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## An Econometric Analysis Of Food Security And Related Macroeconomic Variables In Malaysia: A Vector Autoregressive Approach (VAR)

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### Abstract

Food security is a concept originated in the mid-1970s. According to the definition of the Food and Agriculture Organization (FAO), food security is a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. At the national level, food security is a situation whereby a country is able to cover the food requirements of its population on a continuous and stable basis. Malaysia, although a middle income country, has been a net food importer in the last four decades. In fact, the country has grown to depend more on imports for most important food especially rice. With these trends lurking, understanding the determinants of food security is important because it will help the policy makers keep abreast of the main variables for food security in Malaysia. This paper thus analyse the dynamic relationship between selected macroeconomic variables (biodiesel production, exchange rate, government expenditure on rural development, Malaysia's GDP, food price index and Malaysia's population) and food security in Malaysia using VAR approach. The variance decomposition also shows that biodiesel production, exchange rate and government expenditure on rural development variables will give the highest shock to food security in year ten. Whereas exchange rate and population in year five and finally GDP in year six. This model is a useful tool and reacts as an effort to better understand how food security reacts and is affected by the integration of domestic and global markets. It could also provide a more quantitative means of assessing food security, and in particular to pinpoint specific variables that explain the highest shock to food security at the national level. It would also benefit to consumers and policy makers.

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*Keywords:* biodiesel production; food security; macroeconomic variables; VAR

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## 1. Introduction

Many studies have been carried out to explain food security and its determinants. In terms of literature we could identify the conceptual definition of food security and the determinants of food security at individual, household and national level. Food security is a concept originated in the mid-1970s. Since then, the terms of food security (FS) was introduced, evolved, developed, and diversified by the academic community and politics (Giraldo et al., 2008). Around two hundred definitions of the FS have been developed (Maxwell & Smith, 1992) considering the problem of FS from original view point. According to the definition of the Food and Agriculture Organization (FAO), food security is a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. This involves four dimensions; i) adequacy of food supply or availability; ii) stability of supply, without seasonal fluctuations or shortages; iii) accessibility to food or affordability; and iv) utilization: quality and safety of food. Generally, food security is not simply a function of production or supply; it involves all of the above which include a broad spectrum of socio-economic issues with great influence on farmers and on the impoverished in particular. However, this study will focus on the first dimension which is food availability.

Food security and food insecurity can be examined at many levels such as national or country, household and individual level. In the national level, a country is food secure when on the continuous and stable basis, the food supply and effective demand are able to cover the foods requirements of its population. Food requirement can be met by the country either through domestic food production, through access to food beyond domestic production or through combination of both factors (Aker & Lemtouni, 1999). In close economy, food requirements can be met just by the domestic food production alone. But in open economy, the food requirements of the population depend upon the world market to meet their population's caloric needs. This indicates the country level of food security is dependent upon the interaction of domestic and global forces.

Although there are growing concern of improving food security, factors influencing food security in Malaysia is not well-documented. Identifying the determinants of food security is important as it can assist researchers and policy makers in making decisions on policies that matter for food security in Malaysia. Malaysia has been a net food importer in the last four decades. It depends more on imports for most important food for instance, rice. The domestic consumption of rice increased at an annual rate of 2% during the last decade (1998-2007), but production increased by only 1% during the period. This leads a gap between production and consumption. Consequently, rice imports increased from 594 million tones in 2000 to 799 million tones in 2007, raising Malaysia's rice import bill from RM700 million in 2000 to RM 10.1 billion in 2007 (Department of Statistics, 2008).

The purpose of this study is to analyze the dynamic relationship between selected macroeconomic variables (i.e. biodiesel production, exchange rate, government expenditure on rural development, Malaysia's GDP, food price index, Malaysia's population) and food security in Malaysia using a time series data from 1980-2012 where vector autoregressive (VAR) approach is employed. The results of this study will reveal whether all variables mentioned above have an impact on food security in Malaysia and therefore appropriate policies can be implemented by the government.

The rest of the paper is outlined as follows. Section 2 provides the literature review. Section 3 discusses empirical data used and methodology, followed by empirical results in section 4. Section 5 concludes.

## 2. Literature Review

In terms of literature we could identify the conceptual definition of food security and the determinants of food security both at individual, household and national level.

As been mentioned in previous studies food security has spiralled since in the 1970s where during those years "food security" was mostly concerned with national and global food supplies. However in the 1980s the focus

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