**Notes on the Philadelphia Fed's
Real-Time Data Set for Macroeconomists (RTDSM)**

***Employees on Nonagricultural Payrolls
(Nonfarm Payroll Employment)***

Last Updated: December 22, 2016

I. General Comments

This file provides documentation for the Philadelphia Fed's real-time data set of the total number of employees on nonagricultural payrolls, sometimes called "nonfarm payroll employment." The data set consists of four Excel files, each containing the real-time monthly observations that would have been available to someone at the point of time (the *vintage* date) given in the column headers of the worksheets. These headers follow the nomenclature given by EMPLOY*yy*Mm*m*, where EMPLOY denotes total nonfarm payroll employment, *yy* is a 2-digit number representing the vintage year, M denotes the word month, and *mm* represents the vintage month. For example, the observations available in June 1989 are those given in the column, EMPLOY89M6. The last observation in this column is that for May 1989, since that was the last observation reported in the Bureau of Labor Statistics (BLS) report of June 1989. The time series observations within a vintage are labeled as *yyyy*:*mm*, where *yyyy* is a 4-digit number representing the year of the observation, and *mm* is a 2-digit number representing the month of the observation. For example, the observation for May 1989 is labeled 1989:05. All data are monthly, seasonally adjusted, and expressed in thousands of employees.

Data vintages from December 1964 to present are in the file, **employMvMd.xlsx**.

II. Methodology

Our methodology for collecting real-time observations on nonfarm payroll employment is identical to that described for the other variables in RTDSM[1]. We begin, with the vintage of December 1964, by locating a hard copy *deep-history report* containing the time series observations that would have been available to someone in December 1964. Subsequent vintages are then added from *high-frequency*

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[1] There is one exception: For some variables in RTDSM (variables from the national income and product accounts, M1 and M2, reserves measures, the unemployment rate, and the CPI), we have collected quarterly vintages of the data as they were available in the middle of each quarter. In contrast, the vintages for nonfarm payrolls are collected each month, and the day corresponding to the monthly vintage date depends on the day that the data are released by

reports, which contain a limited span of observations (usually the last 12 months). As we move from one vintage to the next, two things happen. First, we obtain an additional month of data. This is the initial release of employment for that month. Second, we incorporate any revisions to observations common to both vintages. Our high-frequency source is *Employment and Earnings*, produced by BLS. We proceed in this fashion until BLS releases an annual benchmark revision to the data. Since such revisions generally affect more observations than the number reported in a typical edition of *Employment and Earnings*, we must find another deep-history report.

We obtain deep-history reports from a variety of sources (described in a table below), and not all reports begin with the same observation date. Thus, because we are careful to include only those observations that we are sure were available in real time, vintages can have different dates for the initial observation. The following table shows the first observation available in each vintage:

Table 1. First Observation, By Vintage

Vintages	First Observation Date
December 1964 to May 1970	1939:M1
June 1970 to November 1977	1945:M1
December 1977 to September 1978	1947:M1
October 1978 to September 1979	1939:M1
October 1979 to present	1947:M1

As mentioned previously, we obtain deep-history reports from a variety of sources. The following table lists the vintage dates reflecting benchmark revisions, the range of observations affected by the revisions, and the source of our deep-history report.

BLS. The same is true for some other monthly variables in RTDSM (indexes of hours worked, industrial production, capacity utilization, and housing starts).

Table 2. Benchmark Revisions

Vintage of Benchmark Revision	Starting Point of Revised Observations	Deep-History Source
December 1964	startup	*Employment and Earnings Statistics For the United States, 1909-64, BLS Bulletin 1312-2*
December 1965	1954:M1	*Employment and Earnings Statistics For the United States, 1909-65, BLS Bulletin 1312-3*
September 1966	1955:M1	*Employment and Earnings Statistics For the United States, 1909-66, BLS Bulletin 1312-4*
September 1967	1956:M1	*Employment and Earnings Statistics For the United States, 1909-67, BLS Bulletin 1312-5*
June 1968	1957:M1	*Employment and Earnings Statistics For the United States, 1909-68, BLS Bulletin 1312-6*
July 1969	1958:M1	*Business Conditions Digest, October 1969*
June 1970	1954:M1	*Business Conditions Digest, August 1970*
September 1971	1961:M1	*Business Conditions Digest, October 1971*
October 1972	1967:M1	*Employment and Earnings, October 1972*
June 1973	1968:M1	*Business Conditions Digest, July 1973*
December 1974	1968:M1	*Business Conditions Digest, February 1975*
October 1975	1970:M1	*Business Conditions Digest, December 1975*
December 1976	1971:M1	*Business Conditions Digest, December 1976*
February 1977	1975:M7	*Employment and Earnings, February 1977*
December 1977	1971:M1	*Business Conditions Digest, January 1978*
October 1978	1947:M1	*Employment and Earnings, October 1978*

Table 2 (continued). Benchmark Revisions

Vintage of Benchmark Revision	Starting Point of Revised Observations	Deep-History Source
October 1979	1974:M1	*Business Conditions Digest, February 1980*
July 1980	1975:M1	*Business Conditions Digest, September 1980*
July 1981	1976:M1	*Business Conditions Digest, August 1981 & Supplement to Employment and Earnings, August 1981*
June 1982	1977:M1	*Business Conditions Digest, July 1982 & Supplement to Employment and Earnings, June 1982*
June 1983	1978:M2	*Business Conditions Digest, July 1983 & Supplement to Employment and Earnings, June 1983*
June 1984	1979:M1	*Business Conditions Digest, July 1984 & Supplement to Employment and Earnings, July 1984*
June 1985	1980:M1	*Business Conditions Digest, July 1985 & Supplement to Employment and Earnings, June 1985*
June 1986	1981:M1	*Business Conditions Digest, August 1986 & Supplement to Employment and Earnings, June 1986*
June 1987	1982:M1	*Business Conditions Digest, August 1987 & Supplement to Employment and Earnings, June 1987*
June 1988	1983:M1	*Business Conditions Digest, July 1988 & Supplement to Employment and Earnings, August 1988*
June 1989	1984:M1	*Business Conditions Digest, August 1989 & Supplement to Employment and Earnings, August 1989*
September 1990	1985:M1	*Employment, Hours, and Earnings, United States, 1909-1990, BLS Bulletin 2370*
June 1991	1986:M1	*Supplement to Employment and Earnings, July 1991*

Table 2 (continued). Benchmark Revisions

Vintage of Benchmark Revision	Starting Point of Revised Observations	Deep-History Source
June 1992	1987:M1	*Supplement to Employment and Earnings, August 1992*
June 1993	1981:M1	*Employment, Hours, and Earnings, 1981-93, BLS Bulletin 2429*
June 1994	1947:M1	*Employment, Hours, and Earnings, United States, 1909-94, BLS Bulletin 2445*
June 1995	1990:M1	*Employment, Hours, and Earnings, United States, 1990-95, BLS Bulletin 2465*
June 1996	1988:M1	*Employment, Hours, and Earnings, United States, 1988-96, BLS Bulletin 2481*
June 1997	1988:M1	Special file obtained from the BLS.
June 1998	1993:M1	Collected in real time by the Philadelphia Fed.
June 1999	1994:M1	Collected in real time by the Philadelphia Fed.
June 2000	1995:M1	Collected in real time by the Philadelphia Fed.
June 2001	1996:M1	Collected in real time by the Philadelphia Fed.
June 2002	1997:M1	Collected in real time by the Philadelphia Fed.

There are some methodological points to consider in understanding precisely how we incorporate a benchmark revision into a new vintage. First, *Employment and Earnings* always provides a detailed discussion of the revision process, including the reasons for the revision and the range of observations affected. When possible, we do not rely on BLS's discussion about the range of observations affected by the revision when deciding on the range of observations to carry over from the preceding vintage. In many cases, our deep-history reports (listed in Table 2) contain observations dated prior to the date that BLS says is the first date affected by a benchmark revision. In these cases, we use the full array of observations from the new deep-history report, not just the range that BLS asserts is the range affected by the benchmark revision, in creating the new vintage.

Second, in some cases our deep-history report was published on a date after the vintage date, suggesting the possibility that some of the observations in that report may not have been available on the vintage date. (Such a possibility could occur if BLS released revised observations over time, rather than

all at once—which sometimes occurs for other variables, for example, when BEA releases a benchmark revision to the national income and product accounts.) For the employment data, we treat this as a publication lag, not a lag in the availability of the revised observations. Thus, in the interest of maintaining as deep a history as possible in each vintage, we decided on the following policy: Unless we detected evidence in BLS's discussion of the revision that the revised values would be released in a staggered form, we assumed all revised values were released on the same date. We detected no such evidence in any benchmark revision.

Third, there is one potential problem with the preceding policy: When the deep-history report is published a number of months after the date of the benchmark revision, the tail-end observations in the report can reflect normal month-to-month revisions that would not have been known on the date of the benchmark revision. We do not incorporate these observations in the vintage of the benchmark revision. Rather, we take the last 12 observations from those listed in the edition of *Employment and Earnings* in which the benchmark revision occurred. For example, in constructing the vintage of June 1992 (see table 2), we used the *Supplement to Employment and Earnings* of August 1992 for observations from 1986:M1 to 1991:M4 and the *Employment and Earnings* of June 1992 for observations starting from 1991:M5. (Observations prior to 1986:M1 were taken from the vintage of May 1992, as BLS's discussion suggested that this range was unaffected by the benchmark revision.)

III. Exact Release Dates

We thank Francis Horvath and other staff at the Bureau of Labor Statistics, U.S. Department of Labor, for giving us a file of release dates for the data from the U.S. labor market. The file is available on the Philadelphia Fed's web pages for downloading our real-time data. An analysis by Horvath and other BLS staff suggests that February 8, 1966, is the date of the first release to combine the data from the CPS (Household Survey) and the CES (Establishment Survey). The CPS includes the unemployment rate. The CES includes such variables as nonfarm payroll employment and indexes of hours worked. Prior to February 8, 1966, BLS released the data from the CPS in the first week of the month. The data from the CES were released about one week later. Beginning on November 7, 1969, BLS released the combined data from the CPS and CES on the first Friday of the month, a practice that continues today. (When the first Friday occurs early in the month, the data are sometimes released on the second Friday.)

For additional historical perspective on the CPS and the timing of its data releases, see the article by John E. Bregger, entitled "The Current Population Survey: A Historical Perspective and BLS' Role," available on BLS's web page, at the URL: www.bls.gov/opub/mlr/1984/06/art2full.pdf.

IV. Relationship Between Monthly Vintages and RTDSM Quarterly Vintages

In early June 1999, the Philadelphia Fed released its real-time data set, consisting of quarterly vintages of quarterly observations of variables from the national income and product accounts (NIPA) and additional, non-NIPA variables. These quarterly vintages contain the full time-series history available in the middle of each quarter.

If we assume BLS's employment report was always released on or before the middle of the month, the following table shows how to merge the quarterly vintages of the RTDSM data set with the monthly vintages of the data on nonfarm payroll employment—that is, how to merge the two to form a consistent quarterly information set that would have been known in the middle of the quarter.

Table 3. Merging Quarterly Vintages from the Real-Time Data Set With the Monthly Vintages of Nonfarm Payroll Employment

RTDSM Quarterly Vintage	Monthly Employment Vintage (column header name)
yyyy:Q1	EMPLOYyyM2
yyyy:Q2	EMPLOYyyM5
yyyy:Q3	EMPLOYyyM8
yyyy:Q4	EMPLOYyyM11

V. Our Methodology for Incorporating Corrections to BLS Reporting Errors

Occasionally, BLS's *Employment and Earnings* contains errors in the reported data. In general, we do not know whether such errors are due to computational or typographical mistakes. When BLS discovers such errors, they are reported, along with the corrections, in a later edition of *Employment and Earnings*. Our policy on incorporating this new information is as follows: When we discover an *Employment and Earnings* that contains corrections to previously published data, we incorporate such

corrections into that vintage. Subsequent vintages reflect the correction as well. On the premise that the corrections would not have been known at the time of previous vintages, w*e do not adjust the observations in previous vintages*.

VI. Quality of the Data

In our judgment, these employment data are of high quality. We believe each vintage accurately represents the exact time-series history that would have been available to someone at the vintage date. We have taken steps to minimize our own data-entry errors. In particular, all vintages have been checked at least twice for errors. Benchmark vintages have been checked three times. Some subtle errors possibly remain, and users should examine the data carefully for outliers that we may have overlooked.

Questions about the data should be addressed to:

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The remainder of this documentation discusses any special features of the real-time employment data.

EMPLOYyyMmm—Employees on Nonagricultural Payrolls

1.   Thousands of employees, seasonally adjusted, monthly.

2.   First Vintage: December 1964

3.   First Observation: Varies by vintage (see Table 1)

4.   High-Frequency Source: Bureau of Labor Statistics's (BLS) *Employment and Earnings*

5.   Deep-History Source: Varies by benchmark revision (see Table 2)

6.   Vintage Names: EMPLOY*yy*M*mm,* where *yy* is the year of the vintage (two digits), M represents the word month, and *mm* is the month of the vintage, (*mm* = 1,2, 3, ... 12).

7.   Vintage Dates: Each vintage date corresponds with the day the data are released that month.

Special notes.

1.   **EMPLOY70M11—Unusual Revision.** An unusual revision occurred in this vintage, affecting the observations from 1970:M3 to 1970:M7. We do not know the reasons for the revision.

2.   **EMPLOY83M2—Unusual Revision.** An unusual revision occurred in this vintage, affecting the observations from 1982:M8 to 1982:M10. This revision appears to be releated to a BLS computational error in the previously reported observations.

3.   **EMPLOY96M10 to EMPLOY97M5—BLS Computational Error.** In its October 1996 *Employment and Earnings* (page 2)*,* the BLS discusses a computational error (related to faulty seasonal factors) in the data released in its September 1996 *Employment Situation* news release. The BLS says the error, which was discovered after the news release but before the publication of the October 1996 *Employment and Earnings*, only affects the observations from 1996:M3 to 1996:M9, though we cannot be sure that observations prior to the first observation reported in the *Employment and Earnings* of October 1996 were not affected. In constructing the vintage of October 1996, we have used the corrected values, as reported in *Employment and Earnings* of October 1996, which are <u>not</u> the values initially reported by

the BLS in its aforementioned press release. This divergence—between "press release" values and the values reported in *Employment and Earnings*—affects only our vintage of October 1996. To the extent that the BLS's computational error actually affected observations prior to the first observation reported in *Employment and Earnings* of October 1996 (1995:M9), we have determined that our vintages from October 1996 to May 1997 (the last vintage prior to a new benchmark revision) will have incorrect values only over the period 1988:M1 to 1995:M8. If we take the BLS's discussion at face value, its computational error only affects the observations from 1996:M3 to 1996:M9 in the vintage of October 1996, and the only problem is that our observations are the corrected values taken from the October 1996 *Employment and Earnings*, not the incorrect values initially reported in the BLS's press release.

4.   **EMPLOY96M1—Federal Government Shutdown.** Due to the federal government shutdown in 1996, BLS released the last few observations reported in our vintage of January 1996 with a two-week lag. Thus, these observations were not available to the public at the same time of the month as the data of other releases in the 1990s. On the basis of a search of aritcles published in the *Wall Street Journal* around this time, we have determined that BLS released the observations on Friday, January 19, two weeks later than originally planned.

5.   **EMPLOY02M12—BLS Computational Error.** On December 6, 2002, BLS released its employment report for November. On December 9, 2002, BLS announced a computation error (related to incorrect seasonal adjustments) in its release of December 6. This error affected the observation for September 2002. We use the corrected number for September in our data set (130,829). The incorrect number reported on December 6 was: 130,909.

6.   **EMPLOY03M7 to EMPLOY03M10—BLS Computational Error.** On June 6, 2003, BLS released a benchmark revision to nonfarm payrolls. This benchmark is incorporated into the vintage that we call EMPLOY03M6. However, around June 30, 2003, the BLS released a note ("Revisions to some CES Series for History prior to 1990") indicating that some of the data released on June 6 contained errors. Evidently, these errors were related to the seasonal adjustment method applied to payroll employment in the logging and mining sectors. Any aggregate that includes these sectors was, thus, also affected, including nonfarm payroll employment. An analysis of the revised and unrevised data shows that the June 30 revisions to nonfarm payrolls are <u>very minor</u> and affect the observations from 1958:M1 to 1989:M10. The data vendor from which we obtained the observations (in real time) did not recognize until sometime after the employment release of October 3, 2003 that BLS released revisions to its June 6

benchmark. On the grounds that few analysts recognized the June 30 revisions occurred, we have decided not to correct the observations in question. Thus, in RTDSM, vintages EMPLOY03M7 to EMPLOY03M10 do <u>not</u> reflect the minor revision of June 30. Real-time data users who wish to adjust the data set to reflect the revision of June 30 should replace the observations from 1958:M1 to 1989:M10 in vintages EMPLOY03M7 to EMPLOY03M10 with the corresponding observations in vintage, EMPLOY03M11.

7.   **EMPLOY10M3 – Unusual Revisions – Census 2010**. This vintage contains revisions to the observations for 2009:M4 to 2009:M7. Revisions over this period are unusual. According to BLS's press release of March 5, 2010, these revisions reflect "…corrections to initial counts for Census temporary and intermittent workers for Census 2010."

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