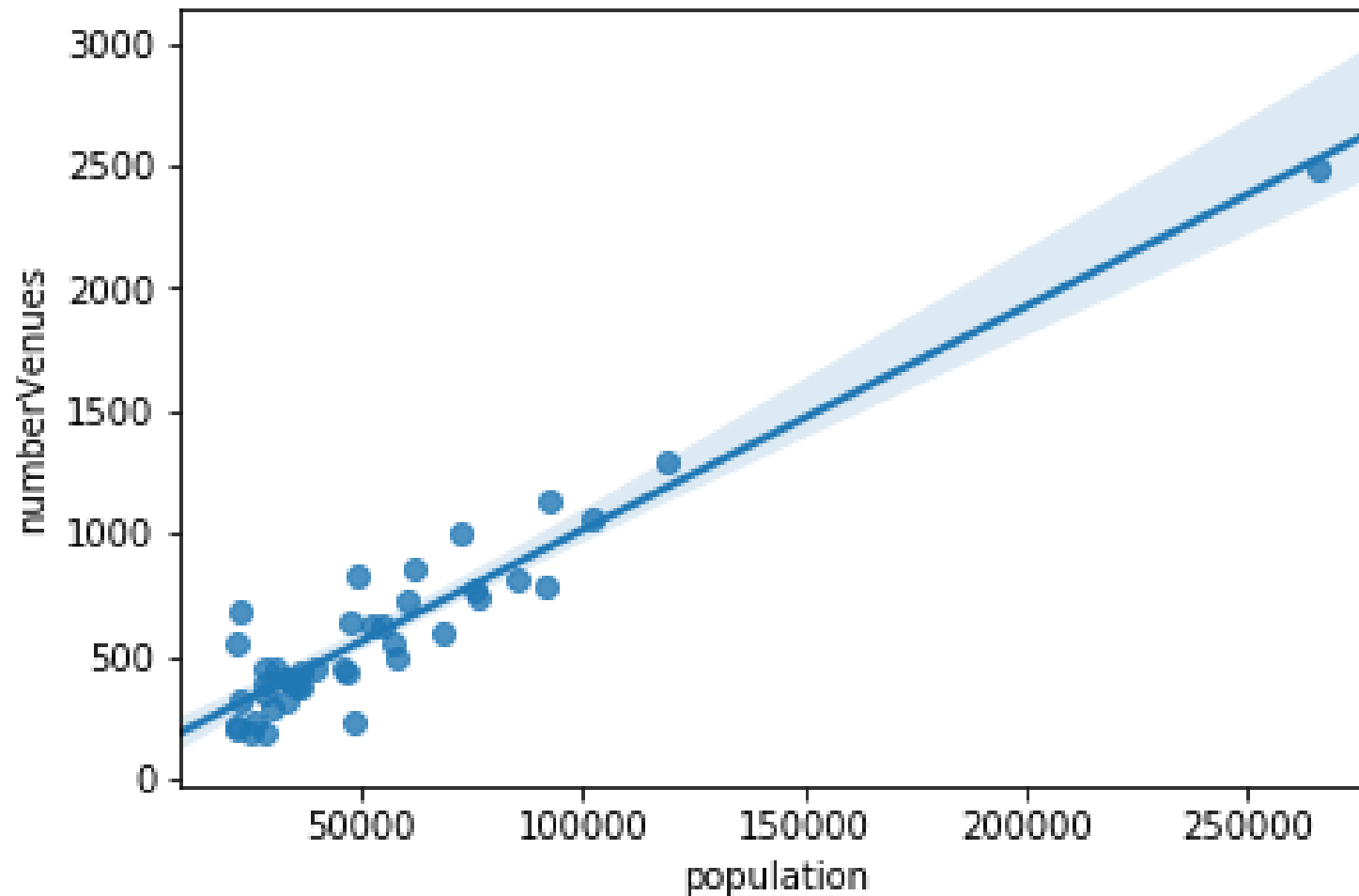# Identifying Growth Opportunities through Business Population Analysis

An evaluation of cities in Indiana of the United States

City Venue Count Varies Approximately Linearly with Population

Several cities are substantially below trend, with far fewer venues than this linear model (including income as well) predicts

city	population	aveIncome	numberVenues	predictedVenues	deltaModel
Lawrence	48704	23801	226	544.333339	-318.333339
Fishers	91832	38600	777	1008.452024	-231.452024
Franklin	25089	24471	189	324.063321	-135.063321
Brownsburg	25911	31964	235	360.740251	-125.740251
Kokomo	57836	22102	499	623.955084	-124.955084
East Chicago	28215	13868	192	312.640633	-120.640633
Columbus	47143	29396	435	551.196338	-116.196338
Muncie	68625	16986	593	706.025907	-113.025907
Crown Point	29625	31673	289	394.666321	-105.666321
Greenfield	22094	24458	212	295.749183	-83.749183

This could be a signal of missed opportunity

Applying the same approach to each category of business we find sectors in various cities that may be ripe for new entrants

city	min	minCategory
West Lafayette	-15.634305	deltaModel Fast Food Restaurant
East Chicago	-14.895415	deltaModel Fast Food Restaurant
Lawrence	-13.439069	deltaModel Fast Food Restaurant
Fishers	-12.264502	deltaModel Bar
Bloomington	-10.268434	deltaModel Fast Food Restaurant
Greenwood	-10.082050	deltaModel Bar
South Bend	-8.948254	deltaModel Pizza Place
Elkhart	-8.228488	deltaModel Bar
Evansville	-8.190686	deltaModel American Restaurant
Merrillville	-8.050455	deltaModel Pizza Place

This analysis is limited by the defects in Foursquare data as well as the underlying assumptions of "all things being equal".

This analysis makes the most sense when all venues are equal, which clearly isn't the case.

Revenue data could help ensure venue activity is appropriately weighted.