CHAPTER I

INTRODUCTION

1.0 Rational Expectations: An Overview [1]

The theory of rational expectations was first proposed by Muth (1960's) of Indiana University. He used the term to describe the many economic situations in which the outcome depends partly upon what people expect to happen. The price of an agricultural commodity, for example, depends on how many acres farmers plant, which in turn depends on the price that farmers expect to realize when they harvest and sell their crops. As another example, the value of a currency and its rate of depreciation depend partly on what people expect that rate of depreciation to be. That is because people rush to desert a currency that they expect to lose value, thereby contributing to its loss in value. Similarly, the price of a stock or bond depends partly on what prospective buyers and sellers believe it will be in the future.

The use of expectations in economic theory is not new. Many earlier economists, including Pigou, Keynes, and Hicks, assigned a central role in the determination of the business cycle to people's expectations about the future. Keynes referred to this as "waves of optimism and pessimism" that helped determine the level of economic activity. But proponents of the rational expectations theory are more thorough in their analysis of—and assign a more important role to—expectations.

---

[1] --Library of Economics and Liberty, Retrieved September 22, 2003 from the World Wide Web:

The influences between expectations and outcomes flow both ways. In forming their expectations, people try to forecast what will actually occur. They have strong incentives to use forecasting rules that work well because higher "profits" accrue to someone who acts on the basis of better forecasts, whether that someone be a trader in the stock market or someone considering the purchase of a new car. And when people have to forecast a particular price over and over again, they tend to adjust their forecasting rules to eliminate avoidable errors. Thus, there is continual feedback from past outcomes to current expectations. Translation: in recurrent situations the way the future unfolds from the past tends to be stable, and people adjust their forecasts to conform to this stable pattern.

The concept of rational expectations asserts that outcomes do not differ systematically (i.e., regularly or predictably) from what people expected them to be. The concept is motivated by the same thinking that led Abraham Lincoln to assert, "You can fool some of the people all of the time, and all of the people some of the time, but you cannot fool all of the people all of the time." From the viewpoint of the rational expectations doctrine, Lincoln's statement gets things right. It does not deny that people often make forecasting errors, but it does suggest that errors will not persistently occur on one side or the other.

Economists who believe in rational expectations base their belief on the standard economic assumption that people behave in ways that maximize their utility (their enjoyment of life) or profits. Economists have used the concept of rational expectations to understand a variety of situations in which speculation about the future is a crucial

factor in determining current action. Rational expectations is a building block for the "random walk" or "efficient markets" theory of securities prices, the theory of the dynamics of hyperinflations, the "permanent income" and "life-cycle" theories of consumption, the theory of "tax smoothing," and the design of economic stabilization policies.

1.1 Analytical Background

Agents' expectations about the future are obviously important for many of their current decisions. All economists agree that people's beliefs about the future affect their decisions today. Therefore, the development of the economy is to a considerable degree affected by current expectations about future developments. Employers and employees negotiate wage contracts with some picture in mind about what will happen to the cost of living or to other related wage rates over the life of a contract. Consumers deciding whether to purchase a car have expectations about future income, job prospects, future cash outlays, and perhaps sources of credit in an emergency – if only to judge whether the automobile installment payments can be met. Similarly, a business firm deciding whether to invest in new factories must form expectations about such things as future sales, future labour and other input costs, and future tax rates.

Bond rates and other asset prices are further obvious examples. Interest rates vary with expected future inflation, since bondholders want to be compensated for the depreciation caused by inflation. Stock prices are influenced by expected future

3

dividends and capital gains. Firms' and households' investment in capital and saving in financial assets are then influenced by these asset prices and expected future returns, incomes, and taxes.

In spite of their importance, expectations have long received very superficial treatment in economic analysis. A couple of decades ago, it was not unusual to assume exogenous or even static expectations, for instance such that the expected future price level was equal to today's price level, regardless of the development of the economy. As a result, the earlier expectation formation models, namely, the 'cobweb' model, introduced by Ezekiel (1938) and the extrapolative model (Metzler, 1941), were criticized as being too naïve and lack the element of learning.

Adaptive expectations or the "error-learning" hypothesis of expectations were an improvement to the previous theories. It was first suggested by Cagan (1956) and later developed by Nerlove (1956). Adaptive expectations imply that expectations of the future are mechanically adjusted to previous expectation errors. In other words, individuals learn from their past mistakes and "adapt" their forecasts accordingly.

Applying an adaptive forecasting model to price expectations, suppose that today's expected price level P^e_t is forecast by adjusting yesterday's expected price level forecast P^e_{t-1} by a fraction δ of yesterday's forecast error $P^a_{t-1} - P^e_{t-1}$ (where P^a_{t-1} is yesterday's actual price level).

$$P^e_t = P^e_{t-1} + \delta \left(P^a_{t-1} - P^e_{t-1} \right)$$

$$= \delta \, P^a_{t\text{-}1} + (\, 1 - \delta \,) \, P^e_{t\text{-}1}$$

The adaptive expectations model was the most commonly used expectations model in macroeconomics throughout the 1960s and much of the 1970s. The popularity of the adaptive expectations model was largely due to its intuitive plausibility, its conceptual simplicity, and the ease with which it could be implemented empirically.

However, adaptive expectations imply that agents mechanically repeat previous errors without ever realizing how primitive their method is; that is, these expectations are only backward-looking. In addition, under the adaptive expectations model, one is likely to make systematic forecasting errors for many periods in a row. If one is truly learning from one's past mistakes surely at some point, one would discover this systematic tendency to underpredict or overpredict and would then modify one's (adaptive) forecasting model so as to avoid such systematic forecasting errors.

Given the problems of the previous expectations models, many macroeconomists turned to the rational expectations model, first suggested by Muth (1961). However, Muth's analysis was restricted to a single market in partial equilibrium.

The theory of rational expectations was later adopted by Lucas (1972) into macroeconomics. Lucas was the most influential macroeconomist of the past twenty years. He was awarded the Nobel prize in 1995 "for having developed and applied the

5

hypothesis of rational expectations, and thereby having transformed macroeconomic analysis and deepened our understanding of economic policy."

The rational expectations hypothesis is forward-looking and implies a much more sophisticated, and more realistic, way of forming expectations. The two key assumptions of the rational expectations model are : (1) that individuals use all the information which is available to them (subject to its cost) to formulate their expectations, and (2) that individuals do not make any systematic forecasting errors.

Rational expectations assume that economic agents are rational optimizers. Therefore, utility maximizing individuals will use all of the information available to them (subject to its cost) to form their expectations. Part of the information available to individuals is the history of past forecast errors. Thus, if in the past one-made systematic forecast errors (such as always under predicting the variable), sooner or later one would infer that the forecasting model one was employing was incorrect and would use this information about systematic past forecast errors to improve one's forecasting model. The rational expectations model assumes that individuals extract all of the systematic information out of past forecast errors, until the forecast errors are truly random.

The theory of rational expectations has three important implications for macroeconomics. First, econometric models are not very useful in evaluating alternative economic policies. Proponents of the rational expectations theory argued that their usefulness is, at best, limited, because the parameters of the model change when new

policies are introduced. They claim that the actions of households and firms are based, in part, on the monetary and fiscal policies in effect during the period in question. Since the estimates of the effects of the new policies are based on the original set of (estimated) parameters, the actual effects may be quite different. Consequently, econometric models are not helpful in selecting appropriate policies.

A second implication of the theory of rational expectations is that no tradeoff exists between inflation and unemployment. For years, it was argued that lower unemployment rates could be obtained at the expense of higher inflation rates through more rapid increases in aggregate demand. In the late 1960s, several economists who argued that a tradeoff existed in the short run, but not in the long run criticized this view. Proponents of the rational expectations theory go even further; they argued that no tradeoff exists even in the short run. The argument is as follows. Suppose that the Central Bank implements a new monetary policy that calls for more rapid increases in the money supply. Since workers and firms realize that an increase in the growth rate of the money supply implies a higher rate of inflation, wages and prices (assumed flexible in the rational expectations framework) will adjust immediately. Assuming full employment initially, money wages and prices increase proportionally, leaving the real wage and, hence, the unemployment rate unchanged. Thus, even though the inflation rate has increased, the unemployment rate remains the same; hence, no tradeoff exists.

A third implication (which is related to the second) is that discretionary monetary and fiscal policy cannot be used to stabilize the economy. Suppose, for example, that

government purchases increased. According to the rational expectations theory, households and firms anticipate the effects of the increase. Many wages and prices will increase, but output and employment will remain the same. The same sort of analysis is assumed to hold for other types of fiscal policy, as well as for monetary policy.

1.2 Problem Statement

A major drawback in using Muth's rational expectations hypothesis in an analytical framework is that it jointly test the rational expectations hypothesis as well as the underlying model specification. For that reason, a rejection of the rational expectations hypothesis may be caused by an incorrect model specification. One way of overcoming this joint testing problem is to test the rational expectations hypothesis directly using survey data.(Beach, Fernandez-Cornejo and Uri, 1995)

There can be two types of tests for the REH, namely, indirect tests with constructed measures of expectations and direct test based on survey data. The most common indirect test of the rational expectation hypothesis involve asset markets and require the estimation of expectations based on market data. Such studies jointly test hypotheses regarding asset pricing and rational expectations. In recent years, the overall results of this literature have included increasingly numbers of studies that reject the joint hypotheses. Test of rational expectations using survey data avoid these problems by directly measuring expectations.

Although much attention has been given to the testing of the rational expectations hypothesis (REH) in developed countries, such as the U.S., United Kingdom, Japan, Australia, Denmark, Finland etc., the number of empirical studies pertaining to the developing countries are nevertheless limited, for example, the research by Kinoshita (1988) on Singapore, Yokoyama (1989) and Habibullah (1994) on Malaysia.

Furthermore, Yokoyama's study that uses the survey data of the 'Business Expectations Survey of Limited Companies' published by the Department of Statistics did not test the rationality criteria of the business firm's forecast for Malaysia but later Habibullah continue the study to test on rational economic forecast using the evidence from Malaysian Business Expectations of Limited Companies.

Considering the current lack of research on this topic in Malaysia and the shortcoming of the previous study by Yokoyama, this present study is conducted to further improve the testing of the REH in our country by using survey data.

This paper examines the rational expectation hypotheses directly for three important macroeconomic variables, which is capital expenditure, gross revenue, and employment. It is important to examine if these survey forecasts are consistent with REH.

1.3 Objective

The objective of this study is to present some empirical evidence on the rationality of business firms' expectations for three variables; namely, gross revenue, capital expenditure and employment, in banks and other financial institutions, manufacturing, logging and constructions by using survey data. The aim is to investigate whether the forecasts documented by such surveys are accurate, that is, whether business firms in the chosen industry make rational forecasts regarding the three variables mentioned above and if not, ways to produce improved forecasts must be found.

In analyzing economic events and forecasting the probable outcome of different courses of action, it is important that the role of expectations is taken into account. This is because; the success or failure of any course of action depends on how economic units react to that course of action.

1.4 Analytical Framework

The above objective will be met using the framework provided below. The analysis will cover:

1) Testing the unbiasedness of the forecasts for gross revenue, capital expenditure and employment in the four sectors.

2) Testing for non-serial correlation between the forecast errors for gross revenue, capital expenditure and employment in the four sectors

10

3) Testing the efficiency of the forecasts for gross revenue, capital expenditure and employment in the four sectors.

1.5 Significance of the Study

The importance of the study can be seen in the sense that it adds to the current literature on the testing of REH using survey data in particular it provides empirical evidence from Malaysia, a developing country.

In addition, through this study, business firms in the four sectors can know whether they have utilized all available relevant information including past realizations efficiently when forming their forecasts. As a result, the business firms can search for better ways to improve forecasts in the effort to increase efficiency in production, thus leading to higher profits.

1.6 Organization Of Study

The remainder of this study is organized into six chapters. Chapter I present the introduction, justification of the study and the scope of the study. In Chapter II, a review on the concept and survey of empirical studies on rational expectation hypothesis are presented. Several programmed and econometric models are examined.

Chapter III review on theory of Rational Expectations. Chapter IV presents the analytical approaches and methodological procedures used in this study. These analytical frameworks are used to model the resources use in analysis REH using finance, logging, industry and constructions sectors survey data. Chapter V discusses the results of the economic forecasts of those four sectors. Finally, Chapter VI covers the major conclusions, recommendations and limitation of this study arising from the overall analysis.