

# Shopping, Near and Far

Local Commerce  
in the Digital age



# About the Institute

The global economy has never been more complex, more interconnected, or faster moving. Yet, economists, businesses, nonprofit leaders, and policymakers have lacked access to real-time data and the analytic tools to provide a comprehensive perspective. The results—made painfully clear by the Global Financial Crisis and its aftermath—have been unrealized potential, inequitable growth, and preventable market failures.

The JPMorgan Chase Institute is harnessing the scale and scope of one of the world's leading firms to explain the global economy as it truly exists. Its mission is to help decision-makers—policymakers, businesses, and nonprofit leaders—appreciate the scale, granularity, diversity, and interconnectedness of the global economic system and use better facts, timely data, and thoughtful analysis to make smarter decisions to advance global prosperity. Drawing on JPMorgan Chase's unique proprietary data, expertise, and market access, the Institute develops analyses and insights on the inner workings of the global economy, frames critical problems, and convenes stakeholders and leading thinkers.

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

## Acknowledgments

We thank James Duguid and Bryan Kim for their critical contributions to this report. It was truly a team effort, and it could not have been done without their willingness to learn new tools, overcome challenges, and push the project forward. We also thank Chris Wheat for his instrumental guidance, feedback, and support.

We are also grateful for the invaluable inputs of researchers and practitioners from a variety of academic and policy organizations, including Steve Tadelis from UC Berkeley, Rebecca Denale, Nick Orsini, Scott Scheleur, Stephanie Lee Studds, and Ian Thomas from the US Census Bureau, Norton Francis from the DC Office of Revenue Analysis, Ferdinando Monte from Georgetown University, Christina McFarland and Anita Yadavalli from the National League of Cities, and Simone Brody, Jennifer Park, and Clarence Wardell from What Works Cities. We are deeply grateful for their generosity of time, insight, and support.

This effort would not have been possible without the diligent and ongoing support of our partners from the JPMorgan Chase Consumer & Community Banks and Corporate Technology teams of data experts, including but not limited to Samuel Assefa, Connie Chen, Anoop Deshpande, Senthilkumar Gurusamy, Ram Mohanraj, Karen Narang, Stella Ng, Ashwin Sangtani, and Subhankar Sarkar. The project, which encompasses far more than the report itself, also received indispensable support from our internal partners in the JPMorgan Chase Institute Operations team, including Elizabeth Ellis, Courtney Hacker, Alyssa Flaschner, Sarah Keuhl, Caitlin Legacki, Sruthi Rao, Carla Ricks, Jolie Spiegelman, Gena Stern, and Maggie Tarasovitch.

Finally, we would like to acknowledge Jamie Dimon, CEO of JPMorgan Chase & Co., for his vision and leadership in establishing the Institute and enabling the ongoing research agenda. Along with support from across the Firm - notably from Peter Scher, Max Neukirchen, Joyce Chang, Patrik Ringstroem, Lori Beer, and Judy Miller - the Institute has had the resources and support to pioneer a new approach to contribute to global economic analysis and insight.

## Contact

For more information about the JPMorgan Chase Institute or this report, please see our website [www.jpmorganchaseinstitute.com](http://www.jpmorganchaseinstitute.com) or e-mail [institute@jpmchase.com](mailto:institute@jpmchase.com).

# Shopping, Near and Far:

## Local Commerce in the Digital Age

Diana Farrell  
Lindsay Relihan  
Marvin Ward Jr.

## Contents

2	Executive Summary
6	Introduction
9	Findings
20	The Road Ahead
20	Local Commerce: Consumer View
25	Data and Methodology
28	Appendix: Measuring Online Commerce
31	Glossary
31	Endnotes
32	References
33	Suggested Citation

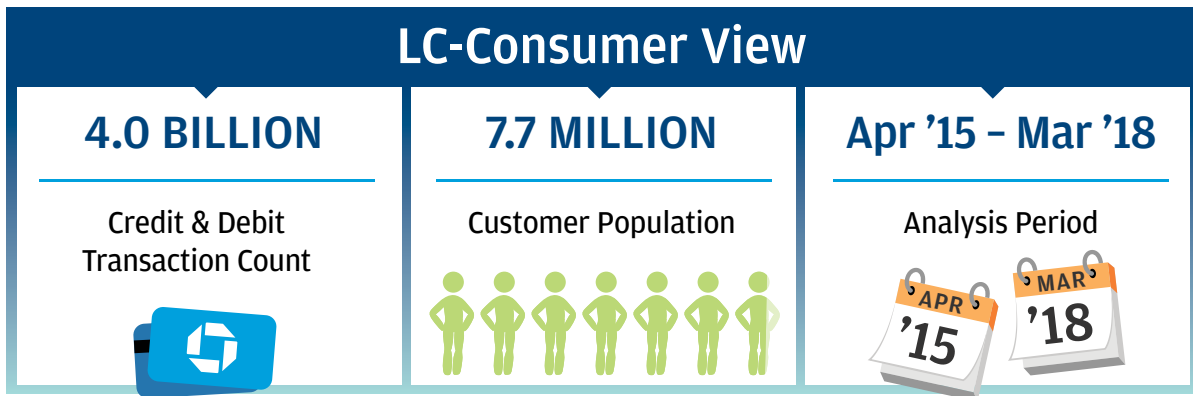
# Executive Summary

In 2016, the metropolitan share of US Gross Domestic Product was nearly 90 percent. Given the large share of economic output from metropolitan areas it is critical for stakeholders, researchers, and policy-makers to have granular, high-frequency economic measurement and analyses at the metropolitan level to complement existing local economic research.

In this report, the JPMorgan Chase Institute expands the scope of our Local Commerce (LC) analyses through the introduction of our consumer view—namely, the transactions executed by consumers that reside within a given area (e.g., a LC metro area). This view complements the merchant view leveraged in our existing [Local Commerce Index \(LCI\)](#)<sup>1</sup> which examines the transactions executed at merchants located within a given area (specifically our LC metro areas). The consumer view enables exploration of the extent to which online commerce has affected growth, who has driven that growth, and how it has impacted the offline marketplace.

## Data

To perform our analysis of the LC-Consumer View, we leveraged transaction-level data that is administratively collected by the bank during the course of normal operations. Each record carries attributes of the consumer, merchant, and the transaction itself.



## What are the Dimensions of Local Commerce?

The LC view categorizes transactions along three primary dimensions:

- Customer Residence,
- Merchant Location, and
- Transaction Channel (online/offline)

Customer and merchant locations allow us to understand the extent to which customers are shopping at local merchants versus merchants that are located in different metro areas. The transaction channel allows us to understand whether or not the purchase was made at distance.

### Inclusion criteria for transactions

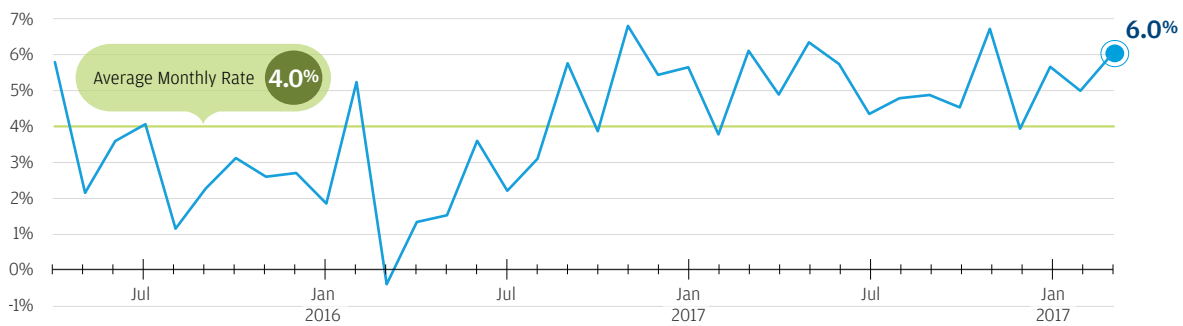
		MERCHANT	
		Local	Non-Local
CONSUMER	Resident	Residents spend in CBSA	Residents spend remotely
	Non-Resident	Non-Residents spend in CBSA	

## Finding One

Between April 2015 and March 2018, the LC-Consumer Index averaged 4 percent in year-over-year growth.

- Resident spending growth increased substantively throughout 2016. Growth through September 2016 averaged 2.9 percent, while growth after averaged 5.2 percent.
- Growth levels remained elevated throughout 2016 and 2017.
- Growth in spending captured by the US Census Bureau's Monthly Retail Trade Survey increases more gradually in comparison to the LC-Consumer Index.

The LC-Consumer Index grew 6 percent between March 2017 and March 2018

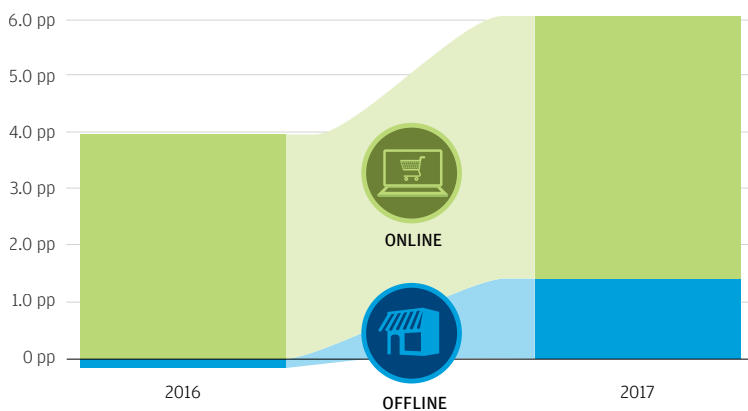


Source: JPMorgan Chase Institute

## Finding Two

Online spending has driven overall growth in the LC-Consumer Index, at times almost exclusively.

The online contribution to growth has been increasing, and accounted for 77 percent of total spending growth in 2017

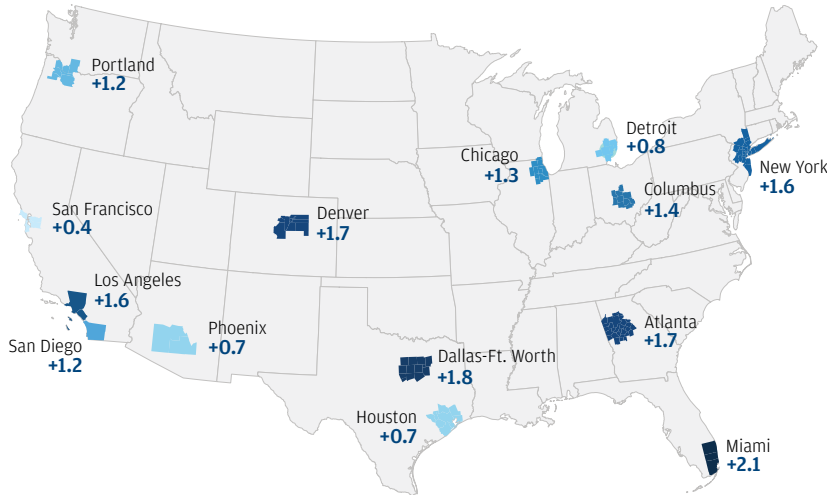


Source: JPMorgan Chase Institute

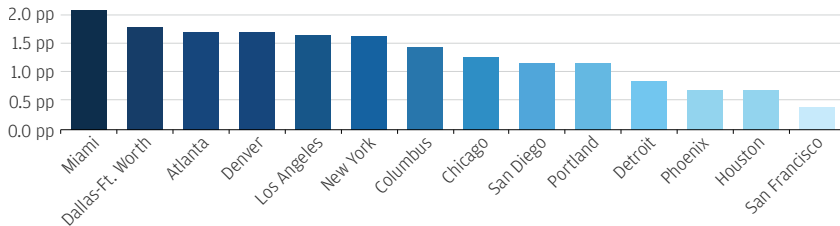
- The relatively high, sustained growth in resident spending has largely been driven by online commerce, which has contributed a monthly average of 4.0 and 4.7 percentage points (pp) in 2016 and 2017, respectively.
- The quarterly year-over-year growth of online spending in the LC-Consumer Index over the 2015 Q2 to 2018 2Q time period was 3.1 pp lower in the LC-C (11.7 percent) than in the US Census Bureau's E-Commerce Series (14.8 percent).

## Finding Three

Non-local shares of LC-Consumer spending are increasing in every metro we track.



- San Francisco saw the smallest increase at 0.4 pp, while Miami saw the largest at 2.1 pp.
- Between April 2015 and March 2018, the share of LC-Consumer spending that took place at non-local merchants increased from 45.5 percent to 48.9 percent.

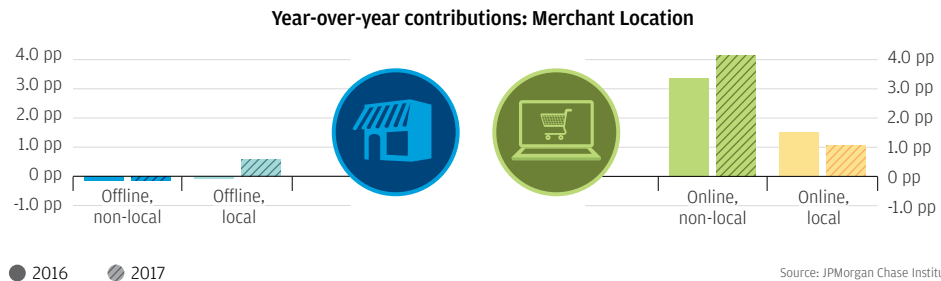


## Finding Four

Online commerce growth is driven by contributions from non-local merchants.

- Overall spending growth is dominated by contributions from online spending at non-local merchants, contributing 3.2 and 4.1 pp in 2016 and 2017, respectively. This is in comparison to the smaller 1.5 and 1.1 pp contributions from online spending at local merchants in 2016 and 2017, respectively.

- For offline transactions, spending at local merchants is the dominant driver of growth.

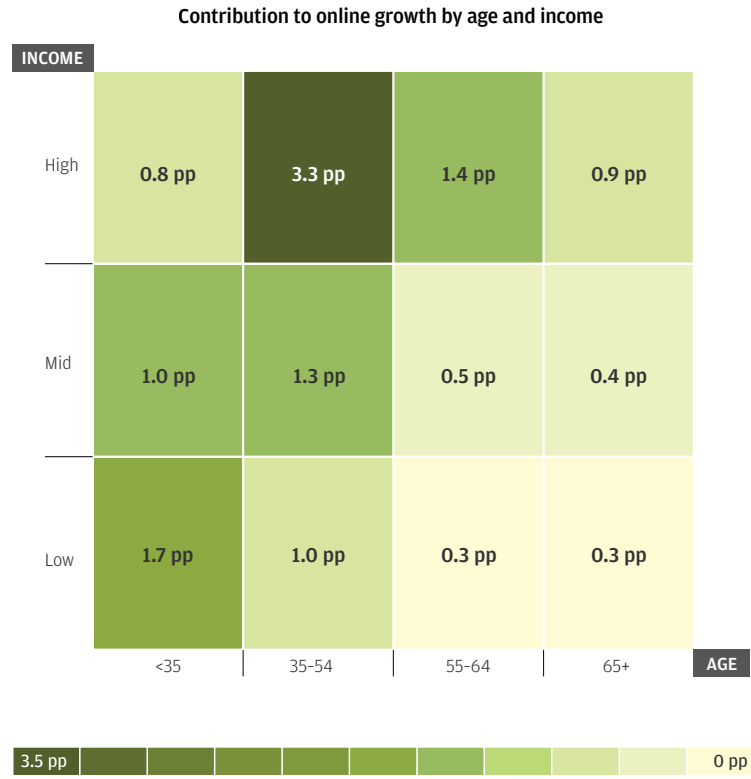


Source: JPMorgan Chase Institute

**Finding Five**

**Online spending growth is driven by high-income consumers between the ages of 35 and 54.**

- Consumers under 35 across all income brackets tend to contribute strongly to online growth, but high-income 35-54 year olds are the dominant contributors to growth in the online market. This group contributed 3.3 pp to overall growth in 2017.
- The growth contributions from high-income 35-54 year olds were 94 percent higher than the next closest group (low-income consumers under 35) in 2017.
- This dominance by high-income 35-54 year olds is largely driven by the fact they hold the largest market share in online spending.



Source: JPMorgan Chase Institute

## Conclusion

The consumer view of Local Commerce provides a granular view of online spending and its implications for local economies that is difficult to capture via other data sources. Our initial analyses revealed that the growth rate for online spending is highest for lower income customers under 35, but the largest contributions to growth come from the high-income 35-54 year olds. High and growing shares of LC-Consumer spending take place online and this is true across all metro areas we tracked. This growth in online spending has been accompanied by an increase in spending at merchants that are located outside the metro area of the consumer. The implications of these changes for local economies are not yet clear, but the LC-Consumer Index can provide unprecedented insight into an evolving commerce landscape.

# Introduction

---

Between 1990 and 2010, the urban population of the United States grew 12.1 percent, compared to 9.7 percent for the nation as a whole. This continued the persistent trend toward urbanization over the whole of the 20th century. By 2010, 80.7 percent of the US population lived in urban areas—a share that is growing over time. The concentration of economic activity toward population centers is even more pronounced. In 2016, the metropolitan share of US Gross Domestic Product was 89.8 percent with the top 100 metro areas alone accounting for 75.4 percent of the total.<sup>2</sup> Given such prominence, high quality economic measurement and analysis at the local level can be a powerful complement to existing research when seeking to better understand the dynamics of the American economy. In particular, the advent of online commerce has complicated the space by making it more difficult to measure the costs and benefits for different groups in the modern economy. To further support local economic analysis in the US, in this report the JPMorgan Chase Institute has expanded the scope of our Local Commerce (LC) analysis through the introduction of the consumer view.

To better understand online commerce and modern payment channels, we leveraged data administratively collected by the bank during day-to-day operations. In order to tie together attributes of the consumer and the merchant, all LC work relies upon credit and debit card purchases, which provide rich electronic records of transaction attributes. The data source that supports the following analysis contains over 4 billion credit and debit card transactions from nearly 7.7 million customers. These data provide an unprecedented view of the online economy.

## The Expansion of the Local Commerce View Enables Analysis of Online Commerce

In 2015, the JPMorgan Chase Institute introduced a new frame for understanding local economies in the US. Leveraging the rare combination of spatial granularity and high-frequency observations, the existing Local Commerce Index (LCI) provides a place-based view of the evolution of spending at merchants in the metro areas we track. The LCI provides a view of transactions which occur at merchants located inside a set of large metro areas, regardless of the location of the participating consumers. This view is tailored toward understanding the local economic activity generated by merchants located in those cities.

The view provided by the LCI has provided a valuable resource to local policymakers, members of the business community, and nonprofit actors interested in questions about local economic activity. However, these same stakeholders are also interested in understanding 1) the new ways in which consumers and firms can connect, and 2) how these new connections affect who receives the economic benefits of commerce. In particular, commerce in each of these metro areas has had to contend with the growth of the online marketplace. Exploration of online commerce requires a wider set of consumer transactions beyond those that occur in person at brick and mortar merchants. The need to see this wider set of transactions is why we have expanded our view of Local Commerce (LC).

The existing LCI captures a merchant view—transactions by consumers at merchants located within LCI metro areas. This new report focuses on the consumer view—transactions made by consumers that live in metro areas across the country. The consumer view allows us to begin to unpack how online commerce has grown, who has driven that growth, and how it has impacted the offline marketplace.



### Box 1: Dimensions of Local Commerce

The LC view is targeted toward the exploration of local economic activity and can provide context for the broader macroeconomic trends we observe. However, the conceptual framework used when analyzing place-based economic trends matters, because it changes the questions one can ask. For this reason, JPMCI frames the LC lens along three dimensions:

1. Customer location;
2. Merchant location; and,
3. Transaction channel (online/offline).

These three dimensions lead to six different groups of transactions (we do not consider non-resident consumers shopping at non-local merchants). Each group captures a different kind of economic activity, and separates our transaction data into assets better suited for answering different questions about local economies (see Table 2).

**Table 1: Inclusion criteria for transactions**

		MERCHANT	
		Local	Non-Local
CONSUMER	Resident	Residents spend in CBSA	Residents spend remotely
	Non-Resident	Non-Residents spend in CBSA	

**Table 2: Partitioning consumer and merchant locations facilitates targeted questions**

		MERCHANT	
		Local	Non-Local
CONSUMER	Resident	Are residents spending more or less at local businesses?	Is more or less resident spending escaping from the local jurisdiction?
	Non-Resident	Are tourists/visitors spending more or less at local businesses?	

In Table 1, we distinguish between transactions tied to the location of the consumer versus the location of the merchant. For the consumer view, we divide transactions based upon whether they occurred at merchants in the same Core-Based Statistical Area (CBSA) as the consumer’s residence, or at merchants located outside of the consumer’s CBSA. Conversely, the merchant view is defined by whether transactions executed at merchants in a given CBSA are undertaken by consumers that live in that CBSA, or they are executed by consumers that do not live in the same CBSA as the merchant. Due to those differences, the consumer view will generally see more transactions from each consumer since it does not matter where the merchant is located. By contrast, the merchant view will see more consumers because it captures the residents and consumers from outside of the CBSA.

The transaction channel (offline versus online) dimension is not inherently spatial, but it does affect the extent to which the distance between consumer and merchant matters. For each question in Table 2, we can refine further by determining the extent to which transactions are offline versus online.

## Box 2: Our Measure of Online Commerce

This analysis identifies online commerce based upon card presence. If a card was used (e.g., via swipe or insert) with a tangible terminal, the transaction is marked “present”, our proxy for offline. All other transactions are online transactions.

Insofar as some non-card payment vehicles (e.g., cash) are difficult to use for online transactions, the share of card purchases that occur online is higher than the share of non-card purchases that occur online. While this will give us higher exposure to online spending as a proportion of total spending compared to other data sources, it also gives us increased ability to explore how online purchases evolve over time. The electronic records associated with each transaction allow us to examine spending growth according to the following attributes:

- Whether the channel used for the transaction was online or offline;
- Whether or not the merchant location is local (in the same metro as the consumer) or non-local (outside of the consumer’s metro);
- The age of the consumer; and,
- The income of the consumer.

From March 2017 to March 2018, LC-Consumer spending increased by 6 percent. Over the period between April 2015 and March 2018, the LC-Consumer Index grew each month, year-over-year, at an average rate of 4 percent. Online spending drove the vast majority of that growth, growing at an average monthly rate of 11.8 percent. Offline spending grew at just 0.2 percent, on average, over the same time period. Most spending through online channels occurred at non-local merchants. In 2017, 44.1 percent of all spending from transactions for which we know the locations of the consumer and merchant took place via an online channel. Of that 44.1 percent, spending at merchants that were not in the same metro area as the consumer accounted for 33.5 percentage points (pp), while spending at local merchants accounted for just 10.6 pp. In the same year, the remaining 55.9 percent of spending took place via offline channels. Of that 55.9 percent, 14.0 pp was spending that took place at non-local merchants, while 41.9 pp was spending that took place at local merchants. Consumers of all ages and incomes contributed to growth in online spending, but the biggest contributors were high-income consumers between the ages of 35 and 54.

## Box 3: Rationale for Studying Online Commerce

The advent of online commerce has been rightfully recognized as a disruptive force in American, and indeed global, commerce. Online commercial channels have been disruptive because they have fundamentally reduced the frictions between consumers and merchants in the marketplace. These include, but are not limited to:

1. Lowering the consumer search costs, such as time and transportation costs, needed to select goods and services (Bakos, 1997; Brown & Goolsbee, 2002);
2. Lowering the prices paid by consumers and increasing product variety through increased competition (Brynjolfsson, Hu, & Smith, 2003; Baye, Morgan, & Sholten, 2003; Zervas, Proserpio, & Byers, 2017);
3. Facilitating matching between consumers and merchants, particularly those who are geographically distant (Sinai & Waldfogel, 2004);
4. Lowering merchant entry costs, such as the retail space and advertising, needed to start a business (Bailey, 1998);
5. Increasing the information available to consumers, such as with merchant and product reviews and rankings (Ursu, 2018); and,
6. Reorganizing consumers’ optimal shopping trips across channels (Relihan, 2017; Venkatesan, Kumar, & Ravishanker, 2007; Bhatnagar & Papatla, 2016).

The most evident impact of these reduced frictions has been the sustained shift in many product markets, from books to clothing to groceries, toward online merchants and away from traditional brick-and-mortar retail. But the impacts go far beyond the winners and losers in retail markets. For instance, online commerce is shifting the composition of the labor force, including where jobs are located, the ability of local governments to raise revenue through traditional sales taxes, and the demand for commercial real estate (Gebeloff & Russel, 2017; Goolsbee, 2000; Zhang, Zhu, & Ye, 2016).

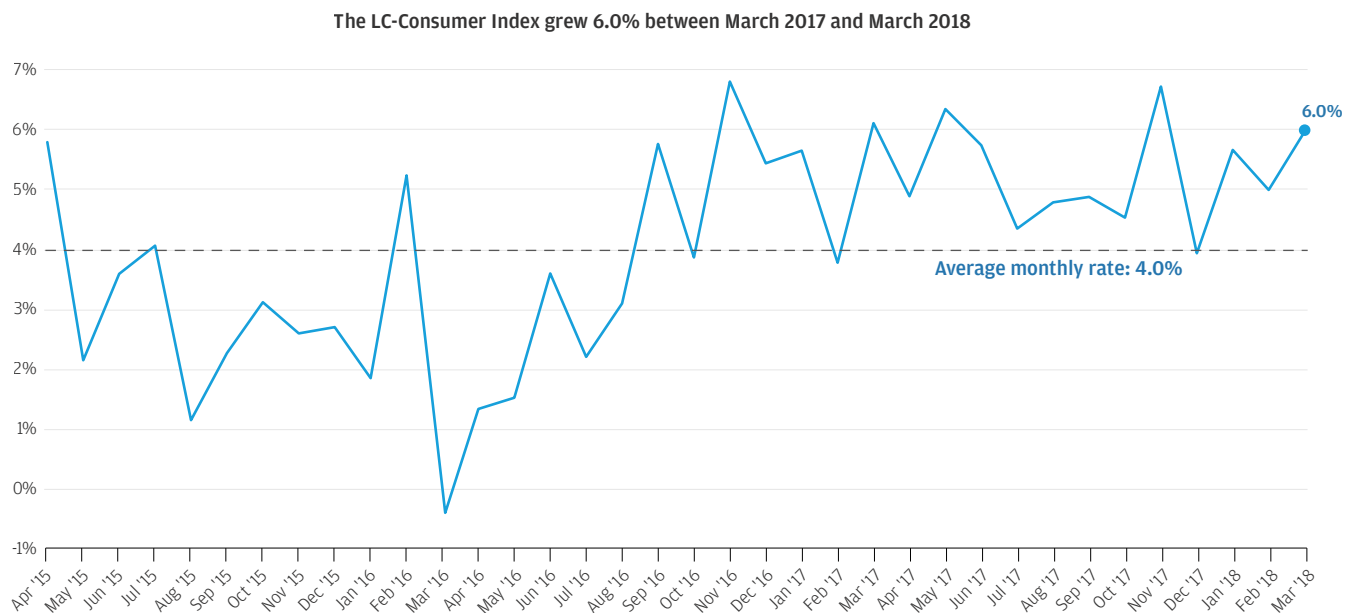
Previous research has been limited in its ability to measure the strength and consequences of the effects of online retail due to data limitations: studies most commonly use surveys, small data samples, and/or data from a subset of retailers. Our unique data lens allows us to better measure and study many of these dynamics playing out in the modern economy, thus enabling a more informed debate and policy discussion. For more on how we think about online and other commerce, see the Appendix.

# Findings

## Finding One

Between April 2015 and March 2018, the LC-Consumer Index averaged 4 percent in year-over-year growth.

Figure 1: LC-Consumer Index



Source: JPMorgan Chase Institute

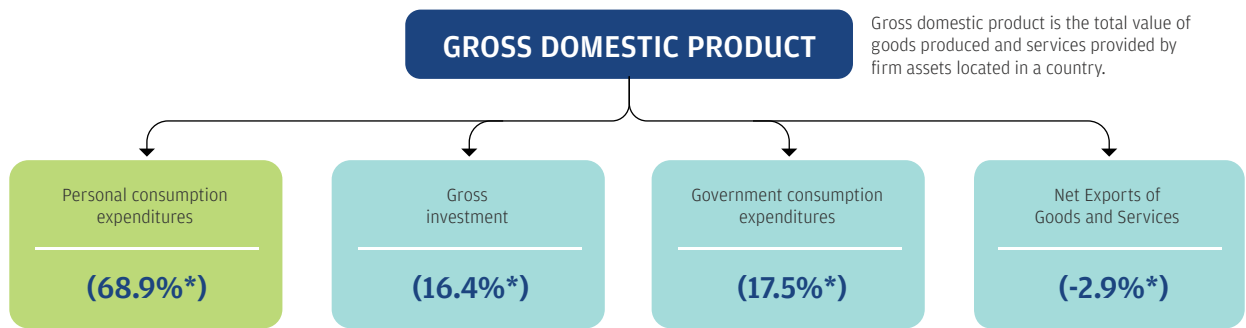
The consumer view reveals that resident spending growth increased substantially during 2016, and growth levels in 2017 and 2018 remained elevated relative to the previous period. In the first half of series (through September 2016), year-over-year spending grew at an average rate of 2.9 percent each month. In the second half of the series, growth averaged 5.2 percent.

We benchmarked the LC-Consumer Index against an existing, established series produced by the US Census Bureau: the Monthly Retail Trade Survey (MRTS).<sup>3</sup> Though both series aim to measure retail sales, there are important distinctions in construction and scope. Importantly, Local Commerce spending is less likely to incorporate large-ticket items that might be financed using other means besides consumer credit and debit cards. LC spending will also not include retail inventories, as the MRTS does. On the other hand, LC spending includes many small service providers and is more likely to include short-lived merchants. Both groups of merchants are less likely to be captured by the MRTS methodology. (For a more detailed description of the LC data asset and its relationship to MRTS data, see our [Frequently Asked Questions](#) page.)

### Box 4: Difference between LC and the MRTS

The most commonly used indicator of US economic health is gross domestic product (GDP), which is the total value of goods produced and services provided by firm assets located in the country. Broadly speaking, GDP is comprised of consumer spending, gross investment, government spending, and the net value of exports. Consumer spending, labeled Personal Consumption Expenditures (PCE) in Figure 2, makes up more than two-thirds of GDP. The data underlying the Monthly and Annual Retail Trade Surveys produced by the US Census are the dominant inputs into the estimation of PCE.

Figure 2: Components of GDP

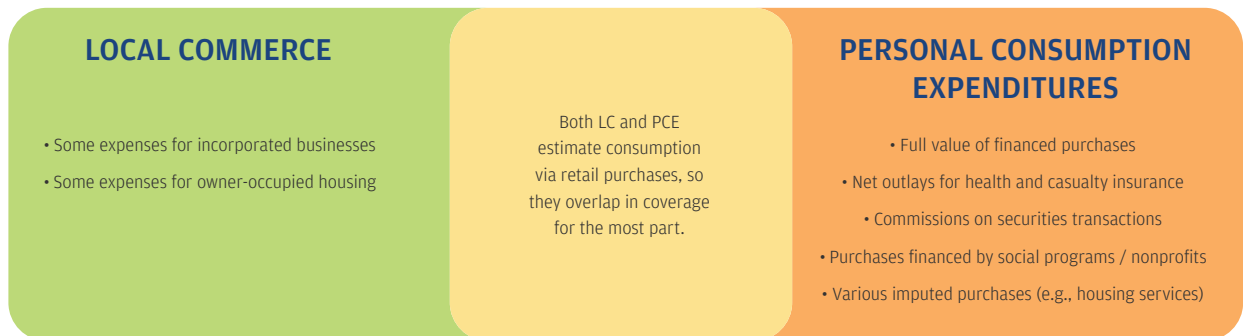


\* Percentage captures the portion of GDP from each component. These figures represent the seasonally adjusted figures from Q4 2016.

Source: JPMorgan Chase Institute

The LC and PCE lenses contain data that can be used to better understand final consumption in the US, but there are some differences. First, while there is considerable overlap, there are some kinds of purchases that are included in LC but not PCE, and vice versa (see Figure 3).

Figure 3: Differences between LC and PCE

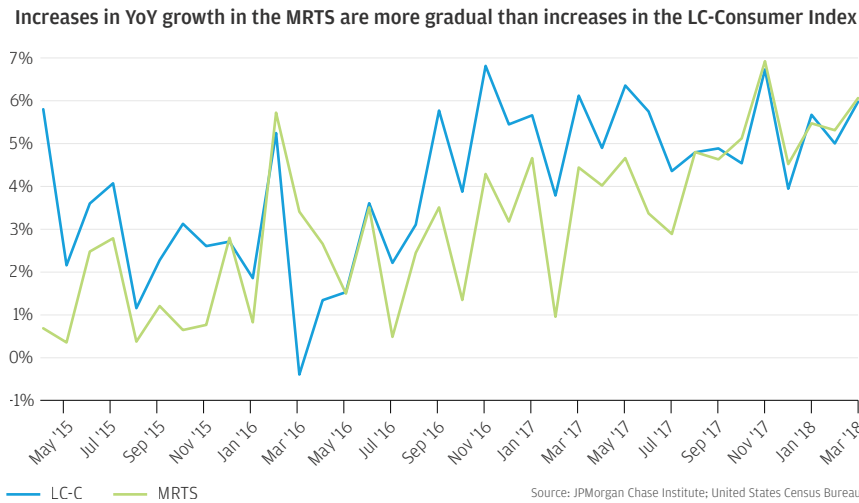


Source: JPMorgan Chase Institute

Second, PCE is an aggregate measure of consumption for the entire US economy. The place-based view offered by the LC lens allows one to examine how different parts of the country are doing. However, caution is needed when interpreting the LC lens because that local view is achieved by restricting where consumers live or firms reside.

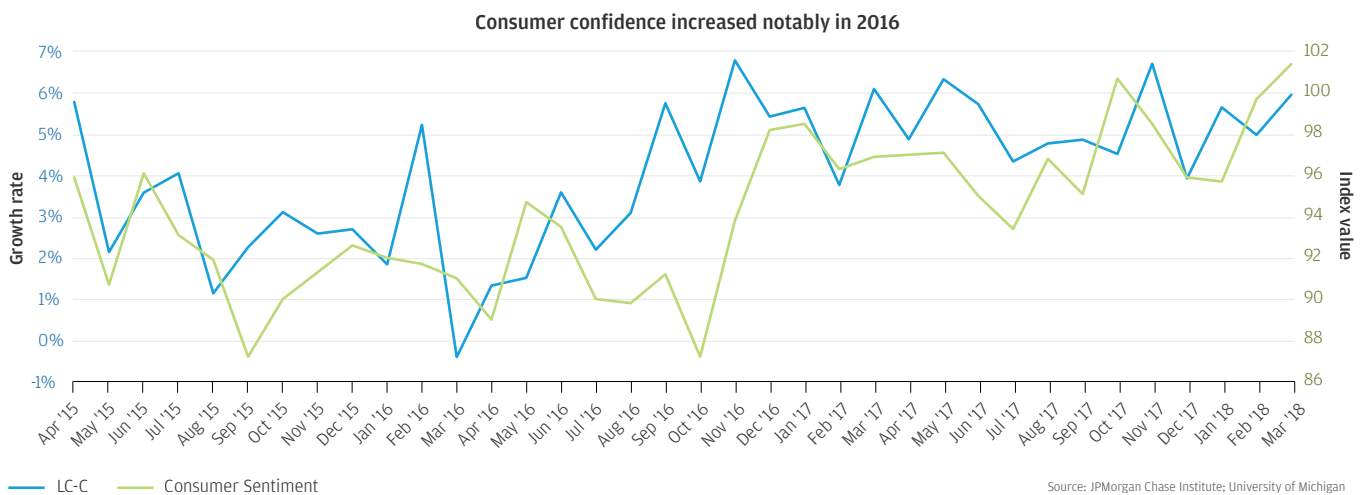
Over the April 2015 to March 2018 period, sales reported in the MRTS grew at an average monthly rate of 3.1 percent (United States Census Bureau, 2018b). The two series show broadly similar patterns, with sustained growth over the sample period and similar short-term variation. However, while both series show generally higher growth in recent months, the trend has been more gradual in the MRTS. By contrast, the LC-Consumer Index saw most of the increase in growth occur during 2016.

Figure 4: The LC-Consumer Index vs MRTS



We also compare our LC-Consumer Index to the University of Michigan’s Consumer Sentiment Index. Interestingly, we find that certain aspects of movement in the LC-Consumer Index seem to more closely reflect movement in the Consumer Sentiment Index than movement in the MRTS series. In particular, both the LC-Consumer Index and the Consumer Sentiment Index increased rapidly during 2016 and then stayed at an elevated level relative to the preceding months (University of Michigan, 2018). This may be reflection of the fact that both the LC-Consumer Index and the Consumer Sentiment Index sample customers, rather than retailers, as in the MRTS.

Figure 5: The LC-Consumer Index vs UMich Consumer Sentiment Index



We note that neither the LC-Consumer Index nor the Consumer Sentiment Index reliably serves as a leading indicator for the other, despite the fact that they appear to partially reflect common information about the economy. The observed association between the series is consistent with the idea that consumer sentiment and consumer spending feed off of one another. The LC-Consumer Index is built on realized purchases by consumers, while the Consumer Sentiment Index is constructed based upon a survey that gathers [individual appraisals of personal financial circumstances and assessments of the economy as a whole](#). When consumers are more confident in their own finances and/or the economy as a whole, they are more likely to make purchases. When consumers spend more, consumption (the dominant portion of GDP) increases. The resultant increase in economic indicators can then raise confidence in the overall economy. Causality is not easily established with such virtuous cycles. This cyclic behavior can also be realized when consumer spending or consumer sentiment is falling.

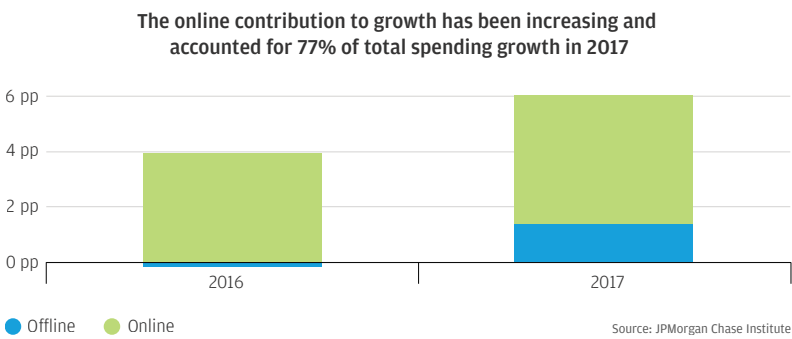
The top line growth in the consumer view paints a different picture of local commerce than the merchant view (see **Box 1: What are the dimensions of Local Commerce?**). The difference stems from the capacity of the consumer view to capture the substantial component of consumer spending that occurs outside of the metro area in which consumers reside. In the findings that follow, we see significant growth contributions from spending at non-local merchants. This view is enabled by the fact that in the consumer view, transactions are included in growth calculations regardless of where the merchant resides.

**Finding Two**

**Online spending has driven overall growth in the LC-Consumer Index, at times almost exclusively.**

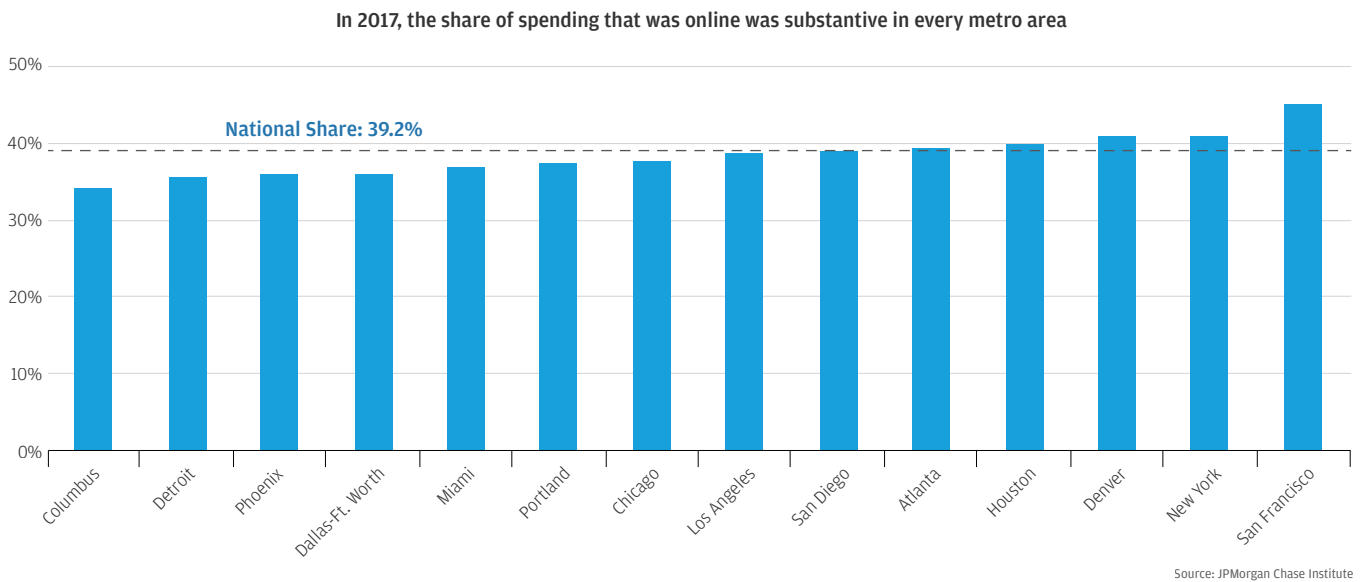
Growth in online spending is the dominant contributor to growth over our sample period. In 2016 and 2017, online growth contributed 4 and 4.7 pp to overall growth, respectively. By contrast, offline spending subtracted 0.7 pp from overall growth in 2016 and added 1.4 pp in 2017. As a percentage of overall spending growth, online spending accounted for 77 percent in 2017.

**Figure 6: Growth contributions by transaction channel**



The online share of total spending increased steadily over already high levels in 2015. In April 2015, online spending accounted for 35.4 percent of overall LC-Consumer spending. By March 2018, that figure was 41.1 percent. The growth in share has been steady, and likely reflects the continued adoption of online products by new consumers, the increase in the availability of new products online, and the reduction in shipping costs to consumers (Yoh, Damhorst, Sapp, & Lacznik, 2003; Hummels, 2007). We examined online spending in 14 metro areas, and found that online spending represented a significant share of total observed spending in all cases.<sup>4</sup> In 2017, the average share of spending through online channels was 39.2 percent nationally. Within the metro areas we track, shares ranged from 34.3 percent in Columbus to 45.1 percent in San Francisco.

**Figure 7: Online Share of Spending by Metro Area**



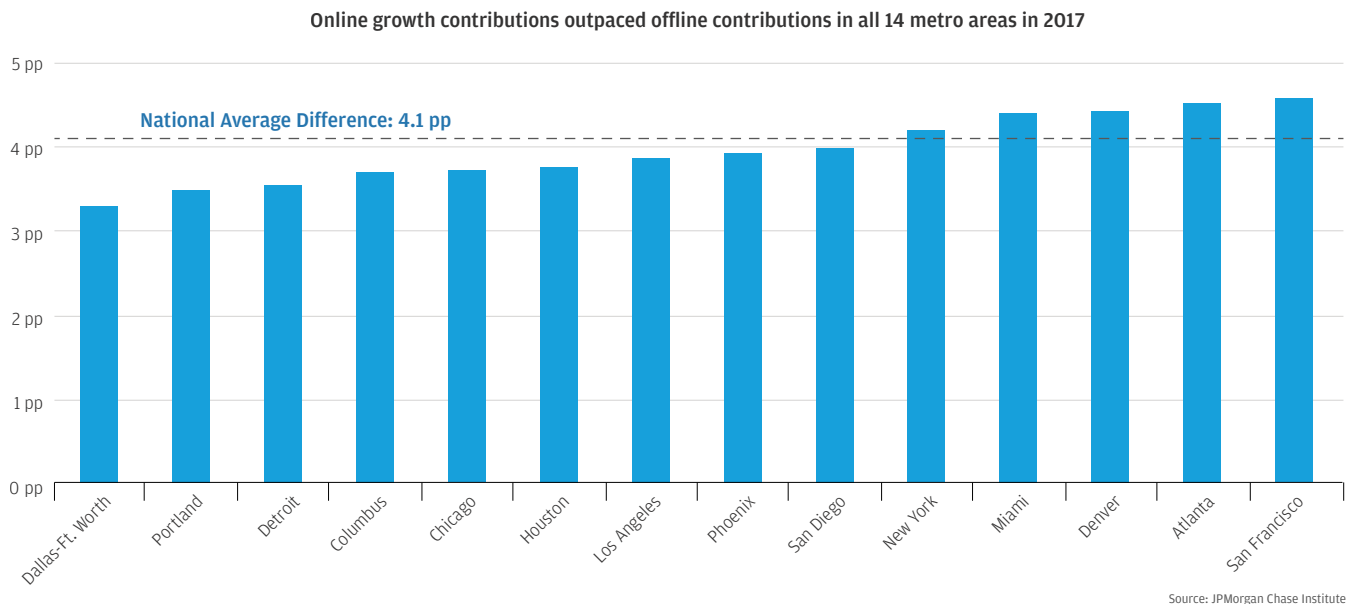
## Box 5: Definition of Growth Contributions

### Growth Contributions

If total growth in spending is comprised of spending through both online and offline channels, it can be helpful to know how much of that growth came from online spending as opposed to offline spending. For example, if the total growth rate in a given month is 6.1 percent, knowing that online spending contributed 4.7 of 6.1 pp and offline spending contributed 1.4 pp indicates that growth was largely driven by online spending. The values of 4.7 pp and 1.4 pp are the online and offline growth contributions, respectively. They provide information about how fast spending for a given category (e.g., online) has grown and how much of the change in total spending came from that group (e.g., the proportion of the dollar increase that was due to online spending).

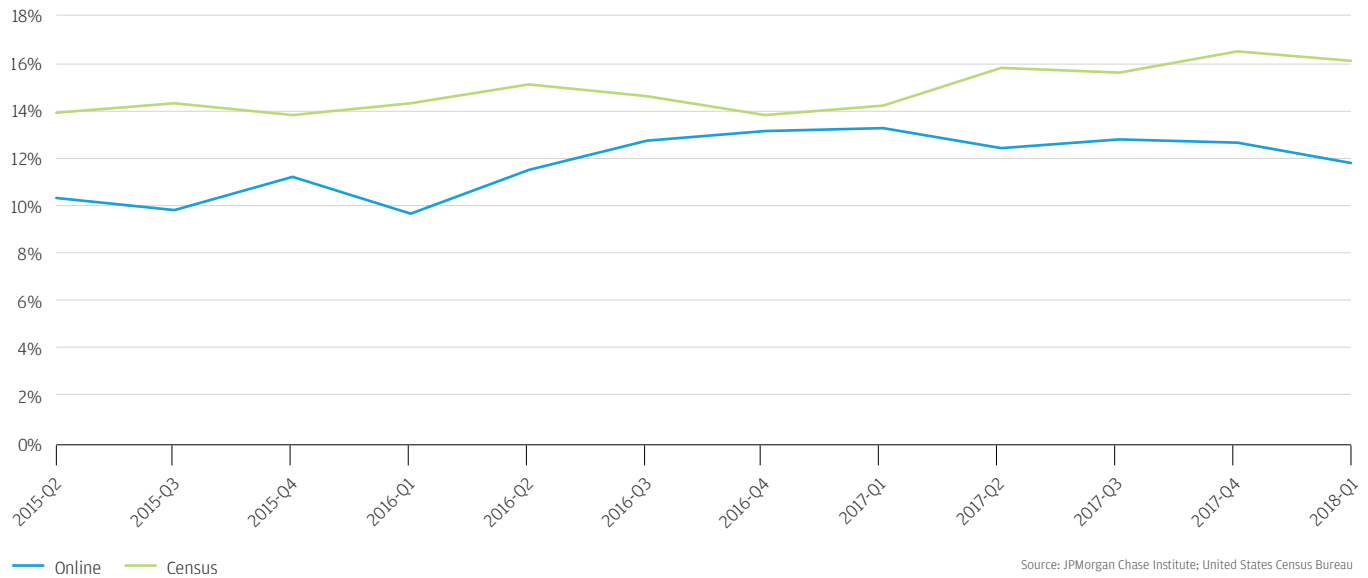
Given the high growth rate of online spending and material share of all spending, it is unsurprising to see that growth contributions from online spending were higher than growth contributions from offline spending for all 14 metro areas in 2017. Moreover, the gap between online and offline contributions was material in all cases. Online contributions were closest to offline contributions in Dallas-Ft. Worth, where the gap was just 3.3 pp. In contrast, the San Francisco metro area saw the largest gap between online and offline contributions, at 4.6 pp.

**Figure 8: Difference between Online and Offline Growth Contributions by Metro Area**



In addition to the MRTS, the US Census Bureau also captures online spending growth in its quarterly E-Commerce series. Again, we benchmark against the Census series to determine the extent to which we see similar dynamics over time. The quarterly year-over-year growth rate for online spending among consumers in the LC-Consumer series averaged approximately 11.7 percent. According to the Census Bureau, average quarterly growth over the same period was 14.8 percent (United States Census Bureau, 2018a).

Figure 9: Online spending in the LC-Consumer Index vs Census E-Commerce statistics



### Box 6: How Does the Census E-Commerce Series Differ from Online Spending Growth in the LC-Consumer Index?

In general, the LC and Census data lenses overlap but differ in important ways (see [Frequently Asked Questions](#)). The e-commerce data collected by the Census reflect sales and revenue from manufacturing, merchant wholesale trade, retail trade, and selected service industries. By contrast, LC data largely reflect retail purchases of goods and services typically purchased with consumer card products. Furthermore, there are also important differences in the way the data are collected, which will drive differences in measurement. The Census Bureau surveys a sample of about 16,500 employer firms. By contrast, LC data are administratively collected from the actual purchases of 7.7 million consumers, regardless of where they shop. The merchants they frequent may or may not have staff on the payroll. Moreover, new merchants enter the data set as soon as consumers begin patronizing them.

The capacity of the consumer view to see a wider set of transactions for each consumer allows us to see that participation in the online economy is quite widespread. While the individual economic circumstances of the metro areas we track differ, we note that online commerce growth is a consistent feature in each of them. Furthermore, the share of total spending that takes place online continues to grow.

New merchants enter LC data as soon as consumers begin patronizing them.

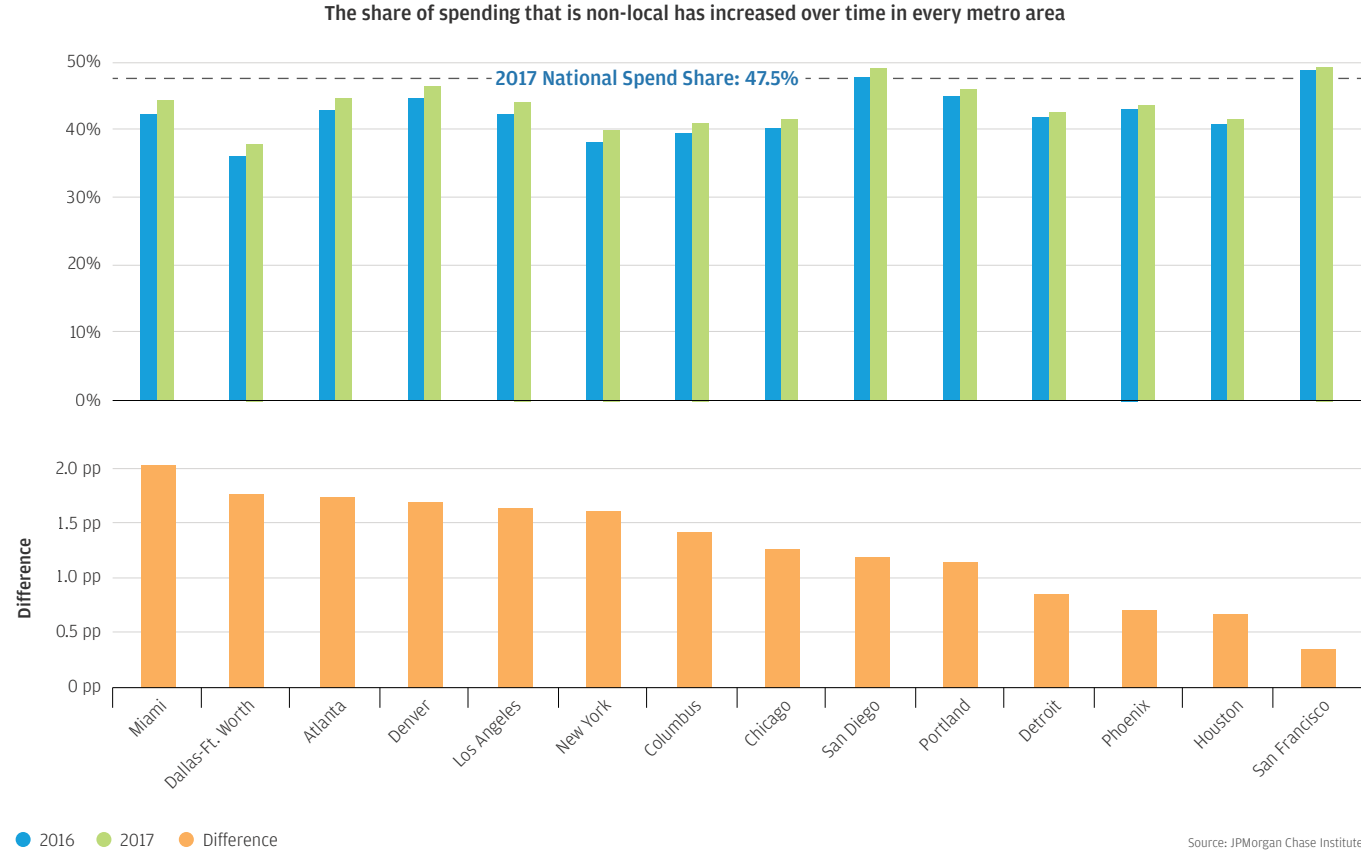


**Finding Three**

**Non-local shares of LC-Consumer spending are increasing in every metro we track.**

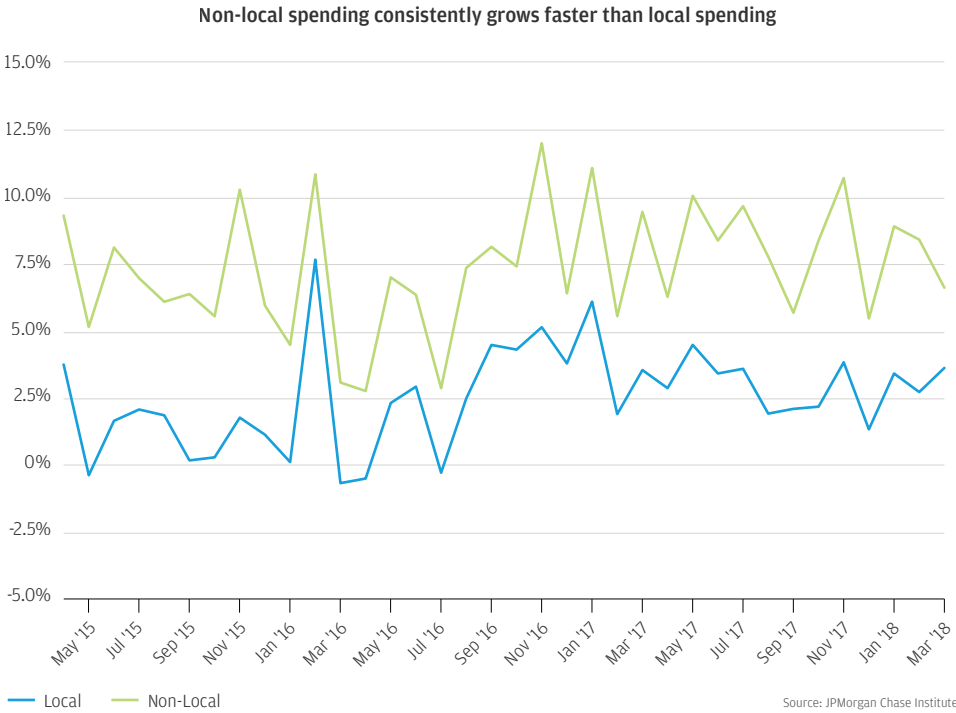
The non-local share of total spending increased between 2016 and 2017 in every metro area we track. San Francisco saw the smallest increase at 0.4 pp, while Miami saw the largest at 2.1 pp. These increases add to a significant existing share of total spending. In April 2015, the share of LC-Consumer spending that took place at non-local merchants was 45.5 percent nationally. By March 2018, that share increased to 48.9 percent. These figures do, in part, reflect month-to-month volatility, but the overall trend over the series is upward.<sup>5</sup> This growth in non-local spending is consistent with the sustained growth in online retail, which primarily takes place at non-local merchants.

**Figure 10. Non-local shares of spending**



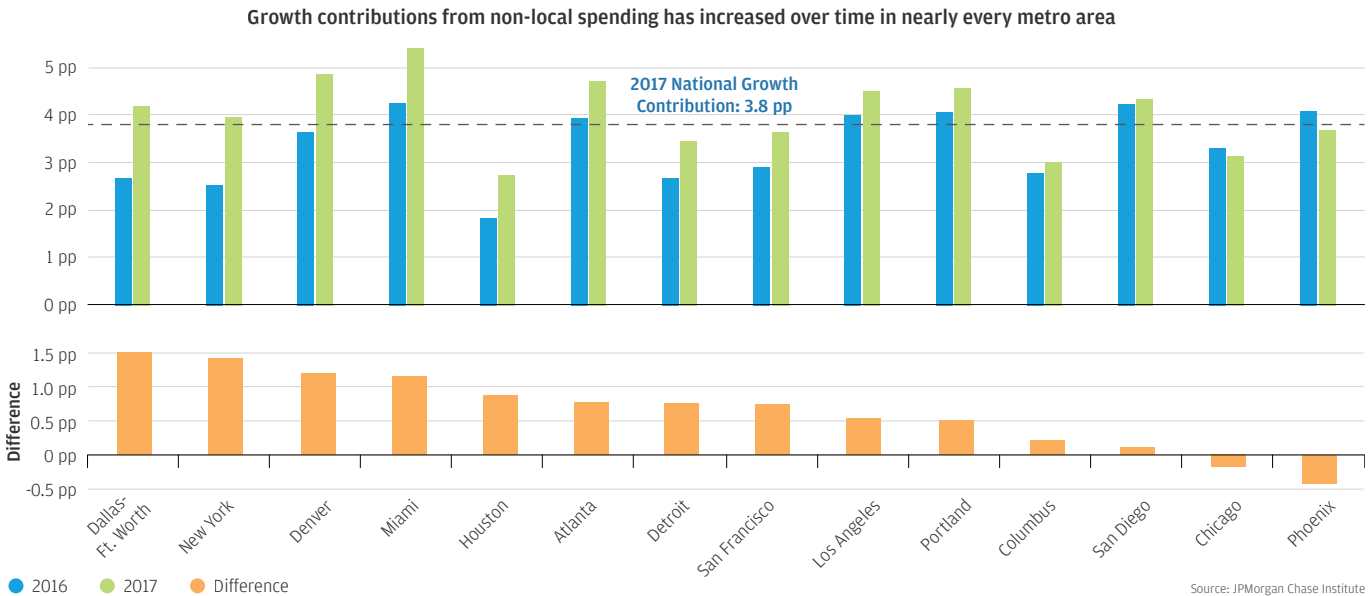
It should be noted, however, that we do not claim that online retail always displaces local offline spending. Depending on the nature of the good or service, some may become more likely to be purchased locally while others may be more likely to be purchased remotely.<sup>6</sup> Moreover, different metro areas offer different sets of goods and services in the immediate vicinity and vary in their access to online goods. Despite these caveats, overall, we find spending at non-local merchants has grown faster than spending at local merchants in every month between April 2015 and March 2018.

Figure 11: Spending growth by merchant location



The growth we have seen in non-local spending has also been consistent across the metro areas we track. Between 2016 and 2017, growth contributions from non-local merchants increased in most cases. However, the variation between metros is substantial.

Figure 12: Non-local growth contributions by city



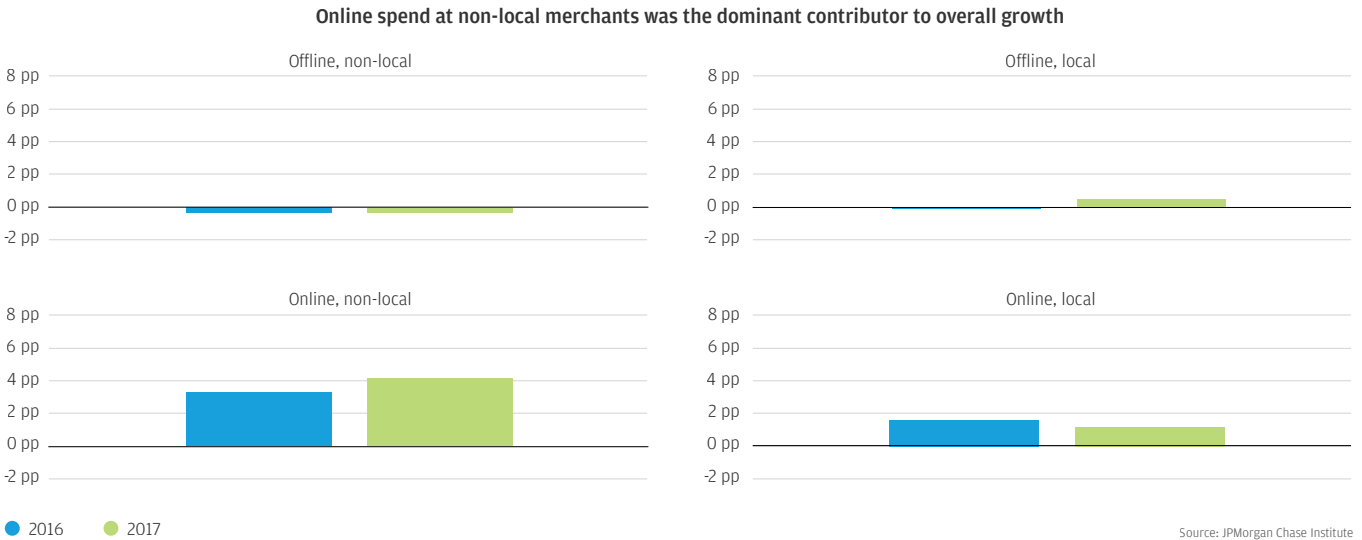
The above figure depicts a large range in growth contributions from non-local spending. In most metro areas we track, we have seen notable increases in non-local growth contributions between 2016 and 2017. The largest increase occurred in Dallas-Ft. Worth, with non-local growth contributions increasing from 2.7 pp to 4.2 pp. We saw declining contributions in only two metro areas: Chicago and Phoenix. Phoenix experienced the most negative change, declining from 4.1 pp to 3.7 pp. The differences may be due to a variety of factors, including local economic performance, geography, and institutional structures. They suggest that while there are common themes in the challenges and opportunities from online retail across metros, local officials, business owners, and other stakeholders face unique factors as well. All such stakeholders will need to tailor their responses to local conditions.

**Finding Four**

**Online commerce growth is driven by contributions from non-local merchants.**

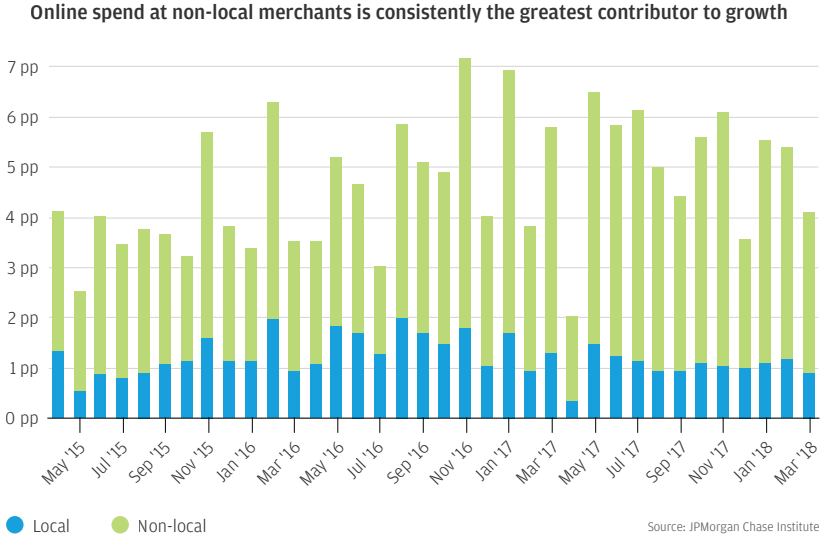
Within the set of online transactions, we can further categorize them into those executed at local merchants and those executed at non-local merchants. Over the life of the series, non-local merchants have been the dominant contributors to overall growth in every month. As can be seen in the figure below, most of the contribution from non-local merchants comes from growth in online spending.

**Figure 13: Year-over-year growth contributions by channel and merchant location**



The dominant contributor to overall growth in 2016 and 2017 was online spending at non-local merchants, contributing 3.2 pp and 4.1 pp, respectively. Online spending growth at local merchants also grew in 2016 and 2017, but contributed only 1.5 pp and 1.1 pp to overall growth. We show in Figure 14 that this dominance of non-local, online retail is not only true on average, but consistently true across the entire sample period.

**Figure 14: Monthly growth contributions of online spend**



In distinguishing local and non-local offline transactions, we find that offline consumer spending at local merchants is increasing and that offline consumer spending at non-local merchants is decreasing. Taken together, these facts suggest that the distance between the consumer and the merchant is declining for offline purchases despite the fact that the same distance is increasing when considering online and offline transactions together. This observation supports the notion that growth in online retail reduces the extent to which consumers must travel to access their desired set of goods and services. In fact, to continue to compete with online retail, merchants may shift to being more local to consumers.

It should also be noted that local merchants tend to be the dominant driver of growth in offline purchases, whether or not the growth rate has been positive. This is because the local merchant spend share is much larger than the non-local share in the offline space. Local dominance is expected given that offline purchases typically require consumers to travel to the merchant. Therefore, they are more likely to travel to merchants that are in close proximity.

Examining the intersection of transaction channel and merchant location illuminates variation in the types of goods and services consumers are buying. Figure 16 depicts the type of products consumers are buying in the four combinations of merchant location and transaction channel. There are notable differences across the kinds of goods and services consumers buy in each quadrant.

We note that the top three spending categories in the set of non-local goods and services purchased online are telecommunications, financial/insurance services, and air transport/services. Remotely delivered goods are the fourth largest product type by dollars spent. Notably, food/grocery spending dominates all offline transactions. In general, the set of goods and services purchased by consumers varies widely within both online and offline channels.

Figure 15: Spend share by merchant location and transaction channel

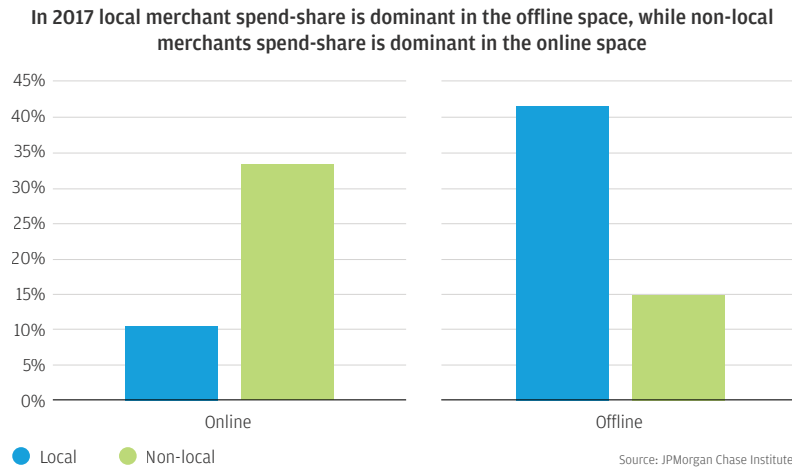
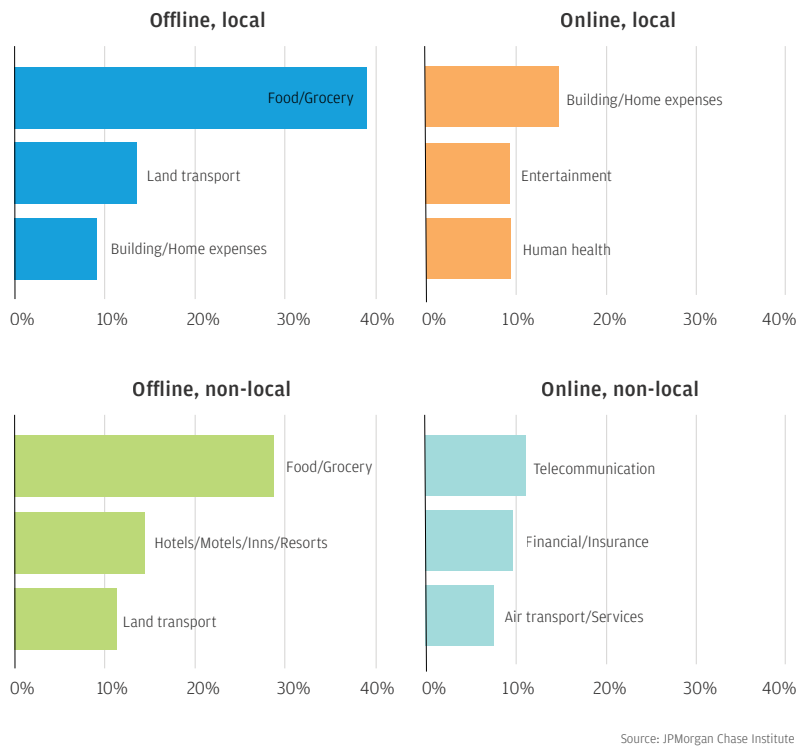


Figure 16: Top three product types by proportion of spend for each combination of channel and merchant location

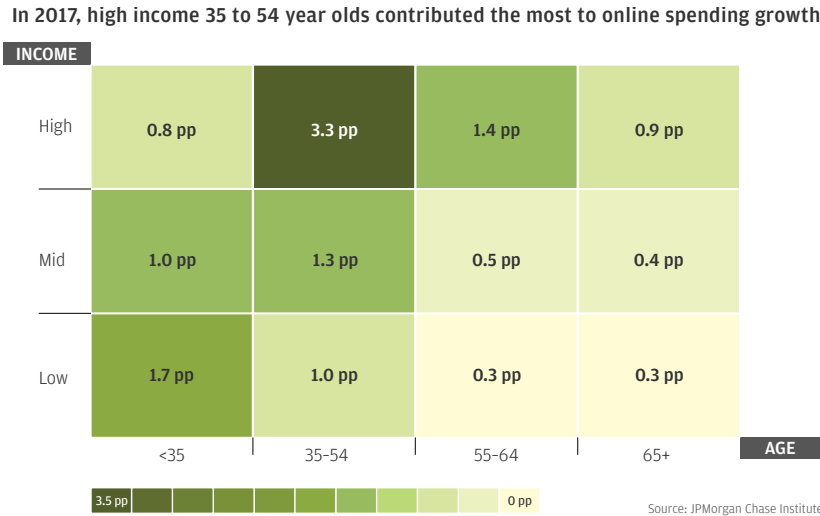


**Finding Five**

**Online spending growth is driven by high-income consumers between the ages of 35 and 54.**

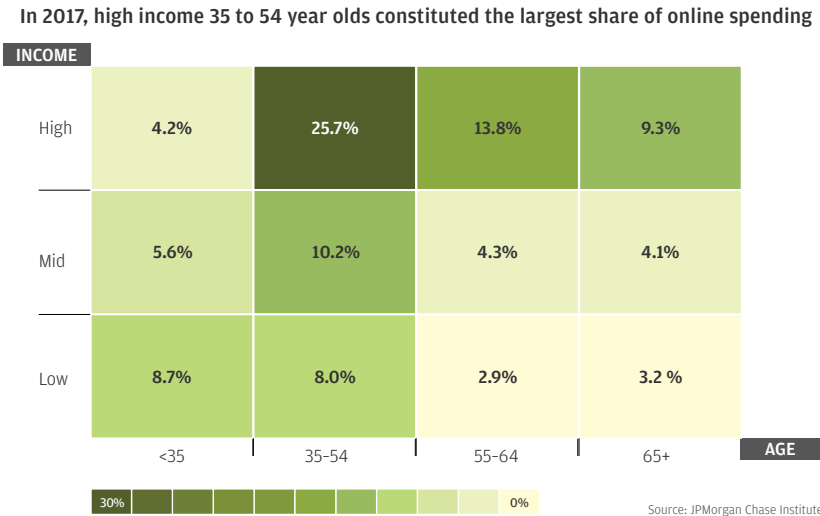
While all ages and incomes participate in online growth, they do not all participate to the same extent. In general, consumers under 35 are consistently strong contributors to overall growth, whether online or offline. However, splitting consumers by age alone obscures the fact that high-income consumers between the ages of 35 and 54 are the dominant contributors to growth in the online market. This group contributed 3.3 pp to overall growth in 2017. Those contributions were 94 percent higher than the next closest group (low-income consumers under 35) in 2017.

**Figure 17: Growth contributions by age and income**



High-income consumers between 35 and 54 are the dominant contributors to online growth because they hold the largest market share. In 2017, this group spent 25.7 percent of all online dollars. The next largest share came from high-income consumers between 55 and 64. For consumers over 35, online shares of spending increase with income. The opposite is true of consumers under 35, but this is driven by the large share of all consumers under 35 that fall into the low-income category.

**Figure 18: Spending share by age and income**



Spending among high-income consumers tends to grow slower than spending among their low-income counterparts. This is a pattern we see in both the consumer and merchant views. However, this trend does not seem to hold in the online spending case. For all consumers over 35, online spending grows faster for high-income consumers. We also see more spending from older consumers. Spend shares for all consumers over 65 years old increased between 2016 and 2017, despite overall growth in online spending.

## The Road Ahead

The consumer view of local commerce provides an unprecedented, administrative view of online spending and its implications for local economies. Our initial analysis has revealed that the broad growth in online spending is highest for lower income and younger consumers, but the largest contributions to growth come from the middle-aged and high-income groups. The shares of online spend are also high across all of our metro areas, suggesting that localities of various sizes should consider how the evolution of commerce will affect them and their local economies. We have also seen that some metro areas are more exposed than others with respect to non-local commerce growth. In general, however, these findings are instructive but only scratch the surface. They raise even more pointed questions:

- Which kinds of local businesses are most likely to be displaced by growth in online commerce?
- Which kinds of local businesses are most likely to grow in tandem with online commerce?
- What does the changing expenditure mix within a given jurisdiction mean for fiscal yield in a given tax base?
- What is the relationship between price and the decision to purchase through online channels?
- How are cities responding to the changing landscape?

This list is far from exhaustive, but it does suggest a wide variety of considerations for local stakeholders as the local commerce space continues to evolve. Moving forward, the consumer view will provide a powerful complement to our merchant view (the existing LCI). Viewed together, they yield insights when they move in tandem and, more importantly, when they differ.

## Local Commerce: Consumer View

April 2015 – March 2018

---

The Local Commerce data asset used to generate the consumer view is based on over 4 billion de-identified credit and debit card transactions from approximately 7.7 million JPMorgan Chase customers across the country. For this analysis, we focused on transactions made by consumers (regardless of the location of the merchant) between April 2015 and March 2018.

The Local Commerce data are “local” because we are able to place transactions within specific metro areas, enabling us to highlight 14 metro areas in this analysis. These data are comprised of transactions executed with consumer card products provided by the bank. By leveraging administratively collected transactions that carry consistently defined attributes of consumers, merchants, and the transactions themselves, the JPMorgan Chase Institute can provide an unparalleled view of local commercial conditions. While other data sources are crucial counterparts to any study of US consumption, we are not aware of any publicly available source that consistently provides the same geographic detail and frequency of observations over time.

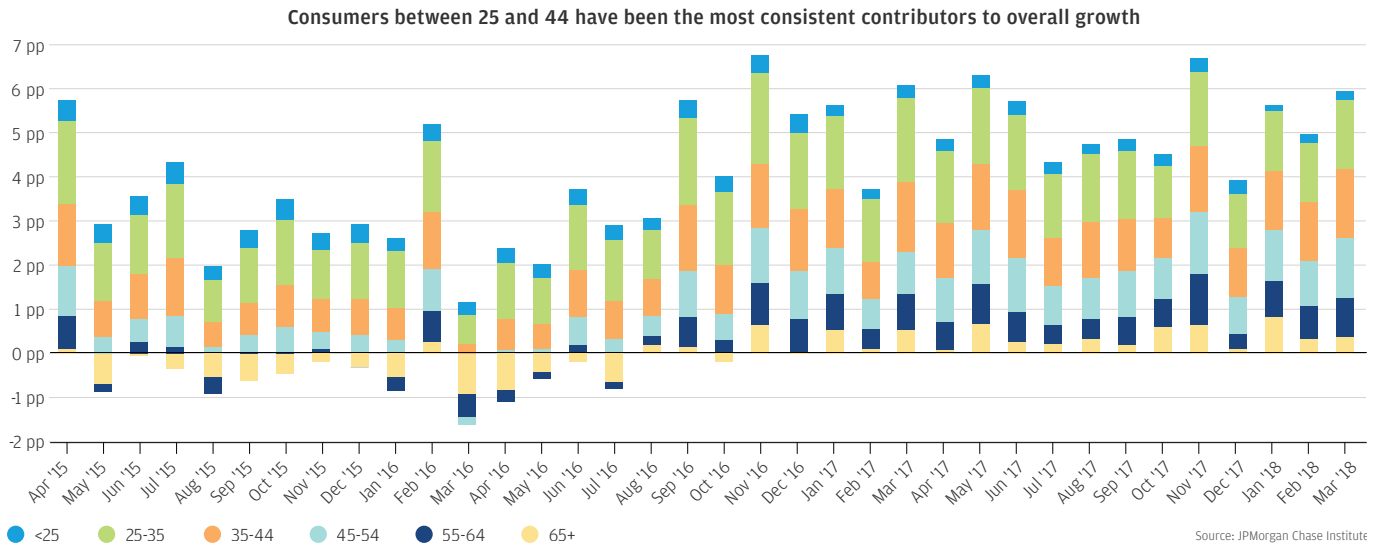
In the first part of this report, we used these data primarily to analyze the growth of online commerce. We examined not only overall growth, but also the consumers and merchants participating in that growth, in addition to drilling down to the metro level. In this section, we share insights about the consumer view through four distinct drivers:

1. The age of the consumer;
2. The income of the consumer;
3. The location of the merchant (local vs non-local); and,
4. The transaction channel.

For each lens we show how different segments within each of these drivers contributed to year-over-year spending growth for each month across the country. We publish detailed series for our national view and 14 of our metro areas on our website.

## Spending Growth by Age

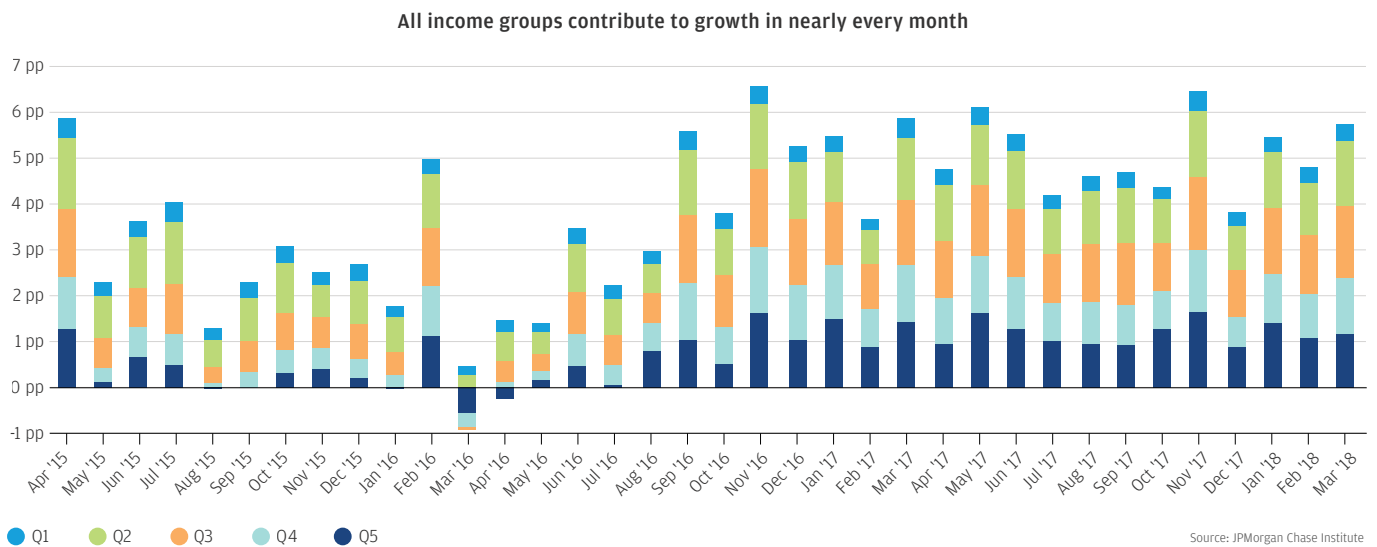
Figure 19: Growth contributions by age



Over the life of the LC-Consumer Index, overall growth has remained consistently positive. Beginning in August 2016, all but one month saw positive contributions to growth from every age group. That said, there are material differences in the magnitude of growth contributions across age groups. Throughout the series, consumers in the 25-34 and 35-44 age groups contributed, on average, a combined 2.6 pp to growth in each month. The former contributed 1.5 pp, while the latter contributed 1.1 pp. The smallest contributions, on average, came from consumers over 65 years of age, though we have seen their contributions increase over time.

## Spending Growth by Income

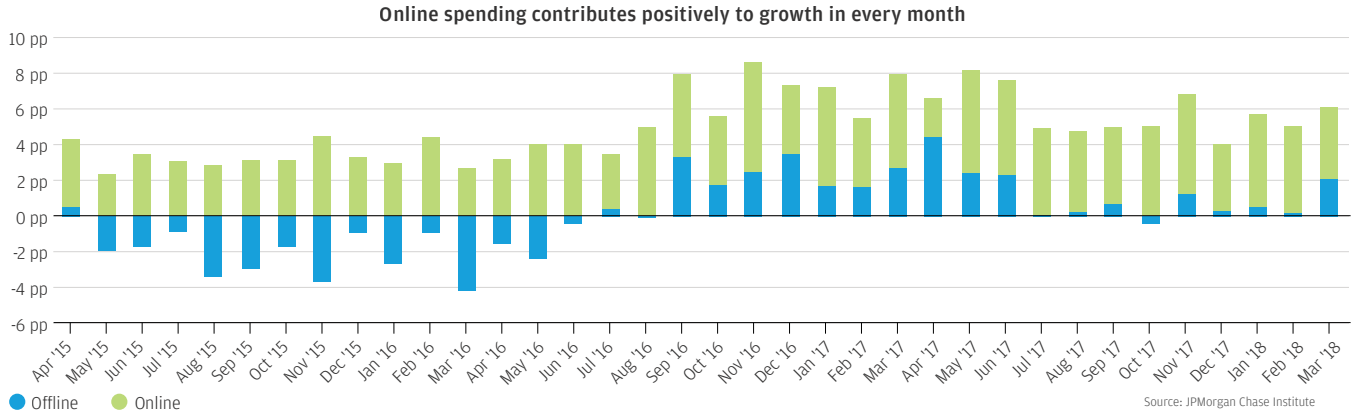
Figure 20: Growth contributions by income



Growth contributions among income groups are more evenly distributed relative to the age groups observed above. The dominant contributors are the 2<sup>nd</sup> and 3<sup>rd</sup> quintiles by income, contributing a combined total of 2.1 pp on average across all months. Both consumer groups contributed over 1 pp on average. The lowest average contribution to growth comes from the bottom income group (the 1<sup>st</sup> quintile), with an average of 0.3 pp. Notably, the contributions from the 1<sup>st</sup> quintile remain relatively flat over time, while contributions for all other income groups are generally larger in 2017 and 2018 than they were in 2015 and 2016.

### Spending Growth by Transaction Channel

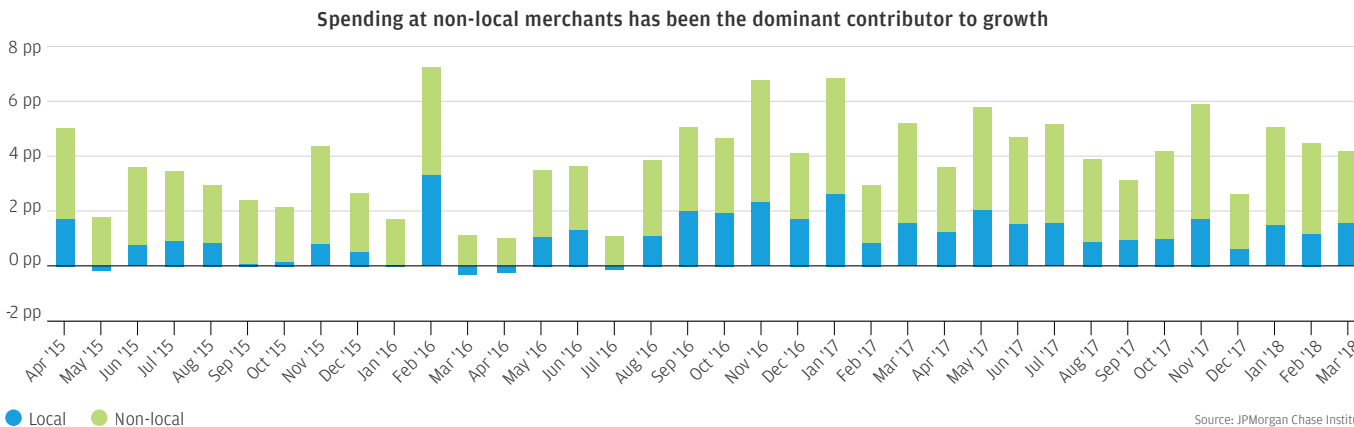
Figure 21: Growth contributions by transaction channel



The average growth contribution from spending via online channels was 4.1 pp over the life of the series. By contrast, the contribution to overall growth from offline spending was just 0.1 pp. Growth contributions have generally been positive over time with a small increase in the latter half of the series. The larger driver of increases in the overall LC-Consumer Index since 2016 has been offline spending. In the second half of the series, growth contributions for offline spending were 2.9 pp higher than they were in the first half (-1.4 pp before December 2016 compared to 1.5 pp from December 2016 on). By contrast, growth contributions for online spending were only 1.2 pp higher in the second half of the series (3.5 pp before December 2016 compared to 4.7 pp from December 2016 on).

### Spending Growth by Merchant Location

Figure 22: Growth contributions by merchant location



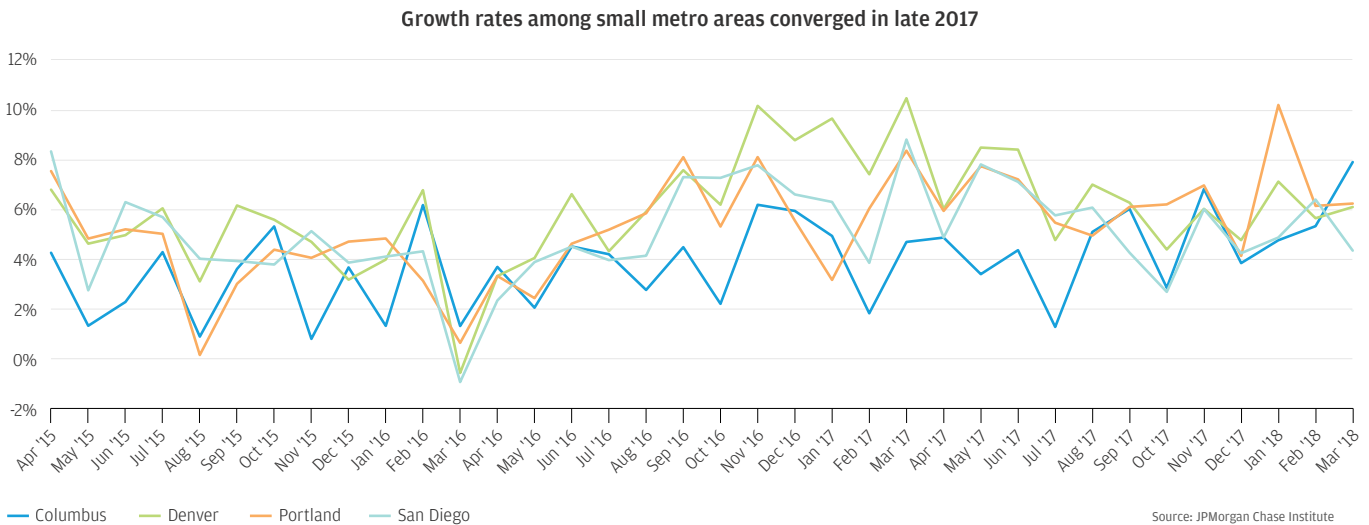
Over the life of the series, we have only seen negative growth contributions from local merchants in four months. In every other month in the series, growth contributions from both local and non-local merchants have been positive. Moreover, spending at both local and non-local merchants was generally higher in 2017 and 2018 than it was in 2015 and 2016. However, spending at non-local merchants has consistently been the dominant contributor to growth in each month. On average, spending at non-local merchants contributed 2.7 pp to overall growth while spending at local merchants accounted for 1.1 pp. Indeed, spending at non-local merchants contributed more to overall growth in every month we observed.



## Spending Growth among Small Metro Areas

The LC-Consumer Index as a whole increased rapidly during 2016, but an examination of small metro areas suggests that this increase in year-over-year spending growth did not occur across all metro areas. Growth in Columbus, for example, did not see the same increase in 2016 that Denver experienced. Across all months, Denver experienced the highest growth on average at 5.9 percent, while Columbus experienced the lowest at 3.8 percent. San Diego and Portland averaged 5.0 and 5.2 percent, respectively.

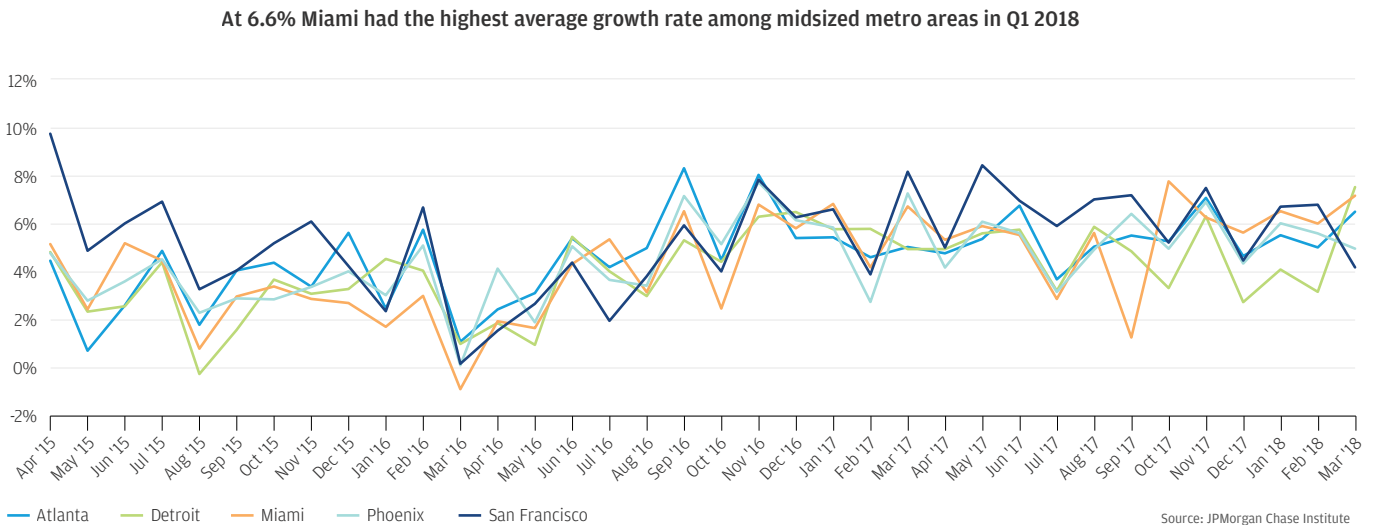
**Figure 23: Spending growth among small metro areas**



## Spending Growth among Midsized Metro Areas

In contrast to the small metro areas, growth rates among midsized metro areas were far more similar to one another. All five metropolitan areas saw generally higher growth in 2017 and 2018, relative to 2015 and 2016. Furthermore, growth rates increased most rapidly during 2016. Over the first quarter of 2018, Miami emerged as the fastest growing metro area, with respect to LC-Consumer spending. Across all months, San Francisco had the highest average growth rate at 5.3 percent, while Detroit had the lowest at 4.1 percent. Miami, Phoenix, and Atlanta saw average growth rates of 4.3, 4.5, and 4.7 percent, respectively.

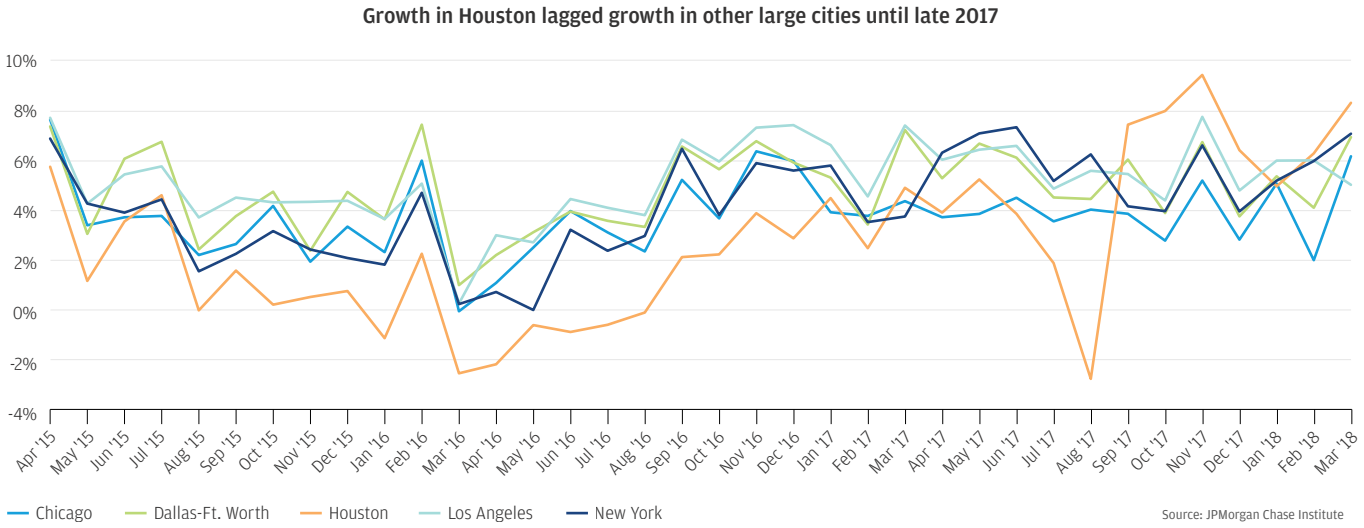
**Figure 24: Spending growth among midsized metro areas**



## Spending Growth among Large Metro Areas

Houston stands out from the rest of the large metro areas we track. In nearly every month until the latter portion of 2017, LC-Consumer spending growth in Houston was lower than all other large metro areas. This trend reversed in September 2017, at which point Houston grew faster than all other large metro areas in every month except January 2018. Across all months, Los Angeles grew the fastest on average at 5.1 percent, while Houston grew the slowest at 2.7 percent. Chicago, New York, and Dallas-Ft. Worth experienced average growth rates of 3.7, 4.2, and 4.8 percent, respectively.

**Figure 25: Spending growth among large metro areas**



# Data and Methodology

---

The objective of Local Commerce (LC) research in the JPMorgan Chase Institute is to leverage high-frequency, spatially granular data to generate insights about the decisions consumers and firms make on a daily basis. From a tactical standpoint, we produce these insights to inform decision makers about the drivers of growth in everyday purchases. We also seek to provide microeconomic context for broader macroeconomic trends.

The data source for our estimates of LC spending includes 35 billion credit card transactions and 60 billion deposit account transactions from over 80 million customers across the US. For the consumer view discussed in this report, we rely specifically on credit and debit card transactions between April 2015 and March 2018. As the first financial institution to use this wealth of information for the public good, JPMorgan Chase & Co. put strict privacy protocols and strong guardrails in place to protect personal information throughout the creation and analysis of this data. A description of these protocols is available on our website.

For a broader discussion of LC-Concepts and measures, see the Data and Methodology section of the original Profiles of Local Consumer Commerce report. [Frequently Asked Questions](#) about LC data can be found on our website.

## Data Privacy

There are several key steps the Institute takes to ensure customer data are safe and secure:

- The Institute's policies and procedures require that data it receives and processes for research purposes do not identify specific individuals or institutions.
- The Institute has put in place privacy protocols for its researchers, including requiring them to undergo rigorous background checks and enter into strict confidentiality agreements. Researchers are contractually obligated to use the data solely for approved research and are contractually obligated not to re-identify any individual or institution represented in the data.
- The Institute does not allow the publication of any information about an individual consumer or business. Any data point included in any publication based on the Institute's data may only reflect aggregate and/or scaled information.
- The data are stored on a secure server and can be accessed only under strict security procedures. The data cannot be exported outside of JPMorgan Chase's systems. The data are stored on systems that prevent them from being exported to other drives or sent to outside email addresses. These systems comply with all JPMorgan Chase Information Technology Risk Management requirements for the monitoring and security of data.

The Institute provides valuable insights to policymakers, businesses, and nonprofit leaders. But these insights cannot come at the expense of consumer privacy. We take precautions to ensure the confidence and security of our account holders' private information.

## Data Source

The data for this analysis are drawn from two overlapping pools of customers in the bank:

1. Credit Card Holders (35.7 billion transactions as of June 2018)
2. Demand Deposit Account Holders (60.3 billion transactions as of June 2018)

To develop the consumer view, we started with a random sample of the customer universe to get a population of approximately 7.7 million customers. For each customer, we captured the transactions they executed from the databases above, and combined the sets of transactions into a single composite transaction input table. After filtering down to just those card transactions that took place between April 2015 and March 2018, we were left with a set of 4 billion transactions.

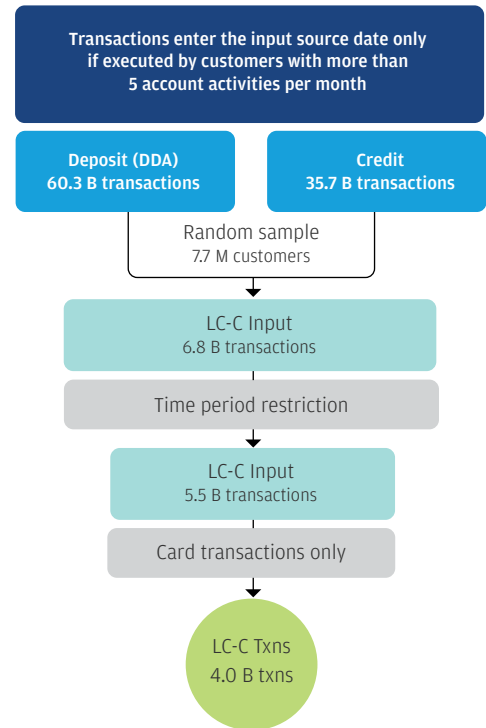
Information from these transactions is combined with customer account and demographic information to generate the rich electronic records that enable the preceding analysis. Each of the following drivers was derived from attributes of each record:

1. Customer age;
2. Customer income;
3. Transaction channel; and,
4. Merchant location.

The fields required for each driver vary in the coverage of non-null values. While the overall LC-Consumer Index figures can include all 4 billion transactions, each driver-specific tabulation can only include those records for which valid values in the relevant fields are present. The table below provides transaction coverage rates for each one-way and two-way tabulation. For example, we have age for 100 percent of customers, but income for only 96.9 percent of customers. Further, when we look at merchant location and channel simultaneously, we are using 77.8 percent of all transactions included in the set.

Figure 26: Transaction coverage by driver

	AGE	INCOME	MERCHANT LOCATION	CHANNEL
Age	100 percent			
Income	96.9 percent	96.9 percent		
Merchant location	77.9 percent	76.5 percent	77.9 percent	
Channel	98.8 percent	95.7 percent	77.8 percent	98.8 percent



Source: JPMorgan Chase Institute

## Sample Creation

The single largest adjustment we make to the input data is the establishment of a stable cohort. When considering measures of growth in consumer activity, there are two margins of variation. The first is the extensive margin, along which growth indicates an increase in the number of people buying goods and services. The second is the intensive margin, along which growth indicates an increase in the volume of goods and services purchased by each person. While it is common to see changes along both margins simultaneously, change in one does not imply change in the other. It is possible to have people maintain constant levels of spending and see growth overall because the population has increased. Conversely, it is possible to see a stable population grow its spending because each person decides to spend more.

We analyze LC data in order to better understand the broader economy. To that end, it is necessary to avoid misinterpreting growth in JPMorgan Chase market share as widespread growth in the broader economy. We are currently considering various techniques for separating extensive margin growth that reflects increases in JPMorgan Chase card market share from extensive margin growth that reflects broader population growth. However, for this report, we focus on the intensive margin.

Intensive margin growth is captured via the establishment of the stable cohort. We identify a sample of customers in the target month that have cleared a transaction threshold in both the target and lag months (typically a year apart). That sample is called the stable cohort, and we use it to calculate growth. For example, suppose we have 100 customers in March 2018 that clear the transaction threshold in both the target and lag months. We measure their spending in March 2018, and then measure the spending of the same people in March 2017. The growth in spending from the same people across these time periods provides our LC-Consumer Index value (6.0 percent in this case). All year-over-year measures that we report are based upon these stable cohorts.

Note that there is no requirement for stable cohorts to include the same people from one month to the next. The stable cohort for March 2018 can differ from the stable cohort for February 2018. In practice, they overlap substantially, but variation is possible.

## Comparison to the US Census Monthly Retail Trade Survey

Despite some differences in the kinds of retail activity covered, both the local commerce data underlying the LC assets and the data used to generate estimates of the Personal Consumption Expenditures (PCE) component of GDP inform our view of consumption activity in the US. The source data for PCE estimates come, in large part, from the Annual and Monthly Retail Trade Surveys (ARTS and MRTS), produced by the US Census Bureau. These surveys seek to capture aggregate sales volumes at retail and food service stores, as well as inventories held by retail stores. This mail-out/mail-back survey of 12,500 merchants across the country remains the most conceptually comprehensive measure of retail activity in the US.

The LC and MRTS lenses differ in important ways. As vital as the MRTS is, it relies entirely on self-reported data from a relatively small number of firms. The sample size limits the ability of the MRTS to speak to local conditions, which is why the MRTS only reports national numbers. The LC lens, by contrast, offers measured data on realized transactions from millions of consumers. The sheer volume of data permits us to report local estimates with confidence.

The goal for both the LC and MRTS lenses is to capture purchases by end users. MRTS does this by asking a limited sample of firms about their sales, thereby avoiding business-to-business transactions. The LC lens, by contrast, uses the card choices of consumers. We exclude virtually all business-to-business purchases by excluding commercial cards from our transaction set, though it is possible for small business owners to make purchases of factor inputs with their personal cards. Moreover, the MRTS targets firms that have been in existence long enough to have acquired employees, and it is structurally biased towards the inclusion of larger firms. By using card spending, the LC lens can see spending at even short-lived merchants, as well as small service providers (e.g., salons, small health providers, etc.) that are likely to be missed by MRTS. In short, neither source is perfect, but the limitations of one are often the strength of the other. As such, LC data provide a powerful and unprecedented complement to MRTS that is freely available to the public.

# Appendix: Measuring Online Commerce

---

## Conceptualizing Online Commerce

One of the most important and unique features of LC data is the ability to directly link consumers to merchants at the transaction level. By capturing both parties in a transaction, and unpacking the attributes of each, we have the opportunity to perform a nuanced analysis of local economies and the dynamics within them. In general, the characteristics of a given transaction determine the costs and benefits to different parties. It matters which parties are involved in the transaction and how they are spatially related. When considering the economic significance of a given transaction, a variety of questions may be asked:

- What is being purchased?
- Does the consumer travel to make the purchase? If not, why not?
- Where do the proceeds of the sale accrue?

The answers to such questions govern how consumers and merchants behave, which in turn impacts the way that local economies grow and develop. The likelihood of a consumer to engage in a given transaction will determine how merchants choose to operate and invest:

- Given the nature of the observed transactions, should a merchant build a storefront or a fulfillment center?
- Should merchants invest more in people or IT infrastructure that can help manage online transactions?
- Will the choice to invest in people be the same in all markets? When and why is it different?

These questions are far from exhaustive, but they make it clear that a more systematic framing of consumer commerce is needed. To treat all transactions the same way (whether online or offline) is to forgo an opportunity to appropriately address the questions like those posed above.

In this report we exploit our unique ability to observe and measure online retail in the LC data. Although we choose to simply categorize online transactions as those which were made without a debit or credit card present at the point of sale, we find it a worthwhile exercise to explore the different types of transactions that are considered online. Below, we walk through a taxonomy of these different types of online purchases. We hope this will serve as a basis for discussion and direction for our and others' future research.

## A Taxonomy of Local Commerce

The broad goal of the taxonomy depicted below is make it easier to decompose the universe of transactions into groups of like transactions. Once the categories are established, they can then be reassembled in a finer-grained way to answer different kinds of questions. This conceptual approach, analysis followed by tailored synthesis, allows us to address a wider set of questions than we could if we just treated all transactions as having the same impact.

To provide an example, suppose a local official is seeking to understand the revenue-generating capacity of the local fiscal base. The official may be concerned that the growth of online commerce will decrease spending at local businesses. If one were to treat all online commerce as having the same impact, a misleading picture can emerge. If local receipts increase when online spending increases, the official may conclude that online spending generally helps. If local receipts decline, the official may conclude the opposite. In reality, it is more likely that some online commerce is beneficial for local fiscal bases while some is not. (Even then, different segments of the local fiscal base are likely to experience different effects.) If a resident of the locality uses an online channel to order food from a local establishment, there is a good chance that most of the proceeds from that sale accrue to members of the local economy. On the other hand, if a resident uses an online channel to purchase dog supplies from a remote online provider, much of the economic benefit of that transaction escapes the local jurisdiction. By decomposing commerce into relevant categories, we can now ask the question, "Which kinds of online commerce support spending at local businesses of a given type?"

The above example illustrates that the question, "What's happening with online commerce?", is usually more about the impact of online commerce than online commerce for its own sake. Moreover, only a subset of online commerce usually applies for a given question. In this way, the taxonomy provides a powerful basis for nuanced measurement by enabling a flexible conceptual mapping. The initial version of this producer-oriented taxonomy has two major axes: Matching and Order Fulfillment.

### Matching

The vertical axis of Figure 27 captures the process by which consumers and merchants are matched with one another. Direct Sales are those that involve a consumer connecting directly with a given merchant. Examples include going to a specific grocery store or buying a computer from an online provider without an intermediary. By contrast, Coordination denotes providers of online marketplaces. Examples here include ride sharing applications that connect riders to any one of a number of drivers. Analogously, one might use a platform to buy insurance from a variety of competing providers.

### Order Fulfillment

The horizontal axis captures the process by which orders made by consumers are collected, processed, and filled by the producer. Labor Intensive indicates that a human being must be there to capture orders, map them to production processes, and perform triage among the available processing options. Capital Intensive indicates that automated processing can execute the functions substantially performed by the human in labor intensive transactions.

These divisions are imprecise. One can, for example, envision a range of merchants that have order fulfillment processes that are neither completely human-driven nor fully automated. However, even approximate binning of transactions into one category or another provides a basis for thinking about the "labor versus capital" tradeoffs that merchants must make on a regular basis. The balance of outcomes from these decisions governs how labor markets grow and evolve in a given local economy.

Figure 27: Local Commerce taxonomy

			Order Fulfillment			
			Labor-Intensive Processing		Capital-Intensive Processing	
			Good	Service	Good	Service
Matching	Direct Sale	Local	Purchase pizza from a local restaurant	Purchase remodeling work from a contractor	Purchase pizza online from a local restaurant	Purchase a training session at a local gym online
		Remote	Order pizza over the phone, delivered to an address	Purchase a cell phone at a local store for a national telecommunications provider	Purchase a stereo directly from an online provider	Purchase a gift card online to a spa for a remote family member
	Coordination	Local	Use an online forum to make a peer-to-peer purchase that requires meeting in person	Use an app to schedule a dog grooming appointment at a local pet store. Pay on site	Use a general food delivery app to purchase pizza from a specific, local pizzeria	Use Uber to purchase a ride
		Remote			Use an online marketplace to purchase a book from a third-party provider	Use a home sharing service to purchase accommodation in a foreign city

■ Offline 
 ■ Online & not measurable 
 ■ Hybrid - online & offline 
 ■ Online & measurable

## Measurement of Online Commerce

The taxonomy provides a conceptual target for the development of a useful set of questions, a guide post that helps orient the path of our investigation. But, it should be recognized that available data attributes do not always follow the bright line boundaries identified in the taxonomy. It is, for example, difficult to universally designate a given merchant as a marketplace provider. The difficulty in designation is largely due to the fact that some firms provide both marketplace and direct sale opportunities. Even if that were not the case, it is not obvious that we would have a clear way to consistently identify marketplace providers using the typical components of a given transaction. Therefore, the taxonomy should be viewed as a guide, rather than a description of the universe of questions that we can currently ask with our data.

In practice, our current asset can speak to transactions that are executed in person and at distance. Our proxy for this distinction is the designation of card presence. Every card transaction leaves a record, part of which indicates whether the transaction was executed with a tangible terminal, or an electronic terminal. When cards are swiped at a terminal, the transaction record includes information about the nature of execution (e.g., swipe versus chip) and information on the type of terminal. This is secondary information in a given transaction, insofar as the only necessary components are time, amount, purchaser, and counterparty. It does, however, enable us to determine whether or not the terminal was the type of terminal we typically see in a store or an electronic version. "Tangible" terminals are tagged as card present, while electronic terminals are tagged as card not present. We have tagged "card not present" as indicative of an online transaction.

This proxy is not perfect, and will capture transactions that may not be the most iconic examples of online commerce. Consumers can, for example, make purchases over the phone or engage with hybrid transactions at the merchant locations when merchant staff initiate within-firm interactions that are themselves at distance (think of purchasing a new cell phone/wireless plan from a typical provider). Alternatively, recurring payments to utilities or health clubs would also be categorized as online.

Caveats aside, by relying on terminal information, the card present flag offers unprecedented consistency in the definition of online commerce. The current, and essential, standard in the measurement of online commerce comes from the US Census Bureau. Data on online sales are collected from merchants via survey, which has the strong advantage of providing nuanced distinctions in the definition of online commerce that our measure can miss. However, the nuanced distinctions may differ across and within merchants, depending on who answers the survey. A consistent proxy, by contrast, is always measured in the same way across merchants, which enables adjustments in interpretation when necessary. The consistent measurement of our proxy should be combined with the conceptual clarity of the information sought by the Census Bureau to gain a more nuanced understanding of online commerce overall.



# Glossary

---

**Consumer Commerce** Commercial transactions initiated by users of consumer debit and credit card products.

**Local Spending** Spending by consumers at merchants located in the same CBSA as the consumer's residence.

**Merchant Location** Determined by the ZIP code predominately supplied by the terminal used in the transaction. In some cases, city and state information are used to identify a ZIP code for use in the analysis.

**Non-Local Spending** Spending by consumers at merchants located outside of the CBSA in which they reside.

**Non-Resident Consumers** Consumers that live outside of the CBSA in question.

**Offline Commerce** Commerce consisting of purchases that require in-person interaction with a physical terminal. We use "card present" as a proxy for offline commerce, which occurs when a customer must use a physical terminal to swipe, insert, or otherwise use a card in an in-person transaction.

**Online Commerce** Commerce consisting of purchases made via electronic channels that do not require the consumer to use a physical terminal at a brick and mortar location. We use "card not present" as a proxy for online commerce, which occurs when a purchase does not involve the customer using a physical terminal to swipe, insert, or otherwise use a card in an in-person transaction.

**Resident Consumers** Consumers that live inside of the CBSA in question.

**Resident Spending** Spending by consumers that live inside of the CBSA in question.

## Endnotes

---

- 1 Formerly branded as the Local Consumer Commerce Index—for more details regarding this rebranding, please refer to the LC FAQs
- 2 According the US Bureau of Economic Analysis (BEA) Regional Accounts, the combined GDP of the country's 382 metropolitan areas was \$16.8 trillion in 2016. Total GDP for the US was \$18.7 trillion.
- 3 For the benchmarking exercise, we compare the LC-Consumer Index to the Monthly Retail Trade Survey Ex-Auto data. Automobile purchases are less likely to be made with credit or debit cards than other means of financing.
- 4 LC Metro Areas: Atlanta, Chicago, Columbus, Dallas-Ft. Worth, Denver, Detroit, Houston, Los Angeles, Miami, New York, Phoenix, Portland, San Diego, and San Francisco
- 5 There is a growing body of research on the cross-channel elasticities between online and offline retail showing that online spending does not simply crowd-out offline spending (Relihan, 2017; Avery, Steenburgh, Deighton, & Caravella, 2012).
- 6 This is consistent with the findings in international trade research that show the internet has had a positive impact on international trade flows (Freund & Weinhold, 2004) along with related findings on transactions on large online platforms (Ali, Martinexz-Jerez, & Douglas, 2009).

# References

---

- Ali, H., Martinexz-Jerez, F. A., & Douglas, J.. 2009. The Geography of Trade in Online Transactions: Evidence from eBay and MercadoLibre. *American Economic Journal: Microeconomics*, 1(1), 53-74.
- Avery, J., Steenburgh, T. J., Deighton, J., & Caravella, M.. 2012. Adding bricks to clicks: Predicting the patterns of cross-channel elasticities over time. *Journal of Marketing*, 76(3), 96-111.
- Bailey, J. P.. 1998. *Intermediation and Electronic Markets: Aggregation and Pricing in Internet Commerce*. Cambridge: Massachusetts Institute of Technology Dissertation.
- Bakos, J. Y.. 1997. Reducing Buyer Search Costs: Implications for Electronic Marketplaces. *Management Science*, 1676-1692.
- Baye, M. R., Morgan, J., & Sholten, P.. 2003. The Value of Information in an Online Consumer Electronics Market. *Journal of Public Policy & Marketing*, 17-25.
- Bhatnagar, A., & Papatla, P.. 2016. Increasing online sales by facilitation spillover shopping. *Journal of Retailing and Consumer Services*, 29, 58-69.
- Brown, J. R., & Goolsbee, A.. 2002. Does the Internet Make Markets More Competitive? Evidence from the Life Insurance Industry. *Journal of Political Economy*, 110(3), 481-507.
- Brynjolfsson, E., Hu, Y. (., & Smith, M. D. (2003). Consumer Surplus in the Digital Economy: Estimating the Value of Increased Product Variety at Online Booksellers. *Management Science*, 1580-1596.
- Freund, C. L., & Weinhold, D.. 2004. The effect of the Internet on international trade. *Journal of International Economics*, 62, 171-189.
- Gebeloff, R., & Russel, K.. 2017, 7 6. How the Growth of E-Commerce is Shifting Retail Jobs. *The New York Times*.
- Goolsbee, A.. 2000. In a World Without Borders: The Impact of Taxes on Internet Commerce. *The Quarterly Journal of Economics*, 115(2), 561-576.
- Hummels, D.. 2007. Transportation Costs and International Trade in the Second Era of Globalization. *Journal of Economic Perspectives*, 21(3), 131-154.
- Relihan, L.. 2017. Is Online Retail Killing Coffee Shops? Estimating the Winners and Losers of Online Retail using Customer Transaction Microdata. *Working Paper*.
- Sinai, T., & Waldfoegel, J.. 2004. Geography and the Internet: is the Internet a substitute or a complement for cities? *Journal of Urban Economics*, 56, 1-24.
- United States Census Bureau, *Latest Quarterly E-Commerce Report*, Time Series available in Excel Format, August 17, 2018a, <https://www.census.gov/retail/index.html#mrt>.
- United States Census Bureau, *Monthly Retail Trade Report*, Retail and Food Services Sales, October 15, 2018b, <https://www.census.gov/retail/index.html#mrts>.
- University of Michigan, *Index of Consumer Sentiment*, Monthly, April 2018, <http://www.sca.isr.umich.edu/tables.html>.
- Ursu, R. M.. 2018. The Power of Rankings: Quantifying the Effect of Rankings on Online Consumer Search and Purchase Decisions. *Marketing Science*, 530-552.
- Venkatesan, R., Kumar, V., & Ravishanker, N.. Multichannel Shopping: Causes and Consequences. *Journal of Marketing*, 71(2), 114-132.
- Yoh, E., Damhorst, M. L., Sapp, S., & Laczniak, R.. 2003. Consumer Adoption of the Internet: The Case of Apparel Shopping. *Psychology & Marketing*, 20(12), 1095-1118.
- Zervas, G., Proserpio, D., & Byers, J. W.. 2017. The Rise of the Sharing Economy: Estimating the Impact of Airbnb on the Hotel Industry. *Journal of Marketing Research*, 54(5), 687-705.
- Zhang, D., Zhu, P., & Ye, Y.. 2016. The effects of E-commerce on the demand for commercial real estate. *Cities*, 51, 106-120.

## Suggested Citation

Farrell, Diana, Lindsay Relihan, and Marvin Ward Jr. "Shopping, Near and Far: Consumer Commerce in the Digital Age." JPMorgan Chase Institute, 2018.

This material is a product of JPMorgan Chase Institute and is provided to you solely for general information purposes. Unless otherwise specifically stated, any views or opinions expressed herein are solely those of the authors listed and may differ from the views and opinions expressed by J.P. Morgan Securities LLC (JPMS) Research Department or other departments or divisions of JPMorgan Chase & Co. or its affiliates. This material is not a product of the Research Department of JPMS. Information has been obtained from sources believed to be reliable, but JPMorgan Chase & Co. or its affiliates and/or subsidiaries (collectively J.P. Morgan) do not warrant its completeness or accuracy. Opinions and estimates constitute our judgment as of the date of this material and are subject to change without notice. The data relied on for this report are based on past transactions and may not be indicative of future results. The opinion herein should not be construed as an individual recommendation for any particular client and is not intended as recommendations of particular securities, financial instruments, or strategies for a particular client. This material does not constitute a solicitation or offer in any jurisdiction where such a solicitation is unlawful.

©2018 JPMorgan Chase & Co. All rights reserved. This publication or any portion hereof may not be reprinted, sold, or redistributed without the written consent of J.P. Morgan. [www.jpmorganchaseinstitute.com](http://www.jpmorganchaseinstitute.com)