

6-1-1990

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O. M. Fakiyesi

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## Recommended Citation

Fakiyesi, O. M. (1990). Asymetric price risk an econometric analysis of aggregate sow farrowings, 1973-86 by Russell Tronstad and Thomas J. McNeill in American Journal of agric. Economics, August, 1989. CBN Economic and Financial Review, 28(2), 59.

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# ASYMMETRIC PRICE RISK: AN ECONOMETRIC ANALYSIS OF AGGREGATE SOW FARROWINGS, 1973 - 86 BY RUSSELL TRONSTAD AND THOMAS J. McNEILL

IN  
AMERICAN JOURNAL OF AGRIC. ECONOMICS, AUGUST, 1989

## Summary Of The Paper

Econometric analysis of risk is considered in the literature to be crucial for adequate policy evaluation. This importance has motivated the writers to examine price risk as deviations of actual prices from expected prices. The objective of the paper therefore, is to investigate the appropriateness of incorporating asymmetric price risk (APR: unfavourable deviations) and symmetric price risk (SPR: favourable and unfavourable deviations) in econometric models of supply response. Specifically, the authors seek to investigate the usefulness of such models in explaining the US aggregate sow farrowings. This is an alternative form of measuring price risk.

To achieve the paper's objective, the article is divided into four sections as follows: Section I Modeling Considerations; Section II Estimation Procedures; Section III Empirical Results; and Section IV Conclusions.

In Section I, the study defines price risk as the difference between an expected price at decision time and the realized price at acquisition or selling time. Unfavourable differences i.e. realized acquisition price of input greater than expected sale price at decision time are included in the APR models. Favourable and unfavourable price deviations are included in the SPR models. These models are specified for cash and futures markets. Corn is considered the main input in feeding hogs therefore, the price of corn and output price of hogs are considered in the analysis. The study utilizes the spectral approach in its analysis as producers use a spectrum of future prices to identify trends in prices.

Section II of the paper concentrates on estimation procedures. All the models specified in the previous section are estimated using a second-order Almon-Polynomial distributed lag. The Schwartz Criterion is used to determine the appropriate lag length for each of the models. The F-Test determines the significance of coefficients associated with prices and price risk. Conventional no-risk models are tested against SPR and APR models using the nested F-test procedure. The SPR models are tested against the APR models by means of the non-nested JA test. The students' t-distribution was utilized for small samples.

Section III highlights the empirical results. The results for the cash price models suggest that APR is preferred over SPR at a significance level of 0.1. Results for the futures price models again suggest that APR is preferred over SPR. Similarly, the nested F-Tests of conventional (i.e. no-risk)

models versus APR and SPR models indicate that price risk is important in model specification. Input elasticity estimates are more elastic for the APR cash and futures models but less elastic for the SPR cash and future models.

Concluding in Section IV, the result of the study lead the authors to suggest that price risk variables influence the quantity response of sow farrowings whether in asymmetric or symmetric form in either cash or futures markets. The results however suggest that the APR framework is preferred to SPR. These results indicate that producers respond primarily to adverse price deviations rather than both favourable and unfavourable price deviations. The policy implications of these results lie in the setting of price floors and price ceilings by the U.S. government. A larger proportion of price risk is eliminated by placing a price floor on output(s) or a price ceiling on inputs when analyzing price risk.

## Remarks

In our view, this is a very technical and comprehensive paper in which the authors have put lots of effort. The paper shows how sophisticated econometric tools can be utilized to address issues within the agricultural sector of any economy. The literature survey is current and tangential to the research topic. The models utilized are adequately specified for cash and futures markets. The use of F-test, nested F-test, the Schwartz Criterion, the non-nested JA-test, and the Students' t-distribution all add to the authenticity of the results. These tests are utilized extensively in the literature. The data base covers the time periods of 1973 to 1986. This is appropriate for a high degree of freedom. Conclusions follow directly from the analysis. There are no loopholes and the policy implications are clearly stated.

Considering the shortcomings of the paper, we are of the view that another estimation procedure-optimisation technique could have been employed, in order to obtain more appropriate results. Basically an econometric approach based on quadratic equations assumes equality. Asymmetric functions imply inequality which permit programic problems and are consequently better handled by programmic techniques.

Mrs. O. M. Fakiyesi  
Economist  
Research Department.