
February 15, 2012

USING ECONOMIC CENSUS DATA TO ESTIMATE THE REVENUE IMPACT OF TAXING SERVICES

By Michael Mazerov

Public finance experts have long identified the failure of states to collect sales taxes on most services purchased by households as a major shortcoming of state tax systems. A 2009 Center report lays out the case for expanded sales taxation of services, including its potential to mitigate erosion of the sales tax base and improve the fairness of existing sales tax practices. The text box on the next page summarizes the major arguments in favor of taxing services.

One of the first questions state policymakers are likely to ask when they consider adding services to the sales tax base is: what would be the impact on sales tax revenue? This is not easy to answer. To make such an estimate, tax policy analysts need to know the gross sales of those services in the state. A first approximation of the potential revenue that would be generated by taxing them is gross sales multiplied by the statutory sales tax rate. Moreover, since states have tended to expand their sales tax bases incrementally, a few services at a time, revenue estimators need to know the in-state gross receipts of services at a disaggregated level. For example, a state might want to tax the fees charged by lawyers for preparing a will or reviewing a real estate contract, but not for representing criminal and civil defendants in court. Just knowing the overall gross receipts of law offices in the state would not permit a reliable estimate of the revenue yield of taxing that narrower group of services.

Fortunately, the U.S. Census Bureau has been collecting and reporting an increasing amount of state-specific data on the gross sales of specific services as part of the Economic Census it conducts every five years. Comprehensive data for the 2007 Economic Census, providing more details than were available in previous versions, were finally published in late 2010 and early 2011. The purpose of this report is to explain:

- what data are available from the 2007 Economic Census that can be used to estimate revenues from expanding the sales tax base to include additional services;
- how to extract the relevant data from the Census Bureau website;
- the types of adjustments needed to translate the data into actual revenue estimates; and
- the limitations of the data.

Why Tax Services?

Levying a sales tax on services satisfies most the criteria by which state tax policy options are normally evaluated.

- **Taxing additional services can generate substantial new sales tax revenue.** The annual nationwide revenue yield from taxing all services purchased by households except health care, education, housing, and a few others would be between \$50 billion and \$100 billion. States that do not tax services to any significant degree – such as California, Illinois, Massachusetts, and Virginia – probably could increase their sales tax revenue by more than one-third if they taxed most of the services that households consume.
- **Taxing services broadly is essential to preventing the long-term erosion of sales tax revenue.** For decades, household spending has been shifting from largely taxable goods to services that are mostly tax exempt. To maintain sales tax revenue in light of this trend, states have had to increase sales tax rates sharply. The ability to continue that practice is constrained, however, by such factors as the ease with which consumers can shift their purchases to the Internet – where sales taxes often are not charged. If consumption continues to shift toward services, including them in the tax base will be essential to maintaining sales tax revenues over the long term.
- **Bringing services into the sales tax base may reduce the year-to-year volatility of sales tax collections.** Sales tax bases are dominated by purchases of “big-ticket” durable goods (such as cars, appliances, and furniture), which often decline sharply during economic downturns. Purchases of some services do not fall as sharply as durable goods purchases do when the economy slows, nor rise as rapidly when the economy is booming, limited research shows. Including more services in the sales tax base could slightly moderate the volatility of sales tax revenues over the course of the business cycle, the research suggests.
- **Expanding the taxation of services will make the sales tax fairer.** The sales tax is intended to be a general tax on consumption. There is little reason to distinguish between consumption of goods and consumption of services, which in fact can be substitutes for one another. For example, it is unfair to tax the person who rents a videotape but not the person who watches a pay-per-view movie on cable TV.

For more detail, see Michael Mazerov, “Expanding Sales Taxation of Services: Options and Issues,” August 10, 2009; www.cbpp.org/files/8-10-09sfp.pdf.

Consistent with the analysis and conclusions of the Center’s 2009 report, this report will focus on estimating the potential revenue yield of expanding the sales tax base to services primarily purchased by households rather than businesses. As the 2009 study discusses at some length, there are compelling economic, distributional, and practical administrative reasons for avoiding sales taxation of services that are sold exclusively from one business to another, such as data processing or rail freight transportation. Accordingly, this report will generally not use such services as examples and will explain how some Census data can be used to separate business-to-business from business-to-household sales of a particular service. That said, states do frequently choose to tax some business-to-business sales of services; moreover, as the 2009 report discusses, they can be justified in doing so under certain circumstances. The Census data do cover such services, and the methodology set forth in this report is equally applicable to estimating the potential revenue yield from taxing them should a state choose to do so.¹

Overview of Revenue Estimating Methodology

To avoid getting lost in some of the detail that will be laid out later in this report, it may be helpful to keep in mind the following roadmap that will be presented for estimating the potential revenue yield of extending the sales tax to a particular service. If the state is contemplating expanding the tax base to include a number of services, this methodology needs to be repeated for *each* one of them:

1. Carefully identify what is and is not encompassed in the specific service being considered for taxation. This step will rely upon the detailed descriptions of service *industries* in the North American Industry Classification System (NAICS) and specific service *products* in the North American Product Classification System (NAPCS).
2. Using NAICS, NAPCS and the analyst's own knowledge, identify all the NAICS industries that produce the specific service that will be taxed. Specific goods and services are defined as taxable under state sales tax laws, not the total sales of particular industries. It is not uncommon for a particular service to be provided by businesses that fall into different NAICS industries. For example, car dealerships and gas stations often perform auto repairs, as do dedicated auto repair shops. The former are classified in NAICS as *retail trade* industries, while the latter are classified as being in one or more *service* industries.
3. Use the Census Bureau's American FactFinder website search tool to access state-specific data from the 2007 Economic Census for the industry or industries identified in Step 2 as producing the service to be taxed. The relevant Economic Census databases for each industry are those titled "Product Lines Statistics." For each industry, identify the specific "product line" that corresponds most closely with the service to be taxed, and total the in-state gross receipts for that product line across the industries that provide or produce it. (For some industries, no state-specific data for individual service product lines are available; only national-level data are available. In those circumstances, it will be necessary to calculate that service's *share* of total nationwide industry receipts, assume that this share is applicable in each state, and multiply the share by total industry receipts for the state to calculate estimated gross receipts from that service in that state.)
4. The Product Lines Statistics cover only businesses that have at least one employee in addition to the owner of the business. However, many service businesses (such as barber and beauty shops, car and appliance repair shops, and dry cleaners) may be operated only by their owners but still account for a significant portion of total state sales of those services. The Census Bureau reports the gross sales of such businesses in a separate data series, "Non-Employer Statistics," which is derived from an annual survey. Unfortunately, while that database does include state-level data, it does not report the gross receipts attributable to specific services. However, such an amount can be estimated by calculating the share of total industry gross receipts in the state that the specific service represents for businesses *with* employees (from the Product Lines data used in Step 3) and then applying that percentage to the total gross receipts for the non-employer businesses in that industry in that state. These estimates would then be added to the estimates derived in Step 3 to estimate the total gross sales of the service in the state by businesses with employees and those without employees, combined.

5. For some industries, the Census Bureau produces a separate publication reporting the share of business gross receipts from sales of the service to household versus business customers. If the state proposes only to tax the service when it is purchased by households, the household share in this report can be multiplied by the total state gross receipts for the service calculated in Step 4 to determine total in-state gross sales of the service to households.
6. The most recent Economic Census reports business gross receipts for calendar year 2007. These data can be “aged” or updated to a more recent year using another Census Bureau database, the “Services Annual Survey.” This database, which reflects an annual sample of businesses rather than a comprehensive census, reports the gross sales of particular NAICS industries for the U.S. as a whole. The percentage increase or decrease in gross receipts between 2007 and the most recent year in the Services Annual Survey (currently 2010) for the industry that is the primary producer of the service under consideration could be assumed to apply to the state gross receipts calculated in Step 4 or Step 5. Alternatively, a broader measure of state economic growth since 2007, such as the change in total personal income, could be used for this purpose.
7. Collecting a sales tax on the purchase of a particular service for the first time is equivalent to increasing its price by the same percentage as the nominal or statutory sales tax rate. That is likely to result in a modest decrease in the amount of the service the consumer will buy, and this should be taken into account in estimating the revenue yield. The magnitude of the decline in total gross sales is uncertain, however. In the absence of clear data, states could reduce the risk of overestimating the revenue yield if they assumed the amount of the service purchased would decline by the same percentage by which its price increased. Thus, if auto repairs were subjected to a 6 percent sales tax, a state could assume that total purchases of auto repair services would decline by 6 percent. Accordingly, the in-state sales or gross receipts of the service being considered for taxation, as calculated following Step 6, should be discounted by the state statutory sales tax rate.
8. The in-state gross receipts for the service calculated in Step 7 is then multiplied by the statutory sales tax rate to estimate the potential revenue from taxing the service.
9. Finally, some reasonable reduction in the potential revenue should be made to account for the fact that there is never 100 percent compliance with any tax, and that compliance with a sales tax is likely to be especially imperfect in the first one to two years until retailers are adequately educated about their tax collection obligations. Recent state experience suggests that a compliance-related discount in the estimate on the order of one-quarter to one-third of the projected revenue for the first one to two years would be reasonable and conservative. A discount of this magnitude would substantially reduce the risk that a state would approve new spending or tax cuts based on a revenue target it would be unlikely to reach.

These nine steps represent the broad outline of a methodology that produces usable and reasonable estimates of the revenue yield from extending the sales tax to a particular service. The remainder of this report will be devoted to offering more specific examples using actual data, explaining additional adjustments or steps that need to be made in the case of certain services, and offering cautions about the limitations and quirks of some of the Census data. Before the revenue-estimating methodology can be described in more detail, however, it is necessary to understand how the Economic Census reports data on the sales of particular services by businesses located in particular states.

Understanding How NAICS and NAPCS Categorize and Describe Service Industries and Products

The Economic Census attempts to survey every individual business location or “establishment” in the United States. The Census form asks each establishment for such information as its total employment, its gross sales, and whether it is a stand-alone business or part of a multi-establishment firm or organization. The business is also asked to report the primary industry category into which it falls under the North American Industry Classification System (NAICS) and, usually, to disaggregate its gross sales into amounts attributable to specific goods and services, referred to as “product lines.”

NAICS Industries vs. NAICS Products and Services

The NAICS classification is based upon the *primary* industry into which the specific business *establishment* falls. The establishment’s gross receipts are broken down into separate product lines because some of the goods or services it sells may also be sold by a very different industry. For example, a bowling alley (NAICS Industry 713950) may well sell fast food (most commonly provided by NAICS Industry 722211, “Limited Service Restaurants”) as well as bowling balls and shirts (most commonly sold by NAICS Industry 451110, “Sporting Goods Stores”). Maintaining a separate classification system for the establishment’s primary industry and the specific goods and services it sells makes it possible to provide a more robust and detailed picture of the source of the establishment’s revenues. So, to continue the example, the use of both an industry and a product classification system in the Economic Census allows the gross receipts of bowling alleys (again, NAICS Industry 713950) to be disaggregated into sales of “bowling center services” (Product and Services Code 31072), “meals and beverages prepared/served/dispensed for immediate consumption” (Product and Services Code 39460), and “resale of equipment for sports & recreational activities” (Product and Services Code 39617), among others. It also reveals what other types of establishments (for example, resort hotels) might contain bowling alleys and the revenues they realize from offering the service.

The data on gross receipts received from the sales of *specific* product lines by businesses in each state are the basic building block of any sales tax revenue estimates; knowing the gross receipts of the overall *industry* is usually insufficient for two related reasons. First, in many cases it is likely that policymakers will choose not to tax all of the services the industry sells, for a variety of economic, distributional, and administrative reasons. For example, while a state might be willing to extend its sales tax to investment advice provided by bank employees, it is unlikely to tax the interest the bank earned on its investments. Accordingly, it would be necessary to have specific data on fees for investment advice; knowing the total gross receipts of banks would not provide useful information. Conversely, it is highly likely that the state is already taxing a significant portion of the gross receipts of many service businesses. For example, even if a state does not tax bowling, it probably *does* tax the bowling alley’s food and bowling ball sales. If analysts attempted to estimate the revenue gain from extending the sales tax to bowling by multiplying the sales tax rate by the gross receipts reported for the entire NAICS industry, they would end up with an overestimate because many of those receipts are already being taxed.

FIGURE 1

North American Industry Classification System (NAICS) Sectors

Sector Number	Description
11	Agriculture
21	Mining
22	Utilities
23	Construction
31-33	Manufacturing
42	Wholesale Trade
44-45	Retail Trade
48-49	Transportation and Warehousing
51	Information
52	Finance and Insurance
53	Real Estate and Rental and Leasing
54	Professional, Scientific, and Technical Services
55	Management of Companies and Enterprises
56	Administrative and Support and Waste Management and Remediation Services
61	Educational Services
62	Health Care and Social Assistance
71	Arts, Entertainment, and Recreation
72	Accommodation and Food Services
81	Other Services (Except Public Administration)
92	Public Administration

Understanding the NAICS Structure

As noted above, NAICS is used to classify the principal industry into which the output of a specific business location or “establishment” falls. It is essential to understand the NAICS structure, because each major NAICS industry grouping has its own separate Economic Census database that must be searched individually for relevant Product Lines data.

Industries are first classified in NAICS as falling into one of 20 major groupings or “sectors;” these are shown – with their NAICS sector numbers – in Figure 1. Four of these sectors – agriculture, mining, manufacturing, and wholesale trade – are almost completely irrelevant to the subject of this report because the industries they encompass produce and/or sell physical goods rather than services. Three other sectors are largely irrelevant because the industries they encompass produce services that most states are unlikely to subject to sales taxes. These are Sector 55, Management of Companies and Enterprises; Sector 62, Health Care and Social Assistance; and Sector 92, Public Administration.² Finally, Sector 44-45, Retail Trade, is also significantly irrelevant to analyzing the revenue impact of taxing services because the vast majority of its gross receipts are attributable to sales of goods. The one significant exception to this is that retail trade establishments frequently provide installation, maintenance and repair services for the goods they sell, and these are services upon which states may consider imposing their sales taxes.³

The remaining 12 NAICS sectors encompass many specific industries that produce services for sale to households that are likely candidates for taxation. It can be difficult, however, to determine

from the sector name alone into which NAICS sector a particular service-producing industry is likely to fall. (It is not self-evident, for example, that self-storage warehouses would be classified into Sector 53, “Real Estate and Rental and Leasing,” rather than Sector 48-49, “Transportation and Warehousing.”) The best way to make a preliminary determination is to examine a list of only the so-called “six-digit” NAICS industries, available at www.census.gov/naics/2007/NAICO607.HTM. Those industries are generally the most disaggregated categories available (some sectors have one further tier of disaggregation), and looking at a listing only of these industries eliminates the confusing hierarchy of NAICS industry groupings.

Among the 12 sectors remaining after the elimination of the goods-producing and other largely irrelevant sectors discussed above, there are approximately 400 six-digit industries. This is a manageable list to peruse when seeking to determine which NAICS industries are likely to produce a particular service states may be interested in taxing. (Indeed, at least half of these 400 industries produce only business-to-business services that states are unlikely to tax.) The NAICS industry listing for which the link is provided above contains links to more detailed descriptions of each industry, which very helpfully include many examples of the types of establishments the industry does and does not encompass.⁴ Where a particular type of establishment is excluded, the description directs the user to the industry the establishment is likely to be a part of. For example, the description of NAICS industry 493110, “General Warehousing and Storage,” states, “Renting or leasing space for self storage are classified in Industry 531130, Lessors of Miniwarehouses and Self-Storage Units.”

Census Products and Services Codes vs. NAPCS

As just discussed, the Census Bureau assigns a specific name and Product and Services Code number to individual product lines, whether they are goods or services. While a comprehensive list of these products and services, together with their code numbers, is available,⁵ there is no glossary that actually describes in detail what the product lines categories encompass. That is not a problem with something straightforward like bowling services, but when it comes to more technical industries, like telecommunications, it is not self-evident to a non-expert what is and is not encompassed in some services.

To understand in detail what is included in particular product lines in the Economic Census, one must rely on the relatively new North American Product Classification System, or NAPCS. NAPCS is a detailed description of all the services produced by the U.S. economy, organized in a hierarchical structure analogous to NAICS. A spreadsheet listing and describing all the NAPCS service categories, titled “All Finalized NAPCS Products,” is available at www.census.gov/eos/www/napcs/finalized/web_All%20Finalized%20NAPCS%20Products.xls. A sample of the available information is shown in Figure 2.

In theory, the names of Products and Services lines in the Economic Census are supposed to be identical to the names of services used in NAPCS; in reality, the synchronization is incomplete and varies significantly among service industries. Where the names are not identical, users need to use their best judgment to determine which NAPCS category most closely corresponds with the Product and Services category used in the Economic Census. This is a very worthwhile exercise, because NAPCS provides the only available detailed description of what the service is and what types of activities it does and does not encompass. While NAPCS includes a numbering structure, as

FIGURE 2

Sample Data from North American Product Classification System (NAPCS) Structure Spreadsheet

1	2	3	4	5	6	7	8	9
Industry Subject Area	Working Group Code	Tri-lateral Detail	National Product Detail			United States		
			Can	Mex	US	Title	Definition	NAICS Industries Producing the Product
48111 (passenger)	1					Scheduled passenger transportation by air	<p>Providing passenger transportation by air from one point to a different point on a flight operated on a regular basis according to a published timetable.</p> <p>Includes:</p> <ul style="list-style-type: none"> • one-way, round trip, open jaw, or other routes. • revenue earned from sale of loyalty program miles or points to third parties. • charges for excess baggage fees, special baggage handling fees, change fees, cancellation fees, call center fees, and other incidental charges paid by passenger to complete the trip. • air transportation sold directly to passengers or through intermediaries such as travel agencies or through airline network agreements. • air transportation provided under contract to third-party payers. • air transportation sold to other passenger transportation providers (airlines and bus companies, etc.) or to tour operators for resale. <p>Continued below.</p>	481111
48111 (passenger)	1 Cont'd						<p>Excludes:</p> <ul style="list-style-type: none"> • reservation service or booking service for an airline flight. • providing passenger transportation from one point to another in chartered aircraft is in product 3.3, Non-scheduled (Chartered) passenger transportation by air. • providing same day-return sightseeing trips by air. • leasing of an aircraft with operator to an air carrier, as an input for providing passenger transportation service, is in product 2, Rental of aircraft with pilot and crew for air carrier use ("Wet Leasing"). 	
48111 (passenger)	1.1					Domestic, scheduled passenger transportation by air	<p>Providing scheduled passenger transportation by air, where the origin, destination, and any and all intermediate stops are within a single country's national boundaries or territories. Service may be on a one way, round trip, open jaw, or other itinerary, but all within a country's national boundaries or territories.</p>	481111
48111 (passenger)	1.1.1	X				Domestic, scheduled passenger transportation by air, first class and business class	<p>Providing domestic, scheduled passenger transportation by air, in luxury or mid-luxury seating arrangements and accommodations during the flight, offering a higher degree of amenity relative to the preponderance of seats within the cabin - commensurate with the highest amenity offered in aircraft with three or more levels of amenity. Additional levels of amenity often include greater seat pitch and size, greater seat comfort, better food and beverage service, and additional levels of staff attention.</p> <p>Excludes</p> <ul style="list-style-type: none"> • service offered in cabins with only a single seat class is in product 1.1.2, Domestic, scheduled passenger transportation by air, coach class. 	481111

Figure 2 reveals, it does not correspond in any way to the Product and Services Code numbers. Accordingly, Product and Services line-items in the Economic Census must be matched to specific services in NAPCS using the name of the service – again, using judgment where the names are not identical.⁶

Steps 1 and 2: Identify the Service Being Proposed for Taxation and the Industries that Produce It

Armed with an understanding of the relationships between the NAICS classification of service-producing industries, the Product and Services categories in the Economic Census, and the NAPCS descriptions of services, the analyst can begin the revenue estimation process. She must first identify in the NAPCS listing the service that most closely corresponds to the definition of the service to be taxed in the draft legislation. If no bill has been drafted, the analyst can get the prospective sponsor’s description of what he or she intends and can recommend that the definition be largely based on the NAPCS definition.⁷

The analyst then needs to try to identify all of the NAICS industries that might receive revenues from selling the service. Fortunately, as indicated in Figure 2, the NAPCS listing contains a column labeled “NAICS industries producing the product;” very often multiple industries will be listed. Use of this list should not be the end of the investigation, however, because it is not necessarily comprehensive.⁸ The revenue estimator needs to use her imagination, knowledge, and general life experience to cast a wide net for the NAICS industries that might contain businesses that sell this service. Keeping the following in mind can aid this process:

- As noted above, installation, repair, and maintenance services for physical goods of all kinds (cars, appliances, furniture, electronics, cameras, etc.) are often provided by the retailing businesses that initially sell them, in addition to service businesses that only do installation or repair.
- Services are often sold by establishments classified in completely different NAICS sectors. For example, hotels often provide services like facials, haircuts, and health club memberships, and a wide variety of businesses may charge for parking, in addition to dedicated parking lots.
- Closely-related NAICS industries in the same NAICS sector are especially likely to provide similar or identical services. For example, there are eight different six-digit NAICS industries performing auto repairs, classified depending upon whether their *primary* repair activity is focused on transmissions, exhaust systems, etc.. But many such shops are likely to perform other types of auto repairs as secondary activities. Similarly, both CPA offices and tax preparation firms prepare tax returns for individuals; both are classified in NAICS Sector 54 as, “Professional, Scientific, and Technical Services,” in consecutive six-digit industries.

Finally, it is important to think about the nature of the service to avoid double-counting or otherwise over-estimating the potential revenue from taxing it. For example:

- Parts installed in connection with a repair service are generally already taxable; any new revenue will come from subjecting the labor charge to sales taxation. The Census Product Lines data

for *retail* industries have separate line-items for labor charges. For other NAICS industries, however, the line-item is for the total repair charge, and (as is discussed in greater detail in Appendix A) it will be necessary to estimate the share of the charge attributable to labor alone using a different Census database.

- Some retailing industries show Product Lines data for both “labor charges for work performed by this establishment” (Product and Services Code 29904) and “labor charges for work contracted out to other establishments” (Product and Service Code 29905). The latter line should not figure into the estimate, because those gross receipts will show up in the “labor charges for work performed by this establishment” of the business to which the work was contracted.
- If the proposed service tax legislation is not clear on the point, it may be advisable to take into account how the state revenue department is likely to interpret the taxability of a service used as an input into the production of another service. For example, if a state is proposing to tax fees received by travel agents for their services, the state revenue department could interpret the tax as applying only to fees paid directly by clients of the agencies; commissions paid to the agencies by hotels might be interpreted as tax-exempt since they are embedded in the price of the hotel room and effectively taxed when the sales tax is applied to the room charge. Applying the sales tax rate to the entire gross receipts received by travel agencies would thus over-estimate the revenue yield of taxing travel agency services.

Step 3: Access/Download Economic Census Product Lines Data

Once all the NAICS industries that seem likely to include business establishments that sell the service of interest have been identified, the state-specific data on business gross receipts attributable to that service can be accessed and downloaded. There are separate Product Lines data tables for each of the 20 NAICS sectors, and if the industries identified as likely producing the service are in more than one sector, then each sector table must be accessed and downloaded separately.

Economic Census data are accessed by using the “American Fact Finder” search tool at <http://www.census.gov/econ/census07/>. This page has individual links to each NAICS sector; clicking on a sector link brings up a list of all tables available for that sector. For all sectors except Sector 23, Construction, the tables that will be accessed are those titled either “Product Lines Statistics by Kind of Business for the U.S.: 2007,” or “Product Lines Statistics by Kind of Business for the U.S. and States: 2007.” (Construction industries are discussed further in Appendix B.) Before accessing the data, it can be filtered to display data only for the state of interest and for all 6-digit NAICS industries, as follows. (As indicated in Figure 3 on p. 14, state-specific data product lines are not available for Sector 22; Utilities; Sectors 48-49, Transportation and Warehousing; Sector 52, Finance and Insurance; and Sector 53, Real Estate Rental and Leasing. A recommended methodology for estimating state-specific product lines data for industries in those sectors is discussed in Appendix C.)

- **Filter to select data for a specific state.** First, click in the small check-box next to the Product Lines table for the sector of interest. Next, click the blue box to the left of that that says “Geographies.” In the “Select Geographies” window that pops up, select the state of

interest by clicking in its check-box. Click “Add” at the top of the window, then close the window by clicking the box at the far upper-right that says “Close.”

- **Filter to display data only for 6-digit NAICS industries.** Next, click on the blue box on the left side of the screen labeled “Industry Codes”. In the window that pops up, click in the box titled “ALL-L6, All available US Industry codes.” Again, click “Add” at the top of the window, then click on the “Close” button at the far upper-right of the window. Finally, click on the blue-highlighted name of the Product Lines table. This will generate a table listing all Product Lines data for the state of interest for all 6-digit NAICS industries in that sector.
- **Filter to display data only for for-profit businesses or for for-profit and non-profit businesses combined.** For some NAICS sectors, the data now displayed will include a column headed “Meaning of type of operation or tax status code.” If that is the case, then some or all product lines data are reported first for “All establishments,” and then disaggregated for “Establishments subject to federal income tax” and “Establishments exempt from federal income tax.” In most instances, states require non-profit organizations exempt from federal income tax to charge sales tax on taxable services they sell, just as they require for-profit businesses to do. If that will be the case for the service of interest, then the data currently displayed can be further filtered to show only the data for “All establishments.”⁹ If non-profits will not be required to charge tax on the service of interest, then the data would be filtered to remove the data for “All establishments” and “Establishments exempt from federal income tax” and display only the data for “Establishments subject to federal income tax.”

To filter based on these criteria, first click the blue-highlighted “Modify Table” menu item toward the top of the screen. Then, within the column heading titled “Meaning of type of operation or tax status code,” click on the blue icon that looks like a funnel. In the pop-up window that appears, choose whichever category of establishments (“All establishments” or “Establishments subject to federal income tax”) is appropriate by clicking in the check-box, then click “OK.”

- **Re-order the displayed data to make it easier to see the service(s) of interest.** Once the data have been filtered using the above steps, the rows can be sorted (re-ordered) to help identify the service of interest and all of the industries within that particular sector that produce it. (Again, if it is known or thought that the same service is produced by industries in different sectors, then the Product Lines databases for those sectors need to be searched as well.) To sort, click the icon with the vertical arrow on it located in the column heading “Product and services code code [sic].” Then click “OK” on the pop-up window that appears. This set of operations has now sorted the Product Lines data so that if the same service is produced by multiple NAICS six-digit industries within that sector, all industries producing it will be grouped together. The entries in the column headed “Meaning of product and services code” can now be visually scanned to find the name of the service or services that were identified earlier using the spreadsheet of NAPCS service names as corresponding most directly to the service(s) proposed for taxation.¹⁰ (The data usually span multiple screens; to scroll them, click on the double up-arrows and double down-arrows on the left side of the table.) And, as noted above, all other product names in that column should also be examined in case the service of interest retains a name from the pre-NAPCS era.¹¹

- **Filter the data to display and download only the service of interest.** Once the row corresponding to the service to be taxed has been identified, the key data item of interest is the value in the column headed “Receipts/Revenue (\$1,000).”¹² *That figure represents the total gross receipts from sales of that particular service in that state by establishments in that industry.* If establishments in more than one NAICS industry in that sector sell that service, their gross receipts will appear on immediately succeeding rows. The figures can either be manually transcribed, or the entire lines of data can be downloaded into a spreadsheet.

In order to download the data only for the service of interest, the table must be filtered again. To do this, click on the “Back to Search” button at the upper left corner of the window. Next, click on the blue “Industry Codes” button on the left. In the pop-up window that appears, click on the “+” icon next to the menu item on the left labeled “Code Type.” Click on the blue “Product and Service” link. This will pop-up a list of all the product lines provided by industries in this sector. (Note that this list is displayed on multiple screens that can be scrolled through by using the page numbers on the bottom-right and upper-right of the pop-up window.) Check the box for the service of interest. (*Be sure to also check the Product and Services Code for the “Industry Total,” which, depending on the sector, is 30000 or 40000. These data may be needed in Step 4.*) Click the blue “Add” label at the top of the window, then close the pop-up window by clicking on the “Close” box at the far upper-right. Again click on the blue-highlighted name of the Product Lines table for that sector that remains on the screen to re-display the data fully-filtered and sorted data. Finally, click on the blue-highlighted “Download” button near the top of the screen, choose the file format you wish to use, click “OK,” and then “Download.”

Step 4: Estimate Sales of the Service by Non-Employer Establishments and Add to Result for Employer Establishments from Step 3

As noted above, the Economic Census reports data only for establishments with at least one employee (in addition to any owner-operator). It is possible to estimate the in-state gross receipts of the service for firms *without* employees using another Census Bureau database, “Non-Employer Statistics.” The latter database does not contain gross receipts data for specific product lines, however, so the Product Lines database in the Economic Census is used to calculate the share of total gross receipts accounted for by the service of interest; that share is then assumed to apply to *non*-employer firms in the same industry. The procedure can best be illustrated using a specific example:

- Suppose Arizona is contemplating extending its sales tax to “pet grooming services.” The execution of Steps 1 through 3 above reveals that this service is provided by establishments in NAICS Industry 812910, “Pet Care (Except Veterinary) Services”; the service corresponds to Product and Services Code 32421 (“Pet care services – pet grooming services”).
- The 2007 Non-Employer Statistics table is accessible at <http://www.census.gov/econ/nonemployer/>. (Even though more recent years are available, the 2007 data should be used to correspond to the year of the full Economic Census.) Click on the blue-highlighted text on the line that reads “Extract and manipulate the data in the New American FactFinder (2004 to 2009).” This will bring up a list of all available Non-Employer Statistics tables for those years. The data are filtered in the same manner as was done with

respect to the Economic Census. Click on the blue “Geographies” button on the left, select the state of interest (Arizona in this case), click “Add,” and then close the pop-up window. Next, click on the blue “Industry Codes” button on the left. At the top of the pop-up window that appears is a heading that reads “Enter an industry, product, or commodity name or code, or use the Industry Code Filter Options Below.” In the box underneath that heading, type in the NAICS industry of interest, in this case 812910. As you type, a drop-down list of available choices will begin to appear. In this case, when you type 81291, the drop-down list will be limited to “81291: Pet care (except veterinary) services.” If you type the additional zero, the drop down list disappears. This means that for this industry, Non-Employer Statistics are only available at the five-digit NAICS industry level. (This is typically the case; only occasionally are data for six-digit NAICS industries available.) Select the item in the drop-down list to put in the box by highlighting and then clicking on it, and then hit the “Go” button. Doing so will pop-up a new window containing only the name of the NAICS industry. Select it by checking the box to its left, click the blue-highlighted “Add” menu item above or below it, then click on the “Close” button in the upper right of the window. Finally, in the list of available tables that now appears, click on the blue-highlighted text reading “2007 Nonemployer Statistics: Geographic Area Series: Nonemployer Statistics for the US, States, Metropolitan Areas: and Counties: 2007.” This results in the display of a single line of data revealing that the 2007 gross receipts in Arizona of non-employer establishments in (five-digit) NAICS industry 81291, “Pet Care (Except Veterinary) Services,” totaled \$27,876,000.

- Re-execute Step 3, but this time when filtering by NAICS industries, choose “All-L5, All Available [5-digit] Industry Codes” since that was the most disaggregated level available in the Non-Employer Statistics database. In this case, the Product Lines database reveals \$24,371,000 of gross receipts for pet grooming services (Product and Services Code 32421) and \$52,437,000 in total gross receipts for Arizona establishments in the five-digit NAICS industry 81291. Thus, pet grooming services represent 46.5 percent of total industry receipts. Assume that the same share of the total receipts of *non*-employer establishments is attributable to providing pet grooming services; 46.5 percent of \$27,876,000 is \$12,962,000. This is added to the \$24,371,000 of gross receipts from pet grooming services for Arizona employer establishments extracted from the Product Lines database, for a total of \$37,333,000 for both types of establishments combined.

Step 5: Possible Adjustment to Eliminate Sales to Particular Classes of Purchasers

States frequently not only exempt certain goods and services from their sales taxes, but certain *purchasers* as well:

- As discussed in the Center’s 2009 paper on sales taxation of services, there can be good tax policy-based justifications for avoiding taxation of services sold from one business to another.
- States cannot legally tax purchases by the federal government.
- States usually also exempt purchases made by state and local government and many types of non-profit organizations.

FIGURE 3:
**Availability of “Product Lines” and “Type of Customer” Data
for Service-Producing Sectors**

Sector	Sector Name	State-Specific Product Lines Data Available?	Type of Customer Data Available?
22	Utilities	No	Yes
23	Construction	See Appendix B	Yes
44-45	Retail Trade	Yes	Yes
48-49	Transportation and Warehousing	No	No
51	Information	Yes	Telecom only
52	Finance and Insurance	No	No
53	Real Estate and Rental and Leasing	No	Yes
54	Professional, Scientific, and Technical Services	Yes	Yes
55	Management of Companies and Enterprises	Yes	Yes
56	Administrative and Support and Waste Management and Remediation Services	Yes	Yes
61	Educational Services	Yes	No
62	Health Care and Social Assistance	Yes	Yes
71	Arts, Entertainment, and Recreation	Yes	No
72	Accommodation and Food Services	Yes	Yes
81	Other Services (Except Public Administration)	Yes	Repair/ Maintenance only

If a state is contemplating extending its sales tax to additional services and wishes to limit the tax to household purchases, the Economic Census contains some data that can be used to estimate the share of total industry receipts attributable just to “business-to-consumer” sales.

Figure 3 lists the availability of data on industry gross receipts by purchaser (“customer”) type for NAICS sectors. When available, these data are contained in databases at the main Economic Census access page (again, <http://www.census.gov/econ/census07/>). For each NAICS sector, they are listed under the heading of “Subject Series: Misc Subjects.” The title of each database is “Revenue/Receipts/Sales by Class of Customer for the US: 2007” or “Revenue/Receipts/Sales by Class of Customer for the US and States: 2007.” Figure 3 indicates whether the data are available for all industries in the sector or only selected industries.

The “Class of Customer” databases do not present results for specific product lines, only for the total gross receipts of an entire NAICS industry. Moreover, for most sectors the results are only available for the United States as a whole. Thus, it is necessary to assume that the share of total gross receipts attributable to sales to households – usually labeled “individuals” in the database – for a particular NAICS industry apply to all services sold by that industry. Where household shares for the industry are only available for the United States, those shares must be assumed to apply in every state. These assumptions may well not be valid, but they are the best that the data permit. If purchases by some types of purchasers will be exempted from taxation, certainly it is better to make some reasonable adjustment for this than none.¹⁵

FIGURE 4:

Sample of “Type of Customer” Receipts Data

Sector 22: Utilities: Subject Series - Misc Subjects: Revenue by Class of Customer for the United States: 2007					
2007 NAICS code	Meaning of 2007 NAICS code	Meaning of Class of customer code	Number of establishments	Revenue (\$1,000)	Distribution of sales, receipts, or revenue (%)
2211	Electric power generation, transmission and distribution	All classes of customer	9,554	445,693,484	100
2211	Electric power generation, transmission and distribution	Residential	X	X	36.7
2211	Electric power generation, transmission and distribution	Commercial	X	X	27.6
2211	Electric power generation, transmission and distribution	Industrial	X	X	12.9
2211	Electric power generation, transmission and distribution	Institutional	X	X	0.8
2211	Electric power generation, transmission and distribution	Government (except utilities)	X	X	1
2211	Electric power generation, transmission and distribution	Government owned utilities	X	X	1.4
2211	Electric power generation, transmission and distribution	Private utilities (including co- ops)	X	X	7.9
2211	Electric power generation, transmission and distribution	All other customers	X	X	11.7

The “Class of Customer” databases are filtered in the same way as the Product Line databases to show the results only for the NAICS industry of interest and (where available) particular states. Figure 4 shows the results when the Class of Customer database for the Utilities Sector is filtered to show the results for NAICS Industry 2211, “Electric Power Generation, Transmission and Distribution.” (No data for NAICS six-digit or five-digit industries were available.) They indicate that 36.7 percent of total receipts of this industry in the United States are attributable to residential customers. If a state were proposing to extend its sales tax only to residential electricity, then this percentage would be multiplied by total gross receipts in a particular state arising from the sale of electricity as determined at the conclusion of Step 4 or Step 5.¹⁴

Step 6: Update the Estimated 2007 Gross Receipts from the Service to a More Recent Year

The 2007 Economic Census data being used here were already more than three years out of date when they were initially released. Someone wanting to estimate the revenue impact of taxing services in 2014 or even early 2015 would still have to use these data because data from the 2012 Economic Census likely will not be published until late 2015. Obviously, it would be desirable to devise some type of reasonable methodology to estimate a more up-to-date value for the gross receipts data contained in the Economic Census.

Fortunately, as was the case with the “Non-Employer Statistics” used in Step 4, the Census Bureau conducts an annual survey of service businesses in between Economic Census years that can be used to update the latter data. Data from this “Services Annual Survey” are also published with a lag, but they are still more current than what is available from the Economic Census.

Data from the Services Annual Survey are available through 2010 (at present) in a set of Excel spreadsheets available under the heading “Latest Annual Services Report” at <http://www.census.gov/services/index.html>; there is one for each NAICS service sector. The data are for the U.S. as a whole, so it is necessary to assume that the national growth rates (positive or negative) in sales of services between the Economic Census year and the most recent survey year are applicable to the specific state. In addition, the data are only available for NAICS industries, not specific service product lines, so it is necessary to assume that the growth rate of sales of the specific service of interest is the same as that of the principle NAICS industry that produces it. If there are reasons to doubt the reasonableness of these assumptions — for example, because the growth rate of the state’s overall economy has been significantly above or below that of the U.S. as a whole over the interval being estimated — then the growth rate of some other statewide economic variable between the Economic Census year and the current year could be used. The rate of change in state personal income or gross state product could be used, for example. Indeed, gross state product data are available by NAICS sectors and for some more-disaggregated industries.

As an example of how the Services Annual Survey data could be used to update Economic Census data, consider again the example used in Step 4 above. At the conclusion of that step it was estimated that 2007 gross receipts in Arizona of establishments providing pet grooming services were \$37,333,000 for employer and non-employer establishments combined. Pet grooming services are a product line provided by NAICS industry 81291, “Pet Care (Except Veterinary) Services.” The Services Annual Survey data for NAICS Sector 81 (available at http://www2.census.gov/services/sas/data/81/2010_NAICS81.xls) indicate that the *national* sales of that industry grew from \$2.346 billion in 2007 to \$2.772 billion in 2010, or by 18.2 percent. Thus, it could be assumed that sales of these services in Arizona experienced the same rate of growth during the same period, rising from \$37,333,000 to \$44,128,000.

Step 7: Adjust Estimated Gross Receipts Downward to Account for Reduced Demand from Tax Increase

Levying a sales tax on the purchase of a particular service for the first time is equivalent to a percentage price increase equal to the nominal sales tax rate. For example, a 6 percent sales tax on

the purchase of an auto repair costing \$100 increases the cost of the repair by \$6, the same as a 6 percent price increase. Common sense and economic theory suggest that an increase in the price of a service may result in a decrease in the amount that consumers will buy and that this should be taken into account in estimating the revenue yield.

Determining the appropriate adjustment is difficult, however, because many things affect how consumers respond to a price increase. For example, people are more likely to reduce their purchases of luxuries than they are of necessities. Since many people need their cars to get to their jobs but don't need to go to the movies, auto repairs may not decline very much (if at all) in the short run in response to imposing a sales tax on them, whereas sales of movie tickets might experience a small decline. The magnitude of any potential reduction in sales also depends on the availability of close substitutes for the newly-taxable services. People can't easily dry clean their clothes at home, and few would start cutting their own hair if that service became taxable. Moreover, if a service were taxed for the first time, people might respond by reducing their monthly savings slightly or buying more of something that is already taxed, so there would be no decline in sales tax revenue. (For example, if a state started taxing pay-per-view movies, people might decide they might as well rent taxable DVDs instead.) Finally, sellers of newly-taxed services might be forced to reduce their prices to offset some or all of the tax increase; this too can mitigate the decline in total purchases that would otherwise occur.¹⁵

It is not feasible to try to estimate how much sales of particular services in particular states would be affected by sales taxes, and it would not be a worthwhile exercise in any case because sales tax revenue estimates are subject to so many different and potentially much larger sources of error. What is needed is a reasonable "rule of thumb" adjustment that can be applied to all estimates across the board. A 2011 study by Georgia State University economists concluded revenue estimates should be lowered by 0.2 to 1.2 times the sales tax rate.¹⁶ (That is, imposition of a 5 percent sales tax on a service was assumed to reduce the amount of the service sold by between 1.0 percent and 6.0 percent.) The upper range of that adjustment may well be too high; a 2000 study by economist Richard Hawkins estimated that the percentage decline in sales generally would be between one-quarter and one-third of the sales tax rate.¹⁷ Nonetheless, if one wished to avoid any significant potential to overestimate sales tax revenue, it could be assumed that the amount of a service purchased would decline by the same percentage by which its price increased.

Consistent with this assumption, the in-state sales or gross receipts of the service under consideration for taxation, as calculated under Step 6, would be discounted by the state statutory sales tax rate. For example, if at the conclusion of Step 6 it had been estimated that gross sales of lawn care services in Maryland in 2009 were \$100 million, it would be assumed that sales of the service would decline by 6 percent, to \$94 million, if the state's 6 percent sales tax were imposed on them. In sum, *even with the application of this very conservative assumption, the state would reap 94 percent of the potential revenue realizable by imposing the sales tax on this service.*

Step 8: Multiply Demand-Adjusted Estimate of In-State Gross Receipts by the Statutory Sales Tax Rate

To determine the potential revenue from taxing the service under consideration, take the calculation from Step 7 — the demand-adjusted estimate of in-state business gross receipts from sales of the service — and multiply that by the nominal or statutory sales tax rate.

Step 9: Consider Lowering the Revenue Estimate to Account for Incomplete Compliance with the Sales Tax

Finally, analysts should consider whether it is advisable to lower the estimated revenue yield to account for what is likely to be less than full seller compliance with the new sales tax collection requirement.

When a service is taxed for the first time, it may take some time for state revenue department officials to write regulations and informal guidance defining the service and answering any related questions from the businesses that sell it (for example, whether sellers of the service can claim exemptions for some of the goods and services they buy in order to produce it). It may take time to identify businesses selling the service and to inform them about their tax collection responsibilities. If some of these businesses are not currently selling *any* taxable goods or services, they have to be registered as sales tax collectors and educated about where, when, and how they need to keep records, file tax returns, and make payments.

It is difficult to generalize about the extent to which these considerations are likely to delay or permanently prevent full compliance with the tax. It will depend on the nature of the service and the sophistication and size of the businesses that sell it, how much lead time there is between enactment and implementation, and whether most of the businesses already sell other taxable goods and services. In Arkansas, the expansion of the sales tax to 15 services in 2004 had been preceded by a year of in-depth discussion and extensive press coverage. Many of the affected businesses were licensed by the state and, therefore, well-known to it. So there was very thorough compliance with the law from the beginning.¹⁸ In New Jersey, which began taxing approximately a dozen new services in late 2006, there is some evidence that compliance was less diligent. Audits completed in 2010 of businesses in the security services industry (which generally would have covered the first three years of implementation) resulted in assessments of additional tax equal to approximately 15 percent of the initial remittances of those firms. Post-audit assessments of landscaping firms, on the other hand, were several times larger than the taxes initially remitted.¹⁹ Of course, the audits likely focused on companies that did not file sales tax returns at all; therefore, the compliance record of these companies was probably much worse on average than that of other landscaping firms.

Although Arkansas' experience in ramping-up compliance with its latest expansion to services appears to have been largely favorable and the data from New Jersey were limited, it nonetheless seems advisable to make some compliance-related reduction in the estimate resulting from Step 8. Especially if the service appears to be provided by many businesses or individuals not currently in the sales tax system, a one-quarter or one-third discount in the revenue estimate in the first year of implementation might not be unreasonable. At the very least, any published estimates that have not

been adjusted should probably include an acknowledgement that compliance issues may affect the timing of revenue realization.

Other Limitations of Economic Census Data

In addition to some of the limitations of the Economic Census data discussed previously — particularly the need at times to rely on national data and assume that national ratios or growth rates apply to specific states — there are others that users need to be aware of:

- **National or regional billing offices for some services can give a misleading picture of the potential revenue yield.** Gross receipts data are reported for the establishments receiving them, not on the basis of where customers are located. It is common for some service businesses, such as cable TV, telecommunications, and other utilities, to collect revenue through a regional or perhaps even national billing office. If a cable TV company has a national bill-processing center in a particular state and that center's receipts are used to estimate state revenues from taxing that service, they will be substantially overstated. Conversely, other states' revenues are likely to be underestimated. The possible difference between business and customer location needs to be kept in mind and investigated. For services where this seems likely, it may be necessary to use other data sources, such as the Consumer Expenditure Survey, to estimate revenue.²⁰
- **Some sales by in-state service businesses to out-of-state customers are likely to be exempted.** Similarly, revenue estimates could be overstated because some of the gross receipts received by an in-state establishment actually performing the service (not merely billing for it) are attributable to out-of-state customers who might well be exempted from the tax. While it is unlikely that a state would exempt from a sales tax on auto repairs a non-resident who brought her car into the state for servicing, it is quite possible that services that can be performed on an interstate basis with no in-state interaction between the provider and the customer (such as a title search or the preparation of architectural drawings) would be exempted if sold to a non-resident.
- **Some of the data sources used under the proposed methodology will bring in some sampling error.** As discussed above, the Non-Employer Statistics and Services Annual Survey data are obtained from a sample of service businesses, not a census. This raises the possibility of sampling error in the estimates, although this is probably a relatively minor concern compared to all the other issues discussed.
- **It is unclear just how accurate the Product Lines sales data really are.** Finally, it is worth keeping in mind that all the data in the Economic Census are gathered through forms sent to harried owners and managers of millions of business establishments. Many are undoubtedly diligent in going back to accounting records to obtain the most accurate information they have on both their *total* gross receipts in the census year and their receipts from various goods and services they sell. For many, however, these figures are undoubtedly an approximation or perhaps even a best guess.

Conclusion

Estimating the revenue that would be generated by starting to tax something that has never been taxed before is difficult and subject to considerable uncertainty. This is especially true with respect to extending state sales taxes to services, given the almost complete lack of state-specific data on household *purchases* of individual services. That said, the Census Bureau has been publishing an increasing amount of state-specific data on business *sales* of services. With some calculations and the making of a few reasonable assumptions, these data can be used to generate what should be reasonably accurate revenue estimates. The author would welcome suggestions for refining the methodology proposed in this report, as well as supplementing it with other types of data.

There is an urgent need for such a methodology, given the growing consideration state policymakers are likely to give to taxing services in coming years. In most states this is a major untapped source of revenue. It seems likely elected officials will look to it in order to finance the service needs of an aging population, an underfunded public retirement system, and a crumbling public infrastructure — to name only three of the major long-term fiscal challenges confronting state governments.

With appropriate consideration of the limitations of both the underlying data and the estimating methodology, adoption of the approach suggested here should provide policymakers with useable estimates of the potential revenue from expanding the taxation of services. As always, it is essential to keep in mind that the actual yield is likely to fall into a range surrounding the “point” estimate the methodology generates. Hopefully, policymakers will proceed cautiously and wait for actual collection experience to validate the estimates before either building even the mid-range of the estimate into their spending plans and/or reducing sales tax rates to offset some or all of the base-broadening. If they act prudently, they should be able to avoid creating serious short-term financial problems while reaping the long-term benefits that an expanded sales tax base promises.

Appendix A: Estimating Labor Charges for Repair, Maintenance, and Installation Services

In most states in which repair, maintenance, and installation of products (for example, cars and home theater systems) are not subject to sales taxes, the parts and other materials used in providing these services *are* subject to tax. Thus, a proposal to extend the sales tax to such services is really a proposal to extend the sales tax only to the *labor charge*, and in order to estimate the revenue yield accurately it is necessary to isolate the labor charge from the total bill.

As noted in the body of the report, many retailers provide repair, maintenance, and installation services for the products they sell. For most types of retailers in NAICS Sectors 44-45, “Retail Trade,” the labor charges are already separately broken out under Product and Services Code 29904, “Labor charges for work performed by this establishment.”²¹ Where that is not the case — for example, for hardware stores (NAICS Industry 444130), where there is a single Product and Services Code 29902 for “Repair and Maintenance Receipts” — it may be advisable to make a conservative estimate that labor charges account for no more than 40 to 50 percent of the total gross receipts.

Most establishments that repair goods but do not sell them are in industries included in NAICS Sector 81, “Other Services (Except Public Administration).” There are eight six-digit NAICS industries that provide various types of vehicle repairs and 10 others that repair other types of goods (such as appliances and furniture). Within these 18 industries there are Products and Services Codes for the repair and maintenance of several dozen specific types of vehicles and other property. None of these codes separate out the labor charge.

Fortunately, however, there is another database for this sector that does separate the labor charges from the materials charges. It is titled “Receipts from Labor Charges and Parts Installed for Repair and Maintenance Services for the US: 2007,” and available at the main “FactFinder” page for the Economic Census. It can be filtered in the same way that all other Economic Census databases are to show results only for all six-digit industries. When filtered in this way, it directly reports the share of each of the industry’s total repair charges attributable to labor under the column heading “Distribution of Lines Receipts (%)” For example, for NAICS Industry 811112, “Automotive Exhaust System Repair,” it shows that labor charges constitute 45.3 percent of total repair charges in that industry.

These data are available only for the U.S. as a whole, so it is necessary to assume that these shares apply to each specific state as well. If, for example, the proposal was to subject only exhaust system repairs to sales taxes in Arizona, the \$5,800,000 in total gross receipts attributable to Product and Services Code 31781, “Other repair for cars & light trucks - Muffler/exhaust repair,” reported for NAICS Industry 811112 would be multiplied by 45.3 percent to determine the labor charges for that service of approximately \$2.6 million.²²

Appendix B: Estimating the Revenue Impact of Taxing Construction-Related Services

At present, only a few states apply their sales taxes to the service of constructing, remodeling, or repairing houses, apartments, and other forms of “real property” (or their subsystems — plumbing, heating, flooring, etc.). Instead, the typical treatment is to tax the building materials when purchased by the construction contractor and to exempt the contractor’s charge to the customer — effectively exempting construction labor services.²³

While housing is a necessity, completely exempting construction labor charges results in states forgoing a great deal of potential sales tax revenue that could be collected from affluent consumers in order to reduce the cost of housing to lower-income households. A tax credit or cash rebate to offset the cost of the sales tax for low- and moderate-income consumers arguably would be a better approach.

Nonetheless, it seems unlikely that the current tax treatment will be radically changed any time soon. Doing so would raise equity issues of its own. For example, people who buy houses or rent apartments already in existence at the time of the tax change would never pay the tax, while future buyers and renters of new dwellings would. Continuing to exempt new construction but deciding to tax more limited remodeling would penalize people who initially could only afford a “fixer-upper” or a smaller house than they will need when their family increases in size.²⁴

One change states might well consider, however, would be to extend their sales taxes to limited repairs and maintenance of real property. This would include things like floor refinishing and painting, as well as plumbing, heating system, and drywall repairs. Unfortunately, the Economic Census data for industries included under NAICS Sector 23, Construction, are not well-suited to estimating the revenue impact of taxing these kinds of services. There are no data for construction industries analogous to the Product Lines data that exist for the other NAICS sectors.

Two Census databases for the construction sector could be useful in revenue analysis, however. The first (again, available at the main American Factfinder page for the 2007 Economic Census) is titled “Value of Construction Work for Establishments by Geographic Area and Type of Construction.” Data are available for individual states on the gross receipts of establishments in the 31 six-digit NAICS construction industries, broken down between gross receipts attributable to “new construction,” “additions, alterations, or reconstruction,” and “maintenance and repair.” For example, the database reveals that New Jersey establishments in NAICS Industry 238230, “Painting and Wall Covering Contractors,” had 2007 gross receipts of \$133.5 million from providing maintenance and repair services to single-family houses and an additional \$39.1 million from providing services to multi-family dwellings like apartments and condominiums.

There are, however, two significant limitations of this data with respect their use for revenue-estimating purposes:

- Even the disaggregated data for “maintenance and repair” services for each six-digit construction industry are not truly analogous to the Product Lines data available for the other NAICS sectors. Just as establishments classified into the NAICS auto transmission repair industry because that is their primary business activity might have a significant side business in repairing exhaust systems, it seems quite likely that establishments classified in the NAICS

painting contractor industry might well have significant receipts attributable to drywall repair. But while the Product Lines data can identify the gross receipts of a transmission shop attributable to exhaust system repairs, the same is not true with respect to the drywall repair services of a painting contractor. Accordingly, if a state chose to tax painting but not drywall repair, the Census data would not permit an accurate estimate.

- The gross receipts data encompass charges for materials, labor, and work subcontracted out (the latter representing a significant share of expenses in construction industries). If states began taxing the labor charge, the contractors would likely begin separately charging the homeowner for the already-taxable materials — just as auto repair shops do. Applying the sales tax rate to the total gross receipts would therefore result in an overestimate of the net revenue yield. Applying the sales tax rate to total gross receipts would also double-count the tax imposed on labor charges incurred by, for example, a plumbing firm that that did repair work as a subcontractor to another plumbing firm.

There is no good solution to the first problem, which generally will result in an underestimate of the potential revenue. (For example, gross receipts attributable to painting performed by a drywall contractor cannot be estimated and therefore would be omitted from a revenue estimate for taxing painting.) The estimate can only use the gross receipts of establishments in NAICS Industry 238230, “Painting and Wall Covering Contractors” (and even then only if the tax is to apply to both painting and wallpapering).

The latter problem, more worryingly, risks an over-estimate of the potential revenue. This risk can be mitigated, however, by estimating the share of the industry’s gross receipts attributable to just direct labor charges. Another Sector 23 database, “Geographic Area Series, Detailed Statistics for Establishments,” contains data on both the total payroll and the total receipts for the industry (the latter is referred to in this particular database as “Value of Business Done”). The payroll share could be calculated, and this share could be applied to the gross receipts attributable to maintenance and repair services. To continue the previous example, this database indicates that total 2007 payroll for New Jersey establishments in NAIC Industry 238230, Painting and Wall Covering Contractors, totaled \$180.5 million, and that the total value of business done was \$584.8 million. The payroll expenses thus represented 30.9 percent of gross receipts in the industry. That ratio could be applied to the \$172.6 million reported above as the gross receipts from maintenance and repair services provided by New Jersey painting and wall covering contractors to estimate that the labor charges alone associated with those services is \$53.3 million. Using the payroll figure in this database also avoids the double-counting of subcontracted labor problem, since the expense only appears as “payroll” for the establishment that actually did the work.

There are two shortcomings of this approach, however:

- The payroll data represent payroll *expenses* of these establishments, not labor charges. It is likely that the expenses would be marked up to some extent if they were directly charged to purchasers. (Otherwise, the company would not earn a profit on its services.)
- The payroll expense-to-total receipts ratio is being calculated for the entire industry. A substantial share of the industry’s gross receipts is likely to be attributable to new construction or major renovation rather than repair. The labor cost share of new construction is likely to be

considerably smaller than it is for repair and maintenance services, which are likely to use fewer materials.

Again, however, both of these factors seem likely to contribute to an underestimate of the potential revenue from taxing the labor component of building repair and maintenance services.

One other somewhat unique characteristic of the construction industry further complicates estimating the potential revenue gain from expanding the sales tax to real estate repair and maintenance services (or construction services more broadly). It is quite common for construction businesses to send their employees to do work in neighboring states. The sales tax would only be imposed by the state in which the service was performed, but the Census gross receipts data would not make a distinction between receipts from in-state and out-of-state work. There is a third Sector 23 Economic Census database that could be used to adjust for this factor. It is titled “Value of Construction Work for Establishments by Location of Construction.” It reveals, for example, that New Jersey painting/wall covering contractors have total gross receipts of \$576 million, \$525 million (or 91 percent) of which was for work performed in New Jersey. The previously-calculated amount of gross receipts of those establishments attributable to repair and maintenance services (\$53.3 million) could be multiplied by that share to arrive at a more conservative estimate of the sales tax base. (Of course, in theory one might also want to look at the same database to determine, for example, the amount of gross receipts of New York painting contractors for work they perform in New Jersey. Given all of the adjustments that have been made in the data already, however, that figure is not likely to be material to the overall total.)

In sum, the Economic Census data have significant shortcomings with respect to their use in estimating the potential revenue from taxing the labor component of construction-related services. This Appendix has provided some suggested workarounds, but it is clear that using them will lead to a much greater degree of uncertainty about the accuracy of the ultimate estimate than is the case with estimates for other services. At the very least, policymakers need to be fully informed of this shortcoming. Alternatively, this may be a set of services for which a different estimating methodology should be explored. For example, the Georgia State Fiscal Research Center study cited earlier (p.17) used data from the Labor Department’s Consumer Expenditure Survey to estimate the revenue yield in that state of taxing various construction and real-estate repair/maintenance services.²⁵

The author would welcome input on possible refinements or alternative solutions to the problems posed by the Economic Census’ construction industry data from analysts who have attempted to use them to estimate sales tax bases.

Appendix C: Estimating State-Specific Product Lines Data for Industries Where It Is Not Available

As noted above (p. 10), state-specific Product Lines data are not available for four NAICS Sectors that produce services: 22, Utilities; 48-49, Transportation and Warehousing; 52, Finance and Insurance; and 53, Real Estate and Rental and Leasing. Accordingly, the best solution appears to be to use the *national* Product Lines data for the industries in these sectors, calculate the *share* of total gross receipts that the particular product line of interest represents, assume that share applies in each state, and apply the share to the total gross receipts for the industry reported for that state.

For example, suppose that analysts in Arizona wished to estimate the revenue impact of taxing “Residential Moving Services,” Product and Services Code 44003, which is provided by NAICS Industry 484210, “Used Household and Office Goods Moving.” The national Product Lines data indicate that this particular service accounts for \$9.0 billion, or 62.1 percent, of the \$14.5 billion of total gross receipts for this industry.

For every NAICS sector there is a database titled “Geographic Area Series: Summary Statistics for the U.S., States. . . : 2007”; this database includes information on the total gross receipts of establishments in every NAICS six-digit industry in every state. When filtered for Arizona and NAICS Industry 484210, it reveals that Arizona establishments in this industry had a total of \$175.9 million in total receipts in 2007. Assuming that the national share of industry sales attributable to “Residential Moving Services” also was applicable to Arizona suggests that total gross receipts from providing this service to Arizona customers in 2007 were 62.1 percent of \$175.9 million, or \$109.2 million.

Notes

¹ This statement requires a significant caveat, however. If states apply their sales taxes to services sold primarily or exclusively from one business to another, they are likely to need to add an additional step to the methodology laid out in this report to reduce the revenue estimate to account for tax-exempt “sales for resale.” States often exempt as “sales for resale” business-to-business sales of goods and services when the product is resold to final consumers in essentially the same form (for example, the physical inventory a retail store buys from a manufacturer and resells without any alteration whatsoever) or when the product comprises a major component of the final product (for example, the payment a TV network makes to the National Football League for the right to broadcast games). It seems likely that many business-to-business sales of services are likely to be granted sale-for-resale exemptions, and the estimated revenue from taxing the service needs to be reduced to account for these exemptions. For example, if a state decides to extend its sales tax to data processing services, it may feel compelled (or be pressured into) exempting those services when they are a major production input for another service business, as they arguably would be for a bank or an airline call center. Making such an adjustment with reasonable accuracy would likely require access to what economists refer to as state-specific “input-output” models, which comprehensively trace the volume of sales made from businesses in a particular industry to businesses in all other industries.

² Because NAICS focuses on classifying the principal activity of specific business locations or establishments, it has the somewhat peculiar characteristic of classifying corporate headquarters of multi-establishment enterprises to Sector 55, Management of Companies and Enterprises, rather than in the industry of the establishments that make its products (whether they are goods or services). The same is true with respect to establishments in the public sector. For example, a public hospital would be classified in Sector 62, Health Care and Social Assistance, but the central office for the city department of health that operates the hospital would likely be classified in Sector 92, Public Administration.

³ There are other, less significant, exceptions. For example, pet supply stores often provide pet grooming services, and large beauty supply stores may have their own in-house salons.

⁴ Most NAICS industry descriptions contain a listing of “Index entries that bring you to this industry.” This listing can be very helpful in understanding the types of businesses the industry encompasses. (The referenced index appears in a NAICS manual that is available only in hard-copy and on a CD-ROM, not online.)

⁵ A spreadsheet of all available product line names and their Census Bureau “Product and Services Code” number is available at www2.census.gov/econ2007/Reference_materials/metafiles/meta1432.txt. The vast majority of these categories describe physical goods sold by manufacturers, wholesalers, and retailers, not services. Services have five-digit Product and Services Code numbers ranging between 34000 and 59810.

⁶ The following example illustrates why some judgment may be needed to match Economic Census product lines and NAPCS service categories. Suppose a state is considering extending its sales tax to the fares received by taxi drivers for providing taxi services to passengers. The analyst charged with making the revenue estimate scans the list of NAICS industries and discovers that Industry 485310 is “Taxi Service.” She downloads the “Product Lines” data for this industry and sees that it includes two separate line-items for “Local Taxi Service” (Product and Services Code 45032) and “Taxicab Services” (Product and Services Code 45060). She wonders what the difference is between those two services. Since there is no Census glossary explaining what each product line in the Economic Census encompasses, she turns to the NAPCS document. The first few digits of the NAPCS product number correspond with the first few digits of the NAICS code of the principal industry that makes the product. Thus, scrolling down the spreadsheet to NAPCS products beginning with code numbers of “485” reveals (at row 576) a product numbered 485-4.3 and titled “Local taxi service,” the same name found in the Economic Census. The description of the service there makes clear that the service is indeed taxi passenger transportation. Scrolling a few rows further down in the NAPCS spreadsheet (to row 583) reveals a service numbered 485-5 titled “Taxicab support services.” These are described as “Providing services to support independent contract drivers and independent taxi cab owner-operators. Includes rental of taxi-cabs, rental of taxi-cab licenses (except by governments), provision of dispatch service, and part-day (or “shift”) rentals.” Although this NAPCS service name differs slightly from the “Taxicab services” name used in the Economic Census corresponding to “Product and Services” code 45060, it is reasonable to assume that it is the same service. (If necessary, this could be confirmed with a call to the Census Bureau industry expert for NAICS Sector 48-49, Transportation and Warehousing; contact information for these experts is available at www.census.gov/econ/census07/www/contact_info/contacts_by_industry.html.)

The description of “taxicab support services” makes clear that the receipts of these businesses do not consist of taxi fares paid by passengers, but, rather, flow from providing exclusively “business-to-business” services to individual taxicab *owners*. Since the state is proposing to tax only taxicab fares, these businesses would be excluded in performing the revenue estimate. Accordingly, the analyst excludes the Economic Census data for “Taxicab Services” from her analysis.

Finally, this is an appropriate place to point out that the NAPCS listing of services is often much more disaggregated than the Economic Census Product Lines categories. For example, in the NAPCS listing, “Local Taxi Service,” product 485-4.3, is broken down further into three categories for taxis hailed on the street, accessed at taxi stands, and dispatched by dispatchers (numbered 485-4.3.1, 485-4.3.2, and 485-4.3.3, respectively). Such disaggregation can be useful in understanding the nature of the services. Nonetheless, because the Economic Census Product Lines data are generally not disaggregated to this extent (at least at present), it would not be possible to accurately estimate the revenue impact if some services at this level of disaggregation were defined as taxable and others were tax-exempt.

⁷ Indeed, as suggested in the Center’s 2009 report (see pp. 35-36), the bill could be drafted to impose the sales tax on the service using the exact name as it appears in the NAPCS list and either replicate the NAPCS description or write that “[service X] means [service X] as defined in the North American Product Classification System as it existed on [effective date of the legislation].”

⁸ For example, the NAPCS service listing contains (at row 4206 of the spreadsheet) service 5617-9.13 titled “Snow removal services for parking lots and driveways.” It says that this service is produced by NAICS industry 571790, “Other services to buildings and dwellings” and NAICS industry 562998, “All other miscellaneous waste management services.” However, the Product Lines database reveals that “snowplowing services” (Census Product and Services Code 33515) are also provided by businesses in NAICS industry 561720, “Janitorial services,” and NAICS industry 561730, “Landscaping services,” even though the term “snowplowing services” does not appear anywhere in the NAPCS service listing.

⁹ “Establishments exempt from federal income tax” includes establishments of federal, state, and local governments in addition to non-profits. There are a small number of services that might be considered for taxation that are sold by such governmental establishments (for example, electricity and sewage hook-ups at campgrounds in state parks). The state might wish to tax the service if provided by a non-profit organization but not the state itself. Moreover, states are prohibited from requiring federal agencies to charge sales tax. Picking up sales of non-profits would require using the in-state gross receipts data for “all establishments,” but this would result in what is likely to be a small overestimate of the revenue yield because it would include tax-exempt sales by governmental establishments.

¹⁰ It is important to note that some specific product lines are aggregations of other product lines. For example, Product and Services Code 36030, “Multichannel programming distribution services (analog & digital)” reports the gross receipts of establishments that sell household cable TV service. The gross receipts shown on that line aggregate the gross receipts for three other subcategories of cable TV service: Product and Services Code 36031, “Basic programming package;” Code 36032, “Premium programming package;” and Code 36033, “Pay per view.” Assuming that the state were proposing to tax all three subcategories, only the gross receipts for the aggregated category would be taken into account in the revenue estimate, otherwise there would be double-counting, resulting in over-estimation of the revenue yield. Product lines that end in something other than zero are subcategories of product lines that appear above them; top-level product lines will always end in zero. Most product lines ending in zero do not have subcategories.

¹¹ For example, as indicated in Note 8, snowplowing services provided by landscaping and janitorial establishments have a pre-NAPCS name, while snowplowing services provided by establishments in the “Other services to buildings and dwellings” and “All other miscellaneous waste management services” industries use the NAPCS convention.

¹² The column immediately to the left, headed “Total sls/rcpts/rev of estabs with line (\$1,000)” presents the total sales in the state of all establishments in that particular industry that sell that particular product line. Those total sales will include sales of product lines other than the one of interest. Moreover, it may well be the case that not all establishments in the industry will have sales of the product line of interest.

¹³ Analysts should of course use their personal knowledge of their state’s economy to evaluate whether national customer shares data are likely to apply and, if not, to make reasonable ad hoc adjustments.

¹⁴ Consistent with the observation in the previous note, an analyst in a state with (for example) a large, electricity-intensive “server farm” or aluminum-processing industry might well conclude that the share of total electricity sales to residential consumers is likely to be somewhat smaller than the national average.

¹⁵ Modeling the imposition of a sales tax on a product market in equilibrium is a standard exercise in basic microeconomics used to illustrate the usefulness of supply and demand curves and to demonstrate that the economic incidence of a sales tax can be partially or entirely on the seller due to a reduction in the equilibrium price. See, for example, Richard A. Musgrave and Peggy B. Musgrave, *Public Finance in Theory and Practice*, Fifth Edition (New York: McGraw Hill) 1989, pp. 249-255.

Despite the theoretical possibility of partial shifting of sales taxes to sellers, it appears that for revenue-estimating purposes most analysts assume that the sales tax *is* fully shifted to the purchaser and that the reduction in the amount purchased depends only on the price-sensitivity (or “elasticity”) of demand:

[The federal] government’s technical staffs typically assume (1) that shifting is the same for all goods and (2) that shifting is full, i.e., consumers bear the full burden. This has also been the standard assumption in most academic studies of sales tax incidence, where it is assumed that prices fully reflect taxes. . . . Timothy J. Besley and Harvey S. Rosen, “Sales Taxes and Prices: An Empirical Analysis,” *National Tax Journal*, June 1999, p. 158.

For example, a 2011 study by the Fiscal Research Center at Georgia State University which used Economic Census data to estimate the revenue impact of extending the sales tax to services in that state, only adjusted the revenue estimate for demand elasticity. (See the section titled “Behavioral Response to Sales Tax on Services,” in Peter Bluestone, “Applying the Sales Tax to Services: Revenue Estimates,” Policy Brief No. 227, Fiscal Research Center, Andrew Young School of Policy Studies, Georgia State University, February 2011, p. 9.) Accordingly, that is the approach recommended here.

¹⁶ See the source cited in the previous note.

¹⁷ Richard R. Hawkins, “Price Elasticities in Consumer Sales Tax Revenue,” *Public Finance Review*, March 2000, p. 177.

¹⁸ Personal conversation with staff of the Arkansas Department of Finance and Administration, November 18, 2011.

¹⁹ Personal conversation with staff of the Tax Division, New Jersey Department of the Treasury, January 25, 2012.

²⁰ For a discussion of using the Department of Labor’s Consumer Expenditure Survey to estimate the revenue yield of expanding the sales tax base to services, see the Georgia State University report cited in Note 15 and a longer predecessor study: John Matthews, David L. Sjoquist, and John Winters, “Revenue Estimates for Eliminating Sales Tax Exemptions and Adding Services to the Sales Tax Base,” Fiscal Research Center Report No. 170, October 2007.

²¹ For auto dealers, the comparable product lines are Product and Services Code 29916, “Labor charges to customers for work performed by this establishment,” and Code 29931, “Labor charges to insurance company for work performed by this establishment.” There is also a line for Product and Services Code 29947, “Labor charges for warranty and extended contract work by this establishment.” States may choose not to tax the latter labor charges (which are usually to the manufacturer rather than the car owner) and instead tax the value of the extended service contracts (Code 29943, “Value of Service Contracts”).

²² Of course, it is unlikely that this specific service alone would be subjected to tax. Moreover, other NAICS industries besides Industry 811112 perform exhaust system repairs.

²³ John F. Due and John L. Mikesell, *Sales Taxation: State and Local Structure and Administration*, Second Edition, (Washington, DC: Urban Institute Press) 1994, pp. 97-100.

²⁴ This discussion, of course, ignores the extensive theoretical literature on the appropriate taxation of housing under a general consumption tax, which involves estimating for owner-occupied homes a monthly taxable value equivalent to what they would pay to rent their own homes on the open market.

²⁵ See the sources cited in Notes 15 and 20.