

بسم الله الرحمن الرحيم

(ولقد كتبنا في الزبور من بعد الذكر أن الأرض يرثها عبادي الصالحون
* إن في هذا لبلاغاً ل قوم عابدين * وما أرسلناك إلا رحمة للعالمين).

صدق ﷻ ﷻ ﷻ ﷻ ﷻ ﷻ

(الآيات 105-107 سورة الأنبياء).

Dedication

*To Spirit of my youngest Brother, **Mohammed**, Allah's
Mercy upon him.*

Abd Elhaleem.

Acknowledgement

From the formative stages of this thesis, to the final draft, I owe an immense debt of gratitude to my supervisor and teacher, Professor ***Zain El Abidein Abd Elrahim Elbeshir***. His sound advices and careful guidance were and are invaluable, and without his time, help and advices, this research would not have been possible.

Especial thanks as well to the Directors of the Arab Authority for Agricultural Investment and Development's Library, especially to both ***Mr. Ammar Eljak*** and ***Ustaza Sawsan Sulaiman*** for their efforts, assistance and providing almost all the materials needed. Also great thanks are due to my colleague and close friend ***Ustaza Asmaa Ali Mohammed***.

Finally, I would be remiss without mentioning the graces of Allah, which had simplified every thing. His extreme generosity will be remembered always.

To each of the above, I extend my deepest appreciation.

Abstract

This thesis is an attempt to find a suitable model that represents the investments of the Arab Authority for Agricultural Investment and Development (AAAID) in its companies in Sudan during the period (1983 - 2007). Such model can then be used to forecast the investment of AAAID in Sudan in the future.

Some regression models, namely, the simple linear, logarithmic, logistic, quadratic and cubic regression, were attempted. The cubic model proved the best among these. Also, different ARIMA models were tried and the model ARIMA (0,1,0) gave the best result in terms of precision and parsimony.

To know whether the oil discovery has a significant impact on AAAID's investments in Sudan or not, the technique of transfer function was employed. The result showed that the oil discovery has no significant impact on AAAID's investments in Sudan.

المستخلص

هذه الرسالة هي محاولة لإيجاد نموذج مناسب يمثل استثمارات الهيئة العربية للاستثمار والإنماء الزراعي بشركاتها العاملة في السودان في الفترة (1983 - 2007). مثل هذا النموذج يمكن استخدامه للتنبؤ باستثمارات الهيئة بالسودان في المستقبل. تمت محاولة عدة نماذج إنحدار وهي تحديداً الخطي البسيط، اللوغاريتمي، اللوجستي، ونماذج إنحدار من الدرجة الثانية ومن الدرجة الثالثة. وقد اتضح أن نموذج الإنحدار من الدرجة الثالثة هو الأفضل بينها. كذلك أجريت تطبيقات لنماذج أخرى مختلفة، وكان النموذج $ARIMA(0,1,0)$ هو الأفضل من ناحية الدقة و قلة المعلمات. لمعرفة ما إذا كان اكتشاف البترول له أثر معنوي على استثمارات الهيئة العربية في السودان أم لا، فقد تم استخدام تقنية الدالة التحويلية (Transfer Function)، وقد أظهرت النتيجة أن اكتشاف البترول ليس له أثر حقيقي على استثمارات الهيئة العربية في السودان.

Contents

الآية	
A.	
Dedication	B.
Acknowledgment	C.
Abstract	D.
Contents	F.
List of Figure	H.

Chapter One

Outline of the Study

1.1 Introduction	1.
1.2 Study Problem	1.
1.3 Study Objectives	2.
1.4 Domain of the Study	2.
1.5 The Data	2.
1.6 Methods of Analysis	2.

Chapter Two

Theoretical Background

2.1 Introduction	3.
2.2 Regression Models	3.
2.3 Box-Jenkins Models (ARIMA)	4.
2.3.1 The auto-regressive process of order p, AR (p)	4.
2.3.2 The moving average process of order q, MA (q)	5.
2.3.3 The mixed model ARMA (p,q)	5.

2.3.4 The integrated autoregressive-moving average process	6.
2.4 Stages of the Box-Jenkins Models	6.
2.5 Transfer Function	7.

Chapter Three

Analysis of Investment Series

3.1 Introduction	9.
3.2 Regression Models	9.
3.3 ARIMA models	11.
3.4 Transfer Function	15.

Chapter Four

Concluding Remarks

Concluding Remarks	18.
References	19.
Appendices	20.

List of Figures

3.1 The Cubic Model	10.
3.2 The autocorrelation function of the original investment's data	11.
3.3 The autocorrelation function of the differenced investment's data	12.
3.4 The ACF & PACF of the residuals of the Model ARIMA (0,1,0)	13.
3.5 The fitted values and the observed values of the models ARIMA (0,1,0)	14.
3.6 The ACF & PACF of the residuals of the Transfer Function	15.
3.7 The fitted values and the observed values of the Transfer Function	16.