Chapter 5. Conclusion

5.1 Summary of the findings

The results of the analyses of the macroeconomic fundamentals are summarised in Table 19 below. The evaluation of the impact of the macroeconomic fundamentals on the crisis was based on whether the parameters exhibited a clear trend (negative or positive) in the 5-year period leading up to 1997 when the crisis began. 8 of the macroeconomic indicators (resource balance gap, GDP growth, excess lending, export growth, short term debt, real exchange rate appreciation, investment efficiency and foreign exchange reserves) exhibited a negative trend while the remaining 4 macroeconomic indicators (savings rate, inflation, openness and interest rates) showed a positive trend. The arbitrary rule adopted for this research is that the current account deficit is unsustainable if 75% of the indicators exhibit a negative trend. Thus based on this rule the current account deficit for Malaysia was sustainable as only 67% of the macroeconomic indicators exhibited a negative trend. The hypothesis thus constructed is therefore not valid as the number of macroeconomic indicators exhibiting a negative trend was less than 75% (of the total) and yet the country did experience a crisis. Other explanations need to be sought to explain the crisis.

It appears that trend analysis of macroeconomic fundamentals alone is insufficient to complete the evaluation, the results for each parameter analysed had to be modified by qualitative analysis. Other investigators have made similar observations (for example see Radelet and Sacchs, 1998). There are several modes to improve the predictability of the model. We can qualify the quantitative trends by a qualitative assessment of the macroeconomic indicator. For example while the trend analysis for GDP growth was positive, the high GDP growth rates were linked to high consumption rates that actually indicated that the current account deficit was unsustainable. A qualitative assessment is therefore necessary to confirm the validity and accuracy of the trends observed.

Table 19. Summary of the results of the analysis of the impact of macroeconomic fundamentals on the sustainability of the current account deficit.

Macroeconomic fundamentals	Trend
Solvency (Resource Balance Gap)	Negative
GDP Growth	Negative
Investment efficiency	Negative
Savings rate	Positive
Inflation	Positive
Openness	Positive
Real exchange rate appreciation	Negative
Banking and Financial system (excess lending)	Negative
Export growth	Negative
Composition of capital flow (short term debt)	Negative
Foreign exchange reserves	Negative
Interest rate	Positive

Macroeconomic indicators are necessary but not sufficient conditions for predicting a financial crisis such as devaluation. It appears now that not only must the economic fundamentals be weak for a crisis to occur, but also that investor perceptions of the economy have to be negative (Radelet and Sachs, 1998)

Thus a new set of parameters will have to be analysed to understand investor perception of the economy and the likelihood of a capital flight. There are 2 types of the second category of parameters. The first type is an extension of the macroeconomic fundamentals: consumption credit trends, bank lending level, investment efficiency, production index for export oriented sector, property investment and cost of banking sector clean up. The second type measures new concerns: transparency, political risk, vulnerability to panic, contagion effect, capital flight and consumer expectations.
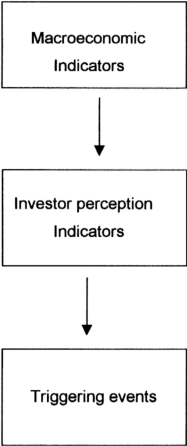
Further it must be realised that all analyses (both the macroeconomic fundamentals and those that measure investor perception) must include a comparative analyses with the country's leading trading partners and competitors.

It is still not enough to predict a crisis by analysing the above parameters. For a crisis to develop a triggering event has to be present or occur. Another set of parameters will have to be developed – these are the parameters that track vulnerability of the economy to triggering events such as the contagion effect and financial panic and likelihood of a traumatic events such as a currency float, bank closures, unexpected election results happening. Steven Radelet and Jeffery Sacchs (1998) have identified several potential triggering events that may precipitate a currency crisis once conditions are in place.

Therefore based on the analyses of the financial and crisis of 1997 in Malaysia and other parts of Asia, macroeconomic fundamentals are not the sole determinants of currency devaluations. Two other sets of data are required to complete the picture – data about investor perceptions on the economy and country as a whole and data on triggering events actually precipitating a crisis.

5.2 Proposed early warning system

The following model is proposed to build a signalling device for expectations of currency devaluation:

```
┌─────────────────────┐
│   Macroeconomic     │
│    Indicators       │
└─────────────────────┘
          │
          ▼
┌─────────────────────┐
│ Investor perception │
│    Indicators       │
└─────────────────────┘
          │
          ▼
┌─────────────────────┐
│                     │
│  Triggering events  │
│                     │
└─────────────────────┘
```

5.2.1 Proposed early warning system for predicting currency crises based on market expectations on the macroeconomic fundamentals.

The analyses of the macroeconomic fundamentals indicate that it is possible to construct a signal system to predict currency devaluations. If there is a clear negative trend for the macroeconomic parameters identified above then expectations of devaluation will be high.

Annual percentage change was used to determine the trend in the macroeconomic fundamentals above. However this may not be accurate enough. Further in order to develop a computer based signalling system a more quantitative approach is necessary. The following model is therefore proposed to develop a more rigorous signalling system.

For each of the macroeconomic fundamental parameter above, a critical value will have to be determined (proposed values given in Table 20 below). Then a ranking will have to be applied to determine how close the country is to the critical level. The proposed scaling system is a 1 (for lowest) to 10 (highest or closest to the critical level). For example if 5% is the critical level for current account deficit. Then when the current account deficit declines to more than 5% of the GDP the score is 10. For 11 parameters the theoretical score is 110. At this score devaluation is imminent. Since political will plays a role in the national economics, a moderating score to account for this has to be included. A set of parameters to rank government willingness to take corrective measures to rectify problematic macroeconomic factors will have to be constructed. This will probably be an arbitrary measurement based on some poll of identified market watchers. Table 20 describes the proposed quantitative method to track macroeconomic performance.

Table 20. Proposed measurement system to measure expectation of devaluation based on macroeconomic fundamentals.

Macroeconomic fundamental	Critical level	Scale	Govt willingness to take corrective actio
Current account deficit	5 % of GDP	1 – 10; interval = 2 % points. Lowest is 10 and highest is 0	1 – 10; arbitrary, have to construct a set of parameters
Solvency / Res Bal Gap	0	1 – 10; interval = 10% point, lowest >100, highest >0	
GDP Growth	historical average or target value	1 – 10; interval = 1% point, lowest < 0%, highest > 10%	
Short term debt index	target value or 100%	1 – 10; interval = 10% point, lowest > 100%, highest =0%	
Total debt index	target value or 100%	1 – 10; interval = 10% point, lowest > 100%, highest =0%	
Real exch rate apprec. index	120	1 – 10; interval = 4% points, lowest < 80, highest > 120	
Openness index	50% or target value	1 – 10; interval = 5% points, lowest < 50%, highest > 100	
Foreign reserves index	3	1 – 10; interval = 0.2, lowest < 1, highest > 3	
Inflation	target value or historical value	1 – 10; interval = 1% point, lowest < 1%, highest >10%	
Interest rate index	US rate, target rate or historical value	1 – 10; interval = ?, lowest ? highest < US rates	

The proposed scale is from 1 to 10 with 1 being the lowest and 10 the highest rank/score. Interval is the proposed interval based on the proposed critical value. Lowest and highest refers to the proposed values for the lowest and highest ranking. The system proposed calls for the highest score be accorded to the situation most likely to trigger a devaluation.

5.2.2 Proposed early warning system for predicting currency crises based on investors' perception of current account deficit unsustainability.

Table 21 below lists the proposed non-traditional macroeconomic parameters to track investor perception of the economy. The table lists how the parameters will be defined, the critical level beyond, which a crisis will be triggered, and the scaling system to measure the response. Much of the work remains to be carried out. A survey will have hot be carried out periodically to measure investor response to consumer expectations of the economy. Definitions and methods will have to be devised to measure the new proposed parameters of transparency, political risk, capital flight, financial panic and contagion effect.

The transparency index can be constructed either by a survey (measuring investor view of the Malaysian economic data) or by studying some quantitative data such as presence of number of publications, research papers, legal cases etc. Similarly, political index can be constructed by a survey measuring investor perception of the political risks (for example the survey can probe investors prediction of riots, change of leadership, change of economic policies etc.). For the capital flight and contagion indices a survey may be of limited help. It is more appropriate to carry out a quantitative (objective) study. For example it is possible to rank the tendency for capital flight by investigating the ease of capital mobility, who are the owners of capital and the destination of the capital flight if it occurs. For the contagion effect, it is possible to study the regional characteristics of Malaysia such as similarity of industries, export markets, investors, level of development etc. For the financial panic index both a survey (like the political risk index above) and other studies like ease of capital mobility, government guarantees etc. The lender of last resort is a tricky parameter to construct. Typically this will be the central bank failing with the IMF will step in. The measurement here is what these institutions will back – banks, strategic companies or state run companies etc. Further whatever the score assigned to the parameter, it will have to be modified by political will to install remedial measures as described in the macroeconomic fundamentals above.

Table 21. Proposed signalling system to track investor perception of the sustainability (or not) of the current account deficit.

Perception parameters	Definition	Critical level	Scale
Investment efficiency/quality Index	ratio of investment in non traded sector to GDP	50% or target value or historical value	1 – 10; interval = 5% points, lowest < 50%, highest = 100
Consumption index	ratio of consumptio credit growth to total loan growth	1.0	1 – 10; interval = 0.1 point, lowest < 0.1, highest > 2
Consumer expectation index	have to conduct a survey.	50%	1 – 10; interval = 5% points, lowest < 50%, highest = 100
Cost of bank restructuring	have to find a method to estimate cost as % of GDP	10%	1 – 10; interval = 1% point, lowest < 1%, highest >10%
Banking system – over lendin Index	ratio of private sector lending to total deposits	100%	1 – 10; interval = 30% point, lowest < 100%, highest 400
Banking system – NPL index	ratio NPL to capital base; NPL defined 3 mth non payment	20%	1 – 10; interval = 2% points, lowest = 0, highest = 20%
Property investment index	ratio of investment in property sector to total loans (growth)	1.0	1 – 10; interval = 0.1 point, lowest < 1, highest > 2
Export growth index	ratio export growth to import growth	100	1 – 10; interval = 1% point, lowest > 100%, highest < 90
Production index	ratio export oriented to import oriented industries indices	100	1 – 10; interval = 10% points, lowest > 200,highest < 100
Transparency index	have to construct – not yet addressed in literature	?	1 – 10; interval = ?, lowest = ?, highest = ?
Political risk index	have to construct	?	1 – 10; interval = ?, lowest = ?, highest = ?
Capital flight index	have to construct – probably have to conduct survey	?	1 – 10; interval = ?, lowest = ?, highest = ?
Financial panic index	have to construct – probably have to conduct survey	?	1 – 10; interval = ?, lowest = ?, highest = ?
Contagion index	have to construct – probably have to conduct survey	?	1 – 10; interval = ?, lowest = ?, highest = ?
Lender of last resort	have to construct – have to determine BN's role	Nil	1 – 10; interval = ?, lowest = Yes (1), highest = No (10)

5.2.3 Proposed early warning system to predict currency crises based on vulnerability of the country to triggering events.

At the moment this set of parameter is more speculative. More research will have to be carried out to determine what are the possible triggering events. In Table 22 below is listed some of the proposed events that can act as a trigger for a currency devaluation provided criteria for meeting a crisis is met as described above.

In constructing the final signalling system, 2 scales are proposed. One is to measure the accuracy of the triggering event in influencing investor actions (Reality scale) and the other is to measure the reliability of the triggering event in influencing investor actions (Vulnerability scale). Again here the role of the government in moderating investor response will have to be included.

Table 22. Proposed format in constructing signalling system to track the onset of a triggering event that can trigger currency devaluation.

Triggering event	Reality scale	Vulnerability scale	Govt willingness to take corrective actio
Currency float	Is the FX level sufficient to defend the currency?	Is the FX level sufficient to defend the currency?	What is the FX and CAD levels?
Bank closures	Recent history of bank closures, bankruptcy laws	Recent history of bank closures, bankruptcy laws	How many banks? State banks, bank shareholders etc
Policy reversals	Recent history of reversals, how strong is the govt	Recent history of reversals, how strong is the govt	How strong is the govt – 2/3 majority?
Political events	Is the succession clearly defined and accepted?	What is the level of govt involvement in business?	When is election?
Poor economic results	Timeliness, accuracy and integrity of the data	Timeliness, accuracy and integrity of the data	What is the FX and CAD levels?

5.3 Conclusion on the crisis in Malaysia and the region

It is slowly beginning to emerge that fundamental government policies were the ultimate cause of the currency crisis in Malaysia (and other affected countries in Asia) Corsetti (1998). In developed countries, the basic goal of economic policies is to ensure full employment of the citizens. In Malaysia however, the basic economic goal is to have high GDP growth rates in order to quickly carry the nation to a developed status. But Malaysia like the rest of Asia (with the exception of Japan) is undercapitalised therefore government policies had to encourage capital inflow to fund the investments designed to develop the country. A key government economic policy in Malaysia (like the rest of Asia) was to peg the Ringgit to the US dollar. By pegging the Ringgit to the US dollar, the government was able to create a stable exchange rate environment. This resulted in cheaper foreign funds as exchange rate risks were discounted (Roubini, 1998). The availability of cheap foreign funds was the key to the rapid development in the country (Moreno, 1999; Fox, 1998).

There seems to be a sort of general consensus on how the crisis started: low asset yields in the matured markets of the US and Western Europe prompted capital inflows to the emerging markets

1. Asian countries (Malaysia for example) pegged their currencies to the USD to allow for stable exchange regimes. This was important in economic development for the following reasons:

   a) stable currencies resulted in cheaper foreign funds as exchange rate risks were discounted – availability of cheap foreign funds was the key to the rapid development of the region.

2. Asian countries experienced persistent high current account deficits (due to expenditure on infrastructure). These deficits were financed by capital inflow. Capital inflow occurred because of:

   a) high domestic interest rates

3. Domestic interest rates were high because:

   a) Governments pursued a monetary policy of exchange rate determination – governments increased domestic credit supply to fund development but this increases inflation and hence depreciates domestic currency. In order to maintain the peg (fixed exchange rate), the government had to use foreign reserves to fund purchase of domestic currency to prop it. To maintain the reserves governments resorted to instituting high domestic interest rates to generate capital inflows to offset the balance of payment disequilibria above.

4. Currency devaluations were devastating because:

   a) Many domestic economies are small and depended on international trade (exports and imports). A 30% drop in the exchange rate will impact say 20% of the Malaysian economy if 70% of the GDP is in international trade. Malaysia imports more than it exports so devaluation will impact the economy negatively by raising prices.

   b) Many national economies are based on commodity exports and imports, which are vulnerable to exchange rate risks. However in the case of Malaysia there were some breaks: palm oil and crude oil generated windfall bonuses in exchange rate gains.

c) Currency devaluations made foreign loans more expensive and raised the cost of business. In Malaysia many 'mega' construction projects funded by foreign loans were stalled and resulted in mass layoffs (the monorail project in KL, Bakun dam).

5. The ultimate reason for the financial crisis appears to be the local economies inefficiently utilising the huge capital flowing in. Low quality investment ultimately led to capital flight out of the region. The capital flight was triggered by the floating of the Thai Baht after a failed attempt by the Thai government to defend it. Investors then perceived that the whole region was vulnerable to a recession and raced to get out. There was no recognised lender of last resort to back the loans so creditors jumped the queue to avoid being the last one out. The intervention of the IMF appeared to exacerbate the situation rather than the opposite.

6. Investment quality was low because of the following reasons:

a) economic policy of pegging the local currencies to the USD. When the USD appreciated against the JPY, local currencies also appreciated against the JPY, which resulted in loss of export competitiveness. However this generalisation does not apply to Malaysia.

b) devaluation of the Chinese Yuan in 1994 led to China being more competitive than South East Asia.

c) Apparently investment was in industries like clothing, footwear and household electronics, which were facing severe competition in the export market. There was a fundamental loss of export competitiveness and yet investment was pouring into these industries.

d) The high economic growth rate in the US brought about by astounding productivity gains.

5.4 Future research

The nature of this thesis does not afford the research to be exhaustive. However this study did unearth many interesting and potentially important areas for further research.

1. The actual design and construction of the signalling system described above. Ultimately it is envisaged that the system will have to be converted into a computer programme that can provide a real time analysis. The actual construction of the various index and the scaling and scoring for the various parameters will have to be tested out thoroughly. Probably a visual basic programme will have to be written.

2. A thorough and exhaustive study on triggering events should be carried out to construct a proper signalling system to detect vulnerability of the economy to a triggering event

3. Radelet and Sachs (1998) have pointed out the importance of domestic investors in determining future crisis in Asia. The differences in perception between the domestic and foreign investors will therefore be of great importance. And also how each group will react and the impact on the economic recovery.

4. Since the imposition of selective capital controls by the Malaysian authorities, this area will be another area of great interest especially since there is considerable success.

5. The contribution of each of the parameters towards predicting currency devaluation. In the present analysis it was assumed that the weight was constant. In practice it may not be, so a weighted contribution for each of the parameters described above will have to be devised.