Introduction of Quarterly Birth/Death Model Updates in the Establishment Survey

Overview

Effective with the release of preliminary January 2011 employment estimates in February 2011, BLS began updating the Current Employment Statistics (CES) net birth/death model component of the estimation process more frequently, generating birth/death residuals on a quarterly basis instead of annually. This will allow CES to incorporate Quarterly Census of Employment and Wages (QCEW) data into the birth/death model as soon as it becomes available. This more frequent updating will help to reduce what is known as the "post-benchmark revision" in the CES series. There will be no change to the timing or frequency of the current CES monthly or annual releases. Benchmarking to the QCEW will continue to be done on an annual basis. The first monthly estimates to be affected by this change will be for the reference month of April 2011.

Methods and Timing

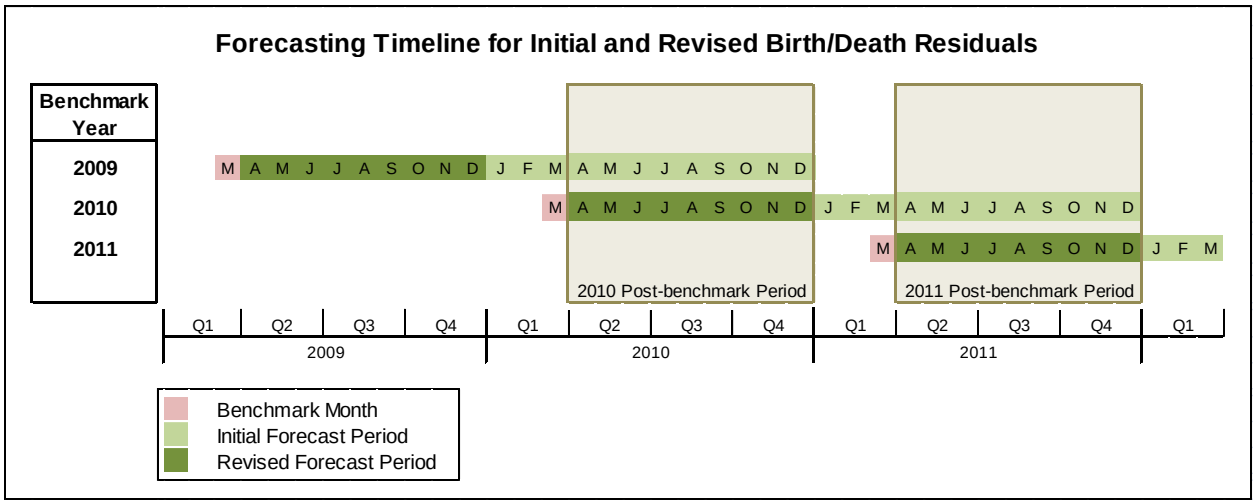
CES estimates are benchmarked annually to March employment counts derived primarily from the QCEW which is based on Unemployment Insurance tax records. On a not seasonally adjusted basis, the sample-based estimates for the year preceding and the 9 months following the March benchmark are subject to revision. The 9 months following the March benchmark are referred to as the "post-benchmark" period. These 9 months of data are revised by applying previously derived over-the-month sample changes and newly calculated net birth/death residuals to the March benchmark level. The change between the original birth/death residuals used for this time period and the new residuals calculated as part of the benchmark process is a major component of the post-benchmark revision.

Currently, the original birth/death residuals are calculated on an annual basis and then applied each month during development of monthly estimates. By switching to the more frequent quarterly computation of the residuals, the size of the post-benchmark revision to the birth/death residual is expected to be smaller than under the current methodology. BLS research results shown below support this conclusion.

Using the current annual forecasting methodology, CES estimates net birth/death residuals twice for the months following the associated March benchmark, that is, April – December. The initial forecasts are 13 – 21 months out from the QCEW input data. For example, the initial forecasts for April – December 2010 were created using input histories that ended in March 2009. Revised forecasts, created using input histories that end with March 2010, will replace the initial forecasts with the introduction of the 2010 benchmark. The change in the cumulative contribution of these net birth/death residuals from the initial values to the revised values comprises the birth/death component of the post-benchmark revision.

A visual representation of the initial and revised birth/death components is presented in Figure 1. As shown in the figure, revised birth/death residuals for the 2010 post-benchmark period (the months April – December 2010) replace initial residuals made during the prior year.

Figure 1.



Quarterly Forecasting

As shown in figure 1, under the annual net birth/death residual forecasting methodology, forecasts extend out up to 21 months beyond the latest QCEW data used in the model. QCEW data for more recent quarters that subsequently become available are not utilized for modeling until the next annual forecasts are produced.

The quarterly forecasting methodology will produce initial forecasts that extend, at most, 12 months. For example, initial quarter 1 forecasts, using input data through March 2010, would forecast net birth/death components through March 2011. When quarter 2 QCEW data is made available, initial forecasts would be made for the months April – June 2011. Similarly, forecasts for July – September 2011 and October – December 2011 would be made when new quarter 3 and 4 QCEW data, respectively, become available. Because the quarterly updating allows the most recent quarter of available QCEW data to be incorporated immediately, rather than at the end of the year, revisions between the initial birth/death factors and the revised birth/death factors are usually reduced.

Table 1 below shows a comparison of the cumulative contribution of net birth/death components to the post-benchmark employment level for the years 2003 – 2009 using both an annual and quarterly methodology. They show that the birth/death component revisions in the post-benchmark period would have been smaller in 6 of the last 8 years with the quarterly methodology. It is notable that the

most significant reduction in the size of the revision was seen in the 2009 post-benchmark period, when earlier incorporation of quarterly data reflecting the sharp employment drop during the recession would have most influenced the birth/death factors. This suggests that the quarterly methodology should help CES estimates better reflect turning points.

Table 1. Cumulative post-benchmark net birth/death contribution in thousands

Post-benchmark Year	Forecast	Annual Methodology	Quarterly Methodology
2010	Initial	759	477
	Revised	537	537
	Difference	**-222**	**60**
2009	Initial	990	730
	Revised	585	585
	Difference	**-405**	**-145**
2008	Initial	1005	1008
	Revised	825	825
	Difference	**-180**	**-183**
2007	Initial	1059	1024
	Revised	883	883
	Difference	**-176**	**-141**
2006	Initial	906	1115
	Revised	1002	1002
	Difference	**96**	**-113**
2005	Initial	866	846
	Revised	817	817
	Difference	**-49**	**-29**
2004	Initial	889	788
	Revised	827	827
	Difference	**-62**	**39**
2003	Initial	768	740
	Revised	695	695
	Difference	**-73**	**-45**

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