THE SUITABILITY OF CROSS-HEDGING POLYMERS WITH BRENT FUTURES CONTRACTS

April Masitwe

A research report submitted to the Faculty of Management, University of the Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the degree of Master of Business Administration

Johannesburg, 2001

ABSTRACT

This research report investigated the effectiveness of cross-hedging polymers with brent futures contracts for manufacturers of plastic commodity products. The purpose was to find out whether volatile polymer raw material prices could, through this method, be stabilised to create predictable input costs for manufacturers. Global polymers from South East Asia, United States Gulf, North West Europe and South Africa were studied. Each were correlated and the polymer with the best correlation level was selected and cross-hedged through a simulation model to determine how effectively volatilities could be reduced.

The results showed that correlations were inconsistent for all polymers. They varied from period to period and from region to region. Correlations (r) ranged from 0.25 to 0.87. The polymers were found to have a time lag of zero to eight weeks with the brent futures price movements. LDPE, which showed the longest lag period, was found to have unreliable correlation with brent futures. HDPE Injection grade US Gulf, which had the best correlation at 0.87, was cross-hedged. The hedge was found to be ineffective, in that it exposed the manufacturer to more volatile input cost. It was also found to add a second excessively high risk exposure from the margin account that the manufacturer had to maintain in the futures exchange.

It was concluded that manufacturers were more cost-effective using an internally managed standby fund to absorb polymer input price because of lesser exposure to risk. However, it could not be guaranteed that the standby option would always be more cost effective.

DECLARATION

I declare that this is my own, unaided work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration in the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination in this or any university.

_____

April Masitwe

March, 2001

DEDICATION

To my wife Mandisa,

without whose love and full support,

this project could never have been completed

ACKNOWLEDGEMENTS

I would like to express my sincere thanks to all those who assisted me in the compilation of this research report. In particular I would like to thank:

Mr Frank Durand, through whose probing questions, guidance and supervision, it was possible to put meaning and relevance to this research topic;

Mr Andre Nel of Nampak Limited Head Office, Treasury Department, for supplying most of the data, giving ideas as to the relevant web sites for data acquisition and generally sharing his knowledge and experience in this field;

Mr Benard Mahl, Polyethylene Sales Manager, Dow Plastics, for assisting with data and sharing his knowledge on global polymer markets;

Mr. Nobert Bherens, Marketing Manager, Polyethylene, SASOL Polymers, for giving me the opportunity to discuss with him the relationship between global polymers and oil and other external influences that could impact on this relationship;

my wife and family for their boundless support and encouragement.

CONTENTS

APPENDICES LIST

LIST OF FIGURES

LIST OF FIGURES (Continued)

LIST OF TABLES

LIST OF ABBREVIATIONS

HDPE:	High Density Polyethylene
LDPE:	Low Density Polyethylene
PP:	Polypropylene
NW E:	North West Europe
SE Asia:	South East Asia
US Gulf:	United States Gulf
SA:	South Africa
BLWM (Blwm):	Blow Moulding Grade
INJ (Inj):	Injection Mould Grade
FLM (Flm):	Film Grade
IPE:	International Petroleum Exchange
Coef.:	Coefficient

DEFINITIONS

Effective Hedge Price: The total spot price paid by the manufacturer for the weekly quantity of polymer purcahsed plus the gain or loss incurred in the futures exchange for the total number of futures contracts purchased.

Cross-hedging: In this study it meant hedging a polymer with brent futures contract, where it is understood that the underlying of the futures contract (that is oil) is not the same as the polymer.

Threshold Correlation Coefficient: The minimum correlation coefficient a polymer should have with the brent futures contract to justify a cross-hedging. The minimum was artificially set for this study as no standard exists.

Alpha: Significance Level

Risk: The uncertainty of whether the price will be high or low

Global Region: NW E, SE Asia and US Gulf

Local Region: South Africa