DYNAMIC ECONOMETRIC MODELING AND POLICY ANALYSIS OF THE LIBYAN WHEAT MARKET

By

KHALED R.M. ELBEYDI

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Doctor of Philosophy

April 2005

Dedication

I would like to dedicate this work to:

My father and mother

My brothers and sisters

My wife and son

And all my friends

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

DYNAMIC ECONOMETRIC MODELING AND POLICY ANALYSIS OF THE LIBYAN WHEAT MARKET

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KHALED RAMADAN ELBEYDI

April 2005

Chairman: Professor Mad Nasir Shamsudin, PhD

Faculty: Agriculture

Wheat plays a major role in food contribution, it is considered as a principal food grain in the daily life of the people in Libya. In addition, wheat is an important commodity to the Libyan economy in terms of its contribution to the country's GDP, food requirement and farm income.

The production of wheat in Libya, however, has been declining over the years. Consequently, it is vital to identify the economic and policy variables that influence its decline in the production in order to formulate appropriate policy measures. This study addresses the issue of government intervention on the Libyan wheat industry. The main objective of this study is to investigate the characteristics of the Libyan wheat market and analyse the impact of changes in government policies on wheat production, area, yield, consumption and imports.

The Libyan wheat market model was estimated using the auto regressive distributed lag model (ARDL). The study used a time series data from 1970 to 2000. The model consists of area, yield, production, consumption and wheat imports equations. Annual models for the Libyan wheat market are developed based on market factors as well as government agricultural commodity programmes.

The results from the wheat area equation indicate that the influence of relative price is significant in affecting acreage, and price-acreage relationship is positive. This means that if the price is enhanced, the production of wheat may improve considerably. The coefficient of agricultural loan is positive and statistically significant. This indicates that agricultural loan is also an important determinant for wheat area equation. The results from the wheat yield equation show that the real fertiliser price coefficient is negative and statistically significant. The implication of this finding in terms of policy formulation is that attention has to be paid to promote the wheat producers with low fertiliser prices to reach the desired level of yield. Technology is also found to be an important non-price factor affecting wheat yield. Income and prices are still important variables in determining the level of wheat consumption. Finally, the findings indicate that import demand for wheat is largely explained by per capita GDP.

Simulations are also used to estimate the impacts of the three agricultural policies on wheat area, production, import, and consumption. The conclusions are drawn

from a simulation experiment and from an analysis of policy. The results suggest that the model is an acceptable approximation of the Libyan wheat market.

Abstrak tesis yang dikemukakan kepada Senate Unversiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

MODEL EKONOMETRIK DINAMIK DAN ANALISIS DASAR PASARAN GANDUM DI LIBYA

Oleh

KHALED RAMADAN ELBEYDI

April 2005

Pengerusi: Profesor Mad Nasir Shamsudin, PhD

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Gandum memainkan peranan utama dalam sumbangan makanan dan merupakan makanan bijirin utama di dalam kehidupan rakyat Libya. Selain daripada itu, gandum juga merupakan komoditi yang penting kepada ekonomi Libya dari segi sumbangannya kepada KDNK, keperluan makanan dan pendapatan tani.

Walau bagaimanapun, pengeluaran gandum di Libya mengalami kemerosotan beberapa tahun kebelakangan ini. Sehubuagan dengan itu, adalah penting untuk mengenalpasti pemboleh ubah – pemboleh ubah ekonomi dan dasar dalam merangka dasar-dasar yang berkaitan. Kajian ini mengetengahkan isu campur tangan kerajaan di dalam industri gandum di Libya. Objektif utama kajian ini adalah untuk mengkaji ciri-ciri pasaran gandum dan membuat analisis terhadap kesan perubahan-perubahan di dalam dasar kerajaan berkenaan pengeluaran, kawasan tanaman, hasil, penggunaan dan import gandum.

Model pasaran gandum Libya dianggark menggunakan ARDL. Kajian ini menggunakan data siri masa dari tahun 1970 sehingga 2000. Model ini merangkumi persamaan-persamaan kawasan tanaman, hasil, pengeluaran, penggunaan dan import gandum. Model tahunan untuk pasaran gandum Libya dibangunkan berdasarkan faktor-faktor pasaran dan program-program komoditi pertanian kerajaan.

Keputusan kajian daripada persamaan kawasan tanaman gandum mendapati bahawa harga relatif mmpunyai pengaruh yang signifikan terhadap keluasan kawasan dan hubungan di antara harga dan keluasan adalah positif. Ini bererti sekiranya harga dinaikkan, pengeluaran gandum mungkin meningkat dengan banyak. Koefisien untuk pemboleh ubah pinjaman pertanian adalah positif dan signifikan. Ini menunjukkan bahawa pinjaman pertanian juga penting di dalam menentukan persamaan untuk keluasan kawasan tanaman. Keputsan kajian turut menunjukkan bahawa harga sebenar baja mempunyai koefisien negatif dan signifikan. Implikasi penemuan ini berkenaan perangkaan dasar menunjukkan bahawa lebih banyak perhatian harus diberikan dalam mempromosi kepada para petani berkenaan harga baja yang rendah untuk mencapai tahap hasil tanaman gandum yang diinginkan. Teknologi turut didapati menjadi faktor bukan harga yang penting dalam mempengaruhi hasil tanaman gandum. Pendapatan dan harga masih lagi menjadi pemboleh ubah yang penting dalam menentukan tahap penggunaan gandum. Akhir sekali, hasil kajian turut mendapati bahawa permintaan ke atas import gandum dipengaruhi oleh KDNK per kapita.

Simulasi turut digunakan untuk menganggarkan kesan tiga dasar pertanian berkenaan kawasan, pengeluaran, import dan penggunaan gandum. Kesimpulan adalah dibuat dari ujian simulasi dan analisis dasar. Keputusan kajian menyarankan bahawa model ini boleh diterima sebagai anggaran kepada pasaran gandum di Libya.

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I certify that an Examination Committee met on……. to conduct the final examination of KHALED R.M. Elbeydi on his Doctor of Philosophy thesis entitled "A Dynamic Econometric Modeling and Policy Analysis of the Libyan Wheat Market" in accordance with Universiti Pertanian Malaysia (Higher Degree) Act 1980 and Universiti Pertanian Malaysia (Higher Degree) Regulation 1981. The Committee recommends that the candidate be awarded the relevant degree. Members of the Examination Committee are as follows:

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This thesis submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee are as follows:

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DECLARATION

I hereby declare that the thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at UPM or other institutions.

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KHALED RAMADAN ELBEYDI

Date:

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