RESEARCH NOTE: EXCHANGE RATES AND SOUTH AFRICAN WOOL PRICES[1]

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Samevatting
Wisselkoerse en Suid-Afrikaanse wolpryse

Die uitwerking van die wisselkoers van die Rand en die Australiese Dollar, sowel as die uitwerking van algemene pryspeile op Suid-Afrikaanse wolpryse is ontleed. Die resultate slaag nie daarin om enige uitwerking van algemene pryspeile en die Rand wisselkoers op wolpryse bloot te lê nie. Suid-Afrikaanse wolpryse word betekenisvol deur Australiese wolpryse beïnvloed. Australiese wolpryse (wat die mark domineer) word egter deur die wisselkoers van die Australiese Dollar beïnvloed. Suid-Afrikaanse wolpryse word dus indirek deur die wisselkoers van die Australiese Dollar beïnvloed.

Abstract

The effects of the exchange rate of the Rand and of the Australian Dollar, as well as the effect of general price levels on South African wool prices were analysed. The results fail to show an effect of general price levels and the exchange rate of the Rand. South African wool prices are materially affected by Australian prices. However, Australian wool prices again, which dominate the market. are affected by exchange rates of the Australian Dollar. Thus, South African wool prices are indirectly affected by the exchange rate of the Australian Dollar.

1. Introduction

South African wool is marketed by means of auctions in Port Elizabeth. The bulk of the wool clip is bought and exported by foreign buyers. Australia, which is the largest producer of wool, is generally regarded as the market leader.

The opinion is sometimes expressed that exchange rate changes influence South African wool prices; a depreciation of the Rand vis a vis the currencies of buyers is alleged to lead to higher wool prices (quoted in Rand) and vice versa. It was decided to test this statement empirically.

2. Research model and data

South African wool prices were originally hypothesized to be a function of the following variables: the consumers' price index in South Africa, the effective exchange rate of the Rand, the effective exchange rate of the Australian Dollar and Australian wool prices.

The consumers' price index was selected as an indicator of South African general price levels (and hence, inflation). Other factors influencing demand for - excepting prices for Australian wool - and supply of wool were assumed to be constant. The effective exchange rate of the Rand was chosen because of the variety of countries buying South African wool. The same applied to the Australian effective exchange rate.

Symbolically, the model is as follows:

$$ma = (cpi, eff, nae, rwp, A) \quad (1)$$

with ma = market indicator, Port Elizabeth market
cpi = consumer price index
eff = effective exchange rate, South African Rand
nae = effective exchange rate, Australian Dollar
rwp = Australian wool price (expressed in Rand)
A = Other factors, taken as a stochastic error term

Monthly data regarding wool prices were obtained from the Wool Board and converted into quarterly data. The price of 24 micrometer combed wool was used as indicator of Australian wool prices. Quarterly data regarding consumer price indices and effective exchange rates of the Rand were obtained from Reserve Bank Quarterlies.

Various issues of the Quarterly Review of the Rural Economy served as source of the effective exchange rate of the Australian dollar. The data stretched from 1984 to 1988, thus involving 20 quarterly observations. This leaves few degrees of freedom, and may have affected statistical significance of some coefficients. More observations may have caused more coefficients to be significant at the 5 per cent level of significance.

3. Results and discussion

The following model was fitted:

$$ma = a + b_1\,cpi + b_2\,eff + b_3\,nae + b_4\,rwp \quad (2)$$

The best fit was selected by stepwise regression and results were as follows (t values in parentheses):

$$ma = \underset{(-2,820)}{-396,29} + \underset{(4,672)}{15,1\,cpi} + \underset{(2,240)}{26,59\,nae} \quad (3)$$

$R^2 = 0,746$ $F = 14,712$ $DW = 0,998$

The F and t values are significant at the 5 per cent level of significance. The low Durbin-Watson value however indicates significant serial correlation at the 5 per cent significance level.

Serial correlation may be caused by improper specification of the model (Intriligator, 1978). The fit was therefore unreliable notwithstanding the high F and t values.

In an effort to avoid serial correlation, the Australian wool price, originally expressed in Rand, was respecified in Australian Dollars. The model thus became:

$$ma = A_0 + b_1 cpi + b_2 eff + b_3 nae + b_4 awp \quad (4)$$

with: awp = Australian wool price for 24 micrometer combed wool (expressed in Australian Dollars).

The following fit was obtained by forward selection (t values in parentheses):

$$ma = \underset{(-3,173)}{-569,24} + \underset{(9,734)}{2,81}\ awp \quad (5)$$

$R^2 = 0,896$ F = 94,749 DW = 2, 64

The F and t values are significant at the 5 per cent level, and no significant serial correlation is present. Logarithmic transformations were also fitted; these did not yield better results than those in equations (3) and (5).

The results show Australian wool price, expressed in Australian Dollars, to be the only hypothesized exogeneous variable to have a significant effect on South African wool prices.

In another study, the Australian wool price - expressed in Australian Dollars - was shown to be materially affected by the effective exchange rate of the Australian Dollar. A 10 per cent depreciation in the exchange rate of the unit leads to a 10 per cent increase in the Australian wool price (awp) over the short run, and 7,06 per cent over the long run; sales revenue of Australian wool producers increases by 10,84 per cent over the long term (Simmons et al, 1987).

These preceding results, together with those obtained in equation (5), imply that via the effect of the Australian wool price, South African wool prices are indirectly influenced by the exchange rate of the Australian Dollar. The coefficients obtained in equation (5) underline the dominant role of Australia in world wool markets.

Between 1984 and 1988, the effective exchange rates of both the South African Rand and the Australian Dollar declined considerably and almost consistently in both countries. These changes were accompanied by increased wool prices, expressed in the local currency. This gave rise to the illusion that the depreciating Rand was partially responsible for higher wool prices in South Africa.

This notion clearly appears to have been an illusion. South African wool prices clearly follow Australian wool prices which, in turn are a function of Australian exchange rates.

Note

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References

INTRILIGATOR, MD. (1978). Econometric models, techniques and applications. London: Prentice-Hall.

SIMMONS, P, FLINT, P and FINDLAY, C. (1987). Exchange rate changes and the wool reserve price. Quarterly Review of the Rural Economy 9:299-305.