CHAPTER 3
LITERATURE REVIEW
cointegration techniques. The first method has been criticised as being inadequate due to the lack of any indication of the underlying process. Fama and Schwert's methodology, which is adopted in many studies despite some criticism, measures an asset's inflation hedge against expected and unexpected inflation. Cointegration techniques are employed to test for the existence of any long run equilibrium relationship between inflation and asset returns. This study adopts the Fama and Schwert Framework.

In Fama and Schwert's methodology, the inflation-hedging characteristics of property are assessed against the components of actual inflation; i.e. expected and unexpected inflation. Inflation expectations are not directly observable, and are therefore gauged by adopting the CPI percentage change, producer price index change, building cost index change or using the Gross Domestic Product (GDP) deflator. The CPI percentage change is the most frequently used and reliably accepted measure of actual inflation.

Actual inflation can be viewed as the sum of expected inflation and unexpected inflation. Expected inflation represents what investors think inflation will be over a certain period. The most common proxy used to estimate the level of expected inflation is the T-Bill rates (Fama and Schwert 1977; Limmack and Ward 1988; Brown 1991; Hoesli 1994). Other measures used are the survey based inflation forecasts by business economists (Rubens et al.1989; Park et al. 1990; Newell 1995; Newell and Boyd 1995) and autoregressive integrated moving average (ARIMA)-based inflation

In Fama and Schwert's (1977) framework, T-Bill yields are used as a proxy for expected inflation. The yield on risk-free T-Bills is viewed as real return plus expected inflation. Assuming that the real return is constant, or that no one can predict changes in the real return, then changes in the T-Bill yield correspond to the changes in the expected inflation.

Unexpected inflation is the difference between actual and expected inflation resulting from a reaction to new market information not previously considered. Since unexpected inflation is not reflected in current pricing, hedging against both the unexpected inflation and expected inflation would be an investor's concern.

3.3 PROPERTY AND INFLATION

International studies of the relationship between property returns and inflation have produced divergent results.

In 1977, Fama and Schwert, concluded that private residential property in the USA, examined during the period 1953 – 1971 was a complete hedge against both unexpected and unexpected inflation. Hartzell, Hekman and Miles (1987), Wurtzebach, Mueller and Machi (1991), and Miles and Mahoney (1997) all found evidence that American commercial property can hedge
against inflation. Hartzell et al. (1987) examined differences in property type and found that returns from office and industrial properties showed strong inflation protection during the high inflation period of 1978 to 1983 but the results were less significant over the 1973 to 1978 period.

Rubens et al. (1989) examined the inflation hedgeability of assets during the period 1960 – 1986 and found that the three types of property; residential, commercial and farmland are at least partial inflationary hedges and that portfolios which include property realize an increase in inflation hedgeability. Bond and Seiler (1998) also show that American property is a significant hedge against both expected and unexpected inflation over the period 1969 - 1994.

When Canadian property returns were regressed against expected inflation, unexpected inflation as well as real GDP growth, all the explanatory variables were statistically significant. This suggested that property can hedge against both expected and unexpected inflation over annual holding periods. It was also found that the responses of property to expected inflation were more than one to one (Li 2001).

Li (2001) also noted that simple correlation statistics for 1974 – 1999 showed that Canadian property is a much better short term inflation hedge than Canadian stocks and bonds, especially in a high inflation environment. Further, it was found that property had a strong positive correlation with
inflation in the high inflation period and a weak positive correlation in the low inflation period.

Newell (1996) summed up that there was strong evidence of inflation hedging for Australian office, retail and industrial property examined over the 1984 – 1995 period.

Sing and Low (2000) empirically tested the inflation hedging characteristics of property and financial assets in Singapore and the results support that property provides a better hedge against inflation than financial assets such as stock, securitized property and T-Bills. Industrial property was found to be the most effective hedge against both expected and unexpected inflation, whereas retail property offers only a significant hedge against expected inflation. Residential property was found to be a good hedge against unexpected inflation in the low inflation period, whereas industrial property showed a better hedge against inflation during the high inflation period.

However support for the inflation hedging ability of property is not unanimous. Liu et al. (1997) using data for Australia, France, Japan, South Africa, Switzerland, the UK and the USA over the period from March 1980 – March 1991 found a negative or insignificant relationship between property returns and inflation. Hoesli et al. (1997) concluded that UK property has poorer short term hedging characteristics than stocks, but better characteristics than bonds. Ganesan and Chiang (1998) also concluded that in Hong Kong, property in general is not a good hedge against inflation. Stevenson and
Murray (1999) also found no evidence that Irish property acts as an effective inflation hedge.

3.4 PROPERTY STOCK AND INFLATION

The inflation hedging behaviours of property stocks or the equivalent of REITs, were tested in countries like the USA (Liu et al. 1977), Switzerland (Hoesli 1994; Liu et al. 1997), Australia (Newell 1996; Liu et al. 1977), the UK (Hoesli et al. 1997; Liu et al. 1997), and the findings showed that there was no significant hedge against inflation. In Hong Kong the empirical studies of Ganesan and Chiang (1998) showed that stock had a partial hedge against expected inflation, but a perverse hedge against unexpected inflation. Sing and Low's (2000) findings were consistent with the general perception that stocks and property stock offer insignificant hedges against inflation in Singapore. Maurer and Sebastian (2002) examined the inflation risk of European real estate securities in France, Germany, Switzerland and the U.K. for the period from 1980 until 2000 and it was found that hedging capacities against expected inflation are significant only for German open-end real estate funds.

3.5 GENERALISED FINDINGS

Based on the literature cited, the findings on the inflation hedging characteristics can be generalized in respect of property and property stock. Property was found to offer significant hedge against inflation particularly the
expected inflation in most of the countries examined. The hedge against unexpected inflation was not significantly shown by the property returns.

With regard to property stock, no hedge was found against inflation in most countries.

3.6 WHAT ABOUT MALAYSIA?

A recent study was done over a short period (1997 – 2001) to investigate the inflation hedging characteristics of residential properties by Mar Iman (2002). The property returns in the study were based on the annual income yield and the study focussed on 147 housing estates in the city of Johor Bahru.

The results show that there is not enough evidence to suggest conclusively that residential property is a hedge against inflation. It was also concluded that short term residential property returns exhibited mixed inflation-hedging characteristics on the basis of geographic locations and non-inflation hedging characteristics on the basis of property types.

Other than the above-study, no other study in Malaysia has been done with respect to inflation hedging characteristics of property or any other financial asset. As such, this research will provide empirical evidence on the subject.