Federal Spending on Information Products and Services from FY 1979 through FY 2015 Q2

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PREFACE

This report examines the federal government's procurement of books, electronic databases, and other information products and services, and analyzes potential savings the government could realize if federal agencies collectively procured these commodities. This report contains comprehensive data on federal spending on these products and services, as well as the major contract vendors who provide these commodities. These data encompass annual and quarterly spending figures from fiscal year (FY) 1979 through the second quarter of FY 2015, and is disaggregated by agency, commodity, and contractor. In addition, the report forecasts such spending through FY 2017, and details the potential savings to the federal government if agencies purchased these products and services through an existing strategic sourcing initiative.

The data analyzed herein are drawn from a publicly available federal database called the Federal Procurement Data System–Next Generation. In addition, all dollar figures in this report have been adjusted for inflation with inflation deflators published by the U.S. Office of Management and Budget; FY 2009 is the base year for inflation adjustment. An appendix contains all data used in the statistical forecasts of future federal spending on information products and services.

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- Federal spending on the 23 commodities that can be reasonably considered to constitute the federal information market based on their product service codes totaled $12.5 billion from fiscal year (FY) 1979 through the second quarter (Q2) of FY 2015, for an average of $337.1 million annually. These figures have been adjusted for inflation, with all amounts expressed in FY 2009 dollars.

- In the most recent complete fiscal year—FY 2014—federal spending on information commodities was $622.9 million, the third highest annual total in the 36-year period from FY 1979 through FY 2014.

- From FY 2010 through FY 2015 Q2, total federal spending on information products and services was $3.1 billion, constituting 25 percent of all spending on these commodities from FY 1979 through FY 2015 Q2.

- Average annual spending in the last five complete fiscal years, FY 2010 through FY 2014, was $581.9 million, which far exceeded the average annual spending of $342.2 million for all complete fiscal years in the longer period from FY 1979 through FY 2014.

- In addition to spending, another measure of the federal government's demand for information products and services—the number of transactions for those commodities—has increased over time. From FY 1979 through FY 2015 Q2, federal agencies processed nearly 210,000 transactions for information products and services. The annual average number of transactions in the last five complete fiscal years was more than 14,000, far higher than the annual average of 5,600 transactions in the longer period from FY 1979 through FY 2014.

- While annual spending and transactions for information products and services have increased, the average dollar amount per transaction has declined. From FY 1979 through FY 2014, the average amount per transaction was $114,700, but from FY 2010 through FY 2014, the average transaction amount was $41,600.

- From FY 1979 through FY 2015 Q2, six of the 23 information products and services accounted for 92.3 percent of federal spending on information commodities: books and pamphlets (22.0 percent); Web-based subscriptions (20.5 percent); administrative support for federal libraries (15.4 percent) and information retrieval (11.5 percent); newspapers and periodicals (11.9 percent); and maps, atlases, charts, and globes (11.0 percent).

    - In the recent period from FY 2010 to FY 2015 Q2, federal agencies have sharply reduced spending on maps, atlases, charts, and globes. Consequently, the five remaining products and services listed above composed 93.3 percent of the federal information market.

- In the time span from FY 1979 through FY 2015 Q2, five agencies accounted for 68.8 percent of total federal spending on information commodities: U.S. Department of Defense (42.9 percent), U.S. Department of Health and Human Services (9.9 percent), U.S. Department of the Treasury (5.6 percent), U.S. Department of Commerce (5.4 percent), and U.S. Department of Justice (5.0 percent).

  - In the more recent period from FY 2010 through FY 2015 Q2, seven federal agencies accounted for the majority of federal spending on information products and services: U.S. Department of Defense (24.6 percent), U.S. Department of Health and Human Services (12.7 percent), U.S. Department of Commerce (9.4 percent), U.S. Department of Justice (7.0 percent), U.S. Department of the Treasury (6.9 percent), U.S. Department of Veterans Affairs (6.6 percent), and U.S. Department of Homeland Security (5.8 percent). Collectively, these agencies' expenditures for information commodities constituted 73.1 percent of the total federal market for those products and services.

- From FY 2010 through FY 2015 Q2, 17 contract vendors received 50 percent of all federal spending on information products and services, four of which accounted for more than 25 percent of all such spending: Reed Elsevier ($293.5 million; 9.5 percent); West Publishing Corporation ($268.5 million; 8.7 percent); Primus Solutions ($173.8 million; 5.6 percent); and EBSCO ($102.0 million; 3.3 percent).

- Federal spending on information commodities is forecast to be $637.5 million in FY 2015 and $659.1million by FY 2017. Moreover, there is a 95 percent probability that spending for FY 2015 will be between $265.6 million and $1.0 billion, and the same probability that FY 2017 spending will be between $267.3 million and $1.1 billion.

- The federal government could have saved between $625 million and $3.1 billion—5 percent and 20 percent savings, respectively—if it had used an existing strategic sourcing initiative for information commodities during the period from FY 1979 through FY 2015 Q2. At the 20 percent discount, the federal government's savings of $3.0 billion would have almost exceeded the $3.1 billion it actually spent on information products and services from FY 2010 through FY 2015 Q2.

- If federal agencies purchased information products and services through a strategic sourcing process—such as the Federal Strategic Sourcing Initiative—the government could save between approximately $25 million and $400 million on those commodities from FY 2015 through FY 2017, depending on the amount of federal spending channeled through strategic sourcing procurement and the discount rates applied to that spending.

INTRODUCTION

The U.S. federal government annually procures billions of dollars in goods and services, and much press and popular attention has focused on how it can save money on these expenditures. This report's purpose is to analyze the government's spending on one category of commodities, referred to herein as "information products and services," and to estimate cost savings the government could realize if it were to procure these goods and services through a particular procurement process called strategic sourcing. Information products and services refers to information resources (e.g., books, electronic databases, and research services), and strategic sourcing includes several procurement practices, such as organizations using collective purchase agreements to obtain discounts. More formal definitions of these terms are provided later in this paper, along with details of the research methodology used to analyze them.

U.S. federal government procurement data, which is available from fiscal year (FY) 1979 onwards, indicates that federal agencies collectively spent $12.3 billion—for an average of $342.2 million annually—on information products and services (these and all other figures in this report have been adjusted for inflation using FY 2009 as the base year) from FY 1979 through FY 2014. In the first half of FY 2015, federal agencies expended an additional $184.2 million on these products and services, bringing the final total to $12.5 billion. The annual amounts that federal agencies have spent on these commodities have fluctuated over time, but have clearly trended upward, increasing from $231.4 million in FY 1979 to $622.9 million in FY 2014. Furthermore, statistical analysis indicates that such spending is estimated to grow to between $267.3 million and $1.1 billion by FY 2017.

Evidence indicates that if federal agencies procured information products and services through the government's existing strategic sourcing program, the Federal Strategic Sourcing Initiative, the government could realize savings between $25 million and $400 million for the three years from FY 2015 through FY 2017. Such savings vary, depending on the proportion of forecasted spending that these agencies channel through strategic sourcing methods.

These and other findings are detailed below, and among the topics analyzed are the products and services that compose the information market, the federal agencies that have been major purchasers of those products and services, and the contractors that have provided them.

Throughout this report, data tables and graphs detail and illustrate the findings. Among the data and graphs contained in this paper are the dataset, diagnostic graphs, and various statistics used to create and assess forecasts of federal spending on information commodities, all of which are in appendix 4.

METHODOLOGY

To reliably analyze federal spending on information products and services, the term itself has to be operationally defined so that data can be obtained and evaluated. However, no widely cited or agreed upon definition appears in academic, government, or industry publications. For the purposes of this analysis, information *products* include books, journals, maps, and newspapers in both electronic and print form, as well as electronic databases that contain such publications and electronic book readers. By contrast, information products do not include computers, monitors, or software containing productivity applications, such as spreadsheets or word processing. Information *services* include personnel who facilitate access to the aforementioned products or who use such products to obtain information for others, such as librarians. Information services do not include researchers (e.g., auditors, scientists, and statisticians), IT staff, or their products (e.g., medicines, reports, and Web sites).

To determine the products and services that constitute information commodities, the researcher studied the product service codes (PSCs) that the federal government uses to identify products, services, and research and development in federal procurement contracts.[1] The researcher identified 23 PSCs (see Table 1) that reliably designate information commodities, such as books, electronic databases, and library services (for formal definitions of these 23 PSCs, see Table 13).[2]

[1] U.S. General Services Administration (GSA), Office of Governmentwide Policy, *Federal Procurement Data System, Product and Service Codes Manual* (Washington, D.C.: n.p., August 2011), 5, https://www.acquisition.gov/sites/default/files/page_file_uploads/PSC%20Manual%20-%20Final%20-%2011%20August%202011.pdf (accessed August 3, 2015).

[2] It should be noted these 23 products and services represent a greater number of commodities than were examined in previous iterations of this analysis, most of which considered data on 15 commodities (the first report analyzed data 16 commodities). Additional analysis showed that there were eight other product service codes (PSCs) that described information commodities, and their inclusion provides a more reliable measure of federal spending on these commodities and does not overstate it. Indeed, the additional PSCs considered in this analysis collectively represent a small portion of total federal spending on information commodities ($118.7 million over the period from FY 1979 Q1 through FY 2015 Q2, less than 1 percent of total spending on information products and services).

PSCs are not the only classification system for products and services in federal procurement contracts, but they have several advantages over other classification methods for reliable analysis of federal spending. Federal procurement contracts also include North American Industry Classification System (NAICS) codes, which outline categories of industries and commercial activities that provide products and services. However, NAICS classifications specify the industries that produce and distribute goods and services, not the procured products and services.[3] The U.S. Department of Defense, for example, uses the Program, System, or Equipment Code (PSE) classification for procurement, but civilian agencies do not.[4] Moreover, federal contract data on PSC classifications are more readily available than are contract data organized by NAICS and PSE categories. Data records for procurement contracts, available through the Federal Procurement Data System–Next Generation (FPDS–NG) and USAspending.gov, almost invariably list PSC classes, but often do not include NAICS or PSE categories.

After determining the PSCs that operationally define information products and services, the researcher used the FPDS–NG to acquire data on those PSCs for the period from FY 1979 (October 1, 1978) through FY 2015 Q2 (March 31, 2015). The FPDS–NG is an online database that the U.S. General Services Administration (GSA) Federal Procurement Data Center operates to publicly disclose information on federal procurement contracts. [5] The researcher downloaded nearly 200,000 procurement records in a comma-separated-value (CSV) format for the 23 PSCs and then used Microsoft Excel, the statistical program R, and the R program packages *car*, *gvlma*, and *MASS* to analyze the data and create the graphs in this report.[6] The data are accurate as of the date of download, June 1, 2015. Future iterations of this report will incorporate spending data after FY 2015 Q2.

[3] U.S. Department of Commerce, U.S. Census Bureau, *2007 NAICS Definitions* (Washington, D.C.: n.p., 2007), 376, http://www.census.gov/cgi-bin/sssd/naics/naicsrch?chart=2007 (accessed July 19, 2011).
[4] IBM, *GSA Federal Procurement Data System-Next Generation (FPDS–NG) Data Element Dictionary* Version 1.4 (n.p., July 15, 2015), 85–86, https://www.fpds.gov/downloads/Version_1.4_specs/FPDSNG_DataDictionary_V1.4.pdf (accessed July 30, 2015).
[5] GSA, Integrated Award Environment Office, "Frequently Asked Questions About FPDS–NG," http://159.142.160.6/faqs_whataboutfpds.asp (accessed August 3, 2015).
[6] R Core Team, "R: A Language and Environment for Statistical Computing" Version 3.1.1 (Vienna, Austria: R Foundation for Statistical Computing, 2014), http://www.R-project.org/; John Fox and Sanford Weisberg, *An R Companion to Applied Regression*, Second Edition (Thousand Oaks, CA: Sage, 2011), http://socserv.socsci.mcmaster.ca/jfox/Books/Companion (accessed August 7, 2015); Edsel A. Pena and Elizabeth H. Slate, *gvlma: Global Validation of Linear Models Assumptions* (R Package Version 1.0.0.2., 2014), http://CRAN.R-project.org/package=gvlma (accessed August 7, 2015); William N. Venables and Brian D. Ripley, *Modern Applied Statistics with S* (New York: Springer, 2002).

While dollar figures in procurement records from the FPDS–NG are not adjusted for inflation, all of the figures in this report have been. The researcher used the U.S. Office of Management and Budget's (OMB's) inflation deflators for defense and non-defense outlays to adjust all dollar figures in this report to FY 2009 dollars.[7]

It should be emphasized that the data used in this analysis have some limitations. Various observers, including federal agencies, have raised concerns about the accuracy and completeness of the data in federal procurement databases such as the FPDS–NG and USAspending.gov. While the GSA, the OMB, and other federal agencies have made efforts to address these concerns, evidence suggests that the FPDS–NG does contain some erroneous data.[8]

Spending figures, PSCs, and other procurement data in the FPDS–NG, for example, reflect the information that government personnel have entered into the system, and the nearly 200,000 transaction records upon which this analysis is based included spending on commodities that were not information products or services, but which were designated by one of the 23 PSCs the researcher reviewed. For example, the approximately 4,300 transactions for PSC 7610 ("Books and pamphlets") in FY 2014 included transactions for commodities described as "Advertisement on recruiting web site" ($3,302.07), "Baggage tags" ($5,510.73), and "Color printers" ($12,066.32).

Conversely, the FPDS–NG also contains transaction records for spending on information commodities that were designated with a PSC outside of the 23 used to define information products and services. For example, the FPDS–NG lists several contracts for the LexisNexis and Westlaw electronic databases with PSCs such as 7030 ("ADP [automatic data processing] software"), R499 ("Other professional services"), and T003 ("Cataloging services"). Those spending figures are not reflected in this report, nor are spending figures for "eBooks" with vendors such as the Mackin Book Company and Rittenhouse Book Distributors because the transaction records classified—or, arguably, misclassified—them with PSCs unrelated to

[7] U.S. Office of Management and Budget (OMB), "Table 10.1—Gross Domestic Product and Deflators Used in the Historical Tables: 1940–2019," *Fiscal Year 2015 Historical Tables, Budget of the U.S. Government* (Washington, D.C.: Government Printing Office, 2014), 217–18, http://www.whitehouse.gov/sites/default/files/omb/budget/fy2015/assets/hist.pdf (accessed October 6, 2014).

[8] Michael Hardy, "Fixing the Next Generation Procurement Data System," *Federal Computer Week* 19, no. 40 (2005): 65–66, accessed April 15, 2012, doi 218835006; Katherine V. Schinasi, " GAO-05-960R: Improvements Needed to the Federal Procurement Data System–Next Generation," U.S. Government Accountability Office (GAO), September 27, 2005, http://www.gao.gov/new.items/d05960r.pdf (accessed August 3, 2015).

information commodities, such as 6730 ("Photographic projection equipment"), R419 ("Educational services"), and U009 ("Education services").

Another limitation on the data for this report is that the FPDS–NG does not include data for many types of procurement actions or federal agencies. The federal agencies that post procurement transaction information in the FPDS–NG include Executive Branch agencies and many Legislative Branch offices, such as the U.S. Government Accountability Office and the Library of Congress. The FPDS–NG, however, does not contain data for the U.S. Congress itself, covert agencies, or Judicial Branch offices. In addition, federal agencies are not required to disclose in the FPDS–NG contracts that are valued at less than $3,000 (although many such contracts are listed), and the FPDS–NG does not include information on grants, subcontracting data, inter-agency agreements, and several other types of expenditures.[9] Consequently, the spending figures in this report are an estimation of actual federal spending on information commodities, and the extent to which the data in this report reliably correlate with actual procured products and services is likely impossible to determine.

OVERVIEW OF THE FEDERAL STRATEGIC SOURCING INITIATIVE

In May 2005, the OMB and the Office of Federal Procurement Policy issued a memorandum requiring federal agencies to identify commodities that the government could efficiently purchase through strategic sourcing. The document defined strategic sourcing as "the collaborative and structured process of critically analyzing an organization's spending and using this information to make business decisions about acquiring commodities and services more effectively and efficiently."[10] Soon after, in November 2005, the GSA and the U.S. Department of the Treasury launched the Federal Strategic Sourcing Initiative (FSSI).[11] As of July 2015, the GSA had eight individual FSSIs covering commodities ranging from computer software and services ("SmartBUY") to janitorial and sanitation supplies ("JanSan"), and the agency had plans for additional FSSIs for furniture and human resources services. In addition, the Library of

[9] GSA, Integrated Award Environment Office, "Frequently Asked Questions About FPDS–NG."
[10] Clay Johnson III, "Implementing Strategic Sourcing," OMB, May 20, 2005, http://www.uspto.gov/web/offices/ac/comp/proc/OMBmemo.pdf (accessed July 15, 2011).
[11] GSA, "FSSI History," https://strategicsourcing.gov/fssi-history (accessed July 31, 2015).

Congress administers an FSSI for information products and services, the commodity group that is the subject of this analysis.[12]

According to the GSA, federal agencies using the existing FSSIs spent $171.3 million through these initiatives and collectively saved $54.8 million in FY 2014 Q2 (January 1, 2014 through March 31, 2014). The joint savings that these participating agencies realized ranged from 20 percent to 47.3 percent (on telecommunications expense-management and wireless services, respectively).[13] However, studies of strategic sourcing by private-sector entities and public-sector agencies outside of the United States have found slightly lower rates of savings, ranging from 8 percent to 20 percent of procurement costs.[14]

FEDERAL MARKET FOR INFORMATION COMMODITIES

Spending data from the FPDS–NG indicates that federal agencies spent around $12.5 billion on information products and services in the 36-and-a-half years from FY 1979 through FY 2015 Q2 (as noted above, these and all other spending figures—classified as "action obligations" in the FPDS–NG—in this report are in constant FY 2009 dollars). Among the complete fiscal years in this study (the years from FY 1979 through FY 2014), annual spending on information commodities ranged from a low of $97.6 million (in FY 1987) to a high of $715.7 million (in FY 2003) and averaged $342.2 million for the period. The range in annual spending on information products and services suggests substantial variation in spending, with a standard deviation of $203.0 million, and a coefficient of variation that was 59.3 percent.[15]

In addition, federal government spending on information commodities has exhibited an upward trend. Nearly one-fourth of total federal spending ($3.1 billion) on these products and services occurred from FY 2010 through FY 2015 Q2 (see Table 1). Average annual spending

[12] GSA, "Current Solutions," https://strategicsourcing.gov/stategic-sourcing-solutions (accessed July 31, 2015); GSA, "Future Solutions," https://strategicsourcing.gov/future-solutions (accessed July 31, 2015).
[13] GSA, "StrategicSourcing.Gov," https://strategicsourcing.gov/ (accessed August 1, 2015).
[14] Cathy Hayward, "Reforming the Old Bill," *Supply Management* (2011), 21–23, accessed April 15, 2012 via ProQuest, doi: 222195677; Carlos Niezen, Wulf Weller, and Heidi Deringer, "Strategic Supply Management," *MIT Sloan Management Review* 48, no. 2 (2007): 7, accessed April 15, 2012 via ProQuest, doi 2224964805.
[15] In statistics, the standard deviation is a measure of variability within a set of data. A small standard deviation indicates little variation and more consistency in the data, while large standard deviations indicate high variability. One method of interpreting standard deviation is to express it in a ratio to the mean—a measure called the coefficient of variation—and as the coefficient of variation increases so does variability in data. Different fields of study have different interpretations about the extent to which coefficients of variation are low, medium, or high, but a 1992 GAO paper suggests that a 59.3 percent coefficient of variation can be interpreted as "medium" on a five-category scale ranging from small to extreme. See GAO, *Using Statistical Sampling* (Washington, D.C.: n.p., 1992), 28–29, http://www.gao.gov/assets/80/76112.pdf (accessed July 22, 2015).

for all complete fiscal years in that period (FY 2010 through FY 2014) was nearly $581.9 million, higher than the $342.2 million annual average in the longer time span from FY 1979 through FY 2014 (see Figure 1). This graph also shows that spending on information commodities increased over the longer 36-and-a-half year period: from $231.4 million in FY 1979 to $362.4 million in FY 2000, to $528.1 million in FY 2010, and to $622.9 million by FY 2014. It should be noted that the spending figures for FY 2014 and other recent fiscal years may change if federal agencies continue to input and update spending data for those years in the FPDS–NG.

Table 1. Federal Spending on Information Commodities, FY 1979–FY 2015 Q2

Products and Services (Product Service Code)	FY 1979–FY 2015 Q2		FY 2010–FY 2015 Q2	
	Spending (US$ millions)	Pct. of Total	Spending (US$ millions)	Pct. of Total
Books and pamphlets (7610)	$2,748.9	22.0%	$649.3	21.0%
Web-based subscriptions (D317)	$2,567.7	20.5%	$748.7	24.2%
Administrative support, library (R605)	$1,927.7	15.4%	$471.8	15.2%
Newspapers and periodicals (7630)	$1,482.7	11.9%	$443.2	14.3%
Administrative support, information retrieval (R612)	$1,441.5	11.5%	$574.7	18.6%
Maps, atlases, charts, and globes (7640)	$1,371.9	11.0%	$9.7	0.3%
Drawings and specifications (7650)	$303.0	2.4%	$54.3	1.8%
Microfilm, processed (7670)	$290.4	2.3%	$1.1	0.0%
Digital maps, charts, and geodetic products (7644)	$115.0	0.9%	$34.3	1.1%
Technical representative–books, maps, and other publications (L076)	$107.0	0.9%	$70.3	2.3%
Maintenance, repair, and rebuilding of equipment–books, maps, and other publications (J076)	$52.2	0.4%	$10.9	0.4%
Quality control–books, maps, and other publications (H176)	$36.4	0.3%	$7.3	0.2%

Table 1. Federal Spending on Information Commodities, FY 1979–FY 2015 Q2

Products and Services (Product Service Code)	FY 1979–FY 2015 Q2		FY 2010–FY 2015 Q2	
	Spending (US$ millions)	Pct. of Total	Spending (US$ millions)	Pct. of Total
Lease or rental of equipment–books, maps, and other publications (W076)	$21.7	0.2%	$1.7	0.1%
Aeronautic maps, charts, and geodetic products (7641)	$12.6	0.1%	$8.7	0.3%
Sheet and book music (7660)	$8.4	0.1%	$0.7	0.0%
Topographic maps, charts, and geodetic products (7643)	$4.7	0.0%	$2.7	0.1%
Modification of equipment–books, maps, and other publications (K076)	$4.0	0.0%	$1.7	0.1%
Hydrographic maps, charts, and geodetic products (7642)	$2.3	0.0%	$0.8	0.0%
Other quality control, testing, and inspection–books, maps, and other publications (H976)	$1.9	0.0%	$0.8	0.0%
Equipment and materials testing–books, maps, and other publications (H276)	$1.4	0.0%	$1.2	0.0%
Installation of equipment–books, maps, and other publications (N076)	$0.5	0.0%	$0.2	0.0%
Inspection–books, maps, and other publications (H376)	$0.4	0.0%	$0.1	0.0%
Books, maps, and other publications (76)	$0.0	0.0%	$0.0	0.0%
Total	$12,502.2		$3,093.9	

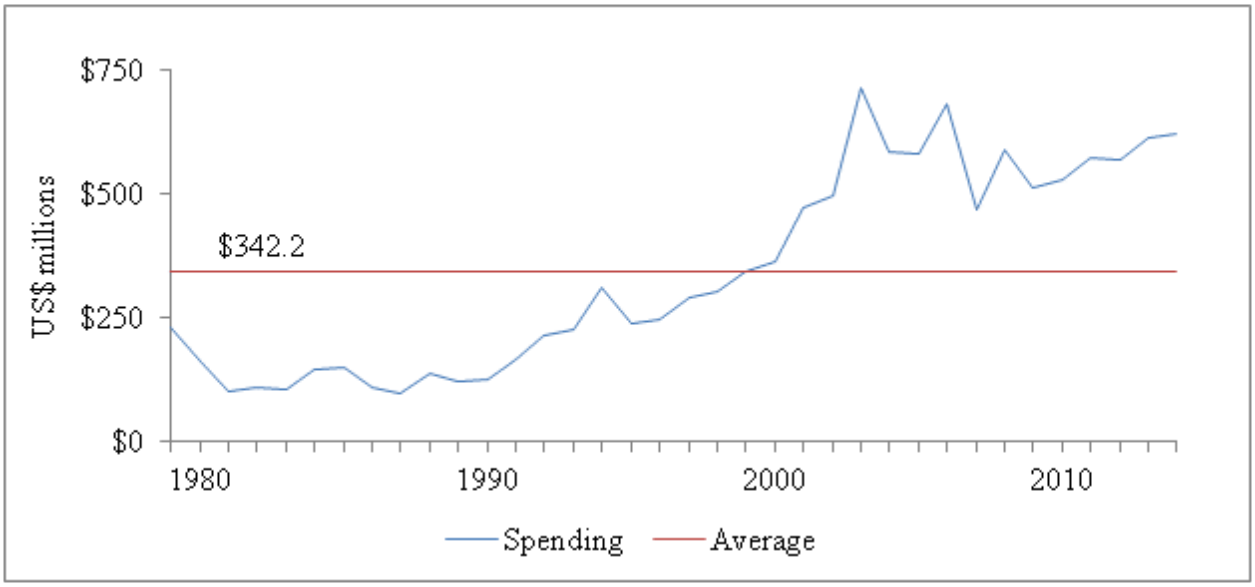


Figure 1. Federal Spending on Information Commodities, FY 1979–FY 2014

According to data from the FPDS–NG, federal spending on *all* products and services from FY 1979 through FY 2015 Q2 was $12.2 trillion. Thus, the $12.5 billion in federal spending on information products and services was a small portion—0.10 percent, i.e. one-tenth of one percent—of that total. Furthermore, annual federal spending on information products consistently has been below 0.25 percent of total annual federal spending for each year from FY 1979 through FY 2014 (see Figure 2).

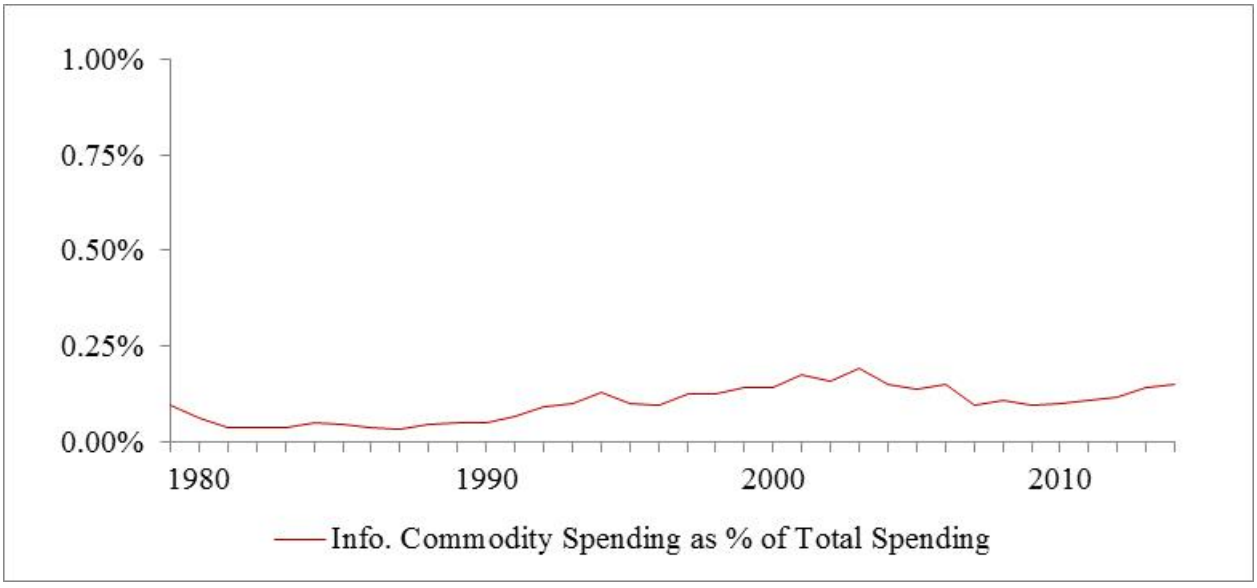


Figure 2. Federal Spending on Information Commodities as a Percent of Total Federal Spending, FY 1979–FY 2014

Though spending on information commodities has constituted a small percentage of total federal spending, data suggest that spending on information products and services has increased in recent years, while overall federal spending has steadily declined. Data from the FPDS–NG show that total federal spending increased from $257.9 billion in FY 2000 to $542.2 billion in FY 2008, but has since declined to $411.4 billion in FY 2014.The contrasting trends in total federal spending and specific expenditures on information products and services are illustrated in Figure 3 (please note the different dollar scales for total federal spending and spending specifically on information commodities).

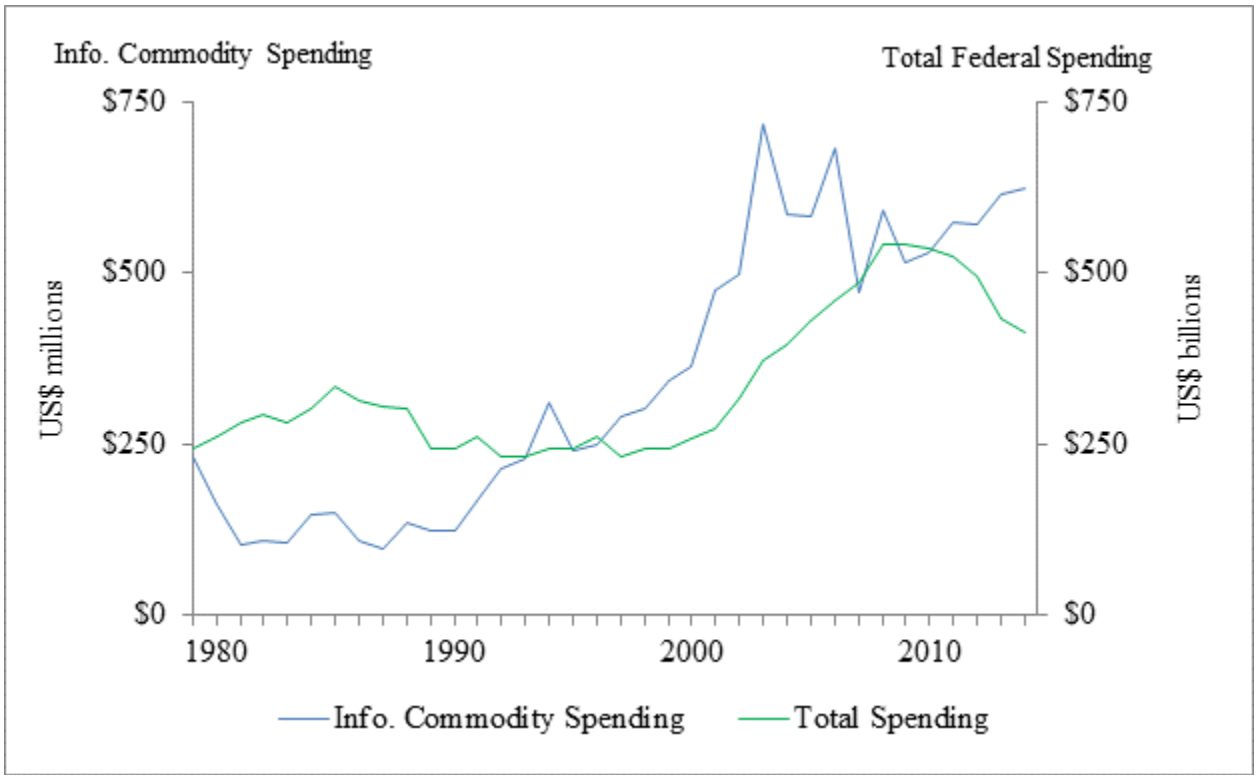


Figure 3. Federal Spending on Information Commodities and Total Federal Spending, FY 1979–FY 2014

These divergent trends in federal spending on all products and services and spending specifically on information commodities raise the question of why they have occurred. A reliable explanation entails, among other things, an examination of possible reasons for the decline in total federal spending, which is a topic of many academic and journalistic analyses, though it is beyond the scope of this report. However, an examination of the growth in annual spending on information commodities can be attempted with available data.

Among the possible explanations for the increase in annual federal spending on information products are that federal agencies are buying more information commodities and that those agencies are paying more for these products and services. With regard to the former hypothesis, federal procurement data indicate that the annual number of procurement transactions (e.g., contracts and contract modifications) for information products and services has fluctuated, but has grown overall. From FY 1979 through FY 2001, the annual number of these transactions fluctuated from nearly 750 to 2,500, and then sharply increased for several years—peaking at nearly 24,000 transactions in FY 2008—before finally declining to around 13,000 transactions in FY 2014.

While the number of transactions in the most recent five-year period from FY 2010 through FY 2014 was high in comparison with the overall time period, the steady decline in annual transactions diverges from the increase in annual spending (see Figure 4). In the period from FY 1979 through FY 2014, annual spending and transactions had a strong positive correlation (r^2=0.768, p<.01), meaning that as transactions increased or decreased, spending tended to move in the same direction. The same relationship is evident in the period from FY 1979 through FY 2009 (r^2=0.699, p<.01), but the correlation was negative from FY 2010 through FY 2014 (r^2= -0.985, p<.01), meaning that as transactions decreased, spending tended to increase.

In sum, an increase in transactions for information products and services contributed to the growth in spending on those commodities until FY 2009, but transaction numbers have had little influence to the more recent growth in spending from FY 2010 through FY 2014.

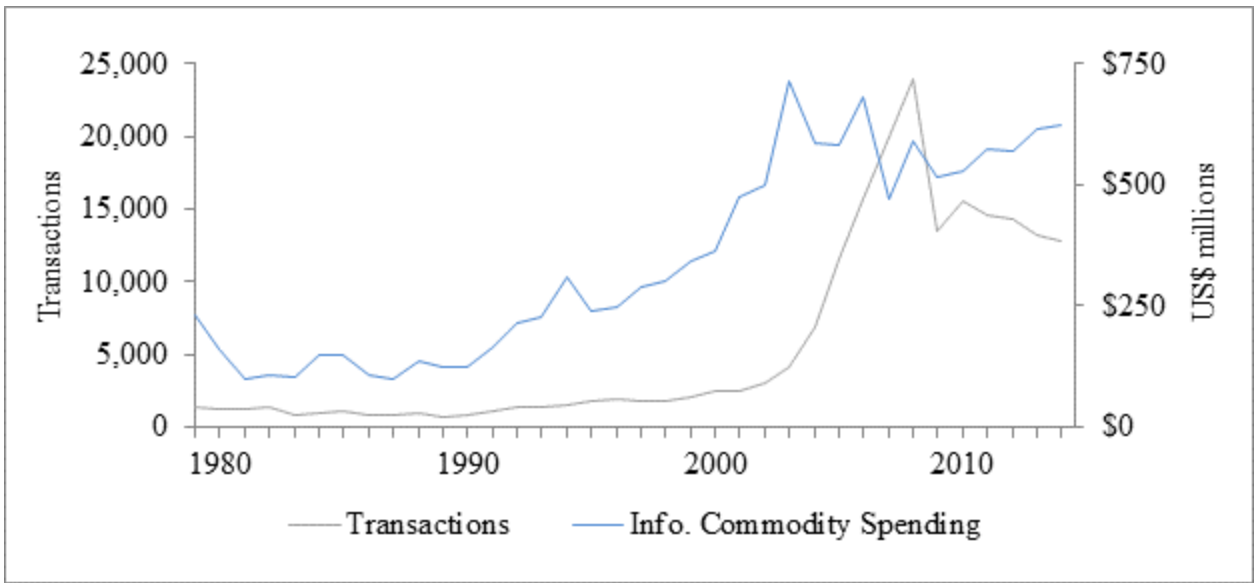


Figure 4. Federal Government Transactions and Spending for Information Commodities, FY 1979–FY 2014

Another possible explanation for the growth in federal spending on information products and services is that those commodities have increased in cost and, therefore, federal agencies are spending more to procure them. Available data indicate that alongside the overall increase in annual spending on and transactions for information products and services has been a decrease in the average amount per transaction that federal agencies have been paying for these commodities.

From FY 1979 through FY 2003, for instance, the average dollar amount per transaction was, on average, $146,329, and rarely went below $100,000 during any year in that time period (see Figure 5, please note the different dollar scales for information commodity spending and the average amount per transaction). In FY 2004, the average transaction amount began a period of sharp decline, and from FY 2004 through FY 2014, the annual average was $42,956, and rarely was above $50,000 in any particular year during that period. The average amount per transaction did increase from $33,901 in FY 2010 to $48,647 by FY 2014, but these figures are low in comparison with the years from FY 1979 through FY 2003. Furthermore, the correlation between spending and the amount per transaction was moderate and negative from FY 1979 through FY 2014 (r^2=0.511, p<.05), but was high and positive from FY 2010 through FY 2014 (r^2=0.992, p<.01), and was statistically insignificant from FY 1979 through FY 2009. Thus, increasing costs of information products and services on the whole accounted for a portion of the growth in federal spending on those commodities from FY 2010 through FY 2014, but over the

longer term, from FY 1979 through FY 2014, the aggregate cost of information products and services has declined.

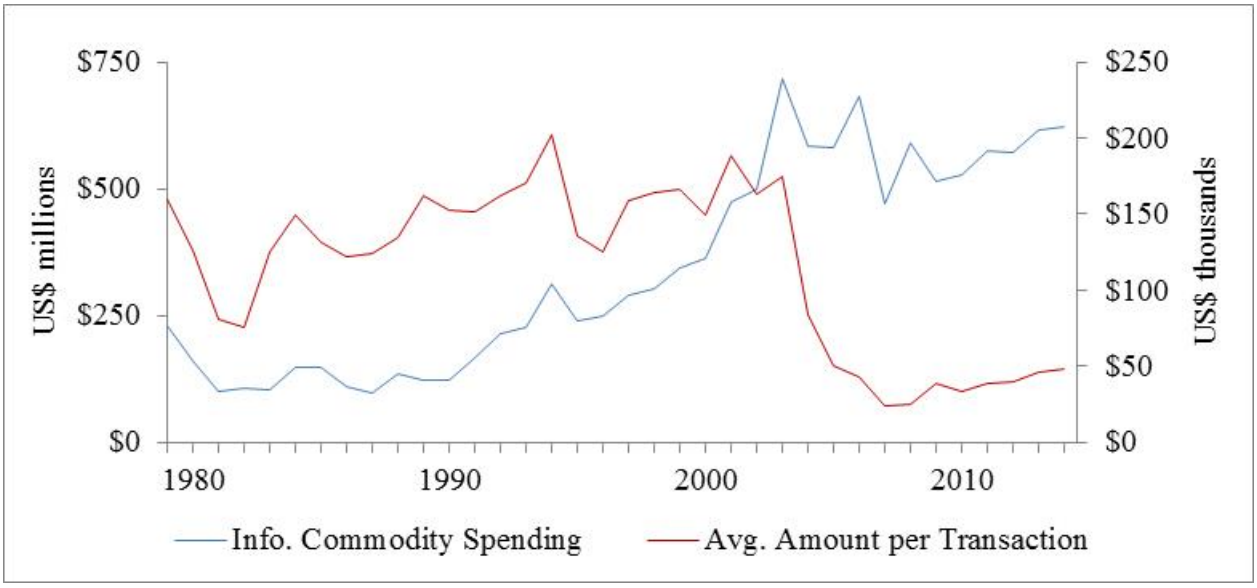


Figure 5. Federal Spending and Average Transaction Amounts for Information Commodities, FY 1979–FY 2014

The relationship between total federal spending and the amount per transaction is somewhat clearer with an examination of the number of transactions for varying spending levels. The 201,550 transactions for information products and services between FY 1979 and FY 2014, for example, can be disaggregated in numerous ways. A disaggregation of these transaction spending amounts into $25,000 intervals reveals substantial growth in transactions in lower ranges of spending during the latter portion of the years in this study. [16]

From FY 1979 through FY 2014, the number of transactions with spending amounts between $1 and $25,000 was higher than those for all other spending ranges, accounting for nearly 54 percent of the transactions in that time span (see Table 2). This appears to be largely due to a substantial increase in the number of transactions in this spending range between FY 2003 and FY 2014, during which these transactions accounted for approximately 64 percent of all transactions (see Figure 6a). Prior to FY 2003, transactions in this spending range accounted for only 10 percent of all transactions, whereas transactions for amounts over

[16] The spending amounts for all transactions from FY 1979–FY 2014 ranged from -$27.0 million to $87.1 million (negative transaction amounts are contract reductions, though most transactions [81.1%] were for amounts over $0). Mean spending for all transactions during this time period was $61,116.49, and the standard deviation was $468,793.95.

$100,000 comprised the highest portion of transactions (nearly 30 percent) for that period (see Figure 6b).

Table 2. Transactions for Information Commodities at Different Spending Ranges, FY 1979–FY 2014

Range	FY 1979–FY 2002		FY 2003–FY 2014		FY 1979–FY 2014	
	No. of Transactions	Pct. of Total	No. of Transactions	Pct. of Total	No. of Transactions	Pct. of Total
≤ $0	5,934	16.8%	31,346	18.9%	37,280	18.5%
$1 to $25,000	3,493	9.9%	106,241	63.9%	109,734	54.4%
$25,001 to $50,000	6,968	19.7%	10,750	6.5%	17,718	8.8%
$50,001 to $75,000	5,424	15.3%	4,630	2.8%	10,054	5.0%
$75,001 to $100,000	3,025	8.6%	2,816	1.7%	5,841	2.9%
> $100,000	10,520	29.7%	10,402	6.3%	20,922	10.4%
Total	35,364		166,185		201,549	

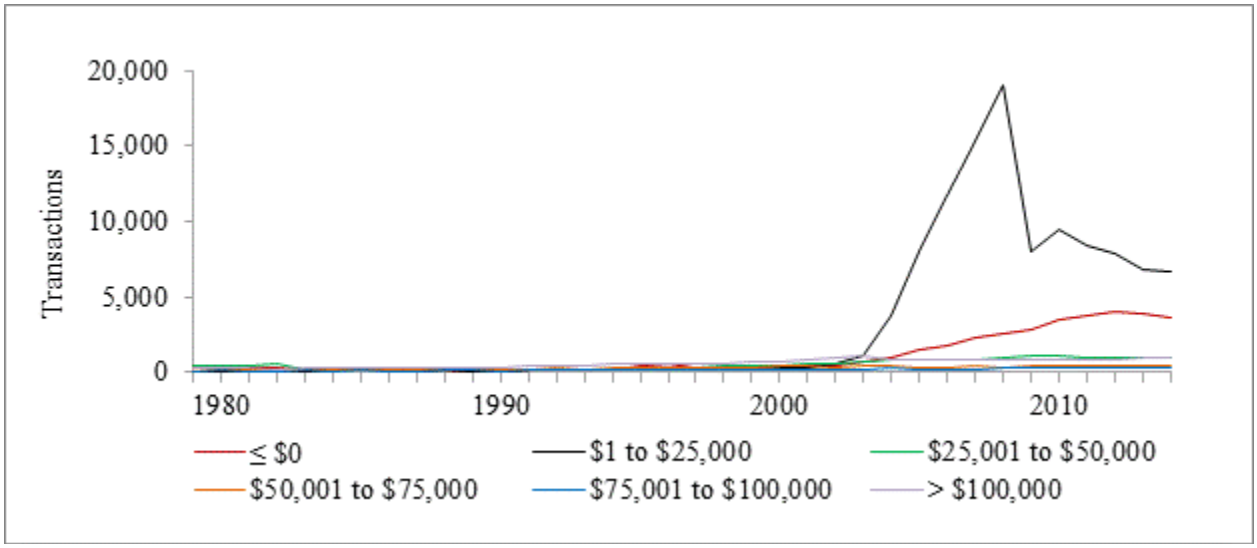


Figure 6a. Transactions for Information Commodities at Different Spending Ranges, FY 1979–FY 2014

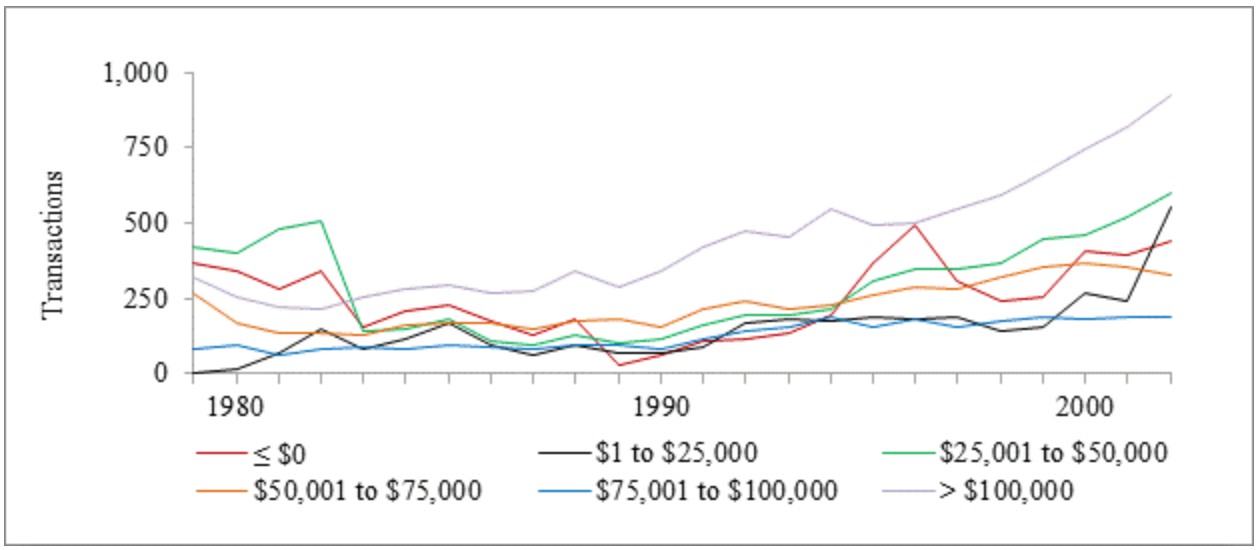


Figure 6b. Transactions for Information Commodities at Different Spending Ranges, FY 1979–FY 2002

Further examination reveals that transactions for amounts well below $25,000 accounted for much of the overall growth in procurement transactions for information products and services. Figures 7a and 7b depict annual transactions for the same spending ranges used in figures 6a and 6b, but transactions in the range of $1 to $25,000 are subdivided into three intervals: $1 to $3,000; $3,001 to $10,000; and $10,001 to $25,000. This additional disaggregation reveals that from FY 2003 through FY 2014, procurement transactions for amounts in the range of $1 to $3,000 and $3,001 to $10,000 accounted for more than 50 percent of all transactions in that time period (see Table 3). Moreover, from FY 2006 to FY 2008, the highest number of procurement transactions was in the range of $1 to $3,000, a transaction category the government's Federal Acquisition Regulations refer to as "micro-purchases."[17] From FY 2009 to FY 2014, the number of micro-purchases declined somewhat, and the quantity of transactions in the range of $3,001 to $10,000 was higher any those of any other spending range, with the exception of transactions equal to or less than $0.[18]

[17] In March 2005, the federal government defined "micro-purchases" as acquisitions not exceeding $3,000; prior to that time, the threshold for such purchases was $2,500. See GSA, Department of Defense (DoD), and National Aeronautics and Aerospace Administration (NASA), *Federal Acquisition Regulation* Volume I, Part 2.1–9 (Washington, D.C: n.p., September 2006), 53, https://www.acquisition.gov/sites/default/files/archives/far/pdf/FAC%202005-13%20FAR.book.pdf (accessed August 7, 2015); GSA, DoD, and NASA, *Federal Acquisition Regulation* Volume I, Part 2.1–9 (Washington, D.C.: n.p., March 2005), https://acquisition.gov/far/current/pdf/FAR.pdf (accessed October 30, 2014).

[18] Transactions for amounts equal to or less than $0 include reductions in contract funds, as well as non-monetary contract modifications, such as changes in the quantities of procured goods and services.

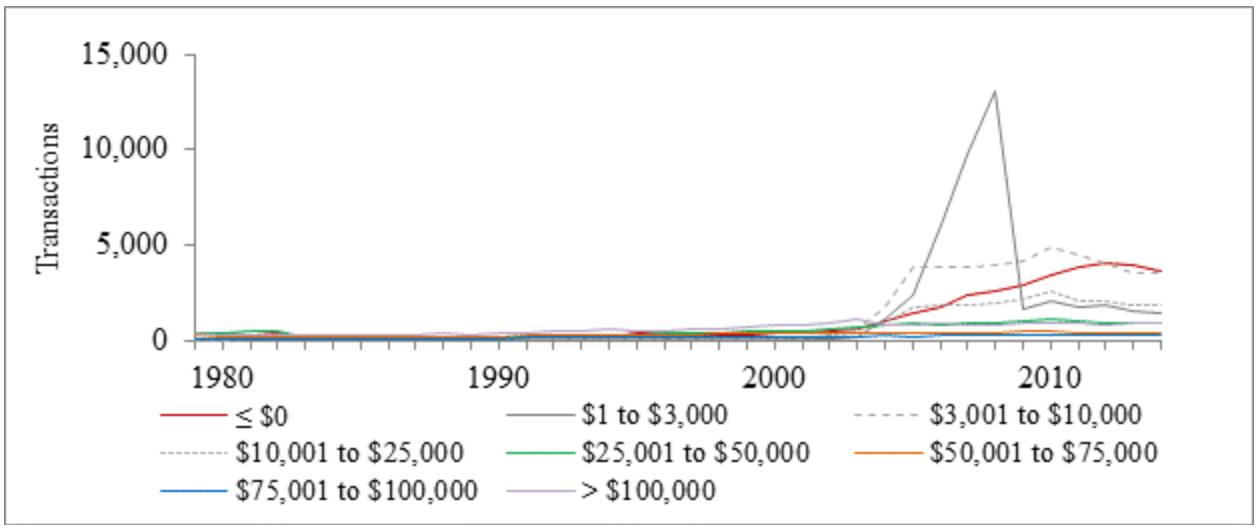


Figure 7a. Transactions for Information Commodities at Different Spending Ranges, FY 1979–FY 2014

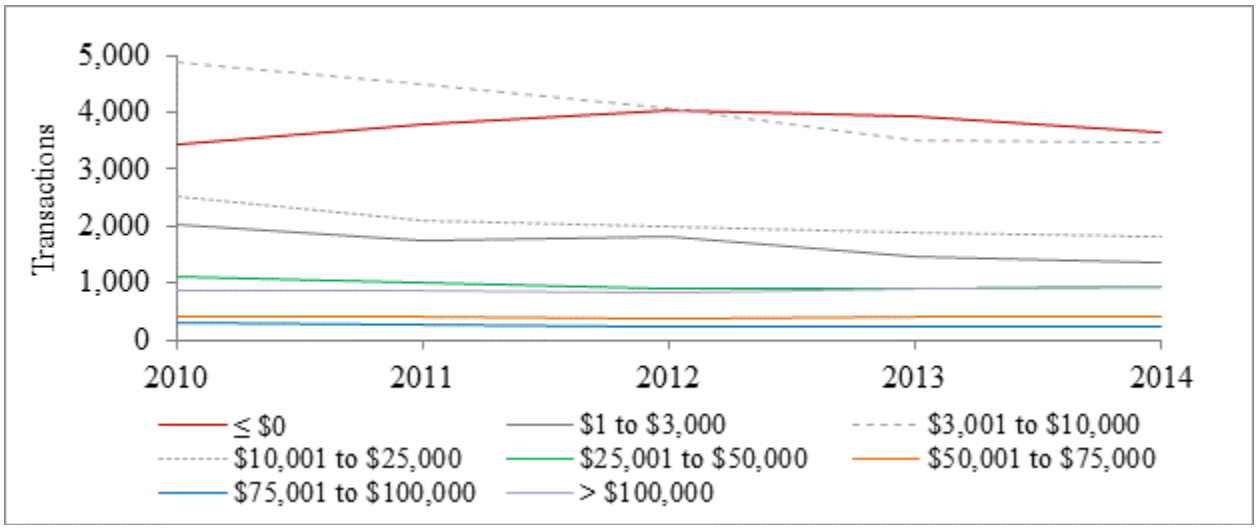


Figure 7b. Transactions for Information Commodities at Different Spending Ranges, FY 2010–FY 2014

Table 3. Transactions for Information Commodities at Different Spending Ranges, FY 1979–FY 2014

Range	FY 1979–FY 2002		FY 2003–FY 2014		FY 1979–FY 2014	
	No. of Transactions	Pct. of Total	No. of Transactions	Pct. of Total	No. of Transactions	Pct. of Total
≤ $0	5,934	16.8%	31,346	18.9%	37,280	18.5%
$1 to $3,000	593	1.7%	42,623	25.7%	43,216	21.4%
$3,001 to $10,000	1,048	3.0%	42,431	25.5%	43,479	21.6%
$10,001 to $25,000	1,852	5.2%	21,172	12.7%	23,024	11.4%
$25,001 to $50,000	6,968	19.7%	10,750	6.5%	17,718	8.8%

Table 3. Transactions for Information Commodities at Different Spending Ranges, FY 1979–FY 2014

Range	FY 1979–FY 2002		FY 2003–FY 2014		FY 1979–FY 2014	
$50,001 to $75,000	5,424	15.3%	4,630	2.8%	10,054	5.0%
$75,001 to $100,000	3,025	8.6%	2,816	1.7%	5,841	2.9%
> $100,000	10,520	29.7%	10,402	6.3%	20,922	10.4%
Total	35,364		166,170		201,534	

The high number of purchases in the range of $1 to $3,000, in turn, prompts another possible explanation for the increased spending on information commodities, which is that it is due to an increased use of government purchase cards by federal agencies to procure these products and services. Federal Acquisitions Regulations allow designated federal procurement officials to use purchases cards—which are essentially federal agency credit cards—for procurement transactions below the $3,000 micro-purchase threshold. These purchases can be completed without going through the normal procurement process, which necessitates the fulfillment of several requirements, such as the public solicitation of competing bids.[19]

However, data do not indicate a consistent or strong relationship between spending on information commodities and spending through purchase cards, as spending through purchase cards generally has been a small percentage of spending on information products and services. More specifically, the first purchase card transactions for information commodities appeared in FY 2003—several years after the federal government allowed agencies to use these cards. In all of the complete fiscal years in this time period (FY 2003 through FY 2014), spending through purchase cards has generally been less than 3.0 percent of the total spending on information products and services, with the highest being 7.8 percent in FY 2010. Furthermore, there is no statistically significant correlation between purchase card spending and total spending for the period from FY 2003 through FY 2014 (r^2= -0.509, $p \geq .05$).

By comparison, purchase card transactions comprised relatively higher proportions of all transactions in the years from FY 2003 through FY 2014, and had a statistically significant correlation with total transactions (r^2=0.871, $p<.01$). Nonetheless, transactions involving purchase cards generally were less than 15 percent of all transactions, and in the years during

[19] GSA, "Subpart 13.3-Simplified Acquisition Methods–13.301 Governmentwide commercial purchase card," https://www.acquisition.gov/sites/default/files/current/far/html/Subpart%2013_3.html (accessed August 2, 2015).

which purchase card transactions comprised high proportions of transactions for information commodities, the corresponding purchase card spending was a small percentage of the total. In the years from FY 2006 though FY 2008, for example, purchase card transactions comprised between 30 percent and 52 percent of all transactions, but accounted for just 2 percent to 3 percent of total spending (see Figures 8 and 9).

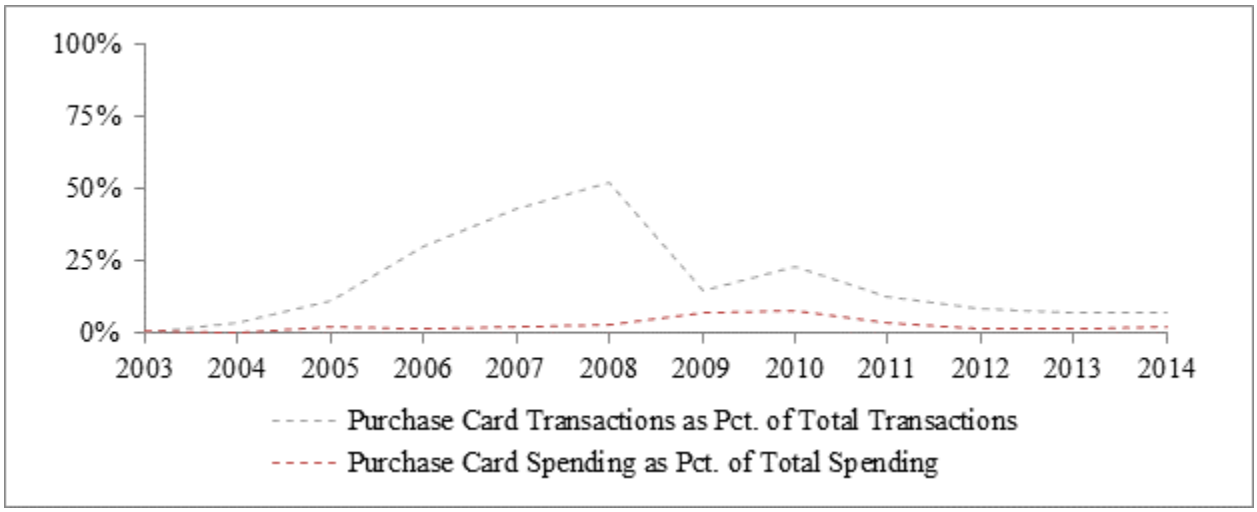


Figure 8. Proportion of Information Commodities Spending and Transactions Through Government Purchase Cards, FY 2003–FY 2014

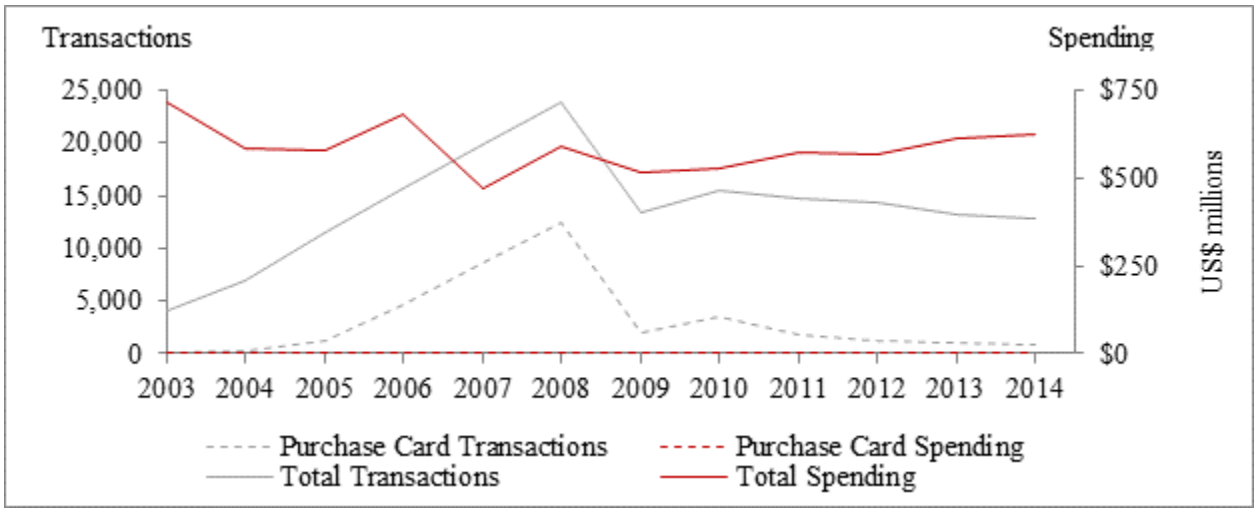


Figure 9. Purchase Card Spending and Transactions for Information Commodities, FY 2003–FY 2014

Yet another possible explanation of the growth in federal spending for information commodities is that it stems from the increasing costs of specific products and services. With

regard to the major products and services in the information market, six of the 23 types of information commodities accounted for 92.3 percent of federal government spending, as measured by contract value, from FY 1979 through FY 2015 Q2. These products and services included books and pamphlets (22.0 percent); Web-based subscriptions (20.5 percent); administrative support for federal libraries (15.4 percent) and for information retrieval (11.5 percent); newspapers and periodicals (11.9 percent); and maps, atlases, charts, and globes (11.0 percent) [See Table 1 and Figure 10].

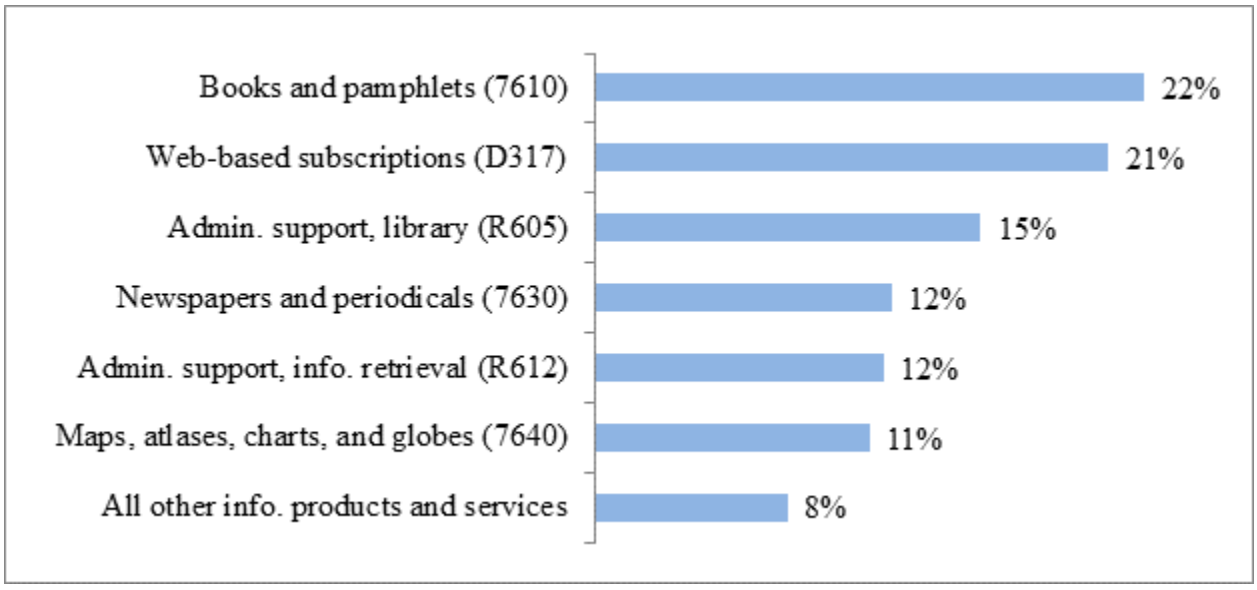


Figure 10. Percent of Federal Spending on Different Information Commodities, FY 1979–FY 2015 Q2

It should be noted that federal agencies have been procuring some of the products and services over a smaller span of time than the 36-and-half year period from FY 1979 through FY 2015 Q2, which limits inferences that can be made from long-term comparisons of spending and other procurement actions for these commodities. Some of these commodities are relatively newer than others, such as Web-based subscriptions, which have been in existence for less time than have books and pamphlets.

An examination of federal spending on information products and services over the recent time period from FY 2010 through FY 2015 Q2—a time span during which all 23 of the products and services in this report have appeared in federal procurement records—reveals that five commodities that accounted for the majority of all spending in that time span also accounted

for the majority of spending on information commodities over the longer term stretching back to FY 1979. These commodities were books and pamphlets (7610), administrative support for libraries (R605), newspapers and periodicals (7630), Web-based subscriptions (D317), and administrative support for information retrieval (R612). These five products and services accounted for 81.3 percent of the federal information market from FY 1979 through FY 2015 Q2, and 93.3 percent of the information market from FY 2010 to FY 2015 Q2 (See Figures 10 and 11, and Tables 1 and 14).

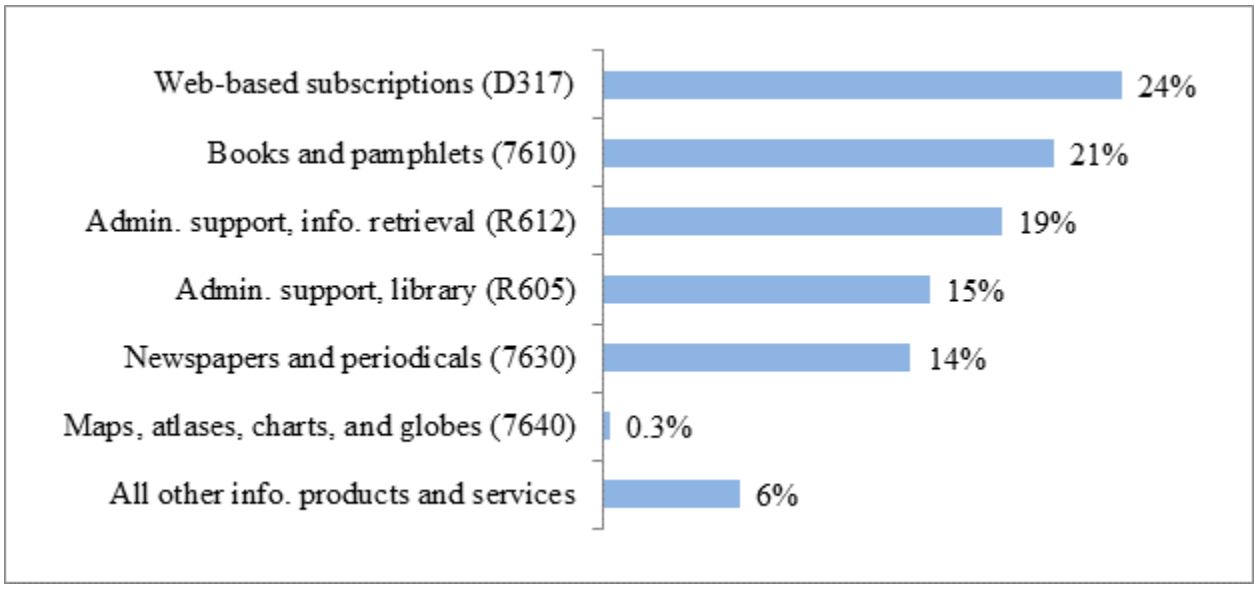


Figure 11. Percent of Federal Spending on Different Information Commodities, FY 2010 Q1–FY 2015 Q2

Disaggregating the total spending on the 23 information commodities analyzed for this report into annual spending amounts reveals that annual spending on all of these commodities has fluctuated over time and that annual spending variations in some commodities have effected large shifts in total federal spending on all information products and services. For example, annual spending on maps, atlases, charts, and globes (7640) increased from $112 million in FY 2002 to $236.4 million in FY 2003, and the $124.4 million increase in spending on this one commodity accounted for 57.1 percent of the $217.9 million increase in total spending on information products and services during those two years (total spending was $497.8 million in FY 2002 and $715.7 million in FY 2003). Similarly, spending on books and pamphlets (7610) grew from $96.1 million in FY 2005 to $177.4 million in FY 2006, comprising 81.2 percent of

the $100 million increase in spending in those two years ($581.5 million in FY 2005 and $681.6 million in FY 2006).

Figure 12 illustrates annual spending on the six major information products and services mentioned above, along with total annual spending. The peaks in many of the lines representing specific products and services appear to be associated with upward movements in the line depicting spending on all information commodities. While variations in the spending for some information products and services do appear to have significantly contributed to changes in the overall spending, it does not appear that a single information commodity solely and systematically led to changes in the overall totals.

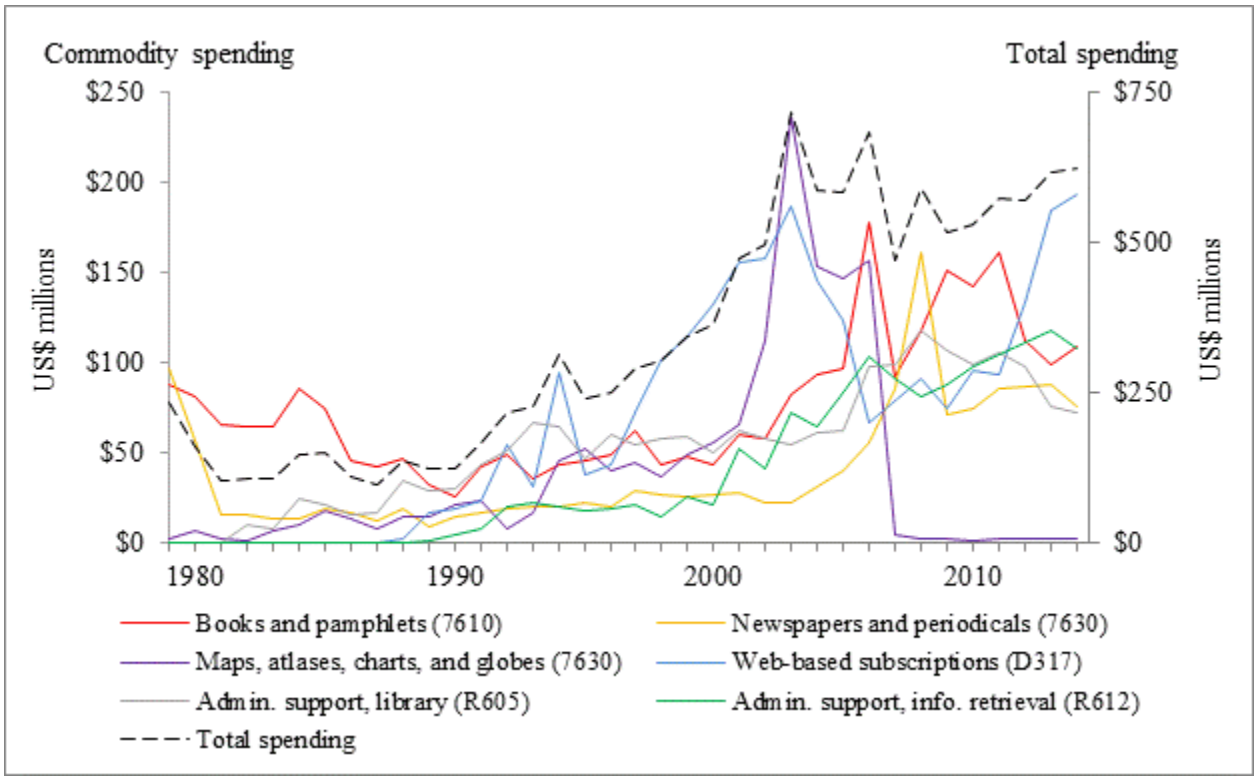


Figure 12. Federal Spending on Different Information Commodities, FY 1979–FY 2014

The concentration of the federal information market on the aforementioned six products and services is also apparent in the numbers of transactions for them. Transactions for these commodities accounted for 92.2 percent of all transactions for information products and services from FY 1979 through FY 2015 Q2. Among these six commodities, books and pamphlets (7610) stand out for a relatively high number of transactions, particularly in the period from FY 2005

through FY 2015 Q2 (see Table 4 and Figure 13; note that Figure 13 illustrates annual transactions for all complete fiscal years [i.e., FY 1979 through FY 2014]).

While some caution is warranted in comparing the transaction totals for these six PSCs given that some of these commodities have been in existence for less time than others, they have constituted the majority (97 percent) of annual transactions for information products and services in the period from FY 2010 through FY 2015 Q2. Furthermore, annual transaction numbers for these six commodities increased from FY 1979 through FY 2014, although their transactions numbers did decline from FY 2012 through FY 2014, with the exception of Web-based subscriptions (D317).

Table 4. Transactions for Information Commodities, FY 1979–FY 2015 Q2

Products and Services (Product Service Code)	FY 1979–FY 2015 Q2		FY 2010–FY 2015 Q2	
	Transactions	Pct. of Total	Transactions	Pct. of Total
Books and pamphlets (7610)	92,576	44.4%	29,974	38.6%
Newspapers and periodicals (7630)	35,997	17.3%	16,430	21.2%
Administrative support, information retrieval (R612)	24,114	11.6%	10,747	13.8%
Web-based subscriptions (D317)	22,055	10.6%	11,130	14.3%
Administrative support, library (R605)	17,515	8.4%	6,371	8.2%
Maps, atlases, charts, and globes (7640)	5,615	2.7%	430	0.6%
Microfilm, processed (7670)	3,775	1.8%	144	0.2%
Drawings and specifications (7650)	1,804	0.9%	507	0.7%
Digital maps, charts, and geodetic products (7644)	1,218	0.6%	475	0.6%

Table 4. Transactions for Information Commodities, FY 1979–FY 2015 Q2

Products and Services (Product Service Code)	FY 1979–FY 2015 Q2		FY 2010–FY 2015 Q2	
	Transactions	Pct. of Total	Transactions	Pct. of Total
Maintenance, repair, and rebuilding of equipment–books, maps, and other publications (J076)	789	0.4%	225	0.3%
Technical representative–books, maps, and other publications (L076)	729	0.3%	319	0.4%
Sheet and book music (7660)	631	0.3%	89	0.1%
Lease or rental of equipment–books, maps, and other publications (W076)	578	0.3%	150	0.2%
Topographic maps, charts, and geodetic products (7643)	322	0.2%	214	0.3%
Aeronautic maps, charts, and geodetic products (7641)	271	0.1%	94	0.1%
Other quality control, testing, and inspection–books, maps, and other publications (H976)	198	0.1%	126	0.2%
Modification of equipment–books, maps, and other publications (K076)	107	0.1%	46	0.1%
Quality control–books, maps, and other publications (H176)	101	0.0%	63	0.1%
Hydrographic maps, charts, and geodetic products (7642)	71	0.0%	23	0.0%
Equipment and materials testing–books, maps, and other publications (H276)	61	0.0%	54	0.1%
Inspection–books, maps, and other publications (H376)	36	0.0%	24	0.0%
Installation of equipment–books, maps, and other publications (N076)	30	0.0%	18	0.0%
Books, maps, and other publications (76)	8	0.0%	0	0.0%
Total	208,601		77,653	

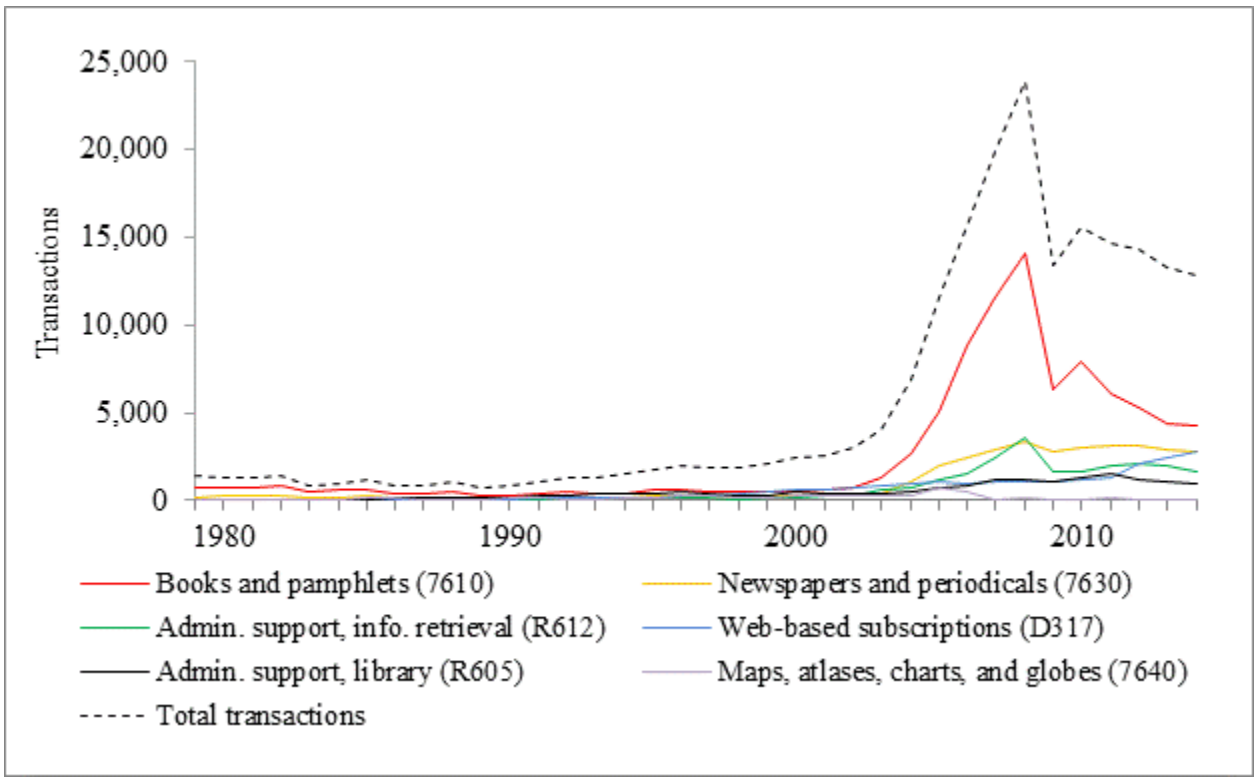


Figure 13. Transactions for Different Information Commodities, FY 1979–FY 2014

As previously noted, the average transaction amounts for the overall federal information market declined, and the same trend is apparent in transaction amounts for many, though not all, information commodities. For example, the average transaction amounts declined for the five information products and services that comprised the majority of spending and transactions—administrative support for federal libraries (R065), administrative support for information retrieval (R612), books and pamphlets (7610), newspapers and periodicals (7630), and Web-based subscriptions (D317) [see Figure 14]. Other commodities, such as aeronautic and digital maps, have exhibited increases in average transaction amounts, although these commodities have constituted relatively small portions of overall federal spending on information commodities (0.1 percent and 0.9 percent, respectively) from FY 1979 through FY 2014.

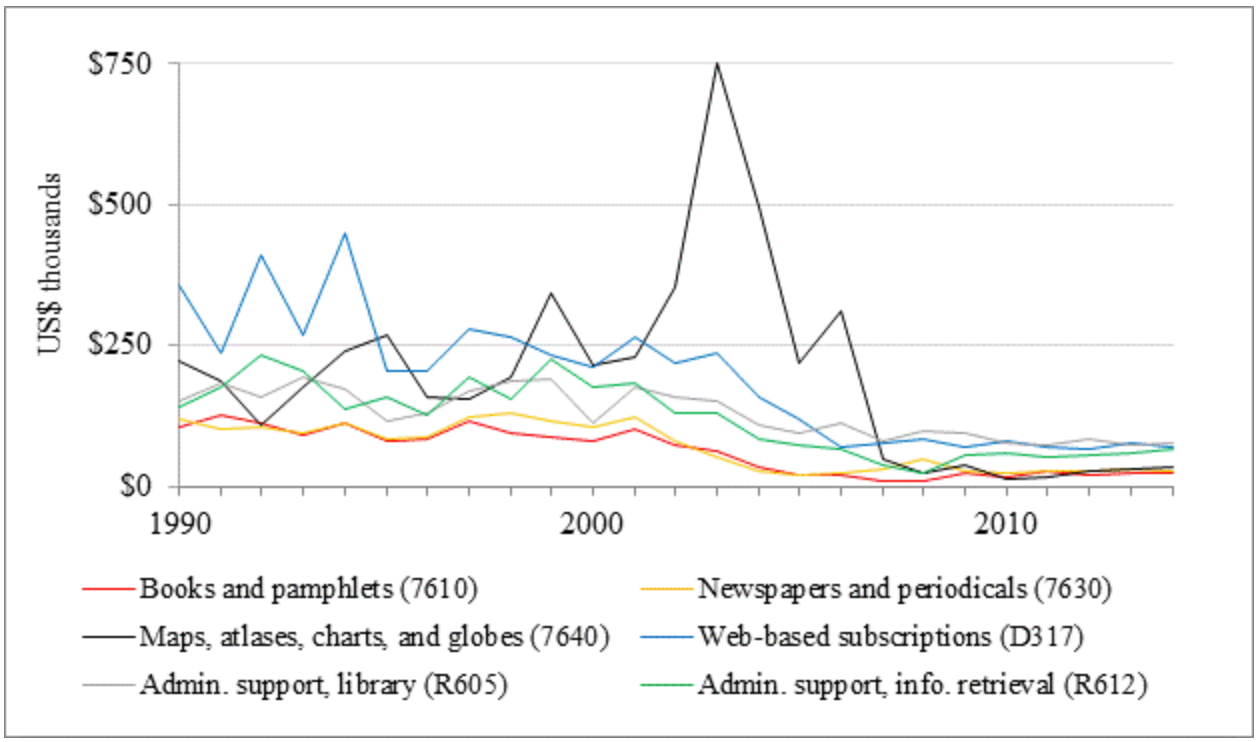


Figure 14. Average Transaction Amounts for Different Information Commodities, FY 1990–FY 2014

One pattern that is apparent in figure 14 is that in the last six years on the graph (specifically, FY 2009 through FY 2014), three commodities consistently had the highest average transaction amounts. Those three commodities were administrative support for information retrieval (R612), administrative support for libraries (R605), and Web-based subscriptions (D317), and from FY 2010 through FY 2014, their average amount per transaction ranged from $53,200 to $84,500, nearly twice the average transaction amounts of the other three major commodities during that period. The differences in these average transaction amounts is apparent in figure 15.

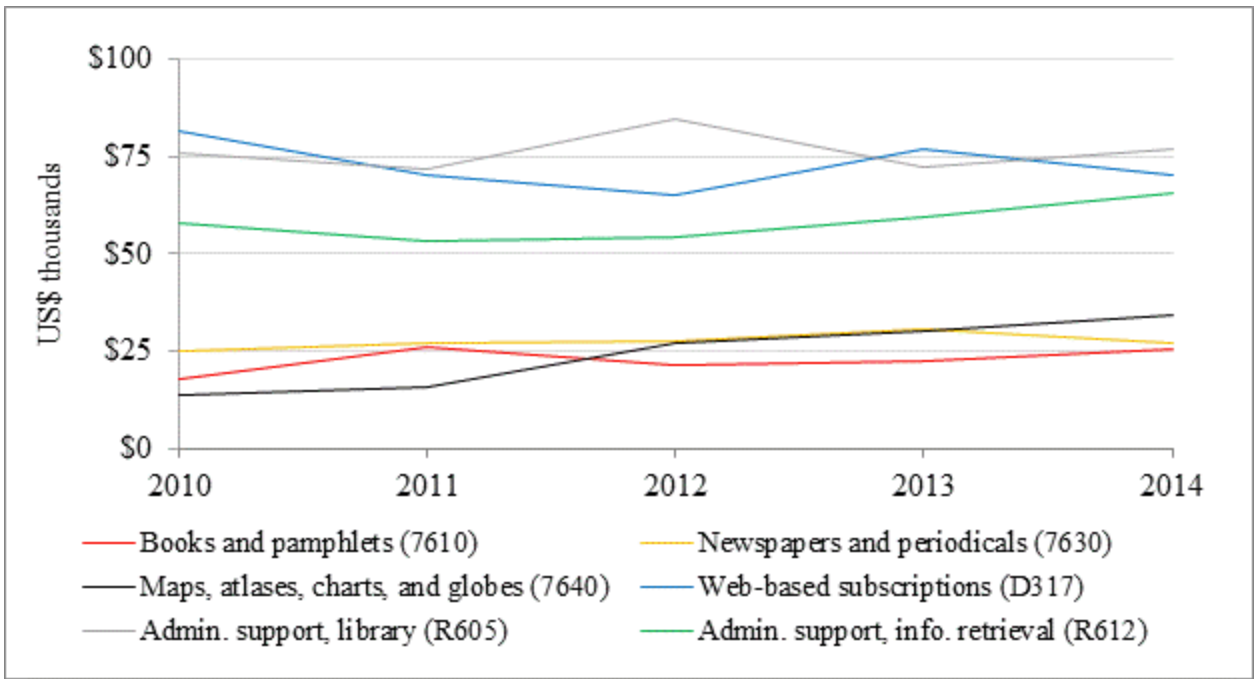


Figure 15. Average Transaction Amounts for Different Information Commodities, FY 2010–FY 2014

In sum, available data indicate that spending on information products and services has grown in the overall period from FY 1979 through FY 2014, and the last five fiscal years of that period, FY 2010 through FY 2014, have seen continual increases in such spending. An examination of several explanations for this spending growth reveals no single systematic cause for this increase in spending. However, several different explanations appear to collectively explain much of this growth.

One such explanation is that over the longer term, from FY 1979 through FY 2014, federal agencies have procured increasing quantities of information products and services on an annual basis. A second contributing explanation is that while the annual number of procurement transactions declined from FY 2010 through FY 2014, the average amount per transaction gradually increased during that time period. Thirdly, a new information commodity—Web-based subscriptions—came into existence in the late 1980s and federal agencies have substantially increased their spending on this commodity over time.

In the recent period, from FY 2010 through FY 2014, federal agencies have procured a moderate number of transactions (around 1,000 to 2,000 annually) for three information products and services with moderately high costs (in the range of $53,213 to $84,494 per year): administrative support for information retrieval (R612), administrative support for libraries

(R605), and Web-based subscriptions (D317). In the same period, federal agencies have procured a relatively higher number of transactions (around 3,000 to 8,000 transactions annually) for products that had relatively low costs (in the range of $17,998 to $30,578): books and pamphlets (7610), and newspapers and periodicals (7630). Consequently, these five products and services have accounted for the majority of spending during this period of gradual growth.

INFORMATION MARKET SPENDING BY FEDERAL AGENCIES

Federal spending on information products and services from FY 1979 through FY 2015 Q2 varied substantially among agencies, from approximately $11.4 million (U.S. Small Business Administration—SBA) to nearly $5.4 billion (U.S. Department of Defense—DoD). Furthermore, federal spending on information commodities averaged approximately $500.1 million per agency. In the recent period from FY 2010 through FY 2015 Q2, agency spending ranged from $4.9 million (SBA) to $761.2 million (DoD), with an average spending of $123.8 million per agency (see Table 5).

Table 5. Federal Agency Spending on Information Commodities, FY 1979–FY 2015 Q2

Agency	FY 1979–FY 2015 Q2		FY 2010–FY 2015 Q2	
	Spending (US$ millions)	Pct. of Total	Spending (US$ millions)	Pct. of Total
Department of Defense	$5,368.7	42.9%	$761.2	24.6%
Department of Health and Human Services	$1,236.1	9.9%	$393.2	12.7%
Department of the Treasury	$694.2	5.6%	$215.0	6.9%
Department of Commerce	$676.4	5.4%	$289.5	9.4%
Department of Justice	$625.6	5.0%	$218.0	7.0%
Department of Veterans Affairs	$484.2	3.9%	$205.1	6.6%
All Other Agencies	$478.8	3.8%	$176.1	5.7%
Environmental Protection Agency	$464.6	3.7%	$99.7	3.2%
General Services Administration	$452.2	3.6%	$39.7	1.3%
Department of Homeland Security	$283.6	2.3%	$180.6	5.8%
Social Security Administration	$263.2	2.1%	$106.0	3.4%
Department of the Interior	$233.3	1.9%	$66.8	2.2%
Department of Transportation	$197.3	1.6%	$25.4	0.8%
Department of State	$183.3	1.5%	$91.9	3.0%
NASA	$167.6	1.3%	$26.5	0.9%

Table 5. Federal Agency Spending on Information Commodities, FY 1979–FY 2015 Q2

Agency	FY 1979–FY 2015 Q2		FY 2010–FY 2015 Q2	
	Spending (US$ millions)	Pct. of Total	Spending (US$ millions)	Pct. of Total
Department of Agriculture	$166.8	1.3%	$45.0	1.5%
Department of Energy	$134.1	1.1%	$25.4	0.8%
Department of Education	$98.3	0.8%	$47.2	1.5%
U.S. Agency for International Development	$98.2	0.8%	$19.6	0.6%
Department of Labor	$62.9	0.5%	$17.2	0.6%
Dept. of Housing and Urban Development	$57.3	0.5%	$14.1	0.5%
Nuclear Regulatory Commission	$29.7	0.2%	$9.0	0.3%
Office of Personnel Management	$18.9	0.2%	$9.3	0.3%
National Science Foundation	$15.5	0.1%	$7.4	0.2%
Small Business Administration	$11.4	0.1%	$4.9	0.2%
Total	$12,502.2		$3,093.9	
Average	$500.1		$123.8	

Five federal agencies accounted for nearly 68.8 percent of all spending for information products and services from FY 1979 through FY 2015 Q2, spending $8.6 billion during that period. Those agencies were the U.S. Departments of Defense (42.9 percent), Health and Human Services (9.9 percent), Treasury (5.6 percent), Commerce (5.4 percent), and Justice (5.0 percent) [See Table 5 and Figure 16]. In the recent period from FY 2010 through FY 2015 Q2, these five departments accounted for a slightly lower proportion of the federal information market—60.7 percent. During that time span, two additional agencies emerged as prominent purchasers of information commodities, namely the U.S. Departments of Homeland Security and Veterans Affairs. Each of these seven departments accounted for at least 6 percent of federal spending on information products and services from FY 2010 through FY 2015 Q2, and their collective spending on these commodities constituted 73.1 percent of the total federal information market (see Table 5 and Figure 17).

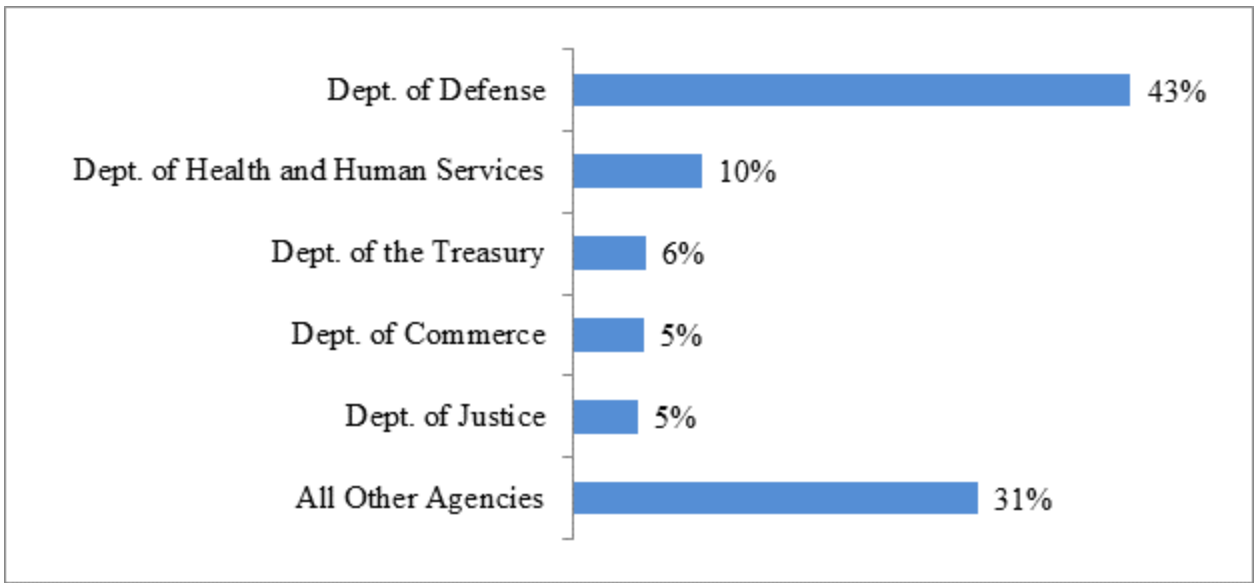


Figure 16. Federal Agency Spending on Information Commodities as a Proportion of Total Spending, FY 1979–FY 2015 Q2

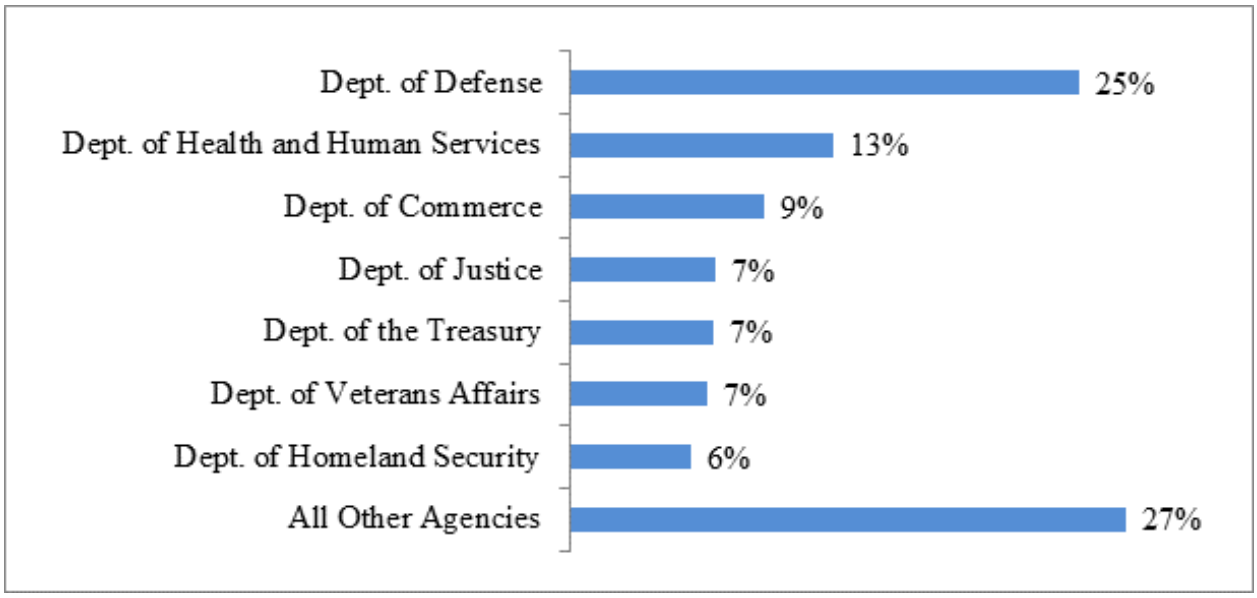


Figure 17. Federal Agency Spending on Information Commodities as a Proportion of Total Spending, FY 2010–FY 2015 Q2

Federal agency spending on information products and services overall fluctuated during the span of complete fiscal years covered in this study—FY 1979 through FY 2014. However, in general, most departments' spending on information commodities either remained essentially constant or trended upward. One apparent exception to this trend was the DoD. Available data indicate a precipitous decline in DoD's spending on information commodities after 2006 (see Figure 18).

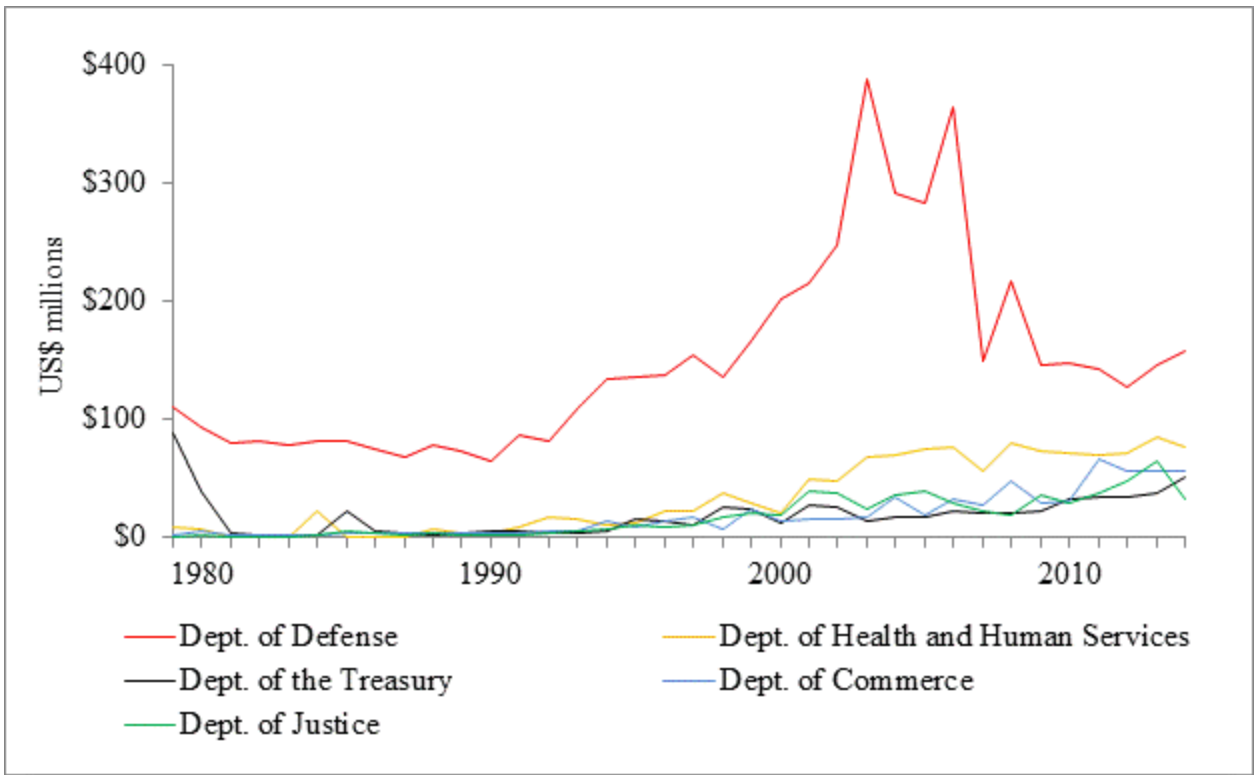


Figure 18. Federal Agency Spending on Information Commodities, FY 1979–FY 2014

Analysis of federal procurement data from the FPDS–NG helps develop a detailed understanding of federal spending on information products and services at the departmental level, as well as at the level of agencies within those departments. However, sometimes the name of the contracting agency in the FPDS–NG database is unclear. For example, the contracting agency specified in a federal procurement contract may be a department, such as the U.S. Department of State, but is more often an agency within a department, such as the National Institutes of Health (NIH), which falls under the U.S. Department of Health and Human Services. In other cases, the specific contracting agency is difficult to determine because the database description is difficult to interpret—for example, the designation "Department of Defense Educational Activity" refers neither to a department nor to an agency, but to a departmental activity.

Federal procurement data indicate that, from FY 1979 through FY 2015 Q2, six DoD agencies were among the major purchasers of information products and services. These agencies were the National Geospatial-Intelligence Agency (NGA); the Departments of the Air Force, Army, and Navy; the Department of Defense Education Activity; and the Defense Logistics Agency (see Figure 19), which collectively spent $5.1 billion on information products and

services, accounting for 40.9 percent of all federal government spending in the information market. Other agencies prominent in the market were the NIH ($837 million; 6.7 percent); the Internal Revenue Service ($513 million; 4.1 percent); the U.S. Patent and Trademark Office ($462 million; 3.7 percent); and offices, boards, and divisions of the U.S. Department of Justice ($416 million; 3.3 percent).

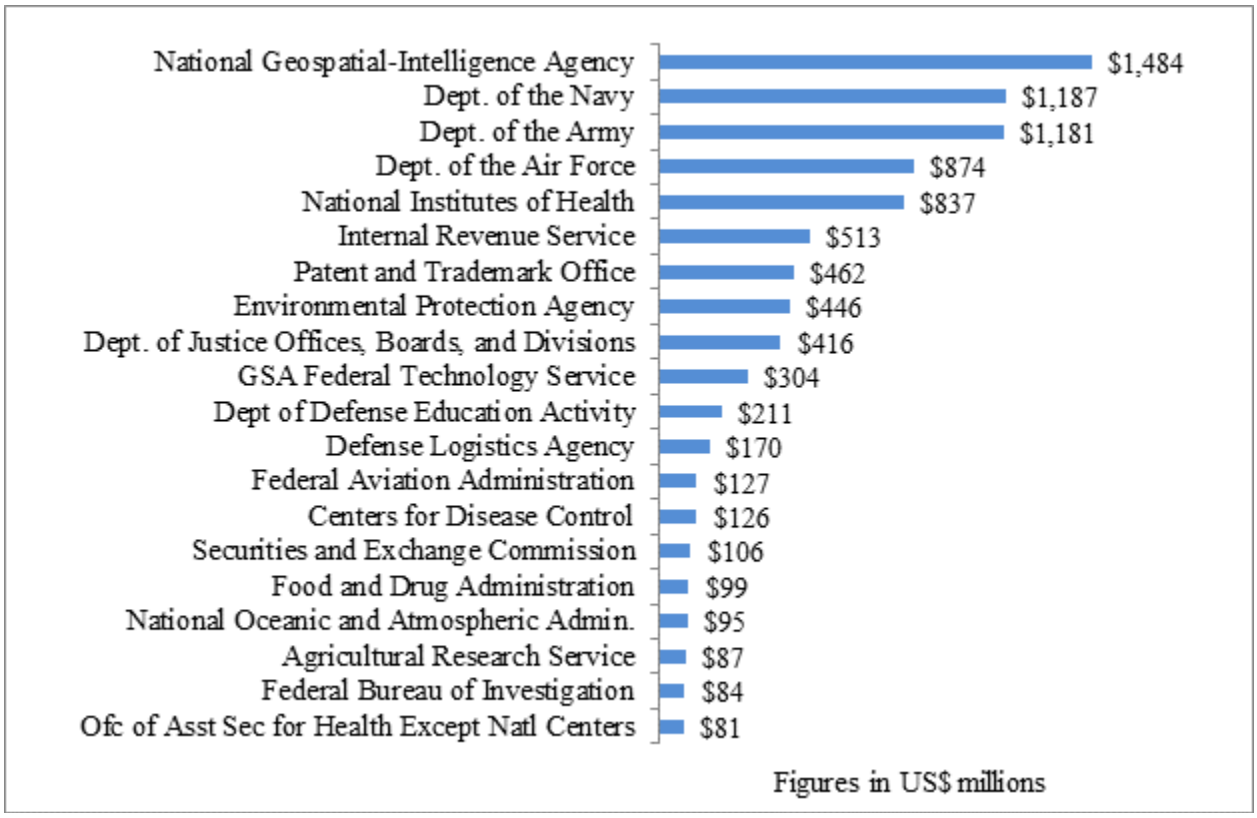


Figure 19. Federal Agency Spending on Information Commodities, FY 1979–FY 2015 Q2

With some exceptions, the major purchasing agencies during FY 1979 through FY 2014 also were the major purchasers during the last five years of that period, FY 2010 through FY 2014. One such exception is the NGA, which spent more on information commodities than any single agency from FY 1990 through FY 2006, but has since dropped completely out of the information market, at least as far as can be determined from unclassified procurement data (see Figure 20).

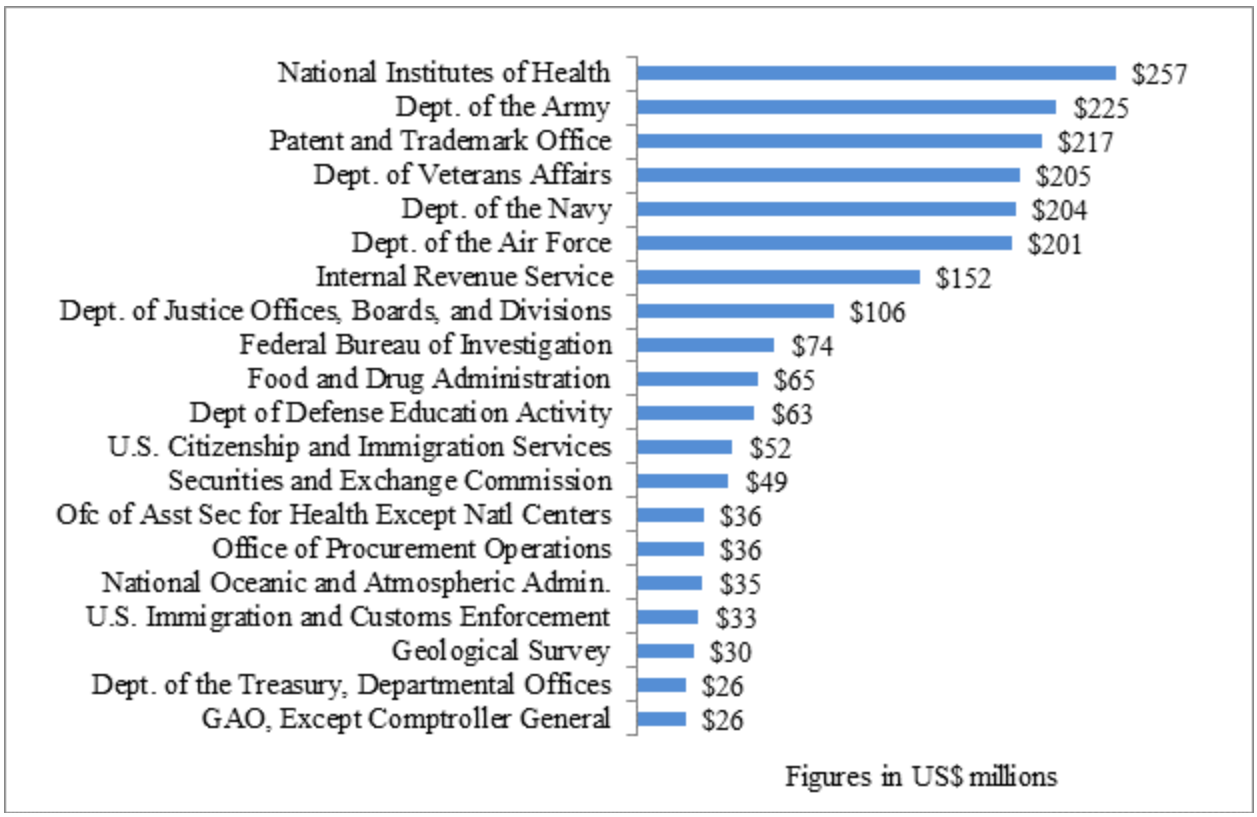


Figure 20. Federal Agency Spending on Information Commodities, FY 2010–FY 2015 Q2

CONTRACTORS IN THE FEDERAL INFORMATION MARKET

From FY 1979 through FY 2015 Q2, federal agencies contracted with thousands of organizations to provide the 23 categories of information products and services listed in table 1. Among this multitude of contractors, seven vendors received one-fourth of all contracts, as measured by the value of those contracts. The top contractor for information commodities for the federal government was the West Publishing Corporation with $707.9 million in contracts, followed by Reed Elsevier ($619.1 million), GeoEye[20] ($464.2 million), the Computer Sciences Corporation ($376.9 million), Primus Solutions ($369.7 million), EBSCO ($326.8 million), IHS Global ($287.3 million), and Gartner ($207.3 million). These seven companies collectively received nearly $3.2 billion in federal government contracts (25.2 percent) for information products and services.

[20] In 2013, GeoEye merged with DigitalGlobe, and the consolidated company was called DigitalGlobe. See DigitalGlobe, "DigitalGlobe Announces Final Results of Merger Consideration Elections Made by GeoEye Stockholders," http://investor.digitalglobe.com/phoenix.zhtml?c=70788&p=irol-newsArticle&ID=1781987 (August 7, 2015).

These and other contractors appear in table 6, which lists the top 10 recipients of federal government contracts for information products and services from FY 1979 to FY 2015 Q2 (Table 15 lists the top 50 vendors for the period).[21] These 10 contractors collectively received $3.7 billion in contracts for information commodities—nearly 30 percent of the entire federal information market for that period.

Table 6. Top 10 Contractors in the Federal Information Market, FY 1979–FY 2015 Q2

	Contractor (Parent Company)	Contracts (in US$ millions)	Pct. of All Contracts
1	West Publishing Corp. (Thomson Reuters)	$707.9	5.7%
2	Reed Elsevier	$619.1	5.0%
3	GeoEye Inc. (DigitalGlobe)	$464.2	3.7%
4	Computer Sciences Corporation	$376.8	3.0%
5	Primus Solutions, Inc. (Arctic Slope Regional Corp.)	$369.7	3.0%
6	EBSCO	$326.8	2.6%
7	IHS Global	$287.3	2.3%
8	Gartner Inc.	$207.2	1.7%
9	DigitalGlobe Inc.	$204.4	1.6%
10	Swets and Zeitlinger BV	$155.3	1.2%
Total		$3,718.7	29.7%

In the most recent five-year period, FY 2010 through FY 2014, some indicators suggest that a declining number of vendors account for an increasingly larger proportion of the federal information market. With some exceptions, the major providers of information products and services for the period from FY 1979 through FY 2015 Q2 were also the major providers of those commodities in the recent years, at least as measured by the value of the contracts those vendors signed with federal agencies (see Table 7). Moreover, the number of vendors accounting for the majority of information commodities was smaller during the last five-and-a-half fiscal years than during the 36-and-a-half-year period stretching back to 1979. Specifically, 38 vendors accounted for 50 percent of the federal information market from FY 1979 through FY 2015 Q2,

[21] The amounts in table 6 differ from those provided in the equivalent tables in previous iterations of this report. These variations are the result of the discontinuation of one PSC in these calculations (7690; see footnote 1); updated data from the FPDS–NG; and data for subsidiary companies listed separately from their parent companies. In addition, previous iterations of this report incorrectly listed data for DynCorp Information Services as data for its parent company, the Computer Sciences Corporation (CSC).

whereas17 vendors accounted for 50 percent of that market from FY 2010 through FY 2015 Q2 (see Tables 15 and 16). Moreover, seven vendors received 25 percent of all federal spending on information commodities from FY 1979 through FY 2015 Q2, whereas four companies received the same percentage of federal spending on information products and services from FY 2010 through FY 2015 Q2. Similarly, the top 50 vendors accounted for 53.6 percent of the federal information market from FY 1979 through FY 2015 Q2, and the top 50 vendors from FY 2010 through FY 2015 Q2 accounted for 66.7 percent of the market.

Table 7. Top 10 Contractors in the Federal Information Market, FY 2010–FY 2015 Q2

	Contractor (Parent Company in Parentheses)	Contracts (in US$ millions)	Pct. of All Contracts
1	Reed Elsevier	$293.5	9.5%
2	West Publishing Corp. (Thomson Reuters)	$268.5	8.7%
3	Primus Solutions, Inc. (Arctic Slope Regional Corp.)	$173.8	5.6%
4	EBSCO	$102.0	3.3%
5	Dun and Bradstreet	$81.5	2.6%
6	Swets and Zeitlinger BV	$68.7	2.2%
7	All Native Services	$68.4	2.2%
8	American Chemical Society	$65.4	2.1%
9	IHS Global	$60.2	1.9%
10	Cambridge Information Group Inc.	$57.7	1.9%
	Total	$1,239.8	40.1%

The consolidation of the federal information market to a declining number of vendors is also apparent in a growing number of vendors that have received most of their federal procurement funding for information commodities within the last five-and-a-half fiscal years (FY 2010 through FY 2015 Q2). Specifically, 23 of the top 50 vendors experienced 50 percent or more of their information commodity sales within the most recent five years, and an additional 15 vendors realized 25 percent or more of their information commodity sales in that same period. For example, long-established organizations such as the Cambridge Information Group, Dun and Bradstreet, and Swets and Zeitlinger have provided information products and services to the federal government since FY 1995, if not earlier, and all of these entities have experienced more

than 50 percent of their information commodity sales to the federal government in the last five fiscal years (see Table 16).

The data in tables 6 and 7 indicate the major vendors in the overall information market, but not the major vendors for particular information products and services. Appendix 3 contains tables listing the major vendors for the top five information commodities for the period from FY 2010 through FY 2015 Q2. Those five commodities were (in declining order of their proportion of the market): Web-based subscriptions, books and pamphlets, administrative support for information retrieval, administrative support for libraries, and newspapers and periodicals (see Figure 11).

BENEFITS OF A STRATEGICALLY SOURCED INFORMATION MARKET

Thus far, this analysis has examined the federal information market as it has existed to date, without an FSSI for information products and services. Calculations based on existing spending figures suggest that an initiative to source information products and services strategically could yield substantial savings on these products and services. For example, if an FSSI had covered information commodities in FY 2014, the federal government could have saved between $30 million to $125 million (see Table 8).

Table 8. FY 2014 Spending by Federal Agency Using Different Savings Scenarios

Agency	No FSSI	5%		10%		20%	
	Spending	Spending	Savings	Spending	Savings	Spending	Savings
Dept. of Defense	$158.2	$150.3	$7.9	$142.4	$15.8	$126.6	$31.6
Dept. of Health and Human Services	$76.7	$72.9	$3.8	$69.0	$7.7	$61.4	$15.3
Dept. of Commerce	$56.6	$53.7	$2.8	$50.9	$5.7	$45.3	$11.3
Dept. of the Treasury	$50.5	$48.0	$2.5	$45.4	$5.0	$40.4	$10.1
Dept. of Homeland Security	$38.9	$36.9	$1.9	$35.0	$3.9	$31.1	$7.8
Dept. of Veterans Affairs	$37.4	$35.5	$1.9	$33.7	$3.7	$29.9	$7.5
Dept. of Justice	$33.0	$31.3	$1.6	$29.7	$3.3	$26.4	$6.6
All Other Agencies	$171.7	$163.1	$8.6	$154.5	$17.2	$137.3	$34.3
Total	$622.9	$591.8	$31.1	$560.6	$62.3	$498.3	$124.6
All figures are in US$ millions.							

The estimates in table 8 are based on a set of scenarios in which the government purchases information commodities at discounts ranging from 5 percent to 20 percent—comparable discounts to those that federal agencies have realized in existing FSSIs administered by the GSA (see "Overview of the Federal Strategic Sourcing Initiative"). If federal agencies had received such discounts for their expenditures during the most recent five fiscal years, the projected savings increase would range from approximately $155 million to approximately $620 million, as illustrated in figure 21.

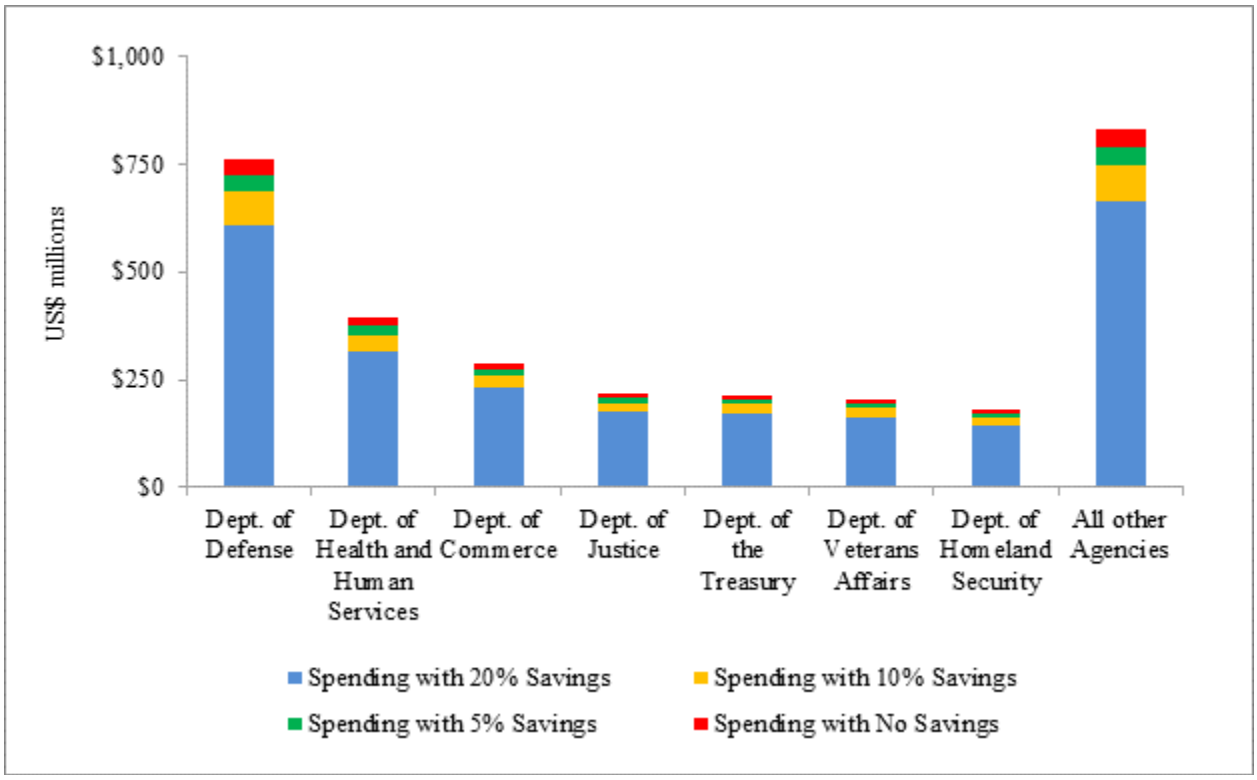


Figure 21. Spending by Federal Agency Using Different Savings Scenarios, FY 2010–FY 2015 Q2

Applying discounted savings rates to the entire period covered by this analysis—FY 1979 through FY 2015 Q2—further emphasizes the savings the federal government could have realized through strategic sourcing arrangements. If the federal government had an FSSI for information commodities, it could have saved approximately $625 million to $3.0 billion—5 percent and 20 percent savings, respectively, of the total spending of $12.5 billion for that period (see Figure 22). The $3.0 billion in savings that the federal government could have realized

through a 20 percent discount on spending in this 36-and-a-half year period almost exceeds the $3.1 billion federal spending on information commodities in the recent period from FY 2010 through FY 2015 Q2.

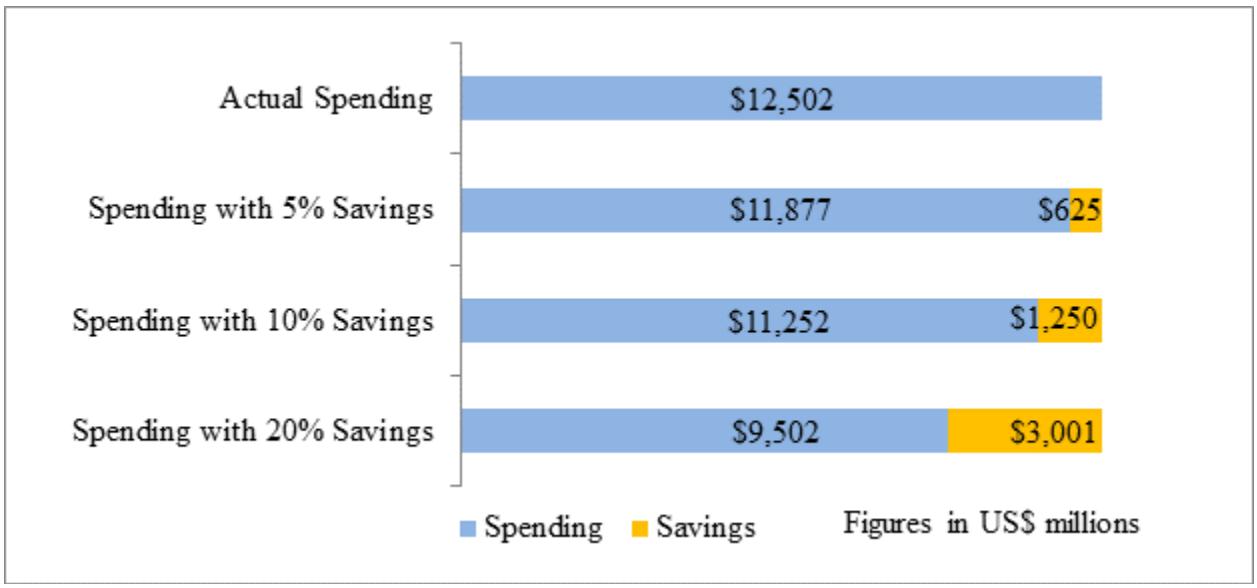


Figure 22. Federal Spending Using Different Savings Scenarios, FY 1979–FY 2015 Q2

The graph in figure 23 shows actual federal spending on information commodities for all complete fiscal years in this study (FY 1979 through FY 2014), as well as projections of federal spending on those products and services at discounts of 5 percent, 10 percent, and 20 percent. This figure highlights the financial benefits to the federal government of strategic sourcing. The graph indicates that, at a 20 percent discount, the federal market would have rarely exceeded $500 million in any of the fiscal years from FY 1979 through FY 2014.

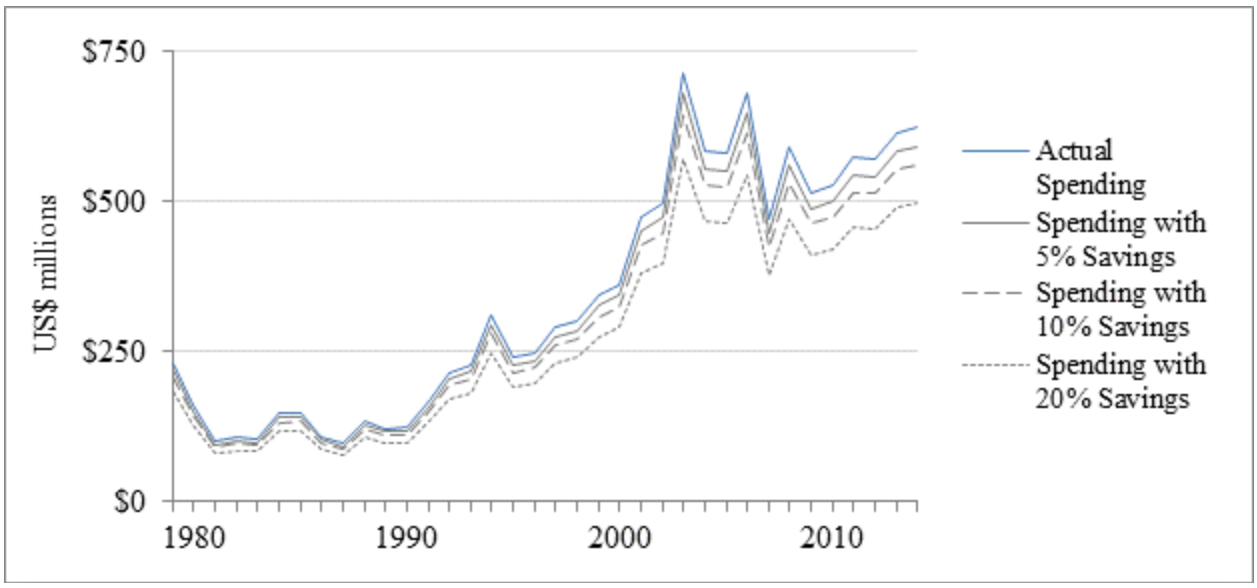


Figure 23. Federal Spending on Information Commodities Using Different Savings Scenarios, FY 1979–FY 2014

Based on quantitative forecasts of federal spending on information products and services in the years beyond FY 2014, strategic sourcing could save the federal government money on these commodities. The spending trend in the information market suggests that spending levels for FY 2015 through FY 2017 are expected to continue an upward trend in spending from FY 2009 through FY 2014. Specifically, in FY 2013 and FY 2014, spending on information commodities was $615.3 million and $622.9 million, respectively, and, as previously noted, the figure for FY 2014 may increase if federal agencies continue to publicize their spending data for that year.[22] The projected spending for FY 2015 is $637.5 million (with a 95 percent prediction interval of $265.6 million and $1.0 million), followed by an increase to $700.1 million in FY 2017 (95 percent prediction interval is $267.3 million and $1.1 billion) [See Table 9 and Figure 24].

[22] In a previous iteration of this report, the projected spending for FY 2014 was $619.7 million, $3.2 million less than the actual figure based on data downloaded from the FPDS-NG on June 1, 2015. See William Noël Ivey, "Federal Government Strategic Sourcing of Information Products and Services," Library of Congress, Federal Research Division, April 2014, 32, http://www.loc.gov/flicc/publications/FRD/Strategic-Sourcing_2014-Q1.pdf.

Table 9. Projected Spending, FY 2015–FY 2017

Fiscal Year	Spending Projection	95% Prediction Interval*	
		Minimum	Maximum
2015	$637.5	$265.6	$1,009.1
2016	$648.3	$266.6	$1,030.0
2017	$659.1	$267.3	$1,050.9

All figures in US$ millions.
*Prediction intervals were derived with a Bonferroni coefficient. See appendix 4 for details.

Statistics also project that quarterly federal spending on information commodities in the four fiscal quarters from FY 2015 Q3 through FY 2016 Q2 will be slightly higher than in the four quarters from FY 2014 Q3 through FY 2015 Q2. As shown in table 10 and figure 25, projected quarterly spending on information products and services is $127.2 million in FY 2015 Q3; $205.5 million in Q4; $142.7 million in 2016 Q1; and $140.2 million in 2016 Q2.[23]

Table 10. Projected Quarterly Spending, FY 2015 Q3–FY 2016 Q2

Fiscal Quarter	Spending Projection	95% Prediction Interval*	
		Minimum	Maximum
2015 Q3	$127.2	$28.0	$226.4
2015 Q4	$205.5	$106.2	$304.9
2016 Q1	$142.7	$43.3	$242.2
2016 Q2	$140.2	$40.6	$239.9

All figures in US$ millions.
*Prediction intervals were derived with a Bonferroni coefficient.

If the federal government established an FSSI for information products and services, and if all federal agencies participated in the program, the government could realize total savings in the range of nearly $100 million to $400 million over the three years from FY 2015 through FY 2017, based on discounts of 5 percent and 20 percent, respectively (see Table 12). Figure 24 depicts estimated growth in the information market by FY 2017 under various discount scenarios.

[23] These forecasts are from a seasonal time series forecast with dummy variables.

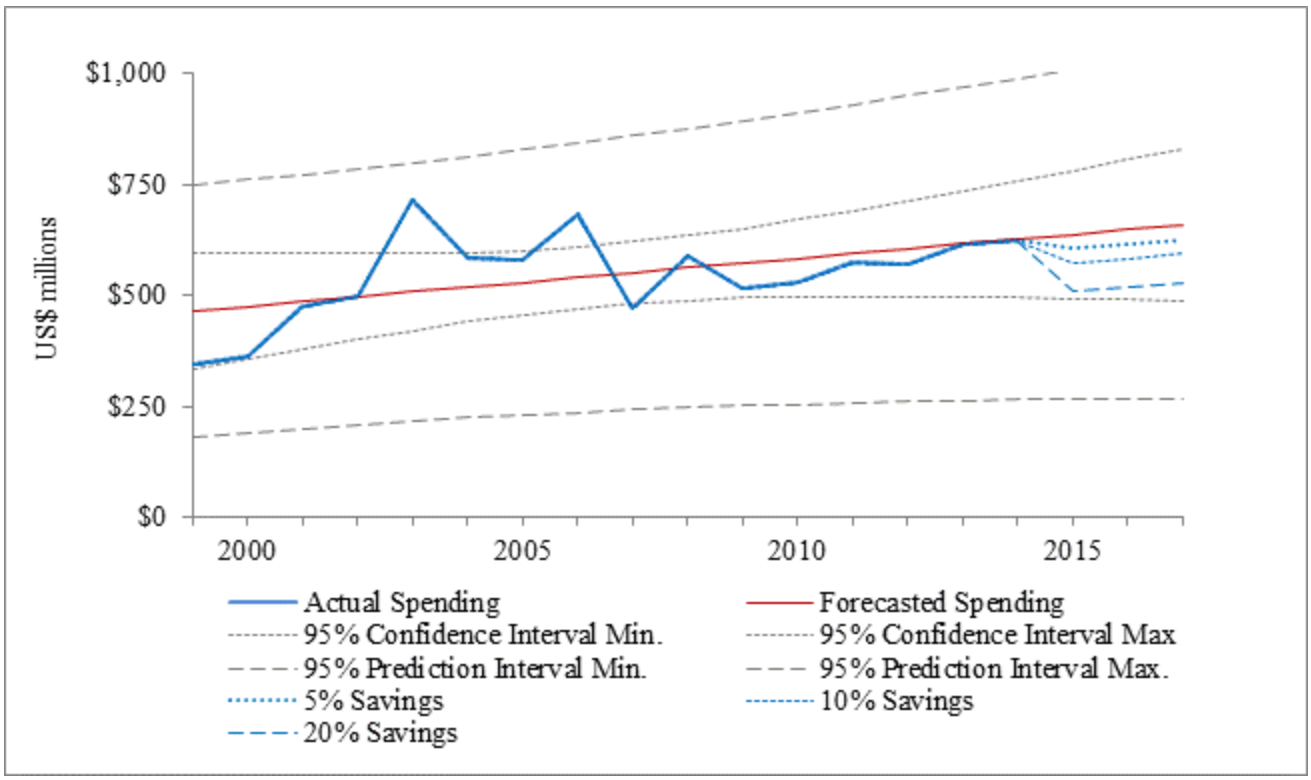


Figure 24. Projected Growth and Potential Savings in the Federal Information Market, FY 2015–FY 2017

The researcher derived these forecasts from a statistical analysis of changes in the federal information market from FY 1979 through FY 2014. To produce this statistical analysis, the researcher fitted a linear regression model to spending figures for the period from FY 1999 through FY 2014 and then used this model to derive forecasts for FY 2015 through FY 2017. The regression model is based on spending for the most recent 16-year period, because in FY 1999, federal spending on information commodities appears to have begun a sustained, upward shift to previously unprecedented annual spending levels. Prior to FY 1999, annual federal spending on information products and services had rarely exceeded $300 million, but since that year, annual spending has frequently exceeded $500 million. This apparent trend shift is reflected in statistical diagnostic tests that invalidated various regression models of spending for the period from FY 1979 through FY 2014. In statistical terminology, regression models for the time span from FY 1979 through FY 2014 exhibited positive autocorrelation in their residuals, insignificant regression parameters, or both. These problems were not evident in some regression models for the period from FY 1999 through FY 2014 (see Appendix 4 for further details).

With regard to the spending forecast depicted in figure 24, the red line represents the linear regression line, and the solid blue line depicts actual spending. The red regression line and various dashed blue lines depict spending forecasts at various savings rates. Although they are simplified projections based on the performance of existing FSSI programs, and, therefore, simply provide probabilistic estimates of savings and growth, these calculations illustrate potential savings that the federal government could realize through the strategic sourcing of information products and services.[24]

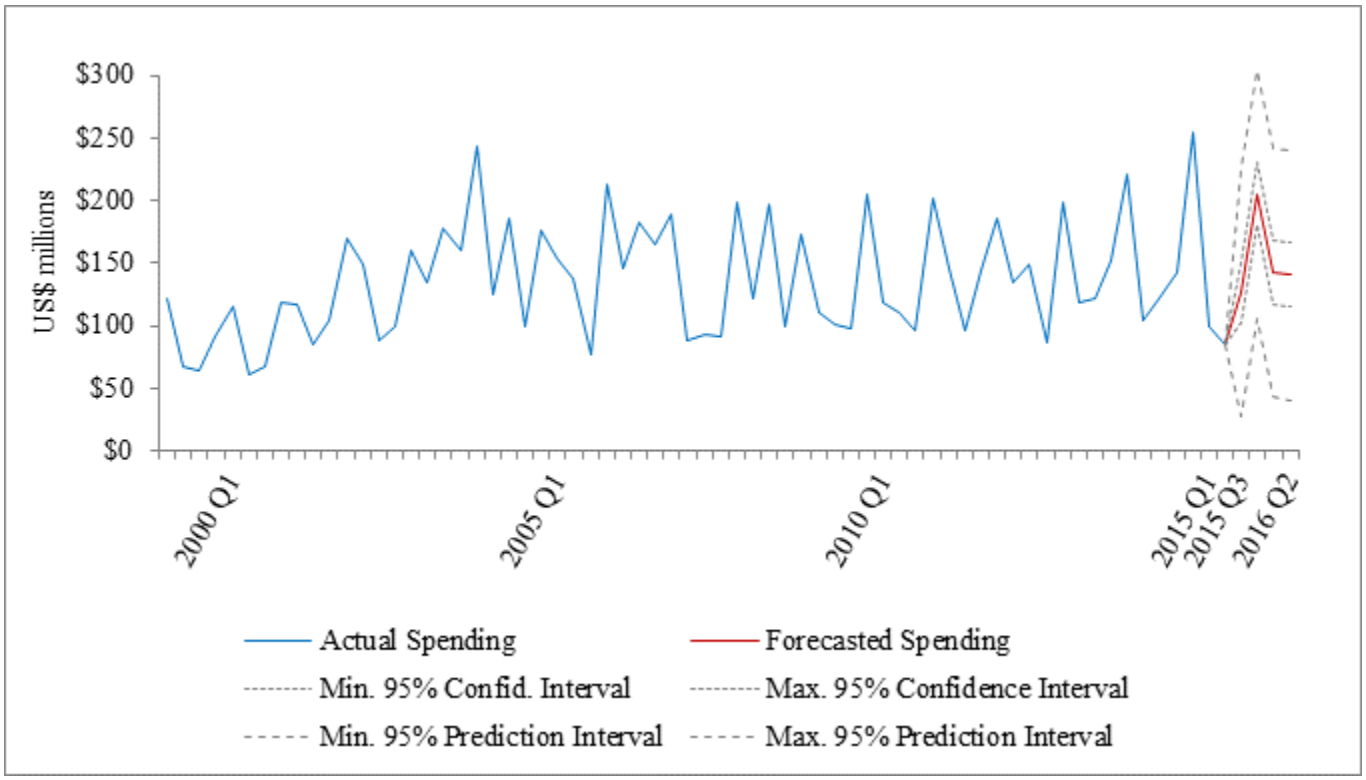


Figure 25. Projected Quarterly Spending in the Federal Information Market, FY 2015 Q3–FY 2016 Q2

These projections of future growth and potential savings in the federal information market assume that all federal agencies would participate in an FSSI for information products

[24] The equation for the linear regression is Y=464.266+ 10.826 X; R^2=0.260, and model standard error of equation ($SE_{\hat{Y}}$) is 89.95. The metrics for the quadratic regression model for the same data were Y= 588.113+ 10.826 X – 2.007 X^2, R^2=0.411, and $SE_{\hat{Y}}$=83.32. For the cubic regression model, those metrics were Y=588.113 - 14.730 X – 2.007 X^2 + 0.672 X^3; R^2=0.678, and $SE_{\hat{Y}}$=64.1. Calculations of the quadratic and cubic regression models incorporated centered predictor variables, and both models had insignificant regression parameters. The forecasted values in tables 9, 11, and 12 and figure 31 are derived from the linear regression equation. The confidence and prediction intervals of the linear regression incorporate a Bonferroni coefficient (B=t(1-0.05/(2x3),16-2)=t(0.9917,14)=3.069).

and services. In actuality, the number of federal agencies participating in the six currently available FSSI programs has varied. In FY 2014 Q2, for example, six agencies participated in the Telecommunications-Expense Management Services program, and 69 agencies participated in the Domestic Delivery Services program.[25]

Recalculating the growth and savings scenarios to include variations in federal agency participation would permit a more detailed picture of potential savings through strategic sourcing to emerge. However, such an exercise entails creating numerous scenarios in which agencies do or do not participate in strategic sourcing to varying extents and at varying discount rates, calculations that are beyond the scope of this report. To estimate the variation in the amount of savings that the federal agencies might realize if varying proportions of agencies participated in an information commodity FSSI program, the researcher made additional limited calculations of savings. Specifically, the researcher calculated spending and savings on information products and services if one-fourth, one-third, and one-half of such spending occurred at the discount rates of 5 percent, 10 percent, and 20 percent.

These findings are detailed in table 12 and depicted in figure 26. According to the researcher's calculations, total savings on federal spending on information commodities would vary from almost $25 million, if one-fourth of such spending occurred at a 5 percent discount, to nearly $400 million, if all of this spending occurred at a 20 percent discount.

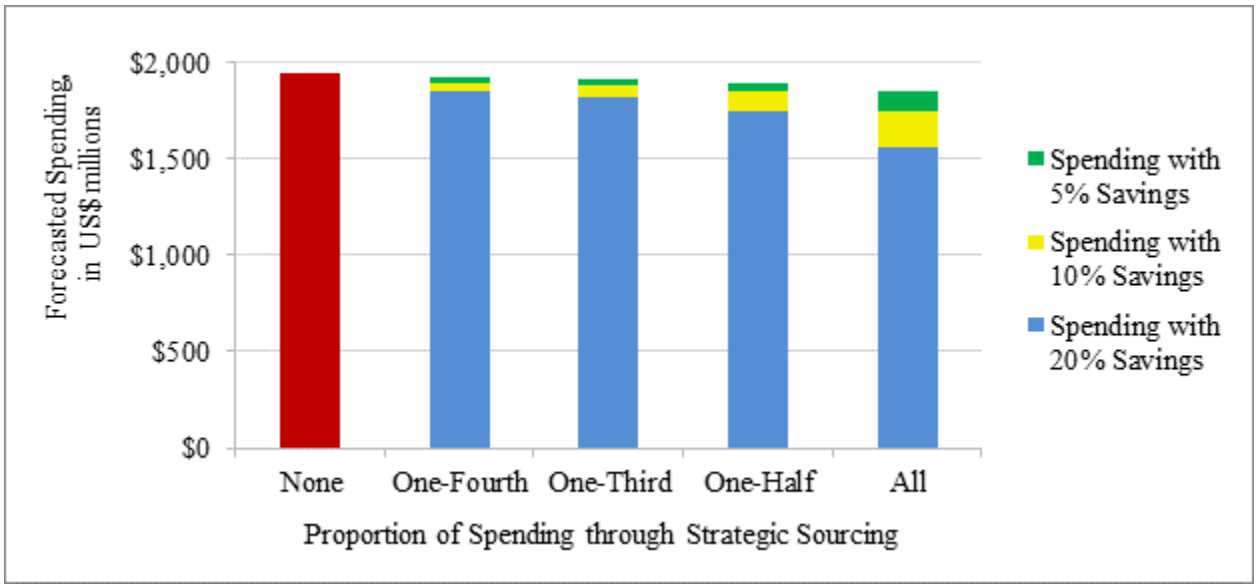


Figure 26. Projected Total Spending Using Different Strategic Sourcing Scenarios, FY 2015–FY 2017

[25] GSA, "Overview of Metrics Data," https://strategicsourcing.gov/ (accessed August 1, 2015).

APPENDIX 1. Estimated Growth, Savings, and Spending Projections, FY 2015–FY 2017

Table 11. Projected Growth and Savings in the Federal Information Market, FY 2015–FY 2017

Saving Rates	2015		2016		2017		Total		
	Spending	Savings	Spending	Savings	Spending	Savings	Spending	Savings	Average Annual Savings
No FSSI	$637.5	N/A	$648.3	N/A	$659.1	N/A	$1,944.9	N/A	N/A
5% Savings	$605.6	$31.9	$615.9	$32.4	$626.2	$33.0	$1,847.6	$97.2	$32.4
10% Savings	$573.7	$63.7	$583.5	$64.8	$593.2	$65.9	$1,750.4	$194.5	$64.8
20% Savings	$510.0	$127.5	$518.6	$129.7	$527.3	$131.8	$1,555.9	$389.0	$129.7
All figures are in US$ millions.									

Table 12. Projected Total Spending Using Different Strategic Sourcing Scenarios, FY 2015–FY 2017

Proportion of Spending Through Strategic Sourcing	5% Discount		10% Discount		20% Discount	
	Spending	Savings	Spending	Savings	Spending	Savings
None	$1,944.9	N/A	$1,944.9	N/A	$1,944.9	N/A
One-Fourth	$1,920.6	$24.3	$1,896.3	$48.6	$1,847.6	$97.2
One-Third	$1,912.8	$32.1	$1,880.7	$64.2	$1,816.5	$128.4
One-Half	$1,896.3	$48.6	$1,847.6	$97.2	$1,750.4	$194.5
All	$1,847.6	$97.2	$1,750.4	$194.5	$1,555.9	$389.0
All figures are in US$ millions.						

APPENDIX 2. Product Service Code Definitions

The General Services Administration (GSA) has established formal definitions for the product service codes (PSCs) used in procurement contracts for the federal government. The following table includes the GSA definitions for the PSCs featured in this report.

Table 13. Formal Definitions of Product Service Codes (PSCs)

PSC	Definition
76	None. This is not a product service code, but a product service group, specifically books, maps, and other publications.
7610	Books and pamphlets. *Includes: Technical and nontechnical books and pamphlets; regulations; instruction manuals; technical orders.* *Excludes: Sheet and book music; periodicals; bibles.*
7630	Newspapers and periodicals.
7640	Maps, atlases, charts, and globes. *Excludes: Training aid maps.*
7641	Aeronautic maps, charts, and geodetic products.
7642	Hydrographic maps, charts, and geodetic products.
7643	Topographic maps, charts, and geodetic products.
7644	Digital maps, charts, and geodetic products.
7650	Drawings and specifications. *Includes: Federal, military, and departmental specifications.*
7660	Sheet and book music. *Excludes: Hymnbooks.*
7670	Microfilm, processed.
D317	Web-based subscriptions. *Includes: Subscriptions to data, electronic equivalents of books, periodicals, newspapers, etc.*
L076	Technical representative–books, maps, and other publications.
R605	Administrative support, library.
R612	Administrative support, information retrieval. *Includes: Services related to search and storage of text, images, video, and other such data.*
J076	Maintenance, repair, and rebuilding of equipment–books, maps, and other publications.
H176	Quality control–books, maps, and other publications.
W076	Lease or rental of equipment–books, maps, and other publications.
K076	Modification of equipment–books, maps, and other publications.
H976	Other quality control, testing, and inspection–books, maps, and other publications.
H276	Equipment and materials testing–books, maps, and other publications.

Table 13. Formal Definitions of Product Service Codes (PSCs)

PSC	Definition
N076	Installation of equipment–books, maps, and other publications.
H376	Inspection–books, maps, and other publications. *Includes: Commercial testing and laboratory services.* *Excludes: Medical and dental laboratory services.*

Source: U.S. General Services Administration (GSA), Office of Governmentwide Policy, Federal Procurement Data System, Product and Service Codes Manual (Washington, D.C.: n.p., August 2011), 5, https://www.acquisition.gov/sites/default/files/page_file_uploads/PSC%20Manual%20-%20Final%20-%2011%20August%202011.pdf (accessed August 3, 2015).

APPENDIX 3. Top Contractors for Information Commodities, FY 2010–FY 2015 Q2

The tables below provide spending data for the major vendors of information commodities for FY 2010 through FY 2015 Q2. Five information products and services account for $2.9 billion in federal spending on information commodities during that time period—93.3 percent of the overall $3.1 billion spent in that period. The following tables provide details of federal spending on those commodities in the aforementioned time period and name the top ten vendors for each commodity.

Table 14. Federal Information Market, FY 2010–FY 2015 Q2

Products and Services (Product Service Code)	Contracts (in US$ millions)	Pct. of All Contracts
Web-based subscriptions (D317)	$748.7	24.2%
Books and pamphlets (7610)	$649.3	21.0%
Administrative support, information retrieval (R612)	$574.7	18.6%
Administrative support, library (R605)	$471.8	15.2%
Newspapers and periodicals (7630)	$443.2	14.3%
Technical representative–books, maps, and other publications (L076)	$70.3	2.3%
Drawings and specifications (7650)	$54.3	1.8%
Digital maps, charts, and geodetic products (7644)	$34.3	1.1%
Maintenance, repair, and rebuilding of equipment–books, maps, and other publications (J076)	$10.9	0.4%
Maps, atlases, charts, and globes (7640)	$9.7	0.3%
Aeronautic maps, charts, and geodetic products (7641)	$8.7	0.3%
Quality control–books, maps, and other publications (H176)	$7.3	0.2%
Topographic maps, charts, and geodetic products (7643)	$2.7	0.1%
Modification of equipment–books, maps, and other publications (K076)	$1.7	0.1%
Lease or rental of equipment–books, maps, and other publications (W076)	$1.7	0.1%
Equipment and materials testing–books, maps, and other publications (H276)	$1.2	0.0%

Table 14. Federal Information Market, FY 2010–FY 2015 Q2

Products and Services (Product Service Code)	Contracts (in US$ millions)	Pct. of All Contracts
Microfilm, processed (7670)	$1.1	0.0%
Hydrographic maps, charts, and geodetic products (7642)	$0.8	0.0%
Other quality control, testing, and inspection–books, maps, and other publications (H976)	$0.8	0.0%
Sheet and book music (7660)	$0.7	0.0%
Installation of equipment–books, maps, and other publications (N076)	$0.2	0.0%
Inspection–books, maps, and other publications (H376)	$0.1	0.0%
Books, maps, and other publications (76)	$0.0	0.0%
Total	$3,093.9	

Although some contractor names in tables 15 and 16 are difficult to interpret—namely "Miscellaneous Foreign Awardee" and "Miscellaneous Foreign Contractor"—these entries are reproduced verbatim from the FPDS–NG.

Table 15. Top 50 Contractors in the Federal Information Market, FY 1979–FY 2015 Q2

Contractor (Parent Company)		Contracts (in US$ millions)	Pct. of All Contracts
1	West Publishing Corp. (Thomson Reuters)	$707.9	5.7%
2	Reed Elsevier	$619.1	5.0%
3	GeoEye Inc. (DigitalGlobe)	$464.2	3.7%
4	Computer Sciences Corp.	$376.8	3.0%
5	Primus Solutions, Inc. (Arctic Slope Regional Corp.)	$369.7	3.0%
6	EBSCO	$326.8	2.6%
7	IHS Global	$287.3	2.3%
8	Gartner Inc.	$207.2	1.7%
9	DigitalGlobe Inc.	$204.4	1.6%
10	Swets and Zeitlinger BV	$155.3	1.2%
11	Lockheed Martin Corp.	$141.5	1.1%
12	Wolters Kluwer	$139.7	1.1%
13	Faxon Company	$123.6	1.0%

Table 15. Top 50 Contractors in the Federal Information Market, FY 1979–FY 2015 Q2

	Contractor (Parent Company)	Contracts (in US$ millions)	Pct. of All Contracts
14	American Chemical Society	$123.2	1.0%
15	Bureau of National Affairs	$112.2	0.9%
16	Dun and Bradstreet	$111.3	0.9%
17	XMCO Inc. (Koniag Inc.)	$110.9	0.9%
18	Boeing Co.	$108.3	0.9%
19	McGraw-Hill, Inc.	$106.1	0.8%
20	Cenveo Inc.	$95.6	0.8%
21	Techna-Graphics Inc.	$89.5	0.7%
22	Basch Subscriptions Inc.	$87.6	0.7%
23	Cambridge Information Group Inc.	$85.6	0.7%
24	Miscellaneous Foreign Contractors	$84.1	0.7%
25	Altegrity Inc.	$82.4	0.7%
26	Pearson Education (Pearson)	$78.4	0.6%
27	Key Book Service Inc.	$72.9	0.6%
28	Hewlett-Packard Co.	$72.4	0.6%
29	Alutiiq Business Services (Afognak Native Corporation)	$70.4	0.6%
30	Alaska Newspapers Inc. (Calista)	$70.0	0.6%
31	All Native Services	$68.4	0.5%
32	Labat-Anderson	$68.4	0.5%
33	Readmore	$68.0	0.5%
34	GCI Information Services Inc.	$67.4	0.5%
35	Western Publishing Co. Inc.	$63.6	0.5%
36	Information International Associates Inc.	$62.3	0.5%
37	ChoicePoint Inc.	$60.8	0.5%
38	Cartech Inc.	$60.0	0.5%
39	Internet Systems, Inc.	$54.5	0.4%
40	Andrulis Corp. (Dynamics Research Corp.)	$53.6	0.4%
41	American Overseas Book Co.	$52.7	0.4%
42	CSR Inc.	$50.6	0.4%
43	International Health Terminology Standards Development Organisation (IHTSDO)	$47.8	0.4%
44	Academy for Educational Development	$43.3	0.3%
45	EADS North America Holdings Inc.	$42.4	0.3%

Table 15. Top 50 Contractors in the Federal Information Market, FY 1979–FY 2015 Q2

Contractor (Parent Company)		Contracts (in US$ millions)	Pct. of All Contracts
46	GTE	$42.3	0.3%
47	Cox Subscriptions Inc.	$42.1	0.3%
48	Pattison Group Inc.	$39.7	0.3%
49	Scholastic Corp.	$37.9	0.3%
50	Logical Technical Services Corp. (Sentrillion)	$36.7	0.3%
Total		$6,746.8	53.6%

Table 16. Top 50 Contractors in the Federal Information Market, FY 2010–FY 2015 Q2

Contractor (Parent Company)		Contracts (in US$ millions)	Pct. of All Contracts	Last Five Years as Pct. of All Years
1	Reed Elsevier	$293.5	9.5%	47.4%
2	West Publishing Corp. (Thomson Reuters)	$268.5	8.7%	37.9%
3	Primus Solutions, Inc. (Arctic Slope Regional Corp.)	$173.8	5.6%	47.0%
4	EBSCO	$102.0	3.3%	31.2%
5	Dun and Bradstreet	$81.5	2.6%	73.2%
6	Swets and Zeitlinger BV	$68.7	2.2%	44.2%
7	All Native Services	$68.4	2.2%	100.0%
8	American Chemical Society	$65.4	2.1%	53.1%
9	IHS Global	$60.2	1.9%	20.9%
10	Cambridge Information Group Inc.	$57.7	1.9%	67.5%
11	Wolters Kluwer	$55.2	1.8%	39.5%
12	Basch Subscriptions Inc.	$52.4	1.7%	59.8%
13	Miscellaneous Foreign Contractors	$51.6	1.7%	61.4%
14	Cox Subscriptions Inc.	$38.5	1.2%	91.4%
15	International Health Terminology Standards Development Organisation	$33.4	1.1%	69.7%
16	DRT Strategies Inc.	$33.1	1.1%	100.0%
17	Bureau of National Affairs	$32.2	1.0%	28.7%
18	Pearson Education (Pearson)	$31.2	1.0%	39.7%
19	Computer Sciences Corp.	$29.6	1.0%	7.8%
20	Economist	$29.2	0.9%	85.5%
21	McGraw-Hill, Inc.	$26.5	0.9%	25.0%

Table 16. Top 50 Contractors in the Federal Information Market, FY 2010–FY 2015 Q2

	Contractor (Parent Company)	Contracts (in US$ millions)	Pct. of All Contracts	Last Five Years as Pct. of All Years
22	Four Points Technology	$24.3	0.8%	100.0%
23	Hewlett-Packard Co.	$22.1	0.7%	30.5%
24	XMCO Inc. (Koniag Inc.)	$21.9	0.7%	19.8%
25	Advanced Educational Products Inc.	$21.8	0.7%	65.1%
26	Boeing Co.	$20.3	0.7%	18.8%
27	Altegrity Inc.	$19.6	0.6%	23.7%
28	QuickSeries Publishing Inc.	$19.2	0.6%	55.5%
29	Library Associates Inc.	$18.4	0.6%	56.3%
30	Pattison Group Inc.	$16.3	0.5%	41.0%
31	Alutiiq Business Services (Afognak Native Corp.)	$15.8	0.5%	22.5%
32	State of California	$15.3	0.5%	65.0%
33	Bulletin News LLC	$14.8	0.5%	57.1%
34	Complete Book & Media Supply Inc.	$14.0	0.5%	59.6%
35	Westat Inc.	$13.6	0.4%	40.0%
36	Mackin Book Co.	$13.3	0.4%	51.9%
37	LRP Associates Ltd	$11.7	0.4%	46.3%
38	Finmeccanica Spa	$11.2	0.4%	95.4%
39	John Wiley & Sons Inc.	$11.0	0.4%	70.3%
40	Gartner Inc.	$10.6	0.3%	5.1%
41	Northrop Grumman Corp.	$10.5	0.3%	22.0%
42	Education Media and Publishing Group Ltd.	$10.2	0.3%	54.4%
43	Carahsoft Technology Corp.	$10.1	0.3%	97.7%
44	Verizon Communications Inc.	$9.8	0.3%	94.8%
45	Heitech Services Inc.	$9.6	0.3%	71.8%
46	New Directions Technologies Inc.	$9.1	0.3%	31.1%
47	University of Maryland System	$8.8	0.3%	49.9%
48	ICG Group Inc.	$8.5	0.3%	100.0%
49	University of Utah	$8.3	0.3%	59.0%
50	State of Texas	$8.2	0.3%	59.1%
Total		$2,061.0	66.7%	

Table 17. Top 10 Contractors for Web-Based Subscriptions (D317), FY 2010–FY 2015 Q2

Contractor (Parent Company)		Contracts (in US$ millions)	Pct. of All Contracts
1	West Publishing Corp. (Thomson Reuters)	$108.61	14.5%
2	Reed Elsevier	$106.37	14.2%
3	Cambridge Information Group Inc.	$35.44	4.7%
4	International Health Terminology Standards Development Organisation (IHTSDO)	$33.52	4.5%
5	DRT Strategies Inc.	$33.34	4.5%
6	Four Points Technology	$23.60	3.2%
7	Cox Subscriptions Inc.	$22.37	3.0%
8	EBSCO	$20.42	2.7%
9	IHS Global	$17.22	2.3%
10	Dun and Bradstreet	$15.47	2.1%
Total		$416.37	55.6%

Table 18. Top 10 Contractors for Books and Pamphlets (7610), FY 2010–FY 2015 Q2

Contractor (Parent Company)		Contracts (in US$ millions)	Pct. of All Contracts
1	American Chemical Society	$59.92	9.2%
2	West Publishing Corp. (Thomson Reuters)	$59.91	9.2%
3	Basch Subscriptions Inc.	$44.98	6.9%
4	Reed Elsevier	$31.42	4.8%
5	Pearson Education (Pearson)	$30.10	4.6%
6	EBSCO	$26.91	4.1%
7	Wolters Kluwer	$25.53	3.9%
8	Miscellaneous Foreign Contractors	$23.08	3.6%
9	XMCO Inc. (Koniag Inc.)	$22.16	3.4%
10	QuickSeries Publishing Inc.	$19.01	2.9%
Total		$343.03	52.8%

Table 19. Top 10 Contractors for Administrative Support, Information Retrieval (R612), FY 2010–FY 2015 Q2

Contractor (Parent Company)		Contracts (in US$ millions)	Pct. of All Contracts
1	Reed Elsevier	$76.21	13.3%
2	Dun and Bradstreet	$63.92	11.1%
3	Primus Solutions, Inc.	$58.33	10.2%
4	West Publishing Corp. (Thomson Reuters)	$48.15	8.4%
5	Hewlett-Packard Co.	$22.12	3.8%
6	IHS Global	$13.78	2.4%
7	Westat Inc.	$13.65	2.4%
8	State of California	$10.22	1.8%
9	State of Texas	$8.17	1.4%
10	Wolters Kluwer	$6.06	1.1%
Total		$320.61	55.8%

Table 20. Top 10 Contractors for Administrative Support, Library (R605), FY 2010–FY 2015 Q2

Contractor (Parent Company)		Contracts (in US$ millions)	Pct. of All Contracts
1	Primus Solutions, Inc. (Arctic Slope Regional Corp.)	$116.23	24.6%
2	Library Associates Inc.	$18.46	3.9%
3	Computer Sciences Corp.	$18.24	3.9%
4	Altegrity Inc.	$17.24	3.7%
5	EBSCO	$12.38	2.6%
6	Heitech Services Inc.	$9.54	2.0%
7	University of North Carolina System	$8.69	1.8%
8	University of Maryland System	$8.67	1.8%
9	University of Utah	$8.31	1.8%
10	Wilson Information Services Corp.	$7.93	1.7%
Total		$225.70	47.8%

Table 21. Top 10 Contractors for Newspapers and Periodicals (7630), FY 2010–FY 2015 Q2

Contractor (Parent Company)		Contracts (in US$ millions)	Pct. of All Contracts
1	Reed Elsevier	$73.33	16.5%
2	Swets and Zeitlinger BV	$56.17	12.7%
3	West Publishing Corp.	$45.51	10.3%
4	EBSCO	$39.75	9.0%
5	Miscellaneous Foreign Contractors	$18.82	4.2%
6	Pattison Group Inc.	$15.97	3.6%
7	Economist	$15.32	3.5%
8	IHS Global	$11.18	2.5%
9	Cambridge Information Group Inc.	$10.58	2.4%
10	Wolters Kluwer	$8.48	1.9%
Total		$295.10	66.6%

APPENDIX 4. Regression Diagnostics and Statistics

The forecast figures in this report are the result of a linear regression analysis. This appendix contains the regression data and output diagnostics, as well as the regression analysis statistics. Please note that all dollar figures are adjusted for inflation, with figures expressed in FY 2009 dollars.

Table 22 contains all data that the researcher used in various regression analyses, and table 23 contains all data used in time series analyses. Regression models incorporating spending data for the years from FY 1979 through FY 2014 had problems with insignificant regression parameters, autocorrelation in residuals, or both. By contrast, these problems did not materialize with regression models based on spending data for the years FY 1999 through FY 2014. Data and graphs of these models suggest that federal spending on information products and services underwent a substantial and sustained increase in the years from FY 1999 through FY 2014 to a generally higher level of spending than the previous years from FY 1979 through FY 1998.

Table 22. Data Used in the Regression Analysis

Fiscal Year	X_i	Federal Spending on Information Commodities, Y_i (in US$ millions)
1979	0	$231.4
1980	1	$160.0
1981	2	$101.4
1982	3	$107.6
1983	4	$104.8
1984	5	$147.3
1985	6	$148.2
1986	7	$109.4
1987	8	$97.6
1988	9	$135.8
1989	10	$122.8
1990	11	$123.8
1991	12	$167.1
1992	13	$214.6
1993	14	$227.7
1994	15	$311.6

Table 22. Data Used in the Regression Analysis

Fiscal Year	X_i	Federal Spending on Information Commodities, Y_i (in US$ millions)
1995	16	$240.0
1996	17	$248.4
1997	18	$289.9
1998	19	$301.1
1999	20	$343.5
2000	21	$362.4
2001	22	$474.5
2002	23	$497.8
2003	24	$715.7
2004	25	$585.0
2005	26	$581.5
2006	27	$681.6
2007	28	$470.4
2008	29	$590.3
2009	30	$515.0
2010	31	$528.1
2011	32	$573.3
2012	33	$570.1
2013	34	$615.3
2014	35	$622.9

Figure 27. Scatterplot of Annual Spending Figures, FY 1979–FY 2014

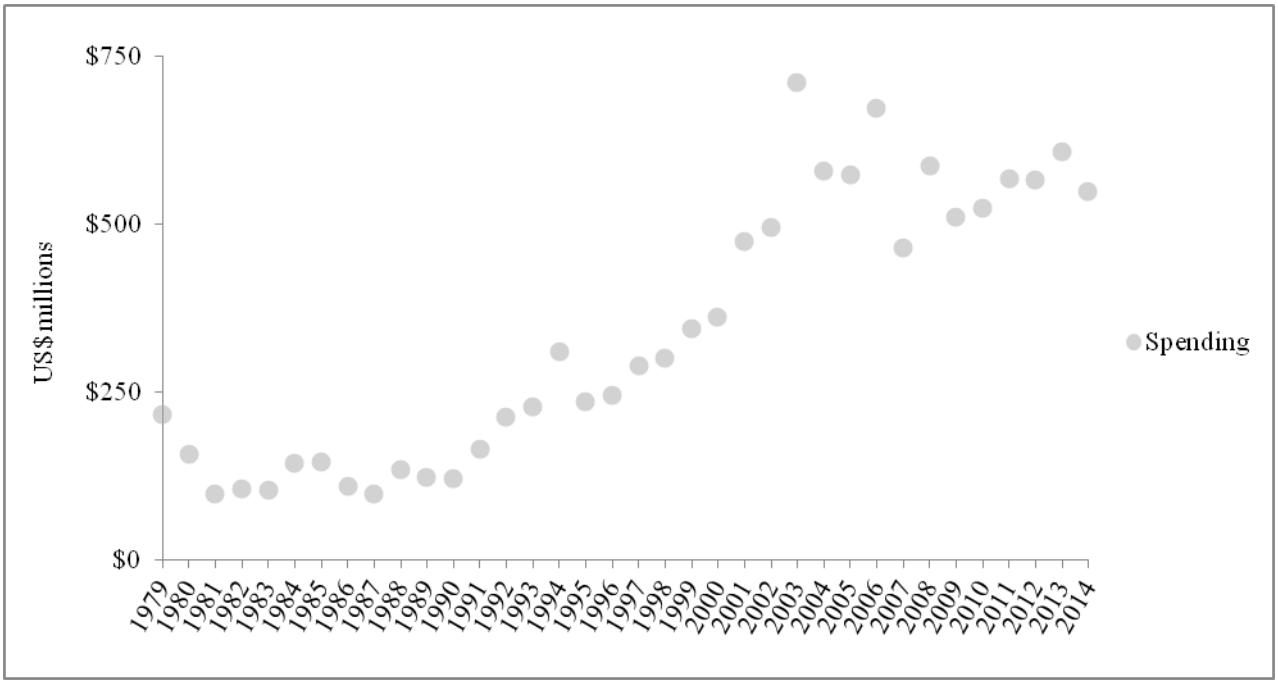


Table 24. Regression Analysis Statistics

ANOVA for Linear Regression Model of FY 1999–FY 2014

	d.f.	SS	MS	F	Sig. F
Regression	1	39,850	39,850	4.926	0.043
Residual	14	113,264	8,090		
Total	15	153,114			

Regression Statistics

Model	FY 1979–FY 2014			FY 1999–FY 2014		
	Linear	Quadratic	Cubic	Linear	Quadratic	Cubic
Multiple R^2	0.8224	0.8332	0.8332	0.2603	0.4105	0.6778
Adjusted R^2	0.8171	0.8231	0.8231	0.2057	0.3199	0.5972
Model Standard Error of Equation ($SE_{\hat{Y}}$)	86.79	85.36	85.36	89.95	83.32	64.12
Durbin-Watson d-Test	0.734	0.773	0.773	1.349	1.654	2.919
$d_{L,1\%}$	1.411	1.354	1.295	1.106	0.982	0.857
$d_{U,1\%}$	1.525	1.587	1.654	1.371	1.539	1.728
4- $d_{U,1\%}$	2.475	2.413	2.346	2.629	2.461	2.272
4- $d_{L,1\%}$	2.589	2.646	2.705	2.894	3.018	3.143
Insignificant parameters (i.e. parameters with 95% confidence intervals containing 0)	None	b2	b3	None	b2	b1

Linear Regression Output

	Coefficient	Standard Error	t Statistic*	P-value	Lower 95% Confidence Interval	Upper 95% Confidence Interval
b_0	464.266	42.9	10.811	0.000	372.162	556.370
b_1	10.826	4.9	2.219	0.05	0.364	21.288

*$t_{0.05,\ 14\ d.f.}$=2.145

Figure 28. Scatterplot of Linear Regression Residuals versus X-Values

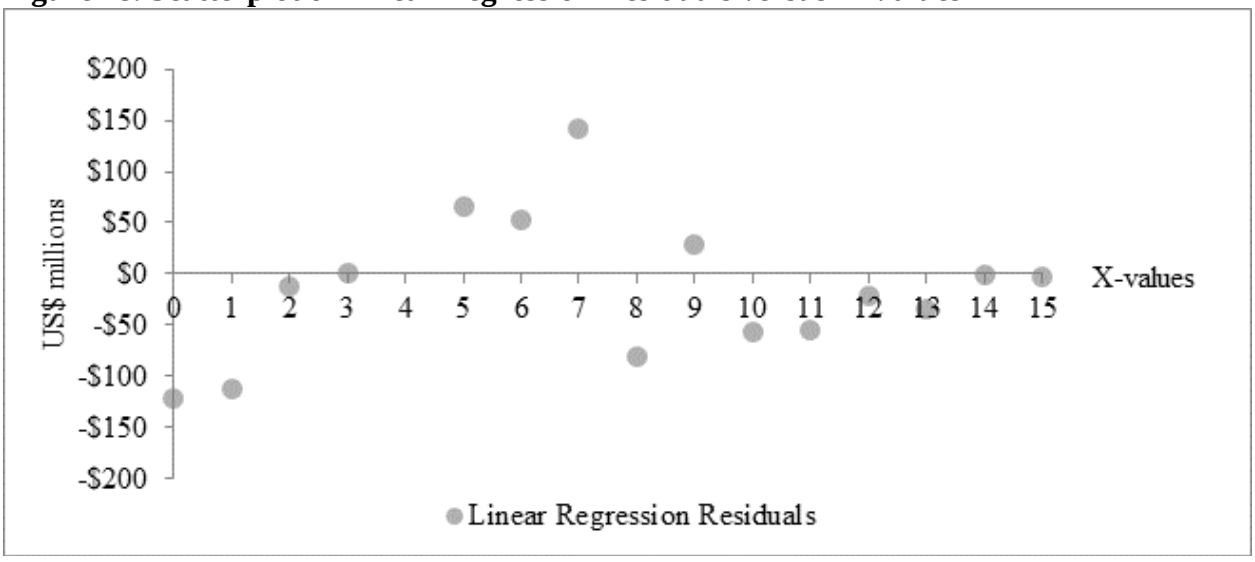


Figure 29. QQ-Plot of Linear Regression Residuals

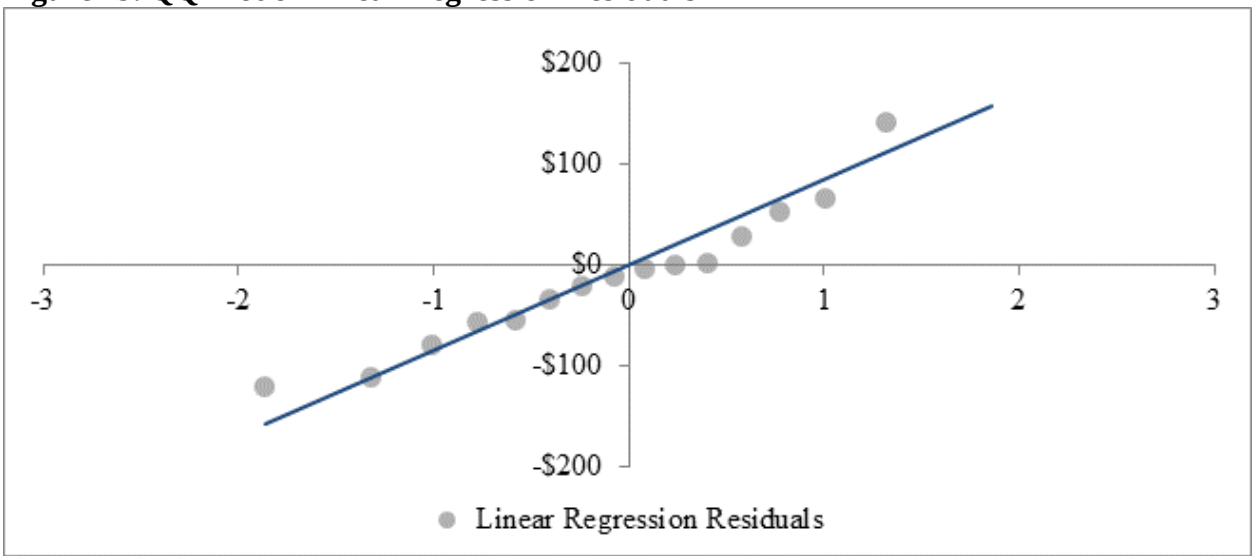
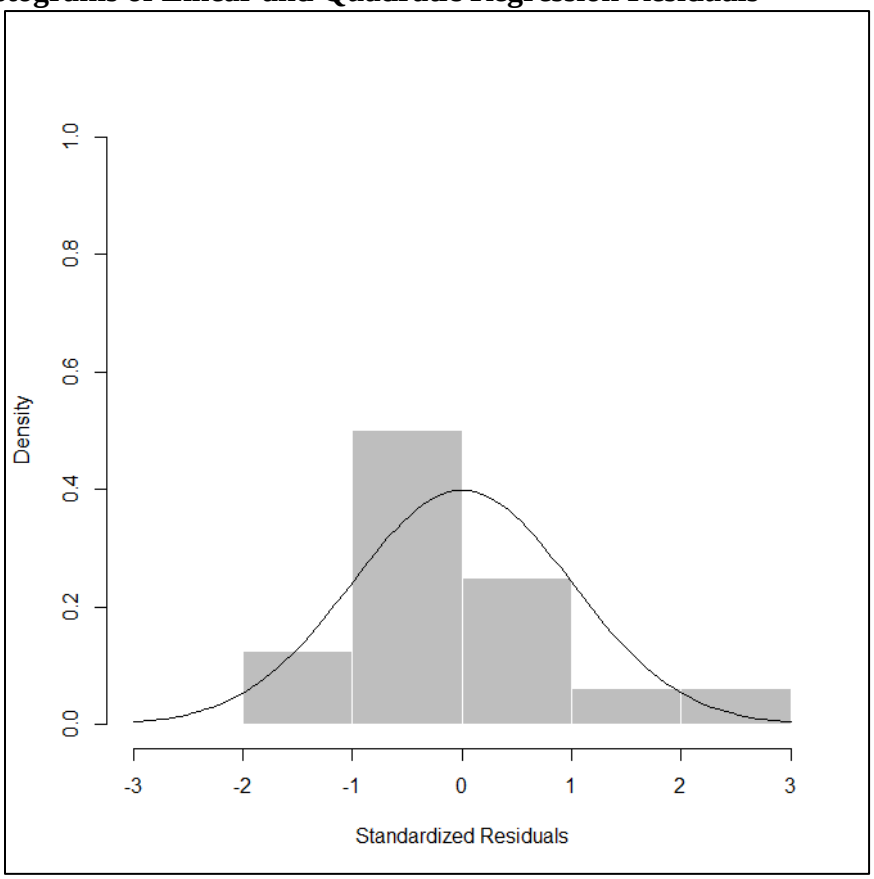


Figure 30. Histograms of Linear and Quadratic Regression Residuals



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