

# Constructing a PCE-Weighted Consumer Price Index

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## Abstract

The Bureau of Labor Statistics (BLS) uses consumer expenditure and pricing data derived from four major surveys to estimate price changes published in the Consumer Price Index (CPI). One of the four surveys, the Consumer Expenditure Survey (CE), produces data that are primarily used to construct expenditure category weights, or “item” weights. The Bureau of Economic Analysis (BEA) also estimates consumer expenditures for publication of Personal Consumption Expenditures (PCE) in the National Income and Product Accounts. This paper evaluates current CPI methods by constructing comparative price indexes for 2005-2010 that utilize weights derived from PCE data instead of expenditure weights constructed from CE data.

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## 1. Introduction

Consumer Expenditure Survey (CE) data are a source of frequent debate in the federal statistical community. Because CE data are derived from household surveys, arguments ranging from population and item coverage bias to inaccurate reporting have been cited as disadvantages.<sup>2</sup> However, alternatives are few and far between, and CE data have many advantages, including scope and population specificity. CE data are utilized in a variety of sources, but definitely one of the most important uses of CE data is in the construction of weights for the U.S. Consumer Price Index (CPI). Reported expenditures in the CE survey are used to calculate the relative importance, or expenditure weight, of each item category in the index. In order for the CPI to be an accurate measure of price change, it is vital that the weight data are accurate and representative of the appropriate population. If there is a systemic bias in the CE weights, the resulting CPI could be biased.

An alternative source of consumer expenditure data for use in the CPI is the Personal Consumption Expenditures (PCE) component of the National Income and Product Accounts (NIPA), produced by the Bureau of Economic Analysis. These data are based on a census of establishments and a variety of other sources rather than on a single survey, and they are widely used as a measure of consumption expenditures. This paper examines the accuracy and reliability of CPI data by comparing the official CPI, based on CE expenditure weights, to one based on PCE expenditure levels using a PCE over CE spending factor. These comparisons examine indexes for the years 2005-2010. Two alternative indexes are constructed for the analysis. The first of these indexes uses PCE expenditure levels with CPI item definitions without adjusting PCE data for coverage differences (for example the inclusion of expenditures for rural households) or conceptual differences (for example PCE's inclusion of employer-provided health insurance). The other index uses PCE expenditure levels adjusted for CPI item definitions, and CPI coverage and concepts. Doing this will allow us to gain a better understanding of item representativeness and item response accuracy in the CE-sourced CPI aggregation weights. It will

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<sup>2</sup> Garner, Thesia I., George Janini, William Passero, Laura Paszkiewicz, and Mark Vendemia provide a brief chronology of work comparing CE and PCE in "The CE and the PCE: a comparison." Monthly Labor Review, September 2006, pp. 20-46.

also be useful in providing a check of the two data sources against each other. Both PCE and CE measure consumer expenditures, but they do so with very different approaches.

## **2. Data and Hybrid Index Design**

Previous work has studied weighting bias, deflator differences, and expenditure ratios between PCE and CE in order to stimulate discussion and methodological improvement. This paper will build upon that body of work by reconstructing CPI aggregation weights using PCE expenditure levels and item definitions in order to create hybrid indexes. These hybrid indexes use CPI index methodology and CE expenditure data to construct weights as the CPI does; however, CPI expenditures in the hybrid index aggregation weights are multiplied by factors that adjust them to PCE expenditure levels. The following pages will discuss the realities of creating such PCE-calibrated CPIs using current CPI methodology and will describe both results and drawbacks of such work. Designing a PCE-calibrated CPI will be especially valuable to the current discussion of CE design, as it gives us a better idea of whether CE item response is both accurate and representative.<sup>3</sup> We see this not only through the closeness of the match between the CPI-U and a PCE-calibrated index but also through the item relative importance differences between the two.

To create PCE-calibrated indexes, a concordance between CPI and PCE item classifications is required. With this concordance, PCE expenditures can be approximately matched to CPI item classifications and used to adjust the CPI expenditure weights to the levels where they would be if the CE reported expenditures at the same level as PCE. This constitutes the PCE scope index in this study: a PCE-calibrated, PCE-valued index. The PCE scope index will be referred to as PCE1 in this paper. The second created index goes one step further and tries to maintain the CPI structure but account for PCE expenditure definition differences using factors derived from secondary sources. These factors adjust PCE expenditures to match CPI expenditure definitions where necessary. For example, both PCE and CPI measure eggs and milk expenditures in the same way, but they measure medical expenditures differently:

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<sup>3</sup> For a description of the current CE redesign project, see <http://www.bls.gov/ce/geminiproject.htm>.

CPI only uses out of pocket consumer spending for medical goods and services including insurance premiums, whereas PCE takes into account all expenditures made both by and on behalf of consumers for medical goods and services, taking into account additional expenditures such as employer and government contributions. Therefore, this secondary index includes a factor that adjusts PCE medical expenditures to include out of pocket payments only. This index will be referred to as PCE2 for the purposes of this paper. The methodology section below will elaborate on this process.

## **2.1 Previous Consumer Expenditure Data Comparisons**

Numerous authors have undertaken important research into the comparison of PCE and CPI data on consumer expenditures in order to examine the quality and accuracy of CE. This previous work delves further into potential causes of bias and error between PCE and CE. Lebow and Rudd (2003) approached the issue of weighting bias in the CPI after the 1990s brought about tremendous change in CPI methodology.<sup>4</sup> They constructed a set of PCE weights to compare to CPI weights in the same time period by performing a variety of adjustments to PCE data and then aggregating the weights. They excluded out-of-scope items, adjusted medical, housing, and education expenditures to more closely align with CPI values, and attempted to adjust for population using a factor. Fixler and Jaditz (2002) compared the CPI and the PCE deflator, the BEA's price index computed from PCE data, and attempted to derive the magnitude of index difference attributable in 1992-1997 to each type of major difference: formulaic, conceptual, and implementation-related.<sup>5</sup> They focused on what they called an "accounting" solution that attempted to adjust for each of the major differences and calculate its ratio of the index discrepancies; Fixler and Jaditz did not attempt to examine weighting or pricing issues directly. McCully, Moyer, and Stewart (2007) build on work like that by Fixler and Jaditz to expand the time period addressed forward to 2007 and calculate formula, scope, weight, and "other" effects, such as seasonal adjustment, that cause

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<sup>4</sup> See Lebow, David E. and Rudd, Jeremy B. "Measurement Error in the Consumer Price Index: Where Do We Stand?" *Journal of Economic Literature*, March 2003, pp. 159–201.

<sup>5</sup> See Fixler, Dennis and Jaditz, Ted. "An Examination of the Difference Between the CPI and the PCE Deflator." BLS Working Paper 361, June 2002.

fundamental differences between the deflator and the CPI.<sup>6</sup> Garner, Janini, Passero, Paszkiewicz, and Vendemia (2006) have produced a variety of papers in which they construct and update expenditure category ratios between PCE and CE data.<sup>7</sup> Those authors construct ratios for both comparable and non-comparable goods and services categories, taking care to examine each category in their paper and explain the caveats to the comparison and provide some reasons why ratios differ from one. A ratio of one would indicate a perfect expenditure match for a given item category between PCE and CE. Many other authors including Clark (2003), Triplett (1978 and 1981), Parker (1994), Schultze and Mackie (2002), and others have also examined the PCE and CPI; the work of the authors mentioned above adds to the debate about differences between the two subjects.

All of the papers discussed above bring to light a variety of fundamental issues in attempting to relate PCE and CE or CPI data. Garner, Janini, Passero, Paszkiewicz, and Vendemia (2006) explain data collection methodology differences between the two. CE obtains its data through a series of diary and interview surveys of consumers. In contrast, PCE data come from a variety of data sources but are primarily derived from the quinquennial Economic Census, with data from trade and industry surveys to supplement in the off years (or non benchmark years). Many authors speak of the item scope differences between the two surveys. As McCully, Moyer, and Stewart (2007) explain, CPI includes out of pocket consumer expenditures and PCE includes purchases both by and on behalf of consumers. Two big conceptual differences discussed by Fixler and Jaditz (2002) are population and implementation at the component level. In most cases, they argue, CE data should be a subset of PCE data. PCE includes expenditures by military personnel and third party payers such as employers that CE does not allow. However, there are some areas in which CE and CPI go outside of the bounds of PCE. PCE does not include items that it considers coercive, such as vehicle registration and licensing, which are included in both CE and the Consumer Price Index. PCE also does not include CPI and CE items such as lawn mowers and garden tractors, household maintenance and repairs, and fishing and hunting licenses. There

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<sup>6</sup> For more information see McCully, Clinton P., Brian C. Moyer, and Kenneth J. Stewart. "A Reconciliation between the Consumer Price Index and the Personal Consumption Expenditures Price Index." September 2007.

<sup>7</sup> See Garner, Thesia I., George Janini, William Passero, Laura Paszkiewicz, and Mark Vendemia. "The CE and the PCE: a comparison." *Monthly Labor Review*, September 2006, pp. 20-46.

are even differences in definition between items that match each other in the two indexes, such as apparel and food. In many cases, PCE and CPI categories will be a perfect match, except that the item classification results in CPI arranging items in a way that is slightly different from how it is done in PCE. For example, CPI and PCE apparel categories concord perfectly, except that CPI includes wallets, umbrellas, and purses in apparel under accessories. PCE includes these items not in apparel but in luggage. Some of this structure knowledge is derived from concordance research conducted as a collaborative effort between the CE, CPI, and PCE offices at the Bureau of Labor Statistics and Bureau of Economic Analysis (Blair, Cage, Garner, McCully, and Passero 2011).

Garner, Janini, Passero, Paszkiewicz, and Vendemia (2006) note that previous studies have shown that although underreporting in CE and diminished representativeness or respondent accuracy may be a cause for the difference between PCE and CE results, the magnitude of PCE revisions indicates that there are potential estimation issues coming from those data as well. Issues may also arise in the way that PCE uses a variety of data sources. The general consensus among authors who studied both PCE and CE data was that one could not be chosen as the whole source of bias and difference between the two, and all agreed that there was further work to be done.

## 2.2 Index Methodology

Two experimental indexes were constructed in this study: an index that is PCE-calibrated using PCE valuation of consumption (PCE1) and an index that is PCE-calibrated using CPI valuation of consumption (PCE2). PCE1 was created in the following manner:

1. A CPI entry level item<sup>8</sup> (ELI) to PCE series code<sup>9</sup> concordance was created with input from the BLS and the BEA. This was done because the CPI uses a proprietary classification system that does not align perfectly with the PCE system: there exist many goods and services that

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<sup>8</sup> More information on ELIs can be found in BLS Handbook of Methods Chapter 17 (<http://stats.bls.gov/opub/hom>): “Within each item stratum, one or more substrata, called entry-level items (ELIs), are defined. There are a total of 305 ELIs, which are the ultimate sampling units for items as selected by the BLS national office. They represent the level of item definition from which data collectors begin item sampling within each sample outlet.”

<sup>9</sup> PCE series code names and definitions can be found in National Income and Product Accounts (NIPA) Underlying Detail *Table 2.4.5U. Personal Consumption Expenditures by Type of Product*. Further information about the PCE series structure is available in the NIPA Handbook at <http://www.bea.gov/national/pdf/NIPAchapters1-9.pdf>.

are classified in general categories in one system and into disaggregated categories in the other system or that have different definitions between PCE and CPI, and there is no easy match between the PCE and CPI classification codes. In the concordance, ELIs were assigned to the lowest-level matching PCE series code publicly available. Although this was sometimes a perfect match, sometimes multiple ELIs matched to one broad PCE code and sometimes an ELI had to be split between multiple PCE codes in the concordance. Using this concordance, all ELIs were broken down into one of three categories: out of PCE scope, one PCE series code per ELI, and multiple PCE series codes per ELI. One example of an ELI that falls outside the scope of PCE is TF011:

<b>Table 1: Out-of-Scope ELI Example</b>				
<b>ELI</b>	<b>ELI Description</b>	<b>PCE Series Code</b>	<b>PCE Description</b>	<b>Allocation Ratio</b>
TF011	STATE VEHICLE REGISTRATION AND DRIVER'S LICENSE	N/A	N/A	0.00

An example with the other two types of ELIs can be seen below in appanel:

<b>Table 2: In-scope ELI Examples</b>				
<b>ELI</b>	<b>ELI Description</b>	<b>PCE Series Code</b>	<b>PCE Description</b>	<b>Allocation Ratio</b>
AA021	MEN'S UNDERWEAR, HOSIERY AND NIGHTWEAR	DMBCRC	Men's and boys' clothing	1.00
AA022	MEN'S ACCESSORIES	DMBCRC	Men's and boys' clothing	0.93
AA022	MEN'S ACCESSORIES	DLUGRC	Luggage and similar personal items	0.07

The ELI AA021 maps into only one PCE series code, DMBCRC. AA022, however, maps mostly into DMBCRC but also maps in part to DLUGRC. This is because CPI includes wallets and umbrellas in apparel, whereas PCE includes those items in luggage.<sup>10</sup>

2. Allocation ratios were assigned to each ELI-PCE code combination so that all ratios for an ELI summed to one.<sup>11</sup> All ELIs that matched perfectly to one PCE code, regardless of the number of ELIs per PCE code, were given a value of '1' as in the example above for ELI

<sup>10</sup> The ELI-to-PCE-series-code concordance can be viewed on the CPI website at <http://www.bls.gov/cpi/cpipceconcd.pdf>.

<sup>11</sup> If the ELI did not completely map to PCE, i.e., part but not the ELI but not the entire ELI was out of PCE scope, then the ratios for that ELI would sum to the percentage of ELI expenditures that were within scope for both CE and PCE. For example, the ratios for EE031, "Other Information Services", sum to approximately .98 because a small web services component of that ELI does not map to PCE at all.

AA021. ELIs that are not included in the scope of PCE were given a value of ‘0’, as shown above in the TF011 example.<sup>12</sup> All other ELIs were divided into their component PCE series codes using underlying CE expenditure data at the observation level. For most ELIs, this meant using data at the CE Diary survey level. For the few split ELIs that are only available in the interview portion of CE, an even split ratio was provided for all PCE codes that mapped to the ELI. This was the case in two education ELIs and one other goods and services ELI. In the apparel example above, a scan of all 2003-2008 AA022 Diary data showed that 7% of all AA022 expenditures were wallets and umbrellas, whereas 93% of AA022 consisted of other accessories. Therefore, the AA022 allocation ratios are 0.93 for DMBCRC and 0.07 for DLUGRC.

3. The ratios were multiplied by CE expenditure data and then summed by PCE code assignment to create a set of total CPI expenditures by PCE code for each year in the period.
4. Using NIPA underlying table 2.4.5U, *Personal Consumption Expenditures by Type of Product* and the CPI expenditure data from Step #3, PCE/CPI factors were created for each PCE series code. For example, in a PCE category where PCE reported \$200 of expenditures and CE reported \$100 of expenditures, the PCE/CPI factor would be 2.
5. The factor was applied to expenditure data and then applied to the CE micro-level data to recalibrate CPI aggregation weights to PCE values for the 2003-2008 period. For example, an ELI that matched one-to-one in definition with a PCE series code would have a recalibration factor of 1. If PCE reported \$200 in expenditures for that PCE code and CPI reported \$100 in expenditures for that PCE code, then the factor would be 2 as in Step #4. Because of the perfect definition match, the PCE calibration for this ELI would simply apply a factor of two to the micro-level data.

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<sup>12</sup> In some cases, it may be possible to find expenditure data in the National Income and Product Accounts that corresponds to these goods and services. However, this study makes no attempt to supplement PCE expenditure data with secondary source data in such a manner to account for item categories included in the CPI but excluded from PCE. A similar procedure could be implemented in a later version of this paper.



6. The adjustments in Step #5 were made for each ELI at the reported CPI expense level. The resulting adjusted costs were then weighted and summed to the elementary CPI item-area category level, annualized for the 2003-2004, 2005-2006, and 2007-2008 expenditure reference periods, and converted into aggregation weights.
7. The new aggregation weights were then used to create indexes for 2005-2010 using standard CPI-U methodology.

Because two market basket structure changes have taken place in the CPI over the past few years, the aggregation weights were adjusted depending on the market basket structure used in that year. The final result of this work was a set of annualized biennial expenditure weights by CPI item-area category that could be used to create PCE1 using CPI index aggregation methods. That is, the indexes presented here all employ the same formula and biennial weight update process used in the CPI-U, whereas the PCE indexes published by the BEA use quarterly weights and a Fisher Ideal index formula.

An important difference between the CE and PCE weights is that the former are calculated and used in the CPI at the item-area level. For example, the CPI employs “apple” category weights for 38 geographic areas and matches them to 38 corresponding area-level basic price indexes. In contrast, PCE weights and indexes are basically at the national level. For this paper, elementary item-area prices and adjusted weights were used. However, the calibration factors and PCE2 adjustment factors were created at a national level and then applied to the local 38-area CPI data. Therefore, for the purposes of this study, we must assume that the PCE/CPI expenditure ratio is uniform across US areas.

To create PCE2, the original recalibration factors were modified by secondary source data to create a new set of factors that not only reflected differences in item definition, but also reflected differences in expenditure definition. The CPI apparel example above is a difference in item definition: CPI wallets and umbrellas are listed in clothing accessories, whereas PCE wallets and umbrellas are included in luggage; the ratios for both PCE1 and PCE2 are created so that the wallet and umbrella value from CPI apparel is recalibrated by PCE luggage expenditures. An expenditure definition difference can be seen in CPI education: CPI higher education tuition reflects only out-of-pocket payments, whereas

PCE higher education tuition reflects all payments – out-of-pocket and third party; the expenditure factor must be adjusted by a constant that represents the average US out-of pocket spending on college tuition as a percentage of total US spending on college tuition. After this proportion adjustment is made, the process aligns perfectly with the process used to create PCE1 in Steps #4-7 above.

In this project, eight adjustments are made to differentiate PCE2 from PCE1, or to adjust PCE categories with different expenditure definitions to fit CPI expenditure definitions. In many cases, this adjustment served to remove third party payments from PCE expenditure data. The adjustments and affected ELIs can be seen in Table 3 below.

<b>Table 3: PCE2 Adjustments by ELI</b>					
<b>ELI(s)</b>	<b>CPI Description</b>	<b>PCE Code(s)</b>	<b>PCE Description</b>	<b>Adjustment Factor</b>	<b>Data Source</b>
All “EB” ELIs	Tuition, other school fees, and childcare	All	All	0.59	NCES <sup>13</sup>
FV051	Board, catered events, and other food away from home	DMSLRC	Meals at schools	0.59	NCES
GD051	Checking accounts and other bank services	DFEERC	Financial service charges and fees	0.08	GJPPV <sup>14</sup>
HA011	Rent of primary residence	All	All	0.98	GJPPV
HD011	Tenants’ and household insurance	All	All	8.00	GJPPV
HF011	Electricity	All	All	1.02	GJPPV
HF021	Utility (piped) gas service	All	All	0.86	GJPPV
HG011	Residential water and sewerage service	All	All	0.69	GJPPV
MA011 and MF011	Prescription drugs	All	All	0.17	AHRQ <sup>15</sup>
MA090 and MG090	Unsampled rent or repair of medical equipment	DOMORC	All other professional medical services	0.17	AHRQ
All “MC” ELIs	Professional medical services	All	All	0.17	AHRQ
All “MD” ELIs except MD031	Hospital and related services	All	All	0.17	AHRQ
All “ME” ELIs	Health Insurance	All	All	0.17	AHRQ
MB023 and MG013	Supportive and Convalescent Medical Equipment	All	All	0.17	AHRQ
All “TD” ELIs	Motor Vehicle Maintenance and Repair	All	All	0.67	GJPPV
TE011	Motor Vehicle Insurance	All	All	2.11	GJPPV

<sup>13</sup> NCES refers to the National Center for Education Statistics publication “What Is the Price of College? Total, Net, and Out-of-Pocket Prices in 2007-2008.” (Wei, 2010)

<sup>14</sup> GJPPV refers to Garner, Janini, Passero, Paszkiewicz, and Vendemia (2006).

<sup>15</sup> AHRQ refers to the Agency for Healthcare Research and Quality’s Medical Expenditure Panel Survey (2008).

For PCE2, student tuition and board expenditures from PCE1 are adjusted to exclude third party payments such as grants using National Center for Education Statistics data on total and out-of-pocket costs of college for American students.<sup>16</sup> Medical expenditures that typically include some insurance payment component are adjusted to exclude third-party payments made by employers, government, and others using data from the Agency for Healthcare Research and Quality’s Medical Expenditure Panel Survey (2008).<sup>17</sup> Utilities, rent, homeowners’ insurance, financial services fees, vehicle insurance, and vehicle maintenance and repair are adjusted using the CE-PCE ratios in Garner, Janini, Passero, Paszkiewicz, and Vendemia (2006) to fit PCE levels. The homeowners’ insurance ratio of 8 is an approximation from the text of the paper rather than an official ratio, and it is used because homeowners’ insurance is included in a large-scope ratio of “other household operations” that has a value closer to 1.03. The ratios from Garner, Janini, Passero, Paszkiewicz, and Vendemia (2006) are not ideal for such an index because they include other factors beyond expenditure difference such as item under- or over-reporting.<sup>18</sup> However, in these cases, quality national data that separated item costs by the expenditure type needed are unavailable.

### **3. Results**

#### **3.1 Item Representation**

In the 2007-2008 annualized weights (which correspond to the 2010 index values), the mean item stratum PCE1-to-CPI-U expenditure ratio was 1.65 – this is a simplified approximation of the ratio that was applied to CE data in Step #3 in order to create weights for PCE1 and PCE2. The mean item stratum PCE2-to-CPI-U expenditure ratio for the same time period is 1.51. It aligns well with the final expenditure totals: at \$9.3 trillion, the 2010 final weighted PCE1 expenditure total was slightly less than

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<sup>16</sup> The National Center for Education Statistics (NCES) data used is derived from Tables 1 and 2 in “What Is the Price of College? Total, Net, and Out-of-Pocket Prices in 2007-2008.” (Wei, 2010)

<sup>17</sup> MEPS data comes from “Medical Expenditure Panel Survey Table 1: Total Health Services-Median and Mean Expenses per Person With Expense and Distribution of Expenses by Source of Payment: United States, 2008.”

<sup>18</sup> The goal of this paper is to produce broad-level PCE/CE ratios to shed a critical light on how the two have changed over the years. These ratios may differ from one for a variety of reasons other than differences in the way category consumer expenditures are measured.

twice the CPI-U expenditure total of approximately \$5.1 trillion. In contrast, the 2010 final weighted PCE2 expenditure total of \$7.5 trillion was 1.46 times the CPI-U total – these expenditure totals correspond with the 2007-2008 annualized weights. The closeness of these numbers is significant because the ratios vary by item, and items with extreme PCE/CPI ratios could skew the weights.

Tables 4 and 5 show more detail for the items with the highest and lowest CPI-U/PCE2 ratios – this is the inverse of the PCE2-to-CPI-U ratio discussed above. These high and low CPI-U/PCE2 ratios can be indicative of item representation issues or of areas where the PCE2 adjustments could be more finely tuned. “Child Care and Nursery School”, as seen leading Table 4, is an excellent example of this. Babysitting, a person-to-person component of child care, frequently involves payments between individuals and is therefore more likely to be represented in the CPI. For the purposes of this paper, child care in one’s home has been zeroed out in the ratio allocations to account for this definition difference, because that is the lowest accurate level at which the “Child Care and Nursery School” data can be disaggregated to remove babysitting. However, not all in-home child care is considered to be babysitting, which may be the cause behind the high ratio seen below.

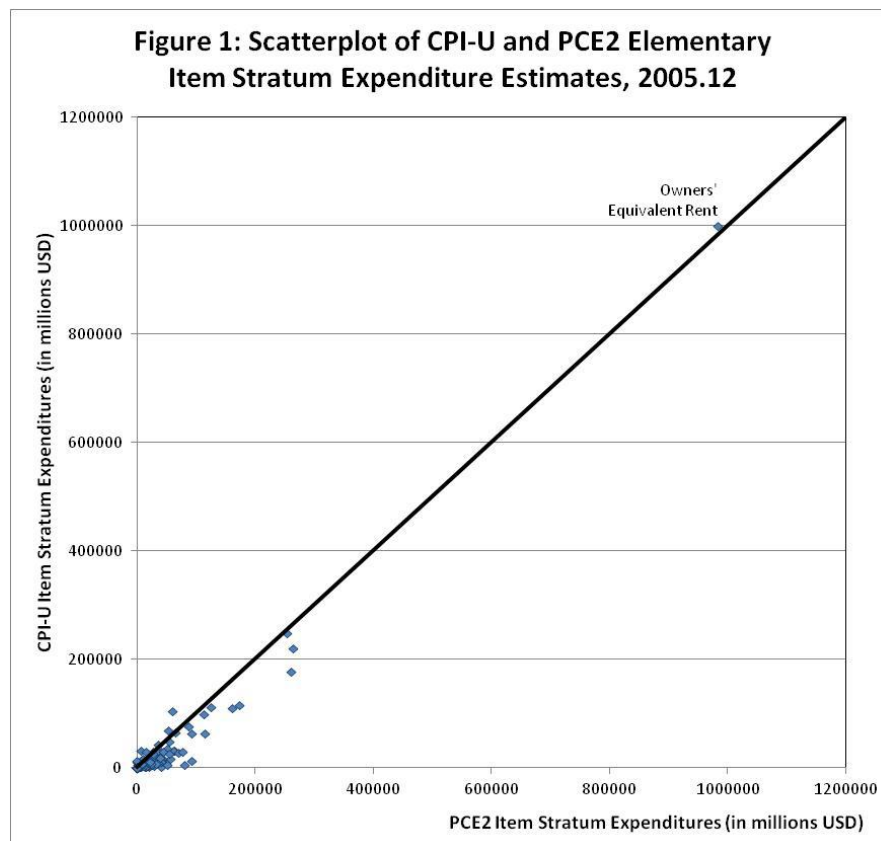
<b>Table 4: Top 5 CPI-U/PCE2 Expenditure Ratio Maximums</b>								
<b>ITEM</b>	<b>ITEM DESCRIPTION</b>	<b>2005 RATIO</b>	<b>ITEM</b>	<b>ITEM DESCRIPTION</b>	<b>2007 RATIO</b>	<b>ITEM</b>	<b>ITEM DESCRIPTION</b>	<b>2009 RATIO</b>
SEEB03	Child care and nursery school	4.155	SEEB03	Child care and nursery school	4.556	SEEB03	Child care and nursery school	4.182
SEMC03	Eyeglasses and eye care	2.529	SEMC03	Eyeglasses and eye care	2.820	SEMC03	Eyeglasses and eye care	2.708
SEMC02	Dental services	2.006	SEHE02	Other household fuels	2.450	SEHE02	Other household fuels	2.640
SEHE02	Other household fuels	1.806	SEMC02	Dental services	2.112	SEMC02	Dental services	1.986
SEHB02	Other lodging away from home including hotels and motels	1.763	SEHB02	Other lodging away from home including hotels and motels	1.623	SEME03	Health Maintenance Plans	1.509

In Table 5, item strata with the lowest CPI-U/PCE2 expenditure ratio can be seen – this is equivalent to the highest PCE2/CPI-U expenditure ratio. Item strata that consistently have much higher PCE2 expenditure levels than CPI-U expenditure levels include “Floor Coverings”, “Other Video Equipment”, and “Technical and business school tuition and fees”. In the maximums table, there are

multiple notable medical item strata, which is indicative of the possibility that the broadly applied medical expenditure adjustment used in PCE2 may not be a perfect fit for all medical expense categories.

<b>Table 5: Bottom 5 CPI-U/PCE2 Expenditure Ratio Minimums</b>								
ITEM	ITEM DESCRIPTION	2005 RATIO	ITEM	ITEM DESCRIPTION	2007 RATIO	ITEM	ITEM DESCRIPTION	2009 RATIO
SEGD01	Legal services	0.136	SEFW02	Distilled spirits at home	0.136	SEEE02	Computer software and accessories	0.131
SEEE02	Computer software and accessories	0.133	SEEE02	Computer software and accessories	0.117	SEFW02	Distilled spirits at home	0.131
SEEB04	Technical and business school tuition and fees	0.132	SEMD03	Care of invalids and elderly at home	0.112	SEHH01	Floor coverings	0.117
SERA03	Other video equipment	0.128	SERA03	Other video equipment	0.099	SEEB04	Technical and business school tuition and fees	0.087
SEHH01	Floor coverings	0.100	SEHH01	Floor coverings	0.090	SERA03	Other video equipment	0.087

Figures 1 and 2 show scatterplots of the CPI-U and PCE2 expenditure values for each item stratum, with rent and a few other large expenditures such as tuition and vehicles excluded in Figure 2 so that all other item trends may be more easily examined. From these scatterplots, it is easy to see the number of items that have a PCE2/CPI-U ratio close to 1.



In both figures, a 1:1 ratio line has been used to illustrate item stratum expenditure level trends; items below the line have a higher PCE2 expenditure level than CPI-U expenditure level, while items above the line have a higher CPI-U expenditure level than PCE2 expenditure level. A majority of the 211 item strata fall below the line, which indicates, as expected due to the PCE weight adjustments, that overall expenditure levels for most items are higher in the PCE-calibrated CPI-U than in the published CPI-U.

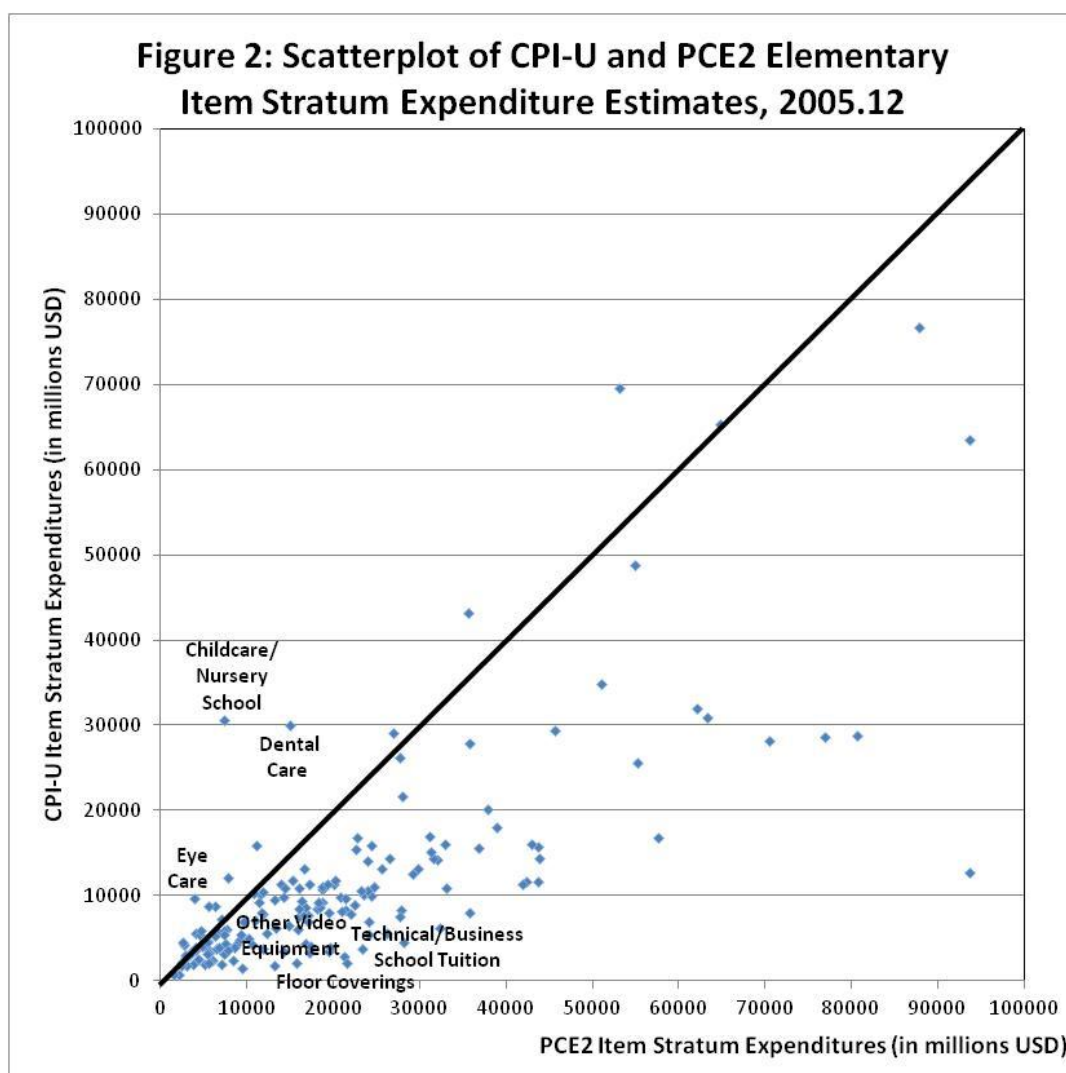


Table 6 shows item category relative importances for the three indexes using December 2005 weights. As one might expect, we see large differences in housing and medical relative importances between PCE1 and PCE2 and small differences in these relative importances between the CPI and PCE2.

Some categories show larger differences between the CPI-U and PCE2, which could be indicative of an item representation issue in CE. Four categories that are commonly cited as being underrepresented in CE due to respondent behavior are apparel, other goods, tobacco, and alcohol. This expectation is supported by the evidence from this study. Tobacco and alcohol, which are believed to be underreported because of their sensitive nature, also have a significantly smaller relative importance in the CPI-U than in PCE2 index. Apparel and other goods may be underreported in CE because of proxy reporting: if only one member reports expenditures for the entire household, they may be more aware of family food, housing, and education purchases than of the clothing and other personal goods purchases made by all household members.<sup>19</sup> Both of those categories also have significantly higher relative importance values in both PCE-calibrated indexes than they do in the CPI-U.

<b>Table 6: December 2005 Item Relative Importances</b>		<b>PCE-Calibrated Indexes</b>	
<b>CONSUMPTION CATEGORY</b>	<b>CPI-U</b>	<b>PCE1</b>	<b>PCE2</b>
<b>FOOD AND BEVERAGES</b>	15.1%	13.8%	17.0%
Food at home	8.0%	7.1%	8.7%
Food away from home	6.0%	4.9%	6.0%
Alcoholic beverages	1.1%	1.8%	2.3%
<b>HOUSING</b>	42.4%	26.5%	32.9%
Rent	5.8%	3.4%	4.1%
Owner's equivalent rent	23.4%	12.9%	15.9%
Other housing	13.1%	10.2%	12.9%
<b>APPAREL</b>	3.8%	4.5%	5.5%
<b>MEDICAL CARE</b>	6.2%	22.3%	5.0%
<b>TRANSPORTATION</b>	17.4%	13.9%	17.3%
Motor vehicles	7.9%	5.3%	6.5%
Gasoline	4.2%	3.4%	4.3%
Other transportation	5.4%	5.2%	6.5%
<b>EDUCATION AND COMMUNICATION</b>	6.0%	5.4%	6.7%
<b>RECREATION</b>	5.6%	6.8%	8.4%
<b>TOBACCO</b>	0.7%	1.0%	1.2%
<b>OTHER GOODS AND SERVICES</b>	2.8%	5.8%	6.0%
	100.0%	100.0%	100.0%

<sup>19</sup> Garner, Thesia I., George Janini, William Passero, Laura Paszkiewicz, and Mark Vendemia provide an in-depth discussion of underreporting in the context of PCE/CE ratios in their 2006 paper.

PCE1 relative importances are slightly different. Because medical care is measured so differently between the two sources (CE and PCE) and therefore carries a large adjustment in this study, medical care makes up almost a quarter of PCE1, but makes up only five percent of the CPI-U and PCE2. In accordance with the other adjustments made to create PCE2, the PCE1 transportation and housing categories have lower relative importances than the corresponding CPI-U and PCE2 categories, while PCE1 education is a bit higher. Slight variations exist in some of the other item categories such as recreation and other goods. This merits further investigation; it is possible that there could be a significant difference in item representation in one of those categories as well.

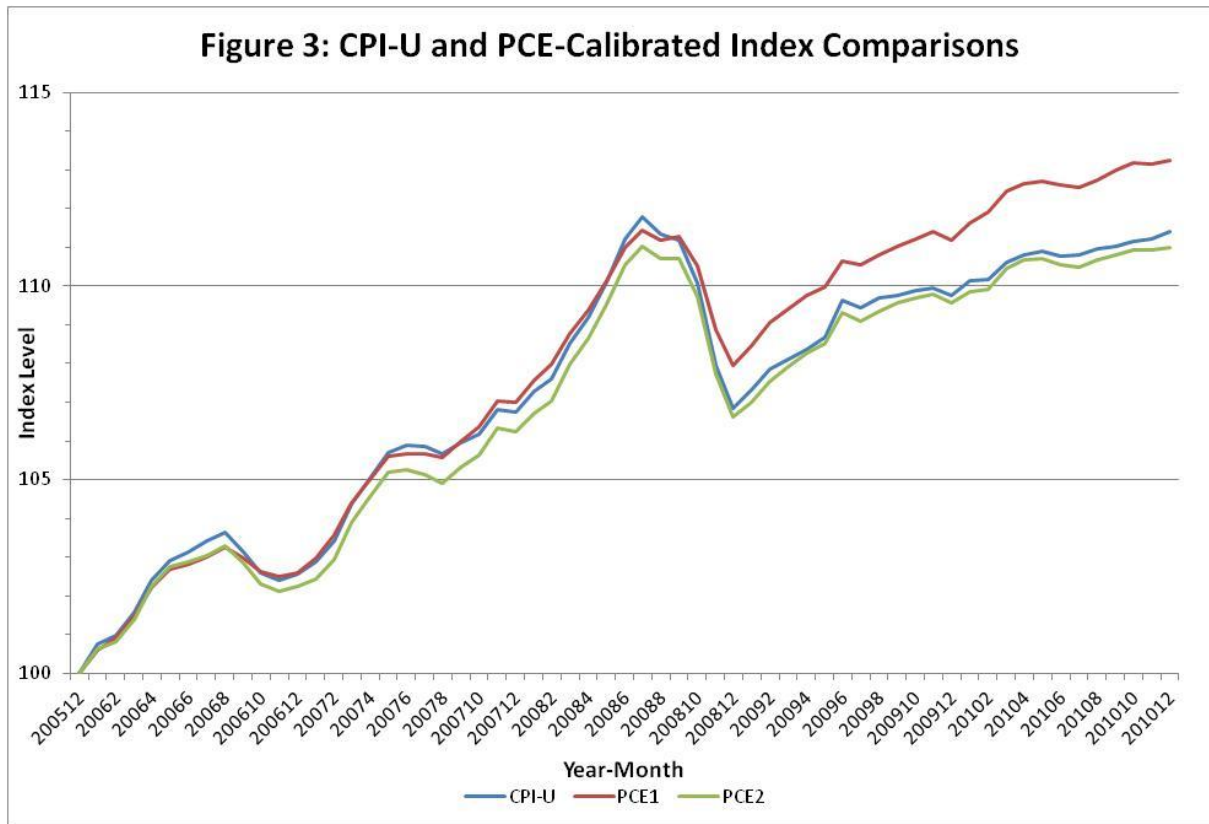
### **3.2 Index Levels and Change**

When the PCE-calibrated indexes are compared to the CPI-U between 2005 and 2010, it is clear how closely the published CPI-U and PCE2 track each other. As shown in Figure 1 above, the CPI-U tends to be slightly higher than PCE2. Overall, though, the PCE2 5-year annualized growth rate is 0.071% lower than the CPI-U 5-year annualized growth rate. In contrast, the PCE1 5-year annualized growth rate is 0.338% higher than the CPI-U 5-year annualized growth rate.

Lebow and Rudd (2003), constructing an index similar to PCE2, concluded that the CPI has an upward bias of approximately 0.1 percent per year due to inaccurate weights. Their conclusion was based on comparison of indexes using CE and PCE weights over the 1987-2001 period, with those weights computed at the 24-item level. This paper, using a later time period and a more detailed weight and index decomposition, shows a difference of 0.071 percent, which is of the same magnitude as Lebow and Rudd's results but slightly lower.

Figure 3 demonstrates the shape and direction of the indexes. As previously noted, both indexes containing the CPI definitions (CPI-U and PCE2) exhibit similar rates of change and rise more slowly than the index that uses PCE expenditure valuation (PCE1). The fact that CPI-U and PCE2 exhibit similar rates of change is logical because their expenditure definitions match in two large categories: medical expenses and education.

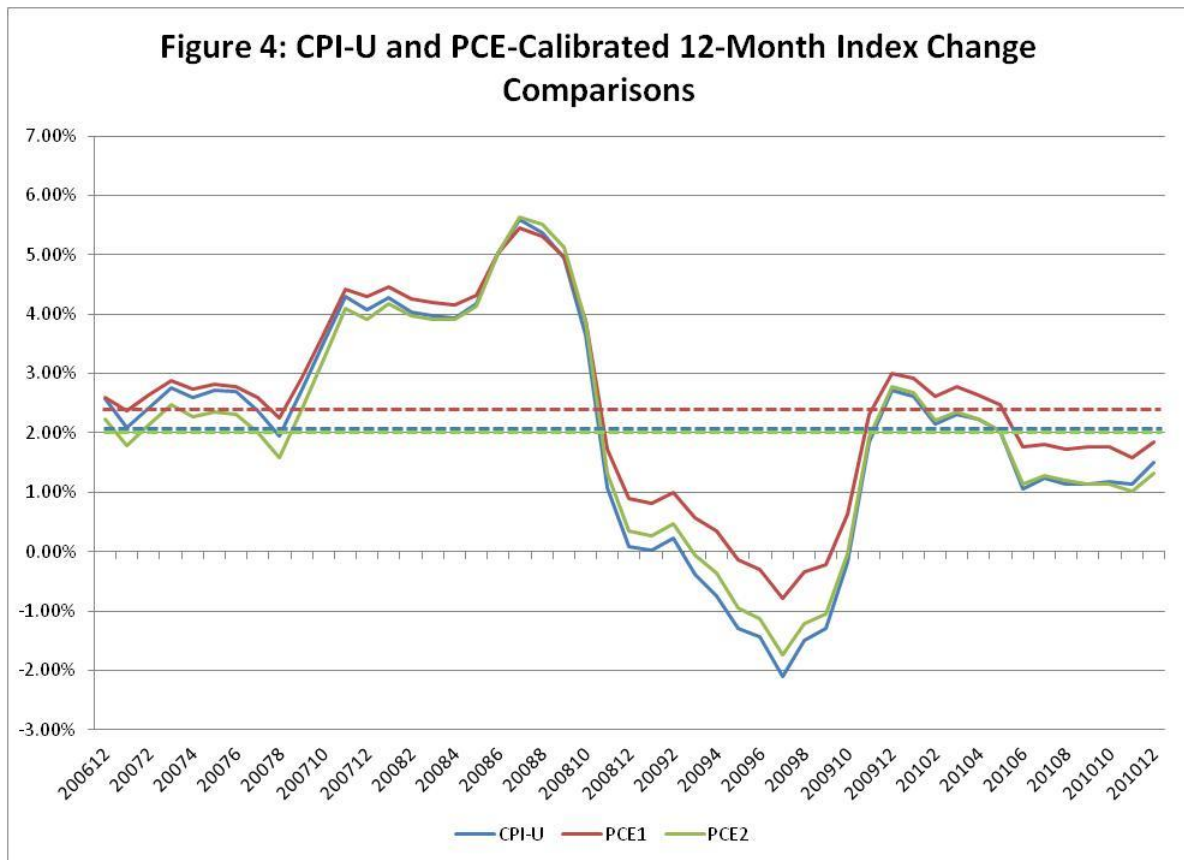




However, Figure 3 also shows that the PCE1 index has risen more quickly than the CPI-U and PCE2 indexes. The PCE1 index series diverges from the CPI-U and PCE2 index series after October 2008. From October 2008 to the end of the study period, the change in the all-items CPI-U index was 1.20%. However, the inflation experience of both medical care and education, items with a significantly larger relative importance in the PCE, was higher during this period at 7.16% and 8.79% respectively. Combined, these categories contribute to a larger rate of inflation for the PCE1 series compared to the CPI-U and PCE2 series. Moreover, the inflation experience for shelter, a category with a lower PCE1 relative importance, was 0.46% – far below the all-items average.

In Figure 4, the 12-month index change values for each of the three indexes can be seen. While 2006-2010 average 12-month index change for the CPI-U is approximately 2.013%, that value is 0.003% lower for PCE2 and 0.441% higher for the PCE1 index. However, the difference between CPI-U and

PCE2 12-month index change ranges from 0.371 to -0.373 over the 2006-2010 period, and this range is evident in Figure 4.



### 3.3 Caveats

As mentioned above, there are a variety of ways in which it is nearly impossible to create a perfect PCE-calibrated CPI due to differences in the nature of the data. Although secondary source data make the ratio estimates for education and medical expenses more useful, they are applied broadly in the creation of PCE2 rather than disaggregated down to the item level. It is unlikely that the ratio of medical expenditures that are paid out-of-pocket by consumers will be identical for the purchase medical specialist services and prescription drugs or primary care doctor visits. It is also possible that the proportions of education expenditures for public and private universities are different between the CPI and the NCES survey from which the tuition ratio is derived. Certainly there are ratios other than those created by Garner, Janini, Passero, Paszkiewicz, and Vendemia (2006) in which the non-consumer portion of the

ratio can be removed in aggregation, although they may be difficult to find in secondary sources. In addition, the populations covered by the aggregate CPI-U and PCE data are very different. CPI-U data cover urban, non-military, non-institutional households, whereas PCE data cover domestic consumers including third parties that make purchases on behalf of consumers. PCE does not include domestic consumers who have been and will be in the country for less than one year.

In the CPI-U, items HA01 and HC01 – the two major CPI housing categories – match their PCE-calibrated counterparts almost perfectly in terms of total expenditure value across all periods. As shown in Figure 1 above, Owners' Equivalent Rent falls extremely close to the  $CPI-U/PCE2=1$  line in 2005. However, the relative importance of housing in the CPI-U is higher than the relative importance of housing in both PCE1 and PCE2 because CE expenditure levels in housing more closely match PCE expenditure levels than expenditure levels in other item categories do; in many item categories outside of housing, CE expenditure levels are lower than PCE expenditure levels.<sup>20</sup>

Other small discrepancies may arise in specifics of the concordance and in the scope of the two consumption datasets; PCE and CPI both contain items that are out-of-scope in the other consumption data. In order to produce the two indexes above, four ELIs from the three market basket structures used had to be removed altogether because they are considered out-of-scope in PCE and therefore have no expenditure value. Vehicle registration and license fees are seen as coercive and not included in PCE, while gardening and lawn services and inside home maintenance and repair are not included in PCE because they are considered to be intermediate expenditures of homeowners. Some additional portions of CPI items, such as hunting and fishing licenses, are excluded from PCE. In such cases, the portion of the ELI that is not used in PCE was removed, causing these ELI proportions to sum to less than one. There is also the potential for item definition differences that were not addressed in the concordance used for this study. This is because CE uses survey data, and item definition interpretations can vary from respondent to respondent. For example, PCE disaggregates the CPI “souvenirs” UCC out to categories that describe the individual components. Guidebooks and programs are included in books, postcards are included in

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<sup>20</sup> See Appendix C for a set of filtered index results where shelter is excluded.

stationery, and t-shirts are a part of apparel. However, determining this disaggregation in the CPI can be nearly impossible because some respondents simply write “\$20 souvenirs” rather than “\$15 t-shirt, \$5 postcards” in the diary portion of the survey.

Finally, an unsolved methodological debate arose during this project that involves the way in which PCE-CPI expenditure ratios were calculated for ELIs that had to be split between PCE codes. Data are PCE-calibrated by fitting CPI expenditures into PCE series categories, but the data must then be mapped back into CPI items (one level above ELIs) in order to construct expenditure weights as CE data are in CPI production. For the purposes of this paper, data were mapped into the item categories corresponding to the ELIs from which their CPI expenditures originally came. However, a future improvement to this methodology would be to identify the CPI items that best match where the PCE expenditures map so that CPI price quotes are functionally “moved” into the categories that best fit the PCE calibration rather than staying in their original item categories.

#### **4. Future Research**

The comparison of PCE and CE data using indexes has been studied for years at the Bureau of Labor Statistics and in the broader federal community.<sup>21</sup> There is still much work to be done, however. If anything, this paper illustrates the need for further analysis in this area. The PCE-calibrated price indexes constructed here only explore only a few of the many possibilities that exist in bringing current CPI data closer to the data used in PCE. Although some of these possibilities seem infeasible currently, there is always the hope that more light will be shed on them in future efforts.

One such area in which methodological improvements could be made is in population matching. CE and CPI populations differ dramatically from the defined PCE population, which is a problem that is rooted in the way the data are collected. PCE data come primarily from the production side as part of the National Income and Product Accounts and are typically the result of equations that take the total purchase value of a good or service and remove all non-consumer use allocations to create a personal

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<sup>21</sup> See Lebow and Rudd (2003) or Fixler and Jaditz (2002) for examples of this.

consumption value. CE (and therefore CPI) data are collected directly from the consumer, a practice that allows for more population limiting. These data are limited to non-military, non-institutionalized households and, in the case of the CPI-U, can be further limited to exclude consumption by rural households. Finding a method by which to more closely match the CPI population to the PCE population would allow for more accurate use of PCE data in weighting the CPI to compare the two data sources.

Further study into the historical differences between the CPI-U and an index similar to PCE2 would also be very useful. Being able to see ten or more years of comparative data instead of five would help researchers to better understand the differences and how they have changed with time and item structure updates in both the CPI and PCE. CPI has undergone two item structure changes in the past few years, and PCE has moved from one benchmark year period to the next. These changes could potentially have a large effect on the data but also help us to more easily identify bias and data inaccuracies as they change from structure to structure or period to period.

A larger-scale update to the methodology used in this paper lies in the items themselves. Although this concording exercise focuses on the weight side of the Consumer Price Index, it would be beneficial to create a hybrid CPI that is matched to PCE definitions for both weighting and pricing. On a similar wavelength, a set of hybrid indexes created using concorded UCCs rather than concorded ELIs could create a more accurate comparison by fine-tuning the good- and service-level comparisons.

Finally, there are a few ways in which data from the Consumer Price Index can be used to create a more accurate representation of a PCE-calibrated index. An index could be constructed by modifying the level of aggregation in the CPI. A CPI aggregated to the major group (apparel, education and communication, food, other goods, housing, medical, recreation, transportation) level would remove many definitional discrepancies between PCE and CPI, allowing us to focus on the largest differences. Going in the opposite direction, more detailed concording research could be done to break data down for classification at the individual observation level, causing each data point in the CPI or PCE data to be intentionally mapped to its correct ELI or PCE series code. This would mean the creation of a “true” PCE1 or PCE2 but would also involve mapping both NIPA and CPI data to underlying categories.

## 5. Conclusion

This paper has contrasted current BLS Consumer Price Index values with the values derived from PCE-calibrated Consumer Price Indexes adjusted to PCE and CPI good and service definitions. Ultimately, the results indicate that adjusting PCE weights to CPI expenditure definitions yields an index (PCE2) that closely tracks the CPI-U. However, there are also strong differences between the two indexes, particularly once results are disaggregated to the item level. We see differences in item relative importance in the apparel, alcohol, and tobacco categories that may be indicative of an item representativeness issue in those categories in the CE survey. Overall, the PCE1 annualized growth rate over five years is 0.338% higher than that of the CPI-U, while the PCE2 annualized growth rate over five years is 0.071% lower than that of the CPI-U.

As shown above, there is still a lot of ground to cover in order for this work to accurately represent the two indexes. Some aspects may be more difficult to correct in future work, such as adjustments for population and scope differences between PCE and CPI, while others may be easily corrected with further research, such as more detailed item concurring using further disaggregated data from both the BLS and the BEA. The closer these indexes come to accurately representing the real CPI and a real PCE-valued CPI, the more useful they are to us in examining the representativeness of CE survey data. Finding that PCE and CE have similar item-level outcomes may be useful in future survey design to reduce respondent burden or allow for detailed data quality checks. Large differences would indicate that it may be time to reexamine the motivations and methodology in the two consumer expenditure datasets. Although, when using this index data, we cannot show whether match issues are due to CE bias or PCE methods, the above results and future work will help us to better determine how to continue refining our data collection and aggregation methods.

## 6. References

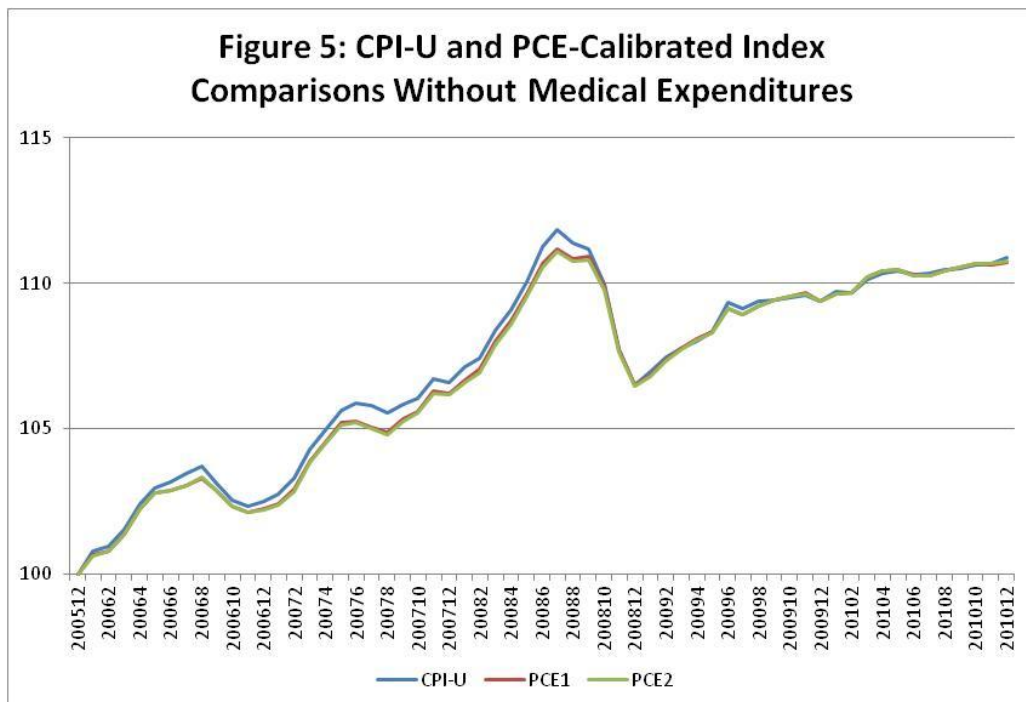
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## 7. Additional Material

### Appendix A. All-Items Less Medical

A “perfect match” index can be created to compare with other PCE-calibrated indexes by simulating a CPI in which only the items whose expenditure definitions and concept definitions match perfectly between the two data sources. When analyzed in conjunction with other research CPIs, this analysis could provide more information on which items present the largest discrepancies between CPI and PCE.

Although it could not be considered to be a perfect match, an index that removes all medical items (ELIs that start with the letter ‘M’) would demonstrate well how expenditure differences can skew the index as medical is both a large expense and differently defined between PCE and CE. Below, experimental indexes that completely exclude medical items have been constructed and compared in the same manner as PCE1 and PCE2 were created in this paper. This exercise helps to demonstrate exactly how large of an effect both the definitional differences and magnitude of medical consumption can have in shifting index values. As shown in Figure 5, the three indexes track each other very closely once medical expenditures have been removed.





## Appendix B. Item Relative Importances in CPI-U, PCE1, and PCE2

**Table 7: December 2005, 2007, and 2009 Item Relative Importances by Index**

ITEM	Item description	CPI-U 2005	PCE1 2005	PCE2 2005	CPI-U 2007	PCE1 2007	PCE2 2007	CPI-U 2009	PCE1 2009	PCE2 2009
SEAA01	Men's suits, sport coats, and outerwear	0.15%	0.18%	0.22%	0.15%	0.17%	0.21%	0.13%	0.15%	0.18%
SEAA02	Men's furnishings	0.18%	0.22%	0.27%	0.18%	0.21%	0.26%	0.18%	0.20%	0.25%
SEAA03	Men's shirts and sweaters	0.20%	0.24%	0.29%	0.22%	0.25%	0.31%	0.23%	0.26%	0.33%
SEAA04	Men's pants and shorts	0.18%	0.21%	0.26%	0.18%	0.20%	0.24%	0.18%	0.20%	0.25%
SEAA09	Unsampled men's apparel	0.02%	0.02%	0.03%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
SEAB01	Boys' apparel	0.18%	0.22%	0.27%	0.19%	0.21%	0.26%	0.17%	0.19%	0.24%
SEAB09	Unsampled boy's apparel	0.01%	0.02%	0.02%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
SEAC01	Women's outerwear	0.12%	0.13%	0.17%	0.12%	0.14%	0.17%	0.14%	0.16%	0.19%
SEAC02	Women's dresses	0.13%	0.16%	0.20%	0.10%	0.12%	0.15%	0.14%	0.17%	0.21%
SEAC03	Women's suits and separates	0.72%	0.83%	1.02%	0.74%	0.85%	1.05%	0.67%	0.77%	0.95%
SEAC04	Women's underwear, nightwear, sportswear and accessories	0.36%	0.48%	0.60%	0.35%	0.48%	0.60%	0.36%	0.51%	0.63%
SEAC09	Unsampled women's apparel	0.03%	0.03%	0.04%	0.01%	0.02%	0.02%	0.02%	0.02%	0.02%
SEAD01	Girls' apparel	0.23%	0.27%	0.34%	0.26%	0.31%	0.38%	0.25%	0.30%	0.37%
SEAD09	Unsampled girls' apparel	0.02%	0.02%	0.02%	0.01%	0.01%	0.01%	0.01%	0.01%	0.02%
SEAE01	Men's footwear	0.23%	0.19%	0.23%	0.22%	0.20%	0.24%	0.23%	0.21%	0.26%
SEAE02	Boys' and girls' footwear	0.17%	0.14%	0.18%	0.14%	0.13%	0.16%	0.15%	0.14%	0.17%
SEAE03	Women's footwear	0.36%	0.30%	0.36%	0.32%	0.29%	0.36%	0.33%	0.30%	0.37%
SEAF01	Infants' and toddlers' apparel	0.18%	0.15%	0.19%	0.18%	0.15%	0.18%	0.20%	0.14%	0.18%
SEAG01	Watches	0.05%	0.09%	0.11%	0.04%	0.09%	0.12%	0.04%	0.09%	0.11%
SEAG02	Jewelry	0.27%	0.57%	0.71%	0.29%	0.62%	0.76%	0.25%	0.64%	0.80%
SEEA01	Educational books and supplies	0.19%	0.15%	0.19%	0.20%	0.16%	0.20%	0.19%	0.16%	0.20%
SEEA09	Unsampled books and supplies	0.01%	0.01%	0.02%	0.01%	0.02%	0.02%	0.01%	0.02%	0.02%
SEEB01	College tuition and fees	1.46%	1.48%	1.83%	1.37%	1.46%	1.80%	1.49%	1.56%	1.93%
SEEB02	Elementary and high school tuition and fees	0.40%	0.30%	0.37%	0.40%	0.31%	0.38%	0.41%	0.33%	0.40%
SEEB03	Child care and nursery school	0.72%	0.10%	0.12%	0.78%	0.10%	0.12%	0.79%	0.10%	0.13%
SEEB04	Technical and business school tuition and fees	0.07%	0.28%	0.34%	0.07%	0.28%	0.34%	0.04%	0.27%	0.33%
SEEB09	Unsampled tuition, other school fees, and childcare	0.13%	0.20%	0.25%	0.11%	0.17%	0.21%	0.10%	0.22%	0.27%
SEEC01	Postage	0.17%	0.09%	0.11%	0.16%	0.08%	0.10%	0.17%	0.08%	0.10%
SEEC02	Delivery services	0.02%	0.03%	0.03%	0.01%	0.03%	0.03%	0.01%	0.02%	0.03%
SEED01	Land-line telephone services, local	0.75%	0.81%	1.00%	0.79%	0.72%	0.89%			
SEED02	Land-line telephone services, long-distance	0.68%	0.35%	0.44%	0.51%	0.31%	0.39%			
SEED03	Wireless telephone service	0.82%	0.67%	0.83%	1.05%	0.76%	0.94%	1.30%	0.90%	1.12%
SEED04	Land-line telephone services							1.09%	0.92%	1.13%
SEEE01	Personal computers and peripheral equipment	0.24%	0.31%	0.38%	0.24%	0.33%	0.41%	0.25%	0.35%	0.43%
SEEE02	Computer software and accessories	0.04%	0.17%	0.21%	0.04%	0.19%	0.24%	0.04%	0.19%	0.23%
SEEE03	Computer information processing services	0.31%	0.33%	0.41%	0.28%	0.28%	0.34%	0.46%	0.45%	0.56%
SEEE04	Other information processing equipment	0.06%	0.11%	0.14%	0.06%	0.13%	0.16%	0.07%	0.16%	0.20%
SEEE09	Unsampled information and information processing	0.01%	0.00%	0.00%	0.01%	0.00%	0.00%	0.01%	0.00%	0.00%
SEFA01	Flour and prepared flour mixes	0.05%	0.05%	0.06%	0.04%	0.05%	0.06%	0.04%	0.05%	0.06%
SEFA02	Breakfast cereal	0.20%	0.22%	0.27%	0.19%	0.25%	0.31%	0.20%	0.27%	0.33%
SEFA03	Rice, pasta, cornmeal	0.11%	0.12%	0.15%	0.10%	0.13%	0.16%	0.12%	0.16%	0.20%
SEFB01	Bread	0.22%	0.24%	0.30%	0.21%	0.24%	0.29%	0.21%	0.22%	0.28%
SEFB02	Fresh biscuits, rolls, muffins	0.10%	0.11%	0.14%	0.10%	0.11%	0.14%	0.11%	0.11%	0.14%
SEFB03	Cakes, cupcakes, and cookies	0.21%	0.24%	0.30%	0.19%	0.21%	0.26%	0.20%	0.21%	0.26%
SEFB04	Other bakery products	0.21%	0.24%	0.30%	0.21%	0.23%	0.28%	0.23%	0.23%	0.29%
SEFC01	Uncooked ground beef	0.24%	0.15%	0.19%	0.20%	0.15%	0.19%	0.19%	0.15%	0.19%
SEFC02	Uncooked beef roasts	0.11%	0.07%	0.09%	0.08%	0.06%	0.08%	0.08%	0.06%	0.08%

ITEM	Item description	CPI-U 2005	PCE1 2005	PCE2 2005	CPI-U 2007	PCE1 2007	PCE2 2007	CPI-U 2009	PCE1 2009	PCE2 2009
SEFC03	Uncooked beef steaks	0.25%	0.15%	0.19%	0.19%	0.14%	0.18%	0.17%	0.13%	0.16%
SEFC04	Uncooked other beef and veal	0.05%	0.03%	0.04%	0.05%	0.04%	0.04%	0.04%	0.03%	0.04%
SEFD01	Bacon, breakfast sausage, and related products	0.13%	0.09%	0.11%	0.12%	0.09%	0.12%	0.11%	0.09%	0.11%
SEFD02	Ham	0.10%	0.06%	0.08%	0.07%	0.05%	0.07%	0.06%	0.05%	0.06%
SEFD03	Pork chops	0.08%	0.05%	0.07%	0.07%	0.05%	0.06%	0.06%	0.05%	0.06%
SEFD04	Other pork including roasts and picnics	0.11%	0.07%	0.09%	0.08%	0.06%	0.08%	0.07%	0.06%	0.07%
SEFE01	Other meats	0.26%	0.26%	0.33%	0.23%	0.26%	0.32%	0.23%	0.26%	0.32%
SEFF01	Chicken	0.31%	0.39%	0.48%	0.26%	0.40%	0.49%	0.27%	0.39%	0.48%
SEFF02	Other poultry including turkey	0.07%	0.10%	0.12%	0.06%	0.09%	0.11%	0.07%	0.10%	0.12%
SEFG01	Fresh fish and seafood	0.20%	0.08%	0.10%	0.15%	0.07%	0.09%	0.15%	0.07%	0.09%
SEFG02	Processed fish and seafood	0.13%	0.05%	0.07%	0.13%	0.06%	0.08%	0.14%	0.07%	0.08%
SEFH01	Eggs	0.09%	0.07%	0.09%	0.12%	0.11%	0.14%	0.09%	0.07%	0.09%
SEFJ01	Milk	0.31%	0.22%	0.27%	0.32%	0.22%	0.27%	0.27%	0.18%	0.22%
SEFJ02	Cheese and related products	0.26%	0.18%	0.22%	0.27%	0.18%	0.22%	0.26%	0.17%	0.21%
SEFJ03	Ice cream and related products	0.14%	0.10%	0.12%	0.14%	0.09%	0.11%	0.13%	0.08%	0.10%
SEFJ04	Other dairy and related products	0.14%	0.10%	0.12%	0.16%	0.10%	0.13%	0.16%	0.10%	0.13%
SEFK01	Apples	0.08%	0.05%	0.06%	0.08%	0.05%	0.06%	0.07%	0.04%	0.05%
SEFK02	Bananas	0.07%	0.04%	0.05%	0.06%	0.04%	0.05%	0.07%	0.04%	0.05%
SEFK03	Citrus fruits	0.09%	0.05%	0.07%	0.08%	0.05%	0.06%	0.08%	0.05%	0.06%
SEFK04	Other fresh fruits	0.24%	0.14%	0.18%	0.24%	0.15%	0.19%	0.23%	0.14%	0.17%
SEFL01	Potatoes	0.07%	0.07%	0.09%	0.07%	0.07%	0.09%	0.07%	0.07%	0.08%
SEFL02	Lettuce	0.06%	0.06%	0.07%	0.06%	0.06%	0.08%	0.06%	0.06%	0.08%
SEFL03	Tomatoes	0.10%	0.10%	0.12%	0.09%	0.10%	0.12%	0.09%	0.09%	0.11%
SEFL04	Other fresh vegetables	0.25%	0.24%	0.30%	0.22%	0.23%	0.29%	0.22%	0.22%	0.28%
SEFM01	Canned fruits and vegetables	0.13%	0.12%	0.15%	0.13%	0.12%	0.15%	0.14%	0.14%	0.17%
SEFM02	Frozen fruits and vegetables	0.08%	0.07%	0.09%	0.08%	0.07%	0.09%	0.08%	0.08%	0.10%
SEFM03	Other processed fruits and vegetables including dried	0.04%	0.04%	0.05%	0.05%	0.05%	0.06%	0.05%	0.05%	0.06%
SEFN01	Carbonated drinks	0.33%	0.42%	0.52%	0.29%	0.37%	0.46%	0.29%	0.31%	0.39%
SEFN02	Frozen noncarbonated juices and drinks	0.02%	0.02%	0.02%	0.01%	0.02%	0.02%	0.01%	0.01%	0.02%
SEFN03	Non-frozen noncarbonated juices and drinks	0.26%	0.32%	0.40%	0.30%	0.37%	0.46%	0.41%	0.43%	0.54%
SEFP01	Coffee	0.10%	0.04%	0.04%	0.11%	0.04%	0.05%	0.11%	0.06%	0.07%
SEFP02	Other beverage materials including tea	0.20%	0.07%	0.09%	0.21%	0.07%	0.09%	0.12%	0.06%	0.08%
SEFR01	Sugar and artificial sweeteners	0.05%	0.08%	0.10%	0.05%	0.07%	0.09%	0.05%	0.08%	0.09%
SEFR02	Candy and chewing gum	0.20%	0.28%	0.35%	0.18%	0.27%	0.33%	0.19%	0.28%	0.35%
SEFR03	Other sweets	0.05%	0.07%	0.09%	0.05%	0.08%	0.10%	0.05%	0.08%	0.10%
SEFS01	Butter and margarine	0.07%	0.04%	0.05%	0.06%	0.04%	0.05%	0.06%	0.04%	0.06%
SEFS02	Salad dressing	0.06%	0.04%	0.05%	0.06%	0.04%	0.05%	0.06%	0.05%	0.06%
SEFS03	Other fats and oils including peanut butter	0.10%	0.06%	0.07%	0.09%	0.07%	0.08%	0.11%	0.08%	0.10%
SEFT01	Soups	0.09%	0.08%	0.10%	0.09%	0.08%	0.09%	0.09%	0.08%	0.10%
SEFT02	Frozen and freeze dried prepared foods	0.26%	0.25%	0.30%	0.29%	0.25%	0.31%	0.31%	0.27%	0.33%
SEFT03	Snacks	0.28%	0.26%	0.33%	0.28%	0.24%	0.30%	0.32%	0.27%	0.34%
SEFT04	Spices, seasonings, condiments, sauces	0.22%	0.21%	0.26%	0.24%	0.21%	0.26%	0.26%	0.23%	0.28%
SEFT05	Baby food	0.07%	0.07%	0.09%	0.07%	0.06%	0.07%	0.08%	0.07%	0.09%
SEFT06	Other miscellaneous foods	0.33%	0.31%	0.39%	0.40%	0.35%	0.43%	0.44%	0.38%	0.47%
SEFV01	Full service meals and snacks	2.59%	1.98%	2.45%	3.03%	2.02%	2.49%	2.87%	2.02%	2.50%
SEFV02	Limited service meals and snacks	2.70%	2.39%	2.95%	2.43%	2.43%	3.00%	2.36%	2.53%	3.13%
SEFV03	Food at employee sites and schools	0.25%	0.21%	0.26%	0.29%	0.20%	0.25%	0.27%	0.22%	0.28%
SEFV04	Food from vending machines and mobile vendors	0.13%	0.10%	0.12%	0.13%	0.09%	0.11%	0.11%	0.08%	0.10%
SEFV05	Board, catered events, and other food away from home	0.28%	0.23%	0.25%	0.30%	0.22%	0.24%	0.33%	0.25%	0.28%
SEFW01	Beer, ale, and other malt beverages at home	0.34%	0.57%	0.71%	0.31%	0.55%	0.68%	0.30%	0.58%	0.71%
SEFW02	Distilled spirits at home	0.13%	0.32%	0.39%	0.07%	0.31%	0.38%	0.08%	0.34%	0.42%

ITEM	Item description	CPI-U 2005	PCE1 2005	PCE2 2005	CPI-U 2007	PCE1 2007	PCE2 2007	CPI-U 2009	PCE1 2009	PCE2 2009
SEFW03	Wine at home	0.25%	0.19%	0.23%	0.23%	0.20%	0.25%	0.24%	0.20%	0.25%
SEFX01	Alcoholic beverages away from home	0.39%	0.75%	0.93%	0.47%	0.77%	0.95%	0.43%	0.78%	0.97%
SEGA01	Cigarettes	0.66%	0.92%	1.14%	0.68%	0.86%	1.06%	0.80%	1.04%	1.28%
SEGA02	Tobacco products other than cigarettes	0.05%	0.07%	0.08%	0.04%	0.05%	0.07%	0.06%	0.08%	0.10%
SEGA09	Unsampled tobacco and smoking products	0.00%	0.01%	0.01%	0.00%	0.01%	0.01%	0.01%	0.01%	0.01%
SEGB01	Hair, dental, shaving, and miscellaneous personal care products	0.37%	0.57%	0.71%	0.32%	0.54%	0.66%	0.35%	0.52%	0.64%
SEGB02	Cosmetics, perfume, bath, nail preparations and implements	0.34%	0.41%	0.51%	0.31%	0.41%	0.51%	0.34%	0.44%	0.55%
SEGB09	Unsampled personal care products	0.00%	0.01%	0.01%	0.00%	0.01%	0.01%	0.00%	0.01%	0.01%
SEGC01	Haircuts and other personal care services	0.67%	1.06%	1.30%	0.63%	1.07%	1.32%	0.64%	1.06%	1.31%
SEGD01	Legal services	0.30%	1.23%	1.51%	0.30%	1.13%	1.39%	0.30%	1.17%	1.45%
SEGD02	Funeral expenses	0.19%	0.26%	0.32%	0.18%	0.24%	0.30%	0.17%	0.22%	0.27%
SEGD03	Laundry and dry cleaning services	0.28%	0.10%	0.13%	0.25%	0.10%	0.12%	0.26%	0.09%	0.12%
SEGD04	Apparel services other than laundry and dry cleaning	0.03%	0.12%	0.15%	0.03%	0.12%	0.15%	0.03%	0.12%	0.15%
SEGD05	Financial services	0.18%	1.23%	0.35%	0.19%	1.26%	0.37%	0.19%	1.27%	0.39%
SEGD06	Care of invalids and elderly at home	0.11%	0.37%	0.46%						
SEGD09	Unsampled items	0.08%	0.08%	0.10%	0.09%	0.08%	0.10%	0.09%	0.07%	0.09%
SEGE01	Miscellaneous personal goods	0.20%	0.37%	0.45%	0.23%	0.39%	0.48%	0.23%	0.43%	0.54%
SEHA01	Rent of primary residence	5.83%	3.40%	4.11%	5.76%	3.37%	4.07%	5.97%	3.58%	4.34%
SEHB01	Housing at school, excluding board	0.15%	0.19%	0.24%	0.15%	0.20%	0.24%	0.16%	0.22%	0.27%
SEHB02	Other lodging away from home including hotels and motels	2.46%	0.78%	0.96%	2.42%	0.84%	1.04%	0.61%	0.68%	0.84%
SEHC01	Owners' equivalent rent of primary residence	23.44%	12.86%	15.89%	23.94%	13.34%	16.47%	23.59%	12.22%	15.12%
SEHC09	Owners' equivalent rent of secondary residence							1.61%	0.86%	1.07%
SEHD01	Tenants' and household insurance	0.38%	0.07%	0.69%	0.32%	0.07%	0.70%	0.35%	0.09%	0.87%
SEHE01	Fuel oil	0.23%	0.32%	0.39%	0.24%	0.30%	0.37%	0.18%	0.20%	0.25%
SEHE02	Other household fuels	0.11%	0.03%	0.04%	0.11%	0.03%	0.03%	0.10%	0.02%	0.03%
SEHF01	Electricity	2.62%	1.61%	2.03%	2.77%	1.69%	2.13%	2.84%	1.72%	2.18%
SEHF02	Utility (piped) gas service	1.53%	0.99%	1.05%	1.10%	0.71%	0.75%	0.91%	0.58%	0.61%
SEHG01	Residential water and sewerage service	0.65%	0.68%	0.58%	0.66%	0.67%	0.57%	0.79%	0.74%	0.63%
SEHG02	Garbage and trash collection	0.22%	0.17%	0.21%	0.25%	0.18%	0.22%	0.26%	0.19%	0.23%
SEHH01	Floor coverings	0.05%	0.28%	0.35%	0.05%	0.30%	0.37%	0.05%	0.25%	0.31%
SEHH02	Window coverings	0.10%	0.14%	0.17%	0.11%	0.15%	0.18%	0.09%	0.14%	0.18%
SEHH03	Other linens	0.23%	0.28%	0.35%	0.20%	0.24%	0.30%	0.19%	0.23%	0.29%
SEHJ01	Bedroom furniture	0.34%	0.35%	0.43%	0.34%	0.34%	0.41%	0.27%	0.28%	0.35%
SEHJ02	Living room, kitchen, and dining room furniture	0.47%	0.50%	0.61%	0.51%	0.50%	0.62%	0.43%	0.46%	0.57%
SEHJ03	Other furniture	0.20%	0.21%	0.26%	0.19%	0.18%	0.22%	0.17%	0.19%	0.24%
SEHJ09	Unsampled furniture	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
SEHK01	Large appliances	0.19%	0.27%	0.34%	0.22%	0.30%	0.37%	0.18%	0.27%	0.33%
SEHK02	Other appliances	0.14%	0.21%	0.26%	0.13%	0.20%	0.25%	0.12%	0.18%	0.22%
SEHK09	Unsampled appliances	0.01%	0.01%	0.01%	0.00%	0.01%	0.01%	0.00%	0.00%	0.01%
SEHL01	Clocks, lamps, and decorator items	0.36%	0.41%	0.51%	0.35%	0.39%	0.48%	0.32%	0.38%	0.47%
SEHL02	Indoor plants and flowers	0.10%	0.22%	0.27%	0.10%	0.23%	0.28%	0.11%	0.24%	0.30%
SEHL03	Dishes and flatware	0.08%	0.25%	0.31%	0.07%	0.21%	0.26%	0.07%	0.18%	0.22%
SEHL04	Nonelectric cookware and tableware	0.09%	0.26%	0.32%	0.09%	0.26%	0.32%	0.09%	0.26%	0.32%
SEHM01	Tools, hardware and supplies	0.21%	0.29%	0.36%	0.21%	0.26%	0.32%	0.19%	0.23%	0.28%
SEHM02	Outdoor equipment and supplies	0.37%	0.15%	0.18%	0.35%	0.15%	0.19%	0.46%	0.18%	0.23%
SEHM09	Unsampled tools, hardware, outdoor equipment and supplies	0.19%	0.06%	0.08%	0.17%	0.05%	0.07%	0.18%	0.05%	0.07%
SEHN01	Household cleaning products	0.37%	0.32%	0.40%	0.35%	0.32%	0.39%	0.36%	0.32%	0.40%
SEHN02	Household paper products	0.20%	0.24%	0.30%	0.22%	0.26%	0.32%	0.24%	0.28%	0.34%
SEHN03	Miscellaneous household products	0.27%	0.22%	0.28%	0.29%	0.22%	0.27%	0.30%	0.22%	0.27%
SEHP01	Domestic services	0.25%	0.31%	0.39%	0.25%	0.30%	0.37%	0.27%	0.31%	0.38%
SEHP02	Gardening and lawn care services	0.25%	0.00%	0.00%	0.25%	0.00%	0.00%	0.26%	0.00%	0.00%

ITEM	Item description	CPI-U 2005	PCE1 2005	PCE2 2005	CPI-U 2007	PCE1 2007	PCE2 2007	CPI-U 2009	PCE1 2009	PCE2 2009
SEHP03	Moving, storage, freight expense	0.08%	0.19%	0.23%	0.08%	0.18%	0.22%	0.10%	0.17%	0.21%
SEHP04	Repair of household items	0.13%	0.06%	0.07%	0.08%	0.04%	0.05%	0.08%	0.04%	0.05%
SEHP09	Unsampled household operations	0.08%	0.17%	0.21%	0.08%	0.17%	0.20%	0.07%	0.17%	0.21%
SEMA01	Prescription drugs	1.01%	2.79%	0.58%	1.22%	2.78%	0.57%			
SEMA09	Unsampled rent or repair of medical equipment	0.01%	0.04%	0.03%	0.01%	0.03%	0.03%			
SEMB01	Nonprescription drugs	0.30%	0.38%	0.47%	0.25%	0.41%	0.51%			
SEMB02	Medical equipment and supplies	0.14%	0.25%	0.07%	0.11%	0.27%	0.08%			
SEMC01	Physicians' services	1.63%	4.16%	0.86%	1.33%	4.14%	0.85%	1.45%	4.21%	0.87%
SEMC02	Dental services	0.70%	1.17%	0.24%	0.73%	1.16%	0.24%	0.71%	1.19%	0.25%
SEMC03	Eyeglasses and eye care	0.23%	0.30%	0.06%	0.24%	0.29%	0.06%	0.25%	0.30%	0.06%
SEMC04	Services by other medical professionals	0.25%	2.59%	0.53%	0.33%	2.59%	0.53%	0.38%	2.79%	0.58%
SEMD01	Hospital services	1.49%	7.34%	1.51%	1.26%	7.54%	1.55%	1.36%	8.02%	1.66%
SEMD02	Nursing homes and adult daycare	0.09%	1.82%	0.38%	0.13%	1.77%	0.36%	0.15%	1.65%	0.34%
SEMD03	Care of invalids and elderly at home				0.08%	0.38%	0.47%	0.11%	0.41%	0.50%
SEME01	Commercial health insurance	0.09%	0.38%	0.08%	0.21%	0.56%	0.12%	0.19%	0.41%	0.08%
SEME02	Blue Cross/Blue Shield	0.11%	0.43%	0.09%	0.12%	0.32%	0.07%	0.12%	0.27%	0.05%
SEME03	Health maintenance plans	0.12%	0.50%	0.10%	0.10%	0.25%	0.05%	0.07%	0.16%	0.03%
SEME04	Medicare and other health insurance	0.05%	0.19%	0.04%	0.11%	0.28%	0.06%	0.11%	0.24%	0.05%
SEMF01	Prescription drugs and medical supplies							1.22%	2.92%	0.60%
SEMF02	Nonprescription drugs							0.31%	0.46%	0.57%
SEMG01	Medical equipment and supplies							0.07%	0.28%	0.08%
SEMG09	Unsampled rent or repair of medical equipment							0.01%	0.03%	0.03%
SERA01	Televisions	0.16%	0.22%	0.27%	0.17%	0.23%	0.29%	0.20%	0.24%	0.30%
SERA02	Cable television	1.14%	0.72%	0.89%	1.19%	0.74%	0.91%	1.27%	0.81%	1.00%
SERA03	Other video equipment	0.05%	0.21%	0.25%	0.03%	0.20%	0.25%	0.03%	0.21%	0.26%
SERA04	Video cassettes, discs, and other media including rental	0.18%	0.36%	0.45%	0.16%	0.34%	0.42%	0.14%	0.30%	0.37%
SERA05	Audio equipment	0.08%	0.23%	0.28%	0.11%	0.24%	0.30%	0.09%	0.21%	0.26%
SERA06	Audio discs, tapes and other media	0.09%	0.23%	0.28%	0.08%	0.18%	0.23%	0.06%	0.15%	0.19%
SERA09	Unsampled video and audio	0.08%	0.10%	0.12%	0.10%	0.09%	0.11%	0.10%	0.09%	0.12%
SERB01	Pets and pet products	0.37%	0.43%	0.53%	0.42%	0.47%	0.58%	0.73%	0.51%	0.64%
SERB02	Pet services including veterinary	0.27%	0.25%	0.31%	0.30%	0.26%	0.33%	0.41%	0.31%	0.38%
SERC01	Sports vehicles including bicycles	0.40%	0.41%	0.50%	0.32%	0.46%	0.56%	0.32%	0.42%	0.52%
SERC02	Sports equipment	0.27%	0.55%	0.68%	0.26%	0.55%	0.68%	0.28%	0.57%	0.71%
SERC09	Unsampled sports equipment	0.01%	0.03%	0.04%	0.01%	0.04%	0.04%	0.01%	0.04%	0.05%
SERD01	Photographic equipment and supplies	0.09%	0.09%	0.11%	0.08%	0.09%	0.11%	0.07%	0.11%	0.13%
SERD02	Photographers and film processing	0.09%	0.16%	0.19%	0.09%	0.12%	0.15%	0.10%	0.12%	0.15%
SERD09	Unsampled photography supplies	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SERE01	Toys	0.26%	0.55%	0.68%	0.24%	0.61%	0.75%	0.36%	0.72%	0.89%
SERE02	Sewing machines, fabric and supplies	0.07%	0.04%	0.05%	0.06%	0.03%	0.03%	0.06%	0.03%	0.04%
SERE03	Music instruments and accessories	0.05%	0.07%	0.09%	0.04%	0.07%	0.08%	0.05%	0.06%	0.08%
SERE09	Unsampled recreation commodities	0.02%	0.06%	0.07%	0.02%	0.06%	0.07%	0.01%	0.04%	0.04%
SERF01	Club dues and fees for participant sports and group exercises	0.51%	0.37%	0.45%	0.56%	0.36%	0.45%	0.60%	0.36%	0.45%
SERF02	Admissions	0.69%	0.60%	0.74%	0.65%	0.61%	0.75%	0.68%	0.61%	0.75%
SERF03	Fees for lessons or instructions	0.22%	0.15%	0.18%	0.23%	0.15%	0.19%	0.25%	0.19%	0.23%
SERF09	Unsampled recreation services	0.22%	0.17%	0.21%	0.26%	0.19%	0.23%	0.35%	0.30%	0.37%
SERG01	Newspapers and periodicals	0.19%	0.47%	0.58%	0.14%	0.41%	0.51%	0.14%	0.40%	0.49%
SERG02	Recreational books	0.13%	0.34%	0.42%	0.12%	0.32%	0.40%	0.12%	0.32%	0.40%
SERG09	Unsampled recreational reading materials	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SETA01	New vehicles	5.15%	3.47%	4.28%	4.63%	2.92%	3.60%	3.57%	2.45%	3.04%
SETA02	Used cars and trucks	1.80%	1.15%	1.42%	1.77%	0.92%	1.14%	2.01%	0.86%	1.07%
SETA03	Leased cars and trucks	0.61%	0.36%	0.45%	0.61%	0.38%	0.46%	0.60%	0.41%	0.51%

ITEM	Item description	CPI-U 2005	PCE1 2005	PCE2 2005	CPI-U 2007	PCE1 2007	PCE2 2007	CPI-U 2009	PCE1 2009	PCE2 2009
SETA04	Car and truck rental	0.09%	0.11%	0.14%	0.08%	0.11%	0.14%	0.09%	0.12%	0.15%
SETA09	Unsampled vehicles	0.20%	0.17%	0.21%	0.09%	0.16%	0.20%	0.11%	0.14%	0.17%
SETB01	Gasoline (all types)	4.15%	3.41%	4.21%	5.21%	4.02%	4.96%	4.34%	3.24%	4.01%
SETB02	Other motor fuels	0.04%	0.03%	0.04%	0.27%	0.21%	0.26%	0.19%	0.14%	0.17%
SETC01	Tires	0.22%	0.24%	0.30%	0.22%	0.25%	0.31%	0.26%	0.26%	0.32%
SETC02	Vehicle accessories other than tires	0.15%	0.42%	0.52%	0.14%	0.43%	0.53%	0.14%	0.42%	0.52%
SETD01	Motor vehicle body work	0.09%	0.15%	0.13%	0.07%	0.12%	0.10%	0.07%	0.11%	0.09%
SETD02	Motor vehicle maintenance and servicing	0.42%	0.76%	0.63%	0.44%	0.75%	0.62%	0.46%	0.75%	0.62%
SETD03	Motor vehicle repair	0.60%	1.08%	0.89%	0.59%	1.03%	0.85%	0.60%	0.97%	0.80%
SETD09	Unsampled vehicle repair	0.02%	0.04%	0.03%	0.03%	0.04%	0.04%	0.04%	0.07%	0.05%
SETE01	Motor vehicle insurance	2.30%	0.70%	1.82%	1.97%	0.68%	1.77%	2.49%	0.73%	1.92%
SETF01	State and local registration and license	0.31%	0.00%	0.00%	0.28%	0.00%	0.00%	0.33%	0.00%	0.00%
SETF03	Parking and other fees	0.16%	0.32%	0.39%	0.17%	0.32%	0.39%	0.19%	0.34%	0.42%
SETF09	Unsampled motor vehicle fees	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
SETG01	Airline fare	0.67%	1.01%	1.24%	0.72%	1.08%	1.34%	0.78%	1.09%	1.35%
SETG02	Other intercity transportation	0.16%	0.13%	0.15%	0.17%	0.13%	0.16%	0.16%	0.11%	0.14%
SETG03	Intracity transportation	0.25%	0.30%	0.37%	0.21%	0.26%	0.33%	0.24%	0.29%	0.35%
SETG09	Unsampled public transportation	0.00%	0.01%	0.01%	0.01%	0.02%	0.03%	0.00%	0.01%	0.01%

## Appendix C. All-Items and Filtered Index Results

In addition to the creation of a set of PCE-calibrated indexes sans medical goods and services, a variety of other filtered indexes were created for the purposes of this study: an index that excluded shelter, a core CPI, a goods-only index, and a services-only index. Table 8 shows 5-year annualized growth rates and average monthly index change values for those filtered indexes compared with data for the all-items indexes.

<b>Table 8: All-Items and Filtered Index Change</b>							
<b>Filter</b>	<b>Index</b>	<b>5-Year Annualized Growth Rate</b>	<b>5-Year Annualized Growth Rate Difference from CPI-U</b>	<b>2006-2010 Average 12-Month Index Change</b>	<b>2006-2010 Average 12-Month Index Change Difference from CPI-U</b>	<b>Minimum 2006-2010 Average 12-Month Index Change Difference from CPI-U</b>	<b>Maximum 2006-2010 Average 12-Month Index Change Difference from CPI-U</b>
<b>All-Items</b>	<b>CPI-U</b>	2.182%		2.013%			
	<b>PCE1</b>	2.520%	-0.338%	2.454%	-0.441%	-1.309%	0.152%
	<b>PCE2</b>	2.111%	0.071%	2.009%	0.003%	-0.371%	0.373%
<b>No Medical</b>	<b>CPI-U</b>	2.086%		1.902%			
	<b>PCE1</b>	1.999%	0.087%	1.895%	0.006%	-0.309%	0.331%
	<b>PCE2</b>	2.007%	0.079%	1.896%	0.006%	-0.397%	0.387%
<b>No Shelter</b>	<b>CPI-U</b>	2.271%		2.141%			
	<b>PCE1</b>	2.613%	-0.343%	2.558%	-0.417%	-2.278%	1.066%
	<b>PCE2</b>	2.122%	0.149%	2.024%	0.117%	-0.912%	0.806%
<b>Core (No Food or Energy)</b>	<b>CPI-U</b>	1.880%		1.838%			
	<b>PCE1</b>	2.338%	-0.457%	2.389%	-0.551%	-0.933%	-0.015%
	<b>PCE2</b>	1.735%	0.146%	1.781%	0.058%	-0.281%	0.499%
<b>Goods Only</b>	<b>CPI-U</b>	1.928%		1.641%			
	<b>PCE1</b>	1.706%	0.223%	1.510%	0.130%	-2.028%	1.495%
	<b>PCE2</b>	1.632%	0.296%	1.437%	0.203%	-1.632%	1.570%
<b>Services Only</b>	<b>CPI-U</b>	2.361%		2.300%			
	<b>PCE1</b>	3.122%	-0.761%	3.164%	-0.864%	-1.692%	-0.254%
	<b>PCE2</b>	2.578%	-0.217%	2.585%	-0.285%	-0.906%	0.255%