Empirical Exercise 16.2

(a) Mean of $\pi^{CPI} = 3.81$. Mean of $\pi^{PCED} = 3.35$. The difference is approximately 0.5%, which is large and economically significant. Over a twenty-year period, prices increase by $(1.0381)^{20} = 2.1$ times using the CPI inflation rate, but only by $(1.0335)^{20} = 1.9$ times using the PCE inflation rate.

(b) Mean of $Y = 0.47$. The mean of Y is the difference in the means because $Y = \pi^{CPI} - \pi^{PCED}$.

(c) $Y = \pi^{CPI} - \pi^{PCED}$, so $E(Y) = E(\pi^{CPI}) - E(\pi^{PCED})$.

(d) $Y_t = \beta_0 + u_t$, so $E(Y_t) = \beta_0 + E(u_t) = \beta_0$ because $E(u_t) = 0$. u_t represents the deviation of Y_t from its mean. Because the factors that lead π^{PCED} to differ from π^{CPI} are serially correlated, Y (and therefore u) is serially correlated.

(e) $\hat{\beta}_0 = 0.47$ and $SE(\hat{\beta}_0) = 0.09$, so a 95% confidence interval is $0.47 \pm 1.96 \times .09$. m was chosen using $0.75T^{0.33}$ rounded up to the nearest integer; $m = 5$ in this case.

(f) Yes. β_0 represents the difference in the mean inflation rates (see (c) and (d)), and (e) suggests that β_0 is between 0.30 and 0.64 percentage points.

(g) The QLR statistic is 7.88 with largest value occurring in 2008:Q2. The 10% critical value is 7.12 and the 5% value is 8.68, so there is statistically significant evidence of a break at the 10%, but not the 5% significance level. Note also that the largest value occurs around the time of the outlier in inflation (2008:Q4) that was uncovered in EE 15.1.