ABSTRACT

Through 2004 to 2006, the ASEAN countries were hit by the largest oil price increases since the 1970s. ASEAN countries are far more oil intensive in production than other countries and hence more sensitive to oil price increases. They are also, as a group far more trade intensive than other economies and highly integrated into global production chains. Consequently, the impact of oil price shocks on the ASEAN economies could potentially be very large, even though the present shock has only been modestly disruptive to growth.

This paper looks at the impact of the present oil price shock on the ASEAN economies, examining the channels of transmission both direct and indirect, and examining why the experience of the current oil price shock has been different to the experience of previous shocks, (and why future oil shocks might be different again). In doing so, it looks at how the oil price shock has impacted on the world economy and why there have only been relatively modest effects on inflation, activity and interest rates this time around. The experience of the oil price shock more broadly also provides some valuable policy lessons particularly in relation to the importance of having well established medium-term frameworks for monetary and fiscal policy, and well anchored inflation expectations. The paper then goes on to examines fiscal and monetary responses to the impacts of higher oil prices, and how appropriate policy response to the shocks differs according to the circumstances of different types of country.

In reality macroeconomic policy decisions would be very simple if the future were known (in the same way as a decision to bet on a horse would be simple if one knew which one was going to win). The complications for monetary and fiscal policy arise because the impacts of any given increase in oil prices are uncertain, and the channels of response are many and varied. Consequently, this paper places its main focus on attempting to understand the transmission mechanisms of an oil price shock, with the aim in turn of informing fiscal and monetary responses in ASEAN economies.
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EXECUTIVE SUMMARY

High oil prices have posed a number of challenges for governments in the ASEAN region. They have led to higher inflation, and higher interest rates than would otherwise have been the case. However, inflation is now falling, growth is picking up and it looks as though the worst may be over, for now at least. However, significant risks remain around the outlook for oil prices. Much of the world’s traded oil supply sits in regions of political instability. Oil demand from China, India and other developing countries will continue to grow rapidly over coming years maintaining pressure on prices. In these circumstances, any significant disruption to supply could lead to sharply higher prices.

The current oil price increase has been relatively non-disruptive to growth because it has mainly been driven by increasing global demand for oil rather than disruptions to supply. An increase in oil prices that comes from an increase in demand is in a sense self-regulating. Higher growth leads to higher oil prices and interest rates, which in turn tend to act as a restraint on growth. Growth moderates and oil price fall back to more normal levels. The next oil shock, if it occurs, is much more likely to be due to supply side disruption. If such a shock were to occur, its effects on the global economy and consequently on ASEAN economies, would be potentially much larger than the present shock.

So far, oil price rises have had only relatively minor impacts on the World economy. Inflation rose by around ½ a per cent a year in 2005 and 2006, as would be predicted by a range of economic models Interest rates have been higher in response, and GDP growth a little slower than otherwise.

- Overall World GDP growth has remained remarkably strong, while inflation has remained low.
- At the same time, higher oil prices (among other factors) have been associated with growing global imbalances. The US current account deficit is projected to approach US$ 1 trillion by 2008, while oil exporting countries are generating current account surpluses of around half of this amount.
- These imbalances are unsustainable. As ASEAN countries are trade intensive and reliant on growth in the North American, Japanese and European markets, higher oil prices may pose more of a threat through the channel of financial instability than they do directly.
- ASEAN economies have higher levels of oil usage in GDP and therefore have experienced proportionally greater impacts from oil prices. Inflation has risen by between two and four percentage points since 2003 in most countries across the region, roughly in line with the prediction from economic models.
- Higher inflation has reduced household incomes, and consumption growth has slowed.
- Monetary policy responded to the higher inflation with most countries raising interest rates through 2004 and 2005.
- With consumption slowing, interest rates higher and slower export growth, GDP growth slowed in most countries in 2005 and 2006, by between 1 and 2 per cent relative to 2004 rates, again roughly in line with the prediction from economic models.
- The slowing in growth in 2005 and 2006 restrained the second round flow through of the oil price increase. For most countries, inflation is forecast to fall back to around the target range for 2007.
- Consequently, the ASEAN region can be said to have weathered the current oil price shock reasonably well.
• However, the risk of further and possibly larger disruption remains.
• The lesson from past oil price shocks is that it is better for monetary and fiscal policy to react earlier to a shock than for the response to be delayed.
• There is little that ASEAN governments can do to change their external environment or prevent future oil price shocks or a global downturn developing.
• However, they can prepare their economies by pursuing prudent medium-term policies that encourage economic flexibility and growth, reducing oil price subsidies and lowering public debt so that fiscal and monetary responses to future crises can be more supportive of growth.
I. INTRODUCTION

Background and Significance

Increased oil prices pose a challenge for ASEAN economies. Since late 2002 oil prices have increased by a factor of four, peaking at $78 per barrel in July of 2006.1 Since then prices have fallen back averaging around 60 dollars a barrel over the last five months. Futures contracts indicate that the market expects that prices will remain at around current levels in the next few years, but there is a wide range of uncertainty around the medium-term outlook. The World Bank is projecting that oil prices will fall to around $33 dollars a barrel by 2015, while the United States Energy Information Agency (EIA) and the OECD International Energy Agency (IEA) are both projecting prices of around $47 by 2015.2 World oil supply will increasingly be concentrated in the Middle East and Africa over the coming decades. Both are areas of political instability and with the World economy set to continue to grow strongly, supply disruptions and periodic price volatility are likely to continue to be features of the oil market.

Most ASEAN member countries have a high rate of oil usage in GDP, and are net importers of oil. Transport fuel, oil powered electricity generation, and a reliance on kerosene for domestic use see oil price impacts flow through to many points in the economy. Deterioration in the balance of trade may flow through to consequent pressure on exchange rates, while increased inflation will have implications for monetary policy and interest rates, raising the costs of financing public and private debt. The cost to government of financing fuel price subsidies also rises, and some countries have taken action to reduce these subsidies, with consequent economic and social impacts. Countries choices on monetary and fiscal policy will affect how the economy manages what look like being permanently higher oil prices.

Questions the study is attempting to answer

This study attempts to deal with two issues: Firstly, what is the impact of the current oil price shock on ASEAN countries? In particular:

- What impact do the rising oil prices have in the short and long terms?
- What are the key transmission mechanisms of an oil price shock to ASEAN economies and what are the direct and indirect effects?

Secondly, what are the appropriate fiscal and monetary policy responses to that shock? For example:

- How have policies reacted in the past and how effective have the responses been?
- How should monetary and fiscal policies in ASEAN economies best respond to these oil price fluctuations and a sustained increase in oil prices?
- What is the ‘best practice’ mix of policies for particular types of countries and what are the implications for regional economic stability and growth?

---

1 $78 was the peak price for West Texas intermediate. The bulk of oil supply for the Asian region however is in the form of heavier grades from the Middle East. The benchmark price for Dubai oil did not rise to the same extent as West Texas. (Refinery capacity constraints led to a premium for lighter grades of oil.) Moreover the rise in the US dollar oil price tended to be exaggerated by the fall in the US dollar against other currencies. Measured in currency neutral SDR terms the rise in oil prices was not quite as large.

2 United States dollars adjusted for inflation (at 2004 prices).
It is not possible to answer these policy questions without first understanding the nature of the shock. There are no fixed rules that say a particular percentage change in oil prices should lead to a particular policy response in a given country. Each oil price shock is different. The shocks that occurred in 1974 and 1981 were caused by supply side disruptions, (the first following the Yom Kippur War in 1973 and the second following the Iranian hostage crisis in 1979). The oil price increases that have occurred over the last four years have largely been driven by burgeoning global demand, much of it from the rapidly industrialising countries in Asia. The policy response to a situation where the oil price increases are being driven by demand, and world economy is growing at a rapid rate with low inflation and interest rates, is likely to be very different to one where there is a sudden supply disruption. When prices are rising due to supply disruption, not only does the government have to deal with the impacts on inflation and incomes in its own country, but also the effects on its external environment, such as shrinking export markets, rising overseas interest rates and possible realignments in major currencies.

Structure of the report

Because of their high trade shares, oil prices will affect the ASEAN economies both via their impact on the world economic activity, exchange rates and interest rates (and hence on ASEAN export markets and financial flows), and via the direct impacts on ASEAN prices and incomes. They could therefore potentially receive a quite large shock from an increase in oil prices. Consequently the report first analyses the main transmission channels via which an oil price shock affects ASEAN economies, and the individual features of those economies that make oil price impacts different to other economies. Given the potential importance of global transmission, it then looks at the global impacts of oil prices, providing an overview of the current global economic outlook and situation, how oil prices have impacted on the outlook and why the impacts have been different over the last three years to those in 1973-74 and 1979-80.

The third chapter looks at the particular circumstances of the ASEAN countries. It starts with an overview of the recent economic developments and the general macroeconomic situation – linking back to the global economic outlook. It then looks at model based estimates of the impacts of an oil price shock on output, inflation and other variables by ASEAN country. The impacts are discussed linking back to current developments and the outlook for the countries, answering the question: to what extent are current developments related to the increase in oil prices.

The fourth chapter then looks at the policy responses and draws up a matrix of best practice policy responses by type of country. What have been the policy responses and implications so far? What are the particular institutional arrangements for individual countries that might affect the way the country responds?
II. CHANNELS OF TRANSMISSION OF AN OIL PRICE SHOCK TO ASEAN ECONOMIES

The policy response to an oil price shock depends on how that shock impacts on the economy. The key to having the best possible policy response is in anticipating how rising oil prices will impact on inflation and activity, both in the short and medium terms and adjusting policy accordingly.

However assessing the likely impacts of changing oil prices can be complicated. Each oil price shock is different. There is a wide variety of economic structures across ASEAN. Moreover, the structures of individual countries are evolving rapidly over time. Consequently, there are no simple rules that can be applied in response to an oil price shock, either across countries, or over time.

Usually monetary policy will need to be tightened in response to the higher inflation engendered by a shock. However, the degree to which it is tightened, or whether it is tightened at all, depends on the impacts on activity relative to those on inflation. The larger the decrease in activity relative to inflation, the lesser the need for a monetary response. However, whether an increase in global oil prices leads to a large or a small impact on activity depends on a wide variety of factors. Hence, while the policy decision if the future is known is relatively simple, estimating the impact of any oil price shock on the outlook is irreducibly complex. It depends on the ability to understand the transmission mechanisms and to forecast the effects that any individual shock will have. Consequently, this section concentrates on outlining the general transmission mechanisms of an oil price shock to ASEAN economies.

2.1 Global versus domestic transmission

As mentioned earlier, ASEAN economies are unusually sensitive to oil price shocks. They feel the impacts two ways: via the impact on world trade and interest rates, and via the direct impact on their oil import and export prices. One thing that ASEAN economies have in common is that they are all trading economies with high trade and export shares. Moreover, as small open economies with high levels of investment they are also sensitive to the impacts of oil prices on financial markets on financial flows, interest rates and exchange rates. For example, if world short and long interest rates are rising with an increase in oil prices, then long-term borrowing costs in most ASEAN economies will rise. If this occurs, then impacts on activity will be larger and there will be less need to tighten monetary policy.

Similarly they are also sensitive to the direct impacts of rising global oil prices on their oil imports and hence on domestic prices. As most ASEAN economies are dependent on oil imports, and intensive in their oil use in GDP they are potentially doubly exposed to an oil price shock.

Figure II.1 below provides a stylised guide to the transmission channels of an oil price shock to ASEAN economies. An increase in global oil prices can be either driven by increased global demand, or by supply side disruption. Whether the shock comes from the supply side or the demand side has important implications for the global effects. If it is due to supply side disruption, it is more likely to lead to slower world growth, higher interest rates, and disruption to world trade and financial markets. The impacts on ASEAN economies would be felt more through the trade and financial channels. If the origin of the shock is through higher world demand, then the impacts will be more through the direct channels.
II.1 Transmission channels of an oil price shock to ASEAN economies

How the various influences are felt in the individual ASEAN economies depends on the structure of those economies, particularly their trade intensity, their level of financial development and exposure to overseas investment sentiment, their oil intensity of production and their level of oil dependency. It also depends on the individual institutional features of the economies in terms of their labour and product markets and their monetary and fiscal policy arrangements. Table II.2 presents some key indicators for the ASEAN economies, particularly with respect to their exposure to developments in world trade, and with respect to exposure to the direct effects of oil price increases.
## II.2 Key indicators for ASEAN economies

<table>
<thead>
<tr>
<th></th>
<th>GDP (MER) 2005</th>
<th>GDP (PPP) 2005</th>
<th>Trade Intensity</th>
<th>Exports /GDP %</th>
<th>Exports Extra ASEAN %</th>
<th>Exports to US %</th>
<th>Oil Self Sufficiency</th>
<th>Oil Intensity</th>
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<tr>
<td><strong>ASEAN 6</strong></td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Brunei</td>
<td>9.5</td>
<td>9.2</td>
<td>120.3</td>
<td>92.4</td>
<td>76.0</td>
<td>10.8</td>
<td>24.00</td>
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<td>Indonesia</td>
<td>281.3</td>
<td>977.4</td>
<td>62.7</td>
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<td>81.5</td>
<td>12.7</td>
<td>0.07</td>
<td>7.3</td>
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<td>130.8</td>
<td>290.7</td>
<td>222.9</td>
<td>123.2</td>
<td>73.9</td>
<td>19.5</td>
<td>0.65</td>
<td>7.2</td>
</tr>
<tr>
<td>Philippines</td>
<td>98.4</td>
<td>414.7</td>
<td>93.5</td>
<td>46.4</td>
<td>82.7</td>
<td>20.5</td>
<td>-0.96</td>
<td>6.4</td>
</tr>
<tr>
<td>Singapore</td>
<td>116.8</td>
<td>123.4</td>
<td>455.6</td>
<td>242.7</td>
<td>68.7</td>
<td>11.5</td>
<td>-0.99</td>
<td>7.7</td>
</tr>
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<td>Thailand</td>
<td>173.1</td>
<td>544.8</td>
<td>148.9</td>
<td>73.7</td>
<td>78.2</td>
<td>15.5</td>
<td>-0.69</td>
<td>8.4</td>
</tr>
<tr>
<td><strong>ASEAN CLMV</strong></td>
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<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Cambodia</td>
<td>6.2</td>
<td>34.7</td>
<td>120.2</td>
<td>56.9</td>
<td>95.3</td>
<td>52.6</td>
<td>-1.00</td>
<td>1.3</td>
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<td>Lao PDR</td>
<td>2.9</td>
<td>12.5</td>
<td>54.6</td>
<td>21.9</td>
<td>15.2</td>
<td>1.0</td>
<td>-1.00</td>
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<td>Myanmar</td>
<td>12.2</td>
<td>93.8</td>
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<td>0.2</td>
<td>50.1</td>
<td>9.7</td>
<td>-0.51</td>
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<td>Vietnam</td>
<td>51.4</td>
<td>251.6</td>
<td>149.6</td>
<td>69.0</td>
<td>82.4</td>
<td>21.3</td>
<td>0.63</td>
<td>8.3</td>
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<tr>
<td><strong>ASEAN TOTAL</strong></td>
<td>882.5</td>
<td>2,752.9</td>
<td><strong>166.3</strong></td>
<td><strong>87.4</strong></td>
<td><strong>74.7</strong></td>
<td><strong>15.9</strong></td>
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<tr>
<td>China</td>
<td>2,234.1</td>
<td>9,412.4</td>
<td>69.5</td>
<td>37.5</td>
<td></td>
<td>5.8</td>
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<td>India</td>
<td>772.0</td>
<td>3,633.4</td>
<td>39.9</td>
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<td>Korea</td>
<td>787.6</td>
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<td>630.1</td>
<td>40.1</td>
<td>19.1</td>
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<td>3,910.7</td>
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<td>1.9</td>
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<tr>
<td>United States</td>
<td>12,455.8</td>
<td>12,277.6</td>
<td>28.8</td>
<td>11.8</td>
<td></td>
<td>2.6</td>
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<td></td>
</tr>
</tbody>
</table>

* GDP at market exchange rates (MER) is in $US billion. GDP at purchasing power parity (PPP) is in international dollars (PPP adjusted $US).

Trade intensity is measured as imports plus exports as a percentage of GDP. Figures are for 2005.

The percentage of extra ASEAN exports in total merchandise exports includes intermediate products ultimately destined for extra ASEAN markets such as the US. Hence the figures underestimate the true level of extra ASEAN trade.

Oil self sufficiency is measured as oil production less consumption over oil consumption – 2003 figures.

Oil Intensity is defined as oil consumption at 2003 prices over GDP at market exchange rates.

Data source: IMF WEO Database, ADB Economic Statistics, EIA International Energy Annual, ADB ASIAN Economic Outlook, OECD Economic Outlook Database, CIE Calculations

As can be seen the ASEAN economies cover a wide range of levels of development, from high income countries with relatively stable economic structures such as Singapore and Brunei, to low income and rapidly developing countries such as the Lao PDR and Cambodia. They also differ widely in terms of their oil dependence, from significant oil producers such as Brunei, Malaysia, Vietnam and Indonesia, to countries that are almost totally dependent on imports (Singapore, the Philippines, Cambodia, Lao PDR and Thailand). This means that the direct impacts of permanently higher oil prices will be felt asymmetrically across the region, leading to higher incomes and improved terms of trade for the four oil producing and energy exporting countries, and lower terms of trade and real incomes for the others (see Appendix B). This in turn means that different macro policy responses will be required across the region. It also means that there will be an unavoidable adjustment to real exchange rates required within the region stemming from the shock.

However, at the same time there are a number of features that the ASEAN economies have in common that will also have a large bearing on their response to an oil price shock. Firstly most of the ASEAN economies are relatively oil intensive in production (with the exception of Cambodia and the Lao PDR), which means that domestic output and consumer prices will be more sensitive to a change in oil prices than in other countries. As can be seen, the oil intensity of production across the ASEAN6 countries and in Vietnam is two to three times that of typical OECD countries. Hence the primary impacts on prices, particularly for the oil dependent economies (Singapore, the Philippines and Thailand) will be felt two to three times more deeply.

The second feature, which the ASEAN economies share in common, is that they are all intensive trading economies. In fact, six of the ten economies more than meet the criterion for being super trading nations with trade shares over 100 per cent of GDP and two others
come close to meeting the criterion. The trade shares for Singapore and Malaysia in particular are extremely high with trade at more than four times and double that of GDP respectively. This in turn reflects high levels of foreign direct investment over the last twenty-five years, the integration of the region into global production chains and the growth of intra industry and intra firm trade. In this respect, it is notable that most of the trade of individual ASEAN countries is external to ASEAN. Moreover much of the rapidly growing trade in intermediate goods with countries such as Korea and China is ultimately destined for third markets (the US, Europe and Japan). Hence, the region is ultimately heavily influenced by developments in world trade. It is also more than usually exposed to changes in international investment sentiment.

The exposure to the world trade transmission channel of an oil price shock, contrasts with that of the main advanced countries. In comparison to a weighted average export share of 85 per cent for ASEAN, the US and Japan have export shares of 11.8 per cent and 14.3 per cent respectively, while that of the euro area is around 15 per cent. Whereas ASEAN economies are heavily exposed to the global effects of an oil price shock, the impacts in the main advanced economies are felt internally.

The impact of global developments on local activity is evidenced by the high correlation of export growth with GDP in many countries in the region. This can be also be seen in the close correspondence of GDP growth in the main ASEAN trading economies with growth in OECD imports. These countries were heavily affected by the turnaround in world trade between 2000 and 2001 as was the region as a whole. The pattern of growth has also been similar over the period of the oil price shock. This linkage helps to explain why the slow down in growth in 2005 and 2006 has been felt by both oil exporting and oil importing countries. It is also a key linkage in the model results reported in Chapter III and IV.

II.3 OECD import growth and GDP growth in selected ASEAN economies.

Data source: OECD Economic Outlook Database, ADB Asian Economic Outlook, IMF WEO Database

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3 See Krugman, 1995.
4 Excluding intra euro area trade.
5 Singapore, Malaysia and Thailand have correlations of between 0.6 and 0.8 over the period 1990 to 2005 while Indonesia and the Philippines were somewhat less sensitive with correlation coefficients of around 0.3 World Bank, 2006, P.8.
It is important to note that not only is ASEAN trade sensitive to OECD imports, but also with the growth in global integration, OECD imports have also become more sensitive to the business cycle. Whereas in the 1970s and 1980s fluctuations in OECD trade were around 2 times that of output, since the early 1990s the fluctuations have been around 3 ½ times that of output. That is for every 1 per cent downturn in GDP growth, import demand now falls by around 3 ½ per cent. This increased volatility of trade increases the exposure of ASEAN economies to the global effects of an oil price shock.

2.2 Regulation of retail petrol and diesel prices

Another structural feature of ASEAN economies that differs substantially across the region and has a significant impact on the transmission of an oil price shock, is the regulation and taxation of gasoline and diesel at the retail level. As noted above, the main initial direct impacts of an oil price shock are usually felt by consumers as domestic retail prices rise with the change in the global markets. However this is not necessarily the case in many ASEAN economies, as retail prices for oil products has in the past been regulated and heavily subsidised, particularly in Indonesia, Malaysia, Myanmar, and Brunei Darussalam (see chart II.4 below). Perhaps not surprisingly those countries which have had the heaviest regulation in the past (Indonesia, Malaysia, Vietnam) have been the most able to afford to do so due to their oil exporting status, and state involvement in oil production, whereas the most oil dependant economies have allowed the market to determine the price (in the case of the Singapore actively discouraging the use of oil via high taxation.)


[Chart showing retail prices for gasoline and diesel in ASEAN countries, 2004]

Note that the comparison is affected by the exchange rate in the particular year and distribution costs for individual countries. In contrast to Brunei, Myanmar, Malaysia and Indonesia which traditionally have had significant retail subsidies, Cambodia, the Lao PDR and Singapore have significant taxes on oil products, the former as a means of raising revenue, the latter to discourage use of private transport within the city state. As a benchmark, the retail price for super gasoline in the US, which has relatively efficient refining and distribution and with road user based taxes of around 10 cents per litre, was 54 cents in 2004.

Data source: World Bank, World Development Indicators Database

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6 See Downes and Drew, 2002 for a discussion.
Where subsidies and price regulation existed the normal transmission of higher global prices to domestic retail prices was dependant on political and administrative decisions. Rising oil prices through 2004 to 2006 had significant impacts on the cost of subsidies in the countries that implemented them, and hence on the fiscal bottom line. As it became apparent that higher oil prices were likely to persist for some time, most countries moved to increase the retail price and reduce the subsidy. This in effect delayed the direct price increases and complicated the macroeconomic policy response to the oil shock (discussed further in Chapter V).

2.3 Summary / conclusion

In summary, the ASEAN economies are a diverse group with a number of particular features that make them respond differently to other countries to an oil price shock. In particular, their high levels of integration into global production chains and the high level of intra industry and intra firm trade make them more susceptible to developments in global trade and financial markets. That in turn makes it particularly important to understand the global ramifications of an oil price shock, why this oil price shock has been different, and why future oil price shocks may manifest themselves in different ways. This is the issue we turn to now.

7 Among other things this means that it is impossible to capture econometrically from historical time-series data the normal pass through of world oil prices to inflation in most ASEAN countries. (Moreover, if a government controls the retail price through administrative fiat, then it does not need an econometric forecast to tell it how the retail price will respond to a change in global oil prices.)
III. OVERVIEW OF GLOBAL SITUATION AND INTERNATIONAL EVIDENCE ON THE IMPACTS OF OIL PRICES

3.1 Global macroeconomic situation and outlook

The global economy continued to grow strongly in 2005 and 2006. The growth occurred in the face of higher oil and commodity prices. Growth is expected to slow a little in the United States, Europe and Japan in 2007, but remain at high levels overall with continued strong growth in China and India. Not only has global growth accelerated in the face of rising oil prices, global inflation as measured by the IMF has also been relatively stable, rising from 3.4 per cent in 2002 to 3.8 per cent in 2006 (forecast to be 3.7 per cent in 2007).

The IMF and OECD produce two different measures for world GDP growth, one aggregated at purchasing power parity (which gives greater weight to developing countries) and another aggregated at market exchange rates. Figure III.1 below shows projections for GDP growth for the world economy aggregated in the two different ways. Measured in PPP terms, world GDP growth has been at its highest level for thirty years over the last three years, running at a little over 5 per cent, markedly higher than the average of 3 per cent experienced in the 1990s.

The high pace of GDP growth is largely being driven by the surge in growth in India and China. While OECD growth recovered from the post 2000 economic downturn in 2004, growth remains at around 2 ½ to 3 per cent with slowing population and labour force growth, particularly in Japan and Europe. In contrast, growth in the rest of the world has risen to more than 7 per cent, with growth surging in both India and China in 2003 and 2004. This in turn has had significant implications for the growth in world industrial production and the demand for oil and energy, discussed below.
The seemingly relatively benign picture of strong growth and continued low inflation is not without risks however. In particular, the surge in growth in China and rise in oil prices has been associated with the development of large regional current account imbalances. On current projections, the US current account deficit is likely to rise to US$1 trillion by the end of 2008, while the Chinese current account surplus is projected to rise to US$300 billion, or around 9 per cent of Chinese GDP (see Figure III.3 below). The imbalances have been associated with massive capital inflows into the United States (largely into US treasuries) from both China where international reserves now exceed US $1 trillion, and from oil exporting countries (OPEC countries, Russia and Norway) which are running current account surpluses equivalent to almost $600 billion (2006 figures)⁸.

The reasons for the development of the imbalances are complex. The important point for the analysis below is that they are in part due to the redistributive effects of higher oil and commodity prices in turn being driven by higher growth in developing countries, particularly China. With high levels of saving in oil exporting countries, adding to those in China, global savings have increased substantially over the last five years, helping to keep global interest rates at the lowest levels for thirty years (Figure III.4). In effect, petrodollars have been recycled and deregulated financial markets have been able to handle the large flows so that interest rates have remained low – an important factor underpinning continued strong growth.⁹

However, the tensions caused by the size of the imbalances are mounting. Clearly international reserves cannot continue to accumulate at current rates in China and some other countries. In the past, the resolution of large current account imbalances has usually involved an economic downturn in the country generating the large deficits. That is not something that is being presently projected by either official agencies or private forecasters. Part of the resolution to the imbalances will likely occur through exchange rate realignment, with for example the Chinese Yuan appreciating against the US dollar and the US dollar depreciating against other currencies, and the rebalancing of demand in the US and some other countries. In the past, the resolution of large current account imbalances has usually involved an economic downturn in the country generating the large deficits. That is not something that is being presently projected by either official agencies or private forecasters. Part of the resolution to the imbalances will likely occur through exchange rate realignment, with for example the Chinese Yuan appreciating against the US dollar and the US dollar depreciating against other currencies, and the rebalancing of demand in the US and some other countries.

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⁹ Moreover risk perceptions have remained low largely because the increase in oil prices were demand driven. In contrast previous oil price shocks have been accompanied by sharply higher perceptions of risk.
other countries. However, the risk remains that something, which disrupted growth and exacerbated the current imbalances (such as a disruption to oil supplies), could lead to a financial crisis and downturn in the global economy.

III.3 Global current account imbalances

![Graph showing global current account imbalances]

Data source: OECD Economic Outlook and CIE calculations

III.4 World interest rates

![Graph showing world interest rates]

Data source: OECD Economic Outlook, IMF IFS Statistics, Financial Times Indexed Bonds, and CIE estimates.

10 The People’s Bank of China has appreciated the yuan by a little over three per cent against the dollar over the last five months. If the appreciation were to continue at these rates (6 top 8 per cent per year) it could rise by 20 to 30 per cent over a three year period. Combined with fiscal consolidation and a rise in household saving in the US, this would go a long way to resolving some of the imbalances.
3.2 Oil market outlook

High levels of growth in GDP and industrial production in countries such as China and other developing countries has been associated with an acceleration in the demand for energy as industrial production and transport activity have grown proportionally faster than GDP. In particular surging growth in China and India in 2003 and 2004 (Figure III.2 above) was associated with extraordinarily high rates of growth of demand for oil (Figure III.5 below). While growth in world oil demand has usually run at between 1 and 2 per cent over the last twenty years, through 2003 and 2004 it ran at between 3 and 4 per cent rising by 8 per cent in the three years to mid 2005. With OECD output dwindling11, OPEC supply struggled to keep pace, stocks and spare capacity fell to low levels and oil prices were driven upwards.

Therefore, it seems reasonably clear that the price rises were driven by rising demand rather than by supply disruptions. This has a number of implications:

Not only have oil prices increased, but also so have the prices of other industrial commodities (basic metals and bulk ores) as have oil substitutes such as natural gas and thermal coal (chart III.6). (In fact long-term gas natural gas contract prices are now usually indexed to the oil price.) This contrasts with previous experience where in general oil prices movements have only been loosely associated with changes in other commodity prices.12

The increases are likely to be much more persistent than in the past. Commodity price shocks that are due to supply disruptions usually wane quickly as supply returns to normal and as higher prices reduce demand. However, with a sustained lift in demand higher prices are likely to persist. In this episode, both oil and commodity prices are remaining stubbornly high and seem likely to do so for some time.

The oil price increases have been much more gradual than in the past. In late 1973 and early 1981, oil prices doubled and tripled virtually over night. In the present episode, the price

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11 OECD production fell by around 10 per cent between 2002 and 2005 and its share of world oil output declined from 29 per cent to 23 per cent over the same period (OECD Economic Outlook Database.)

increases have been smaller in real terms and have occurred over the space of three years (Figure III.7).

With a much tighter oil market, uncertainty has increased. Oil prices are now more volatile as even small disruptions can have large impacts on prices. Much of the world’s oil reserves lie in regions of political instability.

These differences have implications for how oil prices have impacted on ASEAN economies. For example, the gradual nature of the change has meant that the effects on output and prices have been spread over a number of years and have been much less noticeable than in previous episodes. The fact that a range of commodity prices have risen together makes it difficult to predict the effect on any individual country. A country that is a net oil importer may have lost out on oil but may be gaining from exports of other commodities. The oil price shock has been an event that has been more in the nature of a constraint on growth, than something which has disrupted growth. The fact that oil prices seem permanently higher means that permanent rather than temporary responses are appropriate. As oil prices have different impacts on different economies, a permanent shift means that real exchange rates may need to appreciate or depreciate by substantial margins.\(^\text{13}\)

**III.6 Selected energy and commodity prices**\(^{a}\)

Since 2002 the prices of a range of industrial commodities have risen together. This is an indicator that prices are being driven higher by a common factor (higher global demand) rather than by individual supply-side developments.

\(^{a}\) Prices are in $US

Data source: IMF IFS Statistics

\(^{13}\) Forward looking exchange markets would not necessarily respond to changes in commodity prices that were perceived to be temporary.
The size of the increase in the price of oil over the last four years has shaken the confidence of both official agencies and private forecasters in their ability to predict future movements in oil prices. In the late 1990s a consensus developed that fundamental demand and supply conditions would keep the oil price somewhere within the 18 to 22 dollars range in the medium term. The rise of oil prices through 2003 and 2004 effectively shattered this consensus, with some analysts now forecasting that oil prices could rise above the US$100 per barrel mark and others that it will fall back to the 20 to 30 dollar range, as consumers substitute away from oil and as new production comes onto line. This diversity of opinion is reflected in the outlook of official forecaster, with the IEA projecting that real oil prices will stabilise around US$50, while the World Bank has them falling below US$30 by 2015 (Figure III.8).

The most recent developments in the oil market are reassuring. Higher prices are having the effect of curbing demand, with OECD consumption of oil actually falling slightly in 2006 despite the lift in GDP growth. Moreover, non-OPEC oil production has increased with contributions from Russia, Canada, Azerbaijan and Brazil, with future prospects looking somewhat better than they did a few years ago with a recovery in oil exploration and investment from the low levels of the late 1990s. Reflecting this and some easing in geopolitical tensions with the cease-fire in Lebanon, oil prices fell back to around US$60 in October 2006 and have hovered around that level since.

However, OPEC spare capacity, while increasing recently, remains well below the levels of the 1990s. With further large increments to demand anticipated as China and India continue to grow, the market remains finely balanced. Any renewed outbreak of tension in the Middle East or disruption to any other major supplier could see prices spike sharply higher. Hence, volatility and uncertainty seem likely to remain the hallmarks of the oil market for some time to come.

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14 Angola, which has just joined OPEC, has also increased production.
III.8 Oil price projections

With the rise in prices uncertainty over the outlook has increased

Real $US / barrel

Projection

International Energy Agency

World Bank


3.3 Impacts of oil prices on the global economy

The initial impacts of an oil price shock are felt in the form of higher retail prices for petrol and diesel. These usually flow relatively directly in response to higher world prices (unless there is price regulation or constraints on competition in the retail market). In most countries, around half of all household oil consumption is by direct purchase of petrol and diesel, heating oil and kerosene. The remaining half is indirect. That is around half of the impacts on consumer prices come via indirect impacts on transport and production costs. These secondary price effects come through with a lag of six to eighteen months.

The ongoing impacts on inflation and activity are dependant on a range of further responses. The first and most important is the reaction of households to a reduction in real incomes (purchasing power) due to the higher prices. As real incomes fall, households reduce consumption leading to reduced demand and output. Consequently, GDP tends to fall even in those countries which are net oil exporters. These relatively conventional results are reflected in the results from two recent modelling exercises: the first, a collaborative effort by the International Energy Agency, OECD Economics Department and the IMF using the OECD’s Interlink model and the IMF’s Multimod; the second, an exercise conducted by the ADB specifically looking at impacts in Asia using Oxford Economic Forecasting’s (OEF) Global Macroeconomic model.
III.9 Impact of oil prices on GDP, inflation and the current account balance

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<tr>
<th>Country</th>
<th>GDP</th>
<th>Inflation</th>
<th>CAB</th>
<th>GDP</th>
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<td>-1.2</td>
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</table>

a All figures are in deviations from baseline levels: GDP is per cent deviation. Inflation is percentage point deviation from baseline and current account balance (CAB) is percentage point deviation as a per cent of GDP. Results are for the first full year following the price increase.


As can be seen, the common feature across all countries in the model results is that inflation is higher (irrespective of whether a country is an oil importer or oil exporter). Likewise the higher prices translate to lower household incomes and hence to lower consumption and GDP in all countries. The much larger impacts in the ASEAN countries shown largely reflect their higher oil intensity of production and their larger exposure to developments in world trade. Where there are significant differences between countries is in the impact on the current account balance. Net energy exporters such as the UK, Canada and Malaysia receive a boost to their terms of trade and hence to national income and their current account balance improve. Conversely, those countries that are heavily oil dependant, such as Japan, the Philippines and Thailand suffer a fall in their terms of trade and their current account balances worsen. (Globally the current account impacts have to add to zero.)

There are a few simple points that emerge from the model results:

- Price impacts depend on intensity of oil use (expenditure on oil as a percentage of GDP).
- Impacts on national income and the trade balance depend on to what extent a country is an oil producer or importer.
- Second round impacts largely depend on the size of the income effect on households and hence the required adjustment to real wages. If the higher prices feed through to higher wages, the adjustment will be protracted requiring higher interest rates for longer and greater losses of output in the short term.
- Countries that are producers and exporters still have to deal with the price effects. Nevertheless, as they are also receiving a boost to income, the medium-run adjustment

15 Looking at it from a savings and investment perspective the improvement in the current account implies that corporate and government savings increase by more than investment. Household saving necessarily falls in the first period unless consumption fall more than proportionally to income.
to real wages and household incomes will be smaller. There will be distributional effects and other adjustments, but governments have more room to move.

### 3.4 Differences from the response to previous oil shocks

The results in table II.9 raise a number of questions. Chief among them is: if as a rule of thumb a $US10 rise in oil prices leads to 0.3 to 0.4 per cent reduction in output and a ½ a percentage point increase in inflation, then why has not world economic growth slowed substantially? Oil prices have increased by more than US$35 since the beginning of 2002, which would seem to imply a 1 to 1 ½ per cent reduction in output and a 1 to 1 ½ per cent increase in inflation.

The first answer to this question is that the increase in oil prices that has occurred over the last four years may not be as large as they first appear. The US dollar has depreciated considerably against the other major currencies since 2002 (for example by 30 per cent against the Euro) so that the rise in oil price for the world as a whole has not been as large as it has been for the United States. As can be seen in Figure III.7, measured in currency neutral SDR terms, the price increase is much lower than in $US terms. Moreover, overall consumer prices have risen over the period so that measured in real terms they are lower again. But perhaps most importantly of all, oil intensity has fallen over time and the extent to which this has occurred has probably not been fully reflected in the models. As can be seen in Figure III.10 below, the volume of oil consumed relative to GDP has almost halved since the early 1970s and continues to decline.

Taking the above factors together (conversion to SDR, conversion to real prices, and adjustment for declining oil intensity), the overall impact of the most recent oil price increases would most probably be equivalent to the impacts shown in Table II.9 for a $20 price increase, with the main effects spread over the last two years. So, for example, for the Philippines, the overall impact of the oil price increases over the last three years would have been to reduce the level of GDP by 2 ¼ per cent relative to where it would otherwise have been. In other words the model results indicate GDP growth in the Philippines would have been around 1 per cent higher over the last two years if oil prices had remained unchanged. GDP growth in the OECD would have been between ¼ and ½ a per cent higher.
III.10 Oil intensity in constant price GDP – OECD and rest of the world

Oil intensity is measured here as the constant price value (i.e. volume) of oil over constant price GDP – so by way of interpretation, if the price of oil had been at average levels in 2006, expenditure on oil would have represented 1.8 per cent of GDP.

Data source: OECD Economic Outlook Database, IMF World Economic Outlook Database and CIE calculations.

The changed level of oil intensity is also the main reason why the current oil price shock is having such modest effects on inflation and activity relative to the impact in 1974 and 1980-81. As can be seen in Figure III.11 the level of expenditure on oil, even at current high prices is far lower than it was in the 1970s and 1980s (measured as a percentage of GDP).

III.11 Expenditure on oil as a proportion of GDP in the OECD

Data source: OECD Economic Outlook Database, IMF IFS Database and CIE calculations.
The low level of oil expenditure in GDP in the OECD means that the shock to supply prices has been proportionally far smaller than in the 1970s and 1980s. The shock to overall supply prices coming from changing oil prices against the inflation rate (in deviation from trend terms). As can be seen, the shocks in the 1970s and 1980s were huge, representing shocks of 5 to 7 per cent to aggregate supply prices, flowing through to increases in consumer price inflation of similar magnitudes. In comparison, the shock to aggregate supply prices coming from the most recent oil price rises has not been very large.

The current shock to aggregate supply prices in the OECD is not particularly large historically. The size of the shock shown as measured in Figure III.12 above is consistent with an increase in inflation of around \( \frac{1}{2} \) a per cent in 2005 and 2006, conforming with the discussion of the model results above (i.e. that the size of the impacts over 2005 and 2006 would have been roughly equivalent to the results shown for the $US 20 shock). It is also apparent from Figure III.12 above that inflation has become slightly less sensitive to oil price shocks since around the mid 1990s. Recent work by Laxton and others suggests that this is because the inflation targeting regimes adopted by many countries since the early 1990s are helping to anchor inflation expectations in product and labour markets. As a result, wages are not responding as much to a given change in the purchasing power of a worker’s pay packet driven by rising oil prices.

There are a number of other contributing factors to the improved macroeconomic outcomes relative to the experience of the 1970s and 1980s. These include:

- More stable macroeconomic environment
- Improved fiscal frameworks

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\(^{16}\) The shock to aggregate supply prices stemming from a change in oil prices can be approximated by the change in expenditure on oil as a percentage of GDP.

\(^{17}\) Appendix B provides more evidence on this point.

\(^{18}\) See Laxton et al, 2002.
- Deregulated labour markets
- More competitive product markets
- Floating exchange rates
- More highly developed global capital markets which have been able to recycle petrodollars and more efficiently and allowed firms to hedge against volatility and risk.

The first oil price shock in 1973-74 occurred at a time when productivity was falling, when demand was booming and inflation was rising. Exchange rates were fixed and financial markets highly regulated. The monetary policy response in most countries was not sufficient to bring inflation back under control. Fiscal deficits blew out leading to rapid increases in public debt. The real income and real exchange rate adjustments did not occur, inflation expectations increased and the unemployment rate shifted upwards. Once inflation became entrenched, it proved difficult to reduce leading to far higher unemployment than otherwise during the 1980s (Figure III.13).19

### III.13 OECD GDP, inflation and unemployment following the oil shocks

![Graph showing OECD GDP, inflation and unemployment following the oil shocks.](image)

*Unemployment Rate (RHS)*

*Inflation Rate (LHS)*

*GDP Growth (LHS)*

19 GDP growth and inflation are per cent changes through the year to the quarter shown.

Data source: OECD Economic Outlook Database

### 3.5 Policy lessons

The broad policy lesson that can be drawn from the experience of oil shocks in OECD countries in the 1970s and 1980s is that it is better for monetary policy to respond earlier rather than later. With a permanent change in oil prices, relative prices, exchange rates and real incomes all need to adjust to new levels, and the sooner these adjustments occur the lower are the transitional costs to output and employment. The experience of the 1970s and 1980s also highlighted the importance of the interaction of macroeconomic and microeconomic policies. Slow macroeconomic responses exposed flaws in institutional arrangements in labour and product markets, and these in turn meant that the appropriate

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19 In short, while the reasons for the deterioration in macroeconomic performance in OECD countries during the seventies and eighties were varied and complex, the first and second oil price shocks essentially exposed institutional flaws that led to a decade of economic stagnation.
macro policy response was harder to implement. Hence countries which pursue good microeconomic policies and have efficiently functioning labour and product markets will experience much less dislocation from an oil price shock than countries that have markets that are highly regulated or financial sector infrastructure which is under developed. Good microeconomic policy gives macroeconomic policy more room to move while good macroeconomic policy creates an environment in which microeconomic and structural reforms can take place.
IV. OVERVIEW OF MACROECONOMIC DEVELOPMENTS AND OUTLOOK FOR ASEAN ECONOMIES AND IMPACTS OF OIL PRICES

4.1 Overview of ASEAN macroeconomic situation and outlook

The oil price increases have occurred in a period where ASEAN countries have been growing rapidly. Business investment levels have gradually recovered from their post Asia Crisis lows, while export growth, particularly of electronic goods and integrated circuits has recovered following the 2001 slump. Trade within the East Asian region in particular has boomed with growth of up to 30 per cent a year. However, recent work suggests that much of this intra-regional trade is related to the development of regional production chains and is in the form of intermediate products. Abstracting from the trade in intermediate products, the final destination of around 86 per cent of the regions trade is to markets outside of Asia. This trade is reasonably diversified around the globe, with the direction of trade being relatively evenly shared between the United States, Japan, Europe and the rest of the World. The United States is the largest single final destination for the region accounting for around a quarter of extra-regional exports.20

With ASEAN countries having high trade shares one significant risk to the region would be that the current slump in the US housing market turns into a generalised downturn in the consumption of durables and electronic goods, leading to a fall in demand for ASEAN exports. However, the most recent US data indicates that the housing market has stabilised and that consumer confidence is picking up.

Another significant risk is that global imbalances continue to grow leading to an eventual disjuncture, with a rapid depreciation of the US exchange rate and accompanying financial crisis and related international downturn. Such an event could possibly be sparked by financial or political developments that lead financial markets to fundamentally reassess risk, or by renewed unrest in the Middle East that disrupts oil supplies exacerbating the already wide imbalances and leading to a collapse in confidence in the foreign returns on US assets.

GDP growth and projections for 2007 for selected ASEAN economies are shown in Figure IV.1 below, while developments in inflation and the current account balances are shown in Figures IV.2 and IV.3.

20 See World Bank, 2006, pp18 to 21 for a summary.
IV.1 GDP growth – selected ASEAN countries

Figures for 2007 are averages of ADB and IMF projections

Data source: IMF World Economic Outlook, ADB Asian Economic Outlook 2006 Update.

IV.2 Inflation – selected ASEAN countries

Figures for 2007 are averages of IMF and ADB projections

Data source: IMF World Economic Outlook and ADB Asian Economic Outlook 2006 Update.
GDP growth is projected to increase in 2007 in the region as a whole, with interest rates being lowered in many countries and strong growth in exports. At the same time headline inflation is projected to fall with pressure from oil price increases diminishing (with most of the effects of the previous increases having worked their way through the system). In most cases, inflation is falling back to within central bank target ranges in 2007, enabling an easing of monetary policy.

It is interesting to compare the developments in Figures IV.1 to IV.3 with the model predictions reported in Table II.9. Consistent with the model results, inflation did rise by around 2 percentage points in most countries through 2004 to 2006 following on from the oil price increases. As can be seen, the price impacts tended to be delayed in countries with regulated fuel prices such as Indonesia and Malaysia. In Indonesia, the level of subsidy to consumers was so high that it created unsustainable pressure on the Budget. Retail price increases of 125 per cent were announced in July 2005 contributing to the rise in inflation in 2005 and 2006.\(^{21}\) By delaying the response, the eventual impact on inflation appeared to be higher with inflation peaking at almost 13 per cent in 2006.

GDP outcomes for 2005 and 2006 also conform to the model results with most countries slowing by between 1 to 2 per cent relative to the level of growth reached in 2004. Similarly the region’s two most significant oil exporters Malaysia and Brunei (not shown)\(^{22}\) experienced the largest improvements in their current account balances, while Thailand a significant oil importer experienced a large deterioration in its current account position (falling from a surplus of 5 ½ per cent of GDP in 2003 to a deficit of 2 per cent of GDP by 2005).

However, in all cases there are many other factors apart from oil which affect GDP growth, inflation and current account balances.\(^{23}\) For example in the case of the Philippines, a number of factors such as fiscal reforms with the introduction of a value added tax, consolidation of the budget, and increased transmittances from overseas workers, all would

\(^{21}\) The distributional impacts of the increase in prices were offset by increased income support payments.

\(^{22}\) In the case of Brunei, the current account surplus increased by a very large margin – from 46.2 per cent of GDP in 2003 to 70 percent of GDP in 2006.

\(^{23}\) That is, the change in GDP growth or inflation is not necessarily an indication of the size of the oil price effect.
have worked in the direction of improving the current account balance. Consequently, the overall balance improved slightly over the period 2003 to 2006, even thought the Philippines is one of the most oil-dependant countries in the region.

4.2 Oil and energy use by ASEAN countries

Figure IV.4 below shows the level of oil intensity in GDP for individual countries in ASEAN. As can be seen oil intensity is roughly three times higher in the ASEAN region than in the OECD, largely reflecting the different structures of the economies (with the OECD countries with higher per capita incomes having much larger service sectors). There was a marked upward trend in oil intensity in a number of countries through the decade to the late 1990s (particularly Thailand, the Philippines and Vietnam). This reflected a steady increase in the proportion of households being connected to electricity grids over time (thereby reducing their use of bio fuels) and increased ownership of cars and use of transport. However, since the late 1990s the level of oil intensity of the region has been decreasing mainly due to increased exploitation and use of the regions natural gas reserves.

4.3 Impacts of oil price increases on ASEAN economic variables

As discussed in sections 2.3 and 3.1 above, the high level of oil intensity of ASEAN economies means that they experience larger impacts from oil price increases than other countries. Table III.5 below provides more detailed model results showing the impacts on employment, earnings, expenditure, interest rates and fiscal policy, allowing us to trace through the impacts in more detail.

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24 The high level of oil intensity is often interpreted as meaning that ASEAN countries are very energy and oil inefficient in their production of output. However this is not the case. The difference is almost entirely explained by differences in industry composition. Measured at purchasing power parity (which re-weights the industry composition of expenditure and output to give an equivalent share of services to that of advanced countries) ASEAN countries have broadly comparable levels of oil intensity (energy efficiency) to OECD countries.
IV.5 Impacts of a US$20 increase in oil prices on selected Asian economies a

<table>
<thead>
<tr>
<th></th>
<th>Consumer Expenditure</th>
<th>Real Personal Income</th>
<th>GDP</th>
<th>Employment</th>
<th>Average Earnings</th>
<th>Consumer Prices</th>
<th>Short-term Interest Rate (PTS)</th>
<th>Foreign Account Balance % of GDP</th>
<th>Government Account Balance % of GDP</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHINA</td>
<td>-1</td>
<td>-2</td>
<td>-1.3</td>
<td>-0.4</td>
<td>0</td>
<td>0.9</td>
<td>0.4</td>
<td>-0.9</td>
<td>-0.1</td>
</tr>
<tr>
<td>INDIA</td>
<td>-2</td>
<td>-4.4</td>
<td>-1.6</td>
<td>-0.6</td>
<td>1</td>
<td>3.9</td>
<td>2.7</td>
<td>-0.3</td>
<td>-1.1</td>
</tr>
<tr>
<td>INDONESIA</td>
<td>-2.1</td>
<td>-3.5</td>
<td>-1.5</td>
<td>-0.6</td>
<td>0.2</td>
<td>2.1</td>
<td>1.4</td>
<td>0.1</td>
<td>0.3</td>
</tr>
<tr>
<td>MALAYSIA</td>
<td>-1.5</td>
<td>-4.1</td>
<td>-1.7</td>
<td>-0.6</td>
<td>0.4</td>
<td>2.6</td>
<td>1.4</td>
<td>1.2</td>
<td>1.5</td>
</tr>
<tr>
<td>PHILIPPINES</td>
<td>-2.9</td>
<td>-3.7</td>
<td>-2.2</td>
<td>-0.9</td>
<td>0.4</td>
<td>3</td>
<td>2</td>
<td>0.4</td>
<td>-0.9</td>
</tr>
<tr>
<td>SINGAPORE</td>
<td>-1.9</td>
<td>-3.1</td>
<td>-1.8</td>
<td>-0.7</td>
<td>-0.4</td>
<td>2.4</td>
<td>1.9</td>
<td>-1.4</td>
<td>-0.5</td>
</tr>
<tr>
<td>THAILAND</td>
<td>-2.7</td>
<td>-6.7</td>
<td>-2.4</td>
<td>-1</td>
<td>0.5</td>
<td>3.2</td>
<td>3.3</td>
<td>-0.8</td>
<td>-0.8</td>
</tr>
</tbody>
</table>

a Results are shown in per cent deviation from baseline unless otherwise indicated

Data source: OEF Global Economic Model and CIE estimates.

Increased oil prices have their main direct impacts on three groups: consumers who pay higher prices for retail products such as gasoline, kerosene and diesel, businesses which find their operating costs rising, and companies which are involved in the production and distribution of oil. As can be seen in Table IV.5 the effect of the oil price increase is to increase inflation in all countries. This in turn reduces real personal income, which reduces consumption. The reduction in consumption and the reduction in export demand coming from overseas are the primary reasons for the reduction in GDP (as demand falls). This reduces employment, which in turn helps to restrain wage growth in the face of the higher inflation (With unchanged employment and unemployment, the higher consumer price inflation would flow through fully to higher wage inflation). This takes some of the weight off monetary policy with interest rates rising but typically to a lesser extent than the rise in inflation. For oil importing countries, the fiscal balance deteriorates with the downturn in GDP. However, for oil producing countries and net energy exporters the increase in oil and energy related revenue is more than sufficient to offset the fall in other revenue so that the fiscal balance improves.
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V. BEST PRACTICE MONETARY AND FISCAL POLICY RESPONSES

5.1 Overview

The experience of the 1970s and 1980s demonstrated that early intervention to address inflation is the most effective response to an oil price shock. If oil prices are permanently higher, then real incomes and wages for oil-importing countries are necessarily lower than otherwise. For oil-importing countries, their terms of trade will worsen requiring a depreciation of the real exchange rate to restore external balance. History shows that if governments delay adjustment then the problems tend to build, becoming harder to deal with. On the domestic side without real income adjustment, inflation can become entrenched and more difficult to eliminate. On the external side without an adjustment of the exchange rate, deficits will accumulate into unsustainable levels of debt eventually forcing a larger adjustment (sometimes accompanied by a crisis).

By and large, these lessons have been learnt. Most countries now have established independent central banks with explicit inflation targets where the banks react rapidly to changes in the inflation outlook. Moreover, most countries recognize the importance of fiscal stability and controlling public debt, and many countries have explicit medium term fiscal objectives and fiscal policy stabilisation frameworks. In short, the experience of the 1970s and 1980s has lead to changed institutions and policy responses. The continued growth of the world economy in the face of higher oil and commodity prices has demonstrated the value of these policy reforms.

5.2 Fiscal and monetary policy in ASEAN

The countries of ASEAN are economically diverse, ranging from those that are significant oil exporters, to those that are highly dependent on oil imports. There are countries with floating rates with highly developed financial sectors, and those with fixed rates and under-developed financial sectors. A brief summary of monetary and fiscal arrangements by country is set out in Appendix A.

The appropriate policy response differs according to the circumstance of the country.

- As a general rule having a fixed currency or a crawling peg makes monetary policy less effective relative to fiscal policy (With a floating currency both interest rates and the exchange rate will rise with a tightening of monetary policy. With a fixed rate or a crawling peg any increase in domestic interest rates will tend to induce capital inflows neutralizing the effect of the initial tightening on liquidity conditions - unless there are strict capital controls.)

- The other important aspect is whether a country is an oil importer or an oil exporter. For an oil exporter, while household real incomes will still fall, there will be a boost to the income of the companies that produce the oil. This adds to the revenue of the government allowing scope for either tax cuts or income subsidies to the household sector. In addition, there will be a significant improvement in the terms of trade so that, with a permanent shift in oil prices, the real exchange should appreciate. The exchange rate appreciation helps to offset the inflationary consequences and effectively transfers some of the income from the oil producing corporate sector to the household sector. Consequently if the exchange rate is left to do its work there should be less adjustment implied for workers and households in oil exporting countries than oil importing countries. As such, the fiscal and monetary policy responses will not usually be as protracted as in an oil importing country and the economy will recover from the shock sooner.

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25 That is the Mundell Fleming results hold – with a floating rate monetary policy is more effective in controlling activity and inflation, while with a fixed rate fiscal policy is more effective.
How fiscal and monetary policy might vary across these two key dimensions is set out in Table IV.1 below.

| V.1 Monetary and fiscal policy responses to a permanent oil price increase, by type of country |
|---|---|
| **Floating Exchange Rate** | **Fixed Exchange Rate** |
| **Oil exporting country** | Monetary policy will need to respond to higher inflation. The degree of the response depends on the impacts of higher prices on household income, employment and demand, and the impacts coming from global markets on export demand, investment flows, exchange rates and interest rates. In the case of an oil-exporting country there are potential positive income effects offsetting the loss of income by householders. Consequently, inflation might be stronger initially. At the same time, the exchange rate should rise with a permanent increase in oil prices – allowing monetary policy to be eased more quickly than in an oil importing country. | Monetary policy will tend to be ineffective. With a fixed exchange rate the current account will move into surplus, probably requiring purchase of foreign assets by the central bank and a build up in reserves. These will need to be sterilised via domestic bond sales to prevent an expansion of domestic liquidity and higher inflation. The real equilibrium exchange rate will need to rise with the improved terms of trade. Ultimately, this will need to be achieved either through revaluation or via higher prices domestically. | Fiscal policy - more weight is placed on fiscal policy as the fixed exchange rate tends to render monetary policy ineffective. The budget will be moving into surplus with rising revenue from taxes on oil production and revenue. With a fixed exchange rate it is important that this increased is not recycled back to households adding to demand and increasing inflationary pressure. |
| Fiscal policy – with an oil-exporting country revenue will increase and the budget move into surplus, particularly if oil production is by state owned oil companies. It is appropriate to let this happen as inflation is bought under control. In the medium term fiscal policy can be eased returning some of the increased income to the household sector. If oil is a finite resource, some of the income should be saved and invested for future generations. Expenditure on education and health should arguably be treated as investment in this context. | | Fiscal policy – the budget balance will be moving into deficit due to falling revenue. This is not necessarily a problem so long as monetary policy has been tightened sufficiently to deal with inflation, and so long as there is a medium term plan to restore fiscal balance. |
| **Oil importing country** | Monetary policy will need to be tightened to deal with higher inflation. The exchange rate will tend to depreciate with a permanently lower terms of trade. This will tend to accentuate the impact on inflation | The monetary problem for the central bank will tend to be the opposite of the above. The current account will tend to move into deficit, leading to the sale of foreign reserves and a build up in debt. This may become unsustainable over time leading to a forced depreciation in the exchange rate. | Fiscal policy – the budget will be tending to move into deficit. The budget will need to be tightened to ensure domestic demand falls to bring inflation under control. |
| Fiscal policy – the budget balance will be moving into deficit due to falling revenue. This is not necessarily a problem so long as monetary policy has been tightened sufficiently to deal with inflation, and so long as there is a medium term plan to restore fiscal balance. | |

Source: CIE

As discussed in Chapter II and Appendix A, ASEAN economies differ markedly in their state of development and their fiscal and monetary arrangements. In the main, the ASEAN 6 economies (specifically, Thailand, the Philippines, Indonesia and Malaysia) have evolved towards floating exchange rates with independent central banks with inflation targets. In the case of Singapore, moving to the standard arrangement is complicated by its status as a super trader and the consequent large impacts small movements in the currency can have on domestic activity. Hence, the Monetary Authority of Singapore exercises monetary policy via an explicit target for the exchange rate. For Brunei, the economy is too small to justify an independent central bank, and the large role the government plays as an employer means that it has significant control over the price level and the exchange rate via wage setting and income subsidy arrangements. In the case of the CLMV countries, monetary policy

26 In the case of Bank Negara Malaysia the inflation objective is not explicit, but framed as one of price stability within the context of policies that promote maximum sustainable growth.
arrangements are constrained by the under-developed nature of the financial systems, with the Lao PDR and Cambodia in particular having little control over domestic currency due to the widespread use of foreign currency for transaction purposes. However, in the case of both the Lao PDR and Cambodia, the oil intensity of the economies is very low (Table II.2) and hence the present oil price shock has had much less effect than in other countries. Vietnam in contrast has reached a higher level of development, has good credit control via strong capital controls and an ability to target interest rates and inflation.

In most cases the monetary policy response across the region has been reasonably close to best practice as set out in Table V1. Interest rates have generally been raised to deal with inflation (figure V.2) despite GDP growth falling. (It’s notable that the tightening phase started earlier in countries such as Singapore, the Philippines and Thailand which are oil dependent and where the market sets the price of petrol and diesel.) The key uncertainties expressed in the various monetary authority and central reports over the period, related to the extent and duration of the inflation effects of the oil shock and the likely impacts on world activity and hence export markets. One could argue with the advantage of hindsight that interest rates should sometimes have been raised sooner. However, the key to raising them sooner would have been in having a good understanding of the transmission mechanisms.

**V.2 Short-term interests rates in selected ASEAN economies**

![Graph showing short-term interest rates in selected ASEAN economies]

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a Philippines, Thailand, Indonesia: discount rate, Singapore, Malaysia: money market rate, Vietnam: refinancing rate

Data source: IMF IFS Statistics

The main avoidable complicating factor for the setting of monetary policy within ASEAN countries, and perhaps the area where policy has been less than optimal, has been in the interaction with fiscal policy, particularly the administered prices and fuel subsidies, which affected the direct transmission of the oil price increases. As discussed in Chapter II, as oil prices rose the subsidies became very expensive for a number of governments, forcing finance ministries to reduce the level of subsidies and increase prices. This had the effect of delaying the price impacts so that when they came through they were larger, necessitating a larger response from the monetary authorities. For example:

- In Vietnam, government retail subsidies on petroleum products cost around 2 per cent of GDP in 2004. Prices were increased three times through to August 2005 reducing the amount spent on subsidies to 1.6 per cent of GDP. In late 2006 further price increases...
were announced designed to reduce government expenditure on the subsidy by a further 20 per cent, with a plan to totally phase out the subsidy by 2008.27

- In Indonesia, retail petrol and diesel prices rose slowly through 2003 and 2004 with a series of modest administered increases ending with a larger increase of 29% in February 2005. At February 2005 levels, the cost of the subsidies to the government was projected to increase to around 4.7 per cent of GDP. In September 2005, President Yudhoyono announced a large reduction in the level of subsidy and an associated 125 per cent increase in the price of petrol and diesel. The distributional impacts of the increases were offset by an increase in income support payments.28 Despite the increase, subsidies continue to be a significant cost to the budget.29

- In Thailand, the government established an oil stabilisation fund at the initial stages of the shock. Subsidies drawn on this fund were introduced at the start of 2004 but proved too expensive as oil prices rose further. Subsidies on gasoline were removed in November 2004 and phased out on diesel by July 2005.

- In Myanmar, government expenditure on subsidies had become unsustainable by 2005 leading to the announcement of an eightfold increase in petrol prices in October 2005 with subsequent smaller increases to further reduce the costs of subsidies.30

- In Malaysia, rising cost of subsidies led to a series of announced price increases through 2004, and 2006. Petrol and diesel prices increased by 11 per cent and 38 per cent respectively in 2005 with further price increases of 23 per cent in February 2006 and the government appears to be using the most recent oil prices decreases to further reduce subsidies.31 Combined with tax exemptions on gasoline, the subsidies cost around US$3.8 billion or 2.9 per cent of GDP in 2005.32

Indonesia provides a good example of the complications these delays caused monetary authorities with interest rates being increased by 400 basis points between August and December 2005 leading to arguably lower GDP growth and higher unemployment than might otherwise have been the case (if adjustment had been more gradual). GDP growth fell to less than 5 per cent in the first half of 2006 but has since recovered with the impact of higher export demand in particular.33

Overall, the subsidies in the countries that had them, had the effect of worsening the fiscal position compared to where it otherwise would have been, and complicating the monetary policy response.34 However, the trend over the last two years appears to be to reduce

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27 ADB, 2005, P.79 and Press Reports http://english.vietnamnet.vn/biz/2006/08/601005. No doubt the plan to phase out subsidies has been influenced by the rapid development of oil and refinery infrastructure in the country.
28 Via the Unconditional Cash Transfer program. This more than offset the impacts of higher fuel prices on poor households, but at the same time food prices (particularly rice) were rising for other reasons leading to an increase numbers below the poverty line. (World Bank, 2006, P.37.)
29 ADB 2005, IEA 2006, and World Bank, 2006. At the same time the oil sector in Indonesia is going through a rapid transformation with increased participation of foreign companies in production and refining and the gradual opening up of the retail market to competition. This in turn will continue to place pressure on the government to deregulate the retail price.
30 ADB, 2006a, P.212.
32 ADB 2006
33 The experience with fuel subsidies and administered prices also raises questions about the coordination of monetary and fiscal policy in a number of countries.
34 Although experience has differed across countries. In the case of Malaysia, the country’s position as a significant net oil exporter meant that the increase in oil prices led to increases in Budget revenues. This gave the government room to delay the impacts of oil prices on retail prices without significantly worsening the fiscal deficit which stood at 3.6 per cent of GDP in 2006 (World Bank, 2006, P.9). Even with the continued subsidies, significant price impacts were still felt. Bank Negara was able to maintain a stable rate of inflation between 1 and 2 per cent between 1999 and 2004, but inflation rose to 3.6 per cent in 2006. The latest forecasts from the IMF are for inflation to fall to 2½ per cent in 2007 and remain at that level in 2008.
subsidies and increase the role of the market in setting prices, particularly as the oil producing countries move to increase foreign involvement in investment projects and to increase competition in downstream markets. As Indonesia has shown, the distributional impacts of subsidies can be addressed through direct transfer payments. Allowing the market to set the price allows the impacts to come through automatically and adjustments to be made sooner. Higher prices also encourage energy and oil efficiency, potentially reducing the impacts of future oil shocks.

5.3 Regional implications

Just as the impacts of an oil price shock on individual ASEAN countries varies depending on the nature of the shock, so does the impact on the region. As discussed in Chapter II the global effects of an oil price shock are felt in common across the region, whereas the direct effects are idiosyncratic – depending on whether a country is a net energy exporter or importer and the degree of oil intensity in GDP (see Figure II.1). For a permanent oil price shock, the exchange rate implications are quite large, implying movements of between 10 and 20 per cent in real exchange rates between ASEAN countries (see Appendix B) relative to what otherwise would be the case. At face value, this would seem to pose a problem for policy coordination between countries, as some countries have fixed exchange rates while others are floating. However, for almost all economies, trade is predominantly with countries outside the region (and hence the movement of trade-weighted exchange rates are dominated by the bilateral movements against countries such as the United States, Japan and the Euro Area). Consequently, the adjustment of real exchange rates within the region will occur by each individual currency finding its own level (either via adjustment of the nominal exchange rate or via changing wage or price levels relative to those overseas.) Hence there is little requirement for exchange rate coordination.

Similarly, the fact that ASEAN economies trade outside the region much more extensively than they do inside it (Table II.2) means that there are relatively few spill over effects from monetary and fiscal policy between countries. (This will change as ASEAN economies develop and trade increasingly services internal demand within the region.) Consequently, monetary and fiscal policy can be largely viewed as operating independently in the individual countries. Moreover, insofar as the impacts of oil prices are idiosyncratic, policy in different countries will often need to move in different directions. Hence, it seems unlikely that there would be significant gains from policy coordination.35

Where there could be significant spill-overs is in the area of financial contagion, for example stemming from long run structural problems in fiscal policy arrangements in some countries. However, with the build up in foreign exchange reserves in many countries, significant changes in governance, and greater development of financial markets and instruments such as Asia bonds, this seems to be a far smaller risk than in the past (even though public debt remains high in some countries). Moreover, it is one that relates to long run structural policies rather than the need for cyclical, short-run coordination of fiscal and monetary policy.

5.4 Dealing with uncertainty

One of the crucial aspects determining both the reaction of the economy and the appropriate policy response, is whether a particular increase in oil prices will be permanent or temporary. The above policy discussion assumes that the price increases will be permanent. As discussed in Chapter III, this seems like a safe assumption for the present increase in oil prices. However, as outlined in Section 3.2 there is also a wide range of uncertainty around

35 There is a wide range of uncertainty around estimates of real equilibrium exchange rate effects such as those presented in Appendix B, but adjustment of real exchange rates if it needs to occur is almost inevitable in the medium to long run.
the medium term outlook for oil prices. Any further future increase in oil prices may not be as persistent as the present increase. If, for example, it is driven by a disruption to supply rather than at present by continued high demand, it is far more likely to be temporary.

This therefore may introduce a significant element of uncertainty into future decision concerning the appropriate policy response to oil price increases. The response of markets and economic agents depends not only on their current incomes and circumstances but also on expectations about future incomes and circumstances. If households judge that an increase in oil prices is temporary they will tend to react less to their loss in real income, maintaining their consumption via a temporary run down in saving. Consequently, the impacts on activity could be much smaller. Neither would workers necessarily demand compensating increases in pay in response to a temporary erosion in purchasing power. As a result, the need for a policy response for a temporary shock could be smaller. Inflation will rise with the increase in oil prices but fall back in subsequent periods as the price increase is reversed.

The key therefore for the monetary and fiscal authorities is to make a judgement about how persistent an increase in oil price will be. This in turn requires an understanding of the factors that are driving the increase, and how households and markets are likely to react to it. This is really no different to the more generalised problem of setting policy in response to evolving economic circumstances. It is also the key reason why there are no fixed rules about how to respond to an oil price shock. Each shock needs to be judged on its own merits and considered with all other factors that are impacting on the outlook in making judgements about the appropriate stance of monetary and fiscal policy.

It seems likely that, if another oil price shock does occur, then it will manifest itself in very different ways to the present oil price shock. In particular, if it is driven by supply side disruption, then the impacts on global activity and imports and global financial markets may be much larger. It may consequently have much larger negative impacts on ASEAN economies, which will complicate the work of the authorities in responding to the shock. It is also likely to be the case that the duration of the shock will be uncertain. Understanding the likely transmission of such a shock and anticipating its various effects will therefore be crucial in formulating the appropriate monetary and fiscal policy response.

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36 As opposed to a short-term increase in prices, a shock would be defined as a major and persistent change in the oil outlook. If it is driven by a major disruption in supply then the increase in income and saving in oil exporting countries in total will be much less than with a demand shock leading to higher interest rates and a much greater chance of financial disruption (with risk premia rising at the same time.)
VI. CONCLUSIONS

The world oil market remains in a state of tension. So long as China and India continue to grow at current rates, oil prices will be volatile and the oil market sensitive to supply disruption or rumours of disruption. Governments need to anticipate what will happen and how to respond if oil prices again spike higher. The experience of OECD countries in the 1970s and 1980s and the ASEAN economies over the last three years is therefore instructive.

- The oil price increases over 2004 to 2006 only had fairly modest impacts on OECD countries. Inflation in OECD countries increased by around ½ a per cent, interest rates were slightly higher than otherwise, and GDP growth was slightly lower by around ¼ to a ½ a per cent.
- Consequently, further oil price increases are unlikely, in themselves, to be particularly disruptive to OECD growth, or, therefore, to ASEAN export markets.
- However, a greater risk to ASEAN markets may come via the effect another oil price shock (particularly one emanating from supply disruption) could have in terms of accentuating already widening global imbalances, increasing perceptions of risk, and touching off a financial crisis leading to a generalised global downturn.
- The direct impacts of higher oil prices on ASEAN economies from 2004 to 2006 were far greater than those on the OECD economies, due to the higher oil intensity of ASEAN economies.
- However, oil intensity is falling in many countries as they develop and as they diversify and as greater use is made of regional natural gas resources, but exposure to global trade disruption will remain.
- Inflation increased by around 2 per cent in most ASEAN economies in 2005 and 2006. Monetary policy responded to the higher inflation leading to higher interest rates in most countries and GDP growth was lower by around 1 to 2 per cent.
- GDP growth will be higher in 2007 in most countries and inflation is forecast to return to within target ranges in most cases.
- In other words, conditions appear to be returning to normal following the shock.

The main lesson that comes from this experience is that it is better to respond early to oil price changes if they are likely to be permanent. There is little that ASEAN economies can do to prevent another oil price shock occurring or to ease growing global imbalances. However, they can continue to reduce their dependence on oil, by increasing the price of oil products, by further development of regional natural gas resources, and by continuing to grow and diversify their economies. OECD experience suggests that micro economic policies and structural reforms, which create more competitive and flexible labour and product markets, can be important complements to the monetary and fiscal policy response. The faster markets adjust to permanent changes in oil prices, the easier it is for fiscal and monetary policy to do their respective jobs.
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REFERENCES


APPENDIXES

A. FISCAL AND MONETARY POLICIES IN ASEAN ECONOMIES

This appendix briefly sets out the current monetary and fiscal policy arrangements of the ten nations in the ASEAN region.

Brunei Darussalam

The exchange rate regime in Brunei is a pegged exchange rate fixed at a one-to-one parity with the Singapore dollar. The Singapore dollar and Brunei dollar are interchangeable currencies in both countries. The currency is managed by the Brunei Currency and Monetary Board although there are plans for a new monetary authority.

Brunei is an oil and gas exporting economy and 90% of government revenue comes from the export of oil with the remainder made up mainly from income tax. The main observed aim of the government is to control spending to avoid inflation and to save much of the oil revenue. This is only an observed policy as the government have not made any public statements about fiscal policy.

Cambodia

The kingdom of Cambodia has an independent Central Bank (the National Bank of Cambodia). The main aim of the Bank when conducting monetary policy is to avoid financing the fiscal deficit and to keep the currency stable while allowing for changes based on the movements of economic fundamentals. Monetary policy is constrained by the fact that 95% of the currency in circulation is in US dollars. The Central Bank is however currently looking at options to reverse the high level of dollarisation. The exchange rate regime amounts to a managed float where the Central Bank intervenes in the currency market to prevent excessive volatility.

The main fiscal objective of the government is to enhance revenue collection to meet priority needs while continuing to avoid a domestic deficit. The government uses a fiscal revenue target to achieve its objective. The main source of revenue is through trade taxes, although their importance has been declining since the introduction of a Value Added Tax (VAT) in 1998. The government is currently centralised but is going through a process of decentralisation with the first local elections being held in 2002. Oil is highly taxed in Cambodia with very limited competition. Duty, excise tax and value added are all levied on an administrative reference price set by the government.

Indonesia

Monetary Policy in Indonesia is carried out by an independent central bank, Bank Indonesia. The Bank’s main policy framework is one of inflation targeting where the bank aims to keep inflation between 7 and 9 percent. It uses the Bank Indonesia reference rate, which is the rate for a 1-month certificate of deposit, as an intermediate target. The BI reference rate is set monthly by the Bank’s board.

Fiscal policy is centred on the objective of achieving a balanced budget by 2007. This is done through a policy of prudent fiscal consolidation. A large part of government revenues comes from exports of oil and gas although the government also collects both income and value added taxes.

The government shares the oil and gas revenues with the local governments, each region is entitled to a 15 per cent share of oil and a 30 per cent share of gas produced locally. Aceh and Papua receive 70 per cent of their oil and gas revenues due to their autonomous status. These local governments also collect a small amount of local taxes.
The oil price in Indonesia is heavily subsidised, the Indonesian price is linked to the Singapore Gasoline benchmark but in 2004 Indonesian prices were on average 27 per cent lower than those in Singapore. The government is however currently committed to reducing those subsidies. After a series of modest increases in petroleum prices over the past few years, President Yudhoyono announced a sharp rollback of subsidies in September 2005. Prices of retail gasoline and diesel rose by an average of 125 percent as a result. Despite this one-time move, fuel consumption subsidies still take up a sizeable portion of government expenditures.

The Indonesian currency, the rupiah, is a floating rate set by the market with a small amount of Central Bank intervention.

**Lao People's Democratic Republic (PDR)**

Monetary policy in the Lao PDR is constrained by the fact that an estimated 80 per cent of currency in circulation is denominated in foreign currency; the main currency in use is the Thai baht although the US dollar and Vietnamese dong are also common. The country does have an independent Central bank (Bank of Laos). The main policy aim is containing inflation and the main anchor used is the Bank of Laos net domestic assets. The country's currency, the kip, is a managed float, with the central bank intervening to smooth out some of the fluctuations.

The Lao PDR has struggled with large government deficits and the main short term aim of the government is to contain spending, especially on the government wage bill. In the longer term, the government aims to enable Laos to meets its development needs within a fiscal framework. Taxation in Laos is complicated by the regional government system. Under this system taxes are administered by the provinces. Each province is assigned revenue and expenditure targets for the fiscal year. Provinces which run a surplus are expected to remit it to the central government where as those which run a deficit can claim reimbursement. This system is not very effective.

As well as income, profits and sales taxes, there are also a wide range of trade taxes in place. Oil imports are unlimited but subject to tax, although the rates on diesel have recently been reduced to allow for current high world oil prices.

**Malaysia**

Monetary policy in Malaysia is determined by the independent Central Bank, Bank Negara Malaysia. The main policy objective is to attain an appropriate balance between maintaining price stability and achieving the maximum sustainable level of economic growth. The policy rate is the Overnight Policy Rate (OPR). Bank Negara Malaysia has a monetary policy committee, which meets eight times a year to discuss the economic and inflation outlook, and to deliberate on the appropriate monetary policy decision. The responsibility for the monetary policy stance lies solely with the Governor. In July 2005, Malaysia floated its currency the ringgit, removing it from its peg against the US dollar. The Central Bank only intervenes in the market to minimise volatility, and to ensure that the exchange rate does not become fundamentally misaligned.

The Government is currently pursuing a policy of fiscal consolidation, with the fiscal deficit expected to decline to 3.4% in 2007 from 3.5% in 2006. The government is aiming to achieve this through more aggressive tax collection, higher revenues from oil production and a reduction in the fuel subsidy. Malaysia currently implements a fuel subsidy and tax concessions.

**Myanmar**

Monetary policy in Myanmar is undertaken by the Central Bank of Myanmar, which is controlled by the Department of Finance. Little is known about their policy objectives or monetary policy tools but the Bank does have a policy interest rate and also uses open
market operations. The currency is the Kyat which has an official exchange rate which is pegged to the US dollar but there is widespread black market trading. Foreign Exchange Certificates (FECs) were introduced in 1993 to limit the coverage of the official exchange rate. The certificates are issued by the Bank of Myanmar, issued in US dollars; they can then be converted into Kyat at selected banks for a market rate.

The government has struggled with a persistent budget deficit, which is largely due to the small tax base. Expenditure cutting efforts have been made to try and reduce the size of the deficit.

**Philippines**

The Philippines has an independent Central bank, the Bangko Sentral ng Pilipinas (BSP), which conducts monetary policy under an inflation targeting framework. For the year 2007, the headline inflation is targeted at 4-5 percent. The BSP has a Monetary Board, which meets every six weeks to decide on the BSP’s monetary policy stance, including adjustments in key policy rates, which are the repurchase rate and the reverse repurchase rate, and other monetary instruments. The exchange rate is floating with occasional scope for BSP’s participation to reduce excessive volatilities of the exchange rate.

Fiscal policy has gone through some radical changes since the new administration came to power in 2004. A VAT reform has been undertaken with the government's ultimate objective to balance the budget by 2008 while significantly increasing capital and social spending. The fiscal reform package includes measures to enhance revenue administration and crackdown on tax evaders, privatization of assets, and further rationalization of government expenditures.

The Philippines deregulated its downstream oil industry in 1998. In response to the high oil prices, oil tariffs have been modified. An adjustment mechanism is in place where the tariffs on oil and oil product imports are linked to the price of oil. The tariff (base rate of 3 percent) is automatically reduced or increased by 1 percentage point within a 0 to 3 percent range once the monthly average of Dubai crude falls above or below a certain trigger level. The government continues to avoid costly fuel subsidies.

One of the major challenges faced by the BSP in 2006 was the risk of inflation rising due to the oil price hikes. BSP’s efforts were focused on addressing the inflation risks and the associated inflation expectations. Its priority stance was to steer inflation towards the target. This required a careful assessment and understanding of the risks that impinge on the inflation target. The Monetary Board maintained BSP’s policy rates steady throughout 2006 on expectations of a manageable inflation outlook over the policy horizon.

**Singapore**

Singapore’s monetary policy is conducted by the Monetary Authority of Singapore (MAS) based on the management of a trade-weighted exchange rate. The MAS allows the exchange rate to fluctuate within bands, which they do not disclose; neither do they disclose the composition of the exchange rate. The monetary policy and investment meeting is used to decide on monetary policy, although they do not disclose the frequency of their meetings. Three policy options are available to them, they can either realign the central parity as a one-off; change the gradient of the bands to allow for exchange rate appreciation or depreciation; or widen the band to accommodate periods of volatility.

The government has large fiscal reserves but has to adhere to fiscal guidelines, which state that a government must have a balanced budget over the election cycle and that each year, they may only use up to half of the earnings from the fiscal reserve. Any surplus run by the government is transferred to the fiscal reserves while any deficit can only be financed from them with the approval of the President. The government currently has conflicting policy objectives. On the one hand, they need to support the unemployed and low wage earners while on the other they consider that fiscal reserves need to be increased to buffer against
the impacts to the economy of ageing as well as any external shocks or threats to security. The medium term objective of the government is therefore to balance these two objectives.

Singapore has a strict policy on cars, which means that it has very low oil dependence; it has tariffs on oil imports as well as on the importation of vehicles.

**Thailand**

Monetary policy in Thailand has evolved over time with the country having an exchange rate peg up to 1997 and moving to a floating rate following the Asian Crisis. Thailand has an independent Central Bank, the Bank of Thailand responsible for setting and executing Monetary Policy. The Bank is currently operating under an inflation targeting framework with an inflationary target in a range of 0 to 3.5 per cent. The Monetary Policy Committee meets every six weeks to deliberate on changes to the Bank’s policy rate, the 14 day repurchase rate. The Bank of Thailand however announced on the 13th of December 2006 that the policy rate will henceforth be the one day repurchase rate.

The exchange rate policy is a managed float of the Thai Baht, where the value of the currency is predominantly determined by market forces with intervention by the Central Bank only to prevent excessive volatility.

The tax structure in Thailand is highly centralised with the central government collecting and spending a large proportion of taxes. The bulk of tax revenue comes from indirect taxation. The Thai government has been able to turn the fiscal deficit from a deficit in 2002 to a surplus today; in 2005, the government announced a large five-year investment program of 2.5-5 per cent of GDP to be spent on infrastructure projects. The Thai government briefly embarked on a fuel subsidisation program in 2005 to combat rising prices but this was scrapped after just nine months as the costs proved too large to manage.

**Vietnam**

Monetary Policy in Vietnam is conducted by the Country’s Central Bank (the State Bank of Vietnam). The Bank is currently targeting a deceleration of credit growth to 20 per cent by the end of 2006. It achieves its aims mainly through the use of two policy rates, the rediscount rate and the refinancing rate. Officially, the State Bank of Vietnam has a floating currency but it is in effect a De Facto peg against the US dollar. Vietnam has very strict capital controls, which enable it to maintain the peg.

The Vietnam government has a fuel subsidy in place as although it is an oil exporter, it exports only crude and imports all its refined products. The subsidies have been reduced significantly over the last two years and the government has put in place a plan to remove them entirely before 2008. The government has been maintaining a 2 per cent fiscal deficit in recent years; this is despite strong revenues from the oil exporting industry.
B. SENSITIVITY OF MODEL RESULTS TO DIFFERENT SPECIFICATIONS AND ASSUMPTIONS – COMPARISON OF DIFFERENT MODELS

This appendix provides further discussion and background to the simple model results presented in the body of the report. It compares results across different models and explains differences in the results. It looks at the sensitivity of the model results to specification choices, for example, the treatment of exchange rates and the degree to which households and business anticipate future outcomes. These latter can be important in determining the short term impacts of an oil price change and consequently the monetary and fiscal policy response.

There are three international models that have been used to look at the impacts of oil price rises in the ASEAN region in this paper. They are the Global Trade Analysis Project (GTAP) model, McKibbin Software Groups Asia Pacific GCubed model, and the Oxford Economic Forecasting (OEF) Global Macroeconomic model. Results from the OECD’s Economic Departments InterLink model and the IMF’s Multimod are also reported in Chapter III.

Each model has its limitations and model results are necessarily heavily qualified, particularly given the specific institutional arrangements in ASEAN such as the regulation of petrol and diesel prices in many countries. None of the models covers the region as a whole, and while each provides information none are adequate in themselves to analysing fiscal or monetary policy in the rapidly changing region.

The GTAP Model

The GTAP model is a global input output based trade model. Its comparative advantage is in the industry and commodity detail that it brings to the analysis. It provides a detailed picture of the equilibrium shifts in the terms of trade and relative prices following a permanent oil price shock (Table B1 below). However, it is not a dynamic model (for example, it doesn’t include a response for the capital stock) and for example cannot provide information on the impacts of a temporary oil shock. Moreover, the latest GTAP database takes the input output tables from around 2000 and hence may not capture the rapid changes in energy use that have been occurring in ASEAN economies over the last five years. Similarly, the APG-Cubed database is based on GTAP 5 or around 1995 1996 input output data.
B.1 GTAP Impact of higher oil, gas and coal prices \(^a\)

<table>
<thead>
<tr>
<th>Real National Income</th>
<th>Real Private Consumption</th>
<th>Terms of Trade</th>
<th>Real Exchange Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Indonesia</td>
<td>4.7</td>
<td>3.5</td>
<td>8.8</td>
</tr>
<tr>
<td>Malaysia</td>
<td>3.8</td>
<td>0.0</td>
<td>1.7</td>
</tr>
<tr>
<td>Philippines</td>
<td>-4.4</td>
<td>-5.0</td>
<td>-6.5</td>
</tr>
<tr>
<td>Thailand</td>
<td>-4.6</td>
<td>-5.6</td>
<td>-6.4</td>
</tr>
<tr>
<td>Vietnam</td>
<td>6.0</td>
<td>5.7</td>
<td>13.8</td>
</tr>
<tr>
<td>Singapore</td>
<td>-4.4</td>
<td>-4.5</td>
<td>-2.6</td>
</tr>
<tr>
<td>China</td>
<td>-0.6</td>
<td>-1.0</td>
<td>-2.4</td>
</tr>
<tr>
<td>India</td>
<td>-2.8</td>
<td>-3.7</td>
<td>-14.1</td>
</tr>
<tr>
<td>Canada</td>
<td>1.6</td>
<td>0.9</td>
<td>4.0</td>
</tr>
<tr>
<td>Australia</td>
<td>1.5</td>
<td>1.1</td>
<td>7.8</td>
</tr>
<tr>
<td>Korea</td>
<td>-3.9</td>
<td>-4.1</td>
<td>-8.6</td>
</tr>
<tr>
<td>Japan</td>
<td>-1.4</td>
<td>-1.6</td>
<td>-8.7</td>
</tr>
<tr>
<td>USA</td>
<td>-0.7</td>
<td>-0.8</td>
<td>-3.5</td>
</tr>
<tr>
<td>Europe</td>
<td>-1.1</td>
<td>-1.8</td>
<td>-0.8</td>
</tr>
<tr>
<td>Russia</td>
<td>5.2</td>
<td>3.8</td>
<td>21.0</td>
</tr>
</tbody>
</table>

\(^a\) The shock applied is a 100 per cent increase in oil prices and 50 per cent increases in natural gas and coal prices. As the GTAP6 database used here is of 2000-2001 vintage the absolute increase in oil prices would be roughly equivalent to US$25.

Data source: CIE GTAP simulation

The OEF Model

The OEF macro model, results of which are shown in the Chapter III and Chapter IV, is a quarterly forecasting model, which is econometrically based with what might be described as a loose theoretical structure. It is useful for short term forecasting of aggregates such as GDP and inflation, but has two key limitations when it comes to analysing an oil shock in the ASEAN region. The first is that it lacks a steady state – that is there is not an equilibrium version of the model that provides expectational variables for households, business or financial markets. Consequently, it can't really be used to distinguish outcomes between temporary and permanent movements in oil prices. This is a key qualification given the current shock is likely to be persistent and in turn should be having large impacts on variables such as exchange rates and savings behaviour which are absent from the OEF results. The second is the modelling of trade appears relatively rudimentary. Given the importance of trade for the region, this is another key qualification.

Asia Pacific G-Cubed

The APG-Cubed model in contrast is an annual model with a rich theoretical structure, significant industry and trade detail, fully articulated financial flows and stock flow identities and a derivable steady state. It is a useful model for running experiments on, particularly those that involve expectational parameters. It forces the user to think very carefully about individual problems. However, it is not particularly designed for, or suited to, short-term forecasting and policy analysis. Rather, it is the type of model that can be run to complement short term forecasting and policy analysis via the insights it provides.

The figures below contrast the results for real exchange rates, and the monetary policy, response between a temporary increase in oil prices and a permanent increase in oil prices in APG-Cubed. In the temporary oil price shock, there is no significant long run change in the real exchange rate (Figure B.2). The short run changes in the exchange rate are largely driven by the uncovered interest parity condition embodied in the model. (That is they rise as domestic interest rates change relative to world interest rates.) In contrast, in the permanent shock (Figure B.3) there are large long run changes in the exchange rate, and as the foreign...
exchange market is forward looking, exchange rates jump in the first period. This exchange rate behaviour then has large impacts on inflation in the first period. The impact on inflation reverses the direction of change in monetary policy. (Exchange rates are higher and inflation is lower in the first period leading to lower interest rates. The monetary policy response follows a forward-looking Taylor’s rule targeting both future inflation and activity.)

While the movements in the exchange rate are highly uncertain (these are not forecasts) the simulations illustrate how sensitive the macroeconomic outcomes and policy responses can be to expectations, and the extent to which a shock is perceived to be temporary or permanent.

It is also interesting to note that the impacts on the equilibrium exchange rate in APG-Cubed are somewhat different to that in GTAP. This is primarily because APG-Cubed incorporates impacts on financial flows and saving and investment behaviour not captured in GTAP. However, there are many qualifications to the results below. In particular, the real exchange rate results are sensitive to how the oil price increase is generated in the model and the consequent movement in the real exchange rate for the oil producing middle-eastern countries. The figures should therefore not be regarded as forecasts. They do however demonstrate the sensitivity of the short-term monetary policy response to expectations in the case of an oil price shock. They underline the point made in the body of the report that there are no fixed rules in relation to the policy response to an oil price shock. Policy, particularly with regard to a shock like this, is highly contingent, with assessments needing to be made of how the shock will unfold in world markets, and with close monitoring needed of financial market, household and business responses.

B.2 Real exchange rate response- APG-Cubed temporary oil price shock

![Real exchange rate response- APG-Cubed temporary oil price shock](image)

*The shock shown is a 100 per cent increase in energy prices relative to baseline – roughly equivalent to a US$20 increase in oil prices. Results are shown in percentage deviation from baseline. Data source: CIE APG-Cubed simulation*
B.3 Real exchange rate response- APG-Cubed permanent oil price shock

The shock shown is a 100 per cent increase in energy prices relative to baseline – roughly equivalent to a US$20 increase in oil prices. Results are shown in percentage deviation from baseline.

Data source: CIE APG-Cubed simulation

B.4 Monetary policy response - APG-Cubed temporary oil price shock

Series shown are percentage point deviations in short-term interest rates.

Data source: as above
B.5 Monetary policy response - APG-Cubed permanent oil price shock

Data source: as above
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