

Measuring and Adjusting for Frame Undercoverage of the State and Local Value Put-in-Place (VIP) Survey

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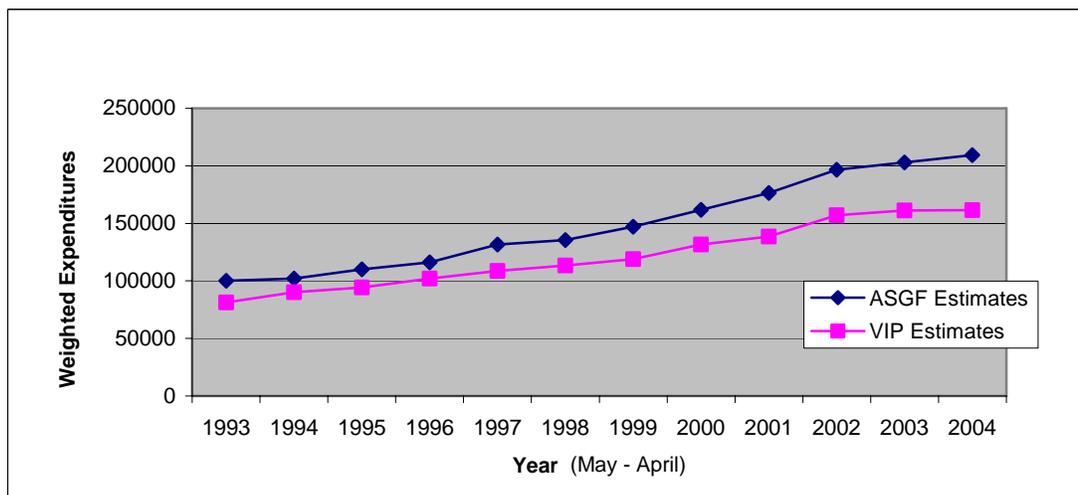
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1. INTRODUCTION

The U.S. Census Bureau conducts the monthly State and Local (S&L) VIP survey to measure the value of construction put in place for building and nonbuilding structures owned by S&L governments. The Bureau also collects fiscal year data on similar construction in the Annual Survey of State and Local Government Finances (ASGF). Conceptually, these estimates should be comparable on a fiscal basis; nevertheless, they have continued to differ during the past decades. Figure 1 presents a time series plot of the total construction expenditures for S&L VIP and ASGF. The S&L VIP estimates are consistently lower than the ASGF estimates. The major difference is attributed to the undercoverage of the S&L VIP frame as reported by Luery, Asanuma, Vu, McDonald, and Newman-Smith (1992).

Figure 1: Time Series Plot of Total Construction Expenditures for S&L VIP and ASGF (In Millions)



To adjust for the deficiencies in the S&L VIP frame, the VIP estimates were increased by five percent then further benchmarked to the ASGF estimates. The existing undercoverage adjustment factor of 1.05 was no longer current. It needed to be updated because its development was unknown and the 18% overall undercoverage rate derived from the study by Luery et al. (1992) was not reflected in this factor. The benchmarking of the VIP to the ASGF was originally intended to be a temporary solution (Luery et al. 1992). Benchmarking of the VIP to the ASGF needed to be discontinued because of the crucial timing and definitional differences between the two sets of estimates:

- Forecasting – ASGF estimates are annual and lag the monthly VIP estimates by more than two years. Thus, we forecasted the ASGF estimates two years ahead and then developed the benchmarking factors based on these forecasts. Table 1 shows the percent change in the monthly benchmarking factors of current year forecasts to the revised forecasts from the previous year. Forecasting led to large revisions for most types of construction (TC) and

¹ This report is released to inform interested parties of research and to encourage discussion. Any views expressed on statistical, methodological, technical, or operational issues are those of the authors and not necessarily those of the U.S. Census Bureau.

the revisions varied from year to year. Refer to U.S. Census Bureau (1990) for the development of the forecast models used in the benchmarking.

- Classification – ASGF estimates are functional type (for example, a highway administration builds an office building, this structure would be classified as “highway”), where VIP estimates are project based (same example as above but now the structure would be classified as “office building”). Assumptions and adjustments were made in order to align the VIP and ASGF estimates when developing the benchmarking factors for the monthly S&L VIP estimates.
- Reporting period – the fiscal year reporting of the ASGF is not always within the VIP data time frame (July through June) since the fiscal year definition varies across the S&L government agencies. A different time configuration of the VIP estimates was used when developing the benchmarking factors (May through April).

Table 1: Percent Change of Current to Last Year Benchmarking Factors for Housing, Transportation, and Power Construction

Date	Housing			Transportation			Power		
	Last Year Factors	Current Factors	Percent Change	Last Year Factors	Current Factors	Percent Change	Last Year Factors	Current Factors	Percent Change
Jan 2004	3.076	3.654	18.8	1.603	1.524	-4.9	4.121	4.549	10.4
Feb 2004	3.065	3.661	19.4	1.609	1.529	-5.0	4.113	4.564	11.0
Mar 2004	3.051	3.662	20.0	1.614	1.534	-5.0	4.136	4.600	11.2
Apr 2004	3.035	3.664	20.7	1.620	1.541	-4.9	4.163	4.640	11.5
May 2004	3.024	3.657	20.9	1.628	1.550	-4.8	4.223	4.697	11.2
Jun 2004	3.018	3.658	21.2	1.634	1.558	-4.7	4.276	4.756	11.2
Jul 2004	3.002	3.656	21.8	1.640	1.566	-4.5	4.333	4.815	11.1
Aug 2004	2.995	3.665	22.4	1.646	1.574	-4.4	4.370	4.855	11.1
Sep 2004	2.981	3.677	23.3	1.650	1.580	-4.2	4.407	4.901	11.2
Oct 2004	2.973	3.690	24.1	1.655	1.586	-4.2	4.467	4.922	10.2
Nov 2004	2.965	3.712	25.2	1.659	1.592	-4.0	4.516	4.926	9.1
Dec 2004	2.963	3.739	26.2	1.662	1.598	-3.9	4.554	4.926	8.2
Jan 2005	2.954	3.766	27.5	1.665	1.603	-3.7	4.572	4.908	7.3
Feb 2005	2.953	3.799	28.6	1.666	1.607	-3.5	4.593	4.878	6.2
Mar 2005	2.950	3.827	29.7	1.667	1.610	-3.4	4.609	4.851	5.3
Apr 2005	2.953	3.861	30.7	1.667	1.612	-3.3	4.605	4.805	4.3
May 2005	2.950	3.900	32.2	1.667	1.614	-3.2	4.500	4.776	6.1
Jun 2005	2.950	3.931	33.3	1.667	1.616	-3.1	4.500	4.724	5.0
Jul 2005	2.950	3.976	34.8	1.667	1.618	-2.9	4.500	4.681	4.0
Aug 2005	2.950	4.005	35.8	1.667	1.619	-2.9	4.500	4.643	3.2
Sep 2005	2.950	4.038	36.9	1.667	1.621	-2.8	4.500	4.605	2.3
Oct 2005	2.950	4.057	37.5	1.667	1.622	-2.7	4.500	4.582	1.8
Nov 2005	2.950	4.077	38.2	1.667	1.623	-2.6	4.500	4.551	1.1
Dec 2005	2.950	4.098	38.9	1.667	1.624	-2.6	4.500	4.535	0.8

This paper reports the results of the State and Local Undercoverage Evaluation (SLUE) that was conducted (from 2002 through 2006) to reevaluate the coverage of the S&L VIP frame by matching known population units against units on the VIP frame. The SLUE study was modeled after the studies by Luery et al. (1992) and Asanuma and Newman-Smith (1993). We derived up-to-date undercoverage adjustment factors and began using them to adjust for the VIP frame undercoverage beginning with the May 2007 press release.

The paper is organized as follows: Section 2 provides an overview of the S&L VIP Survey, Section 3 discusses the subsampling of government agencies from the ASGF for inclusion in the SLUE, Section 4 discusses the collection of construction project information from the agencies for the SLUE, Section 5 discusses the matching of projects collected from

the agencies to the projects on the S&L VIP frame to determine the frame’s coverage, Section 6 discusses the results of the matching, Section 7 discusses the application of the undercoverage adjustment factors, and Section 8 discusses the outstanding issues.

2. S&L VIP SURVEY

The VIP is a Manufacturing and Construction Division (MCD) survey measuring the total value of construction activity performed in the United States. The VIP estimates come from the monthly Construction Progress Reporting Survey (CPRS) augmented with estimates of a non-CPRS component based on regulatory filings, phasing of other Census data, administrative records, trade association data, and other sources. Table 2 lists the VIP major categories, their sizes based on weighted values, and the source of the data (CPRS and/or non-CPRS). Based on year 2006 annual data, state and locally owned construction ranked third behind Private New Residential and Private Nonresidential categories with 20% in weighted value; and was the largest from the CPRS source. Note that the SLUE study only measured the undercoverage of the S&L VIP frame. Other components of the VIP have their own undercoverage adjustment methods. For example, there is a similar ongoing study that measures and adjusts for the coverage of the Private Nonresidential frame of the CPRS (Asanuma and Newman-Smith 1993).

Table 2: VIP Major Categories

VIP Category	Percent of the Total VIP	Data source
Private New Residential	40	CPRS and Non-CPRS
Private Nonresidential	25	CPRS and Non-CPRS
State & Local	20	CPRS
Private Residential Improvements	14	Non-CPRS
Federal	1	CPRS

The sampling frame for the S&L VIP is a list of construction projects in the United States valued at \$75,000 or more that have started or will start construction within 60 days. MCD purchases the list from McGraw-Hill Construction (MHC). The projects are stratified by six construction value groups and 12 general TC categories based on the information provided to us by MHC. Each of the 72 strata is assigned a specific sampling rate with currently 15 of the strata being certainty (that is having a sampling rate of 1-in-1). An independent systematic sample of projects is selected in the remaining 57 strata. There are about 11,000 S&L projects in the survey at a given time. These include newly selected projects along with projects selected from previous months that are still active. For each sampled project, monthly construction progress reports are requested from the owner or builder until the project is completed.

The monthly estimate of the total S&L VIP is a weighted sum of the value of work done on all projects underway during the month of interest, regardless of when construction on the individual project started or when payment was made to the contractors or builders. Each project is first multiplied by the final weight then adjusted for (1) undercoverage of projects not reported by MHC and (2) projects that have already started but have not yet been selected with the late selection factor. The final weight is a product of the selection weight or the inverse of the probability of selection, outlier adjustment factor to reduce the influence of extreme values on the VIP, and adjustment factor for architectural, engineering, and miscellaneous costs. There is also an imputation procedure used for item nonresponse. For more information on the methodology of the VIP survey, see U.S. Census Bureau (1995 and 2007).

3. SUBSAMPLING FROM THE ASGF

In conducting the SLUE study to evaluate the S&L VIP frame’s coverage, a list of projects from an independent source was needed to match against projects on the S&L VIP frame. Because such a list was not readily available, we had to survey S&L government agencies to acquire the information. The frame for the SLUE survey was the ASGF sample of S&L government agencies.

Governments Division of the U.S. Census Bureau provided MCD the ASGF sample file for fiscal year 2000. The file contained 201,060 records for 25,336 government agencies. There were nine different categories of expenditures and 50

function codes. We only wanted those records with construction activity, thus the number of records was reduced to 29,644 (16,986 agencies). In preparation for the stratification of the agencies, we reclassified the function codes to coincide with the 12 S&L VIP general TC categories. The expenditures represented the total amount of a particular construction type spent by an agency. Of the 16,986 remaining agencies, 81% reported one construction type and 19% reported multiple construction types. Of the agencies with more than one type of construction expenditures, only the construction type with the largest weighted value was kept in order to create a value-classifier for stratification purposes. We used both reported and imputed records in the agency subsampling.

The government agencies were stratified by three value groups and 12 general TC categories². The value groups were based on weighted construction expenditures from the ASGF. The three groups were \$10 million or more, \$1 million to less than \$10 million, and less than \$1 million. Refer to Table 5 for a list of the general TC. Each of the 32 strata was assigned a specific sampling rate with 12 of the strata being certainty or take every. Two TC: conservation & development and not elsewhere classified (NEC) had one stratum each, with a sampling rate of 1-in-1. An independent systematic sample of agencies was selected in the remaining 20 strata. There were 4,026 agencies selected from a sample of 16,986 agencies that met our criteria for selection.

4. DATA COLLECTION FOR SLUE

We utilized a mailout/mailback strategy with telephone follow-up (TFU) to collect data from the S&L government agencies. A total of 5,352 forms were mailed to 4,026 agencies that were selected, in two separate waves three months apart. Roughly half of the forms were mailed out July 1, 2004 requesting all contracts awarded and force account³ work started during second quarter 2004; and the other half were mailed out October 1, 2004 requesting similar information for the third quarter. An eligible respondent was asked to provide contract award date, project description, physical location of the project, name of the general contractor, and the contract value for each contract awarded for a construction project valued at \$75,000 or more. For contracts of less than \$75,000 and force account projects, total amounts were requested from the respondent. The majority of agencies (3,888 out of 4,026) were single-mailing agencies, which received one form each. The remaining 138 agencies were multiple-mailing agencies, which received multiple questionnaires addressed to different entities or departments within the agency. To help minimize respondents' burden, different reporting modes were offered to the agencies: mail back, fax back, email back, and phone in. We conducted TFU for nonresponse or delinquent cases immediately after all returned forms were keyed.

Of the total number of forms sent minus the 309 out-of-scope cases, the survey had an overall unweighted response rate of 73%. Table 3 provides the response rates for the different response modes and the TFU's response rate. It is also of interest that 75% of the eligible agencies responded to the SLUE survey.

**Table 3: Response Rates Prior to TFU by Response Modes and After TFU
(Total Number of Cases = 5,043)**

Response Mode	Frequency	Percent
Mail Back	2,165	43
Fax Back	203	4
Email Back	9	< 1
Phone In	13	< 1
Total (no TFU)	2,390	47
Total TFU	1,310	26
Total Response	3,700	73

Agency nonresponse was adjusted by reweighting the design weights within the stratification cells. Thus 32 nonresponse adjustment factors were computed. For the purpose of computing agency nonresponse adjustment factors, we defined a

² The same 12 general TC categories as the monthly S&L VIP.

³ Force account projects are projects that were done entirely by the agency's own employees.

response for both single and multiple mailing agencies as an eligible agency's completion of at least one questionnaire in its entirety, with the exception of missing force account expenditures. The total number of eligible agencies was the 4,026 agencies in the SLUE sample minus the 17 out-of-scope agencies. The nonresponse adjustment factor NF_s is given by

$$NF_s = \frac{\sum_{k=1}^{p+q} a_k y_k}{\sum_{k=1}^p a_k y_k}$$

Where s represents the stratum number ($s = 1, 2, 3 \dots, 32$), p is the number of responses for the s stratum, q is the number of nonresponses for s stratum, y_k = construction expenditures from the ASGF (unweighted) for the k^{th} agency, and a_k = (ASGF sampling weight) x (agency subsampling weight) for the k^{th} agency.

5. MATCHING OF PROJECTS – CHECKING FOR FRAME COVERAGE

To reduce the workload for the matching and verification of the matches, we subsampled 2,098 contracts from 6,845 contracts (valued at \$75,000 or more) that were awarded for construction projects and reported to us by SLUE respondents. The contracts were stratified by three value groups, 12 general TC⁴, and four Census regions. The value groups were based on unweighted contract award value reported by the SLUE respondents. The three groups were \$10 million or more, \$750 thousand to less than \$10 million, and \$75 thousand to less than \$750 thousand. The four Census regions were Northeast, Midwest, South, and West. Each of the 144 strata was assigned a specific sampling rate with 104 of the strata being certainty. An independent systematic sample of agencies was selected in the remaining 40 strata.

The selected projects/contracts⁵ were sent to MHC to match against projects that should be on the S&L VIP frame. MCD reviewed all projects matched by MHC manually. We reviewed the information for each project and decided that a project was a match if the SLUE information was similar to the MHC information on equivalent variables. Each project had six matching variables. We first compared each of the variables individually before concluding on an overall project status. The guidelines that we used to decide whether each variable was referring to the same project or not are as follows:

- 1) Owner of project – name of the government agency, city, and state
 - Same – The information referred to the same government agency.
 - Different – The information referred to two different government agencies.
- 2) Project title/description
 - Same – The project title/description reported by SLUE respondent was similar to the MHC project title.
 - Different – The two titles/descriptions described different projects.
- 3) Physical location of project – street address or site boundaries, city, and state
 - Same – The two addresses described the same location or locations within close proximity.
 - Different – The two addresses described different locations.
- 4) Name of general contractor⁶
 - Same – The information referred to the same contractor.
 - Different – The information referred to two different contractors.
- 5) Date
 - Same – The issue date from MHC was between April 1, 2003 and September 30, 2005.
 - Different – The issue date from MHC was prior to April 2003 or after September 2005⁷.

⁴ The same 12 general TC categories as the monthly S&L VIP and ASGF subsampling. Each contract was manually assigned a general TC code based on the reported project description.

⁵ Contract is surrogate for construction project and vice versa. From here on, contract and project will be used interchangeably.

⁶ This variable was omitted during verification if MHC did not provide a contractor name.

6) Value⁸

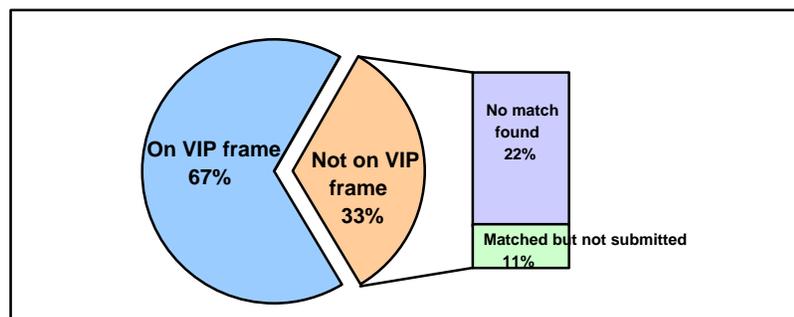
- Same – SLUE contract value was approximately equal to the MHC value (and other variables listed above were referring to the same project).
- Different – SLUE contract value was very different from the MHC value (and other variables listed above seemed to be referring to a different project).

For the majority of the projects, it was clear whether a project was a match or not. For those projects that fell in the gray area or where we disagreed with MHC, we sent them back to MHC for additional information/explanations, performed searches on our end with the information that we had available, and/or as a last resort called the respondent to verify the information.

6. RESULTS OF THE MATCHING

Of the 2,023⁹ SLUE contracts, 67% were found on the VIP frame. Figure 2 shows the breakdown of the coverage for contracts greater than or equal to \$75,000. MHC matched 11% of the SLUE contracts, but equivalent MHC projects were never submitted to MCD for inclusion in the monthly S&L VIP frame. Therefore, these contracts were also treated as nonmatches in the computation of the match rates. The projects found on the VIP frame represented 83% of the weighted value of all contracts awarded in two quarters in the United States (valued at \$75,000 or more), with 2% standard errors. No matching was attempted for force account projects and projects less than \$75,000 since these projects are part of the monthly S&L VIP nonsampled stratum.

Figure 2: Coverage of Contracts at \$75,000 or More (Of Count)



The SLUE contract award and force account values were weighted by multiplying the amount by the final weight. The final weight for a contract at \$75,000 or more was a product of the ASGF weight, agency subsampling weight, agency nonresponse adjustment factor, and contract selection weight. The final weight for a contract less than \$75,000 and a force account project was similar to the final weight of a contract at \$75,000 or more but without the contract selection weight. The estimated match rate \hat{r} for projects with contracts valued at \$75,000 or more is given by

$$\hat{r} = \frac{\sum_{j=1}^m w_j x_j}{\sum_{j=1}^{m+n} w_j x_j}$$

Where m is the total number of matches, n is the total number of nonmatches, w_j = final weight of the j^{th} project, and x_j = SLUE contract value of the j^{th} project.

⁷ Since there were only a handful of projects that fell outside the matching time frame, with a date of October 2005 or after, we did not reject these as matches.

⁸ The SLUE contract value and the MHC value could be very different for a particular project and still be a match.

⁹ There were 2,098 contracts selected for matching. 75 projects were out-of-scope because they were privately or federally owned, not covered by our definition, abandoned or delayed, or duplicates (kept one and deleted others).

The variance for the match rate was computed using the Jackknife method with 20 replicates. The match rate variance estimator $\hat{\sigma}_r^2$ is given by

$$\hat{\sigma}_r^2 = \frac{\sum_{i=1}^{20} (t_i - \bar{t})^2}{20}$$

with $t_i = \frac{20}{19} \left(\sum_{j=1}^m w_j x_j - \sum_{j=1}^{m_i} w_j x_j \right) / \sum_{j=1}^{m+n} w_j x_j$ and $\bar{t} = \frac{\sum_{i=1}^{20} t_i}{20}$

Where i represents the replicate number ($i = 1, 2, \dots, 20$), m is the total number of matches, n is the total number of nonmatches, m_i is the number of matches for the i^{th} replicate, w_j = final weight of the j^{th} project, and x_j = SLUE contract value of the j^{th} project.

Table 4: Match Rates of the Weighted Contract Values and Standard Errors by Value Groups (In Percent)

Value Group	Match Rates	Standard Errors
\$10 million or more	91	3
\$750 thousand to less than \$10 million	84	3
\$75 thousand to less than \$750 thousand	54	1

Table 5: Match Rates of the Weighted Contract Values and Standard Errors by General TC (In Percent)

General TC	Match Rates	Standard Errors
Housing	44	3
Office	86	6
Health care	81	11
Education	88	4
Public safety	91	7
Amusement & recreation	89	5
Transportation	69	4
Highway & street	84	4
Sewer system	76	4
Water supply system	91	9
Conservation & development	84	6
NEC (Not elsewhere classified) – includes Hotel/motel, Commercial, Religious, Communication, Power, and Industrial	39	3

Tables 4 and 5 present the estimated match rates of the weighted contract values and the associated standard errors by value groups and general TC, respectively. In general, MHC coverage was better for large projects than for small projects. This is similar to what Luery et al. (1992) and Asanuma and Newman-Smith (1993) found in their coverage studies of the VIP frames. Tests of significance¹⁰ at the 10% level indicated that the match rates for the three value groups were significantly

¹⁰ Test of significance used in the analysis of the match rates of weighted values were based on student's t, with Bonferroni adjustment of type I error for the multiple comparisons.

different from each other. Nevertheless, we did not produce undercoverage adjustment factors by values. Our concerns were (1) the contract value for SLUE was not always close to being equal to the MHC value on an equivalent project. The two values could be very different when MHC picked up an entire project and SLUE only picked up a portion of the project and vice versa. (2) The match rates by value groups were biased since more effort was taken to match and verify larger projects by MHC and MCD. Also, we had more detailed information for projects at \$10 million or more (since these were selected with certainty for the monthly S&L VIP), so we were able to use this additional information to conduct a more thorough verification than for those smaller projects. The smaller the project values, the probability of having the additional information for the verification of the matches greatly decreased. The match rates of weighted value across the general TC categories were also found to be significantly different at the 10% level for some categories. We collapsed the smaller TC categories if not significantly different from each other to have more reliable estimates since the combined sample sizes are much larger than the sample sizes of the individual category. The match rates of the three largest TC categories: highway & street, education, and sewer-water combined were not significantly different from each other. Nevertheless, we did not combine these TC categories into one because a small change in the adjustment factor could have a great impact on the total VIP estimates due to their sizable contribution.

7. APPLICATION OF THE UNDERCOVERAGE ADJUSTMENT FACTORS

Undercoverage adjustment factors were derived for seven TC categories: highway & street, education, sewer-water, power, housing-hotel/motel, transportation, and others. The undercoverage adjustment factor was a product of the inverse of the match rate of the weighted value and the inverse of the contribution from projects less than \$75,000 and force account projects. For example, the overall adjustment factor F that included all projects is given by

$$F = \frac{1}{.83} \times \frac{1}{.95} = 1.27$$

Where the factor $\frac{1}{.83}$ is to account for all projects greater than or equal to \$75,000 and the factor $\frac{1}{.95}$ is to account for projects less than \$75,000 and force account projects (which represented approximately 5 percent of all projects). Table 6 presents the factors from SLUE along with the benchmarking factors that were used prior to the implementation of the SLUE factors. There are six unique SLUE factors (education and others TC categories have the same undercoverage adjustment factor of 1.20). Five of the seven SLUE categories coincided with the benchmarking categories, transportation no longer grouped with the others category under the SLUE. Note that the benchmarking factors for the education and sewer-water categories sometimes dropped below one. Thus, we had to exclude some of the VIP expenditures that were collected for these categories, which was not justifiable.

Table 6: SLUE and Benchmarking Undercoverage Adjustment Factors for the Monthly S&L VIP

	Highway	Education	Sewer-Water	Power	Housing-Hotel/motel	Transportation	Others	All TC
SLUE Factor	1.25	1.20	1.24	5.85	2.51	1.53	1.20	1.27
Benchmarking Factor (1994-2003)								
Lowest	1.15	0.85	0.74	2.43	2.07	1.31		1.13
Highest	1.24	1.18	1.02	6.66	3.49	1.63		1.27
Last 3 Years Average	1.24	1.09	0.95	5.06	3.41	1.54		1.26
10 Years Average	1.19	1.08	0.90	4.36	2.96	1.44		1.21

Beginning with the 2007 annual revision of the VIP series (released on June 29, 2007), all S&L VIP series were adjusted using SLUE factors listed in Table 6. We also adjusted the S&L VIP series back to the start of the series (January 1993) using the same set of SLUE factors listed in Table 6. The latter adjustment was an attempt to improve the historic S&L VIP series. We found that MHC coverage of projects owned by S&L government agencies appeared to have only changed slightly since the coverage study by Luery et al. (1992). Table 7 shows the comparison of the SLUE factors and the undercoverage adjustment factors derived from the study by Luery et al. (1992). The overall factors were 1.27 and 1.24 for the SLUE and the study by Luery et al. (1992), respectively.

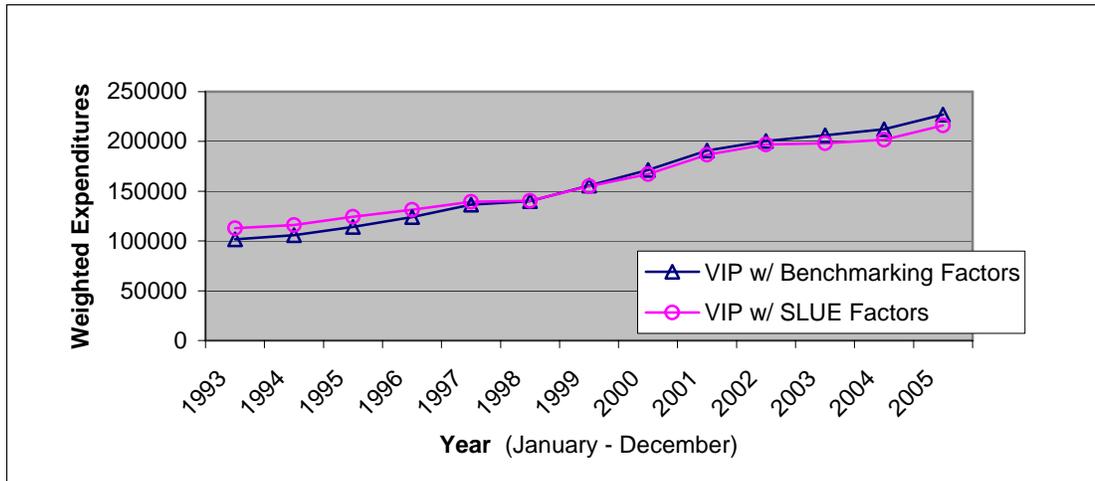
Figure 3 presents a time series plot of the total construction expenditures for S&L VIP with SLUE adjusted and benchmarking. S&L VIP with SLUE adjusted was higher than benchmarking from 1993 through 1998, but lower from 1999 to present. Luery et al. (1992) pointed out that the ASGF estimates included nonconstruction costs and the S&L VIP estimates underreported the architectural, engineering, and miscellaneous costs. One would expect the SLUE adjusted S&L VIP estimates to be lower than the benchmarking; however, we did not see that for the earlier time periods.

Our plan is to update these adjustment factors every five years by conducting similar undercoverage evaluation studies.

Table 7: Undercoverage Adjustment Factors From SLUE and Luery et al. (1992)

TC Category	SLUE Factor	Luery et al. (1992) Factor
All TC	1.27	1.24
Highway	1.25	1.23
Sewer and water	1.24	1.24
Housing, lodging, health care, and education	1.22	1.23
Building ¹¹	1.28	1.20
Nonbuilding ¹¹	2.02	1.48

Figure 3: Time Series Plot of the Total Construction Expenditures for S&L VIP With SLUE Adjusted and Benchmarking (In Millions)



8. OUTSTANDING ISSUES

Starting November 2006, the monthly S&L VIP frames also have included the ITEM reports for the first time. ITEM is an MHC acronym for Individual Trade Equipment and Material. Recall that Figure 2 showed 11% of the SLUE contracts were matched by MHC but were not submitted to MCD for inclusion in the monthly S&L VIP frame. Of this percentage, 7% were identified as ITEM reports and 4% with various statuses. We need to evaluate MHC coverage of the ITEM reports to decide when and how to introduce the new set of SLUE boost factors that includes ITEM reports as matches.

¹¹ The building category for SLUE included: office, public safety, religious, industrial, amusement & recreation, and transportation; and the nonbuilding category for SLUE included: conservation & development, commercial, communication, and power. We did not know which TC were included in the building and nonbuilding categories for the study by Luery et al. (1992). The factors from these two categories should not be compared.

In terms of the number of contracts awarded for state and locally owned construction projects by Census regions, SLUE found that the Northeast had the lowest level of activities followed by the Midwest then the West. The South region awarded the most number of contracts during the second and third quarters 2004. Table 8 presents the match rates and standard errors for projects valued at \$75,000 or more by regions based on weighted contract values. MHC coverage was not significantly different across the four Census regions at the 10% level. Even though the match rate for the Midwest was not significantly different from the other three regions, MHC did not seem to cover this region as well as the others. For the next S&L VIP sample redesign, we should examine stratifying by regions to see if we can further improve the monthly S&L VIP sample.

**Table 8: Match Rates of the Weighted Contract Values and Standard Errors by Census Regions
(In Percent)**

Regions	Match Rates	Standard Errors
Northeast	83	5
Midwest	74	4
South	85	4
West	86	3

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