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An Analysis of Retail and Service Sector Count Data: Identification of Market Potential for Wisconsin Counties

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Abstract

The objective of this applied research project is to use Wisconsin county sales tax data to identify the strengths and weaknesses of selected retail and service sectors. Using "count" data on the number of businesses that report taxable sales we apply regression analysis to develop an estimate of the expected number of firms in the county. By comparing the observed and expected number of firms we can identify strengths and weaknesses. Through the regression analysis we can also identify which socioeconomic characteristics are associated with which types of retail and service firms. The method that we offer we refer to as Firm Count Analysis (FCA) and can be viewed as a complement to Trade Area Analysis (TAA) and the analysis of sales data.

Introduction

One of the most common requests of community economic development practitioners is to develop a market analysis of the relative strengths and weaknesses of the local retail and service market. Traditionally these requests are from communities that are interested in downtown redevelopment or the expansion of their economic development policies beyond the traditional focus on basic industries.[1] The range of market analysis tools at the disposal of the practitioner is vast and varies from the simple to the complex.[2]

The purpose of this applied research project is to introduce a slightly different approach, an approach that has seen significant exposure in the academic literature but only limited application in practice. The approach builds on the notion of thresholds as discussed by McConnon (1989) and Deller and Ryan (1996). Demand threshold is defined as the minimum market size required to support a particular type of retail or service business and still yield an acceptable rate of return for the business owner (Berry and Garrison 1958a and 1958b; Foust and Pickett 1974; Shaffer, Deller and Marcouiller 2004). The concept is based on the internal economy of the firm and the characteristics of consumer demand. Demand thresholds are usually measured in terms of the population required to support one or more firms of a certain type.

[1] A "basic" industry traditionally focuses on producing goods or services that are for export out of the community. These include agricultural, mining, forestry and manufacturing goods and large service industries such as insurance processing companies.

[2] For a more detailed discussion of alternative methods to analyze local retail and service markets, see the UW-Extension program entitled "Downtown and Business District Market Analysis" by Bill Ryan and Matt Kures at http://www.uwex.edu/ces/cced/dma/.

The approach adopted in this applied study builds on threshold analysis by examining the underlying structure of demand for a range of different types of retail and service firms. Rather than narrowly focus on population threshold estimates, such as the number of people required to support a barber shop, we want to expand the analysis to predict the number of firms of a certain type. Once we have a prediction of the number of firms the community should have, given its socioeconomic characteristics, we can compare the predicted to the observed. If the number of observed is greater than the predicted level, then we can reasonably conclude that this sector is a strength for the community. If the observed level is less than the predicted level, then the community does not have as many firms as expected, and the sector could be deemed a weakness. From a community economic development perspective, the community can build on its strengths and further examine its weaknesses for development potential. We refer to this approach as Firm Count Analysis (FCA) and can be viewed as a complement to the more traditional Trade Area Analysis (TAA) where sales data are used to compute Pull Factors and measures of Surplus/Leakage.

One comparable area of work that we are building upon is industry targeting. Today the concept of targeting industry is dominated by the ideas of industry clustering as advanced by Michael Porter (1990). The idea behind business clustering is that firms are integrated both horizontally and vertically across and within industry types.[3] Communities, or more correctly regions, should identify industries where they have a comparative advantage and build on those industries along with those integrated industries. But the “Porter Approach” is but a natural progression of a large family of industry targeting modeling systems.

Using classical location theory of the firm there is a rich and extensive empirical literature that has examined factors that influence the location of firms. The question addressed is what is the probability of a firm of a certain type (i.e., within a certain industry type) being located in a community with a certain set of socioeconomic characteristics. Firms that have high probabilities are then targeted for recruitment.

Unfortunately, the vast majority of this literature has focused on manufacturing location decisions. The bias in the empirical literature towards manufacturing is partially a reflection of the bias in community economic development policy towards “smoke stack chasing” and the narrow thinking

[3] It is important to distinguish between industry clustering in the spirit of Porter that can occur at a larger geographic scale and retail clustering which can occur at a shopping district level or at the shopping center level. While both forms of clustering recognize horizontal and vertical integration, they have the potential to occur at dramatically different geographic scales.

that economic growth was equated with attracting manufacturing firms. These modeling efforts have resulted in a number of Extension based educational programs such as the work of Good and Hastings (1989) with their models of the Northeastern U.S., Leatherman, Howard and Kastens (2002) and their models of the Great Plains and Nagy, Orfert and Skotheim's (undated) work with Canadian regions.

In this applied research project we merge elements from the threshold approach used in looking at retail and service firms, and classical location theory used in looking at manufacturing firms. In the end we will have isolated a handful of socioeconomic characteristics that help explain the presence of retail and service firms and then identify if the community (county) is performing above or below expectations, as defined by the statistical models.

Beyond these introductory comments, our study is composed of four parts. In the next section we outline the empirical methods and provide a bit more background on the theoretical foundations for the modeling approach. We then review the empirical findings in terms of the collection of socioeconomic variables that help us better understand the pattern of observed retail and service firm levels. Next we look at the patterns of strengths and weaknesses where we compare the observed to predicted number of firms. We close by discussing some of the key findings, limitations, and future research efforts.

Methods and Model

As briefly described in our introductory comments, firm location theory has provided us with a rigorous framework for thinking about the forces behind why firms locate or start in one community, but not another. Firm location theory also provides a collection of empirical tools to help target specific types of firms for development. The most general approach to think about firm location is in the neoclassical framework of profit maximization (Shaffer, Deller and Marcouiller 2004). Firms select a location in such a way as to maximize the demand (revenues) for the good or service that they offer for sale while simultaneously minimizing the costs of transporting inputs to the firm and outputs to customers.

Historically, researchers who have studied firm location decisions have broken the profit maximization problem down into its two respective parts. The logic is that firms that are production oriented (e.g., manufacturing) tend to be more concerned with the costs of transportation and the location decision tends to not affect the demand for the good or service. In other words, researchers assumed that for many types of firms, transportation costs drove the decision and the revenue (demand) side could be ignored. The empirical studies that fall into this camp look at items like tax structures, supply of infrastructure, and labor market conditions to name a few. This literature has provided the academic backbone to firm attraction policies such as tax incentives and investments in transportation infrastructure.

There is another set of firms, predominately retail and personal and business service firms, which is assumed to be more focused on the revenue or demand side of the profit maximization question. Here the firm locates relative to its potential customers determines demand and hence profits. Studies that are focused on these types of firms are concerned with the socioeconomic characteristics of the community in predicting retail and service sales levels. Some of these studies have focused on trying to explain levels of sales/revenue (e.g., Deller and Chicoine 1989; Chrisman 1985; Henderson 1990) while others have focused more narrowly on threshold estimates (e.g., Salyards and Leitner 1981; Schular and Leistritz 1991; Deller and Harris 1993; Harris, Chakraborty, Xiao and Narayanan 1996).

For this study we build on the market threshold approach by broadening the focus beyond simple population estimates to include the expansive factors considered in broader firm location studies. In practice, the empirical models often take the form:

$$N = \alpha + \beta P + \sum_{i=1\ldots m} \gamma_i X_i + \varepsilon. \qquad (1)$$

Here N is the number of firms of a particular type (e.g., grocery store, barber shop, etc.), P is a measure of the size of the community, usually population and X is a set of m socioeconomic variables such as income, age profiles, education levels among others. The parameters α, β and γ are to be estimated and ε is the regression error term.

A formulation of a simple regression model as outlined in equation (1) allows the researcher to look at three separate items. The first is perhaps the most academic and is concerned with the parameters α, β and γ in the traditional sense of hypothesis testing. For example, do age profiles influence the number of a particular type of firm and if so, in what way? The second is traditional threshold analysis which focuses on the relationship between the number of firms of a particular type and the measure of community size, again traditionally population. For illustrative purposes, assume that equation (1) can be expressed solely in terms of the intercept term (α) and size (βP). By slightly rearranging the estimated parameters (i.e., $\hat{\alpha}, \hat{\beta}$) we have:

$$N = \hat{\alpha} + \hat{\beta} P \rightarrow \frac{N - \hat{\alpha}}{\hat{\beta}} = P^C \qquad (2)$$

and P^C is the critical value, or population required to support a given number of establishments. The third item is in the spirit of the industry targeting work of Goode, Hastings, Leatherman and Olfret where we look at the expected value of dependent variable, or in this case N, and this is the approach explored here.

Once we apply the appropriate estimation method to the model outline in equation (1) we have a statistical model that can be expressed as:

$$\hat{N} = \hat{\alpha} + \hat{\beta} P + \sum_{i=1...m} \hat{\gamma}_i X_i . \qquad (3)$$

The difference between equation (1) and (2) is that equation (1) represents the "true" relationship between the right-hand-side variables and the number of firms (N). We approximate that true relationship using statistical methods, the results of which are expressed in equation (3). The error term (ε) captures errors in the data (sometimes called noise such as errors in the measurement of the variables), in the estimation (statistical) tools, the specification of the model itself, and the underlying theory. By entering the right-hand-side data for a given community, one can derive an estimate of the expected value of the number of firms ($\hat{N}$). The value of the error term is derived as $\hat{\varepsilon} = N - \hat{N}$ and can be used to assess the strengths and weaknesses of the retail and service market of the community. If $N > \hat{N} \Rightarrow \hat{\varepsilon} > 0$ then the observed value is greater than what is predicted by the model. For our purposes, this is interpreted as the community having strength in this particular sector. If $N < \hat{N} \Rightarrow \hat{\varepsilon} < 0$ then we have the model predicting that the community should have a larger number of firms than observed. For our purposes, this is interpreted as the community having weakness in this particular sector.

For this study we use county sales tax data reported by the Wisconsin Department of Revenue at the county level.[4] Specifically, counties that have imposed the local option sales tax are included in this analysis. Because the data is reported at the county level, the trade area is defined to be the county. This implicit assumption may be reasonable for some goods and services and for some counties, but it is clearly not reasonable for most. Still, the analysis provides one set of information that can be used to develop a picture of the local retail and service markets across Wisconsin. But rather than using sales data as we recently did with a county-level Trade Area Analysis study (Deller, Kures and Ryan 2006), we are interest in the "count data" or the number of establishments (i.e., N above) that are subject to the sales tax.

The advantages of these data include an extensive coverage across a wide range of goods and services as well as inclusiveness of the number of firms in the data. Regardless of the narrowness of the tax code, specifically items that are taxable, if the firm offers for sale any good or service that is subject to the tax, they have a sales tax license and are counted in the data.

[4] For a detailed discussion of the Wisconsin sales tax see http://www.dor.state.wi.us/pubs/pb201.pdf particularly section X.

The weakness of the data is that firm count data does not account for firm size. A small “mom n’ pop” grocery store is treated the same as a large supermarket. Another limitation is that the count data does not capture multi-product line stores. The most evident examples are the growing number of formats such as Wal-Mart Supercenters, Sears Grand Stores, and Super Targets that offer pharmaceuticals, groceries, hardware, automotive supplies and clothing. It is possible to have one community with a Wal-Mart that offers this wide range of goods next to a second community that has separate businesses that offer each good separately. From a market supply and demand perspective, both communities are the same, but they will appear very differently in the county data.

The categories included in this study are:

- Food Services & Drinking Places (Restaurants & Bars)
- Performing Arts, Spectator Sports & Related Industries
- Amusement, Gambling, Recreation Industries
- Automobiles & Other Motor Vehicles
- Gasoline Stations (including convenience stores with gas)
- Clothing & Accessories Stores
- Electronic & Appliance Stores
- Food & Beverage Stores
- Furniture & Home Furnishings Stores
- Health & Personal Care Stores
- Sporting Goods, Hobby, Book, & Music Stores
- General Merchandise Stores
- Other Store Retailers
- Hotels, Motels & Other Traveler Accommodations
- Banking, Insurance and Other Finance Activities
- Administrative & Support Services
- Health Care and Social Assistance Services
- Personal & Household Services
- Business Services
- Repair & Maintenance Services
- Professional Services
- Architectural, Engineering, & Related Services
- Computer System Services
- Scientific & Other Services
- Rental & Leasing Services

Thus there are 25 separate retail and service categories examined. While more detailed data in terms of firm types is preferable from a theoretical perspective, it can also become overwhelming in terms of data overload. The demand structure for stores that specialize in stereo equipment is fundamentally different than the demand structure for stores that specialize in major household appliances such as stoves, refrigerators and washing machines. But for reporting purposes the Wisconsin Department of Revenues groups these two different types of stores into the broad Electronic and Appliance Stores classification. This will lead to what can be called aggregation bias. Care must also be taken when we look at some of the specific categories, such as hotels and business services, where the demand structure is not driven by local household characteristics. The demand for architectural and engineering services, for example, is more a function of other types of businesses in the area and not necessarily the age structure of the community.

The next issue to be addressed is determining the set of right-hand-side variables to include in the analysis; which variables will explain the number of firms by type? Here we rely on economic theory and statistical methods to determine the final specification. Theory suggests that key groupings of variables should include measures of market size and income level and structure, as well as socioeconomic characteristics that might describe differences in tastes and preferences such as age structures and education levels.

The variables included in the analysis are:

- Number of Households[5]
- Number of Persons per Household
- Percent of the Population Under Age 17
- Percent of the Population Over Age 65
- Median Household income
- Per Capita Income
- Share of Total Income from Wages and Salary
- Gini Coefficient of Income Equality
- Percent of Households with Low Income (<$20,000)
- Percent of Households with High Income (>$100,000)
- Unemployment Rate
- Percent of Those Over 25 with at Least a HS Degree

[5] In the threshold literature the size of the market is commonly measured by population. We have elected to use number of households as an alternative. Preliminary analysis revealed that population and number of households are highly correlated and number of households tends to provide more stable results.

- Percent of Those over 25 with at Least a Bachelor's Degree

The next question is which specific variables are best suited to explain, or more precisely predict, the number of firms. Part of the limitations to this study is that our sample size is limited to the number of Wisconsin counties that have a local sales tax, a total of 55 counties.[6] Given a limited sample size it is not possible to include all possible right-hand-side variables at the same time because of a problem with degrees of freedom. A second problem is that many of these potential variables are correlated with each other introducing the problem of multicollinearity.

To address this collection of potential problems we employ a variable reduction method known as stepwise regression. What we are attempting to do is finding the "best" model from a number of possible models. The stepwise method is a uses a modification of the forward- and backward-selection technique. In the forward-selection method, variables are added one by one to the model, and the *F* statistic for a variable to be added must be significant at some preset level. After a variable is added, however, the stepwise method looks at all the variables already included in the model and deletes any variable that does not produce an *F* statistic significant at the preset level. Only after this check is made and the necessary deletions accomplished can another variable be added to the model. The stepwise process ends when none of the variables outside the model has an *F* statistic significant at the preset level and every variable in the model is significant at that level, or when the variable to be added to the model is the one just deleted from it. In essence we are allowing the data to determine which variables should be included as explanatory variables.

The stepwise regression method, however, has been subject to significant criticism. The purest criticism is that stepwise regression minimizes the role of theory in dictating what should be included. If the central thrust of the research is to test specific hypotheses, for example what impact does the widening income gap between the rich and poor have on the structure of local retail and service markets, then this criticism is legitimate. If, however, the thrust of the research is to uncover which variables, from a list suggested by theory, best explain the dependent variable, this criticism is not as disturbing. In the end these “variable reduction” approaches to statistical modeling is often dismissed as “data mining.”

A more appropriate criticism centers on the mechanics of the approach itself. As described above, significance levels of the *F* statistic is but one of many criteria that can be used for variable entry and exit. Others include changes in R^2 or adjusted R^2, the Mallows' C_p statistic,

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[6] Milwaukee County has been removed from the analysis because of its relative size: it represents an “outlier” in the sample and introduces problems with the statistical modeling.

Cox and Snell's R^2, Hagle and Mitchell's pseudo R^2, Bayes Information Criterion (BIC), and the model chi-square test, also called the log-likelihood test. Which criteria to pick is purely up to the researcher and there are no theoretical rules to use one criteria over another. Some argue that the fatal flaw of stepwise regression is that for a given dataset and model, the final selection of variables should be at least close to the same across the different variable selection criteria. The final selection of variables should be consistent across the different selection criteria. This, unfortunately, is seldom the case; final model specification depends on the selection criteria used and there is no solid reason to use one criterion over another.

Despite these serious problems, for our purposes stepwise regression serves as a reasonable first approximation to the models outlined in equation (1). We use the traditional selection criteria of a critical *F* statistic and we elect a critical value of 85 percent confidence level. While this is a lower threshold than the traditional 95 percent level, we are open to having a general discussion of all possible variables that might help us understand the strengths and weaknesses of the retail and service markets across Wisconsin.

Before we begin our discussion of the stepwise regression results, let us briefly review some base statistics describing the sample of Wisconsin counties (Table 1). The classification with the largest number of firms is the "other store retailers" which includes specialty stores that do not fit into the other categories. The one classification that has the fewest is architectural, engineering and related service where the average county has only four of such firms, followed by professional services with only five firms for the average county. The categories that show the largest counts beyond the generic "catch all" classification of other retailer stores include personal and household services with an average of 401 firms, automotive and other motor vehicle retailers with an average of 364 firms, and business services with 262 firms. One must keep in mind that these data are drawn from sales tax data and many service firms may not be subject to the sales tax and hence are not included in the data.

The descriptive statistics for the pool of potential control variables are also included in Table 1. Number of households, our sole measure of market size, averages about 20,070 and range from 2,870 to 188,480. There is little variation in number of persons per household with an average of slightly more than 2.5 with a minimum of 2.19 and a maximum of 2.87. For the typical county in the sample, 23 and 26 percent of the population are between 0-17 and over the age of 65 respectively. Median household income and per capita income have large ranges with per capita income having a low of $18,500 and a high of $131,100 and an average of about $24,000. The Gini Coefficient of income distribution is included to explore the ramification of a widening income gap between the rich and the poor. Lower Gini Coefficients indicate more evenly distributed income while a higher Coefficient suggest more income is concentrated in the hands of a few households. There is wide variation in income distribution across Wisconsin with one county reporting a Gini Coefficient of 0.34 and another is 0.55. The reader can review the remainder summary statistics.

<u>Statistical Results</u>

The explanatory power of the models is remarkably high given the cross-section nature of the data (Table 2). Of the 25 models 16 have R^2 greater than .9, or the models explain more than 90 percent of the variation in the number of firms. The most powerful model from an explanatory perspective is the Computer System Services model with an R^2 of .9715. Eight of the models have explanatory power between 80 and 80 percent as measured by the R^2 statistic. Only one sector, Hotels, Motels and Other Traveler Accommodations, has "poor" performance with an R^2 of .3741, or our "best fit" model given our step-wise regression approach explains 37 percent of the variation in hotels and motels. This latter result can be attributed to the "non-local" nature of these types of services.

Given our discussion below about the use of these models to make statements about the strengths and weaknesses of each sector for every county in the data, the relative levels of the R^2s are important. The percent of the variation in the dependent variable explained by the model, or the R^2, tells us how "tightly" the data fit the model. The "tighter" the model, the more confidence we can place on our estimates of strengths and weaknesses. A model where the data is "loose" suggests that there is something happening within the sector that the model is not explaining. Thus, is the observed weakness or strength actual or a product of a "poorly performing" model? Thus great care must be taken to ensure that the statistical model makes intuitive sense and confidence in the conclusions varies across models.

If we look at the significance levels, or statistical confidence levels, of the overall models based on the equation F statistic, each model is significant at or above the 95 percent level of confidence. The strongest model for an overall significance level is the Food and Beverage Stores model with an F statistic of 403.32 and the weakest is Hotels, Motels and Other Traveler Accommodations with an F statistics of 15.84. Other than the Accommodations model, which is the weakest performing model, all models perform above expectations. Given the relatively low R^2 and F statistic for the Accommodations model, greatest care must be taken when considering this sector.

There are two ways in which we can discuss the results of the models beyond the summary statistics. One way is to walk through each individual model, sector by sector. The second way is to look at the performance of individual variables and the frequency of selection by the step-wise regression method as well as the direction of influence (positive or negative coefficients). We will employ a mixture of both but focus most of our discussion on the second approach.

The one variable that outperformed all other variables in terms of frequency of selection and level of significance as measured by the individual *t* statistics is the number of households, our measure of market size. Of the 25 models, number of household appears in 23 models and is significant above the 99 percent level of confidence in all 23 models. This strong result tells us that the notion of simple market thresholds measured by population, or in our case here number of households, provides a reasonable first approximation to market potential for certain types of firms. In other words the population thresholds provided by McConnon (1989) and Deller and Ryan (1996) are simple yet powerful tools in assessing market structure.

Because of this strong result, coupled with the idea of simple thresholds, we have produced a set of simple scatter plots where we plot number of firms on the vertical axis and number of households on the horizontal axis (Figures 1a through 1z). By introducing a simple "trend line" we get an idea of the nature of the threshold relationship. Notice that in every case, except two, there is a strong positive relationship, or the trend line, is upward sloping; in other words, markets with higher number of households can support more firms.[7] One can also look at the size of the estimated coefficient to gain insights into how sensitive the number of firms is to market size. For example, number of Personal and Household Services, with a coefficient of 9.07, is more sensitive to market size than Health Care and Social Assistance Services with a coefficient of 0.75. This suggests that as the market grows in terms of number of households, the number of firms in Personal and Household Services will grow much faster than the number of Health Care and Social Assistance firms.[8]

The next variable that is most commonly selected by the step-wise regression method is the share of total income that is derived from wages and salary. This variable is intended to capture the structure of income sources. Counties with higher levels of this simple ratio tend to be more dependent on employment for income as opposed to transfer payments, and other non-labor sources of income such as dividends, interest and rent. Of the 25 models, the share of total income from wages and salary enters 18 of the models, and the coefficient is positive in 17 of

[7] It is important to note that the trend line introduced in the scatter plots is not the same as those in the regression models.

[8] The observant reader will note that the size of the coefficient associated with number of households is directly tied to the average number of firms by type. Looking at Table 1, the classification with the highest sample mean, other retail stores, also has the largest coefficient on number of households.

those 18. The only model with this variable entering as negative is in the Performing Arts, Spectator Sports and Related Industries. The consistency of the importance of this variable couple with the positive coefficients suggests that sources of income should be further explored in future research.

Income inequality, as measured by the Gini Coefficient, is also found to be a strong predictor of number of firms. Recall that higher values of the Gini Coefficient are associated with larger gaps between high and low income households while smaller values suggest more even distribution of income. The Gini enters into 15 of the 25 models and the estimated coefficient is positive in each case. This implies that higher levels of income inequality tend to be associated with more firms. Consider, for example, there tends to be a larger number of Automobile and Other Motor Vehicles firms in counties that have higher level of income inequality.[9] Indeed, with a 10 percent increase in the Gini Coefficient, a large increase, we would expect to see almost a 50 percent increase in the number of firms of this type.[10]   Why higher levels of income inequality are consistently associated with a larger number of retail and service firms is not readily clear. Again, the purpose of this applied research is *not* centered on hypothesis testing, but rather on uncovering patterns, and individual county strengths and weaknesses.[11]

To help provide more insight into the impact of income distribution on number of firms we also include the percent of households with annual income below $20,000 and above $100,000. Both measures enter six of the 25 models, and appear in only two simultaneously. One might expect (i.e., hypothesize) that a larger share of low income households would have a dampening (negative) affect on number of firms and this is true in five of the six models. Only in Sporting Goods, Hobby, Books and Music Stores classification is there a positive relationship. It is not clear why the data suggest this pattern.

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[9] Within the literature it is widely accepted that auto supply stores tend to target lower to middle income areas. Higher income households have sufficient income to afford repairs.

[10] This estimated percentage increase is often reviewed to as an "elasticity" (ξ) which is computed as $\xi = \frac{\bar{x}}{\bar{y}} \times \frac{\partial y}{\partial x} = \frac{\bar{x}}{\bar{y}} \times \hat{\beta}$ where $\bar{x}$ and $\bar{y}$ are sample means of the right hand side variable of interest and the dependent variable respectively and $\hat{\beta}$ is the estimated regression parameter. If the estimated elasticity is, for example, .8, this can be interpreted as a 10 percent increase in the value of the independent variable (x) will result in an 8 percent increase in the dependent variable. In addition to computing the elasticity at the sample means, the interested reader can compute the elasticity for individual observations by using the data for the observation (county) of interest.

[11] Recall that hypothesis testing centers on relying on theory to predict the relationship between two or more variables. Theory tells us that x should influence y in some manner. The statistical analysis is then used to test that hypothesis.

The results for high income are more interesting with a mixture of positive and negative coefficients. For example, a higher concentration of high income households is associated with fewer Automobile and Other Motor Vehicles dealerships as well as Sporting Goods, Hobby, Book and Music Stores. When you combine the income distribution results on number of Sporting Goods, Hobby, Book and Music Stores the pattern becomes clear; these types of businesses are attracted to low income counties and repelled from high income ones.[12] The negative result on number of Banks, Insurance and Other Financial Services is surprising. One would think (hypothesize) that firms of these types would be drawn to areas with a large share of high income households. It may be the case that it is not the relative share, but the absolute number of high income households. Further research is required to further our understanding of this result.

There are three classifications that are associated with higher firm counts and these are Administrative and Support Services, Business Services and Scientific and Other Services. Although these results make sense, it may be the case that causation between high income share and these types of firms is reversed; is it the cases that the presence of these types of firms result or drive higher income levels?[13]

The age profiles, introduced to capture a narrow element of the tastes and preferences of the region (county), also help us understand the pattern of firm levels across Wisconsin counties. Percent of the population under 17 is negatively associated with six different classifications of businesses. The strongest negative associations are with Restaurants and Taverns, Car and Other Motor Vehicle dealerships, and Repair and Maintenance Services. The percent of the population over 65 is statistically significant in 12 of the 25 models and the estimated coefficient is positive in every case. Based simply on the size of the estimated coefficients, an aging population appears to have the biggest impact on Personal and Household Services, Business Services, and Furniture and Home Furnishings Stores. The result on Hotels and Other Lodging establishments is particularly interesting. Given other research results (Deller and Jensen 2005), percent of the population over 65 and retirement destination areas are correlated in Wisconsin,

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[12] The potential of aggregation bias is potentially evident here. It is commonly believed that book stores tend to cluster in high income areas, opposite of the results found here. It may be the case that sporting good stores is overpowering book store affects. This is where finer classifications of store and service types make sense.

[13] All of our theoretical discussions have focused on firm location; hence our thinking about causation goes in one direction. If we were, however, thinking in terms of economic growth and development, such as what drives higher income levels, we may think in terms of certain types of industry clusters driving high income. Here the statistical causation direction would move in the opposite direction.

and retirement destination counties tend to be located in high tourism regions. What this suggests is that a higher percent of older persons may not “cause” a higher number of lodging accommodations, but rather there are other factors (e.g., high levels of natural amenities) that draw both lodging accommodations and retirees.

We also include education levels as another dimension that can help to describe variations in tastes and preferences of people within the region. Percent of the population over age 25 with at least a high school diploma is entered into only four models and is negative in each of the four. Percent of the population over age 25 with at least a Bachelor’s degree enters into nine of the 25 models with a mixture of both positive and negative coefficients. Much like the result with a higher share of income households described above, a higher share of persons with a college degree has a strong dampening (negative) affect on the number of Car and Other Motor Vehicle dealerships. But at the same time a higher share of college educated people is also associated with a larger number of Hotels, Motels and Other Accommodations. This latter result is somewhat surprising and there does not appear to be a readily evident explanation for why we might expect this result. Higher education levels are also associated with fewer Repair and Maintenance Service firms as well as fewer Computer System Services. While the former result on Repair and Maintenance Service firms makes intuitive sense, the result on Computer Services does not. Indeed, if Computer Services is part of the “new” high tech economy and education is presumed to be integral to that “new” economy, this result is counter-intuitive. Clearly, the relationship between the “new economy”, education, and computer services is more complex than what is captured in this simple firm count model.

The one set of economic indicators that performed surprisingly poor are the two income measures, per capita income and median household income. Theory suggests that aggregate demand, the key component of revenue maximizing firm location theory, drives the patterns we observe and aggregate demand is determined by market size and ability to pay, or income. Per capita income enters into only two models and median household income enters only one model. Based on our analysis it appears that income distribution is more important than income levels in explaining firm counts. Why this is the case is not readily clear and warrants further research.

Our final two measures are the unemployment rate and number of persons per household. The unemployment rate has been shown in other studies to be a powerful predictor of retail and service sales levels, but given the Wisconsin data it does not appear to be a predictor of firm count data. It may be the case that sales levels are more reflective of short-term economic conditions whereas firm counts are more reflective of long-term conditions. One could think in terms of asset fixity in a long- versus short-term perspective. Firm investments in facilities, operational equipment and inventories are often viewed as long-term; firms will not close then reopen through short-term fluctuations. Firms will ride-out short-term downturns in the economy. Thus, while unemployment rates help explains sales levels, it does not help us understand firm counts.[14]

Number of persons per household enters with a positive coefficient in five of the 25 models and negative in one model. Historically, number of persons per household served as a proxy for families with young children. Today's social dynamics makes this interpretation overly simplistic; hence greater care must be taken when thinking about this particular socioeconomic variable. The classifications of businesses that have a positive relationship with household size includes Furniture and Home Furnishings Stores, General Merchandise Stores, Administrative and Support Services, Personal, Household and Business Services. Interestingly, larger household sizes are associated with few numbers of Performing Arts, Spectator Sports and Related Industries.

As we mentioned in the introductory comments to this section of the study, there are two ways to review the statistical results; the first is to describe the role of individual variables, as we have just done, the second is to review the modeling results across business classifications. Given that we are looking at 25 separate business classifications, a detailed discussion of each classification would be a lengthy undertaking. Rather, we will select a handful of the more interesting classifications to further discussion.

One of the fastest growing classifications is the Food Services and Drinking Places (restaurants and taverns) sector. As the dynamics of family life has changed over the years, the demand for restaurants has grown rapidly and in Wisconsin taverns have acted as social gathering places for generations. Our model explains 96.3 percent of the variation in the number of restaurants and taverns and the overall equation is statistically significant above the 99 percent level of confidence (*F* statistic equals 261.43). Beyond the intercept term, five of the possible 13 explanatory enter into the model. As with almost all of the models, number of households in the county is an important predictor of the number of restaurants and taverns. If we compute an elasticity (see footnote number nine above) we find that a ten percent increase in the number of households will see a six percent increase in the number of Food Services and Drinking Places. Looking at the simple trend line outlined in Figure 1a, we see that there is a fairly "tight fit" (i.e.,

[14] The discussion here treats unemployment as a short-term phenomenon, as the economy fluctuates, the unemployment fluctuates. The idea of persistently high unemployment is not considered and may be a better measure when looking at firm count data. Persistent unemployment could be measured as a moving five year average.

high R^2) between the trend line and the observed data points. This result again gives support to the idea of simple market thresholds as a reasonable first indicator of market potential.

Percent of the population under age 17 has a negative association with the number of restaurants and taverns in the county. This is somewhat surprising because there is a general perception that as the number of single parent and dual wage earning families grows, the demand for prepared meals and services offered by restaurants increases. Thus we should expect a positive relationship between percent of the population under age 17 and the number of restaurants (perhaps not taverns), but we find the opposite. It may be the case that our measure is not capturing the changing dynamics of the family. On the other hand, it may be that the changing family dynamics is affecting the type of products sold in grocery stores and not in the number of restaurants in the region. It is more likely that households with a large number of children will influence the concept of the restaurant (i.e., fast-food, fast-casual, formal dining, etc.) rather than the number of restaurants. Given our simple model, we can not draw any stronger conclusions.

The remaining three variables that are introduced into the Food Services and Drinking Places sector include share of total income from wages and salary, the unemployment rate, and the Gini Coefficient of income equality. Higher values of each of these variables are associated with a larger number of restaurants and taverns. Income levels do not seem to influence the number of restaurants and taverns nor does education levels.

Next consider the number of Food and Beverage Stores within the region. Again, number of households is a strong predictor of this classification of businesses (Figure 1h). The estimated elasticity suggests that a ten percent increase in the number of households, the number of Food and Beverage Stores will increase by 5.6 percent. The percent of the population over age 65 is also positively associated with the number of grocery and beverage stores, although at a low level of statistical significance. The only other variable that was introduced is the percent of households with income below $20,000 and the estimated coefficient is negative. Given simple neoclassical economic theory this latter result is expected.

The model that performs the weakest is Hotels, Motels and Other Traveler Accommodations. As noted above the model explains only 37.4 percent of the variation in the number of establishments and the overall significance of the model is the weakest of all 25 models (*F* statistic equal 15.84). Unlike almost all the other models, the number of households has no influence on the number of Hotels, Motels and Other Traveler Accommodations. Indeed, the simple scatter plot (Figure 1n) shows that there is little if any relationship between market size and number of firms.[15] The role of the percent of the population of 65 and its positive influence on the number of Traveler Accommodations is perhaps an indirect relationship. As discussed above, it may be that migrating retirees are attracted to high tourism areas and in Wisconsin those areas are closely tied to high natural amenities. We also find that counties that have a highly educated population, as measured by the percent of those over age 25 with at least a Bachelor's degree, tend to have a larger number of Hotels, Motels and Other Traveler Accommodations. Why education levels should influence the number of accommodations is not clear and this result may be a statistical anomaly.[16]

The statistical results presented here have provided us with several insights into why some regions have a large number of certain types of retail and service firms while others have a small number. First and foremost, the absolute size of the market, as measured by the number of households, is the strongest predictor of the number of firms. The large *t* statistics coupled with the visual evidence presented in the scatter plots supports this conclusion. Second, the absolute level of income, whether measured by per capita income or median household income, is not nearly as important as income distribution. Interestingly, the more uneven the distribution of income, the more firms of a range of types is likely to be present. Also, the source of income seems to play a roll. Third, age and education profiles play a role in a few classifications of businesses examined.

<u>Market Strengths and Weaknesses</u>

One of the primary reasons for undertaking this applied research project has been to identify the strengths and weaknesses of each county contained in the sample across all 25 business classifications. As outlined in the methods section of this study we are specifically focusing on the error term from the regression models. One way to visualize this approach is to consider one of the scatter plots presented in Figures 1a through 1z. The trend line provides us with the predicted, or expected, number of firms for a given number of households. The actual number of establishments then lines on, above or below the trend line. If the observed number of firms is the same as the expected, or predicted, then the error term is equal to zero and the county is

[15] There are two ways to think about the simple scatter plot (Figure 1n). The first is the relative "flatness" of the trend line points to the statistical insignificance of the relationship. The second is the handful of "outliners" that are clearly heavy tourism dependent areas. This latter problem of "outliers" may introduce statistical problems into the regression analysis. Recall, this is the very reason we removed Milwaukee County from our sample.

[16] Recall that this is one of the fundamental criticisms of step-wise regression; the empirical results may have no theoretical justification and as such are no more than a statistical fluke. The idea of confusing statistical relations with theoretical causation goes back to an infamous study that linked the rain fall in Australia to the performance of the NY Stock Exchange. The point being that statistical relationships do not necessarily lead to meaningful causation.

performing on par with what we would expect. If the observed number of firms is below the trend line, then the difference between the observed and predicted will be negative. Subsequently, the sector is not performing as well as expected and the sector can be considered a weakness. On the other hand, if the observed value is above the trend line, the sector is considered a strength. The observed, predicted and error for all the counties contained in the sample are reported for each of the 25 business classifications in Table 3. All predicted values are based on the regression models reported in Table 2 and discussed at length in the above section of the study.

The policy objective of this approach is to identify retail and service sectors for "targeted" economic development and growth activities. We could offer a simple "decision rule" for which type of firms to target, such as sectors that are identified as "under performing" or the observed number of firms is less than the predicted level (i.e., a negative error term). But, as we will see, there are several cases where the level of under performance is relatively small. These "narrow" margins of error raise an interesting and important question; how large should the error be on the negative side (i.e., weakness) be before the industry is targeted for further growth and development efforts? We could develop a statistical test by building a confidence interval around the predicted level, and if the under performance is outside the confidence interval, then the industry should be targeted.[17] Developing and reporting such a confidence interval for every county in the sample is beyond the scope of this particular study and could be the subject of future work.

A more *ad hoc* approach might be to set an arbitrary interval of say plus or minus ten percent of the predicted value. For example, if the predicted value is 50 firms, then this *ad hoc* rule would be plus or minus ten percent or five $\left(50 \pm 5 \Rightarrow 55:45\right)$ so if the observed value is outside that range, then one could conclude that the industry could be targeted. If the observed value is within that range, then the predicted value is "sufficiently" close to the observed to conclude that the county is performing as expected. What makes this approach *ad hoc* is that the level of ten percent is arbitrary; why not five or twenty percent? For ease of discussion below we will not expand on this idea and leave the interpretation of the whether or not the observed error is sufficiently large up to the reader.

Much like the discussion of the statistical modeling results above, there is a vast amount of information provided in Table 3 and a thorough discussion of all the results would yield pages of

[17] To compute a confidence interval we would ask what the statistical distribution is around our estimated or predicted number of firms for some level of confidence, such as the 95 percent level. The specific formula is $\hat{y} \pm (z \times \sigma)$ where $\hat{y}$ is the predicted value, z is the level of confidence (for a 95 percent level, z is equal to 1.96), and σ is the standard error of the regression equation.

narrative. Therefore, we will select a handful of counties to illustrate some of the means in which these results can be interpreted. Jefferson and Crawford represent two counties that are comparable to a wide range of Wisconsin counties. Jefferson County has a population of about 78,000 persons composed of several smaller cities and is located between the fast growing western suburbs of Milwaukee to the east of the county and Dane County to the west. Jefferson County has experienced strong growth in population, employment and income as well as growth in the retail and service sectors. Crawford County, on the other hand is a more rural county with a population of about 17,000 persons, located in the Driftless Region of Wisconsin it is a traditionally agricultural area that is experiencing a slow transition to a more tourist based economy.

Consider first the number of Food Services and Drinking Places (restaurants and taverns). The statistical model presented in Table 2 suggests that Crawford County should have 97 restaurants and taverns and Jefferson should have 238. When compared to the observed Crawford County has 76 restaurants and taverns which is 21 firms below what we would expect to see. Given the logic of our approach, Food Services and Drinking Places is a weakness for Crawford County and there may be opportunities for growth in this sector. Jefferson County has 258 Food Services and Drinking Places which is 20 firms higher than predicted by our statistical model. Again given the logic of our approach, restaurants and taverns is a strength sector for Jefferson County.

If we look at Amusement, Gambling and Recreational Industries we see that the statistical model predicts that Jefferson County should have 38 firms and indeed it has 38 firms. The error term in this case is zero and the County is performing exactly on par with what we would expect. For Crawford County, the model predicts that there should be 17 firms that fall into the classification of Amusement, Gambling and Recreational Industries, but we observe 10 actual firms. The resulting error term is -7, or the County has seven fewer firms then expected and could be considered a weakness of the County.

The Automotive and Other Motor Vehicles sector is also a strength for Jefferson County and a weakness for Crawford County given our statistical model. For Jefferson County the model predicts that there should be 546 car and other motor vehicle dealerships but we observe 640, or 94 businesses more than we expect. This is clearly a strong sector for Jefferson County. The model predicts that Crawford County should have 235 such firms, but we observe 206, or 26 few firms than expected. Again given the logic of our modeling, this represents a weakness and a potential area of expansion for Crawford County.

If we look at the number of Gasoline Stations (including convenience stores with gas), Jefferson County is predicted to have 50 firms, but in reality has 45 Gasoline Stations or five fewer than expected. Crawford County is predicted to have 27 Gasoline Stations and has an observed 21 or six fewer than expected. If we look at Food and Beverage Stores the predicted and observed value for Crawford County is 27 and 29, respectively and 70 and 71 for Jefferson, respectively. In both of these classifications of businesses the error is relatively small. The purchaser buys convenience goods and services (such as groceries, gasoline) with a minimal amount of effort and usually at the most convenient and accessible store. Convenience goods or services typically have a small unit value; purchases are frequent; they are made soon after the idea of the purchase enters the buyer's mind.[18] Research suggests that these types of good and service markets are "efficient" in the sense that predicted and observed values tend to be close or errors are small.

If we look at Clothing and Accessories Stores we see that Crawford County does better than we would expect given the statistical modeling results; the model predicts that there should be 49 stores but there are actually 54 stores in the County. For Jefferson County the strength of the Clothing and Accessories Stores is even more pronounced where the model predicts 95 stores within this classification but we observe 122 stores, or 27 more than expected. The strength in Jefferson County could be attributed to the Johnson Creek outlet mall development.

The one type of store classification that is widely used as an example of comparison goods, or goods and services purchased only after comparing price, quality, and type among stores and places, is Furniture and Home Furnishings Stores. The theory suggests that these types of firms require large markets to support their cost structures and the comparison shopping nature of the good will tend to drive these firms to agglomerate or cluster in geographically central locations, such as a Madison, Eau Claire or Green Bay. Thus, the findings for Crawford County support this idea where the observed number of stores of this type is smaller than the predicted level by 20 firms. Jefferson County, on the other hand, has some 81 more stores of this type than we would expect given the statistical model. Clearly this is a strength for Jefferson County and it raises the question of if it is a strength that can be built upon. Interestingly, according to the theory, Dane County should have a strong "surplus" of Furniture and Home Furnishings Stores, but we find that the predicted is above the observed, the opposite conclusion than we would expect given the

[18] Intermediate goods posses characteristics of both shopping and convenience goods; the purchaser will spend some time shopping, although the time is minimal and typically the purchase is made close to home. Examples of intermediate goods are drugs, hardware items, banking and dry cleaning services. The purchaser buys comparison goods (furniture, cars, TVs) and services only after comparing price, quality, and type among stores and places.

theory. Despite the perception that Dane County and Madison in particular is a strong retail and service hub, this result suggests that there could be a weakness that could be addressed.

When we examine the services sectors, for brevity we will simply review the strengths and weaknesses for both of our representative counties. In Crawford County we see weaknesses in Banking, Insurance and Other Finance Activities ($\hat{\varepsilon}$ = -8), Administrative and Support Services ($\hat{\varepsilon}$ = -10), Health Care and Social Assistance Services ($\hat{\varepsilon}$ = -4), Business Services ($\hat{\varepsilon}$ = -11), Repair and Maintenance Services ($\hat{\varepsilon}$ = -29), Computer System Services ($\hat{\varepsilon}$ = -16), and finally Rental and Leasing Services ($\hat{\varepsilon}$ = -15). There is a strength, or surplus, in Personal and Household Services ($\hat{\varepsilon}$ = 22) and a weak strength in Professional Services ($\hat{\varepsilon}$ = 1). Jefferson County, on the other hand, tends to experience strengths in many of the service sectors. Jefferson County reveals strengths in Banking, Insurance and Other Finance Activities ($\hat{\varepsilon}$ = 4), Administrative and Support Services ($\hat{\varepsilon}$ = 22), both Personal and Household ($\hat{\varepsilon}$ = 79) and Business ($\hat{\varepsilon}$ = 78) Services, Repair and Maintenance Services ($\hat{\varepsilon}$ = 58), Computer System Services ($\hat{\varepsilon}$ = 24), Scientific and Other Services ($\hat{\varepsilon}$ = 8), and Rental and Leasing Services ($\hat{\varepsilon}$ = 27). Jefferson County has only a small handful of weaknesses in the service sectors including Health Care and Social Assistance Services ($\hat{\varepsilon}$ = -4) and Architectural, Engineering and Related Services ($\hat{\varepsilon}$ = -4),

When interpreting these results it is vital to think about whether policies should be aimed at addressing weaknesses or building upon strengths. In the long-term successful policies will address both but short-term policies may best be focused on a limited, or targeted, set of industries. In the end the community development practitioner must combine information from a range of sources. If that information “triangulates” in a particular direction, then the research foundation has been established. In the end, there is a certain element of art in interpreting the results and crafting policies for the right businesses for the community.

Conclusions

The applied research presented in this study provides the community economic development practitioner with two sets of information; (1) a family of statistical models that provide insights into the drivers of firm levels for retail and service sectors and (2) a set of measures indicating the strengths and weaknesses of individual retail and service sectors for all of the Wisconsin counties contained in the sample. Using traditional firm location theory we combine several lines of research, specifically market threshold analysis and industry targeting methods.

The statistical analysis provides three generalizations: (1) market size, as measured by number of households is the single strongest predictor of firm counts; (2) income distribution is more important to firm counts than income levels; (3) there is significant variation in the socioeconomic drivers of firm activity levels across firm classifications. The first result lends strong support to the simply population threshold approach to market analysis. The second result is somewhat unexpected and warrants further analysis given the widening of the income distribution over the past twenty years. The final result tells us that some counties could specialize in certain types of retail and service firms (e.g., tourism) have will have a difficult time supporting others.

This particular applied research study should be viewed as one of a series of studies looking at the drivers of retail and service patterns across Wisconsin as well as providing indicators of the strengths and weaknesses of those sectors. This work lays out several possible future research directions. First, the county is an arbitrary unit of analysis and is used in this study simply because the data is widely available at the county level. Future work must consider sub-county units of analysis such as the municipality. Second, theory tells us that markets are not independent in a spatial sense: what is located in one county will influence the neighboring counties. Future work must take this “spatial dependency” into consideration. Third, the idea of multipurpose shopping trips suggests that certain retail and service firms will tend to cluster together. Also known as economies of scope in the retail and service sectors, firms of different types (as defined by the NAICS system the data are reported) will group together. In other words, the presence of one group of businesses will increase the likelihood of other types of businesses also be located in close proximity. Future work must acknowledge these clustering or agglomeration affects to increase the efficiency of our models.

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Table 1: Descriptive Statistics for Wisconsin Counties

	Average	Standard Deviation	Minimum	Maximum
Dependent Variables				
Food Services & Drinking Places (Restaurants & Bars)	175	146.8	42	1,053
Performing Arts, Spectator Sports & Related Industries	11	17.8	0	131
Amusement, Gambling, Recreation Industries	26	18.3	6	116
Automobiles & Other Motor Vehicles	364	177.9	123	1,112
Gasoline Stations (including convenience stores with gas)	37	17.8	11	116
Clothing & Accessories Stores	80	56.8	36	410
Electronic & Appliance Stores	47	26.6	18	174
Food & Beverage Stores	50	39.1	16	279
Furniture & Home Furnishings Stores	211	115.3	82	721
Health & Personal Care Stores	18	9.3	5	63
Sporting Goods, Hobby, Book, & Music Stores	78	55.0	24	396
General Merchandise Stores	46	21.5	17	144
Other Store Retailers	1,094	698.7	393	4,821
Hotels, Motels & Other Traveler Accommodations	59	73.8	7	397
Banking, Insurance and Other Finance Activities	36	18.3	11	122
Administrative & Support Services	58	40.0	18	279
Health Care and Social Assistance Services	33	25.0	9	174
Personal & Household Services	401	284.3	121	1,958
Business Services	262	210.9	74	1,382
Repair & Maintenance Services	196	119.5	52	736
Professional Services	5	3.1	1	20
Architectural, Engineering, & Related Services	4	3.8	0	24
Computer System Services	128	100.7	30	654
Scientific & Other Services	25	23.6	3	153
Rental & Leasing Services	151	88.9	52	579
Independent Variables				
Number of Households (000)	20.1	26.3	2.87	188.48
Number of Persons per Household	2.5	0.1	2.19	2.77
Percent of the Population Under Age 17	22.6	1.8	16.89	26.00
Percent of the Population Over Age 65	15.7	3.2	9.27	23.22
Median Household income	67,893	13,103.0	52,742.00	131,098.00
Per Capita Income	23,999	4,193.8	18,510.29	44,176.67
Share of Total Income from Wages and Salary	43.0	11.8	23.79	70.00
Gini Coefficient of Income Equality	0.4	0.04	0.34	0.55
Percent of Households with Low Income (<$20,000)	20.9	4.4	8.77	28.30
Percent of Households with High Income (>$100,000)	6.9	3.6	3.38	24.89
Unemployment Rate	6.2	1.5	2.85	9.64
Percent of Those Over 25 with at Least a HS Degree	66.9	3.5	51.52	72.20
Percent of Those over 25 with at Least a Bachelor's Degree	16.9	6.2	9.97	40.64

Table 2: Results of Stepwise Regression Analysis

	Food Services & Drinking Places (Restaurants & Bars)	Performing Arts, Spectator Sports & Related Industries	Amusement, Gambling, Recreation Industries
Number of Households	5.2514	0.6815	0.5373
	(25.96)	(25.54)	(11.46)
Number of Persons per Household	---	-11.7771	---
		(2.18)	
Percent of the Population Under Age 17	-5.5083	---	---
	(2.25)		
Percent of the Population Over Age 65	---	---	0.8454
			(1.83)
Percent of Those Over 25 with at Least a HS Degree	---	---	---
Percent of Those over 25 with at Least a Bachelor's Degree	---	---	---
Per Capita Income	---	---	---
Median Household income	---	---	---
Share of Total Income from Wages and Salary	1.0616	-0.1133	0.2591
	(2.63)	(1.92)	(2.73)
Unemployment Rate	5.6432	---	---
	(1.67)		
Gini Coefficient of Income Equality	254.0466	---	
	(1.98)		
Percent of Households with Low Income (<$20,000)	---	---	-1.1735
			(3.69)
Percent of Households with High Income (>$100,000)	---	---	---
Intercept	11.5522	32.0460	15.2310
	(0.16)	(2.37)	(1.90)
R square	0.9632	0.9345	0.8563
F statistics	261.43	247.38	75.95

t-statistic is in parentheses.

Figure 1a: Number of Establishments and Market Size Relationship

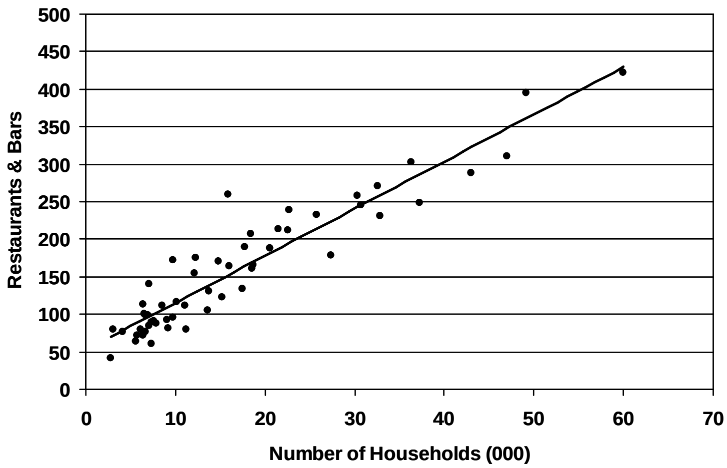

Figure 1b: Number of Establishments and Market Size Relationship

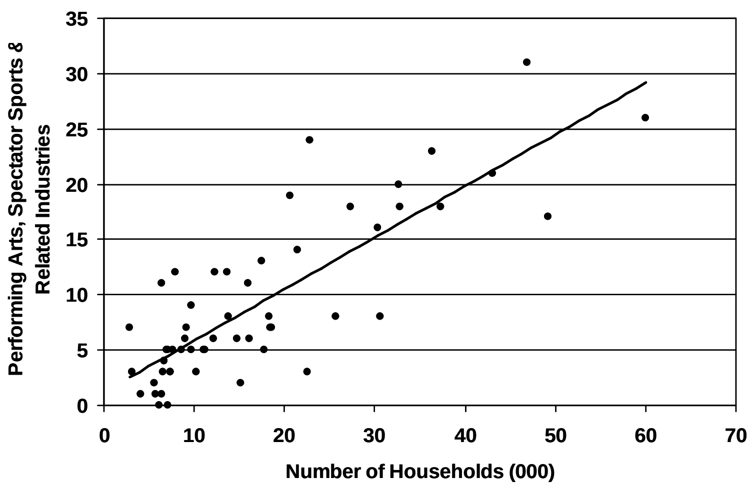

Figure 1c: Number of Establishments and Market Size Relationship

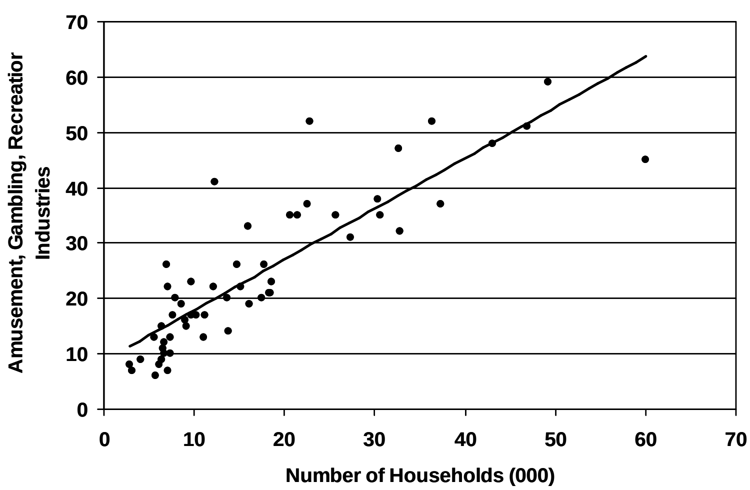

Table 2: Results of Stepwise Regression Analysis (cont)

	Automobiles & Other Motor Vehicles	Gasoline Stations (including convenience stores with gas)	Clothing & Accessories Stores
Number of Households	4.3819	0.5950	1.6349
	(7.38)	(10.65)	(16.35)
Number of Persons per Household	---	---	---
Percent of the Population Under Age 17	-18.7269	---	---
	(2.45)		
Percent of the Population Over Age 65	10.1077	---	1.9887
	(1.57)		(2.94)
Percent of Those Over 25 with at Least a HS Degree	-19.3760	---	-1.7327
	(3.13)		(1.69)
Percent of Those over 25 with at Least a Bachelor's Degree	-14.6663	-0.8007	1.1789
	(3.38)	(2.87)	(1.69)
Per Capita Income	---	---	0.0018
			(2.82)
Median Household income	---	---	---
Share of Total Income from Wages and Salary	2.9078	---	0.2585
	(3.07)		(1.63)
Unemployment Rate	---	---	---
Gini Coefficient of Income Equality	4502.0246	147.0460	---
	(5.38)	(4.22)	
Percent of Households with Low Income (<$20,000)	---	---	---
Percent of Households with High Income (>$100,000)	-23.6735	---	---
	(2.18)		
Intercept	313.1994	-21.0029	57.9957
	(0.54)	(1.76)	(0.73)
R square	0.8689	0.8144	0.9582
F statistics	38.95	76.04	187.32

t-statistic is in parentheses.

Figure 1d: Number of Establishments and Market Size Relationship

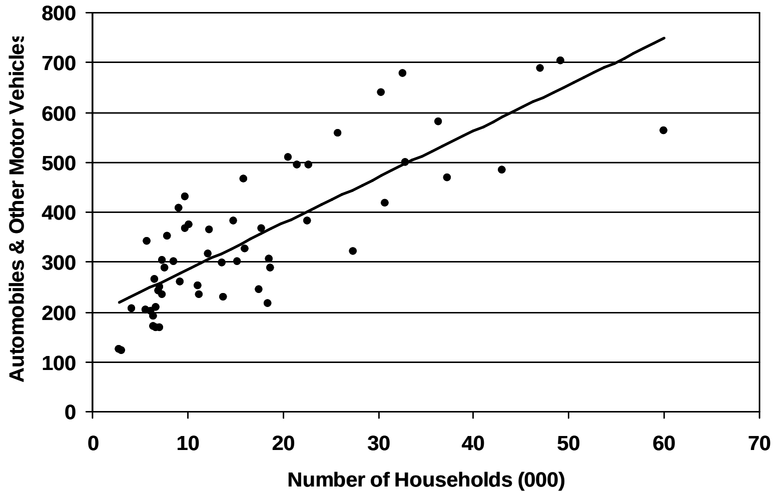

Figure 1e: Number of Establishments and Market Size Relationship

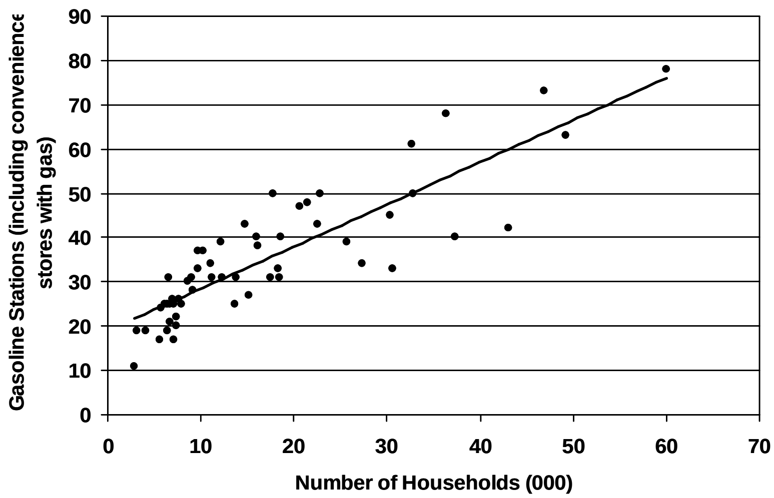

Figure 1f: Number of Establishments and Market Size Relationship

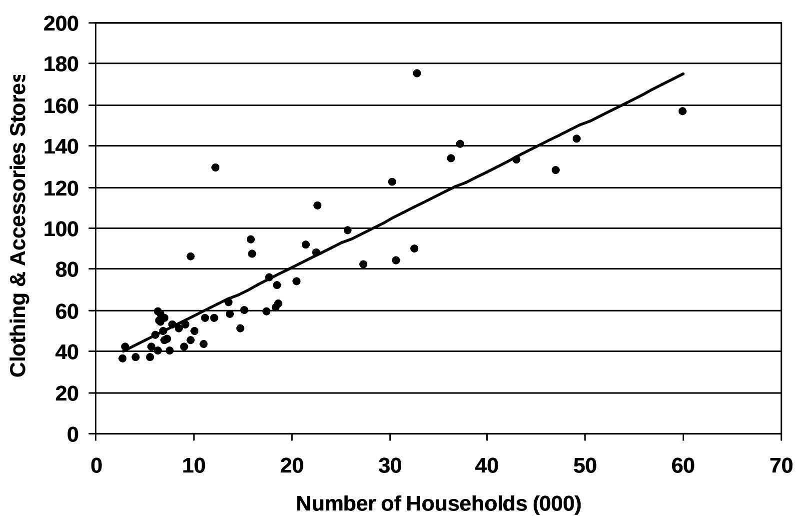

Table 2: Results of Stepwise Regression Analysis (cont)

	Electronic & Appliance Stores	Food & Beverage Stores	Furniture & Home Furnishings Stores
Number of Households	0.7646	1.4028	3.1521
	(14.51)	(27.86)	(11.16)
Number of Persons per Household	---	---	183.4538
			(2.38)
Percent of the Population Under Age 17	---	---	---
Percent of the Population Over Age 65	0.8388	0.7392	12.6882
	(1.62)	(1.48)	(3.60)
Percent of Those Over 25 with at Least a HS Degree	---	---	---
Percent of Those over 25 with at Least a Bachelor's Degree	---	---	---
Per Capita Income	---	---	---
Median Household income	---	---	---
Share of Total Income from Wages and Salary	0.2282	---	1.2287
	(2.14)		(2.40)
Unemployment Rate	---	---	---
Gini Coefficient of Income Equality	---	---	1388.1650
			(7.48)
Percent of Households with Low Income (<$20,000)	-2.1706	-1.1882	---
	(6.07)	(3.39)	
Percent of Households with High Income (>$100,000)	---	---	---
Intercept	53.5549	34.8464	-1122.8197
	(5.94)	(4.60)	(4.45)
R square	0.9142	0.9588	0.9029
F statistics	135.82	403.32	92.95

t-statistic is in parentheses.

Figure 1g: Number of Establishments and Market Size Relationship

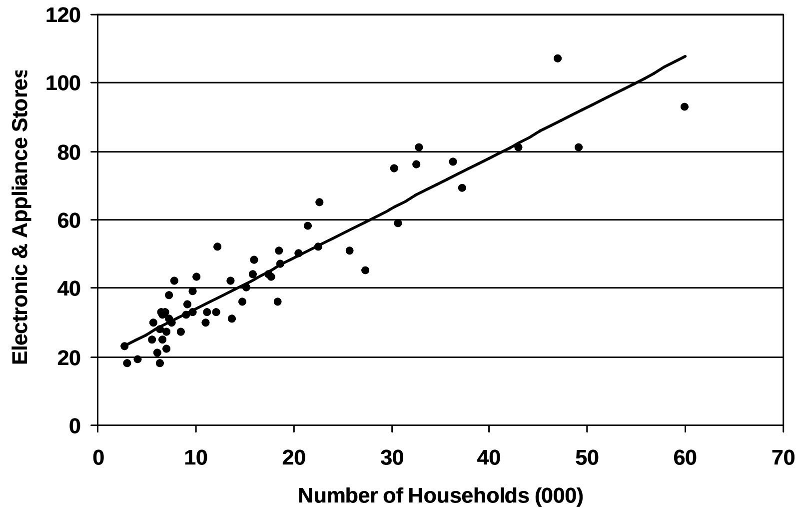

Figure 1h: Number of Establishments and Market Size Relationship

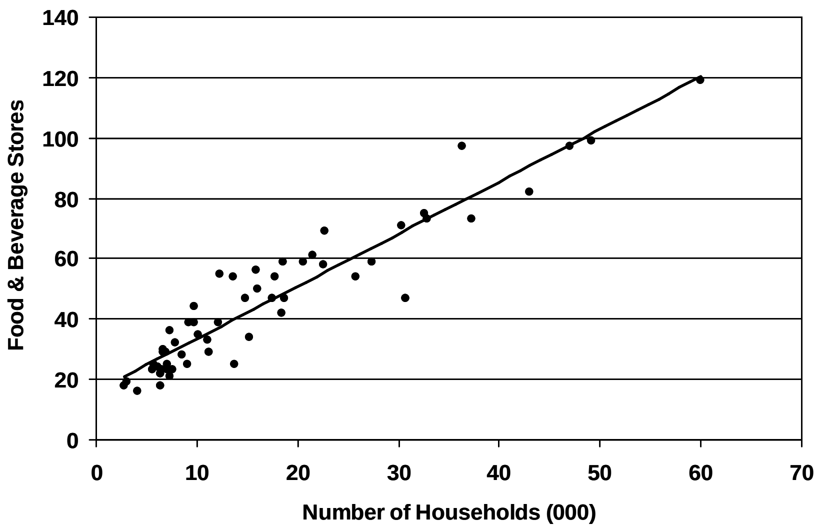

Figure 1i: Number of Establishments and Market Size Relationship

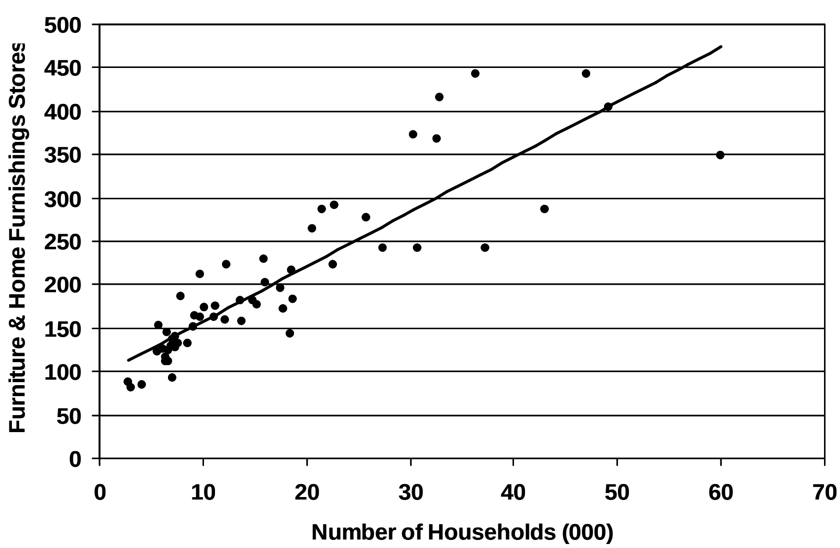

Table 2: Results of Stepwise Regression Analysis (cont)

	Health & Personal Care Stores	Sporting Goods, Hobby, Book, & Music Stores	General Merchandise Stores
Number of Households	0.2724	1.7008	0.6203
	(13.31)	(17.19)	(10.16)
Number of Persons per Household	---	---	27.7635
			(1.62)
Percent of the Population Under Age 17	---	---	---
Percent of the Population Over Age 65	---	4.0606	2.1031
		(4.15)	(2.75)
Percent of Those Over 25 with at Least a HS Degree	---	---	---
Percent of Those over 25 with at Least a Bachelor's Degree	---	1.9834	---
		(3.10)	
Per Capita Income	---	---	---
Median Household income	---	---	---
Share of Total Income from Wages and Salary	---	0.6559	0.3530
		(3.63)	(3.21)
Unemployment Rate	---	---	---
Gini Coefficient of Income Equality	59.1616	1058.3579	---
	(4.62)	(3.12)	
Percent of Households with Low Income (<$20,000)	---	3.8676	-1.8376
		(1.83)	(4.92)
Percent of Households with High Income (>$100,000)	---	-6.0055	---
		(2.89)	
Intercept	-11.5678	-546.0941	-45.5345
	(2.33)	(3.07)	(0.83)
R square	0.8704	0.952	0.8646
F statistics	177.93	135.95	63.87

t-statistic is in parentheses.

Figure 1j: Number of Establishments and Market Size Relationship

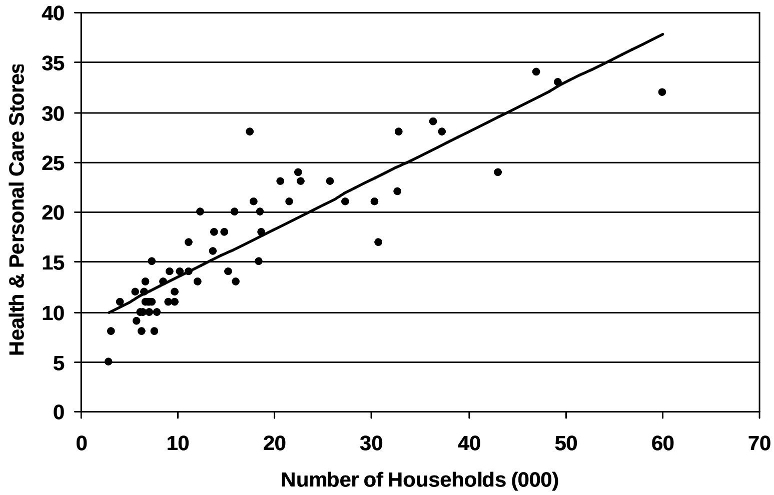

Figure 1k: Number of Establishments and Market Size Relationship

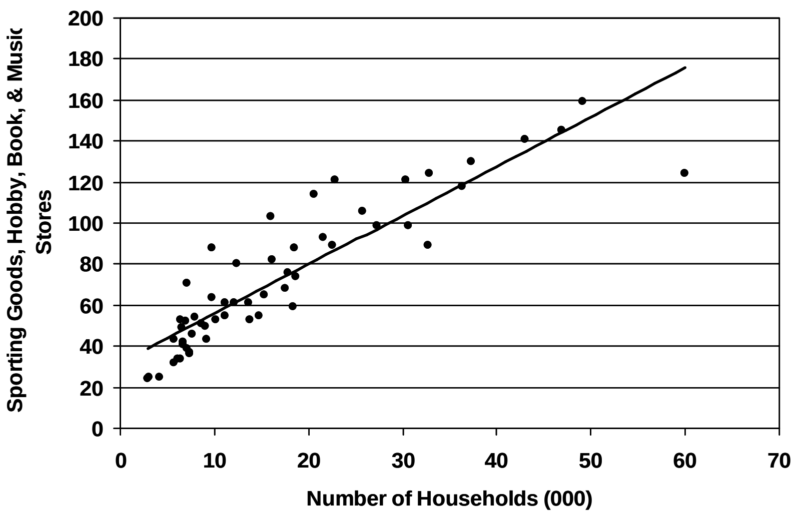

Figure 1l: Number of Establishments and Market Size Relationship

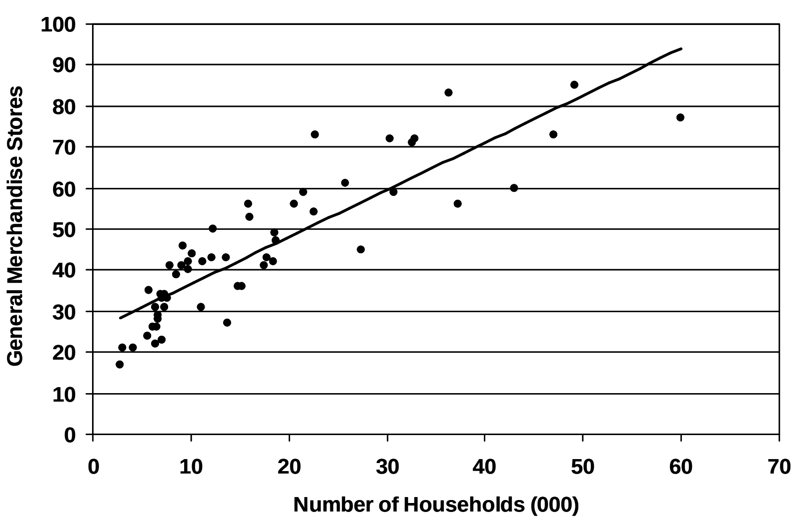

Table 2: Results of Stepwise Regression Analysis (cont)

	Other Store Retailers	Hotels, Motels & Other Traveler Accommodations	Banking, Insurance and Other Finance Activities
Number of Households	21.0573	---	0.4434
	(16.54)		(9.38)
Number of Persons per Household	---	---	---
Percent of the Population Under Age 17	---	---	---
Percent of the Population Over Age 65	32.3554	16.3676	---
	(2.60)	(5.34)	
Percent of Those Over 25 with at Least a HS Degree	---	---	---
Percent of Those over 25 with at Least a Bachelor's Degree	---	7.2589	0.5370
		(4.55)	(1.88)
Per Capita Income	---	---	---
Median Household income	---	---	---
Share of Total Income from Wages and Salary	7.1655	---	0.3403
	(2.78)		(4.28)
Unemployment Rate	---	---	---
Gini Coefficient of Income Equality	5615.4996	---	200.1439
	(6.05)		(3.82)
Percent of Households with Low Income (<$20,000)	---	---	---
Percent of Households with High Income (>$100,000)	---	---	-1.8480
			(2.43)
Intercept	-2404.5381	-321.2086	-64.5602
	(4.27)	(4.72)	(3.55)
R square	0.9307	0.3741	0.8963
F statistics	171.10	15.84	86.47

t-statistic is in parentheses.

Figure 1m: Number of Establishments and Market Size Relationship

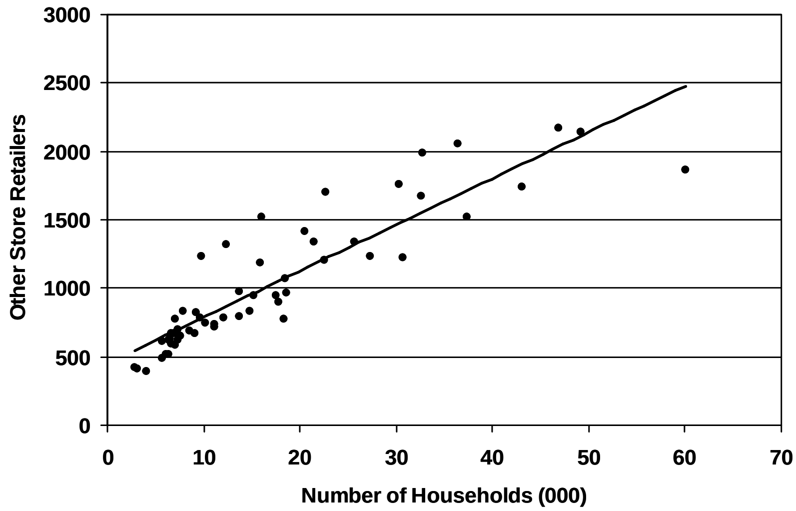

Figure 1n: Number of Establishments and Market Size Relationship

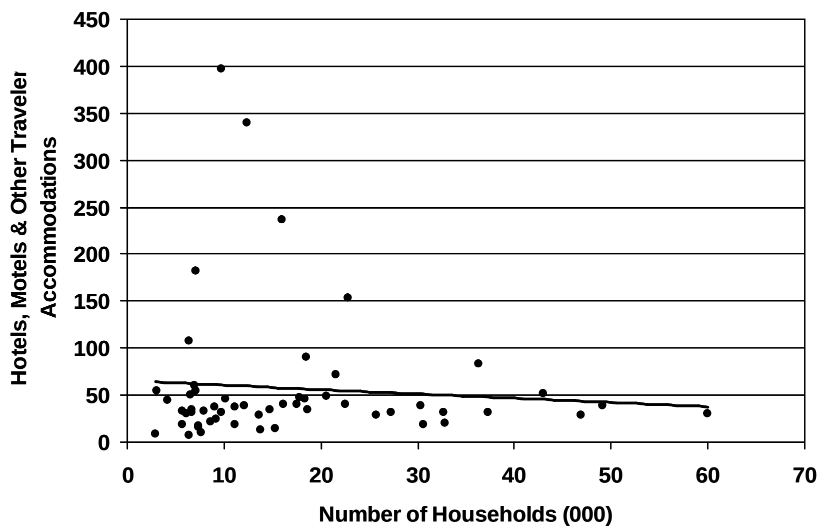

Figure 1o: Number of Establishments and Market Size Relationship

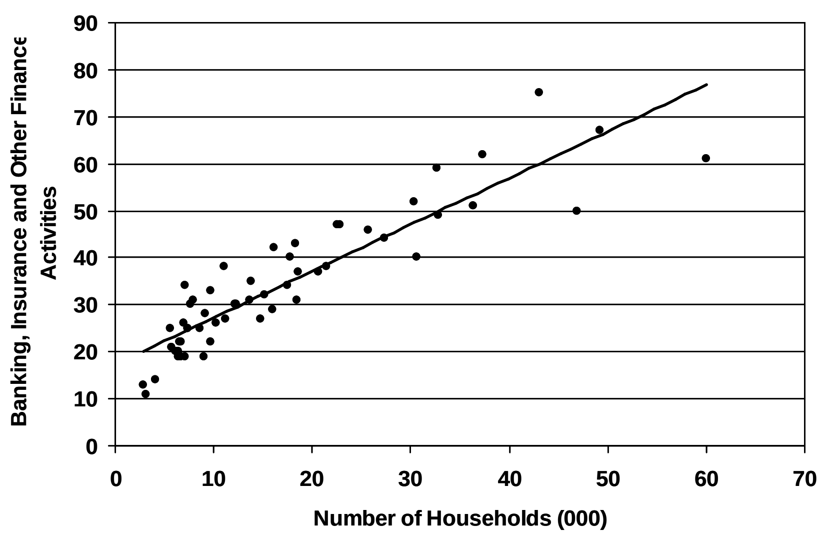

Table 2: Results of Stepwise Regression Analysis (cont)

	Administrative & Support Services	Health Care and Social Assistance Services	Personal & Household Services
Number of Households	---	0.7480	9.0731
		(19.90)	(21.63)
Number of Persons per Household	1.1888	---	198.2918
	(19.35)		(1.73)
Percent of the Population Under Age 17	---	-0.8725	---
		(1.88)	
Percent of the Population Over Age 65	---	---	14.4242
			(2.75)
Percent of Those Over 25 with at Least a HS Degree	---	---	---
Percent of Those over 25 with at Least a Bachelor's Degree	---	---	---
Per Capita Income	---	---	---
Median Household income	---	---	---
Share of Total Income from Wages and Salary	0.2775	0.3875	2.1378
	(2.38)	(5.33)	(2.81)
Unemployment Rate	---	---	---
Gini Coefficient of Income Equality	---	117.4871	2039.8153
		(5.06)	(7.41)
Percent of Households with Low Income (<$20,000)	---	---	---
Percent of Households with High Income (>$100,000)	2.8418	---	---
	(6.94)		
Intercept	2.4459	-26.4098	-1417.9445
	(0.44)	(2.45)	(3.78)
R square	0.9500	0.9539	0.9647
F statistics	329.31	263.70	273.53

t-statistic is in parentheses.

Figure 1p: Number of Establishments and Market Size Relationship

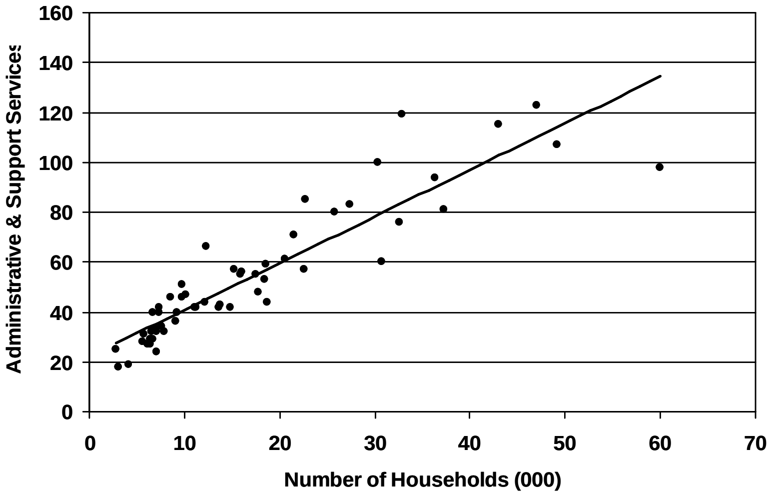

Figure 1q: Number of Establishments and Market Size Relationship

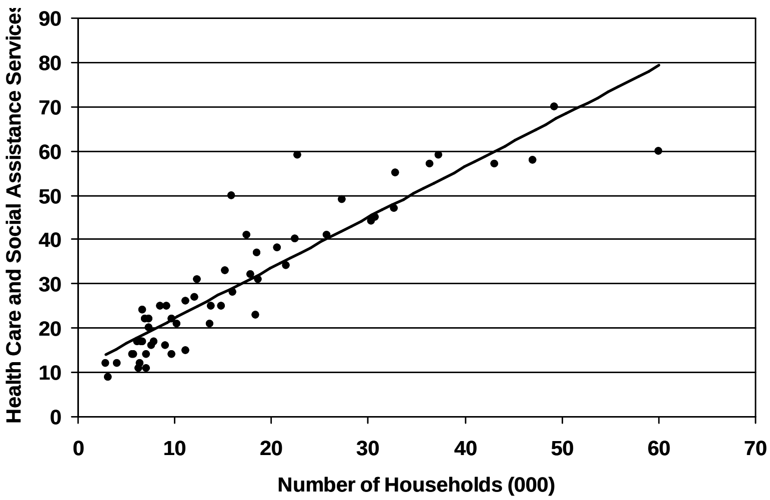

Figure 1r: Number of Establishments and Market Size Relationship

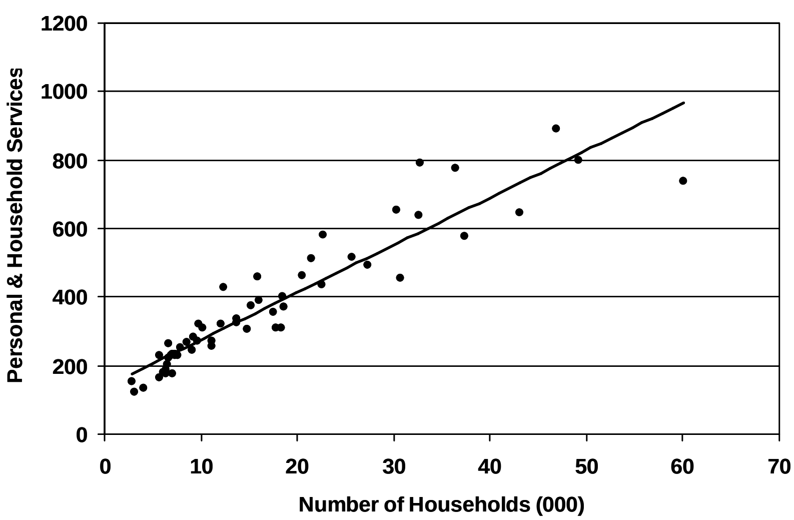

Table 2: Results of Stepwise Regression Analysis (cont)

	Business Services	Repair & Maintenance Services	Professional Services
Number of Households	6.4631	3.5280	0.0862
	(17.66)	(12.25)	(10.75)
Number of Persons per Household	181.6608	---	---
	(1.75)		
Percent of the Population Under Age 17	---	-5.0145	---
		(1.49)	
Percent of the Population Over Age 65	11.6252	---	---
	(2.63)		
Percent of Those Over 25 with at Least a HS Degree	---	---	---
Percent of Those over 25 with at Least a Bachelor's Degree	---	-5.5560	---
		(3.86)	
Per Capita Income	---	---	---
Median Household income	---	---	---
Share of Total Income from Wages and Salary	---	1.5414	---
		(3.05)	
Unemployment Rate	---	---	---
Gini Coefficient of Income Equality	---	1432.3765	18.7946
		(7.17)	(3.74)
Percent of Households with Low Income (<$20,000)	-6.4517	---	---
	(1.97)		
Percent of Households with High Income (>$100,000)	15.1606	---	---
	(4.28)		
Intercept	-476.1601	-309.5491	-4.2546
	(1.38)	(4.18)	(2.18)
R square	0.9486	0.9067	0.8143
F statistics	184.64	97.21	116.18

t-statistic is in parentheses.

Figure 1s: Number of Establishments and Market Size Relationship

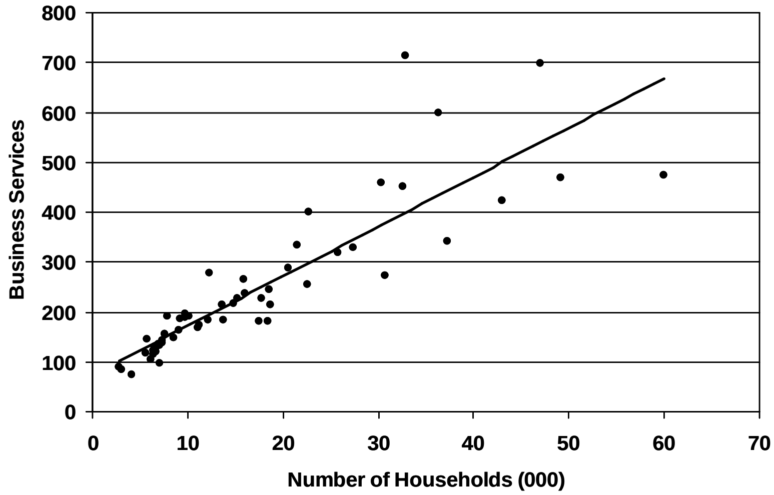

Figure 1t: Number of Establishments and Market Size Relationship

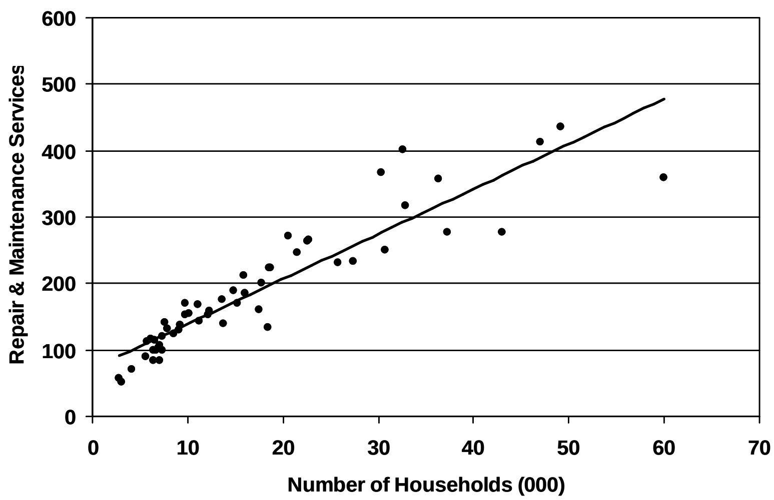

Figure 1u: Number of Establishments and Market Size Relationship

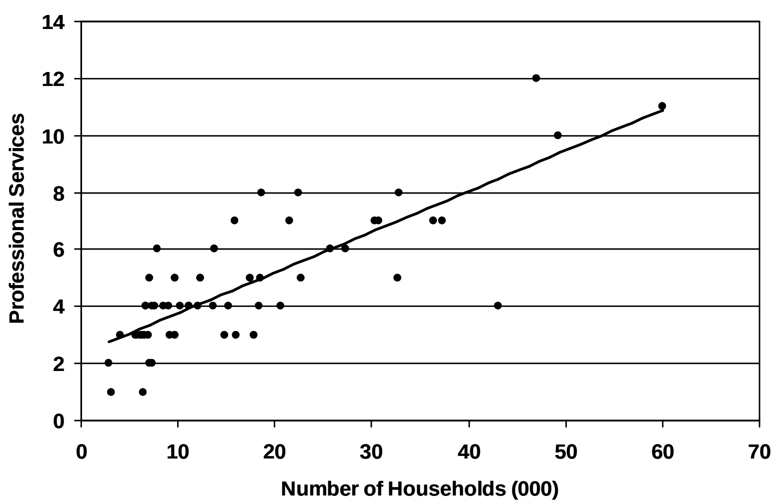

Table 2: Results of Stepwise Regression Analysis (cont)

	Architectural, Engineering, & Related Services	Computer System Services	Scientific & Other Services	Rental & Leasing Services
Number of Households	0.0812	2.7568	0.7089	2.3555
	(7.50)	(19.15)	(20.05)	(15.19)
Number of Persons per Household	---	---	---	---
Percent of the Population Under Age 17	---	---	-0.6014	-2.8703
			(1.48)	(1.49)
Percent of the Population Over Age 65	---	---	---	---
Percent of Those Over 25 with at Least a HS Degree	-0.2546	-3.8728	---	---
	(2.80)	(2.63)		
Percent of Those over 25 with at Least a Bachelor's Degree	---	-1.6521	-0.4083	---
		(1.85)	(1.86)	
Per Capita Income	0.0002	---	---	---
	(3.74)			
Median Household income	---	---	---	-0.0009
				(1.72)
Share of Total Income from Wages and Salary	---	0.8215	0.2017	1.0767
		(3.61)	(3.27)	(3.41)
Unemployment Rate	---	---	---	---
Gini Coefficient of Income Equality	---	757.8064	89.1117	1004.5937
		(9.41)	(2.14)	(5.40)
Percent of Households with Low Income (<$20,000)	---	---	---	---
Percent of Households with High Income (>$100,000)	---	---	1.4576	---
			(2.56)	
Intercept	13.5063	19.4498	-23.2872	-217.0921
	(1.93)	(0.18)	(1.65)	(4.30)
R square	0.8584	0.9715	0.9660	0.9397
F statistics	105.03	341.20	232.02	155.75

t-statistic is in parentheses.

Figure 1v: Number of Establishments and Market Size Relationship

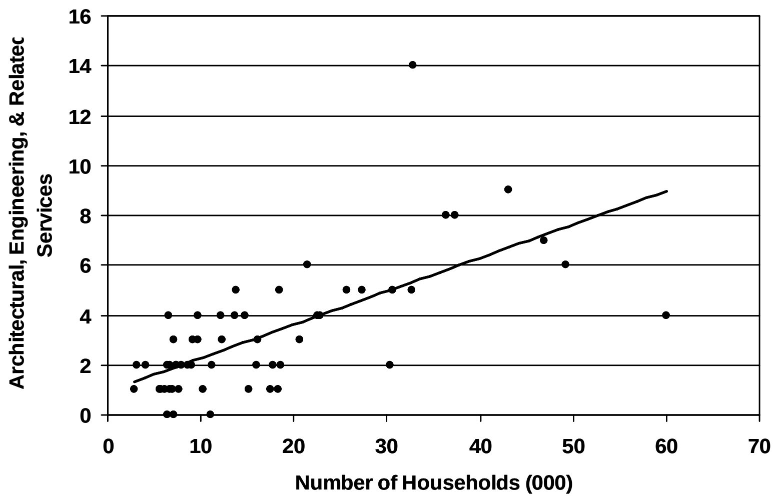

Figure 1x: Number of Establishments and Market Size Relationship

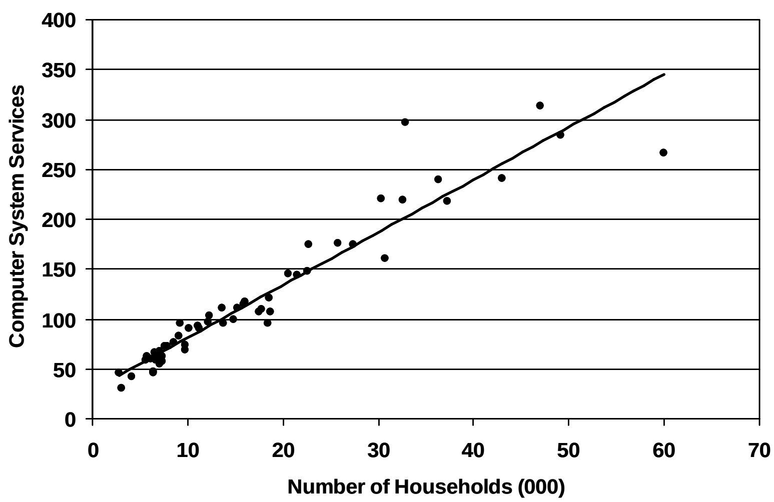

Figure 1y: Number of Establishments and Market Size Relationship

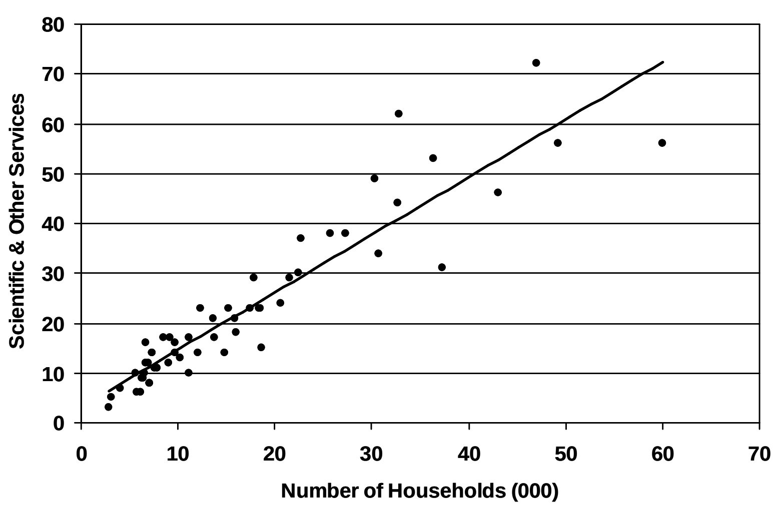

Figure 1z: Number of Establishments and Market Size Relationship

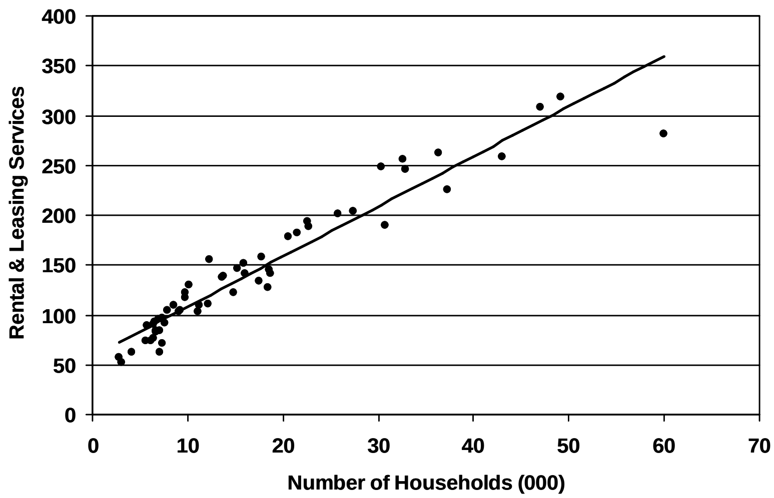

Table 3: Estimates of Strengths and Weaknesses

	Food Services & Drinking Places (Restaurants & Bars)			Performing Arts, Spectator Sports & Related Industries		
	Observed	Predicted	Error	Observed	Predicted	Error
Adams	93	110	-17	6	8	-2
Ashland	99	115	-16	4	1	3
Barron	161	174	-13	7	10	-3
Bayfield	113	83	30	11	5	6
Buffalo	64	87	-23	2	2	0
Burnett	84	94	-10	0	6	-6
Chippewa	211	182	29	3	13	-10
Columbia	214	181	33	14	13	1
Crawford	76	97	-21	4	1	3
Dane	1053	1087	-34	131	124	7
Dodge	270	256	14	20	17	3
Door	175	157	18	12	9	3
Douglas	207	165	42	8	11	-3
Dunn	122	151	-29	2	5	-3
Eau Claire	249	283	-34	18	20	-2
Forest	76	68	8	1	2	-1
Grant	165	158	7	7	9	-2
Green	105	134	-29	12	7	5
Green Lake	87	112	-25	12	5	7
Iowa	82	116	-34	7	1	6
Iron	80	105	-25	3	4	-1
Jackson	89	105	-16	3	0	3
Jefferson	258	238	20	16	17	-1
Juneau	116	131	-15	3	5	-2
Kenosha	422	374	48	26	37	-11
La Crosse	289	315	-26	21	24	-3
Lafayette	72	75	-3	1	3	-2
Langlade	111	120	-9	5	5	0
Lincoln	154	138	16	6	6	0
Marathon	395	335	60	17	28	-11
Marinettee	189	183	6	5	10	-5
Marquette	71	103	-32	1	2	-1
Monroe	164	135	29	6	7	-1
Oconto	170	146	24	6	10	-4
Oneida	259	176	83	11	10	1
Ozaukee	231	252	-21	18	20	-2
Pepin	42	65	-23	7	0	7
Pierce	131	136	-5	8	6	2
Polk	133	161	-28	13	10	3
Portage	233	221	12	8	12	-4
Price	101	109	-8	3	3	0
Richland	60	84	-24	3	4	-1
Rusk	80	99	-19	0	2	-2
St. Croix	179	222	-43	18	15	3
Sauk	239	198	41	24	11	13
Sawyer	140	98	42	5	4	1
Taylor	91	112	-21	5	1	4
Trempealeau	112	123	-11	5	5	0
Vernon	79	83	-4	5	6	-1
Vilas	172	126	46	9	8	1
Walworth	302	263	39	23	20	3
Washburn	98	106	-8	5	5	0
Washington	311	321	-10	31	29	2
Waupaca	188	172	16	19	11	8
Waushara	96	107	-11	5	7	-2
Wood	246	259	-13	8	16	-8

Table 3: Estimates of Strengths and Weaknesses (cont)

	Amusement, Gambling, Recreation Industries			Automobiles & Other Motor Vehicles		
	Observed	Predicted	Error	Observed	Predicted	Error
Adams	16	16	0	407	405	2
Ashland	12	16	-4	169	136	33
Barron	21	25	-4	306	364	-58
Bayfield	15	8	7	192	98	94
Buffalo	13	18	-5	205	265	-60
Burnett	7	18	-11	167	269	-102
Chippewa	37	27	10	381	347	34
Columbia	35	29	6	494	409	85
Crawford	10	17	-7	209	235	-26
Dane	116	124	-8	1112	1193	-81
Dodge	47	39	8	677	595	82
Door	41	24	17	365	326	39
Douglas	21	20	1	216	263	-47
Dunn	22	20	2	300	287	13
Eau Claire	37	39	-2	470	432	38
Forest	9	12	-3	206	191	15
Grant	23	23	0	289	313	-24
Green	20	25	-5	297	386	-89
Green Lake	20	22	-2	351	398	-47
Iowa	15	27	-12	259	289	-30
Iron	7	14	-7	123	190	-67
Jackson	13	19	-6	303	330	-27
Jefferson	38	38	0	640	546	94
Juneau	17	19	-2	375	337	38
Kenosha	45	48	-3	562	556	6
La Crosse	48	43	5	483	436	47
Lafayette	9	13	-4	171	156	15
Langlade	19	16	3	300	258	42
Lincoln	22	23	-1	315	375	-60
Marathon	59	50	9	704	608	96
Marinettee	26	26	0	366	378	-12
Marquette	6	16	-10	341	353	-12
Monroe	19	22	-3	327	300	27
Oconto	26	19	7	381	347	34
Oneida	33	27	6	465	414	51
Ozaukee	32	43	-11	499	521	-22
Pepin	8	13	-5	126	248	-122
Pierce	14	21	-7	230	352	-122
Polk	20	23	-3	244	318	-74
Portage	35	31	4	557	451	106
Price	11	17	-6	264	290	-26
Richland	10	13	-3	234	215	19
Rusk	8	13	-5	201	247	-46
St. Croix	31	33	-2	320	420	-100
Sauk	52	36	16	494	473	21
Sawyer	22	12	10	250	136	114
Taylor	17	22	-5	289	381	-92
Trempealeau	13	21	-8	253	339	-86
Vernon	17	12	5	235	201	34
Vilas	23	19	4	367	302	65
Walworth	52	37	15	580	553	27
Washburn	26	16	10	242	227	15
Washington	51	48	3	687	596	91
Waupaca	35	27	8	510	416	94
Waushara	17	16	1	430	377	53
Wood	35	41	-6	418	509	-91

Table 3: Estimates of Strengths and Weaknesses (cont)

	Gasoline Stations (including convenience stores with gas)			Clothing & Accessories Stores		
	Observed	Predicted	Error	Observed	Predicted	Error
Adams	31	30	1	42	51	-9
Ashland	25	20	5	58	55	3
Barron	31	35	-4	72	75	-3
Bayfield	25	18	7	59	60	-1
Buffalo	17	28	-11	37	56	-19
Burnett	17	26	-9	45	53	-8
Chippewa	43	40	3	88	74	14
Columbia	48	43	5	92	81	11
Crawford	21	27	-6	54	49	5
Dane	116	127	-11	410	419	-9
Dodge	61	53	8	90	90	0
Door	31	29	2	129	88	41
Douglas	33	30	3	61	72	-11
Dunn	27	29	-2	60	66	-6
Eau Claire	40	40	0	141	129	12
Forest	19	25	-6	37	41	-4
Grant	40	32	8	63	75	-12
Green	25	37	-12	64	67	-3
Green Lake	25	31	-6	53	62	-9
Iowa	28	32	-4	53	63	-10
Iron	19	20	-1	42	50	-8
Jackson	20	31	-11	46	50	-4
Jefferson	45	50	-5	122	95	27
Juneau	37	33	4	50	47	3
Kenosha	78	66	12	157	147	10
La Crosse	42	45	-3	133	136	-3
Lafayette	19	29	-10	40	33	7
Langlade	30	28	2	51	53	-2
Lincoln	39	33	6	56	61	-5
Marathon	63	58	5	143	136	7
Marinettee	50	35	15	76	72	4
Marquette	24	30	-6	42	42	0
Monroe	38	35	3	87	58	29
Oconto	43	40	3	51	49	2
Oneida	40	31	9	94	93	1
Ozaukee	50	48	2	175	179	-4
Pepin	11	27	-16	36	37	-1
Pierce	31	35	-4	58	67	-9
Polk	31	38	-7	59	60	-1
Portage	39	39	0	99	99	0
Price	31	27	4	55	54	1
Richland	22	26	-4	46	47	-1
Rusk	25	25	0	48	46	2
St. Croix	34	48	-14	82	97	-15
Sauk	50	41	9	111	93	18
Sawyer	25	23	2	56	57	-1
Taylor	26	33	-7	40	49	-9
Trempealeau	34	32	2	43	60	-17
Vernon	31	28	3	56	53	3
Vilas	37	26	11	86	72	14
Walworth	68	49	19	134	117	17
Washburn	26	25	1	50	54	-4
Washington	73	64	9	128	134	-6
Waupaca	47	40	7	74	79	-5
Waushara	33	33	0	45	49	-4
Wood	33	45	-12	84	110	-26

Table 3: Estimates of Strengths and Weaknesses (cont)

	Electronic & Appliance Stores			Food & Beverage Stores		
	Observed	Predicted	Error	Observed	Predicted	Error
Adams	32	31	1	25	34	-9
Ashland	25	27	-2	30	24	6
Barron	51	43	8	59	45	14
Bayfield	18	21	-3	22	25	-3
Buffalo	25	35	-10	23	30	-7
Burnett	22	34	-12	25	33	-8
Chippewa	52	48	4	58	53	5
Columbia	58	55	3	61	57	4
Crawford	32	31	1	29	27	2
Dane	174	188	-14	279	288	-9
Dodge	76	68	8	75	73	2
Door	52	43	9	55	42	13
Douglas	36	36	0	42	41	1
Dunn	40	39	1	34	39	-5
Eau Claire	69	64	5	73	73	0
Forest	19	24	-5	16	24	-8
Grant	47	42	5	47	46	1
Green	42	48	-6	54	44	10
Green Lake	42	42	0	32	37	-5
Iowa	35	49	-14	39	38	1
Iron	18	25	-7	19	25	-6
Jackson	31	36	-5	36	30	6
Jefferson	75	67	8	71	70	1
Juneau	43	36	7	35	35	0
Kenosha	93	82	11	119	107	12
La Crosse	81	69	12	82	81	1
Lafayette	28	31	-3	18	30	-12
Langlade	27	28	-1	28	30	-2
Lincoln	33	41	-8	39	39	0
Marathon	81	82	-1	99	95	4
Marinettee	43	43	0	54	45	9
Marquette	30	31	-1	25	30	-5
Monroe	48	40	8	50	41	9
Oconto	36	40	-4	47	43	4
Oneida	44	46	-2	56	46	10
Ozaukee	81	79	2	73	80	-7
Pepin	23	28	-5	18	24	-6
Pierce	31	47	-16	25	45	-20
Polk	44	45	-1	47	47	0
Portage	51	55	-4	54	57	-3
Price	33	30	3	23	28	-5
Richland	38	27	11	21	27	-6
Rusk	21	24	-3	24	24	0
St. Croix	45	64	-19	59	65	-6
Sauk	65	61	4	69	58	11
Sawyer	27	22	5	23	24	-1
Taylor	30	39	-9	23	32	-9
Trempealeau	30	39	-9	33	36	-3
Vernon	33	26	7	29	32	-3
Vilas	33	33	0	44	36	8
Walworth	77	66	11	97	75	22
Washburn	33	30	3	29	29	0
Washington	107	86	21	97	97	0
Waupaca	50	48	2	59	52	7
Waushara	39	33	6	39	36	3
Wood	59	66	-7	47	67	-20

Table 3: Estimates of Strengths and Weaknesses (cont)

	Sporting Goods, Hobby, Book, & Music Stores			General Merchandise Stores		
	Observed	Predicted	Error	Observed	Predicted	Error
Adams	50	42	8	41	32	9
Ashland	42	43	-1	28	31	-3
Barron	88	77	11	49	44	5
Bayfield	53	46	7	22	20	2
Buffalo	32	49	-17	24	37	-13
Burnett	39	45	-6	23	36	-13
Chippewa	89	80	9	54	46	8
Columbia	93	81	12	59	51	8
Crawford	41	44	-3	29	36	-7
Dane	396	405	-9	144	154	-10
Dodge	89	105	-16	71	67	4
Door	80	79	1	50	43	7
Douglas	59	77	-18	42	33	9
Dunn	65	64	1	36	40	-4
Eau Claire	130	125	5	56	60	-4
Forest	25	33	-8	21	30	-9
Grant	74	67	7	47	46	1
Green	61	72	-11	43	46	-3
Green Lake	54	64	-10	41	44	-3
Iowa	43	65	-22	46	49	-3
Iron	25	34	-9	21	29	-8
Jackson	37	34	3	34	41	-7
Jefferson	121	101	20	72	62	10
Juneau	53	46	7	44	37	7
Kenosha	124	140	-16	77	72	5
La Crosse	141	133	8	60	65	-5
Lafayette	34	36	-2	31	32	-1
Langlade	51	55	-4	39	33	6
Lincoln	61	67	-6	43	43	0
Marathon	159	140	19	85	77	8
Marinettee	76	79	-3	43	46	-3
Marquette	43	48	-5	35	40	-5
Monroe	82	62	20	53	42	11
Oconto	55	49	6	36	36	0
Oneida	103	92	11	56	48	8
Ozaukee	124	128	-4	72	72	0
Pepin	24	43	-19	17	32	-15
Pierce	53	65	-12	27	43	-16
Polk	68	73	-5	41	42	-1
Portage	106	101	5	61	53	8
Price	49	59	-10	26	34	-8
Richland	36	44	-8	31	29	2
Rusk	34	48	-14	26	30	-4
St. Croix	99	105	-6	45	55	-10
Sauk	121	92	29	73	60	13
Sawyer	71	51	20	33	25	8
Taylor	46	54	-8	33	43	-10
Trempealeau	55	61	-6	31	40	-9
Vernon	61	45	16	42	30	12
Vilas	88	80	8	42	38	4
Walworth	118	118	0	83	64	19
Washburn	52	50	2	34	33	1
Washington	145	135	10	73	76	-3
Waupaca	114	89	25	56	51	5
Waushara	64	55	9	40	35	5
Wood	99	120	-21	59	66	-7

Table 3: Estimates of Strengths and Weaknesses (cont)

	Other Store Retailers			Hotels, Motels & Other Traveler Accommodations		
	Observed	Predicted	Error	Observed	Predicted	Error
Adams	672	681	-9	37	79	-42
Ashland	593	571	22	31	43	-12
Barron	1071	1045	26	91	56	35
Bayfield	620	465	155	108	111	-3
Buffalo	489	732	-243	19	53	-34
Burnett	585	705	-120	54	114	-60
Chippewa	1204	1108	96	40	19	21
Columbia	1336	1220	116	71	30	41
Crawford	673	696	-23	34	40	-6
Dane	4821	4958	-137	138	125	13
Dodge	1674	1545	129	31	0	31
Door	1315	1053	262	340	155	185
Douglas	770	888	-118	46	43	3
Dunn	943	836	107	14	14	0
Eau Claire	1523	1528	-5	32	75	-43
Forest	393	552	-159	44	78	-34
Grant	963	914	49	35	63	-28
Green	975	1043	-68	28	37	-9
Green Lake	828	889	-61	33	87	-54
Iowa	823	1014	-191	25	25	0
Iron	407	551	-144	54	154	-100
Jackson	697	733	-36	17	-6	23
Jefferson	1759	1526	233	38	9	29
Juneau	746	762	-16	46	26	20
Kenosha	1866	2043	-177	30	-1	31
La Crosse	1741	1689	52	52	66	-14
Lafayette	519	604	-85	7	35	-28
Langlade	685	706	-21	22	75	-53
Lincoln	780	933	-153	39	50	-11
Marathon	2138	1964	174	38	28	10
Marinettee	899	1053	-154	48	66	-18
Marquette	607	680	-73	33	81	-48
Monroe	1516	909	607	40	-1	41
Oconto	830	858	-28	35	-5	40
Oneida	1182	1126	56	237	142	95
Ozaukee	1990	2047	-57	20	180	-160
Pepin	422	608	-186	8	52	-44
Pierce	791	975	-184	13	14	-1
Polk	950	1030	-80	40	34	6
Portage	1341	1317	24	29	36	-7
Price	630	778	-148	50	84	-34
Richland	618	609	9	16	49	-33
Rusk	518	611	-93	30	56	-26
St. Croix	1234	1554	-320	32	26	6
Sauk	1700	1362	338	153	43	110
Sawyer	777	634	143	182	88	94
Taylor	654	865	-211	10	13	-3
Trempealeau	736	864	-128	19	39	-20
Vernon	717	613	104	37	48	-11
Vilas	1232	876	356	397	186	211
Walworth	2051	1608	443	83	48	35
Washburn	670	681	-11	60	102	-42
Washington	2173	2088	85	28	30	-2
Waupaca	1410	1171	239	49	59	-10
Waushara	781	767	14	32	73	-41
Wood	1221	1620	-399	19	68	-49

Table 3: Estimates of Strengths and Weaknesses (cont)

	Banking, Insurance and Other Finance Activities			Administrative & Support Services		
	Observed	Predicted	Error	Observed	Predicted	Error
Adams	19	19	0	36	33	3
Ashland	22	30	-8	40	37	3
Barron	31	35	-4	59	55	4
Bayfield	19	21	-2	27	30	-3
Buffalo	25	28	-3	28	35	-7
Burnett	19	21	-2	24	34	-10
Chippewa	47	38	9	57	58	-1
Columbia	38	39	-1	71	61	10
Crawford	19	27	-8	29	39	-10
Dane	122	131	-9	279	284	-5
Dodge	59	48	11	76	75	1
Door	30	30	0	66	54	12
Douglas	43	36	7	53	51	2
Dunn	32	38	-6	57	51	6
Eau Claire	62	55	7	81	87	-6
Forest	14	16	-2	19	30	-11
Grant	37	33	4	44	50	-6
Green	31	37	-6	42	50	-8
Green Lake	31	30	1	32	37	-5
Iowa	28	40	-12	40	51	-11
Iron	11	14	-3	18	29	-11
Jackson	25	28	-3	40	42	-2
Jefferson	52	48	4	100	78	22
Juneau	26	26	0	47	38	9
Kenosha	61	56	5	98	117	-19
La Crosse	75	58	17	115	96	19
Lafayette	20	22	-2	29	31	-2
Langlade	25	24	1	46	35	11
Lincoln	30	33	-3	44	44	0
Marathon	67	59	8	107	103	4
Marinettee	40	35	5	48	53	-5
Marquette	21	21	0	31	28	3
Monroe	42	35	7	56	49	7
Oconto	27	27	0	42	45	-3
Oneida	29	36	-7	55	55	0
Ozaukee	49	46	3	119	122	-3
Pepin	13	23	-10	25	29	-4
Pierce	35	38	-3	43	55	-12
Polk	34	34	0	55	52	3
Portage	46	48	-2	80	73	7
Price	22	26	-4	32	38	-6
Richland	25	24	1	42	34	8
Rusk	20	24	-4	27	32	-5
St. Croix	44	47	-3	83	87	-4
Sauk	47	47	0	85	69	16
Sawyer	34	22	12	32	40	-8
Taylor	30	32	-2	34	43	-9
Trempealeau	38	32	6	42	43	-1
Vernon	27	23	4	42	36	6
Vilas	33	25	8	51	38	13
Walworth	51	49	2	94	87	7
Washburn	26	23	3	33	36	-3
Washington	50	54	-4	123	112	11
Waupaca	37	37	0	61	57	4
Waushara	22	23	-1	46	35	11
Wood	40	51	-11	60	81	-21

Table 3: Estimates of Strengths and Weaknesses (cont)

	Health Care and Social Assistance Services			Personal & Household Services		
	Observed	Predicted	Error	Observed	Predicted	Error
Adams	16	18	-2	243	217	26
Ashland	24	21	3	221	177	44
Barron	37	33	4	402	373	29
Bayfield	12	11	1	176	140	36
Buffalo	14	20	-6	166	242	-76
Burnett	11	17	-6	174	221	-47
Chippewa	40	34	6	434	410	24
Columbia	34	35	-1	512	453	59
Crawford	17	21	-4	263	241	22
Dane	174	176	-2	1958	1999	-41
Dodge	47	49	-2	639	612	27
Door	31	28	3	428	350	78
Douglas	23	31	-8	311	295	16
Dunn	33	31	2	374	328	46
Eau Claire	59	55	4	576	572	4
Forest	12	10	2	135	182	-47
Grant	31	28	3	370	363	7
Green	21	28	-7	336	373	-37
Green Lake	17	22	-5	253	306	-53
Iowa	25	31	-6	283	352	-69
Iron	9	14	-5	121	140	-19
Jackson	20	24	-4	234	276	-42
Jefferson	44	48	-4	653	574	79
Juneau	21	21	0	308	263	45
Kenosha	60	65	-5	739	816	-77
La Crosse	57	61	-4	647	636	11
Lafayette	11	13	-2	186	222	-36
Langlade	25	19	6	266	236	30
Lincoln	27	27	0	322	329	-7
Marathon	70	64	6	800	762	38
Marinettee	32	34	-2	308	368	-60
Marquette	14	14	0	230	269	-39
Monroe	28	28	0	389	340	49
Oconto	25	22	3	307	315	-8
Oneida	50	34	16	458	386	72
Ozaukee	55	55	0	792	785	7
Pepin	12	13	-1	152	220	-68
Pierce	25	29	-4	324	393	-69
Polk	41	29	12	357	372	-15
Portage	41	45	-4	517	498	19
Price	17	22	-5	204	246	-42
Richland	22	16	6	228	206	22
Rusk	17	18	-1	180	203	-23
St. Croix	49	45	4	494	592	-98
Sauk	59	44	15	581	491	90
Sawyer	14	18	-4	232	196	36
Taylor	16	26	-10	228	306	-78
Trempealeau	26	25	1	255	295	-40
Vernon	15	14	1	272	232	40
Vilas	22	20	2	321	288	33
Walworth	57	51	6	776	639	137
Washburn	22	18	4	231	218	13
Washington	58	62	-4	892	818	74
Waupaca	38	33	5	461	444	17
Waushara	14	17	-3	272	274	-2
Wood	45	52	-7	454	588	-134

Table 3: Estimates of Strengths and Weaknesses (cont)

	Business Services			Repair & Maintenance Services		
	Observed	Predicted	Error	Observed	Predicted	Error
Adams	163	148	15	129	143	-14
Ashland	121	71	50	99	87	12
Barron	245	225	20	224	192	32
Bayfield	123	95	28	84	36	48
Buffalo	117	139	-22	90	139	-49
Burnett	96	160	-64	84	114	-30
Chippewa	254	249	5	263	212	51
Columbia	333	306	27	247	239	8
Crawford	127	138	-11	100	129	-29
Dane	1382	1401	-19	736	790	-54
Dodge	451	396	55	401	325	76
Door	278	258	20	159	159	0
Douglas	181	150	31	134	153	-19
Dunn	227	198	29	170	159	11
Eau Claire	342	361	-19	278	245	33
Forest	74	123	-49	70	87	-17
Grant	214	245	-31	224	156	68
Green	214	235	-21	175	199	-24
Green Lake	192	192	0	132	161	-29
Iowa	185	208	-23	137	193	-56
Iron	84	110	-26	52	79	-27
Jackson	142	176	-34	121	171	-50
Jefferson	458	380	78	367	309	58
Juneau	190	156	34	154	159	-5
Kenosha	475	582	-107	360	375	-15
La Crosse	424	405	19	277	281	-4
Lafayette	115	153	-38	100	113	-13
Langlade	149	129	20	125	122	3
Lincoln	184	191	-7	153	179	-26
Marathon	470	502	-32	436	362	74
Marinettee	227	211	16	200	199	1
Marquette	145	180	-35	112	131	-19
Monroe	237	194	43	186	176	10
Oconto	217	212	5	190	192	-2
Oneida	266	248	18	212	178	34
Ozaukee	714	690	24	318	309	9
Pepin	88	135	-47	57	116	-59
Pierce	184	289	-105	140	193	-53
Polk	182	236	-54	161	197	-36
Portage	318	314	4	231	241	-10
Price	129	134	-5	114	141	-27
Richland	137	121	16	100	108	-8
Rusk	105	96	9	116	109	7
St. Croix	328	436	-108	234	289	-55
Sauk	399	305	94	266	254	12
Sawyer	133	118	15	107	91	16
Taylor	155	168	-13	141	183	-42
Trempealeau	167	162	5	169	164	5
Vernon	172	150	22	143	89	54
Vilas	196	193	3	152	115	37
Walworth	600	444	156	358	294	64
Washburn	136	142	-6	104	107	-3
Washington	698	609	89	412	397	15
Waupaca	288	281	7	272	215	57
Waushara	189	183	6	170	146	24
Wood	272	359	-87	250	295	-45

Table 3: Estimates of Strengths and Weaknesses (cont)

	Professional Services			Architectural, Engineering, & Related Services		
	Observed	Predicted	Error	Observed	Predicted	Error
Adams	4	3	1	2	2	0
Ashland	4	3	1	2	2	0
Barron	5	5	0	5	3	2
Bayfield	1	3	-2	0	2	-2
Buffalo	3	4	-1	1	3	-2
Burnett	2	3	-1	0	1	-1
Chippewa	8	5	3	4	3	1
Columbia	7	6	1	6	4	2
Crawford	4	3	1	1	2	-1
Dane	20	21	-1	24	23	1
Dodge	5	7	-2	5	4	1
Door	5	5	0	3	4	-1
Douglas	4	4	0	1	3	-2
Dunn	4	4	0	1	3	-2
Eau Claire	7	7	0	8	7	1
Forest	3	3	0	2	1	1
Grant	8	5	3	2	3	-1
Green	4	5	-1	4	3	1
Green Lake	6	4	2	2	3	-1
Iowa	3	5	-2	3	3	0
Iron	1	2	-1	2	1	1
Jackson	4	4	0	2	2	0
Jefferson	7	7	0	2	5	-3
Juneau	4	4	0	1	2	-1
Kenosha	11	9	2	4	8	-4
La Crosse	4	7	-3	9	7	2
Lafayette	3	4	-1	2	0	2
Langlade	4	3	1	2	2	0
Lincoln	4	4	0	4	2	2
Marathon	10	8	2	6	7	-1
Marinettee	3	4	-1	2	2	0
Marquette	3	3	0	1	1	0
Monroe	3	4	-1	3	2	1
Oconto	3	5	-2	4	2	2
Oneida	7	5	2	2	4	-2
Ozaukee	8	9	-1	14	13	1
Pepin	2	3	-1	1	1	0
Pierce	6	6	0	5	4	1
Polk	5	5	0	1	2	-1
Portage	6	6	0	5	5	0
Price	3	3	0	4	2	2
Richland	2	3	-1	2	2	0
Rusk	3	3	0	1	1	0
St. Croix	6	8	-2	5	5	0
Sauk	5	6	-1	4	5	-1
Sawyer	5	3	2	3	2	1
Taylor	4	4	0	1	2	-1
Trempealeau	4	4	0	0	2	-2
Vernon	4	4	0	2	2	0
Vilas	3	4	-1	4	2	2
Walworth	7	7	0	8	6	2
Washburn	3	3	0	1	1	0
Washington	12	9	3	7	8	-1
Waupaca	4	5	-1	3	3	0
Waushara	5	4	1	3	2	1
Wood	7	6	1	5	5	0

Table 3: Estimates of Strengths and Weaknesses (cont)

	Computer System Services			Scientific & Other Services		
	Observed	Predicted	Error	Observed	Predicted	Error
Adams	83	69	14	12	13	-1
Ashland	63	58	5	16	8	8
Barron	121	118	3	23	24	-1
Bayfield	47	40	7	9	3	6
Buffalo	58	69	-11	10	12	-2
Burnett	55	55	0	8	11	-3
Chippewa	148	129	19	30	25	5
Columbia	144	143	1	29	29	0
Crawford	58	74	-16	12	13	-1
Dane	654	680	-26	153	156	-3
Dodge	219	193	26	44	40	4
Door	103	102	1	23	22	1
Douglas	95	102	-7	23	19	4
Dunn	111	111	0	23	20	3
Eau Claire	218	200	18	31	40	-9
Forest	42	44	-2	7	6	1
Grant	107	105	2	15	19	-4
Green	111	126	-15	21	22	-1
Green Lake	72	92	-20	11	14	-3
Iowa	96	113	-17	17	21	-4
Iron	30	17	13	5	7	-2
Jackson	57	92	-35	14	17	-3
Jefferson	221	197	24	49	41	8
Juneau	90	85	5	13	14	-1
Kenosha	266	280	-14	56	61	-5
La Crosse	241	213	28	46	46	0
Lafayette	46	51	-5	9	8	1
Langlade	77	62	15	17	11	6
Lincoln	97	104	-7	14	18	-4
Marathon	284	254	30	56	54	2
Marinettee	109	107	2	29	23	6
Marquette	63	61	2	6	9	-3
Monroe	117	113	4	18	19	-1
Oconto	99	102	-3	14	19	-5
Oneida	115	117	-2	21	23	-2
Ozaukee	297	283	14	62	62	0
Pepin	46	57	-11	3	8	-5
Pierce	95	137	-42	17	24	-7
Polk	107	113	-6	23	23	0
Portage	176	178	-2	38	34	4
Price	66	68	-2	10	14	-4
Richland	62	62	0	14	9	5
Rusk	60	59	1	6	8	-2
St. Croix	175	208	-33	38	44	-6
Sauk	174	169	5	37	33	4
Sawyer	67	54	13	8	11	-3
Taylor	73	106	-33	11	17	-6
Trempealeau	93	98	-5	17	16	1
Vernon	90	75	15	10	8	2
Vilas	69	63	6	16	13	3
Walworth	240	218	22	53	44	9
Washburn	59	56	3	12	11	1
Washington	314	270	44	72	61	11
Waupaca	145	134	11	24	25	-1
Waushara	74	81	-7	14	13	1
Wood	160	188	-28	34	40	-6

Table 3: Estimates of Strengths and Weaknesses (cont)

		Rental & Leasing Services	
	Observed	Predicted	Error
Adams	103	99	4
Ashland	83	82	1
Barron	145	144	1
Bayfield	91	66	25
Buffalo	74	92	-18
Burnett	62	93	-31
Chippewa	193	154	39
Columbia	182	168	14
Crawford	84	99	-15
Dane	579	619	-40
Dodge	256	223	33
Door	156	133	23
Douglas	128	134	-6
Dunn	147	146	1
Eau Claire	225	219	6
Forest	63	64	-1
Grant	142	126	16
Green	137	149	-12
Green Lake	104	117	-13
Iowa	105	146	-41
Iron	52	66	-14
Jackson	97	111	-14
Jefferson	249	222	27
Juneau	130	110	20
Kenosha	281	272	9
La Crosse	259	234	25
Lafayette	76	89	-13
Langlade	109	88	21
Lincoln	111	132	-21
Marathon	318	259	59
Marinettee	158	143	15
Marquette	89	93	-4
Monroe	141	132	9
Oconto	122	127	-5
Oneida	152	147	5
Ozaukee	246	254	-8
Pepin	57	89	-32
Pierce	139	171	-32
Polk	134	153	-19
Portage	201	203	-2
Price	93	104	-11
Richland	71	89	-18
Rusk	74	83	-9
St. Croix	204	240	-36
Sauk	189	187	2
Sawyer	84	83	1
Taylor	92	127	-35
Trempealeau	103	120	-17
Vernon	109	81	28
Vilas	117	103	14
Walworth	262	230	32
Washburn	95	93	2
Washington	308	283	25
Waupaca	178	155	23
Waushara	122	111	11
Wood	190	210	-20