}	--	-1.019 (-5.702)	--	--	--	-0.400 (-6.368)	--	--	--	--	-1.498 (-7.080)
α_{13}	--	-1.209 (-6.229)	--	-1.232 (-11.291)	--	--	--	--	--	--	--
α_{14}	-3.877 (-11.380)	--	--	--	--	-0.542 (-7.151)	--	--	--	--	--

Table 2a (Contd.): Estimation Results of the JFC Model

Sector	Agriculture	Construction	Manufacturing	Trade	Transportation	Services	Finance	Health	Hospitality	Arts	Administration
Variables	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)	Estimate (t-stat)
<i>γ</i> Vector Elements											
Constant	-3.902 (-3.911)	-4.388 (-7.119)	-9.243 (-5.194)	-4.595 (-8.456)	-2.790 (-5.176)	-3.782 (-9.495)	-6.790 (-12.914)	-3.284 (-7.323)	-5.074 (-14.645)	-8.472 (-21.326)	-7.176 (-8.166)
<i>Agglomeration Economies/Diseconomies</i>											
Residential population per sq. mile / 100	-0.036 (-3.053)	-0.064 (-3.441)	--	--	--	-0.073 (-5.854)	--	--	-0.050 (-2.068)	--	--
Residential population change between 2000 and 2007 (in 10,000s)	--	--	--	-0.019 (-3.845)	--	--	-0.014 (-5.528)	-0.031 (-8.839)	-0.021 (-2.988)	--	-0.037 (-7.581)
<i>Fiscal Conditions</i>											
Natural logarithmic of government expenditure (in dollars)	0.312 (7.006)	0.303 (10.438)	0.243 (7.282)	0.324 (14.456)	0.206 (8.507)	0.309 (15.413)	0.280 (13.16)	0.137 (7.812)	0.330 (18.052)	0.481 (27.888)	0.399 (11.435)
<i>Transportation Infrastructure and Land Development Characteristics</i>											
Natural logarithmic of length (in miles) of roadway network	--	0.115 (2.383)	0.204 (4.027)	0.063 (1.620)	0.152 (4.273)	0.063 (2.595)	0.099 (3.069)	0.197 (7.865)	--	0.117 (6.663)	0.213 (5.669)
Dummy Variable; 1 if Interstate roadway passes through the county, 0 otherwise	--	--	0.283 (2.696)	--	--	--	--	--	--	--	--
Number of airports in each county /10	--	0.071 (2.731)	--	0.049 (2.559)	--	--	--	0.079 (5.569)	0.118 (8.465)	--	--
Metropolitan status (Base Case: County is a non metropolitan area and also non-adjacent to metropolitan county)	--	--	--	--	--	--	--	--	--	--	--
Dummy Variable; 1 if county is metropolitan, 0 otherwise	--	--	0.452 (3.439)	--	--	--	--	--	--	--	--
Dummy Variable; 1 if county is a non-metropolitan but adjacent to a metropolitan county, 0 otherwise	0.053 (0.648)	--	0.235 (1.936)	0.115 (2.849)	--	--	0.220 (6.849)	--	--	--	--
Natural logarithmic of land area (in sq. miles)	--	--	0.518 (2.966)	--	--	--	0.332 (5.344)	0.207 (5.102)	0.124 (2.762)	--	--

Table 2b: Estimation Results of the JFC Model: Cross-Sector Correlation Matrix

Sector	Agriculture	Construction	Manufacturing	Trade	Transportation	Services	Finance	Health	Hospitality	Arts	Administration
Agriculture	1.000										
Construction	0.145 (1.978)	1.000									
Manufacturing	0.000	0.208 (2.592)	1.000								
Trade	0.000	0.479 (6.992)	0.299 (4.056)	1.000							
Transportation	0.000	0.162 (2.356)	0.000	0.176 (2.321)	1.000						
Services	0.155 (1.838)	0.437 (6.181)	0.229 (2.967)	0.453 (7.155)	0.226 (2.961)	1.000					
Finance	0.000	0.334 (4.384)	0.214 (2.720)	0.333 (4.867)	0.146 (1.675)	0.281 (3.417)	1.000				
Health	0.000	0.299 (3.317)	0.175 (2.171)	0.283 (3.508)	0.000	0.335 (4.816)	0.376 (5.160)	1.000			
Hospitality	0.000	0.191 (2.296)	0.290 (3.977)	0.285 (3.676)	0.000	0.173 (2.124)	0.137 (1.527)	0.127 (1.513)	1.000		
Arts	0.000	0.000	0.000	0.000	0.177 (2.006)	0.000	0.000	0.000	0.000	1.000	
Administration	0.000	0.324 (4.557)	0.222 (2.587)	0.368 (5.438)	0.000	0.343 (4.974)	0.230 (2.503)	0.283 (3.715)	0.365 (5.473)	0.000	1.000