A GLOBAL THINK TANK DEDICATED TO DELIVERING DATA-RICH ANALYSES AND EXPERT INSIGHTS FOR THE PUBLIC GOOD

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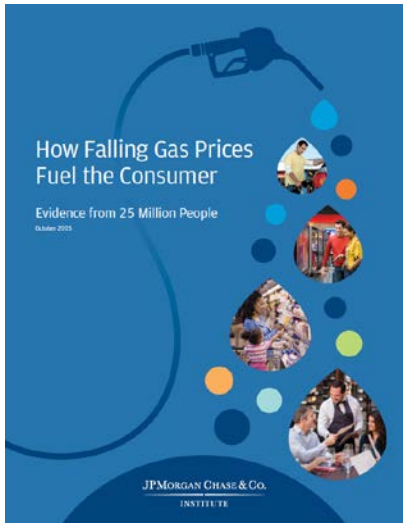
An Introduction to the JPMC Institute

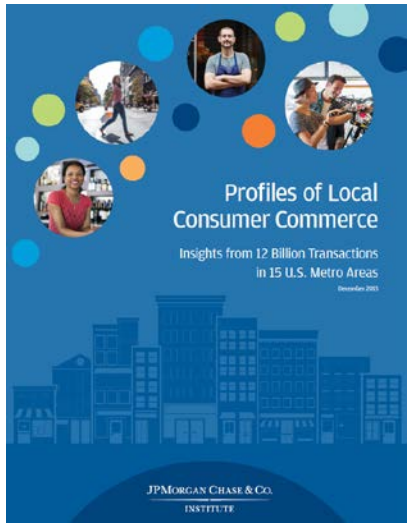
Who We Are

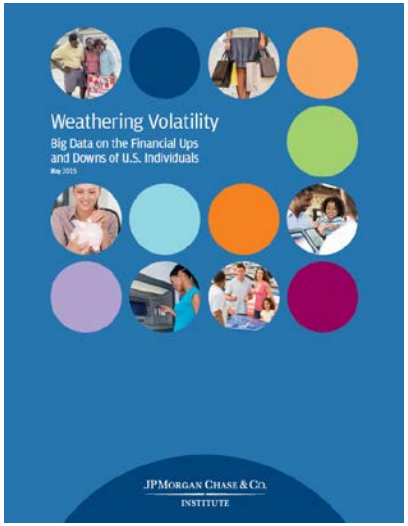
- JPMCI research is **public facing** for public consumption: primary audience is decision-makers: policy makers, businesses, and non-profit leaders
- **Independent research agenda** from commercial operations; leverage bank expertise and data to conduct research on consumers, businesses and markets
- Team of **social scientists and data scientists** (economics to sociology to finance to computer science)
  - Mix of PhDs, grads, undergrads
  - Current part-time PhD students through PhD fellowship
- **DC** and **NYC** Headquartered

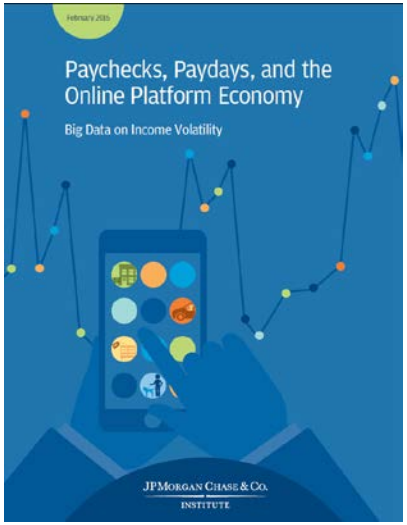
The JPMorgan Chase Institute is a global think tank dedicated to delivering data-rich analyses and expert insights for the public good

Reports



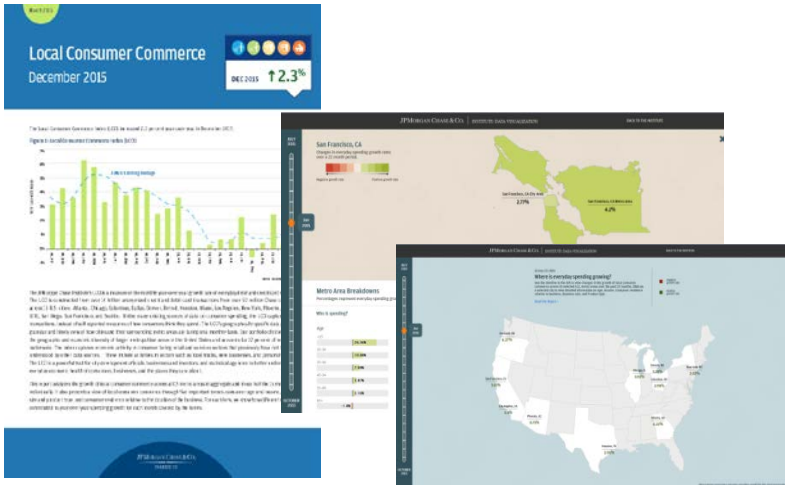


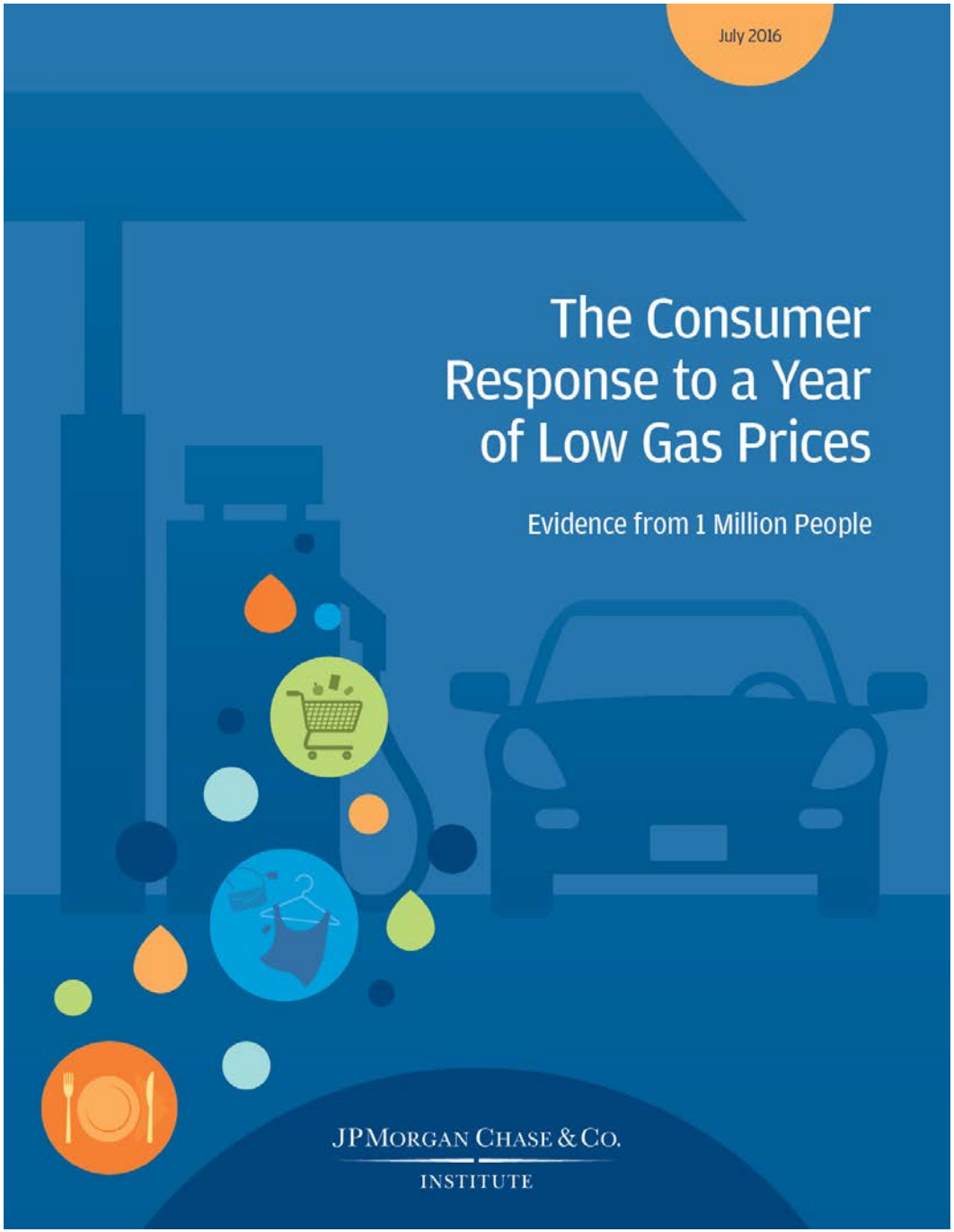




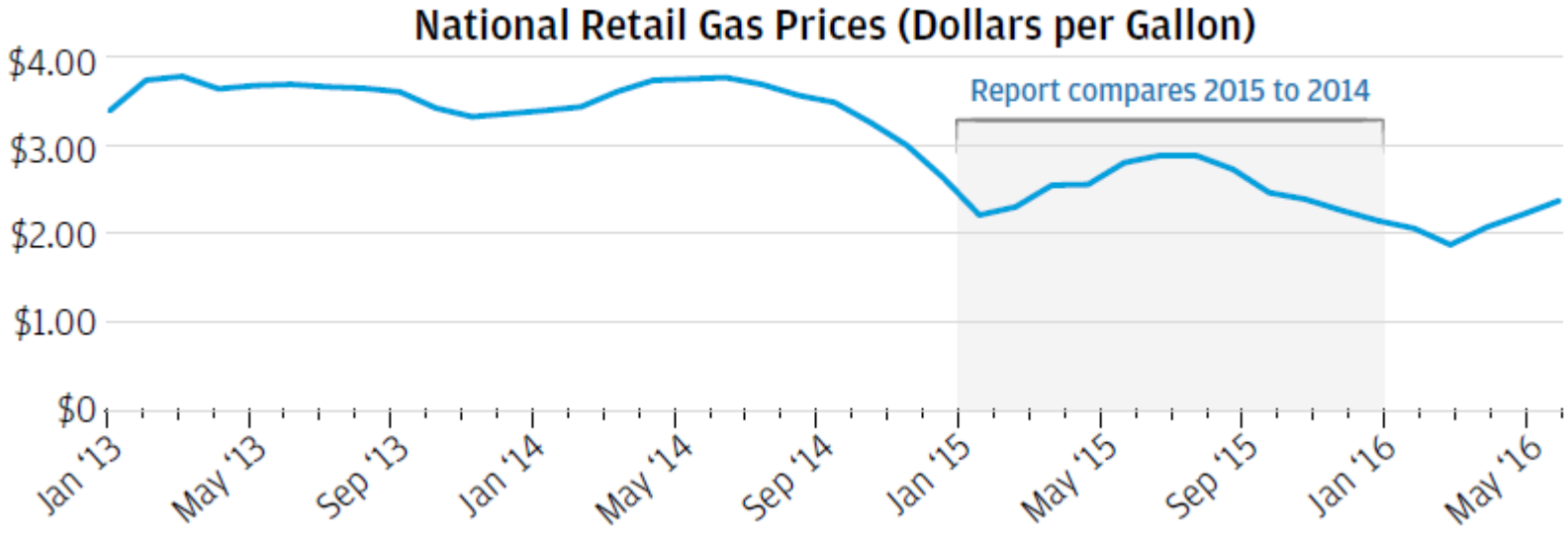
Research Briefs

Indices and Data Visualizations

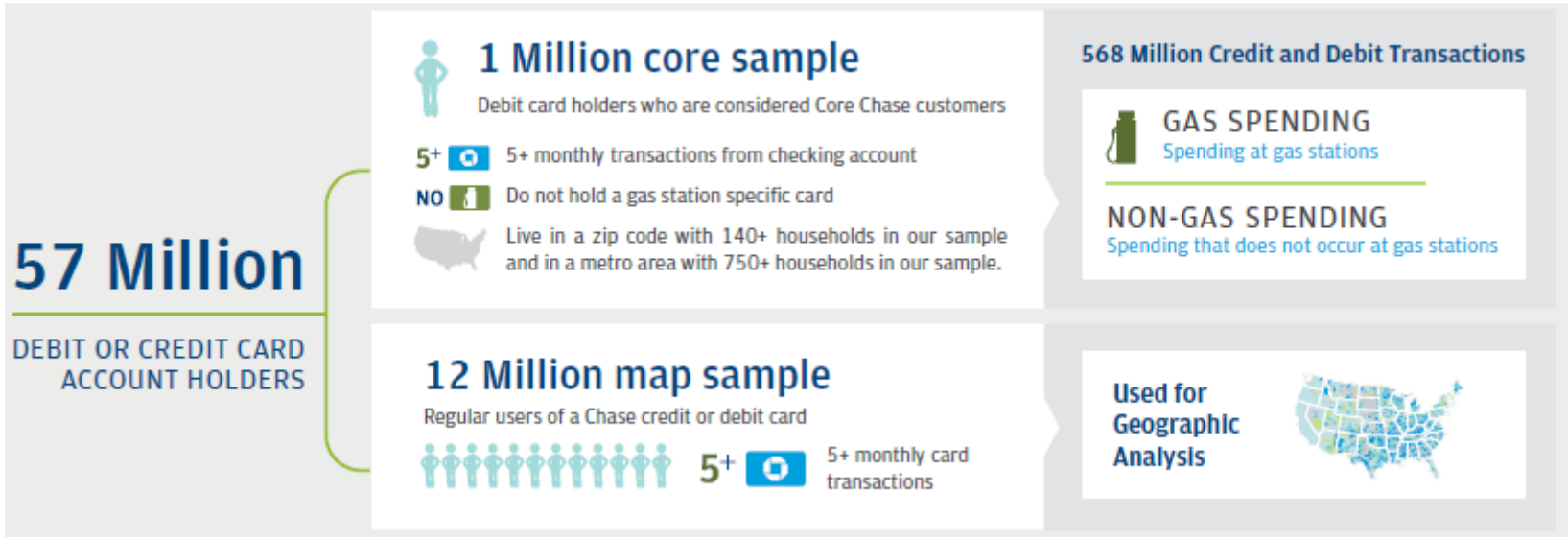



July 2016
The Consumer Response to a Year of Low Gas Prices
Evidence from 1 Million People
JPMorgan Chase & Co.
INSTITUTE

This report quantifies the impact of an entire year of lower gas prices in 2015, when gas prices were 25% lower than the prior year



Data Asset:



The Consumer Response to a Year of Low Gas Prices

Executive Summary

- **Finding 1:** Middle-income households spent almost $500 less on gas in 2015 than in 2014, equal to more than a 1 percent increase in annual income for 60% of households.
- **Finding 2:** 72% of households spent less on gas in 2015, but households in the West and Northeast were impacted the least.
- **Finding 3:** Households spent over $200 – 45 percent of their drop in gas spending – on things other than gas, primarily on restaurants and retail.
- **Finding 4:** Households spent $150 of their potential savings from gas price declines at gas stations. Including this additional spending at gas stations, households spent 58 percent of their potential savings from lower gas prices.

Demographic characteristics of the JPMorgan Chase Institute samples versus the US population

	US Population[1]	JPMC Institute Samples	
		Core Sample[4] (1 million)	Map Sample[5] (12 million)
18-24 (%)	13%	5%	8%
25-34 (%)	18%	23%	21%
35-44 (%)	17%	22%	19%
45-54 (%)	18%	22%	20%
55-64 (%)	16%	16%	17%
65+ (%)	19%	12%	15%
Men (%)	49%	53%	55%
Women (%)	51%	47%	45%
Northeast (%)	18%	19%	17%
Midwest (%)	21%	20%	22%
South (%)	38%	28%	29%
West (%)	24%	32%	32%
Annual income ($)	$42,789[2]	$62,580	$72,555
Annual gas spending ($)[3]	$2,275	$1,626	$1,704
Annual non-gas spending ($)[3]	$32,446	$18,820	$23,989

[1] Unless otherwise noted, national estimates come from the Census Bureau's American Community Survey 2014 One Year Estimates.

[2] This estimate reflects mean person income in 2014 according to the 2014 Current Population Survey. Mean family income for 2014 was $88,765.

[3] National estimates come from the Consumer Expenditure Survey midyear release from July 2014 through June 2015. Non-gas spending excludes categories of spending that are unlikely to be conducted using a debit or credit card, specifically: auto purchase, auto finance, gas, shelter, and pension. Estimates for JPMC Institute samples reflect spending in the same time period (July 2014-June 2015).

[4] The one million sample includes checking account holders with a minimum of five outflows per month, who do not have a gas station specific Chase credit card, and who live in a zip code with at least 140 other individuals in our sample.

[5] The 12 million sample includes households who have either a credit or debit card and a minimum of five transactions per month on either one.

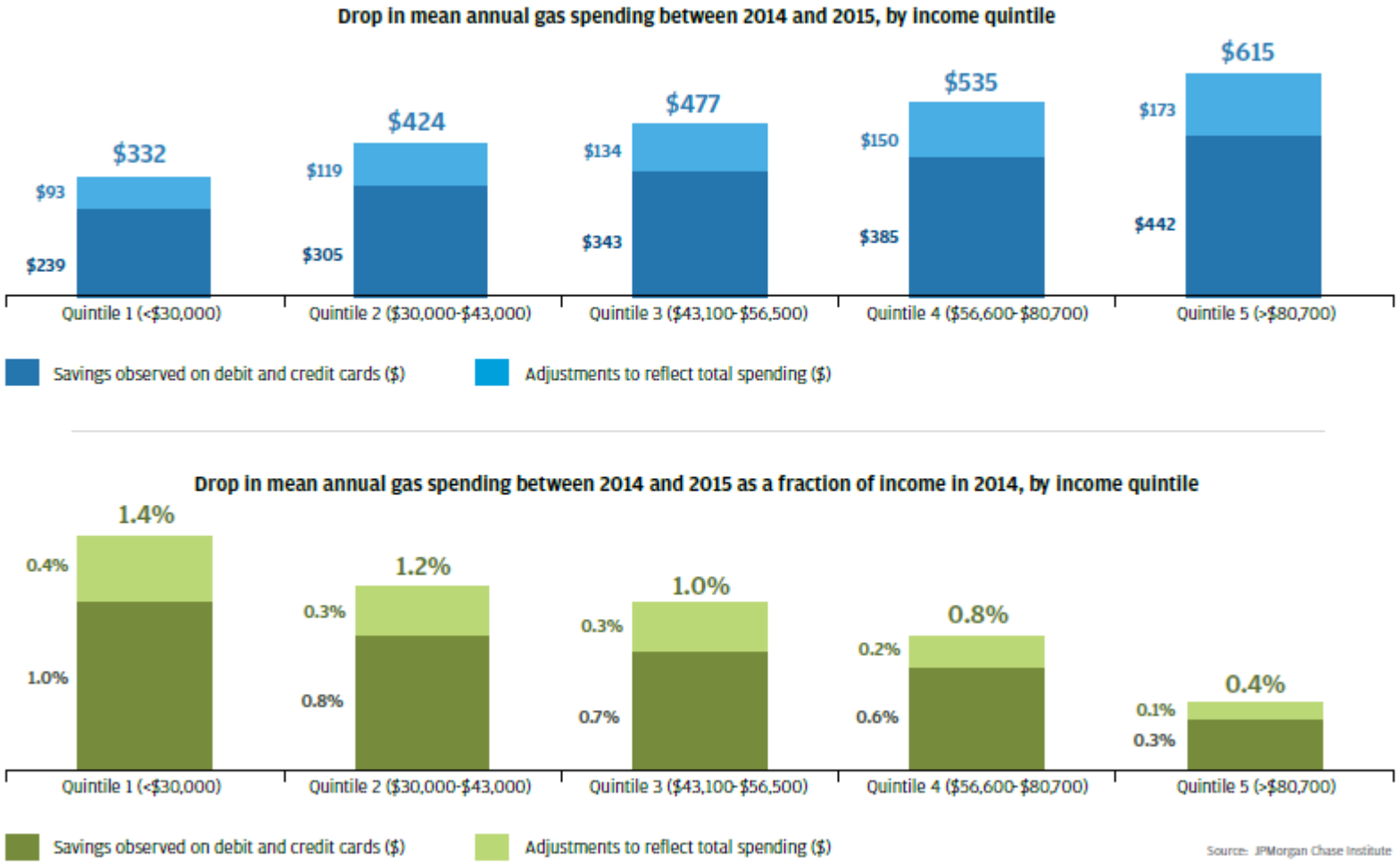
Finding 1

Middle-income households spent about $480 less on gas in 2015 than in 2014. Reductions in gas spending were equivalent to a one percent or greater increase in income for 60 percent of households.

- Middle-income households experienced a $477 drop in gas spending from 2014 to 2015. This is a significant amount for middle-income households, equal to roughly one percent of income or more than half of one month's rent or mortgage payment.
- 60 percent of households—those in the bottom three income quintiles—experienced savings at the pump that were equivalent to at least one percent of annual income.

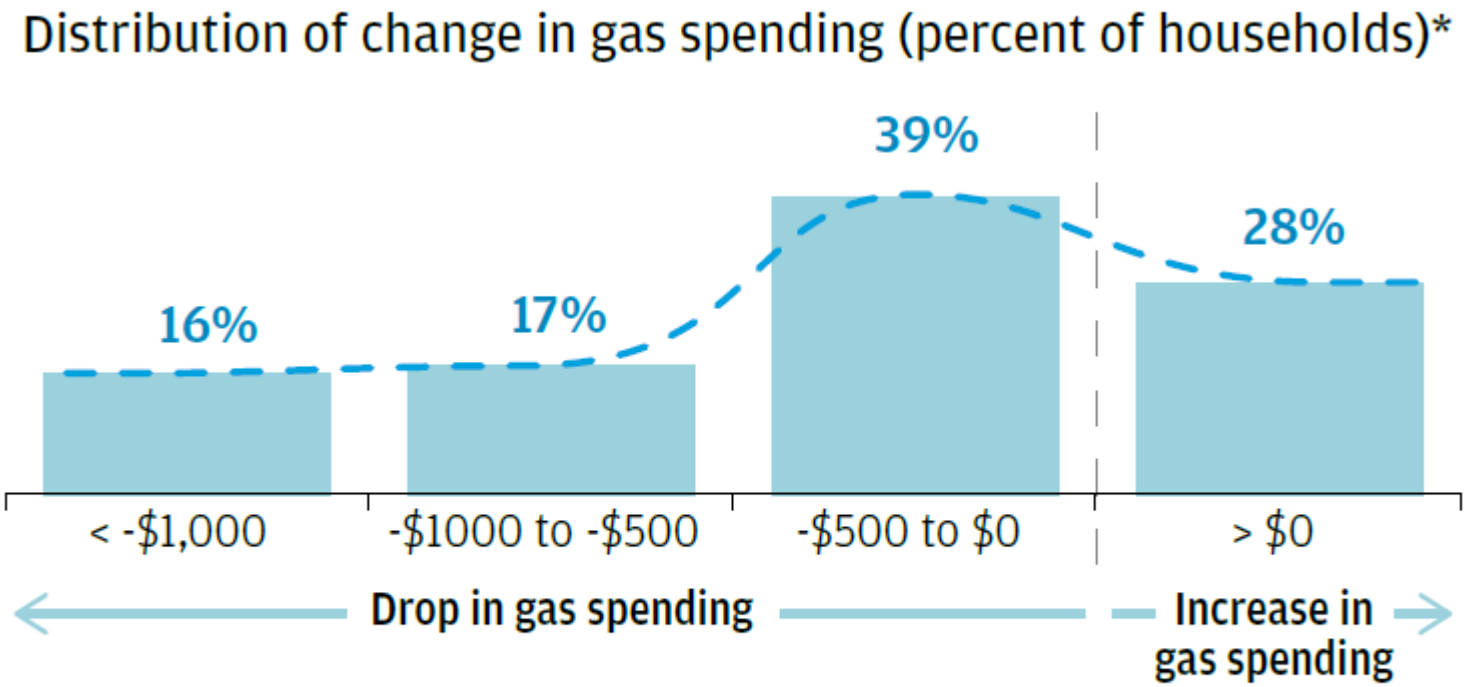
Finding 1

Middle-income households spent about $480 less on gas in 2015 than in 2014. Reductions in gas spending were equivalent to a one percent or greater increase in income for 60 percent of households



Finding 2

Seventy-two percent of households spent less on gas in 2015 than 2014, but households in the West and Northeast were impacted the least.

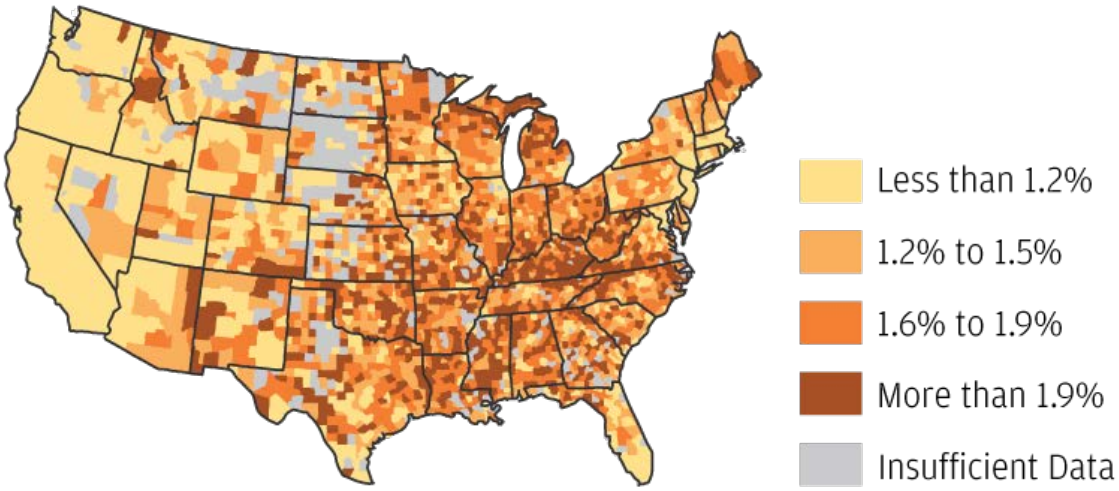


* Spending intervals on this histogram reflect card spending only and are not adjusted to reflect total spending.

Finding 2

Seventy-two percent of households spent less on gas in 2015 than 2014, but households in the West and Northeast were impacted the least.

Drop in gas spending (percent of income)



Metro areas with large drops in gas spending	Drop as a percent of income
Indianapolis, IN	1.3%
Tucson, AZ	1.3%
Dallas-Fort Worth, TX	1.3%
Baton Rouge, LA	1.2%
Louisville, KY	1.2%

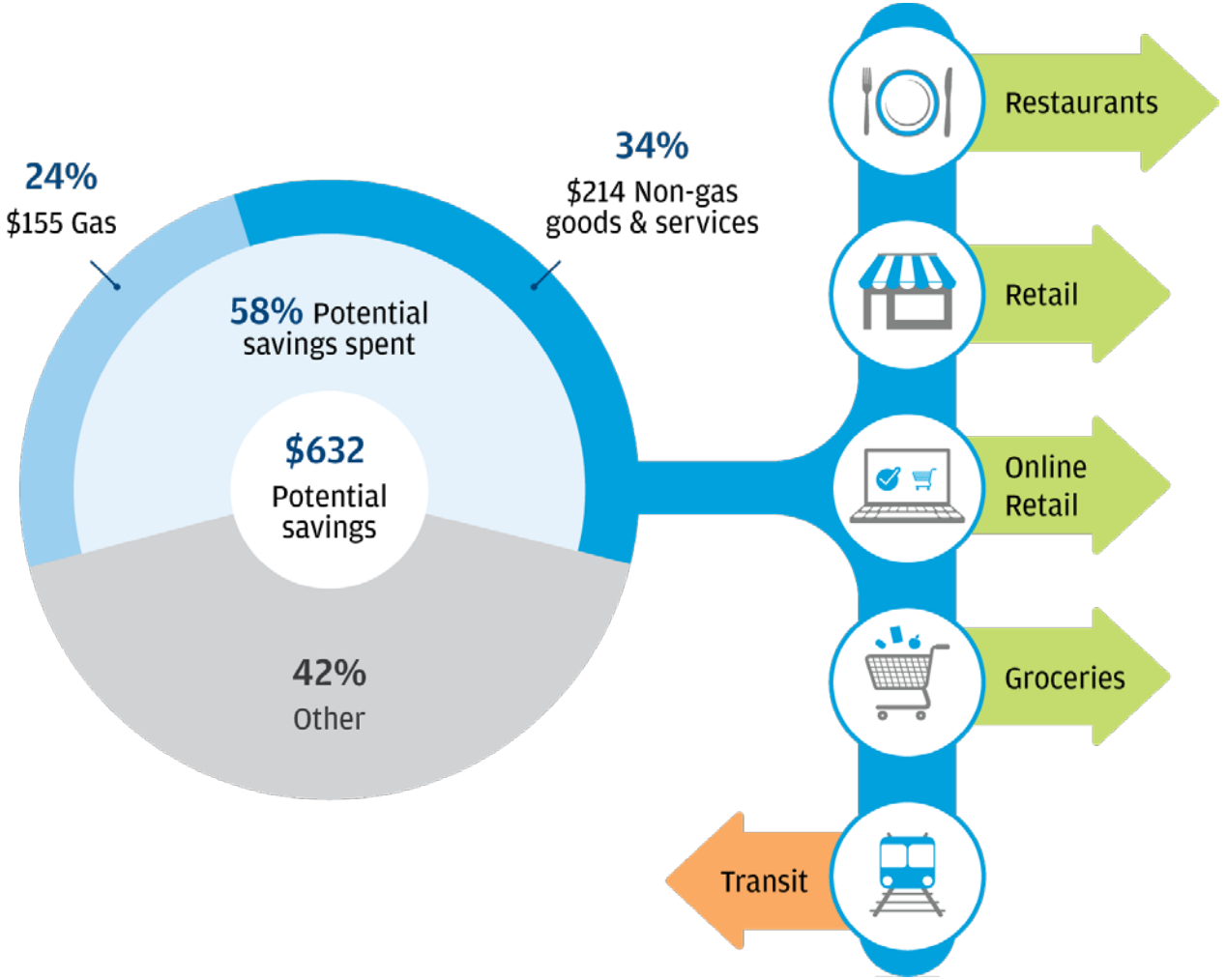
Metro areas with small drops in gas spending	Drop as a percent of income
Washington, DC	0.5%
Las Vegas, NV	0.4%
San Francisco, CA	0.4%
New York, NY	0.4%
Los Angeles, CA	0.3%

Finding 3

Households spent over $200 – 45 percent of their drop in gas spending – on things other than gas, primarily on restaurants and retail.

Finding 4

Households spent over $150 of their potential savings from lower gas prices declines at gas stations. Including this additional spending at gas stations, households spent 58 percent of their potential savings.



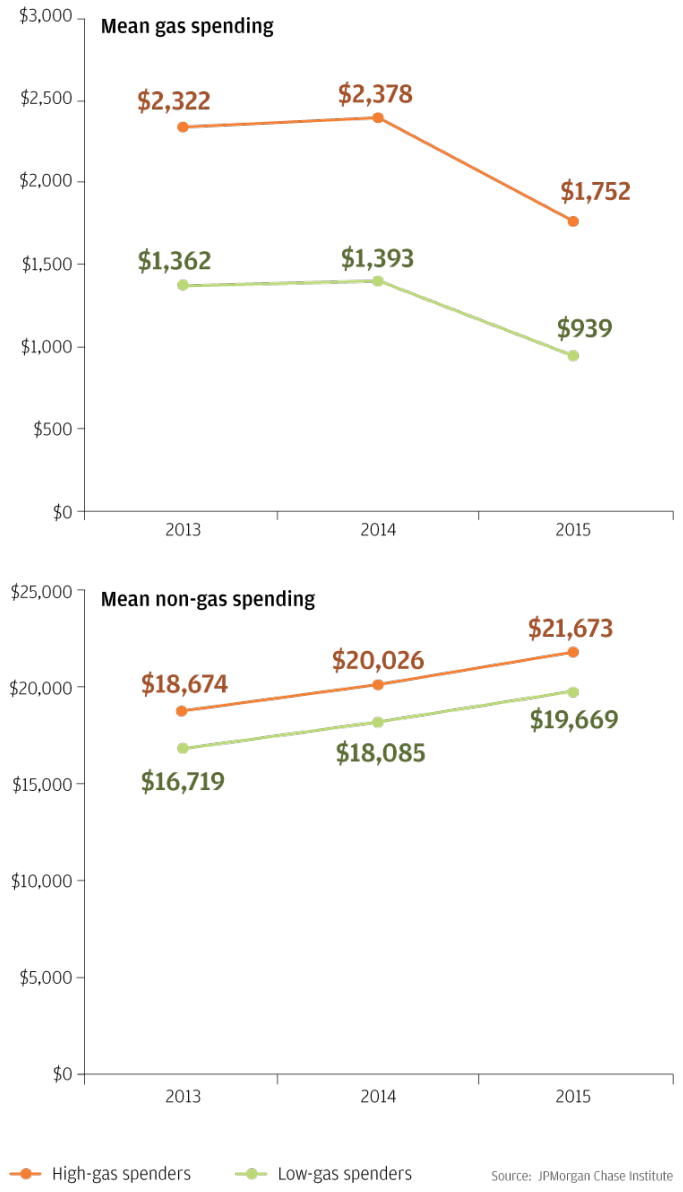
Using a difference-in-difference approach, we estimated that households spent 45 percent of their observed gas savings on non-gas goods and services

Approach:

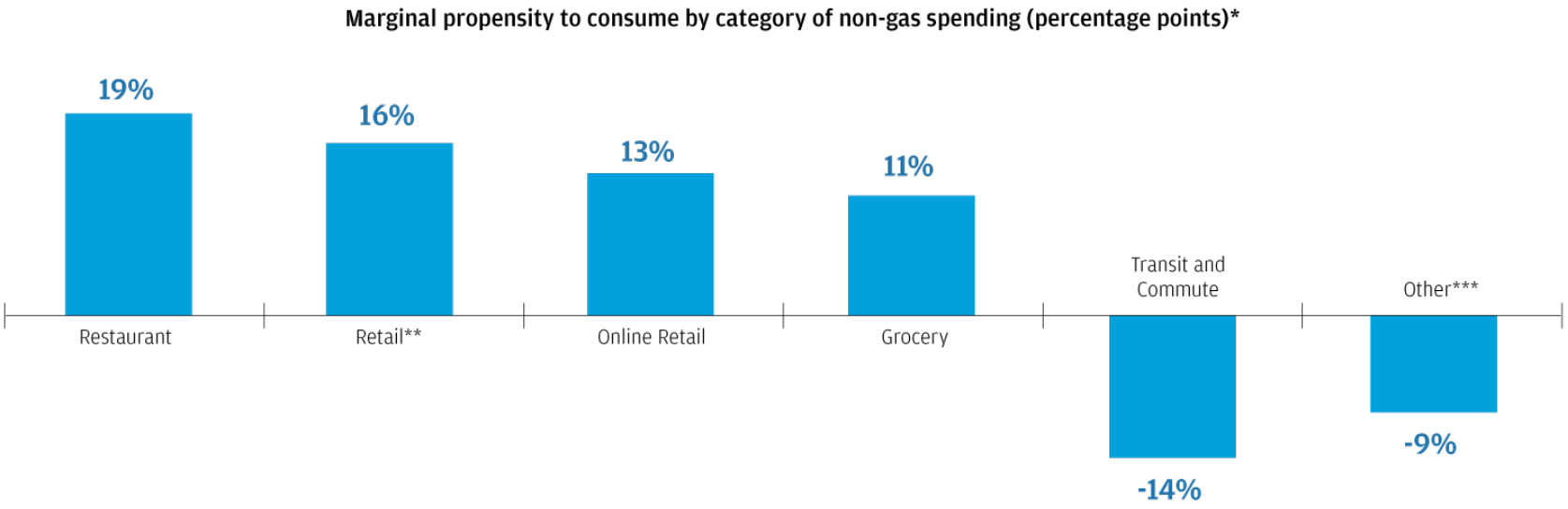
- We segmented households into quintiles of gas spending within each metro area.
- We estimated the difference-in-difference between high- and low-gas spenders in the year-over-year increase in non-gas spending and drop in gas spending between 2015 and 2014.
- We controlled for each household's metro area, income quintile within their metro area, and age of first listed account holder.

Results:

- Between 2014 and 2015 gas spending dropped by $173 more for high-gas spenders than for low-gas spenders.
- Between 2014 and 2015 non-gas spending increased by $63 more for high-gas spenders than for low-gas spenders.
- The baseline marginal propensity to consume (MPC) is 36% ($63/$173),
- The MPC increases to 45% when we adjust for the share of total spending we believe we observe on debit and credit cards among this sample (71% for gas spending, 58% for non-gas spending)



Households spent their savings primarily on restaurants and retail but also reduced spending on transit and commute



* Percentage points sum to the baseline aggregate marginal propensity to consume of 36 percent (without the scaling adjustment to account for non-card spending).
** Retail includes specialty retail stores such as drugstores, clothing, shoe, and equipment stores.
*** Other represents a combination of cash advances and payments, which declined by 13 percentage points but represent spending on unknown categories; and other categories with marginal propensities to consume less than +/-10 percentage points, including school, entertainment, auto parts, department stores, discount store, professional services, electronics and appliances, utilities, home improvement, healthcare, insurance, and travel, which increased in aggregate by four percentage points.

Source: JPMorgan Chase Institute

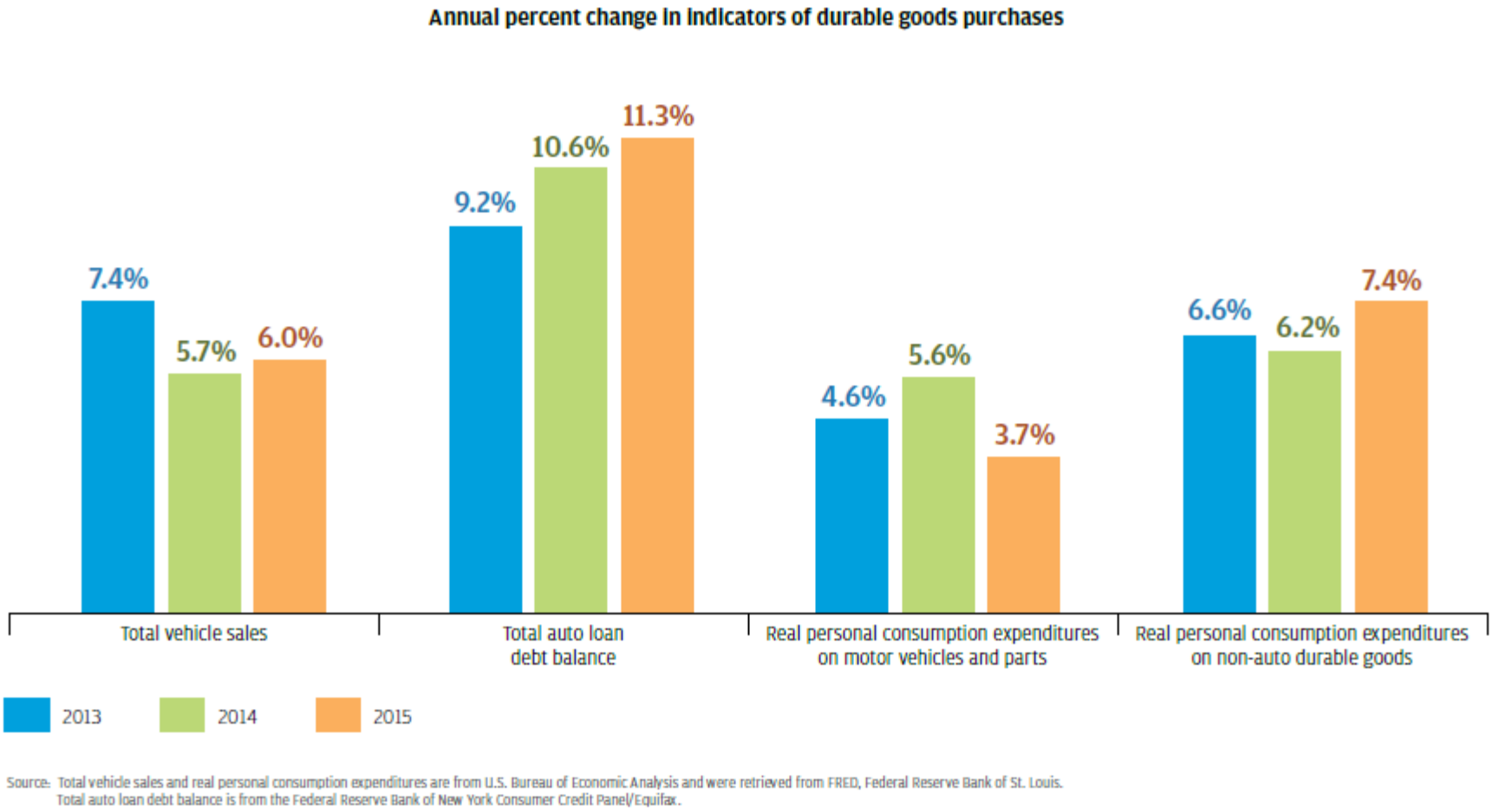
- Households spent approximately 34 percent on non-gas goods and services, principally on restaurants, retail and online retail. Specifically, households spent 19 percentage points of their savings from lower gas prices on Restaurants, 16 percentage points on Retail, 13 percentage points on Online Retail, and 11 percentage points on Grocery.
- For every dollar saved from lower gas prices, households *decreased* their spending on transit by roughly 14 cents.

This report quantifies the impact of lower gas prices on not only non-gas spending but also on spending at gas stations

In our previous report *How Falling Gas Prices Fuel the Consumer,* we estimated that consumers spent roughly 80 percent of their savings at the pump. The comparable figure in this report is 45 percent.

How did households use the other 42% of their potential savings?

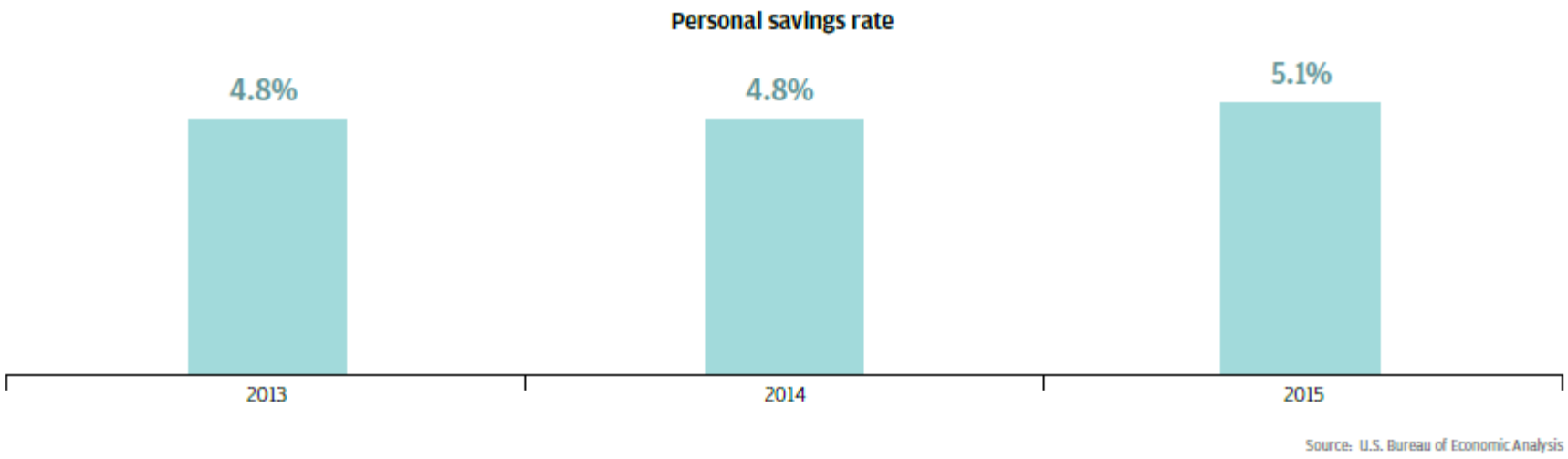
They bought more vehicles and other durables.



Source: Total vehicle sales and real personal consumption expenditures are from U.S. Bureau of Economic Analysis and were retrieved from FRED, Federal Reserve Bank of St. Louis. Total auto loan debt balance is from the Federal Reserve Bank of New York Consumer Credit Panel/Equifax.

How did households use the other 42% of their potential savings?

They might have saved more.



The Consumer Response to a Year of Low Gas Prices

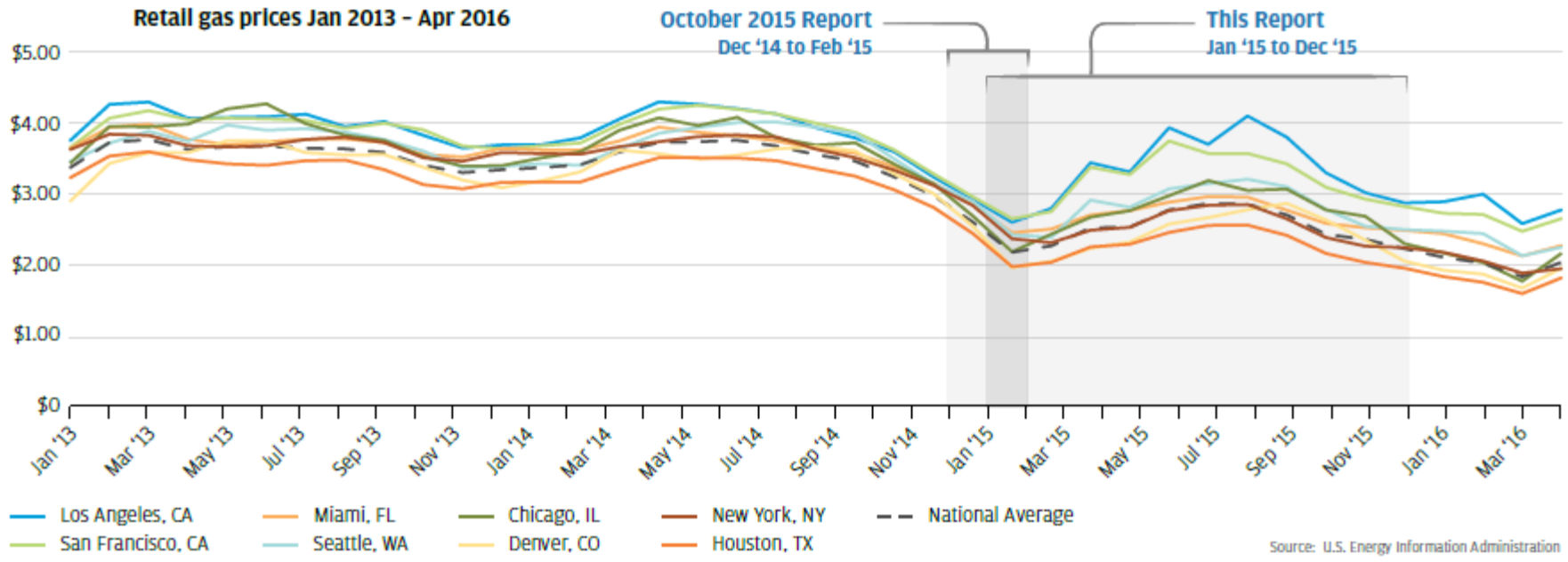
Implications

- **The fall in gas prices had meaningful impacts on households' transportation choices.** Households consumed more gas when gas prices fell. In 2015, this contributed to a reversal of the five-year trend of declining real gas consumption and vehicle miles traveled. In addition, we observed that households decreased spending on transit in response to lower gas prices. For every dollar saved from lower gas prices, households decreased their spending on transit by roughly 14 cents. This might imply lower ridership and revenues for public transit systems around the country and increased carbon emissions by motor vehicles.
- **Lower gas prices benefitted the restaurant and retail sectors.** Households spent roughly 34 percent of their potential gas savings on non-gas goods and services, primarily on restaurants and retail. These sectors which gained the most from lower gas prices in 2015 also potentially stand to lose the most if gas prices return to higher levels.
- **Gas price fluctuations contribute to expense volatility, particularly for lower-income households.** The drop in gas spending was equivalent to more than a one percent increase in annual income for low and middle-income households. Low-income households increasingly live in areas that lack reliable public transportation options and spend the highest fraction of their income on gas.

Using JPMorgan Chase Institute's Local Consumer Commerce data, we explore the impact of lower gas prices in 2015 on consumer spending in 15 metro areas

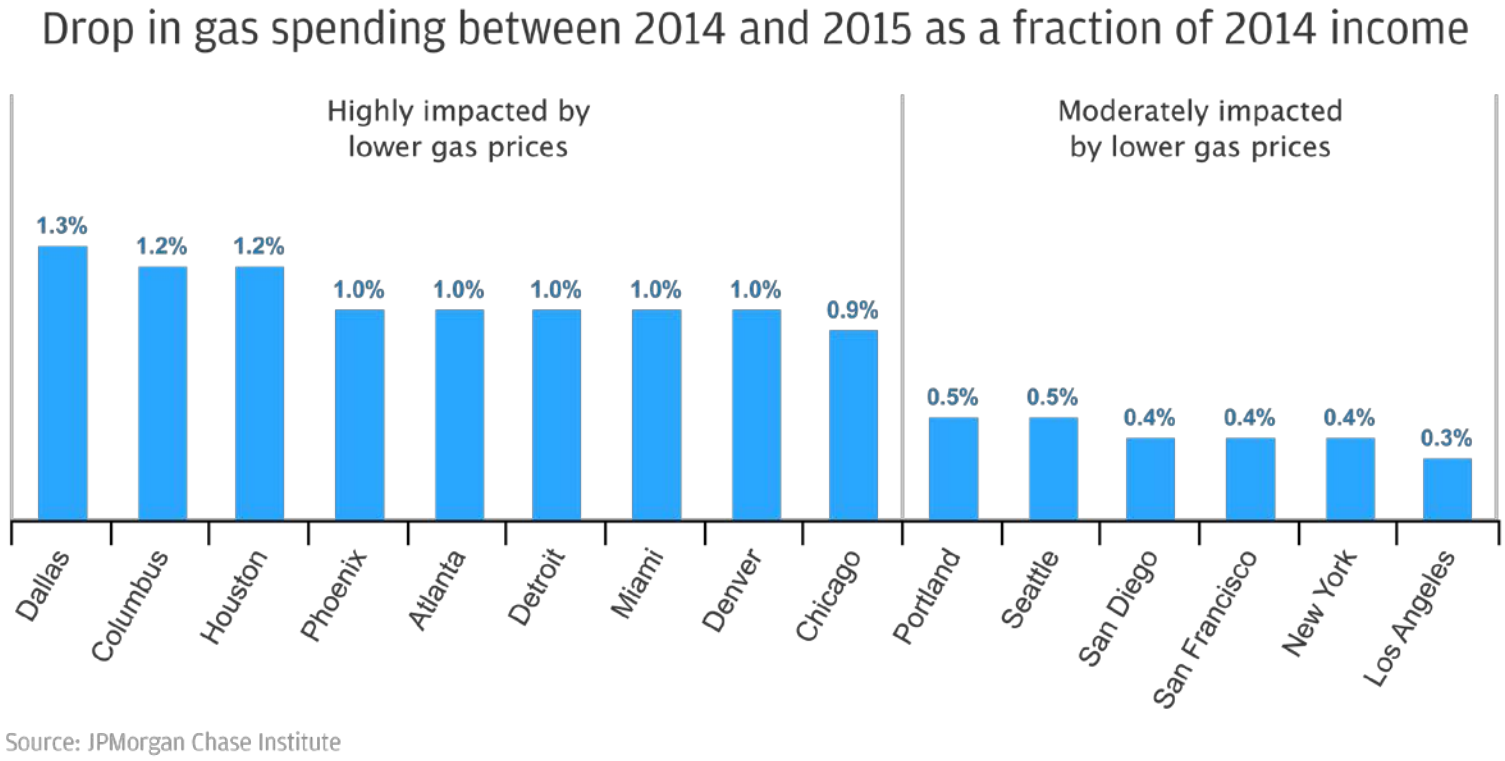
The consumer response to lower gas prices might have differed across metro areas due to three factors.

- **Factor 1: The drop in gas prices in 2015 was much more tempered in California than in other parts of the country.**



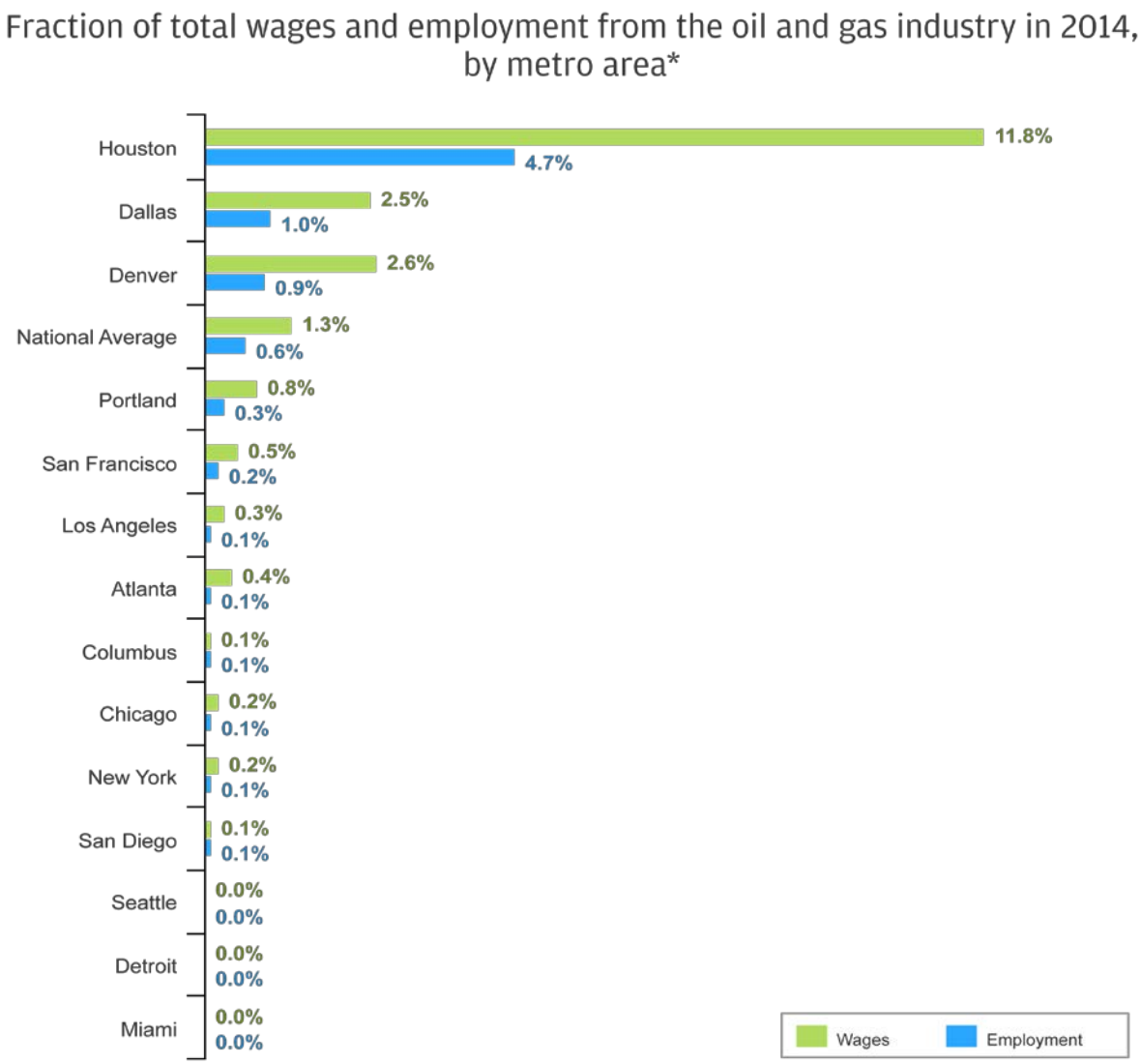
Consumers in Midwestern and Southern Cities spent the most on a gas and experienced large drops in spending at gas stations

- **Factor 2: People in some cities spent a higher fraction of their income on gas than in others.** For example, the drop in fuel spending between 2014 and 2015 was the equivalent of a 1.3 increase in annual income in Dallas compared to just a 0.3 percent increase in income in Los Angeles . Nine of the 15 cities were highly impacted by lower gas prices in that the drop in gas spending represented 0.9 percent or more of annual income. In the other six cities, the drop in gas spending represented at most 0.5 percent of annual income.



Source: JPMorgan Chase Institute

Houston has over four-fold more exposure to the oil and gas industry than the other 14 cities in the Local Consumer Commerce Index

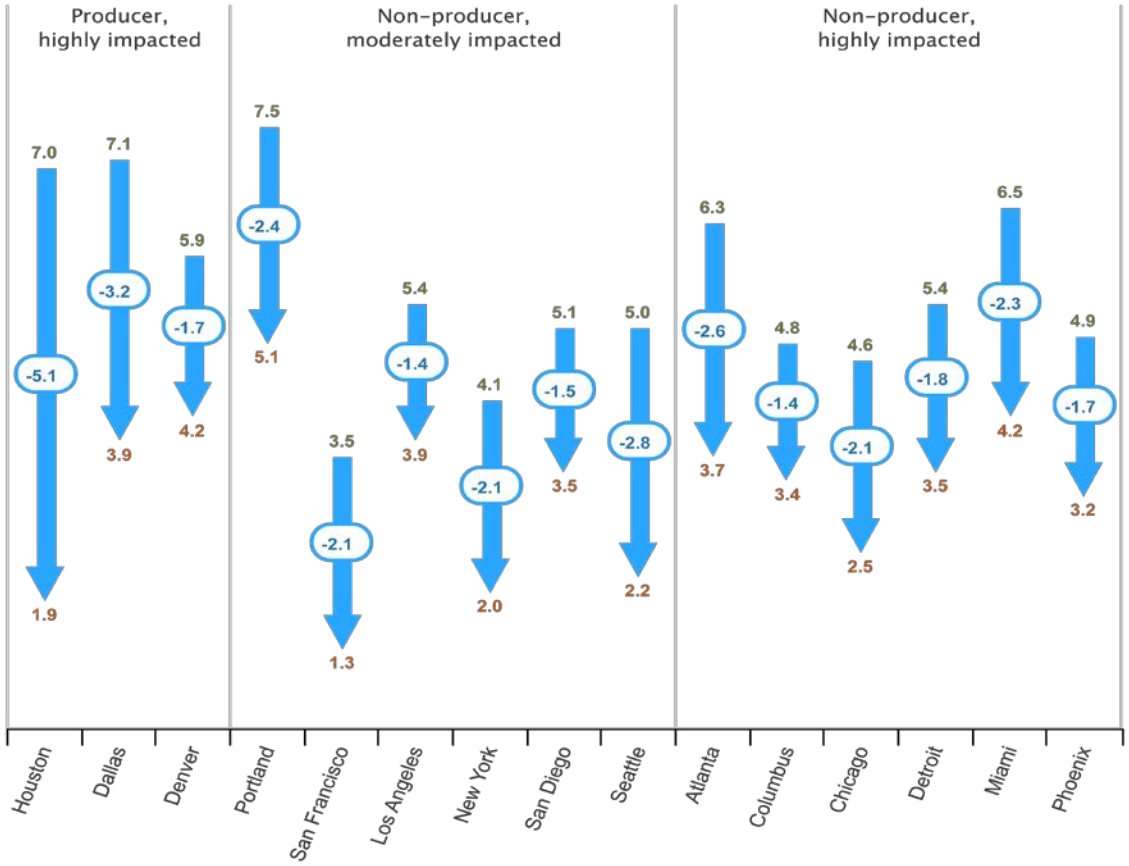


- **Factor 3:** **Some cities have more exposure to the oil and gas industry** such that a large drop in gas prices could potentially lead to wider, negative economic impacts like lower profits, wages, or job loss. Some cities have more exposure to the oil and gas industry such that a large drop in gas prices could potentially lead to wider, negative economic impacts like lower profits, wages, or job loss

Across all 15 cities, Houston experienced by far the largest deceleration in non-gas spending

Findings

Percentage point change in non-gas spending between 2014 and 2015: (percent growth in 2014, percent growth in 2015, percentage point change in growth between 2014 and 2015)*



* Estimates reflect credit or debit spending within a metro area by households that live within that same metro area and therefore exclude air travel and most e-commerce.

Source: JPMorgan Chase Institute

- **Across all 15 cities, Houston experienced by far the largest deceleration in non-gas spending** – a 5.1 percentage point drop from 7.0 percent in 2014 to 1.9 percent in 2015. Houston also experienced the slowest absolute growth in non-gas spending in 2015 (1.9 percent), with the exception of San Francisco (1.3 percent).
- **Dallas experienced the second largest deceleration in non-gas spending after Houston** – a 3.2 percentage point drop in the growth rate. The decelerations in non-gas spending were smaller than three percentage points in the remaining thirteen cities.
- **The decelerations were not clearly smaller in highly impacted cities,** where the boost from lower gas prices might have been greater. Differences in economic conditions among these cities could have easily overwhelmed the differential impact of lower gas prices.

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The methodology in this report reflects a number of differences in sample and methodology compared to our 2015 report (differences reflected in **bold**)

	MPC estimate for Jan 2015 (Farrell and Greig, 2015)	MPC estimate for 2015 (Farrell and Greig, 2016)
MPC time frame	December 2014 – February 2015.	**January 2015 – December 2015.**
Sample	They have a checking account and at least five outflow transactions from their checking account per month between October 2012 and June 2015. They do not hold a gas station specific card. They live in a zip code with at least 140 other households in our sample.	They have a checking account and at least five outflow transactions from their checking account per month between October 2012 and January 2016. They do not hold a gas station specific card. They live in a zip code with at least 140 other households in our sample. **They live in a metro area with at least five zip codes and at least 750 other households in our sample.**
Assignment to treatment and control groups	Household gas spending is estimated based on zip code-level leave-out mean gas spending of all other households in the zip code. Quintiles of gas spending are assigned nationally.	Household gas spending is estimated based on zip code-level leave-out mean gas spending of all other households in the zip code. **Quintiles of gas spending are assigned within each metro area.**
Estimation approach	Difference-in-difference comparison between high- and low-gas spenders in the year-over-year increase in non-gas spending (numerator) and drop in gas spending (denominator).	Difference-in-difference comparison between high- and low-gas spenders in the year-over-year increase in non-gas spending (numerator) and drop in gas spending (denominator). **We control for each household's metro area, income quintile within their metro area, and age when estimating mean gas and non-gas spending for our treatment and control groups.**
MPC on non-gas goods and services	73 percent (confidence interval of 51 – 95 percent) 89 percent when adjusted to reflect total spending	**36 percent (confidence interval of 10 – 63 percent)** **45 percent when adjusted to reflect total spending**

In our previous report *How Falling Gas Prices Fuel the Consumer,* we estimated that consumers spent roughly 80 percent of their savings at the pump. The comparable figure in this report is 45 percent. There are a few considerations in comparing the reports:

- They examine different "experiments" involving different time frames, gas price dynamics and seasonal effects.
- Differences in samples and methodologies do NOT explain the difference in result.
- It is possible that the overall consumption response tempered over time as consumers adjusted to a "new normal" in their level of gas spending.