

Pet Friendly Rankings, Pet Ownership Rates, and Economic Outcomes

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Goss & Associates

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Preface

Pet Friendly Rankings, Pet Ownership Rates, and Economic Outcomes

Pets, companion animals, and work animals play important roles in many people's lives, as well as in the economy at local, regional and national levels. In addition to seeing-eye dogs and dogs that can be trained to detect seizures, animals can also be used in occupational therapy, speech therapy, or physical rehabilitation to help patients recover.

In addition to economic and therapeutic impacts, animals are also valued as companions, which can affect the quality of individuals' lives via health benefits and productivity enhancement.

The Goss & Associates research team thanks PetSmart Charities for its assistance in the completion of this study. However, any errors, omissions, or misstatements are solely the responsibility of Goss & Associates and the principal investigator.

This study, while funded by PetSmart Charities, was developed independently of this organization.

Goals of the study

Two goals of this study are to estimate the impact of pets on the economy, and to investigate the influence of the economy on pet ownership.¹

Many studies have examined and ranked cities according to their "pet friendliness." This study will use meta-analysis to determine the factors important to the achievement of a favorable ranking.

Additionally, case studies and statistical analyses will be used to determine the impact of pet-friendly public policy on economic outcomes and quality-of-life.

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¹Throughout this study, unless otherwise indicated, pet ownership will include companion animals as well as work animals.

Glossary

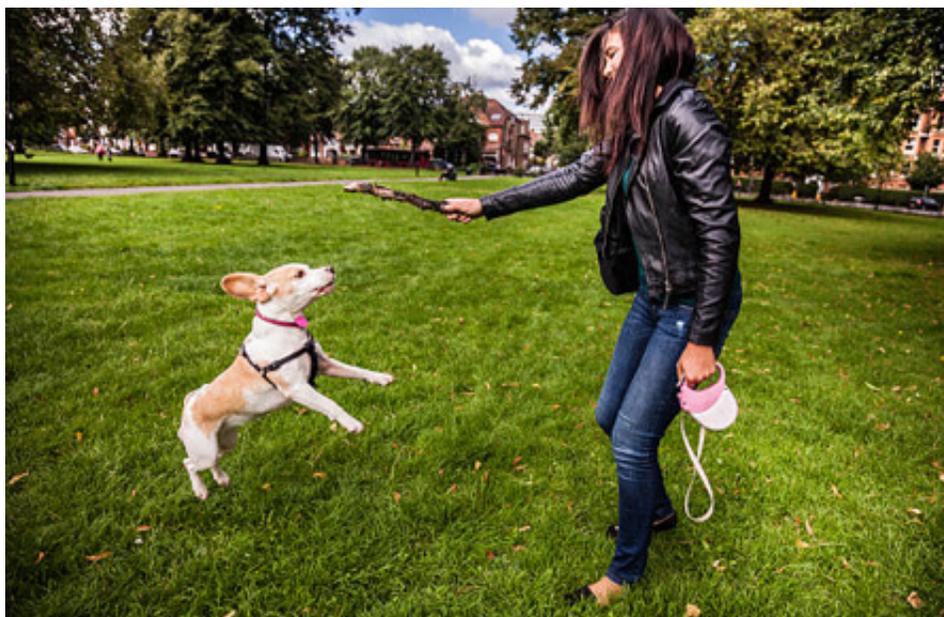
Term	Definition
Competitive effect (pet industry)	One of three elements of the shift-share equation that measures the economic performance of the state or Metropolitan Statistical Area (MSA) pet industry compared to the national pet industry.
Correlation coefficient	Correlation coefficient is a measure that captures the degree to which the movement in two variables, economic growth and pet ownership in this case, are associated. The range of values for the correlation coefficient is -1.0 to +1.0. A correlation of -1.0 indicates a perfect negative correlation, while a correlation of +1.0 indicates a perfect positive correlation (e.g. Fahrenheit and Centigrade temperature).
Direct impacts	The set of expenditures applied to the predictive model for impact analysis. For example, direct impacts include wages paid to pet industry employees.
Disposable personal income	The total amount of money available for an individual or population to spend or save after taxes have been paid.
Gross domestic product (GDP)	The total dollar value of all goods and services produced by all sectors of the economy over a specific time period. GDP growth or contraction is a primary indicator of the size and health of the economy.
IMPLAN	Using classic input-output analysis in combination with regional specific Social Accounting Matrices and Multiplier Models, IMPLAN provides a highly accurate and adaptable model for its users. The IMPLAN database contains county, state, zip code, and federal economic statistics which are specialized by region. See Appendix C for a more detailed description.
Input-output analysis	A type of applied economic analysis that tracks the interdependence among various producing and consuming sectors of an economy. It measures the relationship between a given set of demands for final goods and services and the inputs required to satisfy those demands. (U.S. Bureau of Economic Analysis)
Jobs supported	A job in IMPLAN = the annual average of monthly jobs in that industry. Thus, 1 job lasting 12 months = 2 jobs lasting 6 months each or = 3 jobs lasting 4 months each.
Labor income	Wages & salaries plus self-employment income.
Location quotient	According to the U.S. Bureau of Economic Analysis, a location quotient (LQ) is an analytical statistic that measures an area's industrial specialization relative to a larger geographic unit (usually the nation). An LQ is computed as an industry's share of a regional total for some economic statistic (earnings, GDP by metropolitan area, employment, etc.) divided by the industry's share of the national total for the same statistic. For example, an LQ of 1.0 in pet support means that the region or area and the nation are equally specialized in pet support, while an LQ of 1.8 means that the region has a higher concentration in pet support than the nation. $LQ \text{ pet support} = (\% \text{ of region's employment in pet support} \div \% \text{ of U.S. employment in pet support})$.
Overall sales impacts, or total impacts	Amount of sales, including veterinary services, retail sales, wholesale expenditures, construction sales, etc. It is analogous to gross domestic product (GDP) but will include some double counting and will thus exceed GDP.
Payroll	Payroll includes all forms of compensation, such as salaries, wages, commissions, dismissal pay, bonuses, vacation allowances, sick-leave pay, and employee contributions to qualified pension plans paid during the year to all employees.
Pet industry	North American Industry Classification System (NAICS). Feed stores, NAICS 44422, Pet and Pet Supplies Stores, NAICS, 45391, Veterinary Services, NAICS 54194, Pet Care (except veterinary supplies), NAICS 81291, Petting Zoos, NAICS 71213, Pet Cemeteries, NAICS 81222, Pet Health Insurance, 524128, Artificial Insemination Services for Pets, NAICS 11521.
Private workers	All those working excluding government workers, state, local and federal.
Shift-share analysis	A standard regional analysis method that attempts to determine how much of regional job growth can be attributed to national trends and how much is due to unique regional factors. Shift share helps answer why employment is growing or declining in a regional industry, cluster, or occupation.

Major Findings of Study

Pet Friendly Rankings, Pet Ownership Rates, and Economic Outcomes

Major Findings of Study

- Pet ownership stimulates economic growth and economic growth fuels pet ownership. However, the impact of pet ownership on economic growth is much stronger than the impact of economic growth on pet ownership. Additionally, more pet-friendly states experience healthier economic growth than do less pet friendly states.
- Pet ownership's impact on economic growth is both direct and indirect. Pet owners, by purchasing products and services for their pets, increase overall economic growth via additions to gross domestic product (GDP). Additionally, pets, by contributing to improved health and assisting individuals on the job, boost individual productivity which adds to wage growth and subsequent spending.
- After-tax income is one of the most important factors influencing pet ownership, with home ownership also contributing significantly to pet ownership. Community walkability, parks, pet support services, and mild weather are also important contributors to pet ownership and positive pet friendly rankings.
- Pet laws and ordinances affect pet ownership. States with more stringent pet laws and ordinances have higher rates of pet ownership and higher per capita pet spending. Furthermore, states with higher shelter intake rates experienced higher rates of pet ownership. It was found that states with greater net animal shelter intakes per capita had greater private industry pet support services, and larger economic impacts from the pet industry.



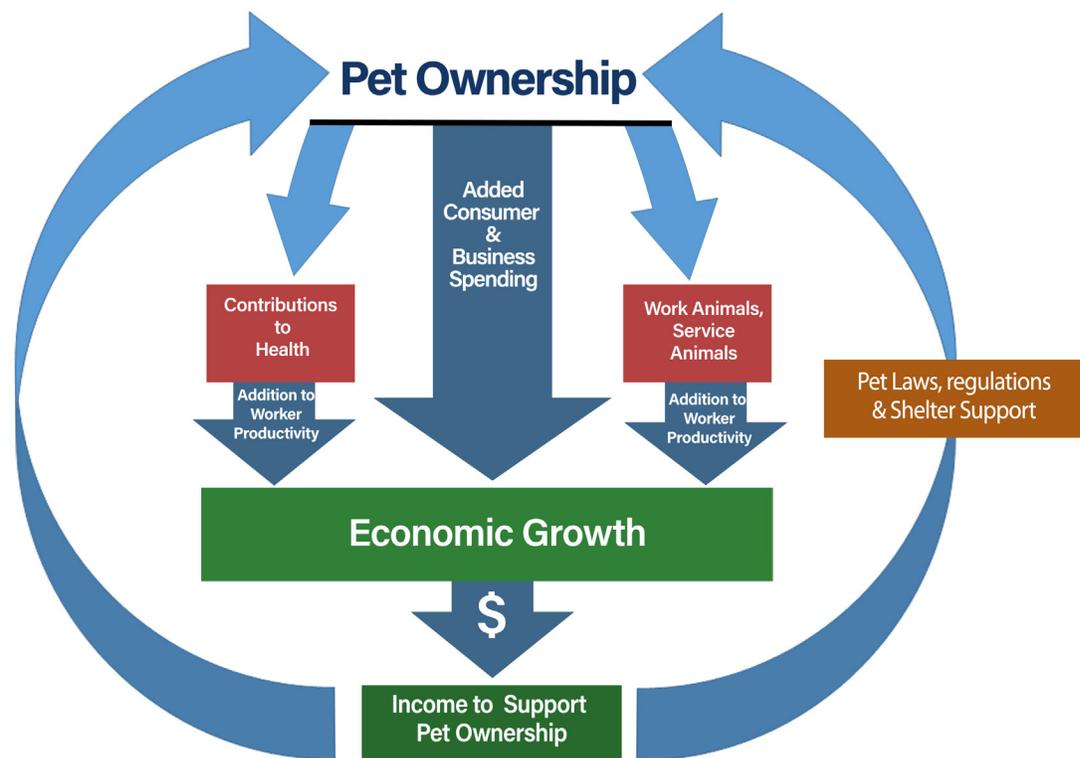
Executive Summary

Pet Friendly Rankings, Pet Ownership Rates, and Economic Outcomes

Figure Ex.1 depicts the interactions between pet ownership and economic growth. As shown, pet ownership has a direct impact on the economy via consumer and business spending on pet products and services. Additionally, pet ownership, as a result of its influence on productivity via improvements in health and enhancements to job performance, boosts worker productivity and overall economic growth.

Likewise, an improving economy provides consumers, businesses, non-profit organizations and government units with greater resources to spend on pets and work animals.

Figure Ex.1: The relationship between pet ownership and economic growth



Source: Goss & Associates, 2017

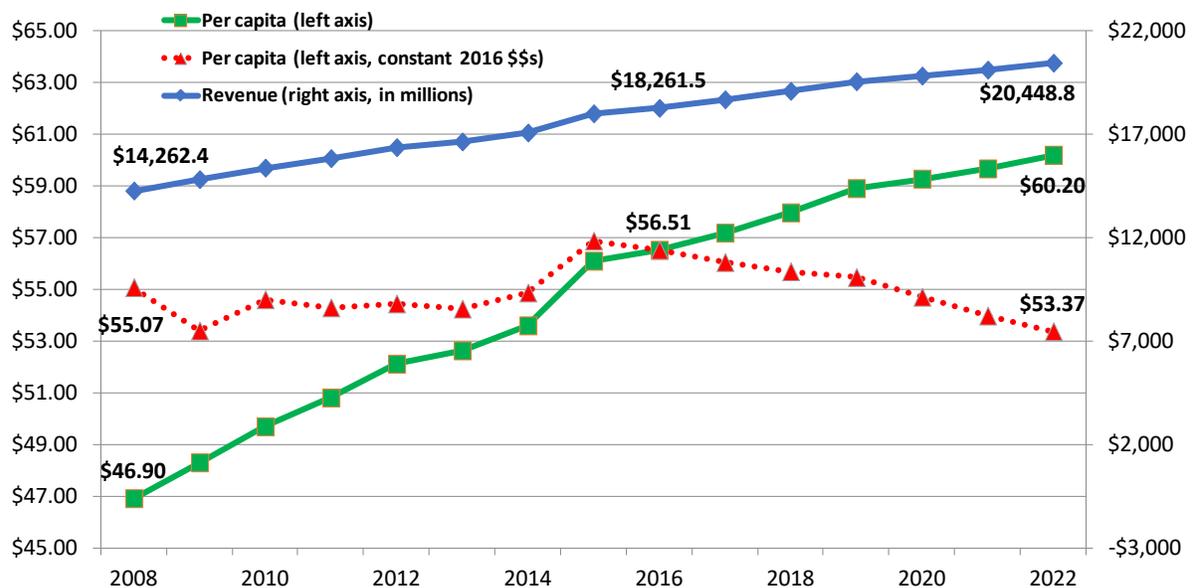
Pet ownership, as a result of its influence on productivity, via improvements in health and enhancements to job performance, boosts worker productivity and overall economic growth.

Executive Summary

I. Pet Ownership's Influence on Economic Growth

- A. Pet ownership adds directly to U.S. gross domestic product via consumer and business spending:
1. Between 2008 and 2016, U.S. pet spending climbed from \$14.3 billion to \$18.3 billion and is projected to expand to \$20.4 billion by 2022.
 2. Between 2008 and 2016, states with GDP growth above the median had pet-friendly scores 20.0 percent higher than states with below median GDP growth.
 3. The top five states in terms of pet household ownership rates for 2015 were: 1) Vermont, 2) Idaho, 3) West Virginia, 4) Montana and 5) Mississippi.
 4. The bottom five states in terms of pet household ownership rates for 2015 were: 51) District of Columbia, 50) New York, 49) California, 48) North Dakota, and 47) New Jersey. income per capita was a strong and positive 0.69.

Figure Ex.2: U.S. pet spending, total and per capita, 2008-2022



Source: Bureau of Economic Analysis, Goss & Associates, IBIS World

Executive Summary

B. Pet Ownership adds indirectly to U.S GDP via expanding worker productivity and improving individual and family health.

1. In 2015, there was a strong correlation between pet ownership and output per worker, or productivity.²
2. Statistically, the correlation coefficient between pet ownership and output per worker was a strong and positive 0.70.

In 2015, there was a strong correlation between pet ownership and output per worker, or productivity.

II. Economic Growth's Effect on Pet Ownership

- A. Current economic growth is only weakly correlated with future pet ownership.
- B. Between 2003 and 2016, the correlation coefficient between economic growth in year 1 and pet ownership in year 2 was a weak +0.28.
- C. Each one percent addition to disposable personal income produces a 0.76 percent increase in pet spending and each one percentage point increase in homeownership adds 1.48 percent growth in pet spending. It is estimated that the downturn in U.S. homeownership resulted in approximately \$6.1 billion less pet spending in 2016 alone.

Between 2003 and 2016, the correlation coefficient between economic growth in year 1 and pet ownership in year 2 was a weak +0.28.



²Productivity also normally calculated as output per hour.

Executive Summary

III. Community Factors that Contribute to Pet Ownership and Private Industry Pet Support Services

A. In 2015:³

1. The MSAs over 1,000,000 in population with the greatest concentration of private industry pet support services were: 1) Los Angeles, CA; 2) Birmingham, AL; 3) St. Louis, MO; 4) Hartford, CT; and 5) Philadelphia, PA.
2. The MSAs with populations between 300,000 and 1,000,000 with the greatest concentration of private industry pet support services were: 1) Portland, ME; 2) Boulder, CO; 3) Eugene, OR; 4) Oxnard-Ventura, CA; and 5) Kingsport-Bristol, TN.
3. The MSAs with populations under 300,000 with the greatest concentration of private industry pet support services were: 1) Auburn, AL; 2) Hanford-Corcoran, CA; 3) Homosassa Springs, FL; 4) Lima, OH, and 5) Panama City, FL.
4. Most important factors affecting private industry pet support services were the percentage of millennials in the community, and the share of the community with a college degree.

B. In terms of 2015 pet ownership:

1. The five states with the highest percent of household pet ownership were: 1) Vermont; 2) Idaho; 3) West Virginia; 4) Montana; and 5) Mississippi.
2. The five states with the lowest percent of household pet ownership were: 46) Connecticut; 47) New Jersey; 48) North Dakota; 49) California; and 50) New York.
3. The top five factors influencing household pet ownership were: 1) homeownership; 2) disposable personal income per capita; 3) private industry support for pet ownership; 4) percent of the population with a college degree; and 5) intake of animals to shelters.

The MSAs with populations over 1,000,000 in terms of the greatest concentration of private industry pet support services were:

- 1) Los Angeles, CA
- 2) Birmingham, AL
- 3) St. Louis, MO
- 4) Hartford, CT

The MSAs with populations between 300,000 and 1,000,000 in terms of the greatest concentration of private industry pet support services were:

- 1) Portland, ME
- 2) Boulder, CO
- 3) Eugene, OR,
- 4) Oxnard-Ventura, CA

The MSAs with populations under 300,000 in terms of greatest concentration of private industry pet support services were:

- 1) Auburn, AL
- 2) Hanford-Corcoran, CA
- 3) Homosassa Springs, FL,
- 4) Lima, OH

³Pet friendly is a measure of private industry support for pets in the community. It does not take into account regulations or animal shelters, or pet homelessness.

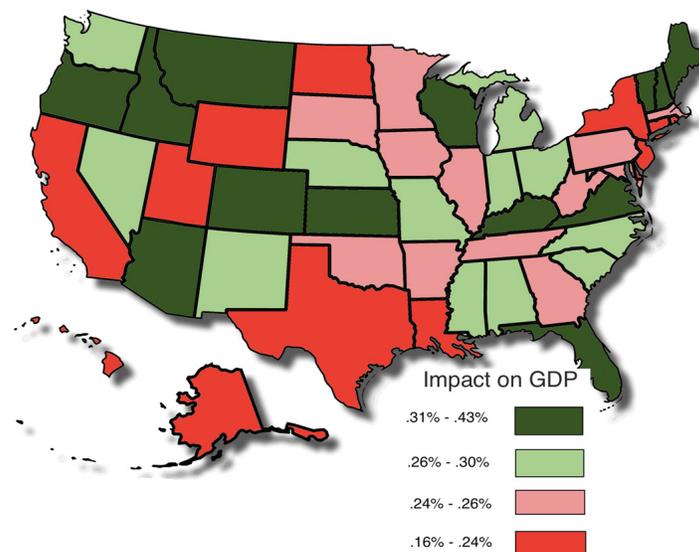
Executive Summary

IV. The Economic Impact of the Pet Industry on U.S. States and Metropolitan Areas:

A. Impacts of the Pet Industry for U.S. States, 2015.

1. Figures Ex.2 and Ex.3 show estimated state impacts for 2015 as a share of GDP and jobs, respectively.
2. The impact of the pet industry for the 50 states was a median of 0.26 percent of GDP and 0.54 percent of total jobs.
3. As a percent of GDP, the top five states experiencing pet industry impacts were: 1) Vermont with 0.43 percent of GDP; 2) Montana with 0.41 percent of GDP; 3) New Hampshire with 0.38 percent of GDP; 4) Maine with 0.37 percent of GDP; and 5) Idaho with 0.37 percent of GDP.
4. As a percent of total jobs, the top five states experiencing pet industry impacts were: 1) New Hampshire with 0.77 percent of total jobs; 2) Colorado with 0.75 percent of total jobs; 3) Oregon with 0.74 percent of total jobs; 4) Vermont with 0.73 percent of total jobs; and 5) Montana with 0.71 percent of total jobs.
5. In 2015, the pet industry supported 558,505 jobs in the U.S. and generated \$44.4 billion in GDP.⁴

Figure Ex.2: Impact of pet industry on state GDP, 2015



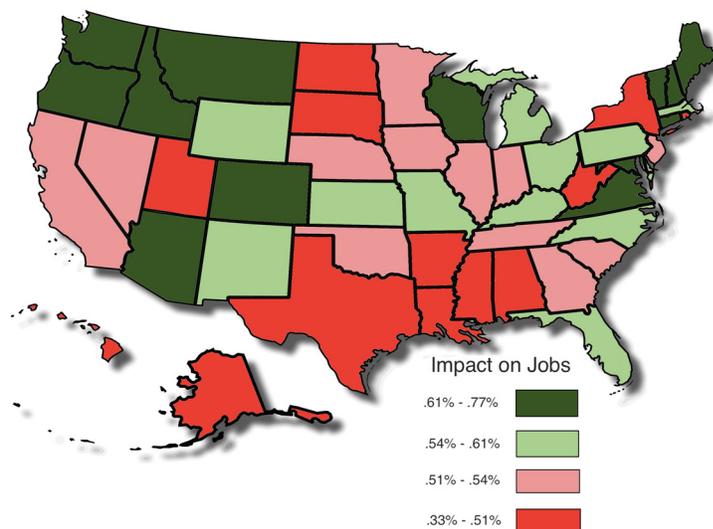
Source: Goss and Associates based on IMPLAN multipliers

⁴A 2015 George Mason study (2015) concluded that the pet industry produced \$221 billion in economic impacts and supported 1.3 million U.S. jobs for 2015. The George Mason study included manufacturing of pet supplies and pet wholesale. The present study does not include these two large and significant sectors. Manufacturing and wholesale trade industries linked to the pet industry are little influenced by local conditions including pet regulations, laws and population characteristics. These two industries are influenced by national and even global factors, and less by population characteristics and pet ownership decisions which is the focus of this study. Accessed June 21, 2017, https://habri.org/docs/HABRI_Report_-_Healthcare_Cost_Savings_from_Pet_Ownership_.pdf.

Executive Summary

As a percent of GDP, the top five states experiencing pet industry impacts were: 1) Vermont with 0.43 percent; 2) Montana with 0.41 percent; 3) New Hampshire with 0.38 percent of GDP; 4) Maine with 0.37 percent; and 5) Idaho with 0.37 percent.

Figure Ex.3: Impact of pet industry on total state jobs, 2015



Source: Goss and Associates based on IMPLAN multipliers

B. Impacts of the Pet Industry for U.S. MSAs, 2015.

1. For MSAs over 1,000,000 in population, the top 5 MSAs were: 1) New York with \$2.02 billion in total impact and 8,797 jobs; 2) Chicago with \$1.28 billion and 5,564 jobs; 3) Boston with \$1.27 billion and 5,521 jobs; 4) Atlanta with \$1.16 billion and 5,041 jobs; and 5) Houston with \$1.08 billion and 4,690 jobs.
2. For MSAs with population between 300,000 and 1,000,000, the top 5 MSAs were: 1) Raleigh-Durham, NC with \$363.6 million and 1,583 jobs; 2) Grand Rapids, MI with \$270.3 million and 1,176 jobs; 3) Madison, WI with \$267.9 million and 1,166 jobs; 4) Buffalo, NY with \$256.3 million and 1,116 jobs; and 5) Portland, ME with \$232.8 million and 1,013 jobs.
3. For MSAs with populations under 300,000, the top 5 MSAs were: 1) Wilmington, NC with \$85.5 million and 372 jobs; 2) Gainesville, FL with \$83.4 million and 363 jobs; 3) San Luis Obispo, CA with \$55.4 million and 241 jobs; 4) Greeley, CO with \$54.1 million and 236 jobs; and 5) Fayetteville, NC with \$52.2 million and 227 jobs.

Executive Summary

C. Economic impact of animal shelters based on total U.S. net shelter intakes for 2016 of 2.7 million:

1. There was an estimated \$1.3 billion in direct spending and total economic impacts of animal shelters of \$2.4 billion.
2. The 5 states experiencing the largest economic impacts for 2016 were: 1) California \$332.8 million, 2) Texas \$200.7 million, 3) Florida \$190.5 million, 4) Arizona \$113.0 million, and 5) Colorado \$92.8 million.
3. The 5 states experiencing the smallest 2016 impacts were: 46) Wyoming \$6.8 million, 47) Nebraska \$5.5 million, 48) Alaska \$4.5 million, 49) North Dakota, and 50) South Dakota \$1.1 million.

V. Public Policy, Pet ownership and Economic Growth

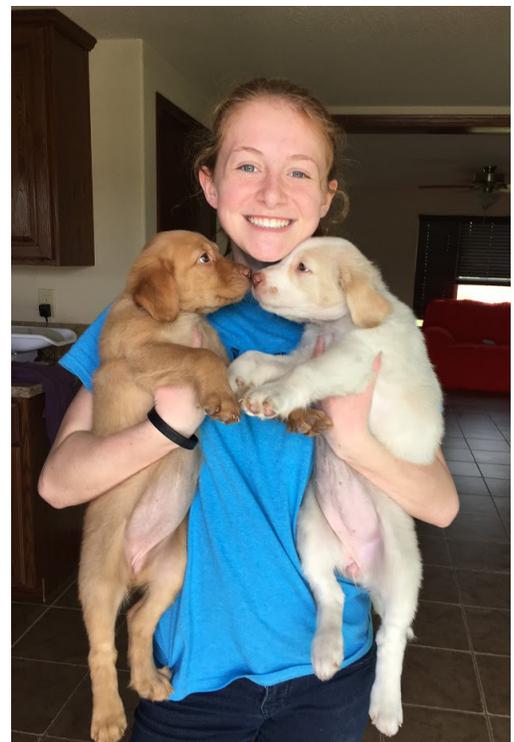
A. The prevalence of pet-friendly housing units, particularly rentals, was found to be key for the existence of a pet-friendly community.⁵

1. Pet-friendly units generally have an increased market value of 20 percent to 30 percent for property owners over non-pet-friendly units.
2. Locations with milder weather and a large number and size of public parks are weighted more highly in terms of pet ownership than those that do not possess these characteristics.

VI. Impact of Pet Laws and Ordinances

- A. Higher ranked states, in terms of pet laws and ordinances or states with more restrictive pet laws and ordinances, have higher rates of pet ownership.
- B. Data indicate that more restrictive pet laws and ordinances result in higher pet friendliness rankings.⁶

Pet-friendly units generally have an increased market value of 20 percent to 30 percent for property owners over non-pet-friendly units.



Goss & Associates, 2017

⁵Carlisle-Frank, Pamela; Frank, Joshua; Nielsen, Lindsey. *Companion Animal Renters and Pet-Friendly Housing in the U.S.*, The Foundation for Interdisciplinary Research and Education Promoting Animal Welfare, FIREPAW, Inc., 2004. *Anthrozoös*. 2005 Mar 1;18(1):59-77. Accessed July 15, 2015 at <https://firepaworg.files.wordpress.com/2016/07/cars-scientific-study-anthrozoos.pdf>.

⁶Breed specific legislation was not considered or examined.

Chapter 1: Pet Ownership and State and Local Economies

Chapter Highlights

- **Between 2008 and 2016, in the U.S.:**
 - o Total pet spending expanded at a compound annual growth rate of 3.14 percent.
 - o Per capita pet spending advanced at a compound annual rate of 2.36 percent.
 - o Per capita pet spending, adjusted for inflation, climbed at a compound annual growth rate of just 0.32 percent.
 - o The total number of dogs and cats expanded from 165.0 million in 2008 to 167.4 million in 2016.
 - o The number of dogs and cats per capita declined from 0.54 in 2008 to 0.52 in 2016.
- **Between 2016 and 2022, in the U.S.:**
 - o Total pet spending is projected to rise at a compound annual rate of 1.9 percent.
 - o Per capita pet spending is forecast to grow at a compound annual rate of 1.06 percent.
 - o Per capita inflation adjusted pet spending is projected to fall at a compound annual rate of 0.95 percent.
- It is projected that the number of dogs and cats in the U.S. will advance from 167.4 million in 2016 to 191.6 million in 2022, or from 0.52 per capita in 2016 to 0.56 per capita in 2022.
- **Between 2003 and 2016:**
 - o Data indicate a slightly negative to no correlation between past economic growth and current or future pet ownership in the U.S. and internationally.
 - The pet industry, as a more mature industry, tends to increase at a slower pace than the overall economy.
 - Pet spending is more of a consumer staple and thus less influenced by the business cycle, rising less in economic upswings, and falling less in economic downturns than the overall economy.
 - o Data indicate a positive correlation between past pet ownership and current/future economic advancement both in the U.S. and internationally.
 - Just as higher human population growth leads to rising economic growth, data indicate that higher pet ownership growth leads to improvements in current/future economic growth, both in the U.S. and internationally.



It is projected that the number of dogs and cats in the U.S. will advance from 167.4 million in 2016 to 191.6 million in 2022, or from 0.52 per capita in 2016 to 0.56 per capita in 2022:

- **Between 1970 and 2016 nationally:**
 - o Each one percent addition to disposable personal income produced a 0.76 percent increase in pet spending.
 - o Each one percentage point increase in homeownership added 1.48 percent growth in pet spending.
 - o It is estimated that the downturn in U.S. homeownership begun in 2004 has resulted in approximately \$6.1 billion less 2016 pet spending.
- Data indicate that states with the strongest pet protection laws experienced the highest state growth and the greatest degree of private spending support for pet ownership.

Each one percent addition to disposable personal income produced a 0.76 percent increase in pet spending nationally.

It is estimated that the downturn in U.S. homeownership begun in 2004 resulted in approximately \$6.1 billion less 2016 pet spending.

Introduction: Nations and Pet Ownership

On a macro level, pet ownership generates new businesses and industries such as dog shows, pet hospitals, pet insurance firms and pet hotels. But importantly, the emergence of these activities stimulates other rounds of economic activity through both forward and backward linkages which sustain higher levels of overall economic growth.

Figure 1.1 depicts the interconnectedness between pet ownership and economic growth. As shown, pet ownership influences economic growth directly by the direct spending of pet owners on pet products and services.

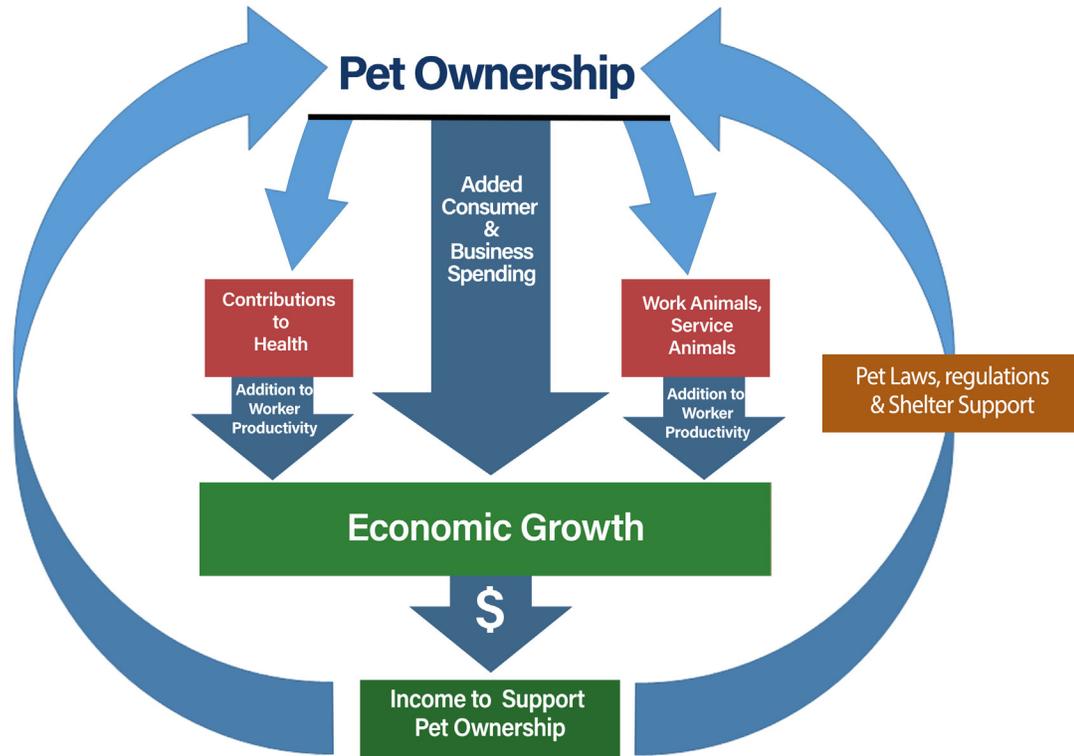
Indirectly, pet ownership affects economic growth by stimulating productivity growth via better health outcomes for pet owners and by additions to worker productivity by working with humans. Pets perform in capacities such as seeing-eye dogs, bomb sniffers, and police officer support.

Aside from their occupational activities, pets serve in therapeutic roles as companions and assistants. For example, dogs detect seizures in humans and assist in occupational therapy, speech therapy and physical rehabilitation to help patients in health recovery.



More than 71 million American households (62%) have a pet, and research studies have found that pets alleviate the pain of depression or loneliness, assist people with physical handicaps or hypertension, and provide various social advantages to their owners.⁷

Figure 1.1: The relationship between pet ownership and economic growth



Source: Goss & Associates, 2017

Additionally, by contributing to healthier workers, pets increase overall labor productivity which adds to economic growth.

⁷Culliton, Barbara J. "Take two pets and call me in the morning; the benefits of pets as therapy for a whole host of ills from hypertension to depression." *Science*, vol. 237, 1987, p. 1560+. Academic OneFile, Accessed 21 June 2017.

A U.S. study found that people who had a dog or cat experienced lower resting heart rates and a lower blood pressure reading at the beginning of a timed math task than participants who were non-pet owners. The study concluded that, “People perceive pets as important, supportive parts of their lives, and significant cardiovascular and behavioral benefits are associated with those perceptions.”⁸

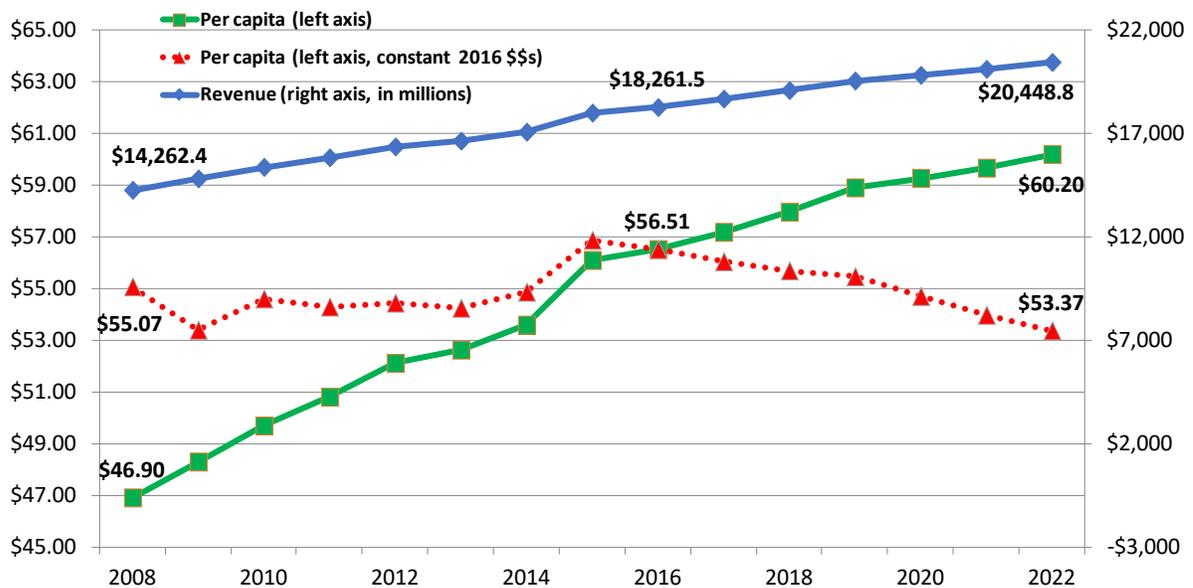
Researchers concluded, in a study of German and Australian adults, that those who owned a pet in both 1996 and 2001 experienced the fewest physician visits, followed by those who had acquired a pet by 2001. On the other hand, the group of people who did not have a pet at either time had the highest number of physician visits.⁹

A 2008 study of women in China found that those who were dog owners had fewer physician visits, were absent fewer days from work due to sickness, and exercised more regularly than non-dog owners.¹⁰

The U.S., with the highest per capita GDP, is the biggest spender on pets with the largest number of dogs in both absolute and per capita terms (one dog for every four Americans). But elsewhere, dogs are on the rise, and the rapid changes in the extent and nature of their ownership reflect new economic realities.

Pets serve individuals, families, businesses and communities across the globe in a myriad of ways. Figure 1.2 depicts the trend in U.S. pet ownership, historically and projected.

Figure 1.2: U.S. pet spending, total and per capita, 2008-2022



Source: Bureau of Economic Analysis, Goss & Associates, IBIS World

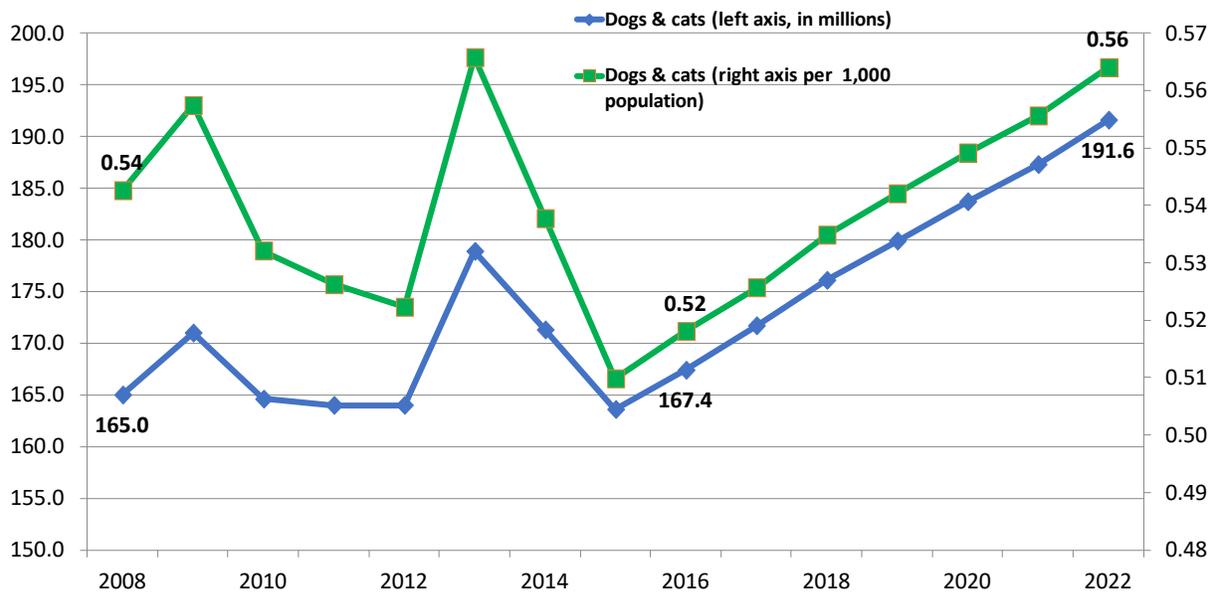
⁸Allen K, Blascovich J, Mendes WB (2002). “Cardiovascular reactivity and the presence of pets, friends, and spouses: the truth about cats and dogs.” *Psychosomatic Medicine*. Sep-Oct; 64(5):727-39.

⁹Health correlates of pet ownership from national surveys. Headey, Bruce; Grabka, Markus McCardle, Peggy (Ed); McCune, Sandra (Ed); Griffin, James A. (Ed); Maholmes, Valerie (Ed). (2011).” How animals affect us: Examining the influences of human-animal interaction on child development and human health, (pp. 153-162). Washington, DC, US: American Psychological Association, xvi, 228 pp. <http://dx.doi.org/10.1037/12301-008>.

¹⁰Headey BW, Fu Na, Zheng R (2008). “Pet Dogs Benefit Owners’ Health: A Natural Experiment in China.” *Social Indicator Research*. 87:481-493.

Figure 1.3 profiles U.S. actual dog and cat ownership from 2008 to 2016, and projected from 2016 to 2022. As presented, the number of dogs and cats per capita in the U.S. declined from 0.54 in 2008 to 0.52 in 2016. During this same period of time, the total number of dogs and cats expanded from 165.0 million to 167.4 million. Looking forward, it is projected that the number of dogs and cats per capita will advance from 0.52 in 2016 to 0.56 in 2022, or in total from 167.4 million in 2016 to 191.6 million in 2022.¹¹

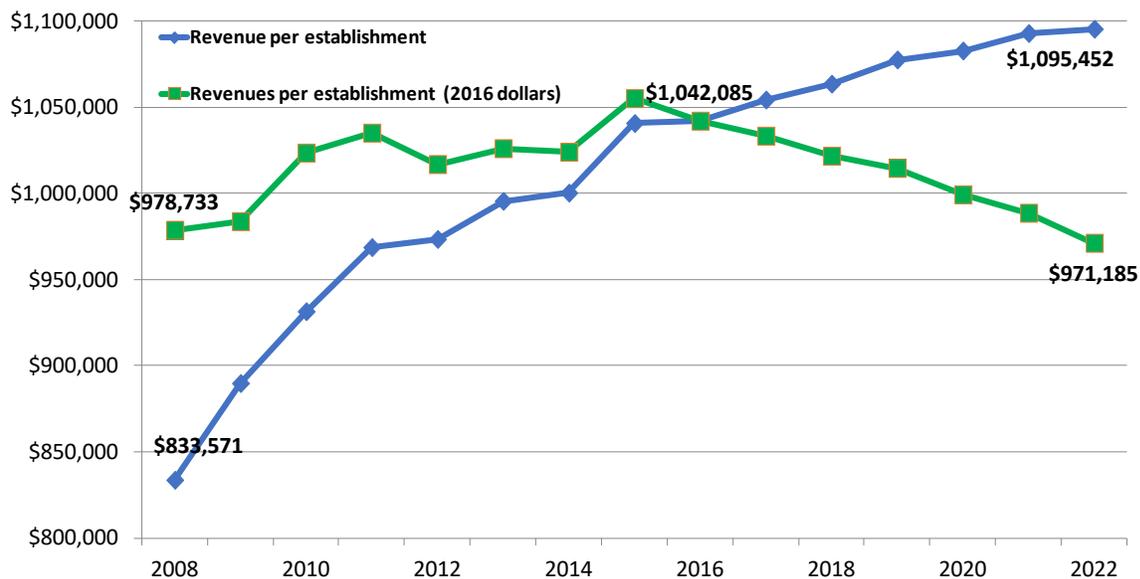
Figure 1.3: U.S. dog & cat ownership (in millions) and per capita dog & cat ownership, 2008-22



Source: IBISWorld

Figure 1.4 compares revenue per pet establishment in 2017 and in 2016, or inflation adjusted, dollars. As presented, non-inflation adjusted pet spending per establishment is expected to expand by 11.9 percent between 2008 and 2022, and inflation adjusted pet spending per establishment is projected to fall by 0.8 percent between 2008 and 2022.

Figure 1.4: U.S. pet spending per establishment in current dollars and in 2016 constant dollars, 2008-2022



Source: IBISWorld

¹¹Due to IBISWorld’s use of a liner regression model, past volatility is “ironed out” under the assumption of fixed estimated coefficients. The IBISWorld forecast would have benefited with the use of a non-linear estimation model.

Chicken or Egg: Does Pet Ownership Precede or Follow Economic Growth?

Dog ownership and pet ownership have been found to both follow and precede economic growth and wealth creation. That is, research has concluded that as nations, states and metro areas benefit from strong economic growth, higher pet ownership follows. Likewise, other research has concluded that pet ownership stimulates and enables economic growth.¹²

Thus, as incomes rise, some people can afford to have pets for the first time, while others decide they can afford new pet toys, trips to the groomer, or higher priced pet games and toys.

Table 1.1 lists pet ownership for the U.S. and 12 other nations for 2012. As listed, the U.S. had the highest number of dogs overall, and the greatest number of dogs per 1,000 population.

As presented, data indicate a negative relationship between dogs per 1,000 population, and the percent change in dogs between 2007 and 2012 with a correlation coefficient of -0.17. On the other hand, there is a positive, though weak, relationship between average GDP growth and dogs per capita with a positive but weak correlation coefficient of 0.21.¹³

Table 1.1: International dog ownership, 2012

Country	Total dogs 2012	Dogs per 1,000 population	% change in # of dogs 2007-12	Average GDP growth
U.S.	75,800,000	241.3	2.20%	0.80%
Argentina	9,200,000	218.6	20.10%	2.60%
Romania	4,100,000	204.4	-4.20%	9.90%
Brazil	35,700,000	176.4	14.30%	4.10%
Philippines	11,600,000	120.8	38.30%	5.10%
Venezuela	3,100,000	113.9	29.80%	14.60%
France	7,400,000	112.7	-6.90%	0.40%
Russia	15,000,000	107.6	28.00%	16.20%
Japan	12,000,000	94.1	-4.30%	0.10%
Greece	700,000	63.4	-2.90%	-388.00%
Switzerland	400,000	49.9	-9.80%	1.70%
China	27,400,000	20.3	2.30%	10.20%
India	10,200,000	8.1	58.10%	7.50%

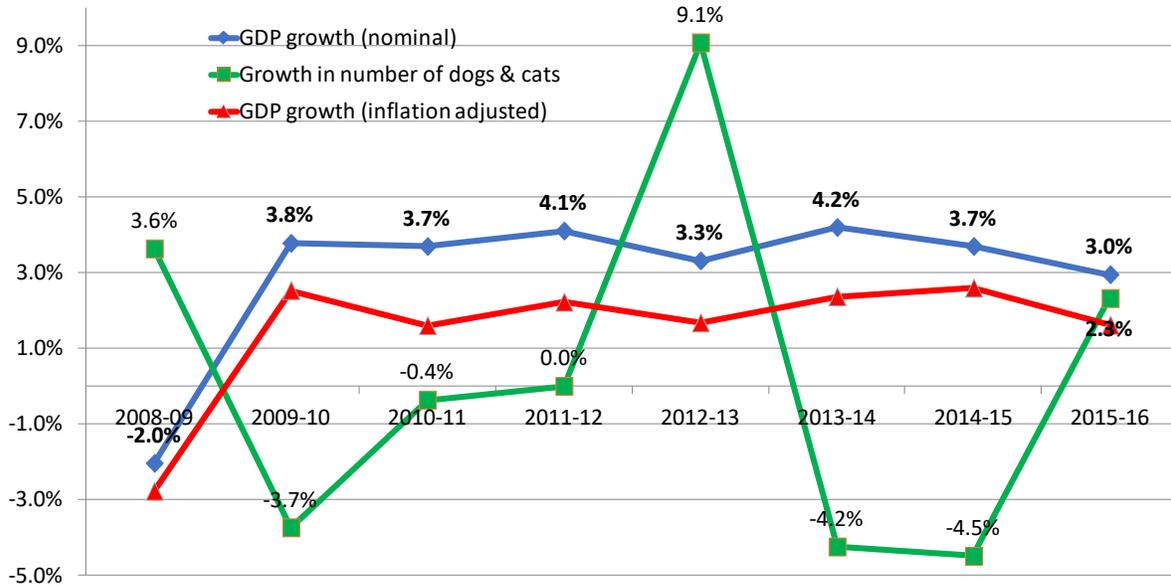
Source: Quartz

¹²“Economic Impacts of the Pet Industry in the United States,” George Mason University 2015 Briefing Paper. <http://pijac.org/sites/default/files/pdfs/PetIndustryImpactsBriefingPaper2015.pdf>.

¹³A correlation coefficient is a measure that captures the degree to which the movement in two variables, economic growth and pet ownership, in this case, are associated. The range of values for the correlation coefficient is -1.0 to +1.0. A correlation of -1.0 indicates a perfect negative correlation, while a correlation of +1.0 indicates a perfect positive correlation (e.g. Fahrenheit and Centigrade temperature).

Figure 1.5 compares the growth rate of GDP, both nominal and inflation adjusted, with the growth in the number of dog and cats in the U.S. As presented, there is significantly greater variability in pet ownership (dogs and cats) than there is in economic growth.

Figure 1.5: Number of pets (dogs & cats) and GDP growth, U.S., 2008-16



Source: Goss & Associates based on U.S. BEA data and IBISWorld data

Next, data from Table 1.1 and Figure 1.5 will be examined to determine on a one-dimensional basis if pet spending tends to precede or follow economic growth.



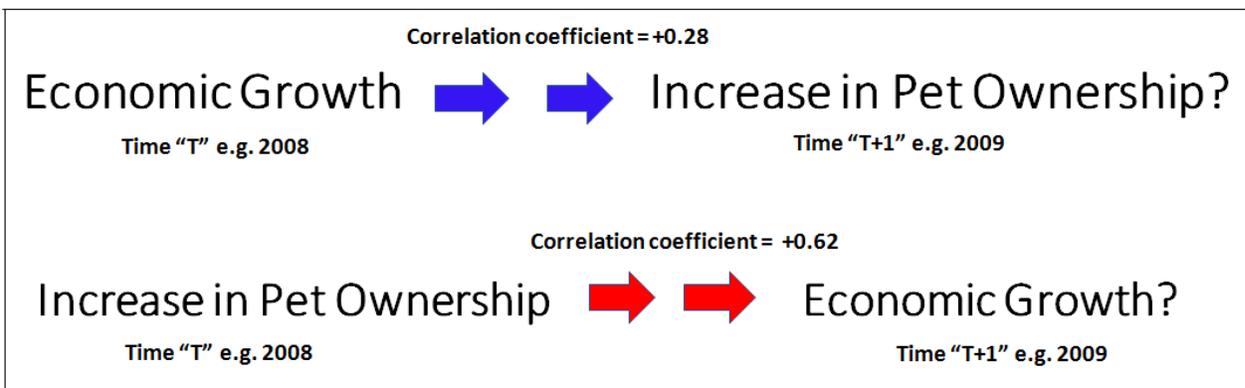
Goss & Associates, 2017

Figures 1.6 (U.S.) and 1.7 (international) show the association between economic growth and pet ownership. In this case, simple correlation coefficients are used to gauge the strength of the relationship.

As presented, the correlation is not strong between economic growth in time t (e.g., 2008) and time $t+1$ (e.g., 2009) with a correlation coefficient of $+0.28$. On the other hand, the association between pet ownership in time t and economic growth in time $t+1$ is positive with a correlation coefficient of $+0.62$. Thus, data show that pet ownership has a stronger influence on economic growth than economic growth has on pet ownership.

Thus, data show that pet ownership has a stronger influence on economic growth than economic growth has on pet ownership.

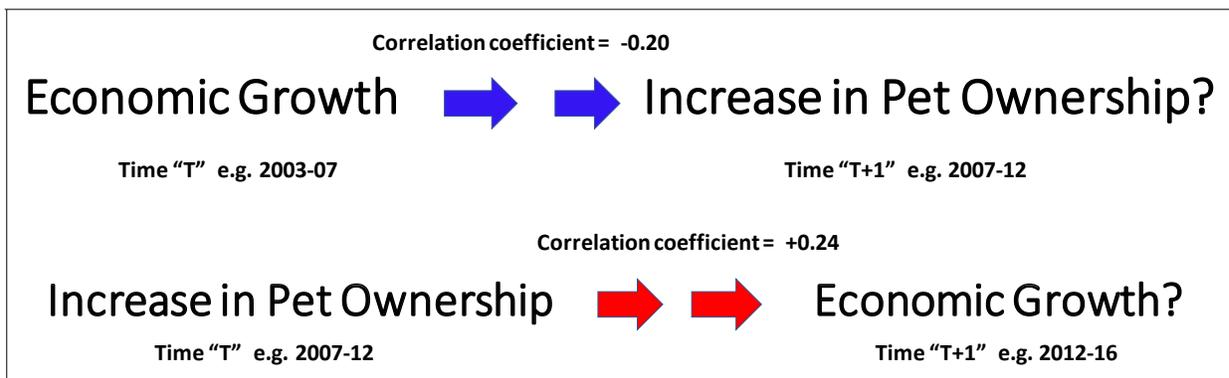
Figure 1.6 Association between economic growth and pet ownership in U.S., 2003-16



Source: Goss & Associates

Internationally, as presented in Figure 1.7, neither relationship is strong, with correlation coefficient between -0.30 and $+0.30$.

Figure 1.7 Association between economic growth and pet ownership internationally, 2003-16⁷



Source: Goss & Associates

Economic Growth and Pet Industry Support Services Among U.S. States

Many factors play a role in pet ownership. For example, population density and weather often dictate the type of pet ownership. Likewise, state and local regulations heavily influence the degree of pet ownership. One metric that is often used to rank geographic areas in terms of business or industry support for an activity such as pet ownership is a location quotient (LQ).

Location quotients (LQs) are ratios that allow an area's distribution of employment by industry to be compared to a reference or base area's distribution. In this chapter, the reference region is the U.S. If an LQ is equal to 1.0, then the industry has the same share of its area employment as does the U.S.

An LQ greater than 1.0 indicates an industry with a greater share of the local area employment than is the case in the reference area.

For example (assuming the U.S. as the reference area), Florida will have an LQ greater than 1.0 in the pet industry because this industry makes up a larger share of the Florida employment total than it does for the country as a whole.

LQs are calculated by first dividing local industry employment by the all-industry total of local employment. Second, industry employment is divided by the all-industry total for the U.S. Finally, the local ratio is divided by the U.S. ratio.

Table 1.2 lists industries supporting pet ownership in the U.S. As presented, 43.5 percent of pet industry support is in NAICS 54194, or veterinary services.¹⁴

Next, the 50 states and D.C. are divided into four quadrants as depicted in Figure 1.8. This separation provides insight into the relationship between economic growth and the support for the pet industry.

Table 1.2: Industries supporting pet ownership, U.S., 2015

NAICS	Industry	Employment	Establishments	Employment per establishment	Share of total pet support
54194	Veterinary services	338,667	30,984	10.9	43.5%
44422	Feed stores	124,031	13,907	8.9	15.9%
45391	Pet and pet supplies stores	110,639	9,417	11.7	14.2%
81291	Pet care (except veterinary) services	90,588	16,325	5.5	11.6%
71213	Petting zoos, reptile exhibits, aquariums	35,203	632	55.7	4.5%
81222	Pet cemeteries	33,436	5,201	6.4	4.3%
524128	Pet health insurance carriers	27,299	562	48.6	3.5%
11521	Artificial insemination services for pets	19,474	4,485	4.3	2.5%
	Total pet support	779,337	81,513	9.6	100.0%

Source: Goss & Associates calculations based on U.S. Census County Business Patterns, 2015

¹⁴The source of data in Table 1.2 is the U.S. Census Bureau County Business Patterns. This dataset does not capture shelter data. In 2016, more than 2,200 sheltering organizations experienced a net intake of 2,245,242 (dogs & cats only).

Quadrant 1 (high growth, high private pet support): Median GDP growth for this quadrant was 8.9 percent with a pet-friendly score of 4.8, the highest group score. Furthermore, this group had a median location quotient of 1.11 indicating that, compared to the nation, there was more private support for pet ownership than the U.S. median. The states are placed into the quadrants relative to their scores. That is, Oregon had the highest degree of private pet ownership support among the group while Colorado had the fastest GDP growth.

Figure 1.8 indicates that states with higher pet-friendly scores experienced superior economic growth compared to states with lower pet-friendly scores.

Quadrant 2 (slow growth, high private pet support): Median GDP growth for this quadrant was 3.7 percent with a median pet-friendly score of 3.7, the lowest group score. Furthermore, this group had a median location quotient of 1.17 indicating that compared to the nation, there was more private support for pet ownership than the U.S. median. The states are placed into the quadrants relative to their scores. That is, Montana had the highest degree of private pet ownership support and the fastest GDP growth among the group.

Quadrant 3 (slow growth, low private pet support): Median GDP growth for this quadrant was 2.0 percent with a median pet-friendly score of 3.9. Furthermore, this group had a median location quotient of 0.82 indicating that compared to the nation, there was less private support for pet ownership than the U.S. median. The states are placed into the quadrants relative to their scores. That is, Wyoming had the highest degree of private pet ownership support among the group while South Dakota had the fastest GDP growth.

Quadrant 4 (high growth, low private pet support): Median GDP growth for this quadrant was 7.8 percent with a median pet-friendly score of 4.3. Furthermore, this group had a median location quotient of 0.89 indicating that compared to the nation, there was less private support for pet ownership than the U.S. median. The states are placed into the quadrants relative to their scores. That is, Indiana had the highest degree of private pet ownership support and Texas experienced the fastest GDP growth.

Figure 1.8 indicates that states with higher pet-friendly scores, Quadrants 1 and 4, experienced superior economic growth compared to states with lower pet-friendly scores.¹⁵ Essentially, pet friendly, in this instance, represented greater legal protections for pets in terms of 1) animal cruelty, 2) animal fighting, 3) animal abuse, 4) exotic pet restrictions, 5) puppy mill restrictions, 6) companion animal treatment, 7) U.S. animal law protection ranking and 8) 2015 Humane Society ranking.

Thus, data in Figure 1.8 indicate, or suggest, that states which have more legal protections for pets tend to experience higher GDP growth. Of course, statistically this issue is too complex to draw such a conclusion based on this limited analysis. However, the association among pet regulation, private pet support, and economic growth will be examined in more depth in a future chapter of this study.

Data listed in Figure 1.8 indicate that greater availability of private pet industry services stimulates pet ownership, and increases in pet ownership encourage upturns in private industry pet support. For example, the existence of a local veterinarian is more likely in areas with a high degree of pet ownership. Additionally, the existence of a local veterinarian is likely to encourage non-pet owners to become pet owners.

¹⁵<http://www.rankings.com/pet-friendly-states/> "We identified 43 current animal rights laws protecting pets in various states, divided across six legal categories: Animal Cruelty, Animal Fighting, Animals in Research, Companion Animals, Exotic Pets and Puppy Mills. We looked at when laws were instated, how they were enforced and how they compared to similar laws in other states. Then we assessed each state on how well they ranked on those two previously mentioned rankings. Each state was graded on the six legal categories and the two rankings to calculate their overall score."

Figure 1.8 Pet friendliness, economic growth and private support for pet ownership by state, 2009-2016¹⁶

	High GDP Growth States	Low GDP Growth States
High pet support from private industry	Quadrant 1	Quadrant 2
	<p>Oregon</p> <p>Colorado</p> <p>New Hampshire</p> <p>Washington</p> <p>Idaho</p> <p>North Carolina</p> <p>Mass.</p> <p>Florida</p> <p>South Carolina</p> <p>Oklahoma</p> <p>Michigan</p> <p>Iowa</p> <p>Median pet friendly score = 4.8</p> <p>Median pet ownership = 60.8%</p>	<p>Montana</p> <p>Virginia</p> <p>Maine</p> <p>Kansas</p> <p>New Mexico</p> <p>Maryland</p> <p>Arizona</p> <p>Wisconsin</p> <p>Connecticut</p> <p>Kentucky</p> <p>Vermont</p> <p>Missouri</p> <p>Alabama</p> <p>Median pet friendly score = 3.7</p> <p>Median pet ownership = 60.4%</p>
Low pet support from private industry	Quadrant 4	Quadrant 3
	<p>Ind.</p> <p>California</p> <p>Ohio</p> <p>Penn.</p> <p>Nevada</p> <p>Tennessee</p> <p>Minnesota</p> <p>DE</p> <p>Nebraska</p> <p>Georgia</p> <p>Utah</p> <p>Texas</p> <p>HI</p> <p>Median pet friendly score = 4.3</p> <p>Median pet ownership = 58.4%</p>	<p>Wyoming</p> <p>Illinois</p> <p>New Jersey</p> <p>South Dakota</p> <p>Mississippi</p> <p>Alaska</p> <p>New York</p> <p>Rhode Island</p> <p>West Virginia</p> <p>North Dakota</p> <p>Arkansas</p> <p>Louisiana</p> <p>Median pet friendly score = 3.9</p> <p>Median pet ownership = 55.8%</p>

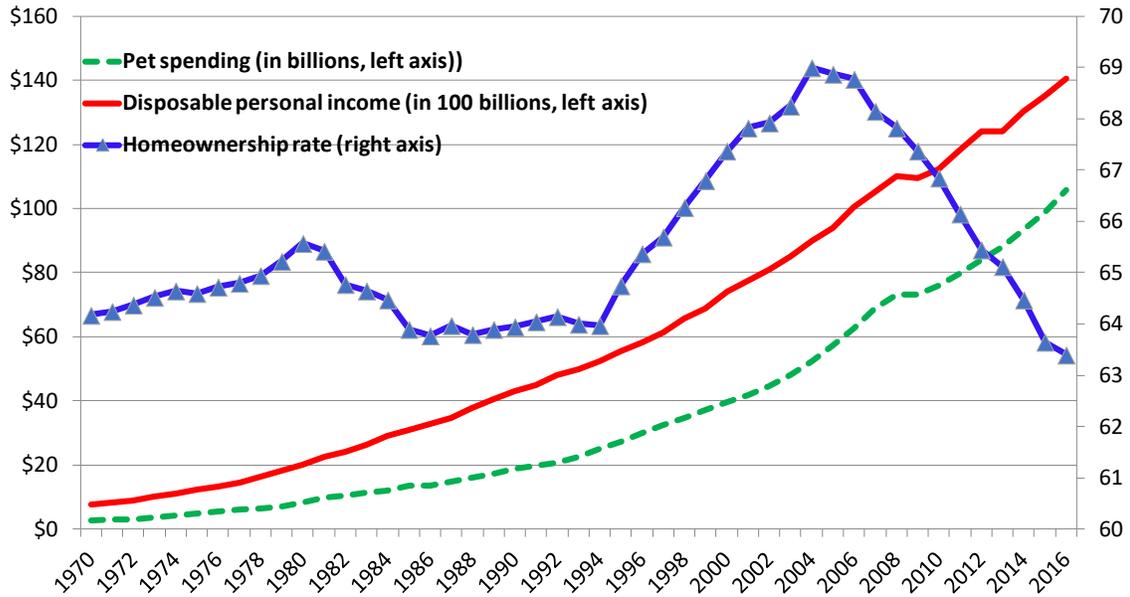
Source: Goss & Associates calculations based on U.S. BEA data and NAIA pet scores

¹⁶Data in Figure 1.8 suggest that greater private industry pet support services stimulates pet ownership and increases in pet ownership encourage upturns in private industry support. For example, the existence of a local PetSmart outlet is more likely in areas with a high degree of pet ownership. Additionally, a local store is likely to encourage non-pet owners to become a pet owner.

Factors that Stimulate Pet Spending

U.S. pet owners have expanded pet spending from \$2.7 billion in 1970 to \$105.7 billion in 2016.¹⁷ Figure 1.9 profiles this rapid expansion with pet spending growing at a compound annual growth rate of 8.3 percent, and disposable personal income climbing by 6.5 percent, compounded annually. U.S. homeownership, on the other hand, rose from 64.2 percent in 1970 to 69.2 percent in 2004, but fell to 63.4 percent in 2016.

Figure 1.9 Pet spending, homeownership and disposable personal income, 1970-2016



Source: U.S. Census

To investigate further, pet spending is modeled using regression analysis with results presented in Appendix A. As presented, each one percent addition to disposable personal income produces a 0.76 percent increase in pet spending and each one percentage point increase in homeownership adds 0.68 percent growth in pet spending.

It is estimated that the downturn in U.S. homeownership resulted in approximately \$6.1 billion less pet spending in 2016 alone.

As presented, each one percentage point addition to disposable personal income produces a 0.76 percent increase in pet spending and each one percentage point increase in homeownership adds 0.68 percent growth in pet spending.

It is estimated that the downturn in U.S. homeownership has resulted in approximately \$6.1 billion less pet spending in 2016 alone.

¹⁷Pet spending defined here includes spending at pet stores and at veterinarians.

Chapter 2: Meta-Analysis of Factors Contributing to Pet Friendliness

Chapter Highlights:

- **Literature Review:**
 - Past studies on subjects within the pet industry tend to converge on the following determinants of pet friendliness:
 - Availability of pet-friendly housing units.¹⁸
 - Cost of pet ownership.¹⁹
 - Terrain considerations.²⁰
- **Meta-Analysis:**
 - Conflicting data from past studies point out that determinants of pet friendliness are complex.
- **The Top 5 pet friendly MSAs for 2015 were:**
 - Over one million in population were: 1) Los Angeles, CA; 2) Birmingham, AL; 3) St. Louis, MO; 4) Hartford, CT; and 5) Philadelphia, PA.
 - With between 300,000 and one million in population were: 1) Portland, ME; 2) Boulder, CO, 3) Eugene, OR; 4) Oxnard,-Ventura, CA; and 5) Kingsport-Bristol, TN.
 - With under 300,000 in population were: 1) Auburn, AL; 2) Hanford-Corcoran, CA; 3) Homosassa Springs, FL; 4) Lima, OH; and 5) Panama City, FL.

The prevalence of pet-friendly housing units, particularly rentals, was found to be key to the existence of a pet-friendly community.

¹⁸Carlisle-Frank, Pamela, Joshua M. Frank, and Lindsey Nielsen. "Companion animal renters and pet-friendly housing in the US." *Anthrozoös* 18.1 (2005): 59-77.

¹⁹WalletHub 2016; Zumper 2016; Econ Life 2013; Forbes 2007.

²⁰Terrain refers to weather, availability of public parks, walkability score, and pet-friendly trails. With many pets, especially dogs, weather is a key habitability consideration.

Introduction

With approximately 70 million dogs and over 74 million cats,²¹ research on pets and the pet industry in the United States is extensive and varied in nature. From health- and psychology-related research on pet owners, to pet behavioral studies, as well as economic analyses of the pet industry, pets in general are a well-studied subject.

One area of pet studies that has received less analysis from academic research is community "pet friendliness." As such, the determination as to what makes an area pet friendly has been studied extensively by non-profit organizations and businesses alike. Because this is a normative question (concerned with what ought to be) rather than a positive question (concerned with what is) businesses and non-profit organizations have undertaken most of the analysis with the academic community focusing on other areas.

Although past studies on the subject have been remarkably varied as to their criteria for what makes a pet-friendly community, they have had some very similar insights. The key themes and criteria for assessment which arise from the research on the subject are the availability of pet-friendly housing units, the cost of pet ownership, and terrain considerations.²²

It makes sense that the studies would converge on these measures. Contained within them are both the requisites for pet ownership and the means to a pleasant life for owners and their pets. The prevalence of pet-friendly housing units, particularly rentals, was found to be key for the existence of a pet-friendly community.

A study funded by FIREPAW found that landlords generally had misconceptions about the additional costs that they would bear should they allow pets in their rental units. It was found that pet-friendly units generally have an increased

²¹AVMA 2012 US Pet Ownership and Demographics Sourcebook.

²²Terrain refers to weather, availability of public parks, walkability score, and pet-friendly trails. With many pets, especially dogs, weather is a key habitability consideration.

market value of 20 percent to 30 percent for property owners over non-pet-friendly units, more than making up for the occasional, and remarkably modest, cost increase due to the inclusion of pets in rental units.²³

Though not investigated here, data indicate that pet friendly renting policies could, to a degree, counteract the decline in pet ownership stemming from the downturn in U.S. home ownership documented in an earlier chapter.

Another key consideration for pet-friendly communities is the cost of pet ownership. WalletHub summarized the costs associated with pet ownership for which data is available in its ranking, including veterinary care costs, minimum petcare provider rate per visit, and dog-insurance premiums.

The ability of pets to thrive in an area is at least partially a function of the affordability of services that cater to them. This in mind, the cost of pet ownership is a key indicator of the pet friendliness of a community.

The third and final key consideration of pet-friendly communities is terrain. Associated with this consideration is weather, availability of public parks, walkability score, and pet-friendly trails. With many pets, especially dogs, weather is a key habitability consideration. Temperate climates with more sunny days tend to be preferred to extreme climates. Pets and pet owners tend to be happier when they have more options for being outside together.

Though not investigated here, data indicate that pet friendly renting policies could, to a degree, counteract the decline in pet ownership stemming from the downturn in U.S. home ownership documented in an earlier chapter.

²³Carlisle-Frank, Pamela; Frank, Joshua; Nielsen, Lindsey. *Companion Animal Renters and Pet-Friendly Housing in the U.S.*

MSAs Ranked Based On Private Industry Pet Support Services

Metropolitan areas across the nation provide support services ranging from pet food from retail outlets to veterinary services. Goss & Associates will use location quotients (LQ) to rank U.S. MSAs for 2015.

At the state level, it was found that states with greater net animal shelter intakes per capita had greater private industry pet support services and larger economic impacts from the pet industry.²⁴ As identified in previous chapters, metropolitan location quotients gauge the relative provision of support services for the industry. MSAs with the highest LQs, using this methodology, are the highest ranking. Table 2.1 lists the top 60 U.S. pet-friendly metropolitan areas for 2015 in terms of private industry pet support services.

Pet-friendly units generally have an increased market value of 20 percent to 30 percent for property owners than do non-pet-friendly units, more than making up for the occasional, and remarkably modest, cost increase due to the inclusion of pets in rental units.

²⁴Correlation coefficient between number of net shelter intakes per capita and private industry pet support services was +0.33.

Table 2.1: Metropolitan rankings, based on the provision of private pet industry support services, 2015

MSAs with more than 1,000,000 population	Rank	MSAs with 300,000 to 1,000,000 population	Rank
Los Angeles-Long Beach-Anaheim, CA	1	Portland-South Portland, ME	1
Birmingham-Hoover, AL	2	Boulder, CO	2
St. Louis, MO	3	Eugene, OR	3
Hartford-West Hartford-East Hartford, CT	4	Oxnard-Thousand Oaks-Ventura, CA	4
Philadelphia-Camden-Wilmington, PA	5	Kingsport-Bristol-Bristol, TN	5
Dallas-Fort Worth-Arlington, TX	6	Scranton--Wilkes-Barre, PA	6
Salt Lake City, UT	7	Chattanooga, TN	7
Jacksonville, FL	8	Deltona-Daytona Beach, FL	8
Tucson, AZ	9	Cape Coral-Fort Myers, FL	9
Houston-The Woodlands-Sugar Land, TX	10	Palm Bay-Melbourne-Titusville, FL	10
Riverside-San Bernardino-Ontario, CA	11	Lexington-Fayette, KY	11
Memphis, TN	12	Lubbock, TX	12
Seattle-Tacoma-Bellevue, WA	13	Columbia, SC	13
Sacramento--Roseville--Arden-Arcade, CA	14	Lakeland-Winter Haven, FL	14
Phoenix-Mesa-Scottsdale, AZ	15	Ocala, FL	15
Charlotte-Concord-Gastonia, NC	16	Modesto, CA	16
Buffalo-Cheektowaga-Niagara Falls, NY	17	Green Bay, WI	17
New Orleans-Metairie, LA	18	Fort Collins, CO	18
Richmond, VA	19	Asheville, NC	19
Miami-Fort Lauderdale-West Palm Beach, FL	20	Colorado Springs, CO	20

MSAs with less than 300,000 population	Rank
Auburn-Opelika, AL	1
Hanford-Corcoran, CA	2
Homosassa Springs, FL	3
Lima, OH	4
Panama City, FL	5
Rome, GA	6
Fargo, ND	7
Weirton-Steubenville, WV	8
Oshkosh-Neenah, WI	9
Rochester, MN	10
Pueblo, CO	11
Owensboro, KY	12
Sioux Falls, SD	13
Manhattan, KS	14
Columbia, MO	15
Wilmington, NC	16
Clarksville, TN	17
Gadsden, AL	18
Bay City, MI	19
El Centro, CA	20

Source: Goss & Associates, 2017 pet friendliness rankings

Meta-Analysis

The purpose of this portion of the study is to determine the factors that make a community pet friendly based on past analyses. In order to assess the weight of the literature for this purpose, it often proves helpful to go beyond a qualitative literature review and conduct a quantitative meta-analysis, which this study will use.

According to Cochrane Statistical Methods Group, meta-analysis is "... the statistical combination of results from two or more separate studies."²⁵ Or as one scholar puts it, it is, "an analysis of analyses."²⁶ As Goss and Phillips²⁷ state, "...it is a method for statistically analyzing results across empirical studies." It is the best way to produce a sophisticated, comprehensive, and statistically rigorous literature review. The other method of conducting a literature review is the more historically prominent chronological narrative.

The chronological narrative, contrary to meta-analysis, has serious limitations in its ability to characterize previous research done in a given subject area, for three reasons. First, reviewers are often unable to deal with the large number of studies on their topic, so they focus on a few, without discussing how they selected those few.²⁸ Second, reviewers often cite the conclusions of previous reviews without investigating them critically. Third, because certain reviewers are prominent in their fields, they are hesitant to give credit to studies whose conclusions oppose their own. Because of the issues inherent in the chronological narrative, the meta-analysis method has been used rather extensively.

²⁵http://handbook.cochrane.org/chapter_9/9_analysing_data_and_undertaking_meta_analyses.htm.

²⁶Glass, Gene V. "Primary, Secondary, and Meta-Analysis of Research," *Educational Researcher*, Vol. 5, No. 10 (Nov., 1976), pp. 3-8.

²⁷Phillips, J. M., & Goss, E. P. (1995). The effect of state and local taxes on economic development: A meta-analysis. *Southern Economic Journal*, 62(2), 320-333.

²⁸Rudner, Lawrence M.; Glass Gene V.; Ewartt, David L.; Emery, Patrick J. "A User's Guide to the Meta-Analysis of Research Studies. Meta-Stat: Software To Aid in the Meta-Analysis of Research Findings."

<https://eric.ed.gov/?id=ED471519>.

Meta-analysis has been used in fields as diverse as sociology, social psychology, finance, political science, marketing, ecology, genetics, and most relevantly to this study, economics.²⁹

Despite the usage of meta-analysis throughout the field of economics, it has not, to the knowledge of the authors, been used to investigate the factors that make a community pet friendly.

In order to undertake a meta-analysis, one must first conduct a systematic review selecting and reviewing all studies relevant to the subject area, sorting their conclusions based on the methodology used, and identifying the data that is suitable for analysis. After the systematic review is conducted, the meta-analysis can begin.



Goss & Associates, 2017

²⁹https://www.meta-analysis.com/pages/why_do.php.

The research team found that the three studies were generally negatively correlated. With the exception of the WalletHub and Forbes studies, which had a very weak positive correlation at +0.12, Zumper was negatively related to WalletHub and Forbes by -0.38 and -0.41, respectively. This means that as the Zumper rank increases, the WalletHub and Forbes rankings decrease. This most likely indicates that the criteria and selection base of analysis for these studies were exceedingly different, and that results would be better if a greater number of data points existed. Interestingly, the strongest associated factors with pet ranking for the Forbes’ study were concentration of well-educated persons, weather ranking, and percentage of millennials, in that order.

Table 2.2 lists the studies examined for the meta-analysis of the chapter, while Table 2.3 list studies containing pet-friendliness rankings.

Table 2.2: Correlation coefficients among pet friendliness rankings

	Wallet Hub	Forbes	Zumper	Goss & Associates
WalletHub study	1.00			
Forbes study	0.12	1.00		
Zumper study	-0.38	-0.41	1.00	
Goss & Associates study	-0.12	0.33	-0.07	1.00
Weather Rank	0.19	-0.43	0.16	-0.05
Millennial as % of Total	0.02	-0.37	0.07	-0.30
Educated as % of Total	0.09	-0.58	0.02	-0.10

Source: Goss & Associates and listed sources

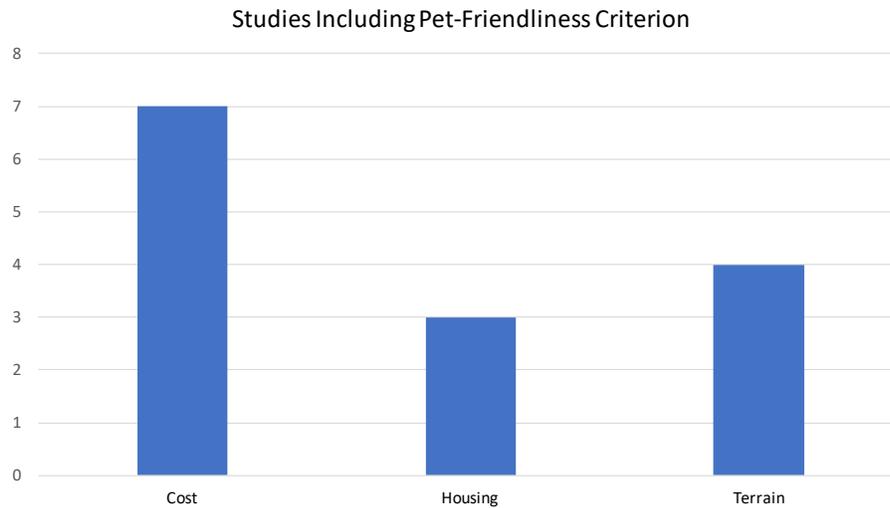
Table 2.3: Studies with pet friendliness rankings

Publishing source	Year of study	Outcome
FIREPAW	2004	Pet-friendly housing generates more economic activity through higher prices than average.
SafeWay	2015	Ranks the top 10 pet-friendly states based on identified independent variables. Tops were: ME, VA, AZ, OK, CO, OR, MA, KS, RI, and WA.
WalletHub	2016	Comparison of the 100 largest US cities across 19 different metrics for a pet friendliness ranking.
Zumper	2016	Determines top 10 pet-friendly cities based on availability of housing that permits pet ownership.
Forbes	2016	Ranks the 50 largest cities in the US - lists 10 of the results.
Goss & Associates	2017	Ranks the nation’s 318 Metropolitan Statistical Areas based on support products, employment and services for the pet industry.

Source: Goss & Associates and listed sources

Figure 2.1 illustrates the frequency of criteria used to determine pet friendliness in the nine assessed studies.

Figure 2.1: Frequency of criteria used to determine pet-friendliness



Source: Goss & Associates

Of the nine studies identified, three assigned quantitative rankings to metropolitan areas based on different, generally non-disclosed, methodologies and criteria. At the same level of analysis, statistics drawn from elsewhere were used to determine the key factors influencing pet rankings. The determinants used in this study were concentration of pet employment³⁰; weather (or terrain) considerations³¹; percentage of millennials; and concentration of well-educated persons.³²

The determinants used in this study were: concentration of pet employment; weather considerations; percentage of millennials; and concentration of well-educated persons.

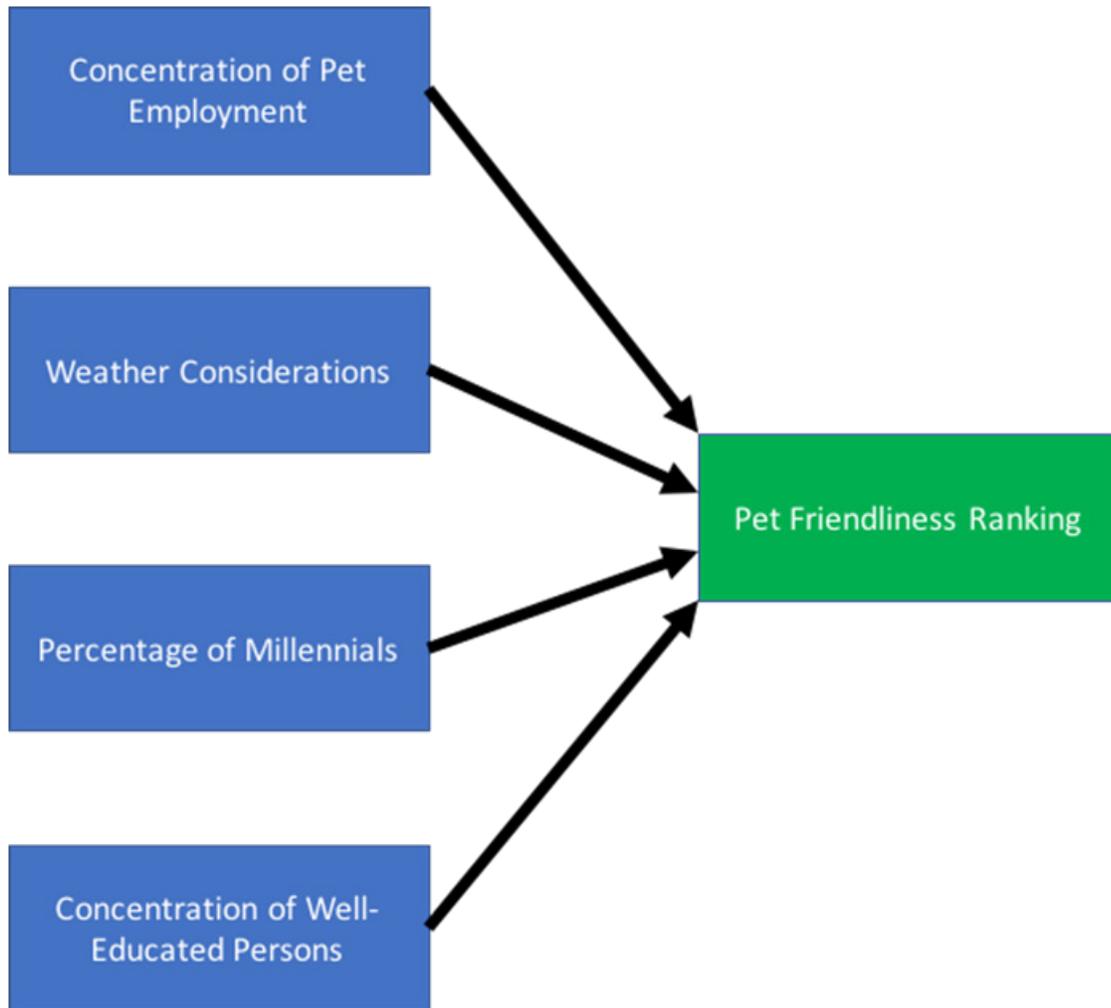
³⁰Goss and Associates calculated.

³¹WalletHub’s weather ranking. <https://wallethub.com/edu/cities-with-the-best-worst-weather/5043/>.

³²Data from the U.S. Census Bureau, 2015.

Figure 2.2 provides an overview of the factors found to affect pet friendliness rankings.

Figure 2.2: Factors influencing pet friendliness



It is difficult to characterize the overall weight of pet rankings statistically because of their lack of proliferation and their non-relationship with each other. However, qualitatively speaking, one can determine the criteria that these studies have in common, such as cost, housing, and weather. From there, one can more effectively discern the factors that make a locality pet friendly.

Table 2.4 contains the percentage of households with pets for the 50 states and DC for 2015.³³ As listed, the top five states in terms of percentage of households with pets for 2015 were: 1) Vermont, 2) Idaho, 3) West Virginia, 4) Montana, and 5) Mississippi. As presented, the bottom five states in terms of percentage of households with pets were: 47) New Jersey, 48) North Dakota, 49) California, 50) New York, 51) District of Columbia.

Table 2.4: Percentage of households with pets, 2015

Ranking	Percentage of households with pets	State	Ranking	Percentage of households with pets	State
1	65.1%	Vermont	27	58.7%	Iowa
2	64.9%	Idaho	28	58.4%	Tennessee
3	64.9%	West Virginia	29	58.4%	Georgia
4	64.3%	Montana	30	58.0%	Arizona
5	63.4%	Mississippi	31	57.8%	South Dakota
6	63.3%	Colorado	32	57.4%	Florida
7	63.3%	New Hampshire	33	57.4%	Oklahoma
8	62.4%	Michigan	34	56.9%	Pennsylvania
9	62.2%	Maine	35	56.8%	Wyoming
10	62.2%	Utah	36	56.0%	Louisiana
11	62.1%	Oregon	37	55.5%	Maryland
12	61.9%	Delaware	38	55.5%	Illinois
13	61.9%	Alabama	39	55.4%	Washington
14	61.1%	Virginia	40	54.3%	Texas
15	61.0%	Kentucky	41	52.9%	Massachusetts
16	60.8%	South Carolina	42	52.9%	Nevada
17	60.8%	North Carolina	43	50.9%	Hawaii
18	60.7%	Indiana	44	50.4%	Alaska
19	60.4%	Missouri	45	50.2%	Rhode Island
20	60.4%	New Mexico	46	50.2%	Connecticut
21	60.0%	Arkansas	47	49.7%	New Jersey
22	59.5%	Kansas	48	49.3%	North Dakota
23	59.2%	Nebraska	49	47.8%	California
24	59.0%	Wisconsin	50	43.7%	New York
25	58.8%	Minnesota	51	30.1%	District of Columbia
26	58.7%	Ohio			

Source: Goss & Associates, 2017

³³See Appendix B for the model used to estimate pets per household by state for 2015.

But is there a relationship between the percentage of households with pets, and pet friendliness ranking?

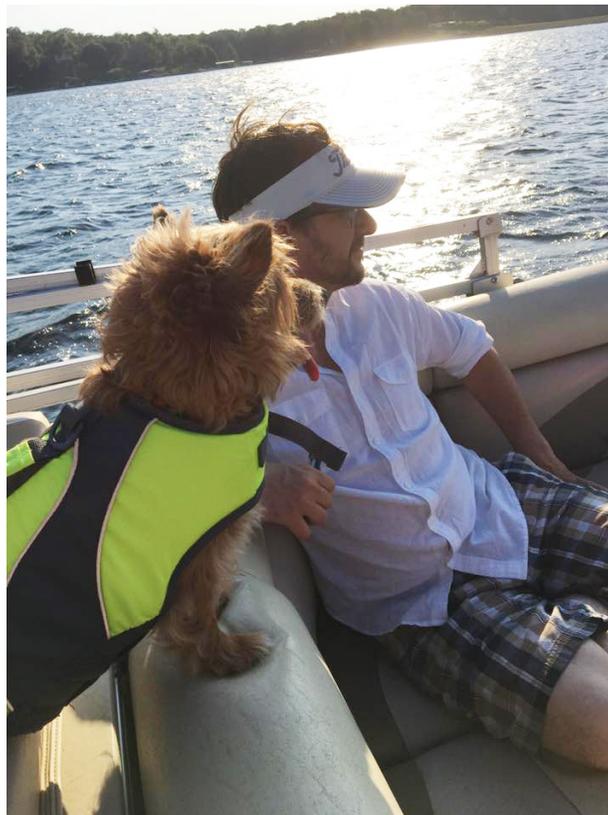
Table 2.5: Pet ownership and pet friendliness	
	Average pet friendliness ranking
Top quintile of pet ownership	18.9
Second quintile of pet ownership	19.0
Third quintile of pet ownership	24.3
Fourth quintile of pet ownership	25.0
Bottom quintile of pet ownership	34.7

Source: Goss & Associates
(Note: Lower ranking indicates greater pet friendliness, or laws and regulations protecting pets)

Data in Table 2.5 support the hypothesis that pet-friendly states have a higher percentage of households owning pets. Additionally, the correlation coefficient between states' pet friendliness scores and pet ownership was +0.47, indicating a strong association between the two factors.

What are the Major Factors Affecting Pet Ownership?

Table B.1 in Appendix B lists a multivariate analysis of the impact of factors on pet ownership. As presented, the factors having a statistically significant impact on pet ownership from largest to smallest impact were: 1) home ownership, 2) per capita disposable personal income, 3) private industry support for pet services, 4) percent of population over age with at least a bachelor's degree, and 5) the number of net shelter intakes per capita.



Goss & Associates, 2017

Chapter 3: Economic Impacts of the Pet Industry on U.S. Metropolitan Areas and States, 2015

Chapter Highlights:

- The 2015 impact of the pet industry for the 50 states was a median of 0.26 percent of GDP and 0.54 percent of total jobs.
- As a percentage of GDP, the top five states experiencing impacts from the pet industry were: 1) Vermont with 0.43 percent of GDP; 2) Montana with 0.41 percent of GDP; 3) New Hampshire with 0.38 percent of GDP; 4) Maine with 0.37 percent of GDP; and 5) Idaho with 0.37 percent of GDP.
- As a percentage of total jobs in the state the top five states experiencing pet industry impacts were: 1) New Hampshire with 0.77 percent of total jobs; 2) Colorado with 0.75 percent of total jobs; 3) Oregon with 0.74 percent of total jobs; 4) Vermont with 0.73 percent of total jobs; and 5) Montana with 0.71 percent of jobs.
- In terms of 2015 impacts, the top five MSAs experiencing impacts were:
 - MSAs with populations over 1,000,000: 1) New York, NY; 2) Chicago, IL; 3) Boston, MA; 4) Atlanta, GA; and 5) Houston, TX.
 - MSAs with populations between 300,000 and 1,000,000 were 1) Raleigh, NC; 2) Grand Rapids, MI; 3) Madison, WI; 4) Buffalo, NY; and 5) Portland, ME.
 - MSAs with populations under 300,000 were: 1) Wilmington, NC; 2) Gainesville, FL; 3) San Luis Obispo, CA; 4) Greeley, CO; and 5) Fayetteville, NC.

Introduction

The pet industry directly supports economic activity in geographic areas across the nation. The impacts come in the form of direct, indirect and induced impacts. The sum of the indirect and induced is often referred to as **spillover impact**. The **direct economic impact** is in the form of revenues which support the wages and salaries of pet industry employees and purchases of goods and services from vendors to the pet industry. These impacts result from the annual operating expenditures and capital spending of the industry.

Direct spending expenditures include a wide range of spending from wages to diagnostic equipment for veterinarians. These purchases generate further expenditures, or **indirect impacts**, within the economy. As suppliers and local vendors spend income received from pet industry, businesses derive further benefit upstream and downstream.

The wage income then exerts an increase in expenditures via the local consumption of goods and services. These effects are called **induced impacts**. The sum of the direct, indirect, and induced impacts is the **total economic impact**.

Economic impacts identified and estimated in this chapter are short-run in nature and represent annual, recurring events. Indicators for long-run, more intangible impacts on the regional economy such as workforce development are recognized. However, assignment of dollar values for these indicators is outside the scope of this analysis.

In terms of long-term, but less measurable impacts, the presence of pet related firms encourages the startup and/or relocation of other businesses in the state. By contributing to the area's attractiveness due to the availability of jobs and pet support services, the pet industry influences community growth in non-pet industries. Moreover, the pet industry contributes to the overall growth of state and local economic activity.

Figure 3.1 provides an overview of pet industry impacts. Direct job impacts for the pet industry come from the U.S. *Census County Business Patterns*. The indirect and induced impacts, or spillover impacts, are estimated using the IMPLAN Multiplier System.³⁴

As indicated, the total impact is the sum of direct (green arrows), indirect (blue arrows) and induced (red arrows) impacts minus leakages (gray arrows). Leakages represent pet spending outside of the area. Input-output multiplier systems are used to estimate each of the impacts in Figure 3.1 by industry. Table 3.1 describes the components of economic development.

Figure 3.1: Sample impacts of pets on the economy

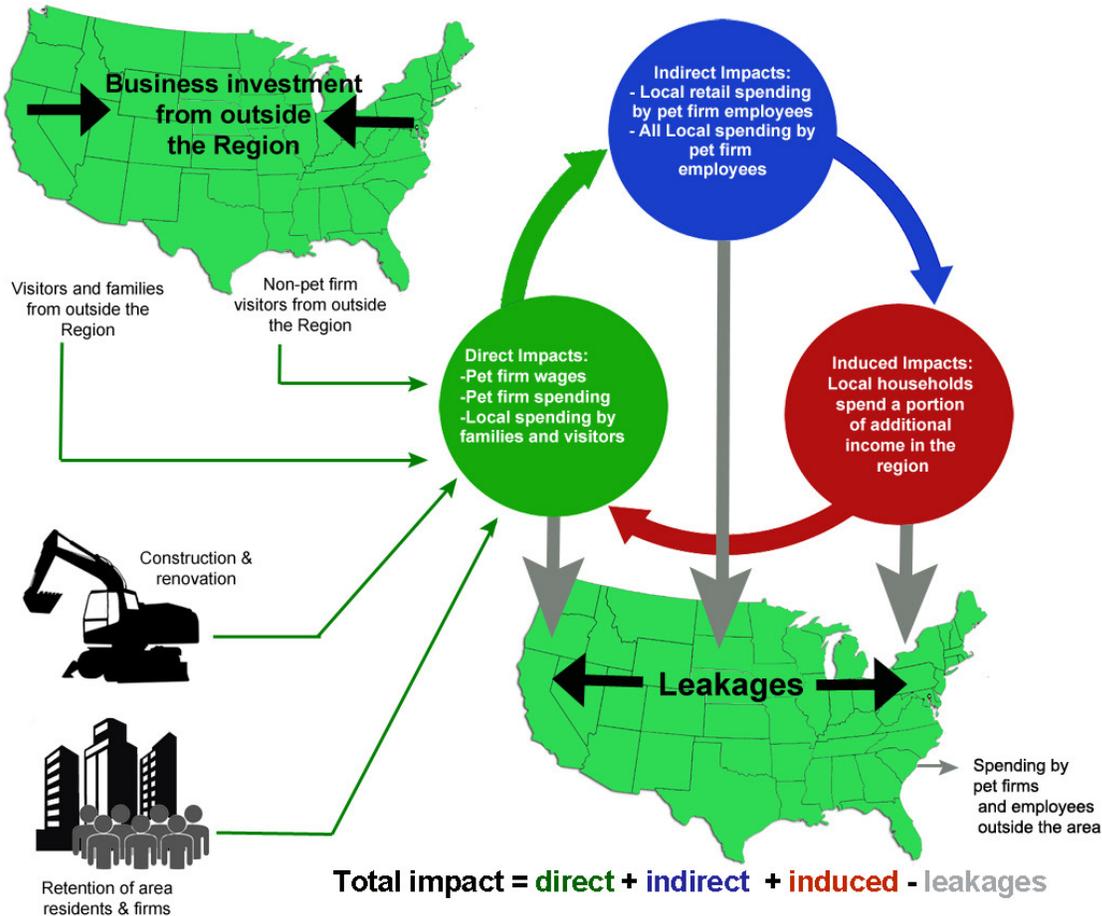


Table 3.1: The three components of the total economic impacts

Direct Economic Impacts	Spending by pet firms flowing into the area has direct economic effects on the local economy via expenditures for goods and services and employee salaries. The most obvious direct expenditures are payment of wages to workers employed by the pet sector. Direct economic impacts are color coded green in Figure 3.1.
Indirect Economic Impacts	Second-round spending takes place as retailers and wholesalers that furnish pet firms with supplies purchase from other companies in the area, resulting in indirect economic impacts on the area and state economies by the pet sector. Furthermore, pet firms encourage the expansion of other businesses in the area. Pet companies generate indirect effects by increasing: (a) the number of firms drawn to the community, (b) the volume of deposits in local financial institutions and, (c) economic development. Examples of indirect economic impacts are color coded blue in Figure 3.1.
Induced Economic Impacts	Induced impacts in the region occur as the initial spending feeds back to industries in the region when workers in the area purchase additional output from local firms in a third round of spending. That is, pet companies increase overall area income and population, which produces another round of increased spending adding to sales, earnings and jobs. Examples of induced economic impacts are color coded red in Figure 3.1.

Source: Goss & Associates

³⁴See Appendix C for a description of the IMPLAN Multiplier System.

Table 3.2 provides an overview of the influences of the pet industry on community and economic development.

Table 3.2: Other Impacts of pet industry		
Issue	Measurement	Community Impact
Direct payments	Wages paid to pet industry employees	Increases sense of collective identity; builds social capital; provides learning opportunities; creates “quality jobs”; encourages the in-migration of trained, educated workers.
Purchase inputs/ equipment	Payments to pet industry vendors	Encourages the startup and/or relocation of businesses to supply products and services.
Philanthropic and government support for pet industry	Donated services	Businesses and community leaders provide valuable “free” services and donated assets to the community.
“Brain gain”	Educated, high human capital individuals	Direct plus matching funds assist in bringing trained, well-paid individuals to the area.
Productivity gains	Improved individual health and longer life expectancy; work animals add to worker productivity	Adds to overall area economic growth.

Source: Goss & Associates, 2017



Source: Cox Business

2015 Case Studies: The Economic Impact of the Pet Industry

Economic Impact of the Pet Industry on Des Moines, 2015. Table 3.3 shows the direct impacts of the pet industry on Des Moines, Iowa for 2015. These direct impacts are based on pet industry jobs from the U.S. Census Bureau's *County Business Patterns*.

As listed, the Des Moines pet industry, for 2015, spent a total of \$146.5 million, and employed 1,692 workers that earned \$65.7 million in wages/salaries and self-employment income. These direct impacts are next used as input to the IMPLAN Multiplier System to produce total impacts. These total impacts are listed in Table 3.4.

Table 3.3: Direct impacts of pet industry on Des Moines, Iowa, 2015

Description	Output	Employment	Wages, salaries, and Self-employment income
Veterinary services	\$79,553,496	791	\$32,157,369
Retail - Miscellaneous store retailers	\$16,687,683	434	\$9,475,016
Death care services	\$32,947,014	351	\$11,646,710
Medical and diagnostic laboratories	\$17,351,166	116	\$12,405,581
Total direct impacts	\$146,539,359	1,692	\$65,684,677

Source: Goss & Associates from IMPLAN Multiplier System; due to rounding, column totals may not equal sum of detail.

As listed, for every one direct job, the pet industry produces another 0.47 spillover jobs. Thus, the provision of 1,692 pet industry jobs results in 2,485 total jobs in the area. Likewise, \$65.7 million in direct wages, salaries and self-employment income for the pet industry for 2015 results in overall wages, salaries and self-employment income for the area of \$105.1 million, or spillover impacts of \$39.4 million. Furthermore, the direct spending of \$146.5 million produces an overall impact of \$264.7 million, or spillover impacts of \$118.2 million for 2015, for the Des Moines MSA.

Table 3.4: Total impact of pet industry on Des Moines, Iowa, 2015

Impact type	Output	Employment	Employee compensation & Self-employment income
Direct Effect	\$146,539,362	1,692	\$65,684,680
Indirect Effect	\$50,617,601	298	\$17,159,649
Induced Effect	\$67,547,783	495	\$22,273,498
Total impact	\$264,704,746	2,485	\$105,117,827

Source: Goss & Associates from IMPLAN Multiplier System; due to rounding, column totals may not equal sum of detail.

Table 3.5 lists several of the top spillover impact industries. None of the industries in Table 3.4 received any direct impacts. As listed, the industries experiencing the largest spillover impact are real estate with \$14.2 million, wholesale trade with \$10.0 million, restaurants with \$4.9 million, banks with \$4.2 million and hospitals with \$3.5 million.

Table 3.5: Spillover pet industry impacts, Des Moines, Iowa, 2016

	Indirect + Induced (spillover impacts)	
	Sales	Jobs
Real estate	\$14,202,062	46
Wholesale trade	\$9,971,173	38
Restaurants	\$4,886,707	82
Banking and depository credit intermediation	\$4,230,439	19
Hospitals	\$3,481,913	22
Insurance carriers	\$3,431,084	6
Management of companies and enterprises	\$3,369,092	15
Limited-service restaurants	\$2,679,214	35
Wired telecommunications carriers	\$2,671,902	6
Offices of physicians	\$2,330,566	15
Wireless telecommunications carriers (except satellite)	\$2,322,208	1
All other industries	\$62,381,531	461
Total spillover impacts (does not include direct impacts)	\$118,165,384	793

Source: IMPLAN Multiplier System

The estimated 2015 pet industry impacts on state and local tax collections for the Des Moines area are listed in Table 3.6. As presented, the Des Moines pet industry accounted for \$12.6 million in state and local tax collections in the Des Moines MSA in 2015.

Table 3.6: Tax revenue impact on the Des Moines MSA

Measure	The pet industry impact
State tax revenue impact - income	\$2,039,955
State & local tax revenue impact - sales	\$4,357,660
Local tax revenue impact - property	\$4,536,500
Other taxes and fees	\$1,711,523
Total state & local taxes and fees	\$12,645,638

Source: Goss & Associates based on IMPLAN Multiplier System

In the next section, estimated impacts of the pet industry for the state of Iowa are derived.

Economic Impact of the Pet Industry on Iowa, 2015. Table 3.7 shows the direct impacts of the pet industry on Iowa for 2015. These impacts are based on pet industry jobs from the U.S. Census Bureau’s County *Business Patterns*. As listed, the Iowa pet industry spent \$463.3 million and employed 5,107 workers earning \$201.8 million in wages, salaries and self-employment income for 2015. These direct impacts are next used as input to the IMPLAN Multiplier System to produce total impacts. Total impacts are listed in Table 3.8.

Table 3.7: Direct impacts of pet industry on Iowa, 2015

Description	Output	Employment	Wages, salaries, and self-employment income
Veterinary services	\$342,160,128	3,449	\$136,429,695
Retail - Miscellaneous store retailers	\$33,165,182	840	\$19,040,939
Death care services	\$35,980,272	369	\$13,532,205
Medical and diagnostic laboratories	\$51,977,504	449	\$32,842,491
Total direct impacts	\$463,283,102	5,107	\$201,845,337

Source: Goss & Associates from IMPLAN Multiplier System; due to rounding, column totals may not equal sum of detail

As listed, for every one direct job, the pet industry produces 0.44 spillover jobs. Thus, the provision of 5,107 pet industry jobs results in total jobs in the state of 7,335. Likewise, \$201.8 million in wages, salaries and self-employment income for the pet industry for 2015 results in overall wages, salaries and self-employment income for the state of \$295.5 million, or spillover impacts of \$93.7 million. Furthermore, the direct spending of \$463.3 million produces an overall impact of \$771.3 million, or spillover impacts of \$308.0 million for 2015.

Table 3.8: Total impact of pet industry on Iowa, 2015

Impact type	Output	Employment	Employee compensation and self-employment income
Direct Effect	\$463,283,102	5,107	\$201,845,337
Indirect Effect	\$130,290,239	863	\$39,919,156
Induced Effect	\$177,747,370	1,365	\$53,739,753
Total impact	\$771,320,711	7,335	\$295,504,246

Source: Goss & Associates from IMPLAN Multiplier System; due to rounding, column totals may not equal sum of detail



In Table 3.9 are listed several of the top spillover impact industries for the state of Iowa. None of the industries in Table 3.9 received any direct impacts. As listed, the industries experiencing the largest spillover impact are real estate with \$30.1 million, wholesale trade with \$21.5 million, restaurants with \$14.7 million, banks with \$12.1 million, and hospitals with \$9.8 million.

Table 3.9: Spillover pet industry impacts, Iowa, 2015

	Indirect + Induced (spillover impacts)	
	Sales	Jobs
Real estate	\$30,081,393	135
Wholesale trade	\$21,535,128	92
Restaurants	\$14,671,194	265
Banks and depository credit intermediation	\$12,107,736	53
Hospitals	\$9,775,403	63
Insurance carriers	\$7,986,234	15
Management of companies and enterprises	\$6,001,603	29
Offices of physicians	\$5,817,757	39
Wireless telecommunications carriers (except satellite)	\$6,272,644	14
All other industries	\$193,788,517	1,513
Total spillover impacts (no direct impacts)	\$308,037,609	2,228

Source: IMPLAN Multiplier System

Table 3.10 lists the impact of the pet industry on state and local tax collections for the state of Iowa for 2015. As listed, the pet industry accounted for \$34.1 million in state and local tax collections for 2015.

Table 3.10: Tax Revenue Impact for Iowa, 2015

Measure	The pet industry impact
State tax revenue impact – personal income	\$6,124,567
State & local tax revenue impact - sales	\$11,884,470
Local tax revenue impact - property	\$11,249,871
Other taxes and fees	\$4,867,391
Total state & local taxes and fees	\$34,126,299

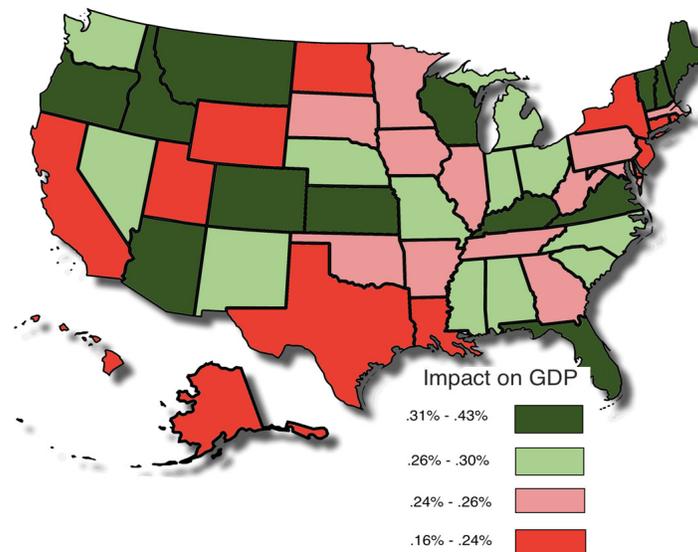
Source: Goss & Associates based on IMPLAN Multiplier System

The Economic Impact of the Pet Industry on States and Metropolitan Areas for 2015

Impacts of the Pet Industry for U.S. States, 2015. Tables D.1 and D.2 in Appendix D lists estimated state impacts for 2015 as a share of GDP and jobs. The impact of the pet industry for the 50 states was a median of 0.26 percent of GDP and 0.54 percent of total jobs. Figures 3.2 and 3.3 profile impacts for the 50 states and D.C.

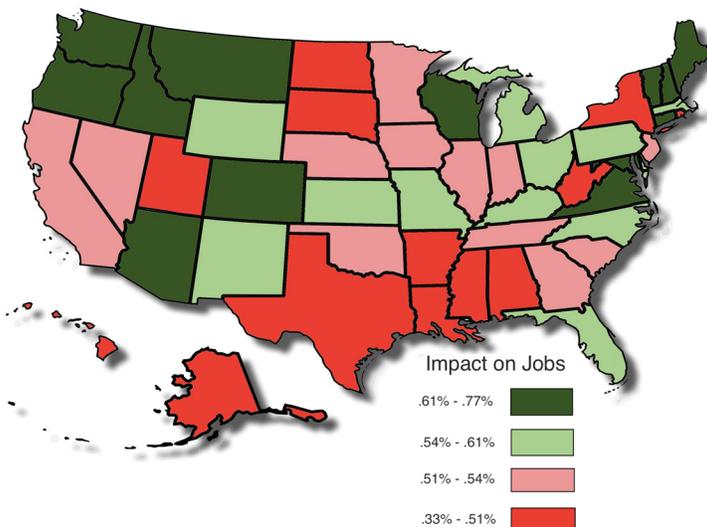
As a percent of GDP, the top five states experiencing impacts were: 1) Vermont with 0.43 percent of GDP; 2) Montana with 0.41 percent of GDP; 3) New Hampshire with 0.38 percent of GDP; 4) Maine with 0.37 percent of GDP; and 5) Idaho with 0.37 percent of GDP. As a percent of total job impacts, the top five states were: 1) New Hampshire with 0.77 percent of total jobs, 2) Colorado with 0.75 percent of total jobs, 3) Oregon with 0.74 percent of total jobs; 4) Vermont with 0.73 percent of total jobs; and 5) Montana with 0.71 percent of jobs.

Figure 3.2: Impact of pet industry on state GDP, 2015



Source: Goss and Associates based on IMPLAN multipliers

Figure 3.3: Impact of pet industry on total state jobs, 2015



Source: Goss and Associates based on IMPLAN multipliers

Table D.2 in Appendix D lists impacts by metropolitan area for 2015. As presented the top five MSAs with populations over 1,000,000 experiencing the largest 2015 impacts were: 1) New York, NY; 2) Chicago, IL; 3) Boston, MA; 4) Atlanta, GA; and 5) Houston, TX. The top five MSAs with populations between 300,000 and 1,000,000 were 1) Raleigh, NC; 2) Grand Rapids, MI; 3) Madison, WI; 4) Buffalo, NY; and 5) Portland ME. The top five MSA with populations under 300,000 receiving the greatest economic impacts for 2015 were: 1) Wilmington, NC; 2) Gainesville, FL; 3) San Luis, Obispo, CA; 4) Greeley, CO; and 5) Fayetteville, NC.

The Economic Impact of Animal Shelters

The previous impacts did not include the economic impact of non-profit support organizations such as shelters. Economic impact of animal shelters based on total U.S. net shelter intakes for 2016 of 2.7 million:

1. There was an estimated \$1.3 billion in direct spending and total economic impacts of animal shelters of \$2.4 billion.
2. The 5 states experiencing the largest economic impacts for 2016 were: 1) California \$332.8 million; 2) Texas \$200.7 million; 3) Florida \$190.5 million; 4) Arizona \$113.0 million; and 5) Colorado \$92.8 million.
3. The 5 states experiencing the smallest 2016 impacts were: 46) Wyoming \$6.8 million; 47) Nebraska \$5.5 million; 48) Alaska \$4.5 million; 49) North Dakota; and 50) South Dakota \$1.1 million.

Summary

In this chapter, estimated impacts from the pet industry were provided. These impacts cannot be compared to that produced by the George Mason Study. The George Mason study included pet manufacturing activities as well as pet industry wholesale trade linked to the pet industry. These sectors, or industries, are not included in the estimated impacts supplied in this chapter.

Manufacturing and wholesale trade industries linked to the pet industry are little influenced by local conditions including pet regulations, laws and population characteristics. These two industries are influenced by national and even global factors, and less by population characteristics and pet ownership decisions which is the focus of this study.

Chapter 4: Pet Policy: Its Evolution and Impact

Chapter Highlights:

- The Animal Welfare Act (AWA), enacted in 1966 and enforced by the USDA, is considered the minimum acceptable standard, and the only federal law regulating animal treatment in the areas of animal research, exhibition, and transport by dealers.
- In 2013, the USDA revised the definition of “retail pet store,” effectively placing more pet animals sold at retail facilities under protection of the law. Before the law’s passage, retail pet stores were not subject to the same licensing and minimum standards of care compliance as were pet animal breeders.
- States ranked more highly in terms of pet laws and ordinances had lower rates of pet ownership.
- States ranked more highly in term of pet law and ordinances had superior pet friendly rankings.



History of Pet Laws and Public Policy

National Pet Law. While many specific policies and laws exist regarding the health, care, and treatment of specific groups and breeds of animals, the *Animal Welfare Act (AWA)*, enacted on August 24, 1966 is considered to be the minimum acceptable standard, and the only federal law regulating animal treatment in the areas of animal research, exhibition, and transport by dealers. Later amendments to the law also placed pets sold at retail under protection of the law. The Act is enforced by USDA's Animal Care, as well as the USDA's Animal, Plant and Health Inspection Service (APHIS).³⁵

The AWA has undergone subsequent revisions from 1970 to 2013, with the most current version, along with corresponding regulations referred to as the “Blue Book.” The act initially provided regulatory authority to the Secretary of Agriculture for the transportation, sale, and handling of animals intended to be used in research and “for other purposes.” Animals included dogs, cats, nonhuman primates, guinea pigs, hamsters, and rabbits.” It required humane handling of animals at auctions, along with licensing and inspection of dog and cat dealers.³⁶

In 1970, the law was amended to include additional warm-blooded animals. The amendment also covered exhibitors, and provided a definition for research facilities. Still exempt from the act were retail pet stores, state and county fairs, rodeos, purebred dog and cat shows, and agricultural exhibitions.

³⁵<https://www.aphis.usda.gov/aphis/ourfocus/animalwelfare>.

³⁶United States Department of Agriculture National Agricultural Library. <https://www.nal.usda.gov/awic/legislative-history-animal-welfare-act-1960s>.

Amendments enacted in 1976 more clearly defined existing regulations and definitions regarding animal transport and commerce, and incorporated licensing. Interstate commerce regarding animals involved in “fighting ventures” became illegal.³⁷

And in 1985, the *Food Security Act* focused on improved standards for the humane care of laboratory animals. Responsibility was placed with the Secretary of Agriculture to regulate exercise for dogs as well as physical environment. Minimization of pain and stress in research and experimentation was addressed, painful practices were defined, and the Institutional Animal Care and Use Committee (IACUC) was established.

As a result, the National Agricultural Library began to seek ways to reduce/replace animal use in research, educate individuals affected by regulations in terms of reducing animal pain and distress, avoid duplication of research, and provide employee training. Also addressed were penalties to be put in place for release of trade secrets by regulators and those regulated.³⁸

The *Food, Agriculture, Conservation, and Trade Act* of 1990 established holding periods for dogs and cats in holding facilities and shelters prior to sale to dealers. Sellers were required to provide documentation for each animal to new owners. Enforcement processes were established and penalties were defined for non-compliance.³⁹

Amendments in the 2000s included the *Farm Security and Rural Investments Act* of 2002. This legislation modified the definition of “exhibitor,” and provided a new definition of “animal” under the Animal Welfare Act.⁴⁰ It also included rules related to exportation of livestock, licensing, inspection, and amendments to regulations related to humane treatment of marine mammals and importation of dogs.

In 2013, the USDA revised the definition of retail pet store, effectively placing more pet animals sold at retail facilities under protection of the law, although retail pet stores were not required to be licensed and inspected under the AWA. The goal of this revision was to “ensure that animals sold at retail for use as pets were monitored for their health and humane treatment.”⁴¹

Prior to this revision, retail pet stores were not subject to the same licensing and minimum standards of care compliance as were pet animal breeders. It was thought that in a retail setting, buyers were able to see the animals’ living conditions first-hand and therefore inspections were unnecessary. However, dealers and breeders who sold animals over the Internet were also allowed to qualify as retail pet stores, and were therefore exempted from licensing and minimum standards of care compliance, thus creating the “Internet sale loophole.”

According to the AWA, this loophole resulted in inadequate oversight and minimum standards of care for large numbers of animals. The final rule, published in September 2013 closed the loophole. The AWA now requires the purchasers’ physical presence at the property before a breeder qualifies for the retail pet store exemption.^{42,43}

³⁷<https://www.nal.usda.gov/awic/legislative-history-animal-welfare-act-1970s>.

³⁸<https://www.nal.usda.gov/awic/legislative-history-animal-welfare-act-1980s>.

³⁹<https://www.nal.usda.gov/awic/public-law-101-624-food-agriculture-conservation-and-trade-act-1990-Chapter-2503-protection> <https://www.nal.usda.gov/awic/legislative-history-animal-welfare-act-1990s>.

⁴⁰<https://www.nal.usda.gov/awic/legislative-history-animal-welfare-act-2000s>.

⁴¹<https://www.federalregister.gov/documents/2013/09/18/2013-22616/animal-welfare-retail-pet-stores-and-licensing-exemptions>.

⁴²<http://aldf.org/blog/usda-closes-internet-sale-loophole-for-pet-breeders-after-pressure-from-animal-groups/>.

⁴³<https://www.animallaw.info/article/state-and-municipal-regulation-dogs>.

State Pet Law and Municipal Pet Law.

Even though most owners deem their pets family members, animals are still considered property, and are subject to state laws. While both state and federal laws can override those at the municipal level, local governments are considered better able to meet the localities' specific needs, and generally oversee pet laws. These include regulations involving areas such as leash laws, procedures for impounding dogs, licensing, vaccination, and the number of animals a person may keep.

Penalties for infractions vary by state and/or municipality, and currently, courts are more likely to recognize the rights of owners than they have in the past.⁴⁴ However, legal challenges to municipal pet laws can be difficult to accomplish. Over time, challenges to local ordinances such as the impoundment of pets have resulted in courts requiring procedures that include adequate notice and opportunity for owners to correct a situation prior to application of penalties such as impoundment or euthanization.

Pet-Friendly Ordinances⁴⁵

In recent years, pet ordinances have expanded beyond issues of public health, safety, and protection of livestock. Current pet laws have expanded to include responsible and humane treatment of animals, reduction of the number of pets living in shelters, and addressing nuisance behavior of roaming and/or noisy pets.

However, while all U.S. pet advocacy groups advocate humane treatment of animals, views on how to use pet ordinances can vary sharply, primarily in the area of how to go about reducing unethical and inhumane breeding and selling practices.

⁴⁴<https://www.animallaw.info/article/brief-summary-local-and-state-dog-laws>.

⁴⁵"Responding to the Data: A Guide to Constructing Successful Pet-Friendly Ordinances." NAIA (National Animal Interest Alliance), p. 6-9, 2005.

NAIA (National Animal Interest Alliance).⁴⁶

According to NAIA, to be successful, pet ordinances must:

- "Distinguish between responsible and irresponsible pet owners;
- Offer support and incentives to encourage and reward responsible pet ownership;
- Enforce reasonable penalties against irresponsible pet owners to bring them into compliance."

NAIA also points out certain types of ordinances that are less likely to be successful and are therefore unenforceable and not supported by their organization as pet-friendly ordinances. These include the number of pet limit laws, specific breed restrictions, and licensing and restrictions on breeders. Such generalized laws are often considered unfair to responsible owners and breeders. According to NAIA, negative consequences frequently result from overly restrictive ordinances, such as the loss of licensing fees due to fear of non-compliance; court challenges; increases in the number of pets placed in shelters rather than remaining in homes where they receive adequate care; and undue bureaucratic complications.

Rather, NAIA suggests, in terms of number of pet limits, regulations have proven to be ineffective, turning responsible pet owners into "criminals" as a result of poorly defined terms and arbitrary laws. In terms of breed-specific restrictions, NAIA suggests a better alternative is to "prosecute actual nuisances and dangers than it is to penalize the universal possibility of a nuisance or danger."⁴⁷ The organization recommends that these areas be dealt with by strict enforcement of dangerous dog laws, and focus on irresponsible owners and illegal dog activities.

In terms of breeder restrictions and licensing, NAIA contends that such ordinances are unworkable and produce unintended consequences, while placing an undue burden on responsible breeders. According to NAIA, as major stakeholders in the production of responsibly bred, healthy pets, breeders are leading sources of pet ownership

⁴⁶Ibid.

⁴⁷Ibid.

education, rescue efforts, addressing of pet behavioral issues, increased tourism activity for communities, including kennel or cat club events and pet philanthropy.

Recent results from an NAIA study show that the number of purebred dogs in shelters has dropped by approximately 5 percent, thus reinforcing the organization's contention that ordinances supporting responsible breeding and ownership are responsible for a reduction in dog overpopulation and the number of shelter deaths.⁴⁸

The NAIA model for the establishment of a pet-friendly ordinance provides incentives to reward responsible owners, assigns penalties designed to bring irresponsible owners into compliance, and implements a program for increasing the number of licensed pets (with the option of offering multiple-year or lifetime licenses and registrations), with jurisdictions (city, township, or county) setting their own license fees.

Regarding pet-friendly licensing, NAIA recommends that jurisdictions:

1. Eliminate unenforceable, arbitrary provisions.
2. Eliminate unrealistic reclaim fees.
3. Provide financial incentives for responsible ownership practices, including:
 - a) Permanent pet identification.
 - b) Secure fencing.
 - c) Proof of training.
 - d) Spaying or neutering.
 - e) Early or lifetime licensing/registration.
4. Offer financial incentives for licensed/registered pets that are identified by microchip.
5. Write and enforce meaningful penalties against violations of dangerous dog laws and nuisance ordinances.
6. Create an animal control advisory board of representatives from pet-related businesses, pet healthcare, animal welfare groups, pet club enthusiasts, as well as non-pet owners. Seek participation and help inform local citizens and the community.

⁴⁸<http://www.naiaonline.org/articles/article/naia-study-confirms-fewer-dogs-scarce-purebreds-in-us-animal-shelters#sthash.cxrTWkHP.dpuf>

7. Explain the benefits of the new, improved ordinance and the licensing and registration programs. Work to increase awareness of the group and its goals. Establish a partnership between responsible owners and animal control agencies.

Appendix E contains model ordinances as outlined by NAIA.

Encouraging to NAIA was Governor Chris Christie's conditional veto of New Jersey SB 63, a revision to New Jersey's Pet Purchase Protection Act, a law subjecting New Jersey's pet stores to stringent regulations and consumer protections. SB 63 would have expanded the bill to include all pet dealers, breeders, and brokers throughout the country doing business with New Jersey. Estimates indicated that the number of breeders that would be excluded from conducting business with the state would be approximately 80 percent.



NAIA points out certain types of ordinances that are less likely to be successful and are therefore unenforceable and not supported by their organization as pet-friendly ordinances.

According to Christie, “The bill would also have the unintended consequence of restricting consumer access to pets, even from responsible breeders.” Christie went on to say that the bill was “potentially unconstitutional.” With his conditional veto, Governor Christie made changes to the bill as follows:

- The attempt to regulate out-of-state pet sellers was removed.
- The designation “pet dealer” for anyone selling more than 10 dogs or cats in the state of New Jersey was removed.
- The bill previously prohibited pet shops from obtaining animals from breeders that had three or more USDA citations; this was replaced with 3 or more separate, final, and conclusive orders for violations.⁴⁹

In May, 2017, the New Jersey legislature failed to override the veto after a vote of 20 to 14, with eight abstentions.⁵⁰

Mike Bober, president of the *Pet Industry Joint Advisory Council*, reacted positively to Christie’s conditional veto indicating that the conditions of the Pet Protection Act passed two years ago “mean New Jersey already has the strongest laws in the nation when it comes to consumers and pet protection.”

Humane society. Other organizations supporting New Jersey’s Pet Protection Bill disagree with Christie’s veto of the revisions. For example, in his blog, Wayne Pacelle, President and CEO of The Humane Society of the United States, spoke out about the Governor’s action, citing the bill as a measure that would have stopped the sale in New Jersey of dogs from the worst puppy mills in the nation, and weakening the *Pet Disclosure Act*.

Combatting Puppy Mills. The Humane Society’s “A Guide to Using Local Ordinances to Combat Puppy Mills” works to limit, or eliminate, “massive dog breeding facilities” in individuals’ counties or neighboring counties, or the sales of puppies at flea markets or in parking lots, or by the side of the road.

Suggestions include ordinances that would place a limit on the number of dogs in a breeding facility or target undesirable sales tactics. Table 4.1 lists several cities and counties that have enacted local ordinances that seek to reduce or eliminate profiting by puppy mills in their areas.⁵¹

The Humane Society suggests a grassroots approach for communities wishing to enact ordinances to combat puppy mills or unscrupulous breeding. Guidelines are summarized in Table 4.2.

The Humane Society’s “A Guide to Using Local Ordinances to Combat Puppy Mills” works to limit, or eliminate, “massive dog breeding facilities” in individuals’ counties or neighboring counties, or the sales of puppies at flea markets or in parking lots, or by the side of the road.

⁴⁹http://naiaonline.org/blog/animal-law/major-victory-in-new-jersey/?utm_source=feedburner&utm_medium=feed&utm_campaign=Feed%3A+NaiaOfficialBlog+%28NAIA+Official+Blog%29#.WShXmYWcGhd.

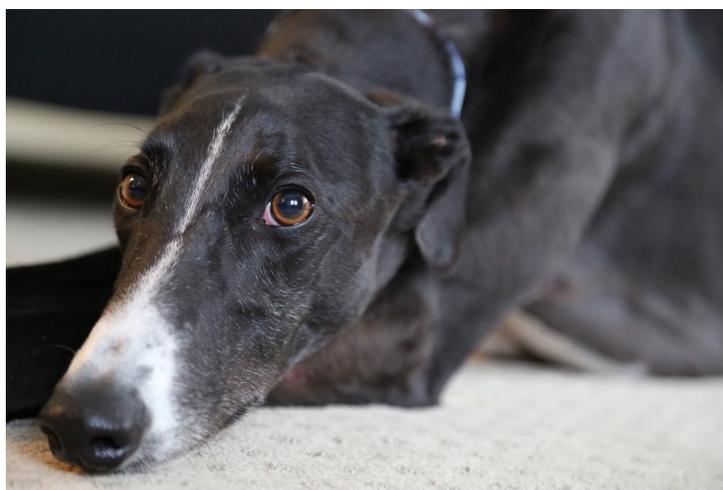
⁵⁰http://www.nj.com/politics/index.ssf/2017/05/pet_semaphore_override_of_christies_veto_of_animal.html.

⁵¹http://www.humanesociety.org/assets/pdfs/pets/puppy_mills/ordinance_guide.pdf.

Table 4.1: Examples of ordinances enacted in cities, counties and states in order to prohibit unscrupulous puppy mills or breeding facilities

Locality	Ordinance
Romulus, NY	Requires commercial pet breeders to provide humane treatment and housing for dogs and cats, and provides for regular inspection of their facilities. Romulus also enacted a moratorium on the establishment or expansion of commercial breeding facilities.
Sherburne County, MN	Bans the keeping of more than 40 dogs and requires that no more than 10 of them may be intact females. (Sherburne County Private and Commercial Kennel Licensing Ordinance 134)
Pima, AZ, Houston, TX and East Baton Rouge, LA	Bans the sale of animals at swap meets and flea markets. (Pima County, AZ, 6.04.170 Sale of animals at swap meets and public property prohibited— Exceptions—Penalty, and Houston, TX, Sec. 6-118. Roadside and flea market sales)
Memphis, TN	Bans the sale of animals on roadsides and in parking lots. (Sec. 5-5 Roadside sale of animals prohibited)
West Hollywood, CA and South Lake Tahoe, CA	Bans the sale of puppies and kittens in pet stores. (West Hollywood Ordinance 10-836, and South Lake Tahoe Ordinance 32-31.1 Retail sale of dogs and cats in pet stores prohibited)
Austin, TX	Requires pet shops to pay a processing fee for every dog or cat they sell who is not spayed or neutered. (Ordinance No. 20080228-057)
New Jersey	A state statute provides the foundation for those interested in proposing a pet shop ordinance. According to the statute, municipalities can choose to prohibit the sale of dogs and/or cats in pet shops. For communities where pet shops selling dogs and cats already reside, an ordinance can still be put forth and the residing stores would be grandfathered. (TITLE 4 – AGRICULTURE AND DOMESTIC ANIMALS, 4:19-15.8 Licensing of kennel, pet shop, shelter, pound)

Source: The Humane Society of the United States



Goss & Associates, 2017

Table 4.2: Guidelines for enacting ordinances to prohibit unethical breeding in communities

Learn the process	Familiarize yourself with the legislative process in your community. Obtain help from an employee or official of your local government.
Get community support	Make your cause visible and involve a diverse coalition.
Find a friend in office	As part of a constituency, talk with an elected official or sympathetic decision maker who has an interest in the topic.
Draft the ordinance	Using the appropriate legislative format, draft the ordinance.
Go public	Inform media of your efforts.
Testify	Coordinate topic areas with fellow advocates, and speak at public meetings.
Compromise	Know ahead of time the areas in which compromise is acceptable.
Celebrate victory, but remain vigilant	After the ordinance is passed, monitor for enforcement and/or additional legislation, issues and challenges.
Or regroup after defeat	Communicate with officials who opposed your bill and use feedback to improve future bills.
Start planning your next victory	Build on success by utilizing lessons learned and relationships forged to work for additional ordinances.

Source: The Humane Society of the United States, http://www.humanesociety.org/assets/pdfs/pets/puppy_mills/ordinance_guide.pdf



Ranking States for Ordinances that Enforce Humane Treatment of Pets

Each year, the Humane Society in its Humane State Rankings, examines current animal protection laws for all 50 U.S. states and Washington, D.C. in a range of areas. Ordinances are related to animal cruelty and fighting, pets, wildlife, equines, animals in research, and farm animals. Categories are listed below.⁵²

- 1) Animal fighting
- 2) Animal cruelty
- 3) Wildlife abuse
- 4) Exotic pets
- 5) Companion animals
- 6) Animals in research
- 7) Farm animals
- 8) Fur and trapping
- 9) Puppy mills
- 10) Equine protection

Using the Humane Society's 2015 Humane State Rankings, Rankings.com, a research organization⁵³ worked with animal rights supporters to use a subset of the data in order to focus specifically on the legal protection of pets. Rankings.com was unable to address access to parks, walking scores, or veterinarian expenses. Each state was scored on core metrics as listed in Table 4.3.

Table 4.3: Core metrics use to score U.S. states on laws ordinances promoting humane treatment of pets*

Category	Criteria for humane treatment of animals
Animal cruelty prevention	Felony penalty for egregious acts of cruelty; felony penalty for a first offense of egregious cruelty; counseling required for animal cruelty offenders.
Animal fighting prevention	Felony penalties for dogfighting; celony penalties for possessing dogs for fighting; prohibits attending dogfights.
Animal research abuse prevention	Prohibits research facilities from obtaining pets from animal shelters; requires research facilities to offer dogs and cats for adoption prior to euthanasia.
Companion animal treatment	Requires animals to be spayed or neutered before being adopted from shelters; grants shelters direct access to drugs needed for humane euthanasia; prohibits the use of gas chambers for euthanasia.
Exotic pet restriction	Prohibits the private possession of primates as pets; prohibits the private possession of most dangerous reptiles as pets; prohibits the private possession of bears as pets.
Puppy mill restriction	Prohibits wire flooring at puppy mills; Includes a puppy lemon law; limits the number of breeding dogs confined at large-scale puppy mills.

Source: Rankings.com.

* Rankings.com used the Humane Society's 2015 Humane State Ranking. However, rankings.com utilized scores involving pets only.

⁵²http://www.humanesociety.org/about/state/humane-state-ranking-2013.html#.UtW4_7Qsw1c.

⁵³<http://www.rankings.com/about/>.

Table 4.4 lists the results of the ranking by state. As shown, the top five states for enactment of laws and ordinances promoting the humane treatment of pets are 1) Illinois, 2) California, 3) Massachusetts, 4) New Jersey, and 5) Oregon.

Table 4.4: U.S. State ranking for laws and ordinances promoting humane treatment of pets, 2015

Ranking	State	Ranking	State
#1	Illinois	#25	Tennessee
#2	California	#27	Maryland
#3	Massachusetts	#28	Ohio
#4	New Jersey	#29	Iowa
#5	Oregon	#30	Georgia
#6	Maine	#30	Kansas
#7	Virginia	#32	Hawaii
#8	Connecticut	#32	Texas
#9	Colorado	#34	Indiana
#10	Arizona	#35	Missouri
#10	West Virginia	#36	New Mexico
#12	Nevada	#37	North Carolina
#12	Washington	#38	Wisconsin
#14	New Hampshire	#39	Alabama
#15	Louisiana	#39	Arkansas
#16	Delaware	#41	South Carolina
#17	New York	#42	Montana
#18	Minnesota	#42	Utah
#18	Rhode Island	#44	Alaska
#20	Vermont	#44	Mississippi
#21	Florida	#46	Kentucky
#22	Pennsylvania	#47	South Dakota
#23	Michigan	#48	Idaho
#24	Oklahoma	#48	Wyoming
#25	Nebraska	#50	North Dakota

Source: Rankings.com

Do Pet Humane Treatment Ordinances Affect Pet Ownership and Pet Friendliness Rankings

Table 4.5 compares pet ownership rates for states according to law and ordinance ranking. As listed, higher ranked states, in terms of pet laws and ordinances, have higher rates of pet ownership.

Table 4.5: Pet laws and ordinances and pet ownership rates per household

	Median pet ownership rate
Top quintile of states in pet law ranking	60.9%
Second quintile of states in pet law ranking	60.4%
Third quintile of states in pet law ranking	58.5%
Fourth quintile of states in pet law ranking	57.4%
Bottom quintile of states in law ranking	56.8%

Source: Goss & Associates 2017

Table 4.6 shows how states with and without mandatory neutering laws differ in terms of various factors. Data indicate that states with mandatory neutering laws have a) lower rates of pet ownership, b) more stringent laws protecting pets, c) lower rates of shelter intakes per 1,000 population, and d) higher economic impacts from pet shelters.

Table 4.6: Differences between states with and without mandatory neutering laws, 2016

	Neutering states	Non-neutering states
Mandatory neutering laws	Yes	NO
Total shelter intakes (average)	61,240	38,329
Average Population	7,595,937	4,222,378
Per 1,000 population shelter intakes	8.6	9.7
Direct spending for shelters	\$30,620,045	\$19,164,559
impact of sheltering	\$55,116,082	\$34,496,206
Percent of households with pets (average)	57.3%	59.1%
Average pet friendly (lower rank-more stringent laws)	23.3	30.8

Source: Goss & Associates calculations

As listed, higher ranked states, in terms of pet laws and ordinances, have higher rates of pet ownership.

Appendices

Appendix A: Statistical modeling of U.S. pet spending

Table A.1 contains the estimated relationship between U.S. pet spending and the factors of disposable personal income, homeownership, and a time variable to account for the increase in pet spending over time. Except for the time variable, all variables are in natural logarithmic functional form. Thus, the estimated coefficients represent elasticities (i.e. the percentage increase in pet spending from a one percent increase in the variable).

Model outcome:

- 99 % in the variation in pet spending is explained by the model leaving only 1% unexplained (i.e. an error of 1%).
- Each variable is statistically significant (has a statistical impact) on pet spending at the 99% level of confidence. That is, there is less than a 1% probability that each of the variables does not have an impact on pet spending.
- Each 1% increase in disposable personal income results in a 0.76% increase in pet spending.
- Each 1% increase in homeownership produces a 0.68% increase in pet spending.

Table A.1: Statistical modeling of U.S. pet spending, 1970-2016

SUMMARY OUTPUT						
Regression Statistics						
Multiple R	0.99					
R Square	0.99					
Adjusted R Square	0.999					
Standard Error	0.04					
Observations	47					
ANOVA						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	3	53.630	17.877	13046.92	1.24079E-63	
Residual	43	0.0589	0.001			
Total	46	53.6896				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	-5.124	1.122	-4.565	0.00004	-7.387	-2.860
Ln (disposable personal income)	0.755	0.037	20.569	0.00000	0.681	0.829
Ln (percent homeownership)	0.675	0.252	2.677	0.01047	0.166	1.183
time	0.031	0.002	13.191	0.00000	0.026	0.035

Source: Goss & Associates estimates based on U.S. BEA data

Appendix B: Model Estimating Pet Ownership Per Household, 2015

Table B.1: Model estimating pet ownership rates, 2015

SUMMARY OUTPUT					
Regression Statistics					
Multiple R	0.95				
R Square	0.91				
Adjusted R Square	0.89				
Standard Error	0.02				
Observations	50				
ANOVA					
	<i>df</i>	<i>SS</i>	<i>F</i>		
Regression	8	0.11	49.01		
Residual	41	0.01			
Total	49	0.12			
	<i>Coefficients</i>	<i>Standard Error</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	0.28	0.09		0.11	0.45
Per capita disposable personal income ('000s)	-0.001	6.43E-07		0.00	0.00
GDP growth 2009_16	0.02	0.03		-0.04	0.08
Homeownership rate 2014	0.01	0.00		0.00	0.01
Pet laws	0.00	0.00		0.00	0.00
Millenial as % of total population	0.00	0.25		-0.50	0.50
Percent of population with B.A. degree	0.19	0.09		0.01	0.36
Private industry pet support	0.08	0.01		0.05	0.11
Shelter intake per 1,000 population	0.01	0.01		0.00	0.03

Source: Goss & Associates, 2015

Appendix C: Choosing a Technique to Measure Impacts: IMPLAN Multipliers

Figures C.1 and C.2 depict GDP and job impacts of the pet industry for 2015, respectively.

Impacts provided in this chapter are estimated using the IMPLAN Multiplier System. The Forestry Service of the U.S. Department of Agriculture developed the IMPLAN multipliers in the 1980s.⁵⁴ For very populous areas, IMPLAN divides the economy into approximately 500 industrial sectors. Industries that do not exist in the region are automatically eliminated during user construction of the model (e.g. coal mining in Omaha). IMPLAN uses an industry-based methodology to derive its input-out coefficients and multipliers. Primary sources for data are *County Business Patterns* data and *Bureau of Economic Analysis* data.

Researchers have used IMPLAN to estimate the impact of changes in military spending on the Washington State economy⁵⁵. IMPLAN and RIMS (Regional Input-Output Modeling System) are two of the most widely used multiplier models.

IMPLAN has been compared to other multiplier systems and found to produce reliable estimates⁵⁶. Likewise, researchers, in estimating the impacts of opening an automobile assembly plant, concluded that IMPLAN's outcomes are, on balance, somewhat more accurate than RIMS⁵⁷.

IMPLAN multipliers possess the following advantages over other I-O Multiplier Systems:

1. Price changes are accounted for in the creation of the multipliers.
2. Employment increases or decreases are assumed to produce immediate in or out-migration.

⁵⁴Goss & Associates is a licensed IMPLAN user.

⁵⁵Hughes, David, David Holland, and Philip Wandschneider. "The impact of changes in military expenditures on the Washington State economy." *The Review of Regional Studies* 21.3 (1991): 311.

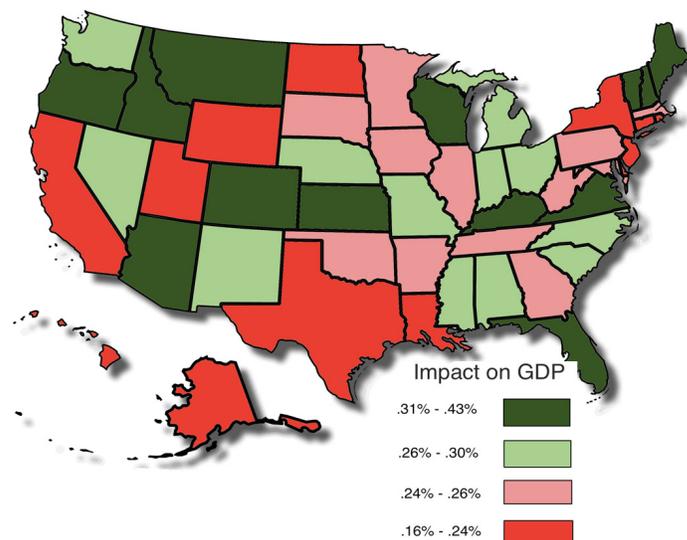
⁵⁶Oosterhaven, Jan, and Karen R. Polenske. "Modern regional input-output and impact analyses." *Handbook of Regional Growth and Development Theories* (2009): 423., Richman and Schwer (1993, p. 143).

⁵⁷Crihfield, John B., and Harrison S. Campbell. "Evaluating alternative regional planning models." *Growth and Change* 22.2 (1991): 1-16.

3. Multipliers are produced at reasonable costs by third party vendors. In this case, the Minnesota IMPLAN Group produces the multiplier system used in this study.

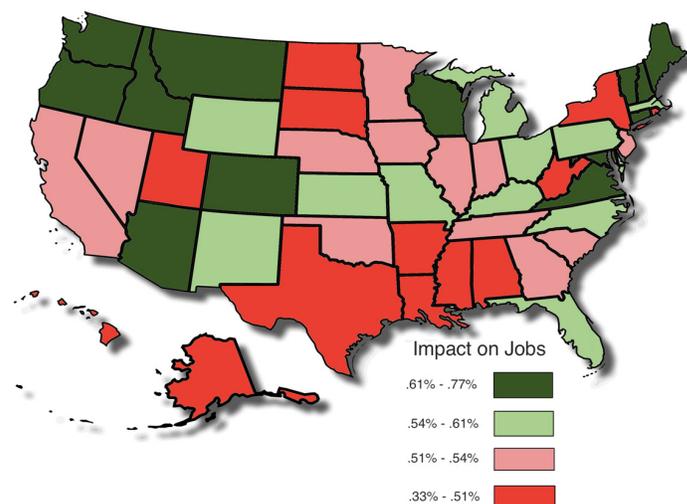
For the estimated state and metropolitan spillover impacts listed in this chapter, it is assumed that the estimated Iowa relationships, both state and metropolitan, are the same.

Figure C.1: Impact of pet industry on state GDP, 2015



Source: Goss and Associates based on IMPLAN multipliers

Figure C.2: Impact of pet industry on total state jobs, 2015



Source: Goss and Associates based on IMPLAN multipliers

Appendix D: Impact of Pet Industry by state

Table D.1: Impact of pet industry on state GDP and jobs, 2016

State	Impact on jobs		Impact on State GDP	Share of GDP	Share of jobs
	Direct	Spillover			
Alabama	6,916	3,017	\$549,257,195	0.27%	0.49%
Alaska	1,227	535	\$97,446,295	0.18%	0.48%
Arizona	12,060	5,260	\$957,785,103	0.33%	0.63%
Arkansas	3,681	1,606	\$292,338,886	0.25%	0.42%
California	61,991	27,039	\$4,923,221,918	0.20%	0.52%
Colorado	13,939	6,080	\$1,107,012,152	0.35%	0.75%
Connecticut	7,466	3,257	\$592,937,279	0.23%	0.62%
Delaware	1,925	840	\$152,880,292	0.22%	0.60%
Florida	35,211	15,358	\$2,796,398,944	0.32%	0.60%
Georgia	16,117	7,030	\$1,279,985,282	0.26%	0.52%
Hawaii	1,628	710	\$129,293,047	0.16%	0.33%
Idaho	3,064	1,336	\$243,337,774	0.37%	0.63%
Illinois	22,865	9,973	\$1,815,900,198	0.24%	0.53%
Indiana	11,388	4,967	\$904,415,983	0.27%	0.53%
Iowa	5,807	2,533	\$461,182,263	0.26%	0.51%
Kansas	6,299	2,748	\$500,256,083	0.33%	0.61%
Kentucky	7,587	3,309	\$602,546,897	0.31%	0.55%
Louisiana	6,583	2,871	\$522,810,890	0.22%	0.46%
Maine	2,684	1,171	\$213,158,807	0.37%	0.62%
Maryland	11,791	5,143	\$936,421,571	0.26%	0.61%
Massachusetts	15,256	6,654	\$1,211,606,097	0.25%	0.61%
Michigan	16,257	7,091	\$1,291,103,849	0.27%	0.54%
Minnesota	10,661	4,650	\$846,678,854	0.26%	0.52%
Mississippi	3,539	1,544	\$281,061,483	0.27%	0.42%
Missouri	11,006	4,801	\$874,078,180	0.30%	0.55%
Montana	2,372	1,035	\$188,380,287	0.41%	0.71%
Nebraska	3,779	1,648	\$300,121,883	0.26%	0.53%
Nevada	4,832	2,108	\$383,749,388	0.27%	0.54%
New Hampshire	3,553	1,550	\$282,173,339	0.38%	0.77%
New Jersey	15,040	6,560	\$1,194,451,737	0.21%	0.53%
New Mexico	3,239	1,413	\$257,235,983	0.28%	0.54%
New York	28,845	12,582	\$2,290,821,832	0.16%	0.44%
North Carolina	18,884	8,237	\$1,499,735,812	0.30%	0.60%
North Dakota	1,245	543	\$98,875,825	0.18%	0.38%
Ohio	21,123	9,213	\$1,677,553,460	0.28%	0.55%
Oklahoma	6,222	2,714	\$494,140,872	0.26%	0.52%
Oregon	9,486	4,138	\$753,362,312	0.35%	0.74%
Pennsylvania	22,690	9,897	\$1,802,001,989	0.25%	0.54%
Rhode Island	1,473	642	\$116,983,205	0.21%	0.42%
South Carolina	7,733	3,373	\$614,141,974	0.30%	0.53%
South Dakota	1,419	619	\$112,694,615	0.24%	0.46%
Tennessee	10,510	4,584	\$834,686,686	0.26%	0.51%
Texas	42,443	18,513	\$3,370,752,333	0.21%	0.50%
Utah	4,177	1,822	\$331,730,379	0.22%	0.42%
Vermont	1,649	719	\$130,960,832	0.43%	0.73%
Virginia	18,675	8,146	\$1,483,137,380	0.31%	0.66%
Washington	15,317	6,681	\$1,216,450,616	0.27%	0.65%
West Virginia	2,263	987	\$179,723,689	0.24%	0.44%
Wisconsin	13,441	5,863	\$1,067,461,822	0.35%	0.66%
Wyoming	1,147	500	\$91,092,829	0.23%	0.54%

Goss & Associates calculations based on IMPLAN Multiplier System

Table D.2: Impacts of pet industry on selected U.S. metropolitan areas, 2015

	Impacts, 2009-15				
	Spillover jobs	Total job impacts	Total impact	Percent total jobs	Percent GDP
MSAs over 1,000,000 workers					
New York-Newark-Jersey City	4,123	8,797	\$2,021,354,402		0.13%
Chicago, MSA	2,608	5,564	\$1,278,488,071		0.20%
Boston, MSA	2,588	5,521	\$1,268,571,655		0.32%
Atlanta, MSA	2,363	5,041	\$1,158,230,222		0.34%
Houston, MSA	2,198	4,690	\$1,077,560,221		0.21%
Dallas-Fort Worth, MSA	2,142	4,570	\$1,049,929,909		0.22%
Phoenix, MSA	1,940	4,139	\$951,015,124		0.43%
Washington DC, MSA	1,745	3,724	\$855,589,374		0.17%
Philadelphia, MSA	1,632	3,482	\$800,122,899		0.19%
Miami, MSA	1,533	3,271	\$751,540,384		0.24%
Seattle, MSA	1,342	2,863	\$657,748,301		0.21%
Riverside, CA, MSA	1,225	2,614	\$600,674,558		0.43%
San Francisco, MSA	1,192	2,543	\$584,400,448		0.14%
Denver, MSA	1,157	2,469	\$567,326,656		0.29%
San Diego, MSA	1,129	2,409	\$553,436,569		0.25%
Minneapolis, MSA	1,105	2,358	\$541,879,780		0.22%
Detroit, MSA	902	1,924	\$442,041,873		0.18%
Tampa, MSA	893	1,904	\$437,579,676		0.33%
St. Louis, MSA	736	1,569	\$360,595,990		0.23%
Pittsburgh, MSA	650	1,387	\$318,629,043		0.23%
MSAs with 300,000 to 1,000,000 workers					
Raleigh, NC, MSA	742	1,583	\$363,644,158		0.48%
Grand Rapids, MI, MSA	551	1,176	\$270,266,306		0.50%
Madison, WI, MSA	547	1,166	\$267,943,639		0.58%
Buffalo, NY, MSA	523	1,116	\$256,335,311		0.45%
Portland, ME, MSA	475	1,013	\$232,800,880		0.81%
Tucson, AZ, MSA	437	933	\$214,351,983		0.59%
New Orleans, LA, MSA	373	796	\$182,973,717		0.23%
Charleston, SC, MSA	351	749	\$172,188,415		0.47%
Greenville, SC, MSA	335	716	\$164,408,160		0.43%
Worcester, MA, MSA	330	705	\$161,996,429		0.41%
Durham-Chapel Hill, NC, MSA	330	704	\$161,869,096		0.36%
Salisbury, MD, MSA	315	673	\$154,572,318		0.96%
Santa Rosa, CA, MSA	293	626	\$143,747,748		0.55%
Baton Rouge, LA, MSA	277	592	\$135,982,504		0.25%
Allentown, PA, MSA	270	576	\$132,312,156		0.36%
Boise City, ID, MSA	246	524	\$120,437,220		0.40%
Asheville, NC, MSA	239	510	\$117,185,968		0.69%
Omaha-Council Bluffs, NE-IA Metro Area	239	509	\$117,025,603		0.20%
Toledo, OH, MSA	233	497	\$114,152,326		0.34%
Myrtle Beach, SC, MSA	225	480	\$110,322,084		0.69%
Lakeland, FL, MSA	212	453	\$104,099,616		0.55%
Huntsville, AL Metro Area	203	433	\$99,541,648		0.41%
MSAs with fewer than 300,000 workers					
Wilmington, NC, MSA	174	372	\$85,496,903		0.63%
Gainesville, FL, MSA	170	363	\$83,405,216		0.69%
San Luis Obispo, CA, MSA	113	241	\$55,353,996		0.40%
Greeley, CO, MSA	110	236	\$54,146,860		0.52%
Fayetteville, NC, MSA	107	227	\$52,248,469		0.31%
Hagerstown, MD, MSA	102	219	\$50,220,790		0.56%
Longview, TX, MSA	91	194	\$44,542,953		0.40%
Topeka, KS, MSA	87	186	\$42,627,226		0.43%
Ocala, FL, MSA	81	172	\$39,535,497		0.50%
Charlottesville, VA, MSA	80	172	\$39,451,084		0.32%
Midland, TX, MSA	73	156	\$35,838,452		0.17%
Tyler, TX, MSA	68	144	\$33,155,460		0.31%
Lynchburg, VA, MSA	59	125	\$28,809,923		0.31%
Columbus, GA, MSA	58	124	\$28,487,710		0.21%
Amarillo, TX MSA	56	120	\$27,622,820		0.23%
Springfield, IL, MSA	54	114	\$26,241,893		0.26%
St. Cloud, MN, MSA	49	105	\$24,202,957		0.26%
Visalia, CA, MSA	43	92	\$21,245,851		0.13%
Waterloo, IA, MSA	34	73	\$16,873,304		0.18%
Macon, GA MSA	33	71	\$16,403,040		0.18%
Tuscaloosa, AL MSA	29	63	\$14,372,508		0.13%
Houma, LA, MSA	23	48	\$11,100,695		0.09%

Goss & Associates calculations based on U.S. BEA data

Appendix E: National Animal Interest Alliance (NAIA) Model Ordinances

Table E.1 contains model ordinances as defined by the National Animal Interest Alliance (NAIA). Ordinances cover areas related to dog licensing; cat licensing and registration; incentives to license; pet nuisance, confinement and control; dangerous dog procedures; at-risk dog identification and procedures; penalties for dangerous dogs running at large; and dog fighting and other crimes.

Table E.1: NAIA Model Ordinances, 2005

Category	Recommendations
Dog licenses	<ul style="list-style-type: none"> • License all dogs at the age of 3 to 6 months. • Choose fee amounts carefully to avoid non-compliance. • According to NAIA, a review of licensing statistics shows that neutered dogs have the highest license compliance rates. Therefore, recognize and reward responsible ownership with price incentives/breaks for spaying/neutering, as well as microchip identification, fences, training, obedience clubs, sports, dog therapy, participating in a dog or cat rescue program). • Provide annual kennel, or facility licenses with pricing based to reward responsible ownership on the part of owners with multiple dogs such as breeders, rescuers, and hunting dog owners. • Set aside license fees to cover costs for animal control programs, including impoundment of uncontrolled dogs, administration of the county animal control program, and annual public education events to encourage the responsible dog ownership. • Waive license fees for service animals, as defined under the Americans with Disabilities Act, 42 USC 12101 et seq. and for any dog used by a public agency or a private organization under contract to a public agency as a police dog, tracking dog, search and rescue dog, arson or drug sniffing dog, or for any other job that furthers the mission of the agency to protect and serve the public interest. • Provide free juvenile licenses for dogs below licensing age (a time when owners are most open to education and information).
What to do about cats	<p>NAIA opposes licensing for cats.</p> <ul style="list-style-type: none"> • Cats pose little threat to human health. • Cats often perform a health benefit in settings occupied by rats and mice. • Some cats never go outdoors. <p>NAIA recommends voluntary, non-regulatory, owner-initiated cat registration linked to microchips to help shelters reunite cats with their owners. This service would be offered by animal control. Registration fees will be set by the county in an amount that encourages cat owners to participate, with financial incentives for keeping cats indoors, spaying/neutering, belonging to a cat club that encourages responsible ownership, participation in cat shows or cat rescue.</p>
One free ride home	<p>A licensed or registered pet will be returned to the owner directly when picked up at large and identified by its chip or license tag. The animal control officer will remind the owner that further violation may result in impoundment and a penalty. Penalties can be increased for subsequent violations.</p>
<i>(continued)</i>	

(Continued) Table E.1: NAIA Model Ordinances, 2005

Category	Recommendations
Nuisances	<ul style="list-style-type: none"> • Nuisances include excessive noise, soiling of public property and of private property not owned or rented by the pet owner, and odors caused by failure to clean the dog’s resident property. • It is a dog owner’s responsibility to minimize the impact this noise has on the neighborhood. The noise rises to the level of nuisance when the dog barks, howls, or yelps in a habitual, consistent, or persistent manner that continually disturbs the peace of the neighborhood. • Nuisance soiling also includes odors caused by failure to properly dispose of feces and clean urine from kennels and yards. • Owners are responsible for picking up feces deposited by their dogs in public places, confining their dogs and cats so that their pets do not soil neighbor’s yards, and cleaning up their own properties. • A warning letter will be issued to the owner on the first offense. A citation may be issued on subsequent offenses. • Penalties may include fines or court-ordered owner attendance at a responsible dog ownership session, or dog and owner attendance at an obedience school at the owner’s expense. The fines may be waived upon completion of the requirements. • Dog owners who repeatedly violate nuisance laws will be subject to increased fines and to requirements that they provide secure confinement or noise control for their pet. If the violation involves sanitation on the property, health inspectors may make periodic visits to assure that sanitation is maintained.
Confinement and control	<ul style="list-style-type: none"> • All dogs and cats must be confined to prevent escape. • When off the owner’s property, the dog must be restricted by a leash or otherwise controlled by a legally responsible person to prevent it from causing a nuisance. • Tethering: Because tethering in an unfenced area is allowed only as a redundant method of confinement behind a perimeter fence or within another enclosure in urban areas, a reasonable timetable should be set to enable dog owners to obtain the required fencing. • Animal control personnel have the authority to remove a dog or cat from a vehicle if the animal’s health is endangered by such confinement in hot weather.
Dangerous dogs	<ul style="list-style-type: none"> • Communities have a right and a responsibility to deal with dangerous dogs in a manner that clearly identifies such dogs and holds owners responsible for their actions. Identification of potentially dangerous dogs is valuable to allow for intervention before a serious injury or death occurs. However, animal control agents should be trained to recognize the difference between a potentially dangerous dog and a dog that is acting as a watchdog or is simply alerting strangers to avoid its territory.
<i>(continued)</i>	

(Continued) Table E.1: NAIA Model Ordinances, 2005

Category	Recommendations
At-risk dog	<p>An at-risk dog is a dog that:</p> <ul style="list-style-type: none"> • when off the property of the owner and unprovoked, menaces, chases, displays threatening or aggressive behavior or otherwise threatens or endangers the safety of any person; • a dog that, while running at large, menaces, attacks, or injures a domestic animal; • a dog that, while running at large, jumps on, chases, or bites a person causing a less than severe injury. (A severe injury is any physical injury that results in broken bones or disfiguring lacerations requiring multiple sutures or cosmetic surgery.) • a dog that, unprovoked and absent extenuating circumstances, menaces, attacks, or bites a person on the owner’s property causing a less than severe injury. <p>Procedure for classifying a dog as at risk:</p> <ul style="list-style-type: none"> • Upon filing of a complaint, animal control investigates and notifies the dog owner of the charge. The results are reported to a court officer or to an appointed animal control board and to the dog owner. <p>If the dog is deemed to be at risk, the owner has the option of filing an appeal with the animal control board or court or accepting the designation. The dog warden or his representative shall have discretionary authority to refrain from classifying a dog as at risk if it can be determined that the behavior was the result of the victim abusing or tormenting the dog, or it was directed toward a trespasser or a person committing or attempting to commit a crime or it involved other similar mitigating or extenuating circumstances.</p> <p>Sanctions for owning an at risk dog:</p> <ul style="list-style-type: none"> • The owner must provide secure fencing to keep the dog confined on his own property. When off the owner’s property, the dog must be kept on a secure leash of no more than four feet in length and under control of a legally responsible person. The owner must also place photos of the dog on file with the animal control agency, microchip the dog for identification, and provide proof of liability insurance that covers injuries. (This insurance may be difficult or impossible to obtain, so owners should have the option of self-insuring against an incident.) • Depending on the outcome of the investigation, the court may also assign the dog to private or group obedience classes or to evaluation by a behavior specialist and may require the owner to attend a responsible ownership class. These additional requirements will be at the expense of the owner. <p>Procedure for removal from at risk dog list:</p> <ul style="list-style-type: none"> • If there have been no further incidents for a period of 18 months and the owner can provide proof of obedience training at a reputable club or business, he may appeal to the court of the animal control board for removal of the designation. <p style="text-align: right;"><i>continued</i></p>

(Continued) Table E.1: NAIA Model Ordinances, 2005	
Category	Recommendations
<p>Dangerous dog</p>	<p>A dangerous dog is one that:</p> <ul style="list-style-type: none"> • has previously been classified as at risk and exhibits escalating aggressive behaviors that result in further complaints; • a dog that, without provocation, inflicts severe injury on a human being; menaces, maims, or kills domestic animals when off its owner’s property; or is used to threaten people or domestic pets, or is used as a weapon in the commission of a crime. <p>The dog warden or his/her representative shall have discretionary authority to refrain from classifying a dog as dangerous, even if the dog has engaged in the specified behaviors, if it can be determined that the behavior was the result of the victim abusing or tormenting the dog or it was directed towards a trespasser or a person committing or attempting to commit a crime, or it involved other similar mitigating or extenuating circumstances.</p> <p>The animal control officer or his/her representative shall investigate the circumstances and notify the dog owner of the charge. The results of the investigation should be reported to a magistrate or other court officer or to an appointed animal control board and to the dog owner. If the court officer deems the dog to be dangerous, the dog owner has the option of filing an appeal with the animal control board or accepting the designation. Depending on the circumstances, the dog may be impounded pending disposition of the case.</p> <p>Sanctions for owning a dangerous dog:</p> <ul style="list-style-type: none"> • A dangerous dog may be returned to the owner or may be destroyed depending on the outcome of the investigation. If the dog is returned to the owner, it must be microchipped, confined in a locked pen with a top when not in a home or other building, and restricted by a sturdy leash no longer than four feet when in public. The pen must be built so the dog cannot dig his way out or otherwise escape. Photos of the dog must be filed with the animal control agency and the owner must provide proof of at least \$100,000 in liability insurance. Depending on the outcome of the investigation, the court may require a behavioral evaluation of the dog and sentence the owner to attend a responsible ownership class. <p>Confinement of dangerous dogs:</p> <ul style="list-style-type: none"> • Dogs that have been adjudicated as dangerous must be confined behind a locked fence of sufficient height and materials to contain the dog and prevent trespass. Confinement must be sufficient to prevent children from coming into contact with the dog. When off the owner’s property, a dangerous dog must be restricted by a leash of no more than four feet in length and may be required to wear a muzzle. <p>Transporting dangerous dogs:</p> <ul style="list-style-type: none"> • Dogs that have been adjudicated as dangerous must be confined in a crate in a closed vehicle to prevent opportunities for escape and in a manner sufficient to prevent children from coming into contact with the dog through an open window in the vehicle. <p style="text-align: right;"><i>continued</i></p>

(Continued) Table E.1: NAIA Model Ordinances, 2005	
Category	Recommendations
Penalties for dangerous dog running at large	<p>NAIA has a no-tolerance policy towards dangerous dogs running at large. Therefore, the punishment will be severe, absent mitigating circumstances.</p> <ul style="list-style-type: none"> • Dangerous dogs that run at large and repeat the behavior that earned the designation will be impounded and euthanized. • Dangerous dogs that run at large without repeating that behavior may be returned to their owners at the discretion of the animal control agency after reviewing the case and inspection of the confinement facility. • Owners who fail to confine their dangerous dogs out of carelessness or neglect face high fines and possible jail time. The assigned penalties must be enforceable.
Dog fighting and other crimes	<p>Raising and training dogs for fighting and participating in dog fighting are serious crimes that deserve tough penalties, including prison time. Those who use dogs to illegally threaten others or to guard criminal activities should also face serious consequences, including jail time.</p>
<p>Source: "Responding to the Data: A Guide to Constructing Successful Pet-Friendly Ordinances." NAIA (National Animal Interest Alliance); http://www.naiaonline.org/pdfs/NAIA_%20Model_Animal_Control_Law_Final.pdf</p>	

Appendix F: Researchers' Biographies

Ernie Goss is the Jack MacAllister Chair in Regional Economics at Creighton University and established and served as the initial director for Creighton's Institute for Economic Inquiry. He is also principal of the Goss Institute in Denver, Colorado. Goss received his Ph.D. in Economics from The University of Tennessee in 1983 and is a former faculty research fellow at NASA's Marshall Space Flight Center. He was a visiting scholar with the Congressional Budget Office for 2003-04, and has testified before the U.S. Congress, the Kansas Legislature, and the Nebraska Legislature. In the fall of 2005, the Nebraska Attorney General appointed Goss to head a task force examining gasoline pricing in the state.

He has published more than 100 research studies focusing primarily on economic forecasting and on the statistical analysis of business and economic data. His book Changing Attitudes Toward Economic Reform During the Yeltsin Era was published by Praeger Press in 2003, and his book Governing Fortune: Casino Gambling in America was published by the University of Michigan Press in March 2007.

He is editor of Economic Trends, an economics newsletter published monthly with more than 9,500 subscribers, produces a monthly business conditions index for the nine-state Mid-American region and conducts a survey of bank CEOs in ten U.S. states. Survey and index results are cited each month in approximately 100 newspapers, and citations have included the New York Times, Wall Street Journal, Investors Business Daily, The Christian Science Monitor, Chicago Sun Times and other national and regional newspapers and magazines. Each month 75-100 radio stations carry his Regional Economic Report.

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Scott Strain is a senior research economist at Goss & Associates. He has worked as an economist and statistician for more than 20 years providing forecasts and analysis across a wide-range of industries. Scott served as an industry economist, working in new product development regarding both quantitative and qualitative research. Scott was Senior Director of Research for an economic development agency, providing economic impact and tax incentive analysis to both private businesses and government entities. He served on the business advisory committee that worked with Nebraska state senators and the director of the state's Economic Development Department to develop the Nebraska Advantage Act – a comprehensive package of business incentives that has helped to add more than \$6 billion in new capital investment and over 13,000 new jobs in the state of Nebraska since the Act's inception in 2006.

Jackson Blalock Blalock is a Financial Research Assistant with Goss & Associates. A Creighton Undergraduate Economics Major possessing a 4.0 cumulative GPA in his Junior year, he also serves as the Vice President of Finance for the Creighton Student Union, providing oversight and management of its financial operations. As an Army ROTC Cadet, he is a graduate of Fort Benning's Air Assault School, a recipient of the Superior Cadet Award, and has served in two unit staff positions simultaneously. As the Student Accounts Intern at the Creighton University Business Office, he developed detailed policies and procedures to aid in the training of future interns.