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# ***U.S. Economic Contribution of the Consumer Technology Sector***

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Contribution of the  
Consumer Technology  
Sector*

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**The Consumer Technology  
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## **U.S. ECONOMIC CONTRIBUTION OF THE CONSUMER TECHNOLOGY SECTOR**

### Foreword

The consumer technology (consumer tech) sector of the U.S. economy transforms cutting edge innovations into widely adopted products and services. Over the past 20 years, this innovative industry has fundamentally changed the way people communicate, work, and enjoy leisure time.

The Consumer Technology Association (CTA)<sup>TM</sup> engaged PricewaterhouseCoopers LLP (PwC) to measure the contribution of companies in the consumer tech sector to the U.S. economy. The consumer tech sector generates substantial economic activity in the United States through the manufacture of electronic products, the creation of services and content for these products, and the distribution of these products, services, and content throughout the economy.

At each step of the supply chain, workers earn compensation, federal and state taxes are paid, and value is added to the national economy. The impact of the consumer tech sector is much broader than the direct output and employment it generates. Companies in the consumer tech sector purchase goods and services (i.e., inputs) from other domestic industries, generating economic activity in those sectors. Employees in the consumer tech sector and its supply chain spend their incomes, supporting the local and national economies. As a result, the economic impact of the industry reverberates through the economy.

This report quantifies the U.S. economic contribution of the consumer tech sector, including direct, indirect, and induced effects across the three main segments of the industry – manufacturing, distribution, and content and services.

This report focuses solely on tangible economic impacts although innovation in the consumer tech sector has much wider social and economic benefits. For example, the economic activity attributable to cell phone production and communication services excludes the broader social and economic benefits of this technology, such as business productivity, convenience, and safety.

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## U.S. Economic Contribution of the Consumer Technology Sector

### Executive Summary

The consumer technology (consumer tech) sector is among the most vibrant and innovative parts of the U.S. economy. Consumer technology can be found virtually everywhere, from TVs, computers, and cellphones to software apps and automobiles. It has revolutionized the news, consumer entertainment content – even how we hail car services.

The Consumer Technology Association (CTA) represents more than 2,200 companies engaged in the manufacture and distribution of consumer tech products and the creation of content and services used by these products. CTA engaged PwC to measure the U.S. economic contribution of the consumer tech sector.

The economic contribution of the consumer tech sector includes direct, indirect, and induced effects. Companies in the consumer tech sector purchase goods and services (i.e., inputs) from other domestic industries, generating economic activity in those sectors and their supply chain (i.e., “indirect” effects). Employees of the consumer tech sector and its supply chain spend their wages, supporting the local and national economies (i.e., “induced” effects). Goods and services produced by the consumer tech sector are in some cases purchased by businesses (e.g., personal computers, cellular phones, etc.). As many technological products are sold for both personal and commercial use, the economic effects of production for the consumer and enterprise markets are separately identified.

The report finds that:

- In 2015, the consumer tech sector *directly* provided 4.7 million jobs and generated \$1.9 trillion in output, \$931 billion of value added, \$435 billion in labor income, and \$192 billion in tax payments in the United States (see **Table E-1**). It directly accounted for 5.2 percent of U.S. gross domestic product (GDP).

**Table E-1. U.S. Economic Contribution of the Consumer Tech Sector, 2015**  
(Dollar amounts in billions; jobs in thousands)

	Direct	Indirect	Induced	Total	Economic Multiplier <sup>a</sup>
Total Output <sup>b</sup>	\$1,859	\$702	\$957	\$3,519	1.89
Value Added <sup>b</sup>	\$931	\$379	\$536	\$1,846	1.98
Labor Income	\$435	\$255	\$330	\$1,019	2.34
Tax Payments	\$192	\$91	\$130	\$413	2.15
Employment	4,714	4,205	6,416	15,334	3.25

<sup>a</sup> The economic multiplier represents the total economic contribution relative to the direct contribution.

<sup>b</sup> Total output represents the sum of receipts (or sales) and other gross income generated by the consumer tech sector. Value added equals the total output of the consumer tech sector less the associated value of inputs. The sum of value added across all sectors in the economy is gross domestic product (GDP).

Source: PwC calculations and the IMPLAN model.

- Including *indirect* and *induced* effects, the consumer tech sector supported 15.3 million jobs and contributed \$3.5 trillion of total output, \$1.8 trillion of value added, \$1.0 trillion of labor income, and \$413 billion in taxes in 2015. The *direct, indirect, and induced* economic activity amounted to 10.3 percent of U.S. GDP.
- The economic multiplier, which represents the ratio of the *total* economic contribution of the consumer tech sector to the *direct* effect, ranges between 1.89 (for total output) to 3.25 (for employment). In other words, for each direct job generated in the consumer tech sector, another 2.25 jobs are supported throughout the rest of the economy.
- Exports of goods and services directly and indirectly attributable to the consumer tech sector amounted to \$379 billion, or 17 percent of total U.S. exports in 2015. Exports of goods and services account for 11 percent of total consumer tech sector output. This translates into approximately 1.5 million U.S. jobs reliant on consumer tech exports. Tax payments of \$14 billion are attributable to the sale of U.S. consumer tech goods and services overseas. That number grows to approximately \$39 billion when indirect and induced effects are included.
- On a national basis, the consumer tech sector directly and indirectly accounted for 10.3 percent of GDP, 9.6 percent of labor compensation, and 8.4 percent of employment in 2015. Average compensation of employees associated with the consumer tech sector is above the national average.
- The economic impact of the consumer tech sector can be seen across the United States. In 22 states consumer tech manufacturing, content and services, and distribution directly and indirectly generated at least \$50 billion in total economic output in 2015. California alone had over \$700 billion in consumer tech sector related output, followed by Texas (over \$350 billion) and New York (over \$240 billion). The consumer tech sector in those three states alone accounted for over \$380 billion in total workforce compensation in 2015.
- The share of employment generated by the consumer tech sector (including indirect and induced impacts) in each state ranges between 4.4 percent (in the District of Columbia) and 12.4 percent (in California).
- This report updates a PwC report that measured the economic contribution of the consumer tech sector as of 2008. Since that time, a number of changes have occurred in the consumer tech sector and the overall economy, including: increased prominence of computer manufacturing, software and internet publishing, and related industries; integration of consumer technology across the economy, e.g., in auto manufacturing; and the advent of the “sharing economy” which is facilitated by consumer technology. Accordingly, this report uses an updated methodology, with newly revised government industry definitions and an updated definition of the consumer tech sector. As such, while the results of the two reports are not strictly comparable, they indicate that the consumer tech sector’s direct, indirect, and induced impacts on output, contribution to GDP, and labor income have all grown more or less in line with the overall economy, so consumer tech’s share of the economy has been roughly constant. In terms of nominal dollars, the consumer tech sector’s direct, indirect, and induced contributions to GDP have increased from \$1.3 trillion in 2008 to \$1.8 trillion in 2015, while its total labor income impact has increased from \$836 billion to \$1.0 trillion.

## U.S. Economic Contribution of the Consumer Technology Sector

### I. Definition of the Consumer Technology Sector

We have divided the consumer tech sector's economic activity between (1) manufacture of consumer electronics and related products (referred to as "manufacturing"), (2) the supply of content and services for these products (referred to as "content"), and (3) wholesale and retail distribution of consumer tech products and services. We have also divided the consumer tech sector's economic activity into sales to consumers and sales to businesses. Shipments for consumer use appear as personal consumption in the nation's gross domestic product (GDP), while shipments for business use appear as intermediate inputs or capital investment.

#### A. Consumer Segment of Technology Industry

Based on discussions with the Consumer Technology Association (CTA) and industry descriptions, we identified industries that manufacture consumer electronics and related products or supply content and services for these products. We ranked all industries by total sales for personal consumption, and generally defined the consumer tech sector to include all electronics manufacturing and content industries with more than \$120 million of sales for personal consumption in 2013.<sup>1</sup> As a guide for the selection of industries, we used the industry descriptions of the members of the CTA. For example, we excluded motor home manufacturing, since the CTA does not have members in this industry. As another example, we excluded automobile manufacturing as overly broad, but included motor vehicle electric and electronic equipment manufacturing and other motor vehicle parts manufacturing. According to this definition, the consumer tech sector includes 28 industries: 17 manufacturing and 11 content industries (see **Table 1**). In total, these 28 industries sold \$515 billion of goods and services to the consumer sector in 2013, of which manufacturing industries accounted for 12 percent (\$62 billion) and content industries accounted for 88 percent (\$453 billion).

#### B. Industry-Specific Adjustments

Three manufacturing industries included in the consumer tech sector were adjusted to exclude significant non-electronics production: (1) doll, toy, and game manufacturing; (2) other motor vehicle parts manufacturing; and (3) photographic and photocopying equipment. The non-

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<sup>1</sup> We also included blank magnetic and optical recording media manufacturing (NAICS 334613), because this industry contains CTA members. Due to insufficient consumer sales of electronic goods and content or insufficient data, the following industries with CTA members are modeled as indirectly associated with the consumer tech sector: musical instrument manufacturing (NAICS 339992), other communications equipment manufacturing (NAICS 334290), automatic environmental controls (NAICS 334512), industrial process control instruments (NAICS 334513), totalizing fluid meter and counting devices (NAICS 334514), electricity and signal testing instruments manufacturing (NAICS 334515), analytical laboratory instruments (NAICS 334516), irradiation apparatus (NAICS 334517), software and other prerecorded and record reproducing (NAICS 334614), directory, mailing list, and other publishers (NAICS 51114, 511199), news syndicates, libraries, archives and all other information services (NAICS 519110, 519120, 519190), engineering services (NAICS 541330), computer systems design and related services (NAICS 5415), R&D and testing labs (NAICS 541380, 541711, 541712), travel arrangement and reservation services (NAICS 5615), transit and ground passenger transportation (NAICS 485), computer training (NAICS 611420), and computer and electronic repair and maintenance (NAICS 8112).

electronics output of these industries was estimated based on sales information in the 2014 Economic Census published by the U.S. Bureau of the Census. For each industry, the Economic Census provides sales by product line.<sup>2</sup> We estimate that electronic products account for 45 percent of sales in the doll, toy, and game industry; 55 percent of sales in the other motor vehicle parts industry; and 74 percent of sales in the photographic and photocopying equipment industry.

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<sup>2</sup> Product line data are available in *2014 Annual Survey of Manufactures: Value of Products Shipments: Value of Shipments for Product Classes: 2014, 2013, 2012*, Issued January 8, 2016, AM1431VS101, available at [http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ASM\\_2014\\_31VS101&prodType=table](http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ASM_2014_31VS101&prodType=table)

**Table 1. U.S. Consumer Technology Sector, 2013** (Dollar amounts in millions)

Industry	NAICS Code	Personal Consumption	
		Amount	Percent of Industry Output
<b>Manufacturing of consumer technology products</b>		<b>\$62,101</b>	<b>9.7%</b>
1. Electronic computer manufacturing	334111	\$29,408	33.2%
2. Electromedical and electrotherapeutic apparatus manufacturing	334510	\$4,721	19.5%
3. Computer terminals and other computer peripheral equipment mfg	334118	\$4,667	18.9%
4. Primary battery manufacturing	335912	\$4,399	59.7%
5. Doll, toy, and game manufacturing (portion)	33993	\$3,703	71.4%
6. Audio and video equipment manufacturing	3343	\$3,474	40.2%
7. Other motor vehicle parts manufacturing (portion)	336390	\$3,204	4.7%
8. Watch, clock, and other measuring and controlling device mfg	334519	\$2,159	22.3%
9. Computer storage device manufacturing	334112	\$1,949	8.8%
10. Motor vehicle electrical and electronic equipment manufacturing	33632	\$1,793	8.6%
11. Broadcast and wireless communications equipment	33422	\$984	3.9%
12. Telephone apparatus manufacturing	33421	\$431	2.8%
13. Search, detection, and navigation instruments manufacturing	334511	\$402	0.7%
14. All other electronic component manufacturing	334412-19	\$345	0.1%
15. Storage battery manufacturing	335911	\$288	5.1%
16. Photographic and photocopying equipment mfg (portion)	333316	\$159	4.2%
17. Blank magnetic and optical recording media manufacturing	334613	\$15	1.2%
<b>Content and services for technology</b>		<b>\$453,144</b>	<b>32.4%</b>
1. Wired telecommunications carriers	517110	\$190,085	50.2%
2. Wireless telecommunications carriers (except satellite)	517210	\$100,152	58.1%
3. Software publishers	511210	\$45,508	33.4%
4. Motion picture and video industries	5121	\$31,408	22.2%
5. Internet publishing and broadcasting and web search portals	519130	\$15,664	10.8%
6. Satellite, telecommunications resellers, and all other telecom	51741-91	\$12,018	49.6%
7. Sound recording industries	5122	\$6,126	37.4%
8. Radio and television broadcasting	5151	\$6,120	7.4%
9. Video tape and disc rental	532230	\$3,638	80.4%
10. Cable and other subscription programming	515210	\$2,338	2.9%
11. Data processing, hosting, and related services	518210	\$1,773	1.5%
<b>Total consumer technology sector</b>		<b>\$515,245</b>	<b>25.3%</b>

Source: PwC calculations and the IMPLAN model.

Note: The economic model used to derive the estimates is based on 2013 data and relationships. We use these levels in determining the industries to include in the consumer tech sector. In later tables, we have inflated those results to 2015 levels. Details may not add to totals due to rounding.



## II. Sector Characteristics

This section provides an overview of the industries that produce goods and content for the consumer tech sector and reflects both the consumer and enterprise market segments. There have been major advances over the last 15 years that have had a pronounced impact on the consumer tech sector specifically and the overall economy in general. These developments include increased computer processing speed, advances in smart phone technology and apps, ubiquitous Wi-Fi, computerized and technologically advanced cars, social networking sites, and the sharing economy.

The introduction and rapid adoption of new products have spurred growth in the consumer tech sector as well as industries that supply consumer tech content and services in upstream and downstream industries. For example, today more than two-thirds of U.S. adults have a smartphone, up from approximately one-third in 2011.<sup>3</sup> Increases in the availability and capability of consumer tech products have resulted in significant changes to the industry over the past several decades.

### A. Household Spending on Consumer Technology

While virtually every U.S. household owns at least one TV and that has been the case for many years, the quality of TVs has improved dramatically. Almost all TVs sold today are flat-panel LCD TVs, and about one-third of those are big screen (50"+) TVs.<sup>4</sup> Likewise, more than 90 percent of U.S. adults own a cellphone, a percentage that has not increased dramatically in recent years, but smartphone ownership has increased from 35 percent in 2011 to 68 percent today.<sup>5</sup> Similarly, the percentage of U.S. adults that own a desktop or laptop computer has remained at just over 70 percent since 2004, but the percentage that own a tablet computer has increased from 3 percent in 2010 to 45 percent today.<sup>6</sup> Along with growth in the availability and capability of these devices, the percentage of Americans that use the internet has grown from 52 percent in 2000 to 84 percent today.<sup>7</sup>

Despite increased household utilization of more advanced consumer technologies, average spending has increased only modestly. As illustrated in **Figure 1**, real average household spending on audio and visual equipment, telephones, computers, and related services (including telephone, cable TV, and internet services) increased from \$2,467 in 2002 (expressed in 2014 dollars using the consumer price index) to \$2,966 in 2014. Compared to average household spending on all products and services, spending in these categories increased from 4.8 percent in 2002 to 5.5 percent of total spending in 2014.

Household spending on consumer technology has increased relatively little because prices for most of these products have fallen. For example, according to the Bureau of Labor Statistics, TV prices have fallen 92 percent since 2002, while personal computer prices have fallen 81 percent,

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<sup>3</sup> Monica Anderson, "Technology Device Ownership: 2015," Pew Research Center, October 29, 2015, available at <http://www.pewinternet.org/2015/10/29/technology-device-ownership-2015/>

<sup>4</sup> CTA research.

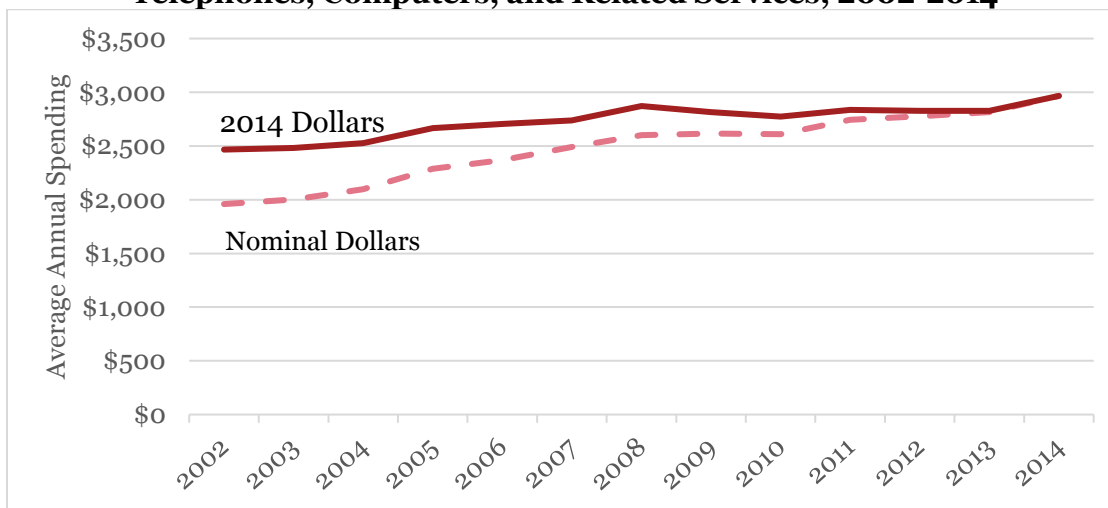
<sup>5</sup> Monica Anderson, "Technology Device Ownership: 2015," Pew Research Center, October 29, 2015, available at <http://www.pewinternet.org/2015/10/29/technology-device-ownership-2015/>

<sup>6</sup> *Ibid.*

<sup>7</sup> Andrew Perrin and Maeve Duggan, "Americans' Internet Access: 2000-2015," Pew Research Center, June 26, 2015, available at <http://www.pewinternet.org/2015/06/26/americans-internet-access-2000-2015/>

telephone (device) prices have fallen 61 percent, and internet service prices have fallen 22 percent. Consumers have been able to take advantage of more features and richer technology at lower prices.

**Figure 1. Average Household Spending on Audio and Visual Equipment, Telephones, Computers, and Related Services, 2002-2014**



Source: U.S. Bureau of Labor Statistics, Consumer Expenditure Survey, various years.  
 Note: 2014 dollars are calculated using the consumer price index.

## B. International Trade

Exports of consumer technology have grown over an extended period – suggesting growth is a function of underlying fundamentals and not solely a function of factors like currency valuations. **Table 2** presents the growth in exports for the period from 2002 to 2015 for selected consumer tech products.

As described in the previous section, over the last 15 years prices for consumer technology have declined significantly. A portion of these declines are attributable to the increased efficiencies brought about through international trade.

**Table 2. Growth in Exports for Select Consumer Tech Sector Products, 2002-2015**

	2002-2015 Export Growth
Computer equipment	22%
Communications equipment	173%
Audio and video equipment	76%
Navigation, measuring, medical, and control instruments	83%
Magnetic and optical media	148%

Source: U.S. Department of Commerce, International Trade Administration.

### C. Sharing Economy

The pervasiveness of consumer technology, and its ability to connect consumers and providers seamlessly and with little transaction cost, has arguably been the key condition that enabled the development of what is now commonly referred to as the sharing economy. Sharing has, of course, been around for a long time, and many industries have for many years offered alternatives to ownership, such as renting. However, the sharing economy represents a new model that brings together a set of characteristics that have growing appeal to consumers, including:

- Digital platforms that connect spare capacity and demand, e.g., for vacation home rentals, car sharing, and ride hailing.
- Transactions that offer flexible use of property without ownership, providing the ability to realize more choice while mitigating the costs associated with ownership, including renting, lending, subscribing, reselling, swapping, and donating.
- More collaborative and personalized forms of consumption built on trust, emotional connection, and branded experiences, e.g., home sharing services that provide travelers the ability to connect with local hosts and receive travel tips in a personalized fashion.

Because it is a relatively new and fast growing part of the U.S. economy, government statistics do not fully capture the current state of the sharing economy. However, survey data and other sources provide some indication of the potential economic impact of the sharing economy.

In a survey from December 2014, PwC found that almost half (44 percent) of American adults were familiar with the sharing economy, and almost one-fifth (19 percent) of adults had engaged in a sharing economy transaction. PwC looked at five key sharing economy sectors – travel and hospitality, car sharing, finance, staffing, and entertainment and media. The survey indicated that entertainment and media sharing was most widely adopted, with 9 percent of respondents having engaged in a transaction. This was followed by car sharing, with 8 percent of respondents having engaged in a transaction and 1 percent having provided car sharing services. The survey indicated that 6 percent of respondents had participated as a consumer in the travel or hospitality sharing economy and 1 percent had participated as a provider.

In a more recent survey from November and December 2015, the Pew Research Center finds that 72 percent of American adults have used at least one of 11 different shared or on-demand services, with 15 percent having used a ride-hailing service and 11 percent having used a home-sharing service.<sup>8</sup>

PwC found that price is an important factor driving growth in the sharing economy, as is the quality of the user experience. For example, the survey indicated that 56 percent of consumers like car sharing because of better pricing, while 32 percent like it because it offers more choice in the marketplace, and 28 percent like it because it offers more convenient access. As further evidence that quality matters, another recent study found that the rise of car sharing is associated with a decline in consumer complaints about traditional taxi service.<sup>9</sup>

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<sup>8</sup> Pew Research Center, “Shared, Collaborative and On Demand: The New Digital Economy,” May 19, 2016, available at <http://www.pewinternet.org/2016/05/19/the-new-digital-economy/>

<sup>9</sup> Scott Wallsten, “The Competitive Effects of the Sharing Economy: How is Uber Changing Taxis?,” Technology Policy Institute, June 1, 2015, available at [https://www.ftc.gov/system/files/documents/public\\_comments/2015/06/01912-96334.pdf](https://www.ftc.gov/system/files/documents/public_comments/2015/06/01912-96334.pdf).

PwC estimated that annual global revenues in the sharing economy have the potential to grow from \$15 billion in 2015 to \$335 billion in 2025, with the fastest growth in peer-to-peer lending and crowdfunding (63 percent growth), followed by online staffing (37 percent growth), peer-to-peer accommodation (31 percent growth), car sharing (23 percent growth), and entertainment and media (17 percent growth).<sup>10</sup>

By providing entrepreneurs new ways to work and earn income, the sharing economy is enabling more risk-taking among entrepreneurs, adding jobs and increasing incomes. A study by the JPMorgan Chase Institute finds that about 3.1 percent of adults in the U.S., or 7.5 million workers, earned income from online platforms in at least one month between October 2014 and September 2015.<sup>11</sup> The study finds the percentage is higher in west coast cities such as San Francisco (5.1 percent) and Los Angeles (4.2 percent). The percentage of adults who earn income from online platforms in any one month has increased dramatically, from 0.1 percent in October 2012 to nearly 1.0 percent in September 2015.<sup>12</sup> The study finds that a higher percentage of adults earn income from capital platforms, such as those that provide home-sharing services, rather than from labor platforms, such as those that provide ride-hailing services, and there is very little overlap between the two, i.e., less than 3 percent of participants earned income from both labor and capital platforms. However, more income is earned from labor platforms than from capital platforms.

Online “gig workers” are typically part-time. According to the JPMorgan Chase Institute study, among established platform users, labor platform income is about 26 percent of total annual income, while capital platform income is about 10.7 percent of total annual income.

The results of the JPMorgan Chase Institute study are consistent with another recent study, by professors Lawrence Katz and Alan Krueger, which is based on a large survey conducted in October and November 2015.<sup>13</sup> Katz and Krueger find that 0.5 percent of all U.S. workers in a given week engage in “direct selling” to customers via an online labor platform.<sup>14</sup>

In sum, the sharing economy is an important and growing part of the U.S. economy, made possible to a large degree by consumer technology.

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<sup>10</sup> PwC, “The Sharing Economy,” available at <https://www.pwc.com/us/en/technology/publications/assets/pwc-consumer-intelligence-series-the-sharing-economy.pdf>.

PwC, “The Sharing Economy – Sizing the Revenue Opportunity,” available at <http://www.pwc.co.uk/issues/megatrends/collisions/sharingeconomy/the-sharing-economy-sizing-the-revenue-opportunity.html>.

<sup>11</sup> JPMorgan Chase & Co. Institute, “The Online Platform Economy: Who Earns the Most?,” available at <https://www.jpmorganchase.com/corporate/institute/institute-insights.htm#ope-most>

JPMorgan Chase & Co. Institute, “Paychecks, Paydays, and the Online Platform Economy: Big Data on Income Volatility,” February 2016, available at <https://www.jpmorganchase.com/corporate/institute/report-paychecks-paydays-and-the-online-platform-economy.htm>

<sup>12</sup> JPMorgan Chase & Co. Institute, “The Online Platform Economy: What is the Growth Trajectory?,” available at <https://www.jpmorganchase.com/corporate/institute/institute-insights.htm>

<sup>13</sup> Lawrence F. Katz and Alan B. Krueger, “The Rise and Nature of Alternative Work Arrangements in the United States, 1995-2015,” Working Paper, March 29, 2016, available at [https://krueger.princeton.edu/sites/default/files/akrueger/files/katz\\_krueger\\_cws\\_-\\_march\\_29\\_2016.pdf](https://krueger.princeton.edu/sites/default/files/akrueger/files/katz_krueger_cws_-_march_29_2016.pdf)

<sup>14</sup> Unlike the JPMorgan Chase Institute study, the Katz and Krueger study is based on a one week snapshot in time, and the results for online capital platform users are not separately identified.

### III. Economic Contribution of the Consumer Tech Sector

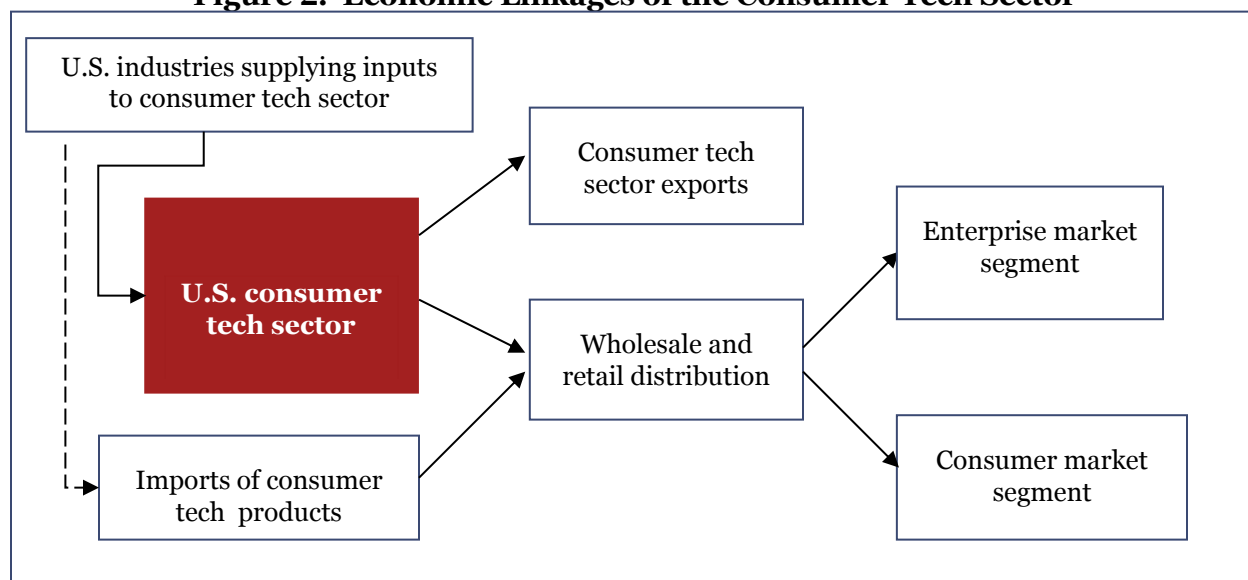
This section estimates the U.S. economic contribution of the consumer tech sector as defined in section II, above.

#### A. Economic Linkages

The consumer tech sector touches many different parts of the U.S. economy (see **Figure 2**). The economic impact of the sector is determined by cumulating direct, indirect, and induced effects throughout the production process:

- **Direct effect.** The consumer tech sector directly employs workers and sells its output into the enterprise and consumer markets and for export.
- **Indirect effect.** The consumer tech sector indirectly is responsible for output and employment throughout its supply chain. The consumer tech sector also is indirectly responsible for employment in the wholesale and retail sectors that distribute domestic and imported electronics products to U.S. customers.
- **Induced effect.** The economic activity in each of these sectors generates income in the form of wages to employees and profits to owners. A portion of this income is spent, generating additional economic activity and employment in the economy.

**Figure 2. Economic Linkages of the Consumer Tech Sector**



As globalization has transformed the way companies do business, it also has affected how value is created and benefits like jobs and labor income are distributed. This analysis does not capture the impact of foreign production taking place in overseas markets even if the foreign production is conducted by U.S.-headquartered firms. Such activity could ultimately result in spillover effects in the United States (beyond the spillover effects on U.S. headquarters, which are captured in this analysis in terms of employment, labor income, tax payments, or overall induced effects).

Estimates of indirect effects do not include non-CT products and services exported by U.S. industries to be used as inputs in consumer tech products manufactured abroad. These products might then be imported into the United States as finished goods. As a hypothetical example, a U.S. company might produce semiconductors, export them to Malaysia to be integrated into computers, and then import them to the U.S. as finished goods. Our estimates do not reflect the economic activity attributable to the exported semiconductors.

## B. Methodology

For each of the 28 industries in the consumer tech sector, we used the IMPLAN model to measure the direct, indirect, and induced economic effects. The IMPLAN model is a widely used modeling system built around an input-output table of the U.S. economy (see **Appendix C**).<sup>15</sup>

The total economic contribution of the consumer tech sector is determined by consolidating the contributions of the 28 component industries to avoid double-counting intra-sectoral sales, i.e., sales between industries within the consumer tech sector. For example, the audio and video equipment manufacturing industry (NAICS 3343) relies on inputs from the electronic computer manufacturing industry (NAICS 334111) and both of these industries are part of the consumer tech sector. The indirect effects of the audio and video equipment industry include employment in all input sectors, including the electronic computer industry. The direct effect of the electronic computer industry includes the same jobs. Thus, to prevent double counting, we excluded the indirect and induced effects in other consumer tech sector industries.

The IMPLAN model used in this analysis is based on economic relationships for 2013. We extend economic activity forward to 2015 assuming that the underlying relationships between industries have remained the same.<sup>16</sup>

## C. Detailed National Results

The impact of the consumer tech sector on the U.S. economy is estimated using five different metrics: total output, value added, labor income, tax payments, and employment (see **Table 3**).

**Table 3. Description of Key Metrics**

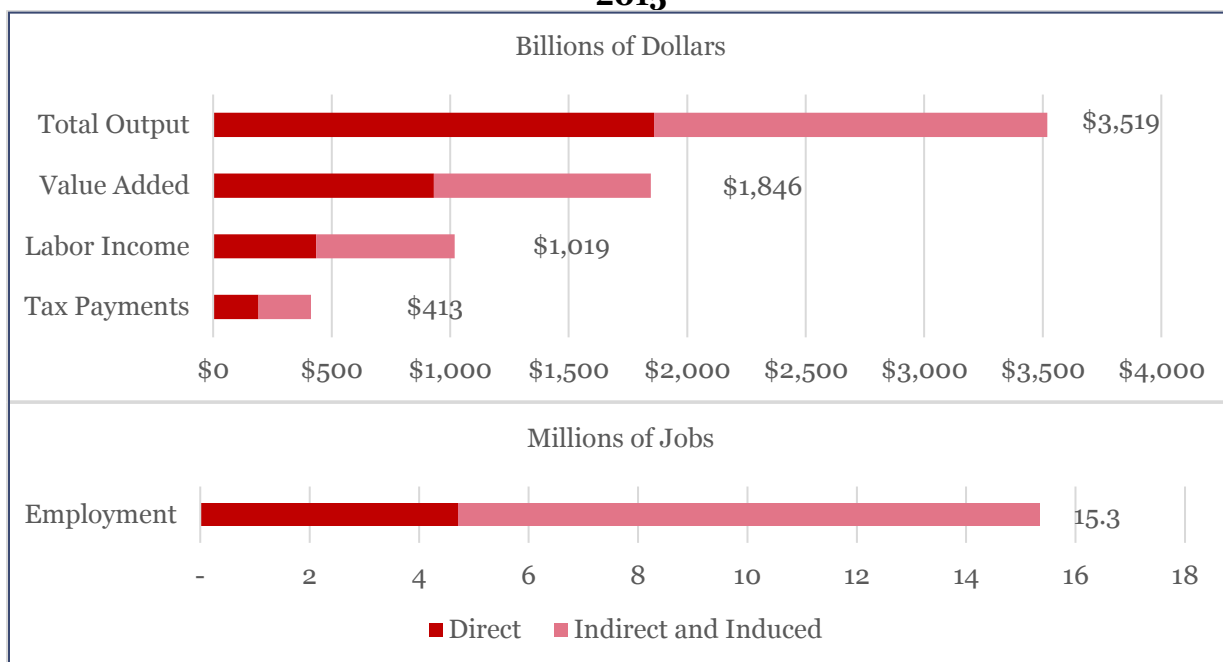
<b>Metric</b>	<b>Description</b>
Total or Gross Output	The sum of receipts (or sales) and other gross income generated by each sector. For wholesale and retail sectors, total output only reflects the wholesale or retail margin and not the value of the product sold.
Value Added	The total output of each sector less the associated value of inputs. The sum of value added across all sectors in the economy is gross domestic product (GDP).
Labor Income	The wages, salaries, and benefits paid to employees.
Tax Payments	The taxes paid to federal, state, and local governments.
Employment	The number of full-time and part-time jobs, averaged over the year.

<sup>15</sup> The IMPLAN model utilizes its own industry definitions; however, they generally conform to NAICS definitions.

<sup>16</sup> We have derived output measures at 2015 levels based on sector-specific deflators in the IMPLAN model.

We estimate that the consumer tech sector directly provided 4.7 million jobs and generated \$1.9 trillion in output, \$931 billion in value added, \$435 billion in labor income, and \$192 billion in tax payments in the United States in 2015. Including indirect and induced effects, the industry supported 15.3 million jobs and contributed \$3.5 trillion of output, \$1.8 trillion in value added, \$1.0 trillion of labor income, and \$413 billion in tax payments (see **Figure 3**).

**Figure 3. Direct, Indirect, and Induced Impacts of the U.S. Consumer Tech Sector, 2015**



Source: PwC calculations and the IMPLAN model.

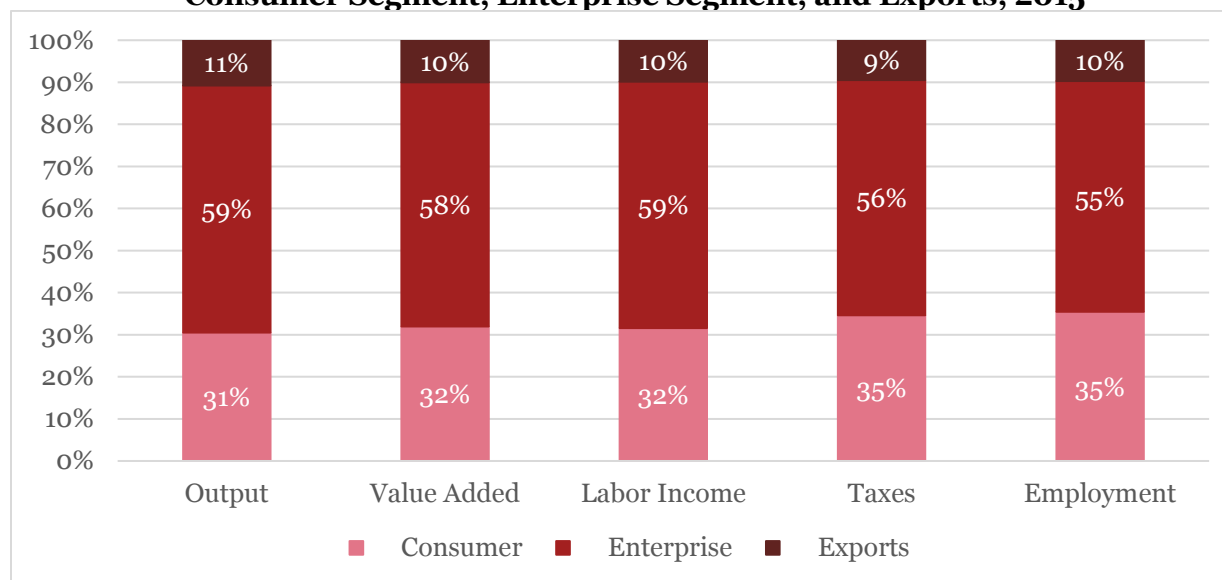
The economic activity generated by the consumer tech sector is responsible for a significant share of the overall economy. The consumer tech sector’s direct, indirect, and induced value added represents 10.3 percent of the nation’s GDP. Employment attributable to the consumer tech sector is responsible for 8.4 percent of total U.S. employment, and those workers are paid 9.6 percent of the total U.S. labor income. The employment generated by the consumer tech sector pays higher wages than the average job in the economy. Within the consumer tech sector, the average compensation per direct job is over \$92,000. Including indirect and induced employment, the average labor income per consumer tech-supported job is over \$66,000. The average for the overall economy is about \$58,000.

Consumer tech-supported jobs are also highly productive. The direct, indirect, and induced value added per job is over \$120,000 in 2015, compared to about \$98,000 for the overall economy. The direct jobs are even more productive, generating over \$197,000 in value added per consumer tech sector job in 2015.

The consumer tech sector provides output to several different customers markets. Consumer tech products are sold directly to consumers, serve as inputs to other industries, and are exported abroad. The majority of the output actually serves as inputs for other industries: the

enterprise market claims 59 percent of gross output and labor income, 58 percent of value added, 56 percent of taxes, and 55 percent of employment. The consumer market accounts for approximately one-third of the sector’s activity: 31 percent of output, 32 percent of value added and labor income, and 35 percent of tax payments and employment (see **Figure 4** with additional detail provided in **Table 4**).

**Figure 4. Composition of Economic Activity in the Consumer Tech Sector: Consumer Segment, Enterprise Segment, and Exports, 2015**

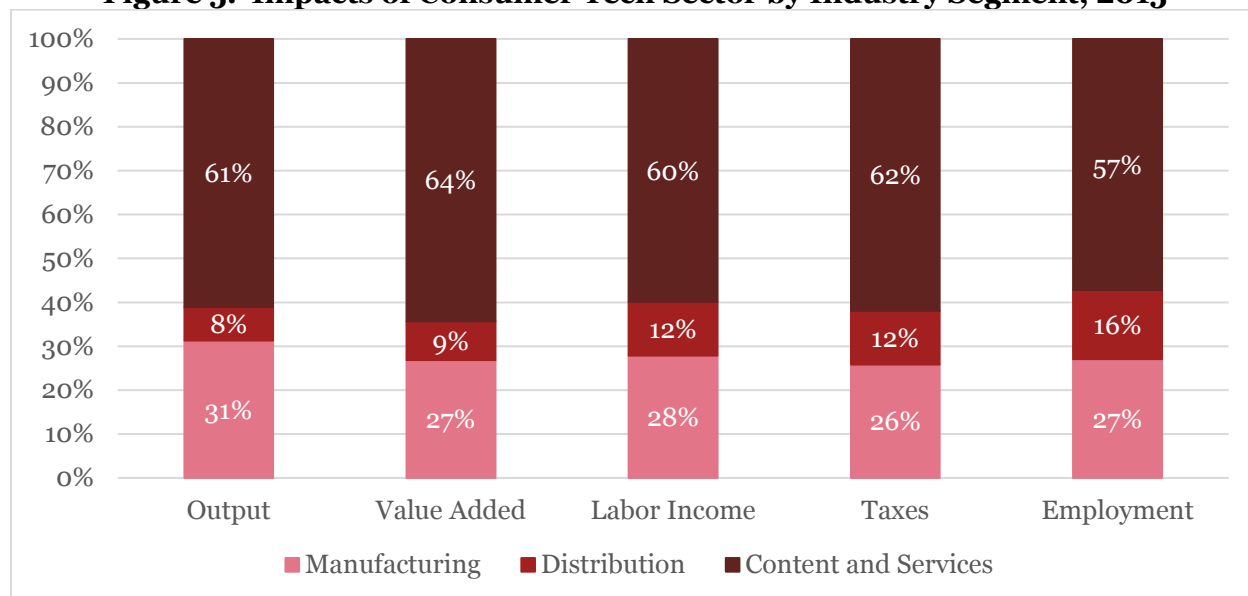


Source: PwC calculations and the IMPLAN model.

The dominant share of the enterprise market illustrates the importance of the consumer tech sector to other parts of the U.S. economy. As technology has become more common in a diverse range of products, the electronics used in consumer tech products are being adopted by other industries. As a result, other sectors of the economy increasingly rely on the consumer tech sector for inputs.

By industry segment, content and services generates significant direct, indirect, and induced activities: \$2.1 trillion in total output, \$1.2 trillion in value added, \$610 billion in labor income, \$256 billion in tax payments, and 8.8 million jobs in 2015. Manufacturing generates \$1.1 trillion in output, \$496 billion in value added, \$284 billion in labor income, \$107 billion in tax payments, and 4.1 million jobs. The distribution segment generates \$271 billion in output, \$163 billion in value added, \$124 billion in labor income, \$51 billion in tax payments, and 2.4 million jobs. Content accounts for 61 percent of the consumer tech sector’s output, 64 percent of value added, 60 percent of labor income, 62 percent of tax payments, and 57 percent of employment (see **Figure 5**).



**Figure 5. Impacts of Consumer Tech Sector by Industry Segment, 2015**

Source: PwC calculations and IMPLAN model.

**Table 4. Total Impact of the Consumer Technology Sector, 2015**  
(Dollar amounts in millions, jobs in thousands)

	Output	Value Added	Labor Income	Taxes	Employment
<b>I. Manufacture of Consumer Technology Products</b>					
<i>A. Sales to Final Domestic Consumption</i>	97,163	40,119	27,270	7,967	371
<i>B. Sales to Domestic Businesses</i>	699,027	316,623	178,068	68,440	2,613
<i>C. Exports to Foreign Countries</i>	304,083	139,554	78,889	30,340	1,161
<b>II. Distribution of Consumer Technology Products</b>					
<i>A. Domestically Produced</i>	126,844	76,398	58,105	23,884	1,107
<i>B. Imported</i>	144,645	86,133	66,294	26,705	1,318
<b>III. Production of Content and Services for Consumer Technology Products</b>					
<i>A. Sales to Final Domestic Consumption</i>	706,075	387,370	170,465	84,529	2,647
<i>B. Sales to Domestic Businesses</i>	1,366,555	754,391	418,626	162,349	5,787
<i>C. Exports to Foreign Countries</i>	74,788	45,766	21,232	8,904	330
<b>Total</b>	<b><u>\$3,519,181</u></b>	<b><u>\$1,846,354</u></b>	<b><u>\$1,018,949</u></b>	<b><u>\$413,118</u></b>	<b><u>15,334</u></b>
Consumer Segment (includes Distribution)	1,074,728	590,020	322,134	143,085	5,443
Enterprise Segment	2,065,582	1,071,014	596,694	230,789	8,400
Exports	378,871	185,320	100,121	39,244	1,491

Source: PwC calculations and the IMPLAN model.

Note: The total impact is the sum of direct, indirect, and induced impacts. See Appendix A for additional detail. Details may not add to total due to rounding.

## D. Detailed International Trade Results

International trade plays a vital role in the consumer tech sector. Both imports and exports contribute to the domestic economy: exports generate activity in the manufacturing and production of consumer tech products and related content, while imports generate jobs in the distribution sector.

Exports are an important component of the consumer tech sector, generating direct, indirect, and induced activity of \$379 billion in total output, \$185 billion in value added, \$100 billion in labor income, \$39 billion in tax payments, and 1.5 million jobs (see **Table 5**). This activity represented between 9 percent and 11 percent of total activity generated by the consumer tech sector.

Altogether, international trade generated direct, indirect, and induced activity of \$524 billion in total output, \$271 billion in value added, \$166 billion in labor income, \$66 billion in tax payments, and 2.8 million jobs in 2015. This activity represented between 15 percent and 18 percent of total activity generated by the consumer tech sector. As discussed earlier, these figures exclude additional domestic economic activity through the distribution of consumer tech imports that contain non-consumer tech U.S.-manufactured components. Including those effects would be in addition to the amounts reported here.

**Table 5. International Trade Impacts in the Consumer Tech Sector, 2015**  
(Dollar amounts in millions, jobs in thousands)

	Direct Impact	Indirect Impact	Induced Impact	Total, Int'l Trade	Int'l Trade Share of Sector Impact
<b>Consumer Tech Exports</b>					
Total Output	\$182,795	\$98,917	\$97,159	\$378,871	11%
Value Added	\$78,812	\$50,973	\$55,535	\$185,320	10%
Labor Income	\$34,101	\$32,485	\$33,535	\$100,121	10%
Tax Payments	\$13,796	\$12,201	\$13,247	\$39,244	9%
Employment	347	494	650	1,491	10%
<b>Total International Trade for Consumer Tech</b>					
Total Output	\$242,248	\$127,087	\$154,182	\$523,516	15%
Value Added	\$115,762	\$67,801	\$87,891	\$271,453	15%
Labor Income	\$70,264	\$42,485	\$53,667	\$166,416	16%
Tax Payments	\$28,453	\$16,185	\$21,311	\$65,949	16%
Employment	1,089	665	1,054	2,809	18%
<b>Consumer Tech Exports / Total International Trade</b>					
Total Output	75.5%	77.8%	63.0%	72.4%	--
Value Added	68.1%	75.2%	63.2%	68.3%	--
Labor Income	48.5%	76.5%	62.5%	60.2%	--
Tax Payments	48.5%	75.4%	62.2%	59.5%	--
Employment	31.9%	74.2%	61.7%	53.1%	--

Source: PwC calculations and the IMPLAN model.

Note: International trade includes manufacture and production of consumer tech products and consumer tech content for export and wholesale and retail distribution of imported products. Details may not add to totals due to rounding.

## E. Detailed State Results

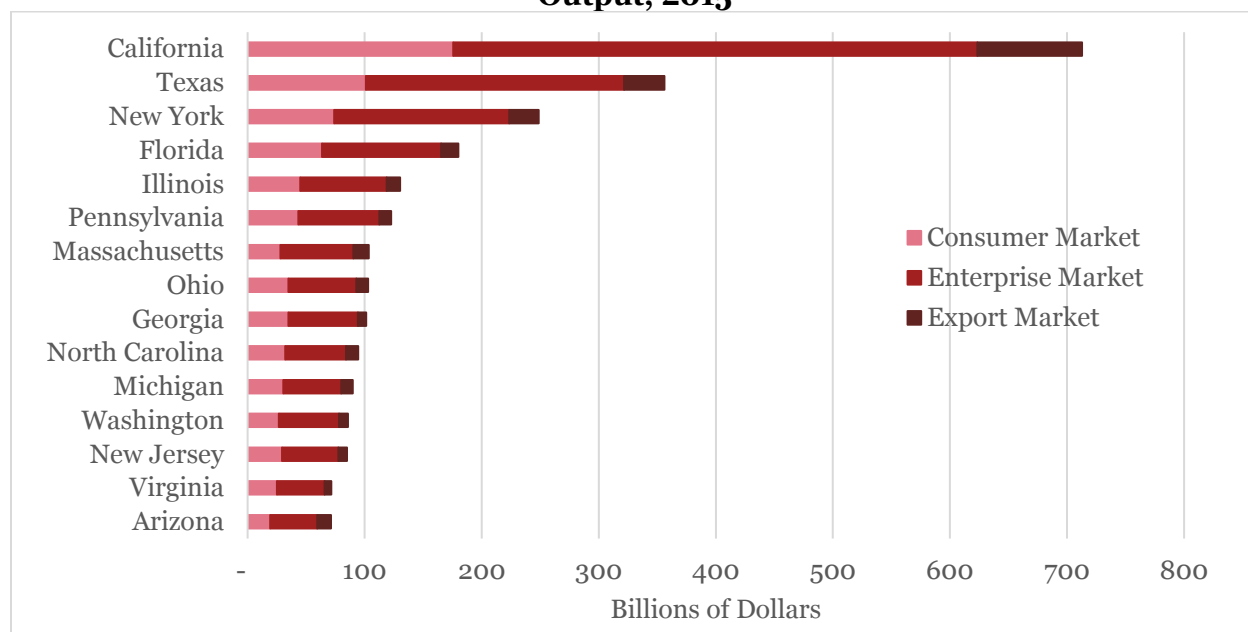
The economic contribution of the consumer tech sector at the state level reflects the indirect and induced effects attributable to direct activity within each state's borders, as well as indirect and induced activity within a state that is attributable to direct activity in other states.<sup>17</sup>

All states have significant activity in each segment of the consumer tech sector. California is the state that has the largest amount of consumer tech sector activity. Other states with significant levels of activity are Texas, New York, Florida, and Illinois. It is not surprising that these states have the highest amounts of consumer tech sector activity because they also have the largest overall economies.

**Figures 6, 7, 8, and 9** present state results for gross output, value added, employment, and labor income for the 15 states with the largest amount of activity (details for all states are available in **Appendix B**).

**Figures 10, 11, and 12** demonstrate the importance of the consumer tech sector to the overall economies of each of the 50 states and the District of Columbia, presenting the consumer tech sector contribution as a percentage of the total state economic activity. The importance of the consumer tech sector varies by state. California and Oregon are the states with the largest share of their economies attributable to the consumer tech sector (at more than 10 percent). Other states with significant shares include Colorado, Massachusetts, and Arizona. States with relatively small shares include Wyoming, Alaska, West Virginia, and the District of Columbia.

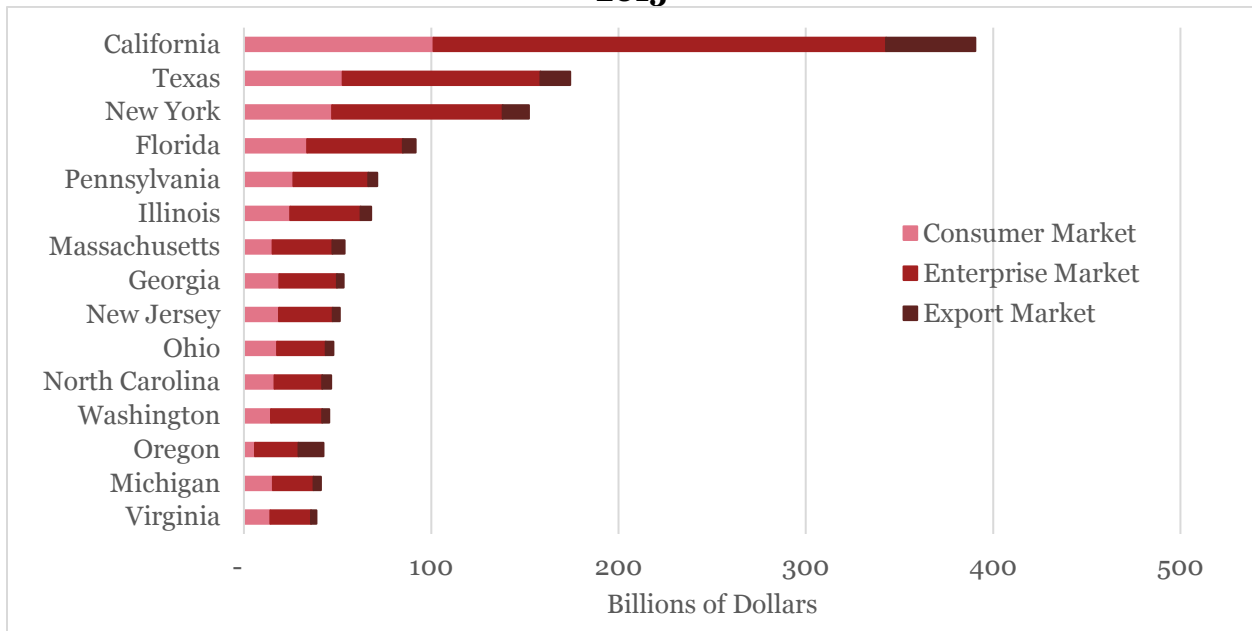
**Figure 6. Consumer Tech Sector Total Contribution in Top 15 States: Total Output, 2015**



Source: PwC calculations and the IMPLAN model. See Table B-1 in Appendix B for underlying figures.

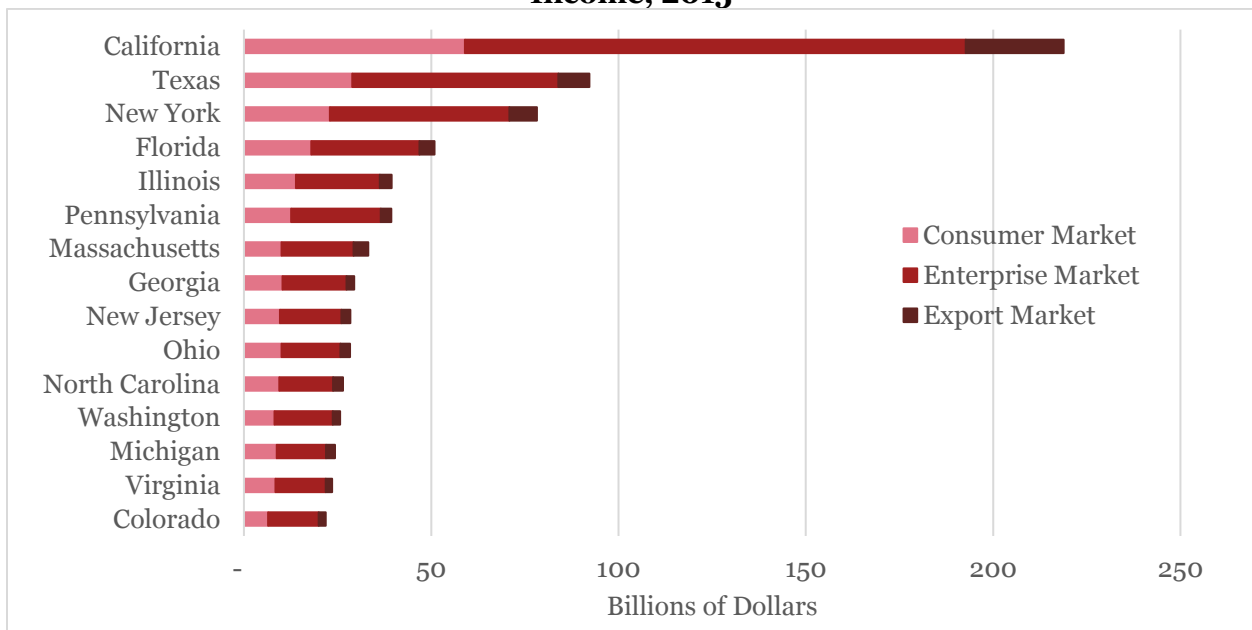
<sup>17</sup> We have allocated the indirect and induced effects by industry attributable to direct activity in other states based on the overall level of economic activity of that industry in each state.

**Figure 7. Consumer Tech Sector Total Contribution in Top 15 States: Value Added, 2015**



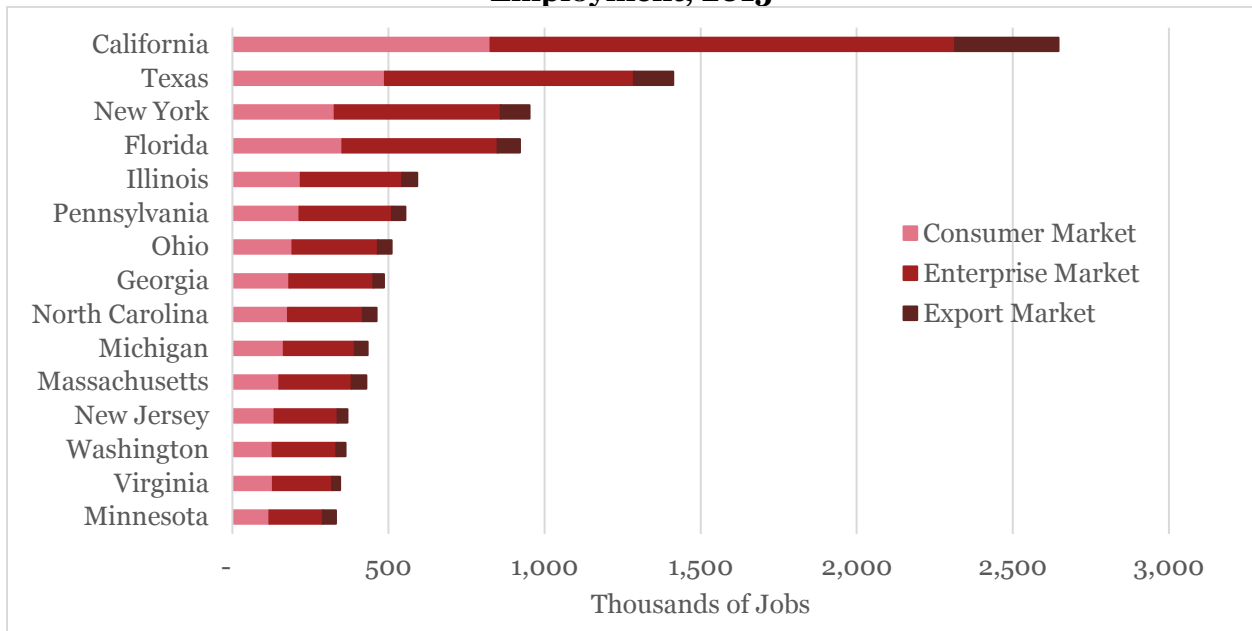
Source: PwC calculations and the IMPLAN model. See Table B-2 in Appendix B for underlying figures.

**Figure 8. Consumer Tech Sector Total Contribution in Top 15 States: Labor Income, 2015**



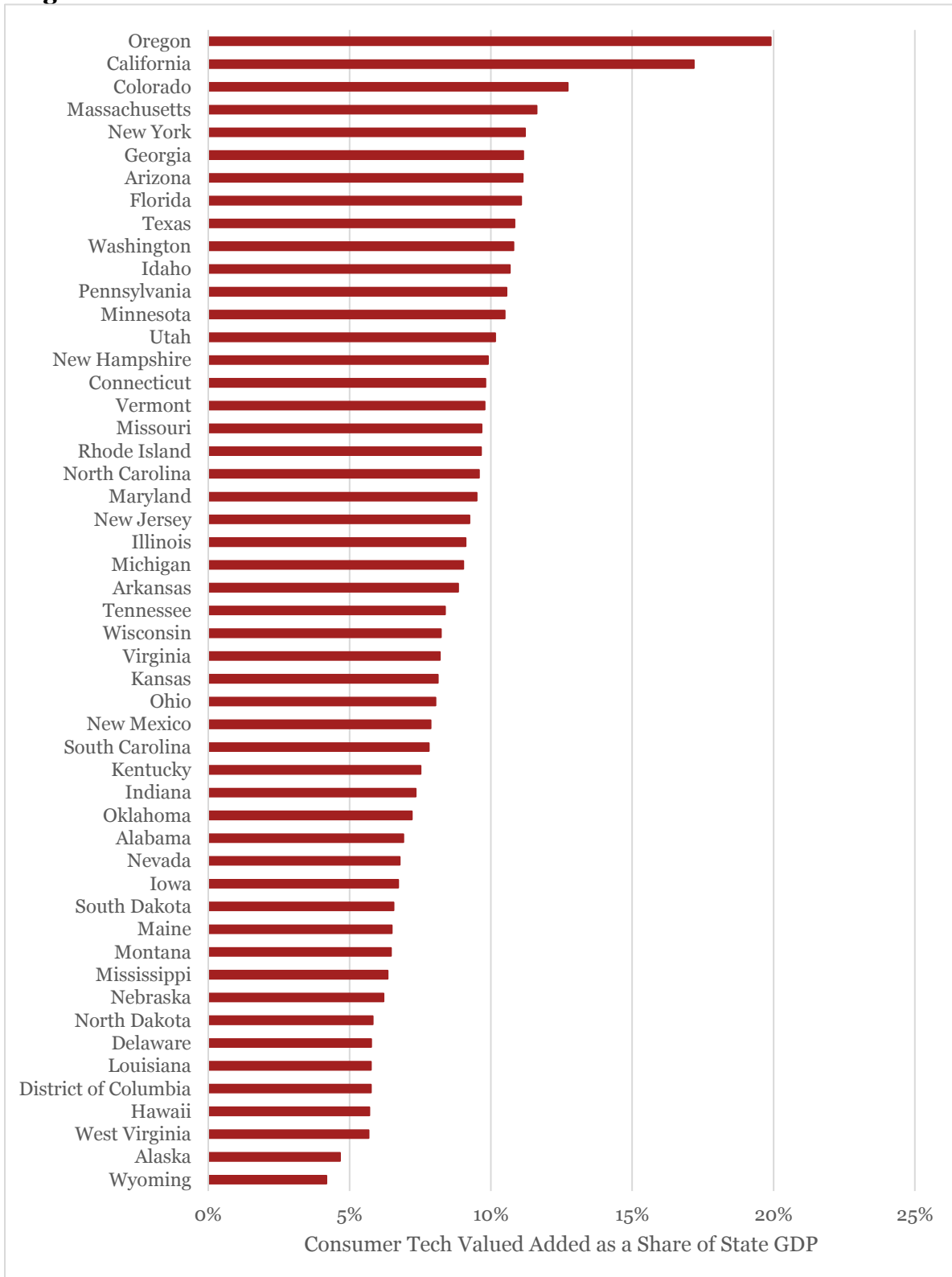
Source: PwC calculations and the IMPLAN model. See Table B-3 in Appendix B for underlying figures.

**Figure 9. Consumer Tech Sector Total Contribution in Top 15 States: Employment, 2015**



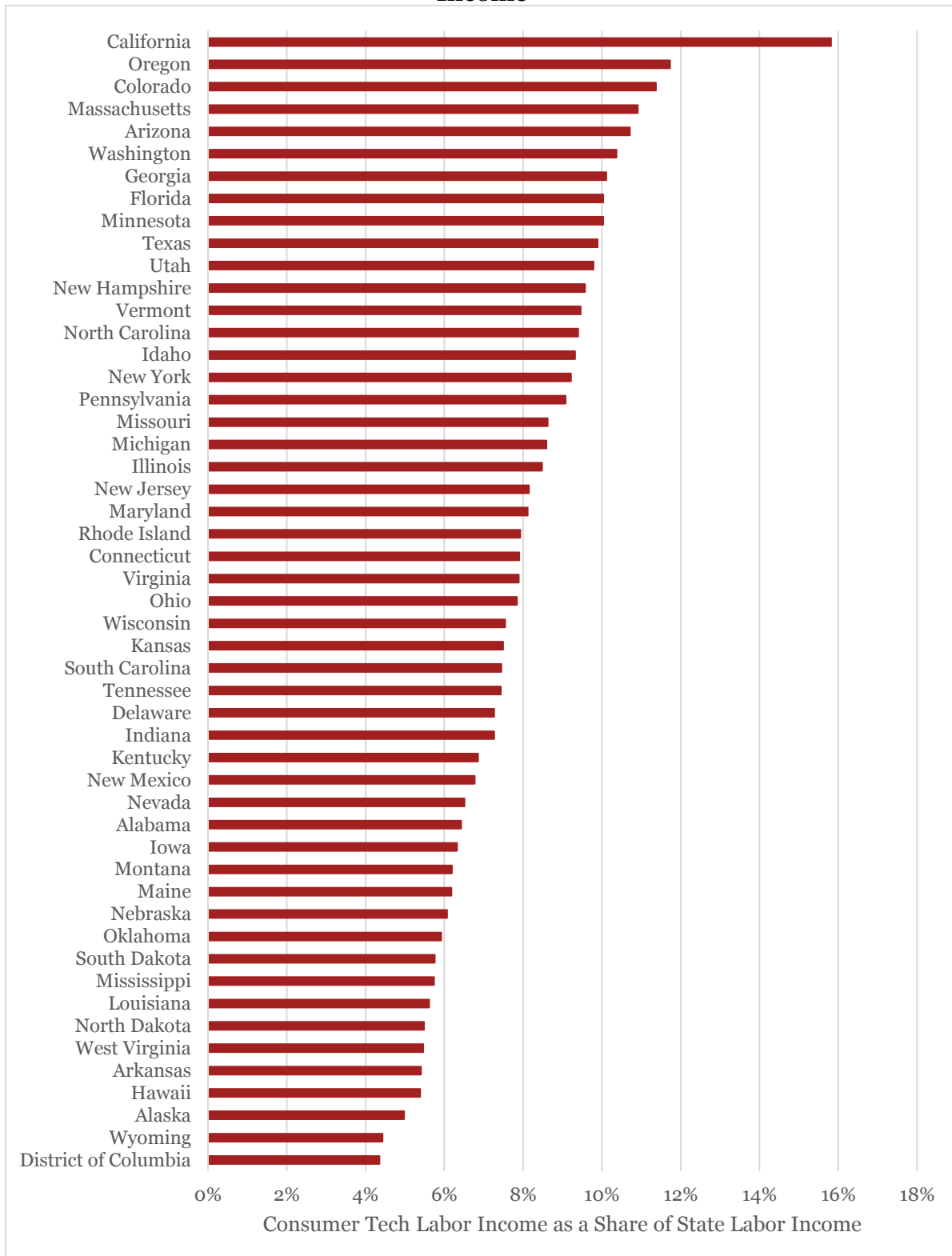
Source: PwC calculations and the IMPLAN model. See Table B-4 in Appendix B for underlying figures.

**Figure 10. Consumer Tech Sector Total Value Added as a Share of State GDP**



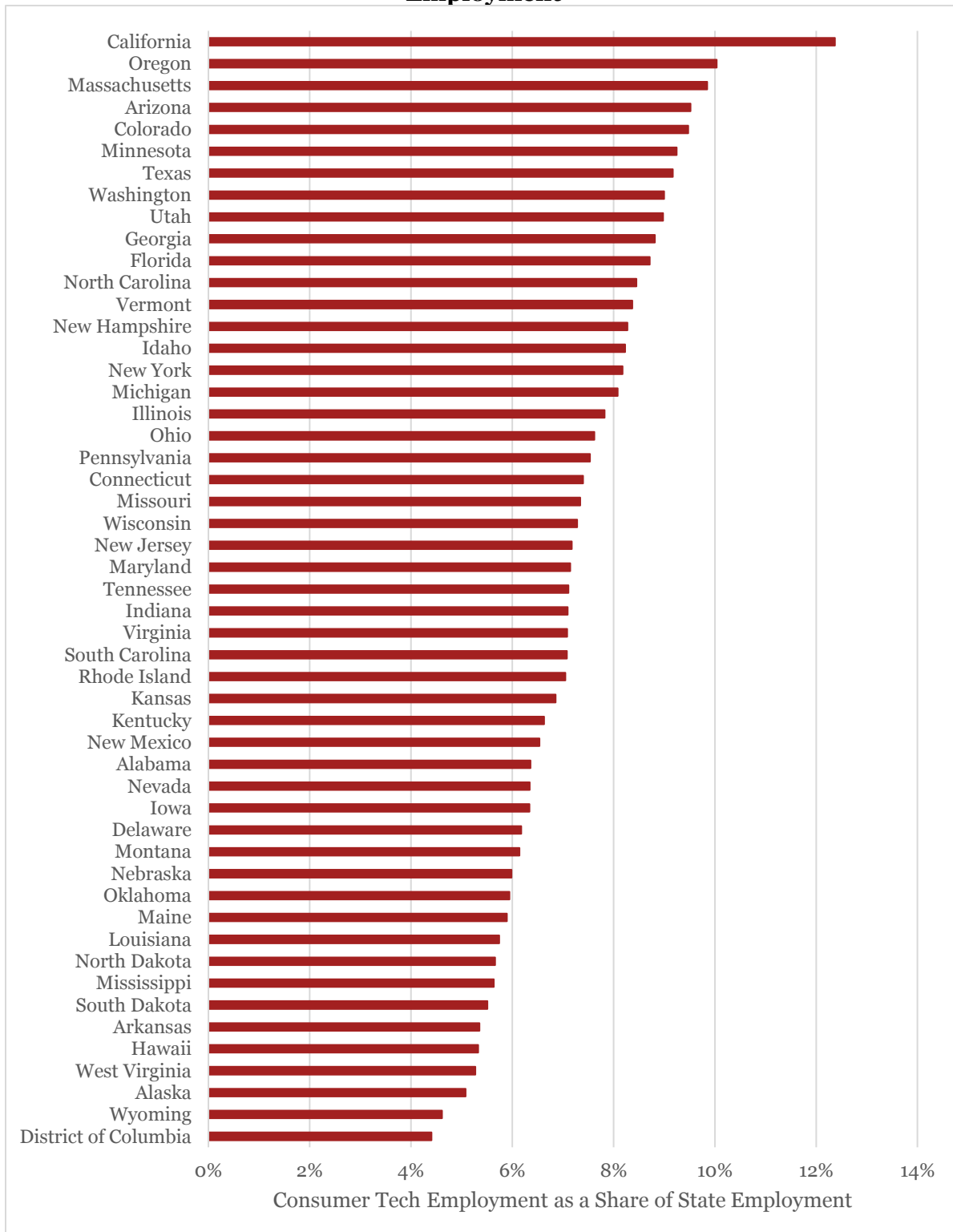
Source: PwC calculations and the IMPLAN model. See Table B-5 in Appendix B for underlying figures.

**Figure 11. Consumer Tech Sector Total Labor Income as a Share of State Labor Income**



Source: PwC calculations and the IMPLAN model. See Table B-5 in Appendix B for underlying figures.

**Figure 12. Consumer Tech Sector Total Employment as a Share of State Total Employment**



Source: PwC calculations and the IMPLAN model. See Table B-5 in Appendix B for underlying figures.



## **F. Comparison with the 2008 Report**

This report updates a PwC report that measured the economic contribution of the consumer tech sector as of 2008. Since that time, a number of changes have occurred in the consumer tech sector and the overall economy, including: increased prominence of computer manufacturing, software and internet publishing, and related industries; integration of consumer technology across the economy, e.g., in auto manufacturing; and the advent of the “sharing economy” which is facilitated by consumer technology. Accordingly, this report uses an updated methodology, with newly revised government industry definitions and an updated definition of the consumer tech sector. As such, the results of the two reports are not strictly comparable.

With that caveat in mind, comparison of the two reports indicates that the consumer tech sector’s direct, indirect, and induced impacts on output, contribution to GDP, and labor income have all grown, but grown more or less in line with the overall economy, so consumer tech's share of the economy has been roughly constant. In terms of nominal dollars, the consumer tech sector’s direct, indirect, and induced contributions to GDP have increased from \$1.3 trillion in 2008 to \$1.8 trillion in 2015, while its total labor income has increased from \$836 billion to \$1.0 trillion. In terms of jobs, the consumer tech sector’s direct employment has increased by over 300,000 jobs, from 4.4 million in 2008 to 4.7 million in 2015. The sector’s total impact (including direct, indirect, and induced impacts) on employment has remained roughly constant. In both 2008 and 2015, the consumer tech sector’s largest impacts are in California, Texas, and New York.

**Appendix A: Detailed National Impacts****Table A-1. Output Attributable to the U.S. Consumer Technology Sector, 2015**

	<b>Direct Impact</b>	<b>Indirect Impact</b>	<b>Induced Impact</b>	<b>Total Impact</b>
<b>Total Output (Millions of Dollars)</b>				
I. Manufacture of Consumer Technology Products				
A. Sales to Final Domestic Consumption	52,420	19,544	25,199	97,163
B. Sales to Domestic Business	336,332	188,077	174,618	699,027
C. Exports to Foreign Countries	139,689	87,036	77,358	304,083
II. Distribution of Consumer Technology Products				
A. Domestically Produced Goods	52,862	24,122	49,861	126,844
B. Imported Goods	59,453	28,169	57,023	144,645
III. Production of Content and Services for Consumer Technology Products				
A. Sales to Final Domestic Consumption	425,296	109,707	171,072	706,075
B. Sales to Domestic Business	750,328	233,680	382,547	1,366,555
C. Exports to Foreign Countries	43,106	11,881	19,801	74,788
<b>Total Output</b>	<b><u>\$1,859,486</u></b>	<b><u>\$702,216</u></b>	<b><u>\$957,479</u></b>	<b><u>\$3,519,181</u></b>
Consumer Market (includes Distribution)	590,031	181,542	303,155	1,074,728
Enterprise Market	1,086,660	421,757	557,165	2,065,582
Exports	182,795	98,917	97,159	378,871

Source: PwC calculations and the IMPLAN model.

Note: Details may not add to totals due to rounding.

**Table A-2. Value Added Attributable to the U.S. Consumer Technology Sector, 2015**

	<b>Direct Impact</b>	<b>Indirect Impact</b>	<b>Induced Impact</b>	<b>Total Impact</b>
<b>Value Added (Millions of Dollars)</b>				
I. Manufacture of Consumer Technology Products				
A. Sales to Final Domestic Consumption	16,800	9,795	13,524	40,119
B. Sales to Domestic Business	122,559	95,150	98,914	316,623
C. Exports to Foreign Countries	51,606	43,806	44,141	139,554
II. Distribution of Consumer Technology Products				
A. Domestically Produced Goods	33,551	14,429	28,417	76,398
B. Imported Goods	36,950	16,828	32,356	86,133
III. Production of Content and Services for Consumer Technology Products				
A. Sales to Final Domestic Consumption	232,884	59,534	94,952	387,370
B. Sales to Domestic Business	409,396	132,359	212,636	754,391
C. Exports to Foreign Countries	27,206	7,166	11,394	45,766
<b>Total Value Added</b>	<b><u>\$930,952</u></b>	<b><u>\$379,068</u></b>	<b><u>\$536,334</u></b>	<b><u>\$1,846,354</u></b>
Consumer Market (includes Distribution)	320,186	100,586	169,249	590,020
Enterprise Market	531,954	227,509	311,550	1,071,014
Exports	78,812	50,973	55,535	185,320

Source: PwC calculations and the IMPLAN model.

Note: Details may not add to totals due to rounding.

**Table A-3. Labor Income Attributable to the U.S. Consumer Technology Sector, 2015**

	Direct Impact	Indirect Impact	Induced Impact	Total Impact
<b>Labor Income (Millions of Dollars)</b>				
I. Manufacture of Consumer Technology Products				
A. Sales to Final Domestic Consumption	9,747	8,059	9,464	27,270
B. Sales to Domestic Business	55,388	62,152	60,528	178,068
C. Exports to Foreign Countries	24,399	27,724	26,767	78,889
II. Distribution of Consumer Technology Products				
A. Domestically Produced Goods	31,895	8,599	17,611	58,105
B. Imported Goods	36,163	10,000	20,132	66,294
III. Production of Content and Services for Consumer Technology Products				
A. Sales to Final Domestic Consumption	77,057	38,804	54,604	170,465
B. Sales to Domestic Business	190,194	94,411	134,020	418,626
C. Exports to Foreign Countries	9,702	4,761	6,768	21,232
<b>Total Labor Income</b>	<b>\$434,544</b>	<b>\$254,510</b>	<b>\$329,895</b>	<b>\$1,018,949</b>
Consumer Market (includes Distribution)	154,861	65,461	101,811	322,134
Enterprise Market	245,582	156,564	194,548	596,694
Exports	34,101	32,485	33,535	100,121

Source: PwC calculations and the IMPLAN model.

Note: Details may not add to totals due to rounding.

**Table A-4. Tax Payments Attributable to the U.S. Consumer Technology Sector, 2015**

	Direct Impact	Indirect Impact	Induced Impact	Total Impact
<b>Total Tax Payments (Millions of Dollars)</b>				
I. Manufacture of Consumer Technology Products				
A. Sales to Final Domestic Consumption	3,105	2,099	2,762	7,967
B. Sales to Domestic Business	21,503	23,292	23,646	68,440
C. Exports to Foreign Countries	9,194	10,586	10,559	30,340
II. Distribution of Consumer Technology Products				
A. Domestically Produced Goods	13,339	3,432	7,113	23,884
B. Imported Goods	14,657	3,984	8,064	26,705
III. Production of Content and Services for Consumer Technology Products				
A. Sales to Final Domestic Consumption	47,712	13,776	23,041	84,529
B. Sales to Domestic Business	77,711	32,016	52,621	162,349
C. Exports to Foreign Countries	4,602	1,615	2,688	8,904
<b>Total Tax Payments</b>	<b>\$191,823</b>	<b>\$90,800</b>	<b>\$130,495</b>	<b>\$413,118</b>
Consumer Market (includes Distribution)	78,813	23,292	40,980	143,085
Enterprise Market	99,214	55,308	76,267	230,789
Exports	13,796	12,201	13,247	39,244

Source: PwC calculations and the IMPLAN model.

Note: Details may not add to totals due to rounding.

**Table A-5. Employment Attributable to the U.S. Consumer Technology Sector, 2015**

	<b>Direct Impact</b>	<b>Indirect Impact</b>	<b>Induced Impact</b>	<b>Total Impact</b>
<b>Total Employment (Thousands of Jobs)</b>				
<b>I. Manufacture of Consumer Technology Products</b>				
<i>A. Sales to Final Domestic Consumption</i>	85	111	175	371
<i>B. Sales to Domestic Business</i>	535	913	1,165	2,613
<i>C. Exports to Foreign Countries</i>	239	406	516	1,161
<b>II. Distribution of Consumer Technology Products</b>				
<i>A. Domestically Produced Goods</i>	609	147	352	1,107
<i>B. Imported Goods</i>	742	171	404	1,318
<b>III. Production of Content and Services for Consumer Technology Products</b>				
<i>A. Sales to Final Domestic Consumption</i>	811	722	1,115	2,647
<i>B. Sales to Domestic Business</i>	1,585	1,648	2,554	5,787
<i>C. Exports to Foreign Countries</i>	108	87	135	330
<b>Total Employment</b>	<b><u>4,714</u></b>	<b><u>4,205</u></b>	<b><u>6,416</u></b>	<b><u>15,334</u></b>
Consumer Market (includes Distribution)	2,246	1,150	2,046	5,443
Enterprise Market	2,120	2,561	3,719	8,400
Exports	347	494	650	1,491

Source: PwC calculations and the IMPLAN model.

Note: Details may not add to totals due to rounding.

**Appendix B: Detailed Tables by State****Table B-1. Gross Output in the Consumer Tech Sector by State, 2015**  
(Dollars in millions)

	Total Output		Consumer Market		Enterprise Market		Exports	
	Direct	Total	Direct	Total	Direct	Total	Direct	Total
U.S. Total	1,859,486	3,519,181	590,031	1,074,728	1,086,660	2,065,582	182,795	378,871
Alabama	13,702	31,745	6,077	11,854	6,466	16,926	1,159	2,965
Alaska	2,067	5,656	958	2,007	1,049	3,280	60	369
Arizona	37,975	71,365	9,632	19,211	22,273	40,309	6,070	11,845
Arkansas	9,217	19,230	4,376	7,386	4,325	10,362	516	1,483
California	438,016	712,754	108,106	175,599	282,040	447,691	47,870	89,465
Colorado	37,921	70,548	11,500	20,900	23,425	43,042	2,996	6,605
Connecticut	21,383	41,202	6,937	12,858	12,909	24,785	1,538	3,558
Delaware	2,439	6,913	912	2,292	1,389	4,106	138	514
D.C.	4,142	9,408	1,238	2,641	2,653	6,031	250	736
Florida	95,015	179,918	35,888	63,604	52,880	101,621	6,247	14,693
Georgia	54,293	101,359	20,105	34,929	31,168	59,148	3,020	7,281
Hawaii	4,102	9,499	1,803	3,446	2,142	5,441	157	612
Idaho	9,993	17,364	1,601	3,477	6,243	10,313	2,149	3,573
Illinois	60,566	130,240	23,144	44,978	32,776	73,758	4,647	11,504
Indiana	24,026	54,407	9,135	18,401	11,487	28,853	3,404	7,153
Iowa	10,221	25,234	3,808	8,307	5,299	14,207	1,114	2,720
Kansas	12,205	26,524	4,546	8,916	6,258	14,581	1,401	3,026
Kentucky	15,202	32,544	6,255	11,550	7,433	17,599	1,514	3,395
Louisiana	12,570	33,474	5,043	11,305	6,956	19,796	571	2,374
Maine	3,185	8,034	1,317	2,867	1,507	4,283	362	884
Maryland	27,996	55,347	11,036	19,796	14,915	30,849	2,045	4,702
Massachusetts	56,948	103,487	15,179	28,023	35,094	62,429	6,675	13,035
Michigan	44,176	89,905	16,225	30,378	23,496	49,655	4,454	9,871
Minnesota	34,918	69,573	11,322	21,312	18,962	38,429	4,634	9,831
Mississippi	6,863	16,191	3,409	6,413	3,088	8,589	366	1,190
Missouri	26,769	54,578	10,009	18,739	15,252	31,865	1,507	3,974
Montana	2,786	6,725	1,259	2,531	1,408	3,750	119	444
Nebraska	5,915	15,055	1,734	4,294	3,636	9,280	545	1,481
Nevada	7,408	17,656	3,271	6,675	3,743	9,743	394	1,238
New Hampshire	6,830	13,757	2,343	4,477	3,501	7,339	987	1,941
New Jersey	40,496	85,004	15,505	29,491	22,089	48,148	2,903	7,365
New Mexico	8,108	15,930	2,328	4,740	4,243	8,575	1,537	2,614
New York	140,167	248,553	43,822	74,054	83,615	149,505	12,730	24,993
North Carolina	47,416	94,417	17,273	32,042	25,385	51,957	4,759	10,418
North Dakota	2,618	6,571	970	2,103	1,411	3,825	237	643
Ohio	45,449	102,943	16,940	34,847	24,553	57,934	3,956	10,161
Oklahoma	12,032	27,118	5,554	10,381	5,958	14,936	521	1,802
Oregon	46,181	69,675	5,498	11,257	25,624	37,910	15,058	20,508
Pennsylvania	60,293	122,584	24,247	43,444	31,998	68,988	4,048	10,152
Rhode Island	4,479	9,075	1,943	3,449	2,272	4,943	263	683
South Carolina	15,863	33,733	7,373	13,382	7,226	17,360	1,264	2,992
South Dakota	2,710	6,368	1,082	2,131	1,392	3,622	237	615
Tennessee	25,398	53,239	10,027	18,854	12,834	28,852	2,536	5,533
Texas	195,459	355,986	55,623	101,100	123,877	220,416	15,959	34,470
Utah	15,617	31,398	3,840	7,952	9,960	19,628	1,816	3,818
Vermont	4,376	7,788	837	1,709	2,534	4,395	1,005	1,684
Virginia	34,094	71,478	13,141	25,132	18,742	40,661	2,210	5,684
Washington	43,595	85,618	14,405	26,654	25,878	51,441	3,312	7,524
West Virginia	3,257	8,791	1,670	3,407	1,468	4,796	120	588
Wisconsin	21,926	49,367	9,292	18,170	11,263	27,322	1,371	3,875
Wyoming	1,102	3,855	492	1,264	569	2,305	41	286

Source: PwC calculations and the IMPLAN model.

Note: Details may not add to totals due to rounding.

**Table B-2. Value Added in the Consumer Tech Sector by State, 2015**  
(Dollars in millions)

	Total Value Added		Consumer Market		Enterprise Market		Exports	
	Direct	Total	Direct	Total	Direct	Total	Direct	Total
U.S. Total	930,952	1,846,354	320,186	590,020	531,954	1,071,014	78,812	185,320
Alabama	5,644	14,229	2,928	5,793	2,428	7,331	289	1,105
Alaska	923	3,156	440	1,090	456	1,858	27	209
Arizona	14,040	32,802	4,409	9,810	7,918	18,017	1,713	4,974
Arkansas	6,582	11,375	3,518	4,992	2,861	5,739	203	644
California	229,700	390,541	62,094	101,252	144,388	241,595	23,217	47,694
Colorado	20,245	38,586	6,732	12,032	12,310	23,368	1,204	3,186
Connecticut	13,182	24,792	4,558	8,067	7,924	14,864	699	1,861
Delaware	1,068	3,709	295	1,107	710	2,330	64	272
D.C.	3,064	6,772	992	1,968	1,902	4,310	170	494
Florida	43,997	91,756	18,009	33,774	23,736	51,126	2,252	6,855
Georgia	27,404	53,184	10,664	18,943	15,357	30,629	1,384	3,612
Hawaii	1,796	4,928	805	1,761	922	2,849	70	319
Idaho	3,326	6,869	619	1,527	2,036	3,968	670	1,374
Illinois	29,231	67,900	12,269	24,678	14,956	37,569	2,006	5,653
Indiana	9,637	24,060	4,214	8,767	4,375	12,469	1,048	2,823
Iowa	4,433	11,443	1,842	4,008	2,254	6,363	337	1,073
Kansas	5,495	12,317	2,246	4,391	2,748	6,653	500	1,273
Kentucky	6,390	14,566	3,097	5,680	2,927	7,657	366	1,229
Louisiana	5,843	15,414	2,383	5,347	3,137	8,977	323	1,090
Maine	1,259	3,748	587	1,403	564	1,977	108	368
Maryland	16,923	33,369	6,763	12,057	9,172	18,777	989	2,535
Massachusetts	25,485	53,786	7,513	15,323	15,356	31,998	2,617	6,465
Michigan	18,230	41,148	8,138	15,472	8,814	21,748	1,278	3,928
Minnesota	14,992	33,535	5,570	10,971	7,798	18,130	1,624	4,434
Mississippi	2,733	7,015	1,472	2,913	1,162	3,653	99	449
Missouri	13,638	28,150	5,242	9,892	7,852	16,510	543	1,748
Montana	1,065	2,903	517	1,128	513	1,600	35	175
Nebraska	2,414	6,834	829	2,081	1,442	4,177	143	576
Nevada	3,442	9,380	1,630	3,622	1,662	5,147	150	611
New Hampshire	3,189	7,093	1,189	2,410	1,632	3,776	368	907
New Jersey	24,597	51,169	10,262	18,730	13,128	28,650	1,207	3,789
New Mexico	3,398	7,544	937	2,230	1,795	4,090	666	1,225
New York	85,242	152,149	28,430	47,117	50,288	91,027	6,524	14,006
North Carolina	20,606	46,521	8,104	16,380	10,873	25,453	1,629	4,688
North Dakota	1,174	3,172	496	1,074	616	1,838	62	260
Ohio	18,045	47,804	8,058	17,609	8,998	26,124	989	4,071
Oklahoma	6,200	13,831	3,073	5,574	2,933	7,460	194	797
Oregon	29,498	42,411	2,713	5,891	16,544	23,273	10,240	13,247
Pennsylvania	37,672	71,113	15,887	26,369	20,188	40,009	1,597	4,734
Rhode Island	2,748	5,423	1,257	2,150	1,397	2,945	93	328
South Carolina	6,307	15,257	3,162	6,293	2,751	7,753	393	1,211
South Dakota	1,304	3,053	569	1,079	677	1,740	58	234
Tennessee	11,223	25,399	4,840	9,468	5,411	13,479	971	2,452
Texas	89,361	174,160	28,348	52,651	54,750	105,731	6,263	15,778
Utah	6,371	14,686	1,916	4,093	3,919	9,029	536	1,564
Vermont	1,284	3,024	394	840	680	1,612	210	572
Virginia	16,555	38,636	6,934	14,123	8,807	21,745	813	2,768
Washington	21,568	45,474	7,467	14,486	12,786	27,379	1,316	3,609
West Virginia	1,559	4,249	854	1,727	662	2,270	43	252
Wisconsin	10,394	24,026	4,693	9,258	5,207	13,103	494	1,665
Wyoming	477	1,893	227	625	233	1,133	17	135

Source: PwC calculations and the IMPLAN model.

Note: Details may not add to totals due to rounding.

**Table B-3. Labor Income in the Consumer Tech Sector by State, 2015**  
(Dollars in millions)

	Total Labor Income		Consumer Market		Enterprise Market		Exports	
	Direct	Total	Direct	Total	Direct	Total	Direct	Total
U.S. Total	434,544	1,018,949	154,861	322,134	245,582	596,694	34,101	100,121
Alabama	2,555	7,904	1,284	3,019	1,115	4,238	156	647
Alaska	458	1,677	215	570	228	999	15	109
Arizona	7,195	18,959	2,163	5,460	4,046	10,492	985	3,007
Arkansas	1,076	3,914	486	1,336	521	2,257	69	320
California	115,570	218,832	34,492	58,980	70,135	133,711	10,942	26,142
Colorado	9,921	21,805	3,144	6,444	6,169	13,489	609	1,872
Connecticut	4,879	12,545	1,707	3,942	2,844	7,545	328	1,057
Delaware	970	2,434	305	750	622	1,529	43	155
D.C.	866	3,636	247	955	560	2,388	59	293
Florida	20,520	50,851	8,271	17,978	11,059	28,851	1,189	4,023
Georgia	12,817	29,440	5,096	10,270	7,077	17,153	644	2,016
Hawaii	834	2,858	377	977	431	1,699	26	182
Idaho	1,502	3,786	370	937	869	2,139	263	710
Illinois	14,350	39,414	6,052	13,861	7,407	22,387	892	3,166
Indiana	4,975	13,683	2,187	4,886	2,203	7,174	584	1,623
Iowa	2,228	6,639	903	2,222	1,104	3,749	221	669
Kansas	2,731	7,191	1,139	2,504	1,316	3,924	277	763
Kentucky	2,892	8,076	1,345	2,945	1,333	4,391	215	740
Louisiana	2,320	7,861	1,037	2,735	1,189	4,615	94	511
Maine	671	2,316	311	833	306	1,263	53	220
Maryland	7,323	17,846	2,450	5,661	4,345	10,689	529	1,496
Massachusetts	14,139	33,209	4,945	10,079	7,819	19,210	1,375	3,919
Michigan	9,637	24,286	4,230	8,798	4,674	13,120	734	2,368
Minnesota	8,486	20,520	3,123	6,543	4,326	11,169	1,036	2,808
Mississippi	1,209	3,948	653	1,539	510	2,145	46	264
Missouri	6,403	15,699	2,208	5,070	3,960	9,635	235	994
Montana	542	1,709	270	646	257	961	15	102
Nebraska	1,285	4,099	429	1,204	765	2,537	91	358
Nevada	1,658	5,271	784	1,961	820	2,983	54	327
New Hampshire	1,899	4,491	776	1,567	906	2,360	217	563
New Jersey	11,087	28,396	4,289	9,632	6,093	16,427	706	2,337
New Mexico	1,220	3,623	456	1,177	581	1,942	183	503
New York	34,282	78,241	11,109	22,907	20,475	47,927	2,699	7,408
North Carolina	10,722	26,465	4,480	9,404	5,390	14,391	853	2,670
North Dakota	577	1,876	236	602	295	1,106	45	168
Ohio	9,610	28,288	4,205	10,043	4,777	15,745	627	2,499
Oklahoma	2,180	7,109	1,004	2,560	1,100	4,095	76	455
Oregon	5,925	13,827	1,600	3,471	3,205	7,318	1,119	3,038
Pennsylvania	17,246	39,368	5,883	12,595	10,549	23,947	813	2,825
Rhode Island	1,066	2,761	405	950	611	1,616	50	195
South Carolina	3,243	8,891	1,630	3,547	1,402	4,634	211	710
South Dakota	538	1,628	198	507	305	982	34	139
Tennessee	5,130	14,577	2,294	5,286	2,462	7,969	374	1,322
Texas	39,543	92,194	14,161	28,934	22,867	55,010	2,515	8,250
Utah	3,149	8,250	987	2,286	1,911	5,097	251	867
Vermont	771	1,907	223	507	405	1,028	142	372
Virginia	9,067	23,566	3,805	8,384	4,768	13,439	495	1,743
Washington	11,145	25,716	4,003	8,178	6,505	15,540	637	1,997
West Virginia	756	2,430	389	918	346	1,365	21	147
Wisconsin	5,156	13,990	2,404	5,270	2,507	7,735	244	985
Wyoming	221	948	102	304	111	578	8	66

Source: PwC calculations and the IMPLAN model.

Note: Details may not add to totals due to rounding.

**Table B-4. Employment in the Consumer Tech Sector by State, 2015**  
(Thousands of Jobs)

	Total Employment		Consumer Market		Enterprise Market		Exports	
	Direct	Total	Direct	Total	Direct	Total	Direct	Total
U.S. Total	4,714	15,334	2,246	5,443	2,120	8,400	347	1,491
Alabama	45	162	24	64	18	85	3	13
Alaska	6	25	3	9	3	15	*	2
Arizona	91	325	37	104	45	172	10	49
Arkansas	19	84	10	30	8	47	1	7
California	927	2,646	397	827	446	1,489	84	331
Colorado	92	318	41	108	44	182	6	29
Connecticut	49	167	23	59	22	94	4	14
Delaware	8	34	5	13	3	19	*	2
D.C.	7	35	3	10	4	22	*	3
Florida	270	921	136	352	119	497	14	72
Georgia	149	485	73	182	69	270	7	33
Hawaii	12	50	6	17	6	29	1	3
Idaho	21	75	8	22	11	40	3	13
Illinois	165	592	81	219	74	325	11	48
Indiana	82	263	42	101	31	133	8	29
Iowa	37	128	18	47	16	69	3	12
Kansas	36	128	17	46	16	69	4	13
Kentucky	48	161	26	62	19	85	4	14
Louisiana	40	150	20	55	19	86	2	10
Maine	11	48	6	18	4	26	1	4
Maryland	66	246	35	94	27	132	5	20
Massachusetts	149	429	72	151	65	231	11	48
Michigan	143	433	71	165	62	227	10	41
Minnesota	108	331	53	119	45	171	10	41
Mississippi	22	86	13	34	8	46	1	6
Missouri	70	263	35	97	31	147	4	18
Montana	11	39	6	15	5	22	*	2
Nebraska	19	75	8	24	10	44	2	7
Nevada	27	99	15	39	11	53	1	6
New Hampshire	21	70	10	26	9	36	2	9
New Jersey	98	368	47	135	43	202	7	31
New Mexico	19	71	9	25	8	36	2	9
New York	308	952	146	327	136	532	26	92
North Carolina	140	462	73	178	58	239	10	45
North Dakota	9	33	4	11	4	19	1	3
Ohio	146	510	73	192	63	274	10	44
Oklahoma	33	133	18	51	14	73	1	9
Oregon	71	229	28	68	33	115	9	46
Pennsylvania	156	555	89	215	57	296	9	43
Rhode Island	11	43	6	16	5	23	1	3
South Carolina	53	177	30	74	19	90	3	14
South Dakota	8	32	3	10	4	18	1	3
Tennessee	78	265	39	100	34	141	6	24
Texas	473	1,412	215	489	232	797	26	126
Utah	46	156	17	46	25	94	4	17
Vermont	11	36	4	10	5	19	2	7
Virginia	95	345	48	130	42	189	5	26
Washington	112	362	54	128	51	205	7	29
West Virginia	12	48	7	19	4	26	*	3
Wisconsin	79	259	44	104	31	136	4	18
Wyoming	4	18	2	6	2	11	*	1

Source: PwC calculations and the IMPLAN model.

Note: Details may not add to totals due to rounding. (\*) indicates fewer than 500 jobs.



**Table B-5. Consumer Tech Sector Total Economic Contribution as a Share of State Total, 2015**  
(Percentage of State Total)

	Consumer Tech Generated Value Added / State GDP	Consumer Tech Generated Labor Income / State Labor Income	Consumer Tech Generated Employment / State Employment
Alabama	6.9%	6.4%	6.4%
Alaska	4.7%	5.0%	5.1%
Arizona	11.1%	10.7%	9.5%
Arkansas	8.8%	5.4%	5.4%
California	17.2%	15.8%	12.4%
Colorado	12.7%	11.4%	9.5%
Connecticut	9.8%	7.9%	7.4%
Delaware	5.8%	7.3%	6.2%
D.C.	5.8%	4.4%	4.4%
Florida	11.1%	10.0%	8.7%
Georgia	11.1%	10.1%	8.8%
Hawaii	5.7%	5.4%	5.3%
Idaho	10.7%	9.3%	8.2%
Illinois	9.1%	8.5%	7.8%
Indiana	7.3%	7.3%	7.1%
Iowa	6.7%	6.3%	6.3%
Kansas	8.1%	7.5%	6.9%
Kentucky	7.5%	6.9%	6.6%
Louisiana	5.8%	5.6%	5.7%
Maine	6.5%	6.2%	5.9%
Maryland	9.5%	8.1%	7.1%
Massachusetts	11.6%	10.9%	9.9%
Michigan	9.0%	8.6%	8.1%
Minnesota	10.5%	10.0%	9.2%
Mississippi	6.4%	5.7%	5.6%
Missouri	9.7%	8.6%	7.3%
Montana	6.5%	6.2%	6.1%
Nebraska	6.2%	6.1%	6.0%
Nevada	6.8%	6.5%	6.3%
New Hampshire	9.9%	9.6%	8.3%
New Jersey	9.2%	8.2%	7.2%
New Mexico	7.9%	6.8%	6.5%
New York	11.2%	9.2%	8.2%
North Carolina	9.6%	9.4%	8.5%
North Dakota	5.8%	5.5%	5.7%
Ohio	8.0%	7.8%	7.6%
Oklahoma	7.2%	5.9%	5.9%
Oregon	19.9%	11.7%	10.0%
Pennsylvania	10.6%	9.1%	7.5%
Rhode Island	9.7%	7.9%	7.1%
South Carolina	7.8%	7.4%	7.1%
South Dakota	6.6%	5.8%	5.5%
Tennessee	8.4%	7.4%	7.1%
Texas	10.8%	9.9%	9.2%
Utah	10.2%	9.8%	9.0%
Vermont	9.8%	9.5%	8.4%
Virginia	8.2%	7.9%	7.1%
Washington	10.8%	10.4%	9.0%
West Virginia	5.7%	5.5%	5.3%
Wisconsin	8.2%	7.5%	7.3%
Wyoming	4.2%	4.4%	4.6%

Source: PwC calculation and the IMPLAN model.

Note: Details may not add to totals due to rounding.

### ***Appendix C: Description of the IMPLAN Model***

IMPLAN is a well-known modeling system developed by the IMPLAN Group LLC for estimating economic impacts and is similar to the Regional Input-Output Modeling System developed by the U.S. Department of Commerce. The model is primarily based on government data sources. It can address a wide range of impact topics in a given region (county, State, or the country as a whole).

IMPLAN is built around an “input-output” table that relates the purchases that each industry has made from other industries to the value of the output of each industry. To meet the demand for goods and services from an industry, purchases are made in other industries according to the patterns recorded in the input-output table. These purchases in turn spark still more purchases by the industry’s suppliers, and so on. Meanwhile, employees and business owners make personal purchases out of the additional income that is generated by this process, sending more new demands rippling through the economy. Multipliers describe these iterations. The Type I multiplier measures the direct and indirect effects of a change in economic activity. It captures the inter-industry effects only, i.e. industries buying from local industries. The Type SAM (Social Accounting Matrix) multiplier captures the direct and indirect effects. In addition, it also reflects induced effects (*i.e.*, changes in spending from households as income increases or decreases due to the changes in production).