Commentary

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Economists have long been interested in the performance of specific regional economies and the forces driving a particular economy. The McCarthy–Steindel and Kuttner–Sbordone studies of the New York metropolitan area follow in this tradition. McCarthy and Steindel focus on documenting the performance of New York relative to that of the nation and distinguishing the roles of national and regional factors in area employment, income, and wages. Kuttner and Sbordone pick up where McCarthy and Steindel leave off, examining the role of industry as well as national and regional factors in New York area employment.

More recently, economists have been interested in whether regional economic fluctuations are driven by region-specific forces that should be viewed as macroeconomic phenomena. Macroeconomists have generally taken the view that the performances of regional economies differ over the business cycle only to the extent that industry mixes vary across regions. Recent studies by Norrbin and Schlagenhauf (1988), Altonji and Ham (1990), and Clark (forthcoming) have challenged this view. Although Kuttner and Sbordone do not explicitly take up the issue, their analysis provides some evidence on the question. Kuttner and Sbordone measure the role that an area-specific factor plays in New York employment fluctuations, controlling for the effects of national and industry forces.

In conjunction, the McCarthy–Steindel and Kuttner–Sbordone studies provide interesting and thought-provoking evidence on the performance of the New York economy and the factors affecting New York, as well as on the importance of a perhaps "macroeconomic" New York–specific factor. McCarthy and Steindel show that although recent employment growth in New York has been poor relative to that of the nation, income growth has been considerably stronger. They also find that the strength of the linkage between New York and the nation has varied over time. Detailed analysis of the 1989-96 period indicates that region-specific factors initiated the slowing of the New York economy while national factors played an important role in perpetuating the slowdown.

Kuttner and Sbordone show that national, industry-specific, and region-specific factors have all been important sources of fluctuation in the New York area economy. The national and area economies tend to move together closely over the business cycle. However, the relationship between the national and area economies has been significantly affected by shifts in New York's industry mix. Although important, national and industry-specific factors account for only about half of the business cycle variation in New York employment growth; the remaining half is attributed to a New York–specific factor. Thus, contrary to the standard view of macroeconomists, there appears to be an

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important New York–specific factor even after accounting for industry mix.

This note offers some comments on the McCarthy–Steindel and Kuttner–Sbordone analyses. Given that some of my own research is closely related to the Kuttner–Sbordone paper, I will exploit my comparative advantage and devote most of my attention to that study.

McCarthy–Steindel

The McCarthy–Steindel paper would be strengthened by providing more extensive treatment of two results reported in the paper. Specifically, I would suggest a more detailed analysis of the finding that when New York is compared with the nation, employment has been weaker than personal income and wages in recent years. Could the better performance in income and wages be the result of measurement problems in the income and wage data? Regional economists who know the construction of the data may find the payroll employment numbers to be more reliable than the personal income and wage numbers, with problems in measuring profits, rent, and the like making the income numbers less reliable than the wage numbers. Alternatively, could the better performance in income and wages be the result of shifts in New York's industry mix toward higher wage industries? This is admittedly a difficult question that could take up an entire additional paper. However, some other research probably exists (perhaps New York State Department of Economic Development [1994]) that could be cited in an extended discussion, and some simple and preliminary analysis could be added.

I would also suggest that the authors consider in more detail the finding that estimates of the elasticity of New York employment, income, and wages with respect to national employment, income, and wages vary widely over the sample period. Do formal tests reject the null of stability in the elasticity? Such tests could include the Hansen (1992) test or allowing for three distinct elasticities over 1960-90 and testing the equality of the three elasticities. Some of my analysis using data for the state of New York suggested that the elasticity is in fact generally stable while the intercept of the relationship between New York and the United States is unstable.[1] Is the behavior of the elasticities reported in the authors' Charts 4, 7, and 9 consistent with the vector autoregression (VAR) for New York and the United States being the "true" model? How much does any instability in the estimated elasticity affect the VAR results on the sources of fluctuations in New York? Specifically, does allowing for shifts in the VAR model significantly affect the conclusions on the sources of fluctuations?

Kuttner–Sbordone

This section begins with an overview of the factor model approach used in the second part of the Kuttner–Sbordone paper. It then suggests some extensions of the study and describes some apparent limitations of the analysis. Finally, the section discusses the general implications of the paper's findings.

Overview of the Factor Model Approach

The dynamic factor model used by Kuttner and Sbordone to sort out the relative importance of national, industry-specific, and region-specific factors fits in the general class of unobserved components models. Although seemingly complicated, the estimation of such models can be viewed as simply picking parameter values to make the covariance structure implied by the model "fit" the observed covariation in the data. The model implies that the variances and covariances of the observed data series are particular functions of a set of parameters. The parameters are then estimated to make the model-implied variances and covariances as close as possible to the actual variances and covariances among the observed data. After the model parameters are estimated, predictors of the underlying unobserved factors or components can be obtained by exploiting the model and the observed data. Assuming a normal distribution, the model implies that the unobserved factors and the observed data are jointly normally distributed.[2] That structure can be used to calculate predictors of the unobserved factors, conditional on the observed data.

A simple example can be used to illustrate the basic factor model methodology. Suppose two observed variables, $y_{1,t}$ and $y_{2,t}$, are functions of an unobserved common variable c_t and two unobserved idiosyncratic variables

$u_{1,t}$ and $u_{2,t}$:

$$y_{1,t} = c_t + u_{1,t}$$
$$y_{2,t} = B\, c_t + u_{2,t},$$

where the unobserved variables c_t, $u_{1,t}$, and $u_{2,t}$ are all uncorrelated, and $var(c_t) = 1$. This model implies that

$$var(y_1) = 1 + var(u_1)$$
$$var(y_2) = B^2 + var(u_2)$$
$$cov(y_1,y_2) = B.$$

The variances and covariances $var(y_1)$, $var(y_2)$, and $cov(y_1,y_2)$ are all observed. We can therefore estimate the model parameters B, $var(u_1)$, and $var(u_2)$ by picking the parameter values that solve the above equations. So, the estimated parameters would be

$$B = cov(y_1,y_2)$$
$$var(u_1) = var(y_1) - 1$$
$$var(u_2) = var(y_2) - cov(y_1,y_2)^2.$$

Given the model parameters, predictors of the unobserved factors c_t, $u_{1,t}$, and $u_{2,t}$ could be obtained by exploiting the observed data on $y_{1,t}$ and $y_{2,t}$. The predictor of c_t would be a simple weighted average of $y_{1,t}$ and $y_{2,t}$, with the weights depending on the model parameters.

Suggestions for Further Analysis

Some additional analysis would strengthen the Kuttner–Sbordone paper. First, standard error bands should be reported for the historical decompositions of the authors' Chart 7. It seems that such bands could be computed using a bootstrap procedure, taking random draws of the model coefficients from a normal distribution and using the maximum likelihood estimate of the variance-covariance matrix. Historical decompositions could be computed for each draw of the model parameters, and standard errors could be computed from the variation across decompositions. Second, it would be interesting to see variance decompositions of New York employment growth at a horizon of one quarter and at an infinite horizon (the unconditional variance). Those results would document the extent to which national, industry-specific, and region-specific factors propagate across industries and regions.

Third and finally, the results should be subjected to some robustness checks—in particular, to some alternative model structures. Of particular concern is the possibility that Kuttner and Sbordone's finding of a small role for manufacturing in both national and New York fluctuations (documented in their footnote 11, Table 3, and Chart 7) may not be robust to alternative specifications of the model. The Kuttner–Sbordone paper combines a VAR structure with a factor model structure in which the national shock is allowed to be serially correlated. Consequently, the dynamic behavior of employment growth is captured by either the unobserved national factor or the VAR structure. In contrast, Clark (forthcoming) assumes the national factor to be serially uncorrelated. In that analysis of U.S. Census regions and one-digit Standard Industrial Classification industries, more than half of the variation in manufacturing is industry-specific, and industry-specific factors account for about 30 percent of the variation in regions at a four-quarter horizon. The contrast between the Kuttner–Sbordone and Clark results suggests that the Kuttner–Sbordone finding of a small role for the manufacturing-specific factor (and industry factors more generally) may be affected by the model structure. Therefore, I would be interested in seeing results for a model that allowed enough lags in the VAR structure to account for all serial correlation and that assumed the national factor to be serially uncorrelated. The restrictions on the national factor process could of course be tested.

Possible Limitations of the Analysis

The factor model methodology used in the second part of the Kuttner–Sbordone paper appears to suffer from two limitations. First, the factor model estimates do not seem to capture adequately the important low-frequency movements in employment growth documented in the first part of the paper. The authors' Chart 1 shows that much of the slowdown in employment growth in the 1970s and 1990s can be attributed to the trend component. For the factor model to capture the trend component, the estimated "intercept" of the region equation, $\sum a_{i,N,t}\, \mu_i + \mu_N$, would need to track the trend reported in Chart 1. However, back-of-the-envelope calculations based on a reading of the industry shares from Chart 3 and the μ_i and μ_N estimates reported in Table 2 indicate that the intercept does not track the trend. Rather, it appears that the factor model

estimates inappropriately force much of the low-frequency variation in employment growth onto the New York–specific factor. The region factor, which the model assumes to be serially uncorrelated, was persistently negative over the 1970s and 1980s. Thus, it seems that the factor model does not accurately capture the significant long-term fluctuations in New York's employment growth. Given that the long-term fluctuations inappropriately affect the factor model estimates, I would like to see the model estimated with just the cyclical components charted at the bottom of Chart 1. I would expect New York–specific shocks to be less important in the cyclical components.

The second limitation of the Kuttner–Sbordone analysis is that region- and industry-specific factors are treated differently. According to the underlying disaggregate model, employment growth in industry *i* and region *r* is a function of a national factor, an industry-*i*-specific factor, and a region-*r*-specific factor. When aggregated across regions, the model implies that growth in U.S. industry *i* is a function of the national factor, the industry-*i*-specific factor, and a weighted average of the region-specific factors. When the regions are specified as New York and the rest of the United States, the weighted average of the region-specific factors is simply a weighted average of the New York–specific factor and the rest of the U.S.–specific factor. The rest of the U.S. factor represents a weighted average of the factors specific to disaggregate regions of the United States. However, the estimated model drops the rest of the U.S. factor from the industry equations. The authors have indicated that the rationale for dropping the rest of the U.S. factor is that the weighted sum of disaggregate region-specific factors should average zero.[3]

Although reasonable on the surface, this rationale becomes unsatisfactory after more careful consideration. Assuming that the weighted sum of disaggregate region-specific factors averages zero is unsatisfactory because the same type of restriction is not imposed on the industry-specific factors. Each region is affected by the weighted sum of industry-specific factors, which are not assumed to average zero. Clark's (forthcoming) results, which do not impose the region-factor restriction, suggest that the restriction may impact the results, but probably not dramatically. Clark finds that, on impact, region-specific factors account for an average of about 7 percent of the variation in industry employment growth. The asymmetry in the treatment of region and industry factors is more troubling because it highlights the limitations of economists' understanding of potentially region-specific fluctuations.

General Implications

The results of the Kuttner–Sbordone study indicate that, contrary to the standard view among macroeconomists, much of the variation in the New York economy appears to be region-specific even after accounting for industry mix. In conjunction with Clark's (forthcoming) results for U.S. Census regions, such evidence suggests that regional economies should be viewed as distinct macroeconomies. However, the existing evidence is only suggestive. As noted by McCarthy and Steindel, more research on a number of questions is needed. For example, what are the sources of region-specific fluctuations? Are the seemingly region-specific shocks found in studies using aggregate industries really the result of highly disaggregate industry shocks? How should the propagation of region-specific disturbances across regions be viewed? Was the 1990-91 recession, for instance, the result of a national disturbance that first affected the East and West Coasts or coast-specific disturbances that gradually spread across the rest of the country?

Conclusion

The McCarthy–Steindel and Kuttner–Sbordone studies provide very interesting evidence on the performance of the New York economy and the factors affecting New York, as well as on the importance of a perhaps "macroeconomic" New York–specific factor. The papers fit nicely together, with McCarthy and Steindel focusing on the relative performance of the area economy and the relative importance of national and region-specific factors, and Kuttner and Sbordone extending the analysis to consider the role of industry factors. In my comments, I have offered a few suggestions for making the results of the papers stronger, discussed some potential limitations of the Kuttner–Sbordone analysis, and discussed the macroeconomic implications of the Kuttner–Sbordone paper. According to these studies,

the New York economy seems to be importantly affected not only by national and industry forces but also by area-specific forces. Given that economists have a poor understanding of such region-specific factors, these papers suggest that there is much work to be done to understand fluctuations in the New York area economy and in other regional economies.

ENDNOTES

1. Specifically, applying Hansen (1992) tests to a 1960-93 regression of growth in New York State employment on a constant, the growth in U.S. employment, and three lags of growth in U.S. employment showed the constant coefficient to be unstable at 5 percent confidence, the coefficient on U.S. growth to be unstable at 10 percent confidence, and all other coefficients to be stable. The joint null of stability in all parameters cannot be rejected at 10 percent confidence. Similarly, when the elasticity is simply estimated by regressing New York employment growth on a constant and U.S. employment growth (a procedure that yields results similar to those obtained when lags of U.S. growth are included), allowing for shifts in the coefficients over 1970-80 and 1981-93 yields no significant shift in the slope but significant shifts in the intercept.

2. Normality is not required to generate predictors of the unobserved components. Under normality, the standard predictors (which can be generated using the Kalman filter) will be optimal. Under more general conditions, the standard predictors will be minimum mean-squared error *linear* predictors.

3. More technically, the weighted average of the idiosyncratic region-specific factors has an expectation of zero and a variance that converges to zero as the number of regions grows large.

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