Table 12.1: Types of measures

		Use of space	
		explicit	implicit
Type of input data	point	**second moment distance statistics (G(s), K(s), D(s))** and nearest neighbor statistics	Morris, Bernhardt, and Handcock's (1994) inequality measure
	area	**LISAs (G(s) & I), global measures of autocorrelation (G(s), Moran's-I, and Geary's-c)**, quadrat methods, White's (1983) inequality measure.	**Ellison's and Glaeser's** (**(1997), location quotient, coefficient of localization**, inequality measures (entropy, Simpson's index, dissimilarity, kappa, etc.)

Table 12.2: Selected formulae for assessing business externalities

Measure	Estimator	Reference(s)	Comments
K-function	$K(s) = \frac{A}{n(n-1)} \sum_i \sum_j w_{ij} I(d_{ij} < s)$	Ripley (19770, Besag (1977), Diggle (1990)	Measures clustering or dispersion with respect to complete spatial randomness.
D-function	$D(s) = K_{case}(s) - K_{control}(s)$	Diggle and Chetwynd (1991)	Indicates clustering or dispersion as a deviation from the overall spatial inhomogeneity of the population.
G-function	$G(s) = \frac{\sum_i \sum_j w_{ij}(d_{ij} < s) x_i x_j}{\sum_i \sum_j x_i x_j}$	Getis and Ord (1992), Ord and Getis (1995)	Measures clustering or dispersion with respect to complete spatial randomness.
Coefficient of localization	$COL_j = 0.5 \sum_i \lvert p_{ij} - p_{i+} \rvert$ p_{ij} = proportion of industry j in region i p_{i+} = proportion of all industry in region i	Hoover (1948), Duncan and Duncan (1955), Duncan (1957), Isard (1965)	High values indicate a deviation from the reference distribution.
(	$\gamma_j = \frac{\sum_i (p_{ij} - p_{i+})^2 - \left(1 - \sum_i p_{i+}^2\right)\left(\sum_k p_k^{-2}\right)}{\left(1 - \sum_i p_{i+}^2\right)\left(1 - \sum_k p_k^{-2}\right)}$ p_{ij}, p_{i+} as defined above. p_k = proportion of national industry employment in establish - ments of size quantile k	Ellison and Glaeser (1997)	High values indicate a deviation from the reference distribution. Control for national industry size distribution.

Table 12.3: Coefficients of localization[1]

Spatial Resolution	Industry	Establishments				Employment			
		Atlanta		Los Angeles		Atlanta		Los Angeles	
		COL	rank[2]	COL	rank	COL	rank	COL	rank
2 km.	1 Electronics	0.0083	4	0.0287	5	0.2572	5	0.5191	5
	2 Textiles	0.0083	5	0.0279	6	0.2584	3	0.5181	6
	3 Motor Vehicles	0.0085	2	0.0300	2	0.2598	2	0.5589	2
	4 Petrochemicals	0.0084	3	0.0298	3	0.2583	4	0.5592	1
	5 Aerospace	0.0085	1	0.0301	1	0.2608	1	0.5583	3
	6 Publishing	0.0081	6	0.0293	4	0.2560	6	0.5460	4
5 km.	1 Electronics	0.0413	4	0.1288	5	0.5980	6	0.6051	6
	2 Textiles	0.0406	5	0.1210	6	0.6221	3	0.6344	5
	3 Motor Vehicles	0.0425	2	0.1357	2	0.6283	2	0.7940	2
	4 Petrochemicals	0.0414	3	0.1347	3	0.6114	4	0.8123	1
	5 Aerospace	0.0430	1	0.1361	1	0.6448	1	0.7931	3
	6 Publishing	0.0396	6	0.1326	4	0.6109	5	0.7641	4
10 km.	1 Electronics	0.1266	3	0.3101	5	0.7045	6	0.4546	6
	2 Textiles	0.1231	5	0.2860	6	0.7187	4	0.5330	5
	3 Motor Vehicles	0.1309	2	0.3309	2	0.7966	2	0.7386	2
	4 Petrochemicals	0.1264	4	0.3259	3	0.7257	3	0.7250	3
	5 Aerospace	0.1326	1	0.3317	1	0.8477	1	0.8060	1
	6 Publishing	0.1188	6	0.3215	4	0.7093	5	0.6973	4

1. The Coefficient of localization (COL) ranges between 0 and 1 with high values indicating concentration.

2. Values indicate an ordinal ranking from the highest relative concentration (difference in distribution) for low ordinal values, 1, to lowest relative concentration (similarity in distribution) for high ordinal values, 6.

Table 12.4: Ellison-Glaeser, sensitivity to industry and spatial aggregation[1]

Atlanta, GA

Spatial Resolution	Industry	$(_{raw}$	([H(5)]	([H(20)]	([H(100)]	([H(i)]	*ordinal*([H(i)]
	1 Electronics	0.111	-2.296	-0.358	0.005	0.112	3
	2 Textiles	0.100	-1.790	-0.265	0.029	0.101	4
2 km.	3 Motor Vehicles	0.325	-2.509	-0.173	0.218	0.329	2
	4 Petrochemicals	0.057	-2.270	-0.438	-0.055	0.057	5
	5 Aerospace	0.859	0.216	0.732	0.836	0.871	1
	6 Publishing	0.047	-2.911	-0.624	-0.109	0.047	6
	1 Electronics	0.127	-2.231	-0.331	0.025	0.130	3
	2 Textiles	0.117	-1.728	-0.237	0.050	0.121	4
5 km.	3 Motor Vehicles	0.337	-2.417	-0.142	0.238	0.347	2
	4 Petrochemicals	0.068	-2.229	-0.421	-0.042	0.068	6
	5 Aerospace	0.903	0.578	0.856	0.912	0.931	1
	6 Publishing	0.075	-2.792	-0.574	-0.075	0.076	5
	1 Electronics	0.135	-2.188	-0.313	0.038	0.141	3
	2 Textiles	0.122	-1.704	-0.226	0.059	0.128	4
10 km.	3 Motor Vehicles	0.340	-2.367	-0.125	0.250	0.356	2
	4 Petrochemicals	0.090	-2.140	-0.382	-0.013	0.094	5
	5 Aerospace	0.919	0.799	0.931	0.958	0.967	1
	6 Publishing	0.079	-2.767	-0.564	-0.068	0.082	6

Los Angeles, CA

Spatial Resolution	*Industry*	$(_{raw}$	([H(5)]	([H(20)]	([H(100)]	([H(i)]	*ordinal*([H(i)]
	1 Electronics	0.017	-2.654	-0.505	-0.103	0.016	5
	2 Textiles	0.033	-2.000	-0.360	-0.045	0.033	3
2 km.	3 Motor Vehicles	0.034	-4.059	-0.691	-0.128	0.033	3
	4 Petrochemicals	0.023	-2.391	-0.492	-0.094	0.022	4
	5 Aerospace	0.073	-4.694	-0.949	-0.188	0.066	1
	6 Publishing	0.049	-2.907	-0.622	-0.108	0.048	2
	1 Electronics	0.017	-2.653	-0.505	-0.103	0.016	6
	2 Textiles	0.102	-1.781	-0.261	0.032	0.103	2
5 km.	3 Motor Vehicles	0.049	-3.979	-0.664	-0.110	0.048	5
	4 Petrochemicals	0.049	-2.297	-0.451	-0.064	0.049	4
	5 Aerospace	0.134	-4.310	-0.817	-0.108	0.129	1
	6 Publishing	0.060	-2.856	-0.601	-0.093	0.061	3
	1 Electronics	0.018	-2.646	-0.502	-0.101	0.018	6
	2 Textiles	0.128	-1.691	-0.220	0.063	0.133	2
10 km.	3 Motor Vehicles	0.065	-3.887	-0.633	-0.089	0.065	4
	4 Petrochemicals	0.055	-2.272	-0.439	-0.056	0.056	5
	5 Aerospace	0.224	-3.716	-0.614	0.016	0.226	1
	6 Publishing	0.073	-2.797	-0.576	-0.077	0.075	3

Table 12.4: Ellison-Glaeser (continued)

1. The (metric iscomposed of two components: a raw concentration measure and a industry employment size distribution measure (the Herfindahl). The notation above displays (as a function of the Herfindahl index evaluated using a given number of quantiles of the employment size distribution. For examples, ([H(5)] is evaluated using quintiles of the employment size distribution whereas ([H(i)] is evaluated at the observation level.

2. Values indicate an ordinal ranking from the highest relative concentration (difference in distribution) for low ordinal values, 1, to lowest relative concentration (similarity in distribution) for high ordinal values, 6.

Table 12.5: Rank orderings for Los Angeles

Establishments:

Statistic	Spatial Res.[1]	Industry (*clustered (dissimilar) ---------- dispersed (similar)*)					
Localization	2	aerospace	vehicles	petrochem	publishing	electronics	textiles
	5	aerospace	vehicles	petrochem	publishing	electronics	textiles
	10	aerospace	vehicles	petrochem	publishing	electronics	textiles
(	2	-	-	-	-	-	-
	5	-	-	-	-	-	-
	10	-	-	-	-	-	-
G(s)	2, s	textiles	publishing	petrochem	electronics	aerospace ‖	vehicles
D(s)	s	textiles	publishing	petrochem	aerospace	vehicles ‖	electronics

Employment:

Statistic	Spatial Res.	Industry (*clustered (dissimilar) ---------- dispersed (similar)*)					
Localization	2	petrochem	vehicles	aerospace	publishing	electronics	textiles
	5	petrochem	vehicles	aerospace	publishing	textiles	electronics
	10	aerospace	vehicles	petrochem	publishing	textiles	electronics
(	2	aerospace	publishing	textiles	vehicles	petrochem	electronics
	5	aerospace	textiles	publishing	petrochem	vehicles	electronics
	10	aerospace	textiles	publishing	petrochem	petrochem	electronics
G(s)	2, s	textiles	aerospace	petrochem	publishing	vehicles ‖	electronics
D(s)	s	textiles	publishing	petrochem	vehicles	electronics ‖	aerospace

Note: ‖ indicates division between clustering and dispersion

[ ] indicates statistical insignificance

1. The spatial resolutions for D(s) and G(s) are over a range of distances,*s*,though G(s) has a mimimum resolution of 2km given its reliance on a grid.

Table 12.6: Rank orderings for Atlanta

Establishments:

Statistic	Spatial Res.[1]	Industry (*clustered (dissimilar) ---------- dispersed (similar)*)					
Localization	2	aerospace	vehicles	petrochem	electronics	textiles	publishing
	5	aerospace	vehicles	petrochem	electronics	textiles	publishing
	10	aerospace	vehicles	electronics	petrochem	textiles	publishing
(	2	-	-	-	-	-	-
	5	-	-	-	-	-	-
	10	-	-	-	-	-	-
G(s)	2, s	publishing	electronics	textiles ‖	petrochem	vehicles	aerospace
D(s)	s	publishing	petrochem	electronics	textiles	aerospace	vehicles ‖

Employment:

Statistic	Spatial Res.	Industry (*clustered (dissimilar) ---------- dispersed (similar)*)					
Localization	2	aerospace	vehicles	textiles	petrochem	electronics	publishing
	5	aerospace	vehicles	textiles	petrochem	electronics	publishing
	10	aerospace	vehicles	petrochem	textiles	electronics	publishing
(	2	aerospace	vehicles	electronics	textiles	petrochem	publishing
	5	aerospace	vehicles	electronics	textiles	publishing	petrochem
	10	aerospace	vehicles	electronics	textiles	petrochem	publishing
G(s)	2, s	aerospace	vehicles	publishing	electronics	textiles	petrochem
D(s)	s	petrochem	electronics	publishing	textiles	vehicles ‖	aerospace

Note: ‖ indicates division between clustering and dispersion

[ ] indicates statistical insignificance

1. The spatial resolutions for D(s) and G(s) are over a range of distances, *s*,though G(s) has a mimimum resolution of 2km given its reliance on a grid.