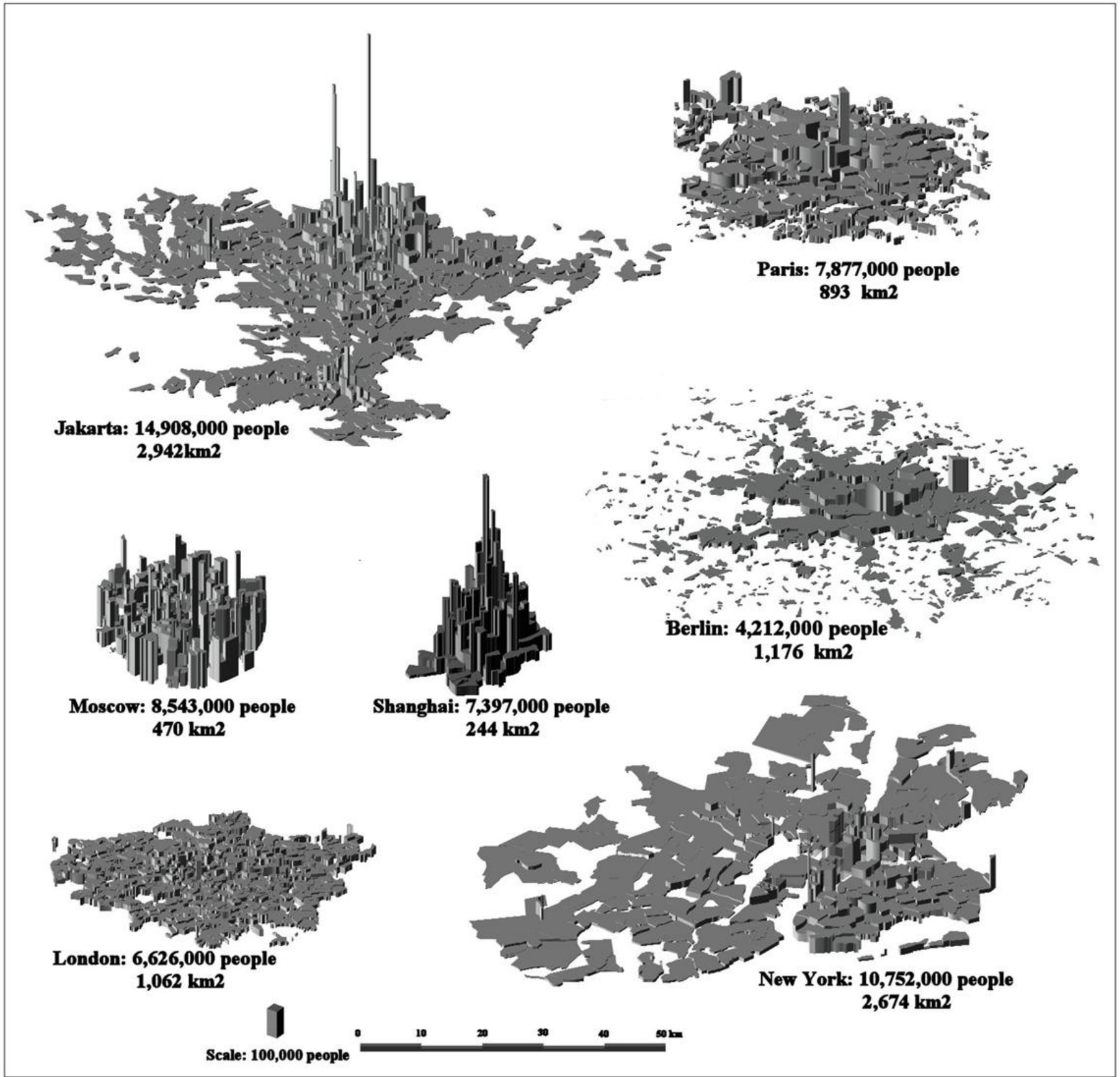
Substitution in Consumption and Production; Empirical Testing of the Monocentric City Model

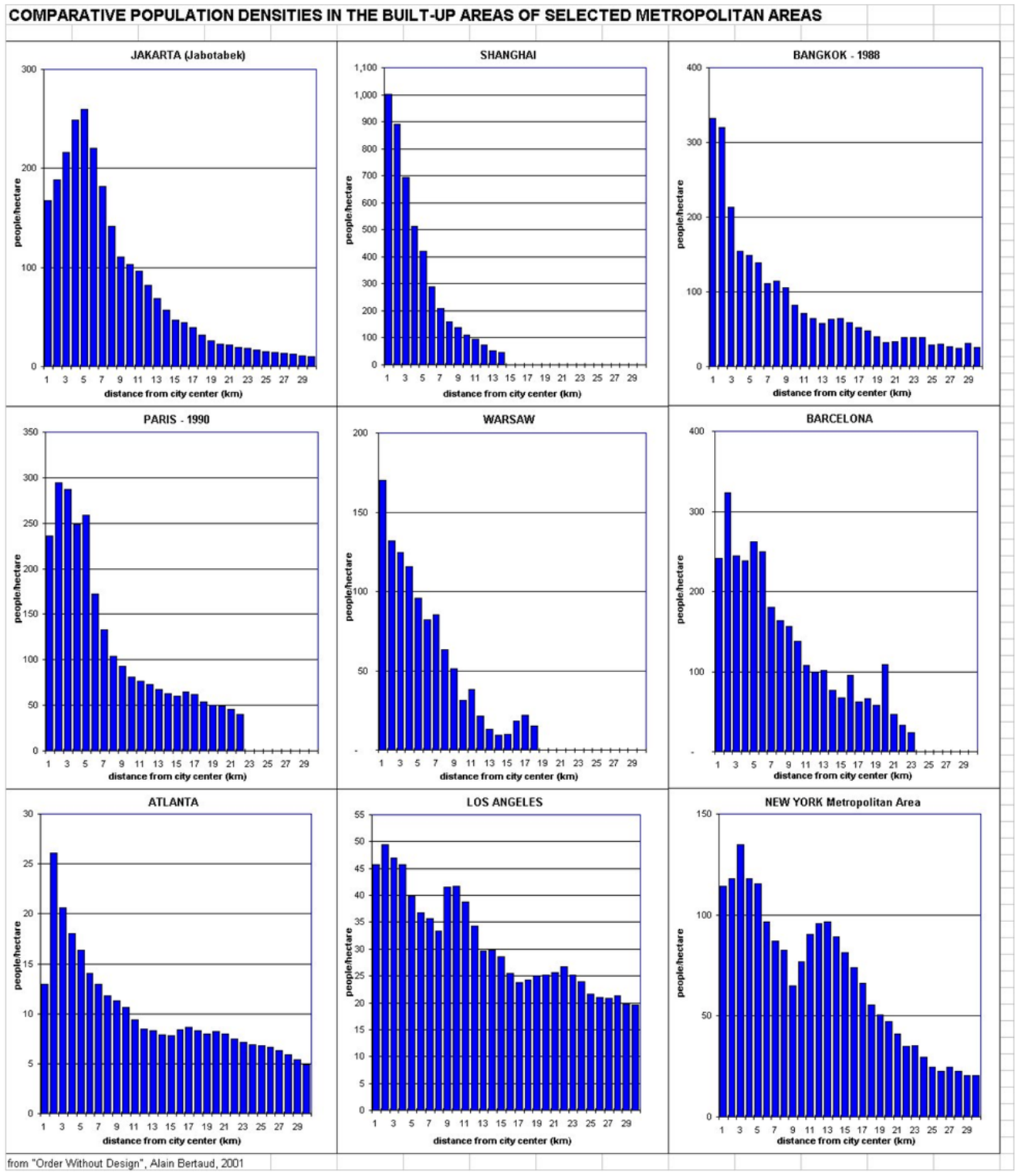
J. M. Pogodzinski

Lecture 15

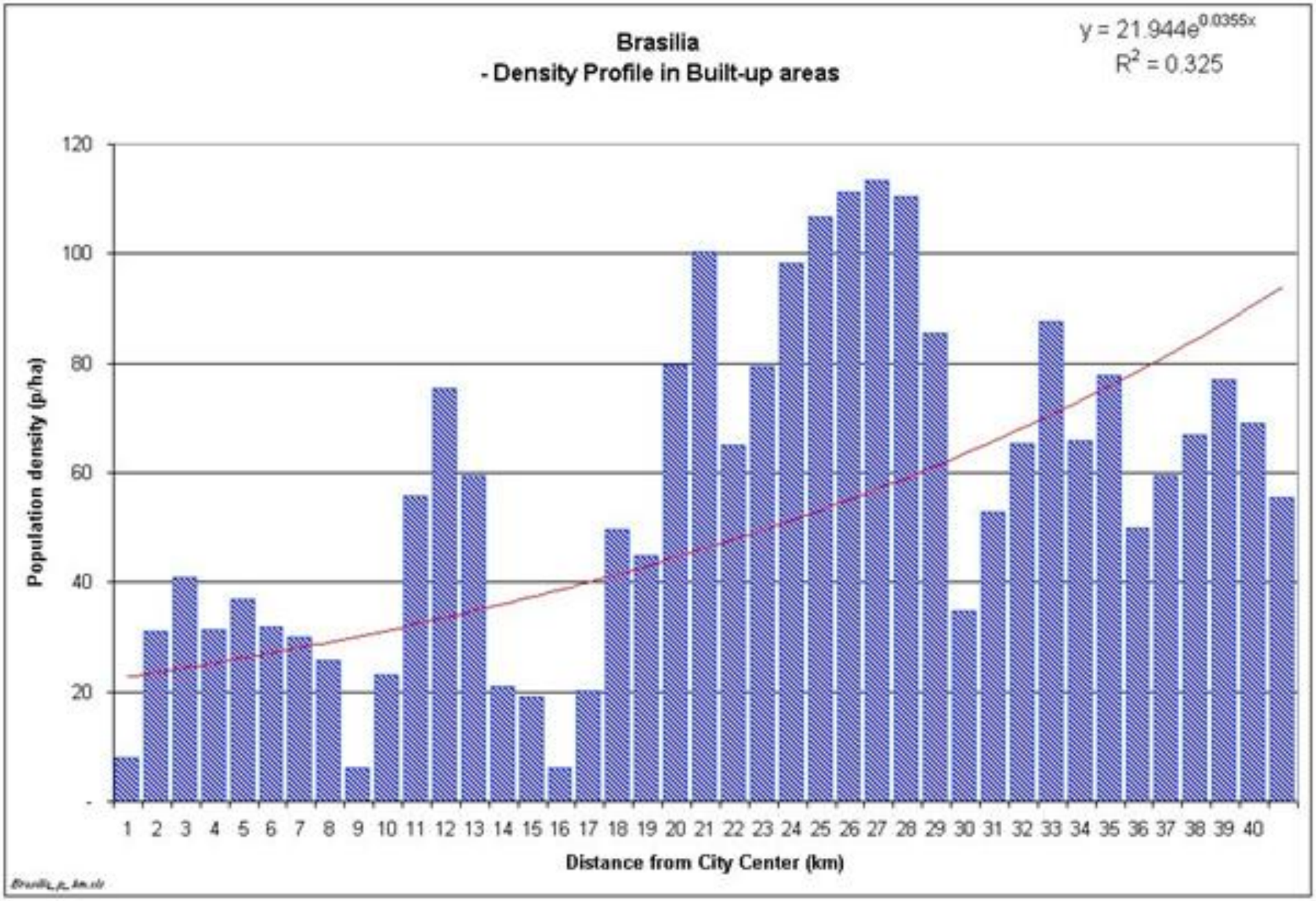
Spatial Distribution of Population in 7 Major Metropolis Represented at the Same Scale (Bertaud)



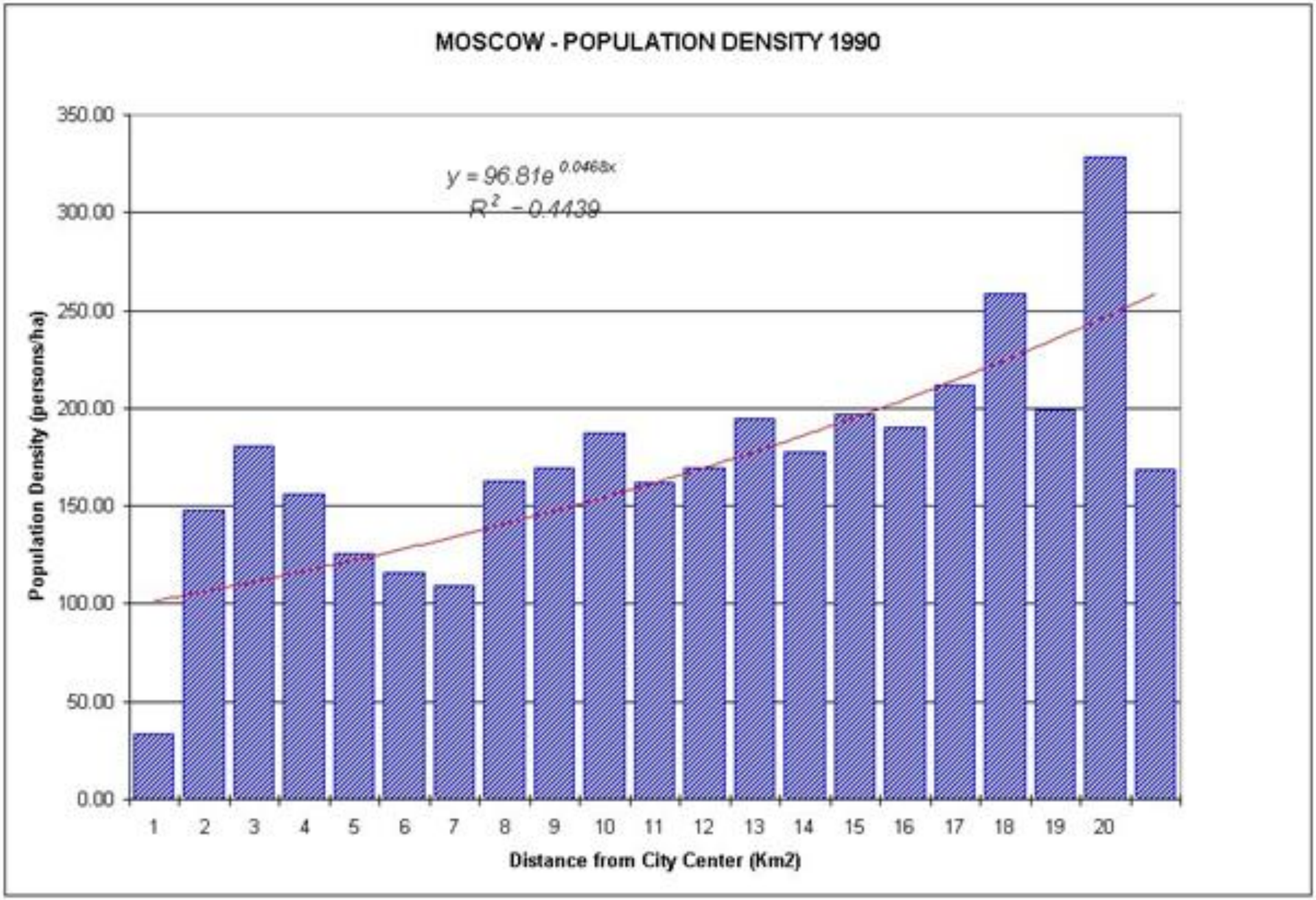
Population Densities by One-Kilometer Rings: Market-Oriented Cities (Bertaud)



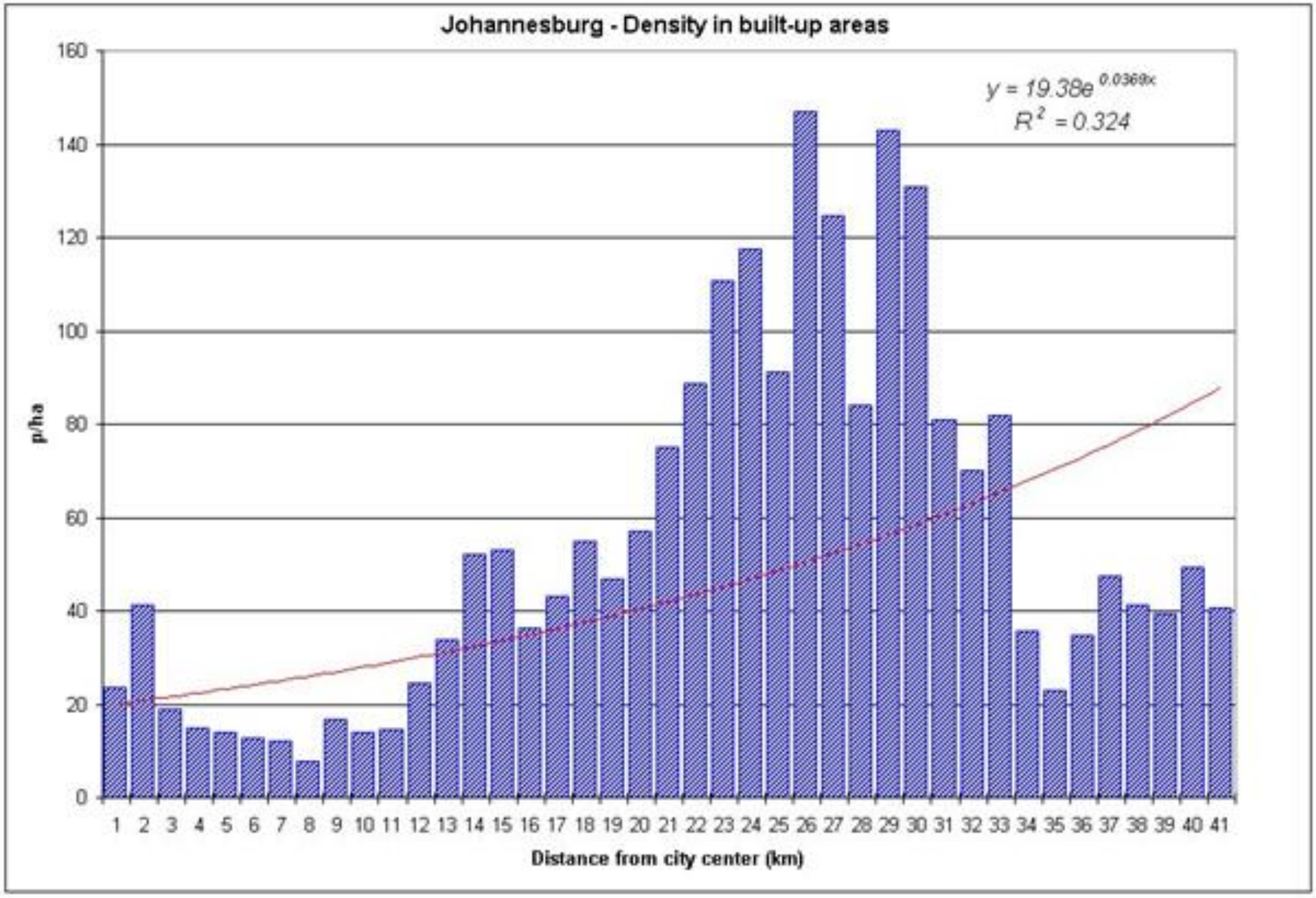
Population Densities by One-Kilometer Rings: Centrally Planned Cities (Bertaud)



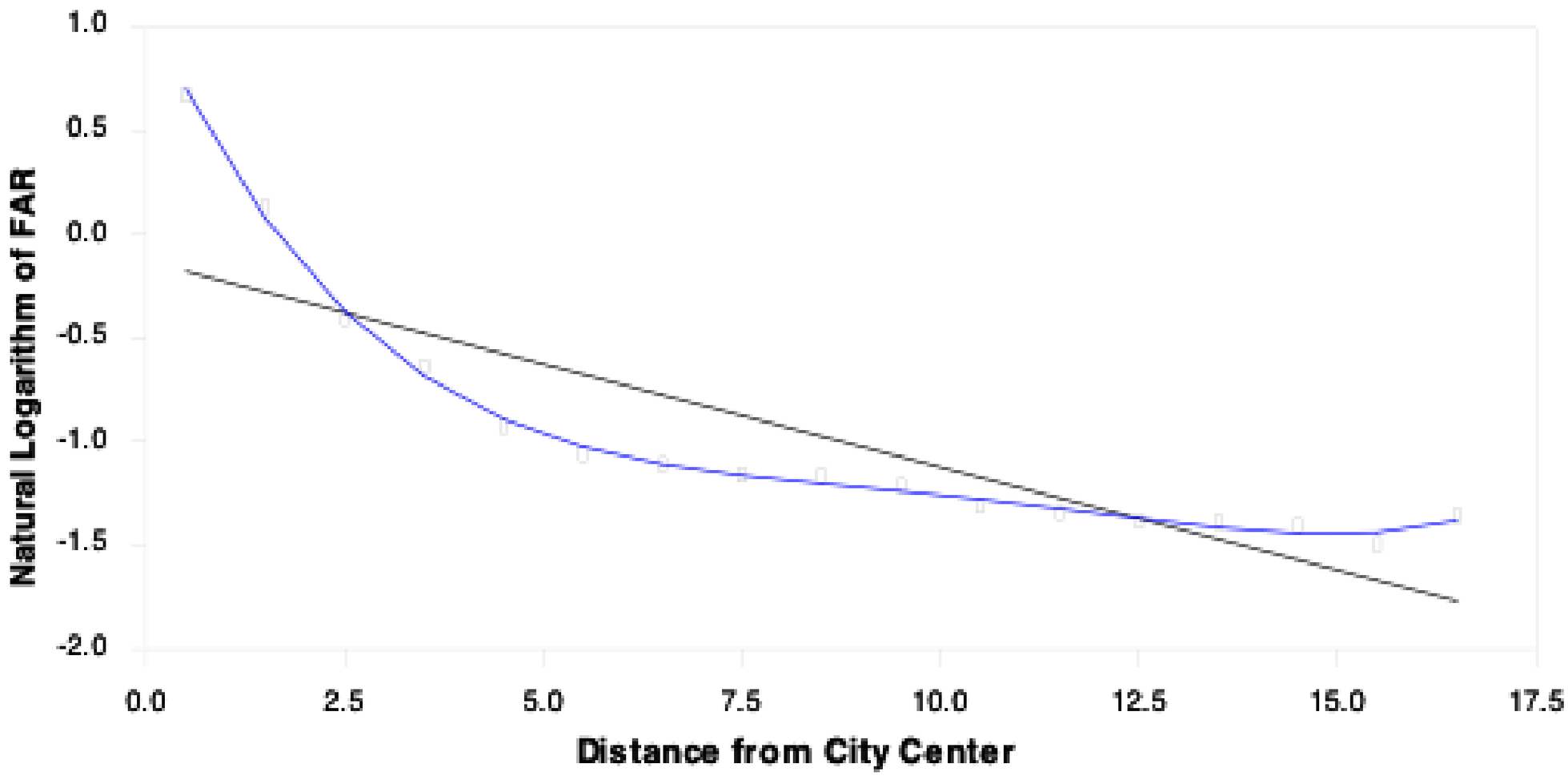
Population Densities by One-Kilometer Rings: Market-Oriented Cities (Bertaud)



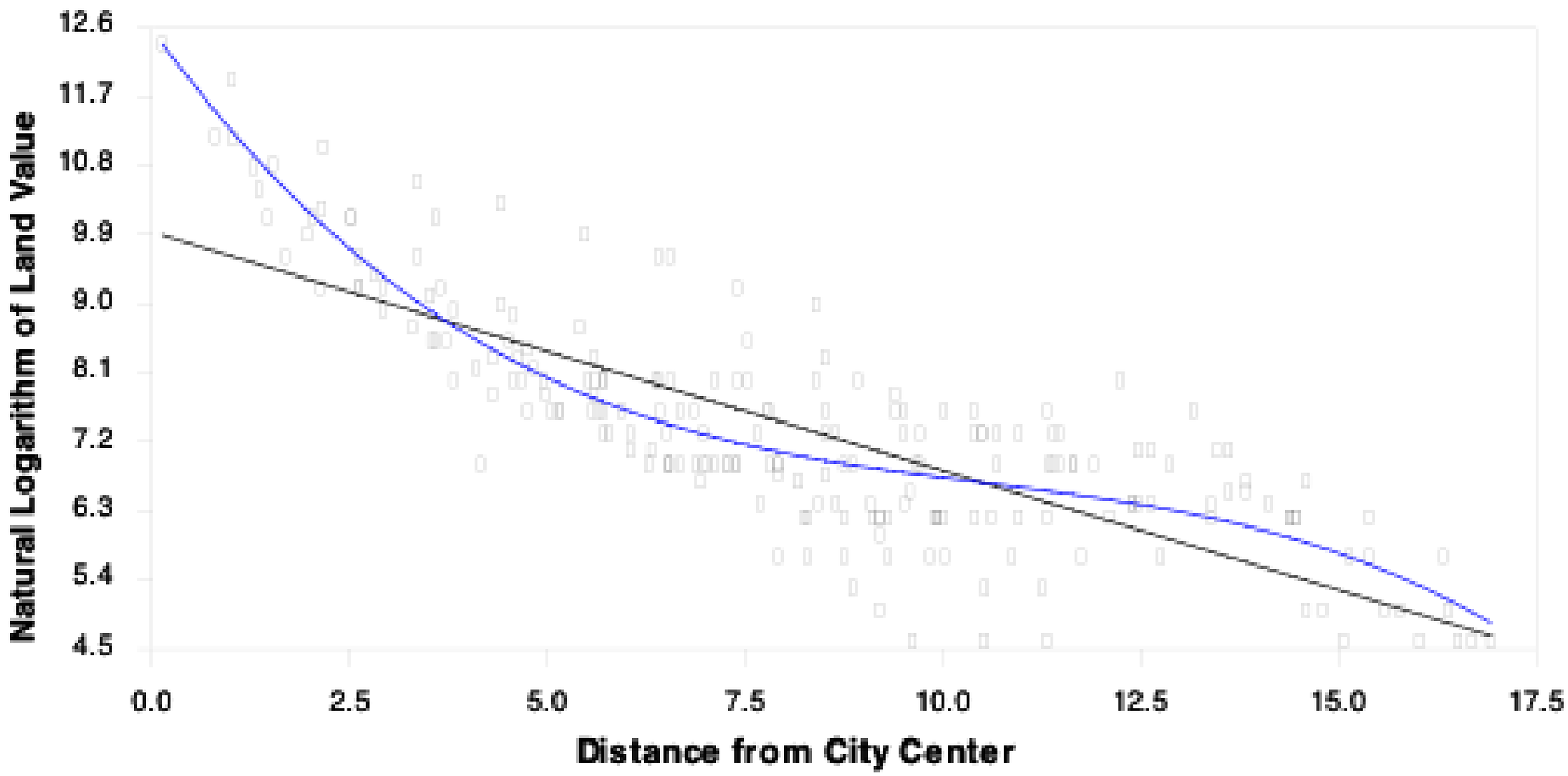
Population Densities by One-Kilometer Rings: Market-Oriented Cities (Bertaud)



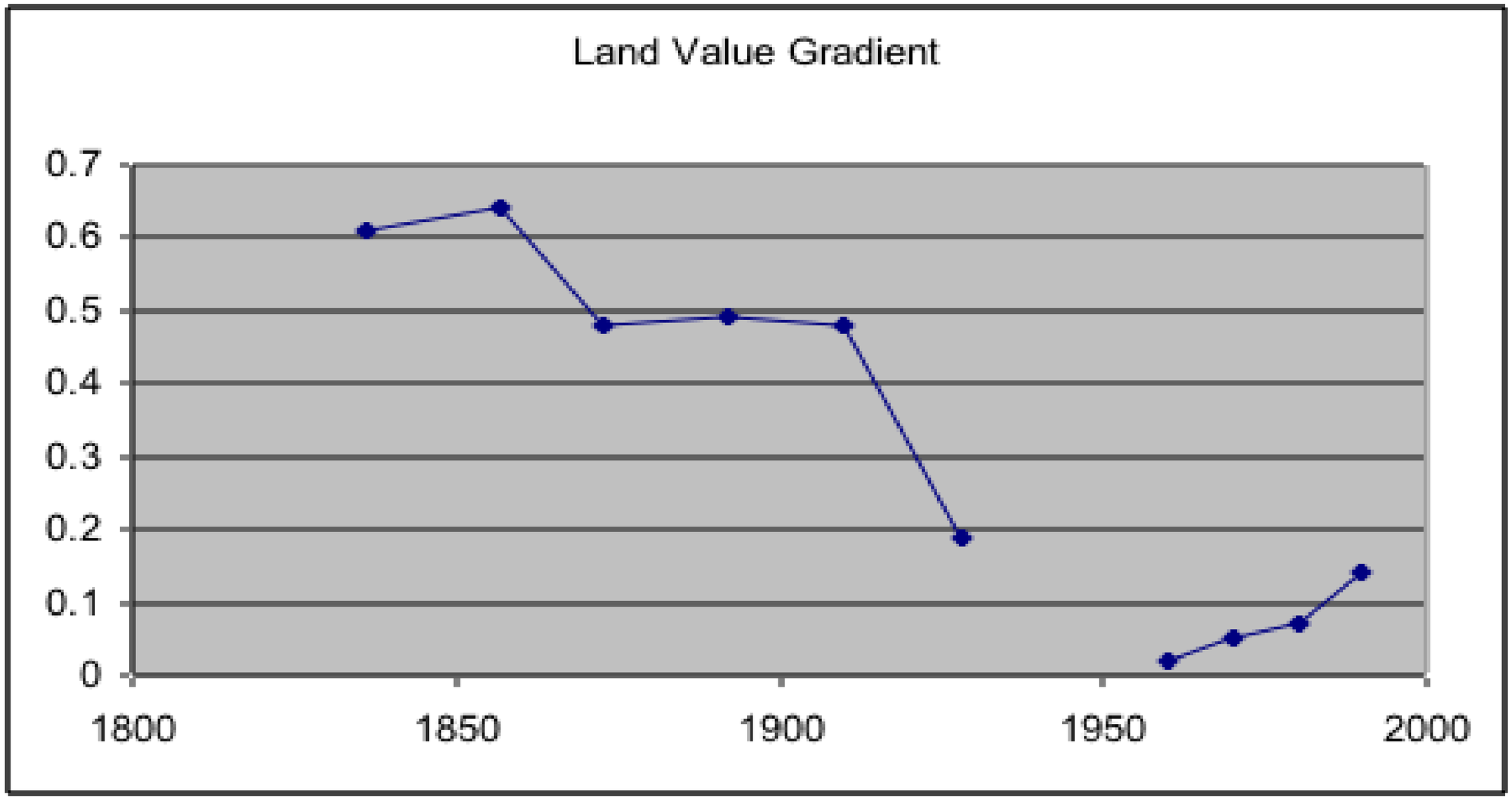
Log of Floor-Area Ratios in Chicago



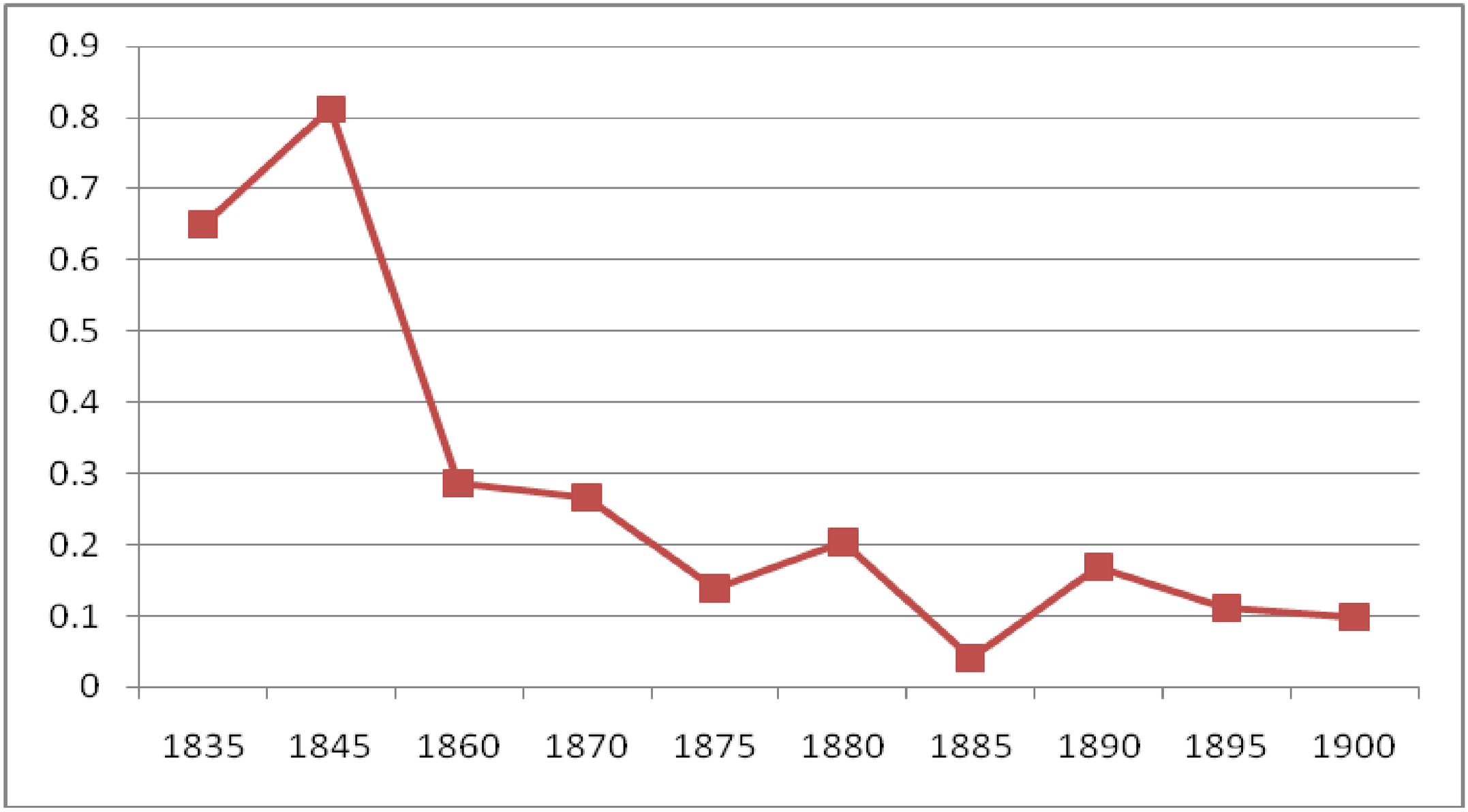
Log of Land Values in Chicago in 1873



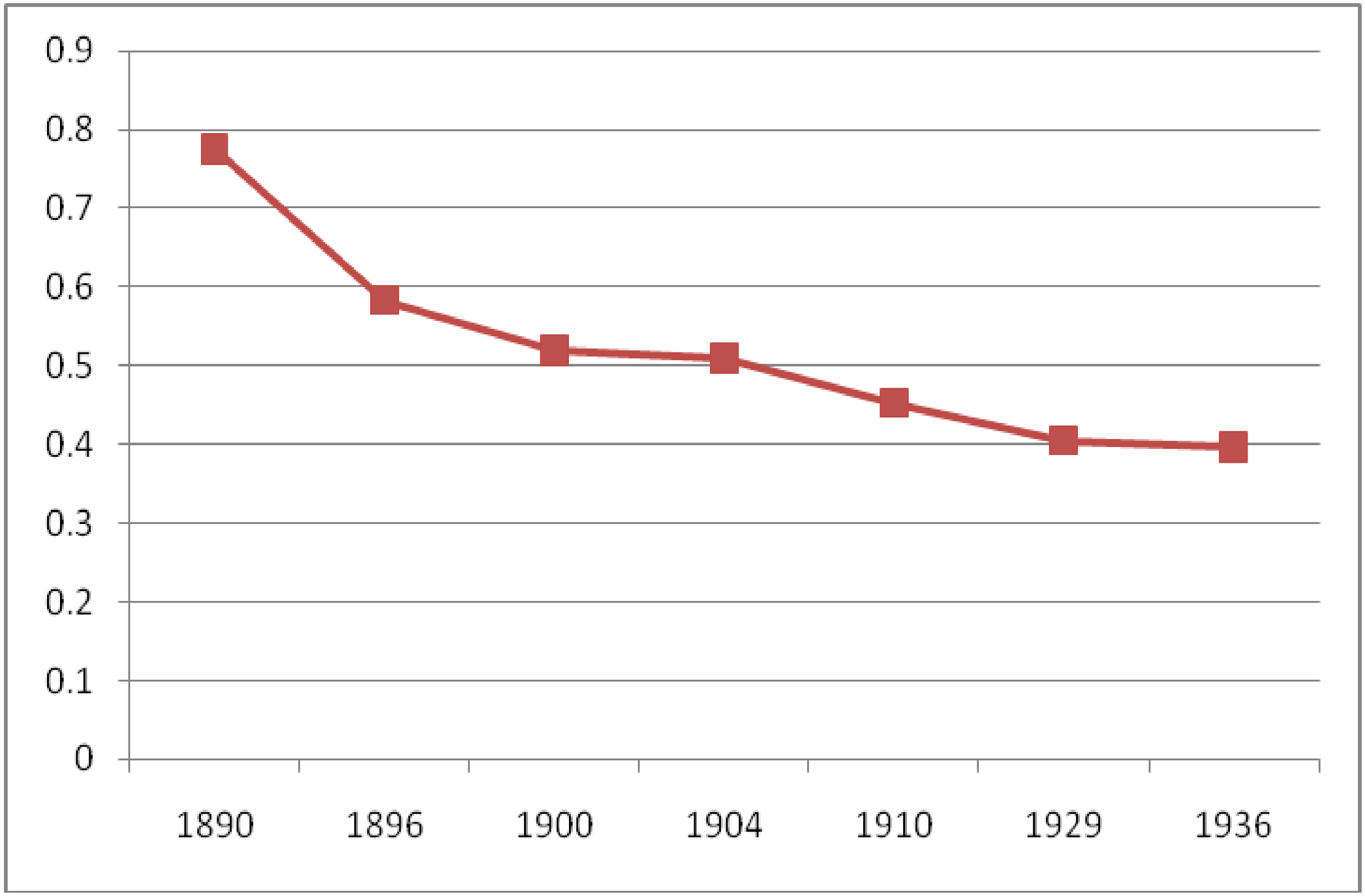
Land Value Gradient in Chicago over Time



Land Value Gradient in New York over Time (Atack and Margo)



Land Value Gradient in Berlin over Time (Ahlfeldt and Wendland)



Population Density Gradients in 2000

Metro Area	Population (millions)	Gradient	T-Value	R^2
New York	17.6	0.124	44.518	0.345
Los Angeles	13.8	0.051	19.124	0.134
Chicago	8.6	0.087	31.009	0.365
Washington DC	6.8	0.073	17.498	0.228
SF-SJ-Oakland	6.1	0.069	15.008	0.203
Philadelphia	6.7	0.080	18.460	0.200
Boston	4.5	0.100	23.424	0.406
Detroit	4.6	0.072	21.446	0.287
Dallas	5.0	0.046	9.154	0.089
Houston	4.5	0.082	13.030	0.183

Brueckner and Fansler's Estimates for Total Urban Land Area in American Cities

Variable	Coefficient	
Constant	-41.0723 (-2.277)	-63.4691 (-1.244)
Population	0.0004 (10.030)	0.0004 (9.876)
Median Agricultural Land Value in County	-0.0303 (-3.090)	-0.0289 (-2.888)
Household Income	0.0062 (3.033)	0.0062 (3.050)
Percentage of Commuters using Public Transit	-0.2444 (-0.4056)	
Percentage of Households with One or More Cars		0.2475 (0.4604)
R^2	0.7982	0.7985

Angel, Sheppard, and Civco's Estimates for the Natural Logarithm of Total Land Area for Cities throughout the World

Variable	Coefficient	T-Value
Ln Total Population	0.662	13.194
Ln Income	0.496	7.084
Ln Share of IP Addresses	0.051	2.165
Ln Air Links	0.122	4.773
Ln Agricultural Rent	-0.260	-7.431
Ln Fuel Cost	-0.087	-1.171
Shallow Ground Water	0.267	2.919
Temperate Humid Climate	-0.314	-2.414
Mediterranean Warm Climate	1.135	6.914
Mediterranean Cold Climate	0.681	2.867

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