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**Development Microeconometrics Midterm**

## Question 3

In matching the calculation of the denominator, "denom," there are two issues that come up. First, 262 rows have missing calculated values for the "denom_test" variable. 225 of these were already missing values in "denom." These 225 are missing either employment data or job creation or destruction data. They are all large companies, coded as 1000 employees or more, and all are also young (5 years old or less, or coded as unknown age). They also are marked as a 1 with the "d_flag" marker, and according to the codebook, these firms' data were suppressed to prevent disclosure of sensitive information. The other 37 have a "denom" value in the data, but are missing either employee counts or job creation or destruction values. Again, these are marked as having sensitive data.

The second issue looks to be a rounding or truncation issue, as all calculated values of "denom_test" are within 1 or less of the "denom" value (except for one row with a discrepancy of 2). Given the magnitude of the "denom" field, these are inconsequential deviations.

For the job creation rates, we have the same problem of missing data as explained above as well as rounding issues. The test calculation matches for every value once the test variable is rounded to the nearest tenth.

## Question 12

Chart 1: Cyclical Unemployment rate and differential net job creation rate for small and large firms.

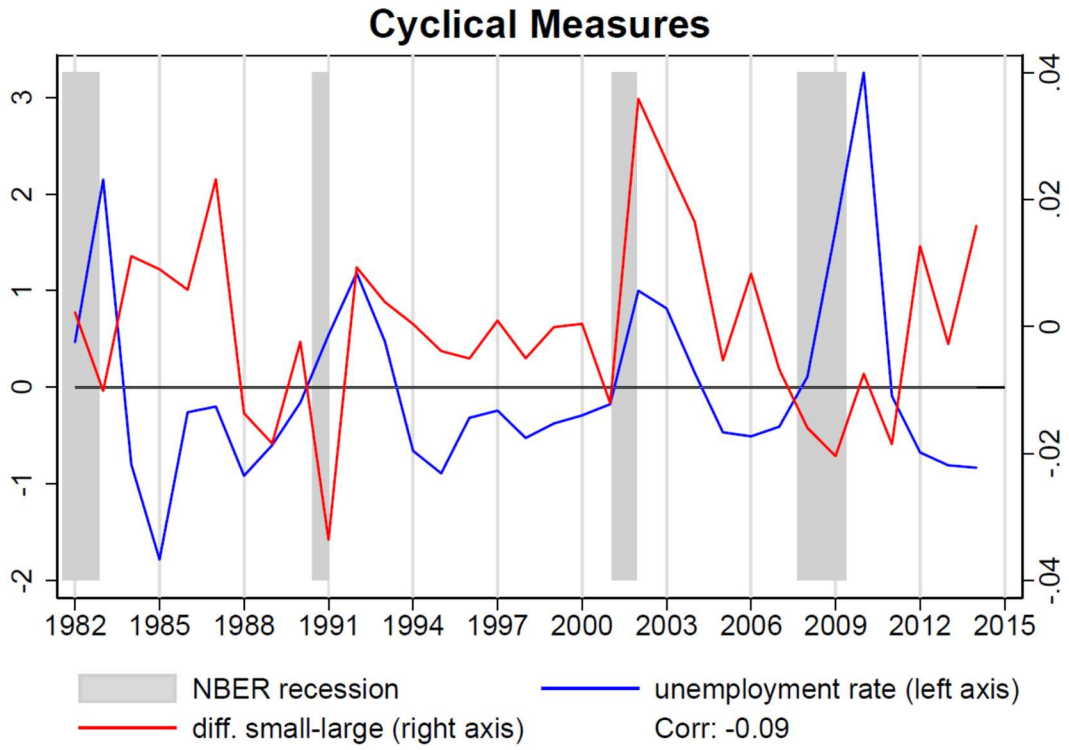
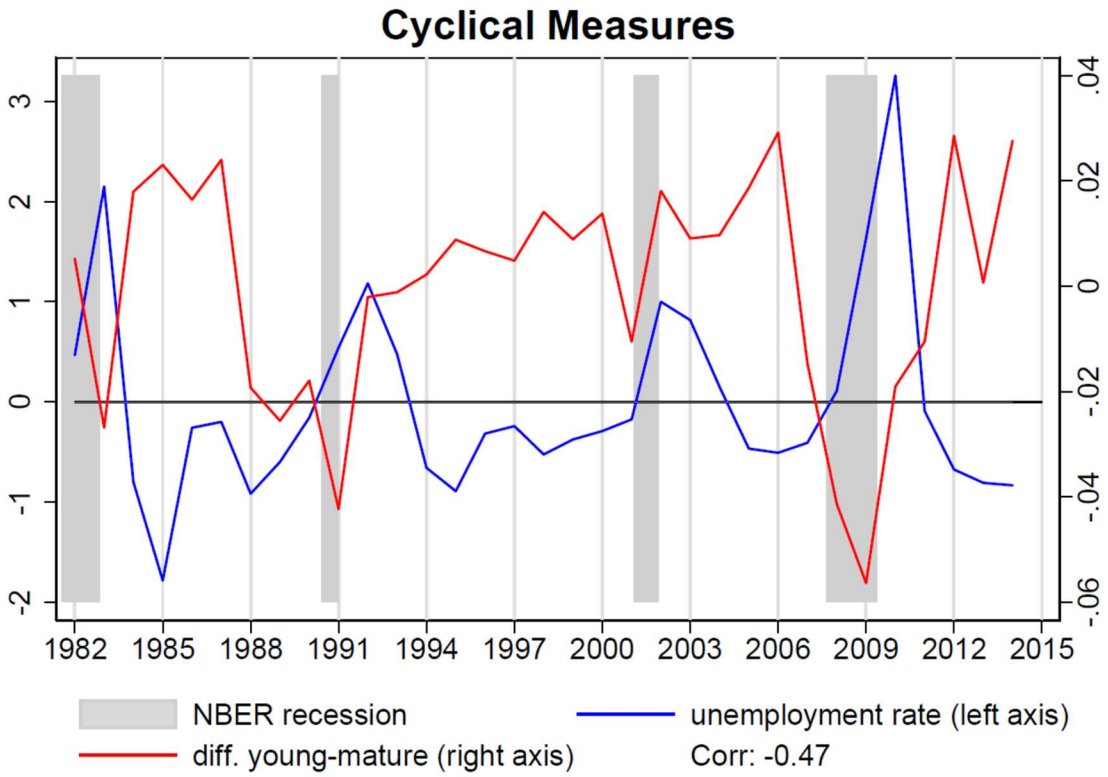


Chart 2: Cyclical Unemployment rate and differential net job creation rate for young and mature firms.




The charts above show that the unemployment rate deviation from its trend generally increases during and shortly after recession periods, showing that a higher unemployment rate than the natural level or trend level persists for some time after recessions, before recovering and settling below trend and persisting again at a lower rate of unemployment than long term trend until the next recession.

Chart 1 shows that the differential net job creation rate between small and large firms generally grows more negative just before and during recession periods, and turns more positive after recessions. That is, during these time periods, the spread between the two categories widens. As we would expect the NJCR to be negative during recessions (as job destruction levels are likely to exceed job creation), it seems that smaller firms engage in job destruction at a higher rate before and during recessions, and engage in job creation at a higher rate just after recessions than do the large firms. As the recession fades, over time, larger firms then seem to engage in increasing job creation, reducing the differential (see 1986-1990 or 2006-2008 for example). So, the small firms exhibit more variability in NJCR slightly before, during and just after these recession periods until the larger firms increase their job creation rate later during the recovery or growth portion of the cycle.

Chart 2 shows the same relationship dynamic for young vs mature firms, with young firms behaving similarly to small firms in chart 1, but at an even higher volatility level. Like small firms, young firms seem to be more susceptible to recession periods, engaging in higher rates of job destruction before and during recessions, and then higher rates of job creation as the recession ends. As the recovery continues, mature firms seem to increase their job creation rates (and/or young firms reduce their rates), reducing the differential (again see 1986-1990 or 2006 to 2008 for example).

**Question 13**

Table 1.2: Contemporaneous Correlations of NJCR Differentials with GDP and Unemployment Rate

| | SMALL-LARGE | YOUNG-MATURE | MATURE: SMALL-LARGE | SMALL: YOUNG-MATURE |
|---|---|---|---|---|
| GDP (corr) | 0.1576 | 0.5041 | -0.1654 | 0.5714 |
| (p-value) | 0.3812 | 0.0028 | 0.3577 | 0.0005 |
| Unemp. (corr) | -0.0884 | -0.4739 | 0.2504 | -0.5762 |
| (p-value) | 0.6248 | 0.0053 | 0.1598 | 0.0004 |

The categories highlighted in gray above are significant, well above the 95% level (young vs mature correlation, both aggregated and for small firms, are statistically significant). As well as being statistically significant, the correlation levels of around .5 indicate moderately strong levels of correlation indicating a moderately strong linear relationship.

For the significant correlations highlighted above, both have a pro-cyclical relationship to the cyclical deviations with unemployment (as the correlation is negative). As unemployment increases away from its trend (e.g. during recessions), the differential between young and mature firms also increases, meaning that the NJCR for younger firms generally declines more severely than for mature firms (in the aggregate and also for small firms within these categories). Then, during recovery periods, generally younger firms would increase job creation at a higher rate than mature firms. Thus, younger firms are more sensitive to cyclical deviations in unemployment and GDP than their more mature counterparts.

There are two main advantages to looking at the differentials rather than at individual levels. First, examining non detrended levels alone runs into a problem of persistence and of relative weighting. For example, during and shortly after recessions, unemployment levels can remain high for some time. That is, they are persistent above the natural or trend rate, and it is more informative to look at the change in unemployment from year to year, rather than the levels of unemployment. Also, when comparing the levels of NJCR for small and large firms or young and mature firms, the respective total employment between the two categories is not equally balanced, and this can lead to misinterpretations.

Second, looking at the differentials allows for the direct isolation and examination of the impacts of recessions and recoveries on the relationship between two subcategories such as age and size of firms. Examining the differentials would uncover whether these subgroups respond differently in magnitude or timing to changing economic conditions. The results of this type of analysis can aid policymakers in deriving appropriate economic stimulus policies. For example, knowing that younger firms are more susceptible to layoffs earlier and more dramatically in recessions but quicker to rehire workers during recovery could mean that a targeted stimulus of short duration to such firms and a lagged deployment of longer duration stimulus to mature firms could help speed economic recovery more efficiently than non-targeted stimulus.