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# INDONESIA IN A CHANGING GLOBAL ENVIRONMENT

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# Indonesia in a Changing Global Environment*

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## 1. Introduction

Indonesia faces a number of important challenges both in the short run and in the longer run. The world economy is currently growing robustly but a number of uncertainties cloud the economic outlook. A strong global economy is being challenged by higher oil prices. The emergence of significant trade imbalances between East Asia and the United States will undoubtedly put pressure of economic and political relations between the major regions of global growth. At the same time that the global economy is providing short term economic stimulus to Indonesia, there are a number of serious environmental problems that Indonesia needs to face. Key among these is depletion of natural resources, particularly the degradation of forests, and rising greenhouse gas emissions[1]. As a major fossil fuel producer, global policies to reduce greenhouse gas emissions will impact directly on Indonesia.

This paper gives an overview of the current state of the global economy, with a focus on the three most important risks currently facing world growth –the impact on the global economy of rising oil prices, the resolution of transpacific trade imbalances and the related to this, surprisingly low long term real interest rates globally. The paper then focuses on the longer term issues currently facing Indonesia. The first set of issues are related to rising energy use, rising greenhouse emissions and the implications for Indonesia of serious global climate change policy. The second set of issues are the serious depletion of natural resources particularly the depletion of forests. The paper also outlines how these two longer term issues can be dealt with within a single framework which focuses on creating property rights and clear incentives to manage forests and greenhouse gas emissions. This is particularly important for Indonesia which is the only member of OPEC to have ratified the Kyoto Protocol[2].

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1 See WRI (2004) for an overview.

2 Further details on the Kyoto Protocol can be found in section 4.

## 2. Short term Global Economic Outlook

The world economy is growing strongly after several years of slow growth. The latest IMF World Economic Outlook predicts global growth to be 5 percent in 2004 and 4.3 percent in 2005[3]. Figure 1 shows the composition of this growth in OECD economies. Strong growth in the United States and Australia, a tentative recovery in Japan and low but rising growth in Europe suggests a sustained economic recovery in OECD economies. More impressive growth continues in Asia as shown in Figure 2. China continues to be a powerhouse despite attempts to cool the economy through monetary restrictions and interest rate increases. It is likely that the contraction of policy will be effective but there is unlikely to be a major slowdown in China (See McKibbin and Stoeckel (2004a)).

There are more serious threats to global economic growth than policy developments in China. Since early 1999 oil prices have been rising sharply from around $10 per barrel to over $55 per barrel in October 2004. This rise in oil prices is a significant shock to the world economy. The International Energy Agency (IEA) in a recent study predicted that every $US10 per barrel rise in oil prices reduced world GDP by 0.4%. A recent study by McKibbin and Stoeckel (2004b) suggests an even larger figure than the IEA study, closer to 0.6% of GDP for every $10 per barrel. Although not as large an increase in real terms as the oil shocks of the early 1970s, the current rise in oil prices is significant and could slow the world economy significantly. In particular McKibbin and Stoeckel (2004) find quite different effects on different economies with Japan the hardest hit of Indonesia's trading partners. The impacts on Indonesia are likely to be complex. On the one hand the value of oil exports increases which generates revenue. On the other hand, growth in key trading partners is likely to slow and the demand for other exports from Indonesia will tend to decline. Secondly within

3 IMF (2004). Table 1.1, page 3.

Indonesia there are severe distortions in domestic energy pricing (discussed further below). In particular the Indonesian government subsidizes domestic energy prices. This has the curious implication that as world oil prices rise the dollar value of subsidies provided by the Indonesian government rises which puts severe pressure on the fiscal position. It is hard to imagine that the current policy of energy subsidies can persist for very long without major pressures on the fiscal position in Indonesia.

A second important issue clouds the global outlook. Since the 1997 Asian crisis there has emerged a serious trade imbalance between Asia and the United States. Figure 3 shows the current account balances for the Asian NICS and Indonesia. Since 1998 there has been a sharp shift in the current accounts of all Asian crisis economies towards current account surpluses. This sharp move towards current account surplus reflects the large capital outflow from these countries. The Current account of the NICS went from near balance in 1996 to a surplus of nearly 8% of GDP by 2003. The puzzle is why these trade positions have not reversed given the recovery in these economies. The second feature of figure 3 is the gradual deterioration of the US current account deficit from under 2% of GDP in 1995 to nearly 5% of GDP by 2003[4].

In a recent paper Lee, McKibbin and Park (2004) explore the causes of these trade imbalances and policies to deal with these. They find that the source of these imbalances is not trade policy or exchange rate policy in Asia (in contrast to Dooley et al(2004)), but are driven by two key factors. In order to understand these factors it is important to understand that the current account is both the difference between exports and imports of countries (adjusted by factor payments) and the difference between national savings and investment. A country with excess national saving relative to investment will experience a current account surplus – a country with low saving relative to investment will experience a current account

4 By the second quarter of 2004 this figure is closer to 5.7% of GDP

deficit. The major story behind these current account imbalances is changes in saving and investment balances and not trade policy or exchange rate policy.

One important explanation for the rise in current account surpluses in Asia and rise in current account deficits in the US since 2000 is the large increase in US fiscal deficits since 2000. Over the period between late 80s and 2001, the US fiscal balance improved dramatically from negative to positive, peaking at a surplus of 4.4 percent of GDP in 2000. However, in 2002 the fiscal balance deteriorated significantly due to tax cuts, an increase in spending due to the war on terror and an economic slowdown. The federal government budget balance (including the social security surplus) shifted from a surplus of 2.5 per cent of GDP in FY 2000 to a deficit of more than 4 per cent of GDP in FY 2004. This large change in government saving translated into a large fall in national savings and a worsening of the current account as foreigners increasingly financed US investment

The second key factor is shown in Figure 4 which shows the ratio of total investment to GDP in Indonesia, Korea, Malaysia and Thailand[5]. Since the 1997 Asian crisis, investment has dropped sharply in all of these economies. For a given savings rate, a sharp drop in investment (both public infrastructure spending and private investment) should improve the current account surpluses of these countries. The decline in investment has been between 10% to 20% of GDP for these economies. This is both dramatic and puzzling and explains a significant part of the improvement in the current surpluses of Asia. Not only does it have serious implications for trade imbalances but also for future growth prospects in Asia since investment is a critical driver of future productive capacity. In the short run it is fortunate for the United States that it can continue to borrow to offset its low national saving rate at very low real interest rates thanks partly to the collapse in Asian investment. Low real interest rates also possibly reflect the extremely low short term nominal interest rate in the major

5 See McKibbin, Lee and Park (2004) Table 4.

economies of the United States, Europe and Japan. Monetary authorities in these regions will eventually have to raise nominal policy interest rates. Eventually the large current account imbalances should self correct either by a rise in global real interest rates or a depreciation of the $US or both. A gradual adjustment is feasible and should be manageable for countries like Indonesia but a sharp adjustment in either policy interest rates or long term real interest rates could cause serious problems for the recovery phase in Indonesia especially if real interest rates begin to reflect a shortage of global savings.

Thus the global economy in the near term looks favorable to Indonesia, yet there are potential problems such as the global rise in oil prices, the emergence of trade imbalances between Asia and the United States and an upward movement of world real interest rates.

## 3. Longer Term Resource, Energy and Climate Issues

Until the 1997 crisis, Indonesia had experienced three decades of sustained economic growth of above 6 percent for year. Like many countries this has been importantly driven by access to cheap energy sources. Indonesia is exceptional in that it has large reserves of fossil fuels and is a member of OPEC[6]. Figure 5 shows the path of energy use in Indonesia since 1980. Total energy consumption has risen more than 3.5 fold since 1980, while per capita energy use has risen 2.5 times. Energy use per unit of GDP has remained surprisingly constant over this period with a slight upward trend since the 1997 crisis. This constancy of energy use per unit of GDP is surprising when compared to developed countries because in most OECD economies there is a trend decline in energy use per unit of GDP (of approximately 1% per year) reflecting increase energy efficiency as well as changing economic structure away from energy intensive manufacturing towards less energy intensive

6 For an overview of Indonesia energy profile see Resosudarmo and Tanujaya. (2002)

service industries[7]. In Indonesia it appears that either this gradual increase in energy efficiency has not occurred or there has been a particular pattern of structural change that offsets the effects of energy efficiency, over the past few decades. If there is a lack of energy efficiency it is most likely due to subsidies to energy prices which reduce incentives for substitution away from energy use towards labor and capital. As noted above, when combined with the current period of high oil prices, this aspect of Indonesia energy policy is not only possibly causing a serious structural distortion in the nature of production but it is also creating fiscal problems.

Figure 6 shows the composition of energy consumption in Indonesia by energy source as a share of total energy consumption (defined in quadrillion BTUs). Not surprisingly, oil (petroleum) dominates energy use followed by gas then coal. Coal has made the biggest proportional gain in market share since 1980. The rise in coal use has important implications for greenhouse gas emissions in Indonesia because of the greater carbon emissions per unit of energy in coal relative to oil and gas. Renewable energy sources barely appear on the charts.

The energy trends in Indonesia are problematic. Despite the reliance on fossil fuel energy within Indonesia, one of the positive developments since the early 1980s has been the reduced reliance on fuel exports as a share of total exports which has declined from 80% in 1982 to just over 20% by 2000.

Directly related to energy use is the emissions of carbon dioxide, the most important greenhouse gas. As Indonesia has ratified the Kyoto Protocol, its domestic emission of carbon dioxide will be more closely scrutinized in coming years. The implications of global climate policy will be discussed in the next section. Figure 7 shows that the paths of carbon dioxide emissions from fossil fuels, on a per capita basis and as a share of GDP looks very similar to the paths of energy use. This is not surprising given the almost exclusive reliance on fossil

7 See McKibbin Pearce and Stegman (2004).

fuels for energy in Indonesia. There has been a roughly 4 fold increase in carbon emissions in Indonesia between 1980 and 2001. The composition of the sources of emissions is somewhat different to the energy use composition that was shown in figure 5. This is because each type of fossil fuel produces different amount of carbon dioxide emissions per unit of energy. For example burning coal emits by far the largest amount of carbon dioxide per unit of energy. This is followed by oil and then natural gas. By 2001 coal is responsible for 25% of carbon dioxide emissions. Thus emissions of carbon dioxide have risen faster than energy use since 1980 in Indonesia.

Given ratification of the Kyoto Protocol, and the fact that there is no sign of a change in the trend of carbon dioxide emissions in Indonesia, it is clear that changing the future path of emissions will require significant policy responses if Indonesia is to be a full participant in Kyoto. Optimists will argue that this can be done by foreign investment in energy technologies induced by the Clean Development Mechanism of the Kyoto Protocol. It is not clear how much nor how important CDM will be but I feel that the complexity of the process and high costs of administration will result in very little new energy investment from this source. Perhaps the more important economic issue related to climate policy for Indonesia in the near future, is not the impact of any domestic policies on greenhouse emissions, but the economic impact in coming years on Indonesia of global policies targeting one of Indonesia's major exports (fossil fuels) that may be put in place. This will be discussed in the next section.

There are many other resource and environmental issues that Indonesia needs to face[8]. Many of these are discussed in other papers in this volume. Perhaps the most closely related to carbon emissions is the change in land use and in particular the issue of the destruction of forests in Indonesia. This is a fundamentally important issue that needs to be addressed in a much shorter time frame that carbon dioxide emissions. Figure 8 shows the alarming decline

in forests in Indonesia between 1990 and 2000 both relative to the world and in comparison with the rest of Asia. While plantation area has risen by 38% over the period, the overall forest cover has fallen by 16% implying a large decline in natural forest cover. This has a wide variety of implications for issues of eco-system loss and soil degradation and well as social implications for native forest users. The burning of these forests also have implications for the emission of carbon dioxide as well as the emissions of black carbon which has important implications for health, agriculture productivity as well as localized climate change. Recent work by Streets (2000,2004) and others suggest that direct action to reduce the emissions of black carbon from household energy use and burning of forests is an important issue that needs urgent attention in countries like China but also for Indonesia.

## 4. Responding to the Climate and Other Challenges

The global community has been struggling with the issue of how to effectively respond to the threat of climate change for several decades. In 1992, the United Nations Earth Summit in Rio de Janeiro produced a landmark treaty on climate change that undertook to stabilize greenhouse gas concentrations in the atmosphere. By focusing on stabilization, however, the treaty implicitly adopted the position that the risks posed by climate change require that emissions be reduced no matter what the cost. The agreement, signed and ratified by more than 186 countries, including the United States, spawned numerous subsequent rounds of climate negotiations aimed at rolling back emissions from industrialized countries to the levels that prevailed in 1990. To date, however, the negotiations have had little effect on greenhouse gas emissions and have not produced a detectable slowing in the rate of

8 See Resosudarmo, B.P., N.I. Subiman, and B. Rahayu (2000) for a discussion of marine resource depletion in Indonesia.

emissions growth[9]. The treaty's implementing protocol, the 1997 Kyoto agreement, has crawled to life after being heavily diluted at subsequent negotiations in Bonn and Marrakech[10]. The survival of the Kyoto Protocol in its current form has been given some impetus by the recent ratification by Russia yet there are a still many problems to be faced before we see if Kyoto is actually reducing emissions. More than a decade of negotiations has produced a policy that is very strict in principle but ineffective in practice.

The problem at the international level is actually worse than it appears from the troubled process of Kyoto ratification. Even when the Kyoto Protocol enters into force (which it had not at the time this paper is written) , it only places restrictions on the industrial economies excluding the world's largest greenhouse emitter, the United States. Developing countries, including Indonesia, have ratified the agreement but have not taken on any responsibilities for reducing emissions except those that emerge from mechanisms such as the Clean Development Mechanism (CDM) and joint implementation (JI). Thus in a real sense a majority of the future global greenhouse emissions are not bound by the current international agreement. Indeed, the reality is that developing countries are not taking on commitments is one of the reasons claimed by both the United States and Australia for not ratifying the Kyoto Protocol. The fact that the world's largest emitter, the United States, is not involved in climate policy substantially dilutes global action even further. Because there are no binding commitments by the key developing countries of China, India, Brazil and Indonesia (amongst others) means that effective action against possible climate change is still a hypothetical debate.

Yet developing countries have a valid point in their argument that while they are

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9 See McKibbin and Wilcoxen (2002) for a summary of the negotiations and critique of the approach.

10 Earlier estimates of the cost of Kyoto can be found in Weyant (1999). Direct comparisons of the COP3 and COP7 versions of the protocol, can be found in Bohringer (2001), Buchner et al (2001), Kemfert (2001), Löschel and Zhang (2002) and McKibbin and Wilcoxen (2004).

prepared to be part of regime to tackle climate change, they should not be required to bear a disproportionate part of the costs of taking action. Current concentrations of greenhouse gases in the atmosphere are primarily the result of economic activities in the industrial economies since the Industrial Revolution. Because it is the stock of carbon in the atmosphere that matters for temperature changes, any climate change in the near future will be largely the result of the activities of industrial economies. Why should developing countries not be able to follow the same energy intensive development paths of the currently industrialized economies? The answer to this question has inevitably lead to an expectation of compensation paid for by the industrialized economies for action taken in developing countries. One of the biggest dilemmas for developing countries is not just the reality that at some stage they need to make some form of commitment to curbing greenhouse gas emissions but the fact that most estimates of the damages from climate change are borne by developing countries[11].

Standing back from the intensity of international negotiations it is worth clarifying several important facts about the costs and benefits of climate policy and exploring whether there are approaches possible in Developing Countries that are not being considered because of the standard refrain that "Kyoto is the only game in town". This mindset has already hindered effective action for the past decade as countries and industries postpone action until agreements are clarified. Given the uncertainties of climate change and the decisions on energy systems being made in the regions of the developing world that are growing rapidly (including Indonesia who at some stage will likely substitute away from oil into other energy sources which may include coal rather than more greenhouse friendly options), this delay in providing clear incentives for moving away from fossil fuel based systems, may ultimately prove to be extremely costly.

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11 See IPCC (2001).

One of the largest sources of anthropogenic greenhouse gas emissions is the burning of fossil fuels. The cheapest means of changing of the global energy system to be less reliant of fossil fuels, is to remove these emissions from future energy systems rather than from existing energy systems. There are huge investments in physical and human capital surrounding existing energy systems which are costly to change. However, future investments (largely to occur in developing countries) are much cheaper to change before they are undertaken. Technology will ultimately be the source of reductions in emissions whether through the development of alternative sources of energy or through ways of sequestering carbon released from burning fossil fuels. Developing countries have huge potential to avoid the pitfalls in terms of carbon intensities, experienced by industrialized economies in their development process. The key issue is how to encourage the emergence of energy systems in developing countries that are less carbon intensive over time. Ultimately if climate change does emerge as a serious problem, developing countries will have to move towards a less carbon intensive future. It is likely to be significantly cheaper to do this over time than to face a massive restructuring at some future period – the sort of problems being faced within industrialized economies today.

The current state of global policy on climate is that the United States (the largest emitter of greenhouse gases) has rejected Kyoto and is arguing for following policies that directly or indirectly reduce emissions through technological change; the European Union is committed to emission targets (assuming Russia provides a great deal of those reductions required through selling emission permits) and is implementing a Europe wide emissions trading scheme (that exempts key sectors such as aluminium, motor vehicles and chemicals), on January 1, 2005, but with actual caps that appear only to bind by the end of 2008; Japan is considering what it can do given current emissions are 16% above target in an economy recovering from a decade of recession; and developing countries have refused to officially discuss taking on commitments.

Given this background, there are a number of ways a country like Indonesia could begin to address carbon emissions. The most obvious first step would be the removal of energy subsidies. The second would be to further raise the price of energy to further reflect the true economic and environmental cost of burning fossil fuels. A further approach could be direct importation of less carbon intensive technologies provided by the CDM. This latter outcome is possible but not likely as already outlined above. Thus the focus here will be on the other alternatives.

Economic theory provides guidance about the structure of a possible climate change policy for Indonesia[12]. Since greenhouse gases are emitted by a vast number of highly heterogeneous sources, minimizing the cost of abating a given amount of emissions requires that all sources clean up amounts that cause their marginal cost of abatement to be equated. To achieve this, the standard economic policy prescription would be a market-based instrument, such as a tax on emissions or a tradable permit system for emission rights. In the absence of uncertainty, the efficient level of abatement could be achieved under either policy, although the distributional effects of tax and emissions trading policies would be very different.

Under uncertainty, however, the situation becomes more complicated. Weitzman (1974) showed that taxes and permits are *not* equivalent when marginal benefits and costs are uncertain, and that the relative slopes of the two curves determine which policy will be better[13]. Emission permits are better than taxes when marginal benefit schedules are steep and marginal costs are flat: in that situation, it is important to get the quantity of emissions down to the threshold. A permit policy does exactly that. In the opposite situation, when marginal costs are rising sharply and marginal benefits are flat, a tax would be a better policy. The potential inefficiency of a permit system under uncertainty is not just a theoretical

12 See McKibbin and Wilcoxen (2002a) for a survey and Pezzey (2003) for a comparison of taxes and permits.

curiosity: it is intuitively understood by many participants in the climate change debate by the expression of the concern about a policy that "caps emissions regardless of cost."

Applying this analysis to climate change shows that a tax is likely to be far more efficient than a permit system under the uncertainties surrounding climate change. All evidence to date suggests that the marginal cost curve for reducing greenhouse gas emissions is very steep, at least for developed countries. Although there is considerable disagreement between models on how expensive it would be to achieve a given reduction in emissions, all models show that costs rise rapidly as emissions targets become tighter. At the same time, the nature of climate change indicates that the marginal benefit curve for reducing emissions will be very flat.

Although a tax would be more efficient than a permit system for controlling greenhouse gas emissions, it has a major political liability in that it would induce income transfers from firms to the government. This would likely be perceived as unreasonably large. In particular, firms would end up paying far more in taxes than they spent on reducing emissions because a tax is levied on all emissions and not only those that are removed at the margin. As a result, the transfers would dominate the political debate and would give firms a powerful incentive to fight the proposal. The political problem is not just that firms dislike paying taxes; rather, it is that the transfers would be so much larger than the abatement costs that they would completely dominate the political debate. The problem is not unique to climate change and is probably the most important reason that Pigouvian taxes have rarely been used to control environmental problems.

Given the advantages and disadvantages of the standard economic instruments is it possible to combine the attractive features of both systems into a single approach? Secondly, is it possible to develop a system which is common in philosophy across developed and

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13 See also Pizer (1997) for a more recent discussion of the issue.

developing economies but in which developing economies do not incur the short run costs to the economy in the form of higher energy prices until they have reached a capacity to pay?

There are a number of goals that should be at the core of any climate change regime. These involve the recognizing the tradeoff between economic efficiency and equity within and between countries. The policy should also be based around clear property rights over emissions and clear long run emission targets but near certainty in the short run costs to the economy. A sensible climate policy should also create domestic institutions that allow people to self-insure against the uncertainties created by climate change. There should be market mechanisms that give clear signals about the current and expected future costs of carbon. There should be coalitions created within countries with the self interest of keeping climate change policy from collapsing rather than creating a system of international sanctions in order to sustain the system.

The McKibbin Wilcoxen Blueprint (see McKibbin and Wilcoxen (2002a, 2002b)) was created to attempt to explicitly deal with these issues. It is a Hybrid system that blends the best features of taxes and emission permit trading[14]. It is a system that can be applied across developed and developing countries but which recognizes that developing countries should not bear the same economic costs as industrial countries in the short run.

Although set out in detail in McKibbin and Wilcoxen (2002a) the approach can be briefly outlined here. The basic idea is to impose a requirement that energy producers have an annual emission permit to produce energy each year, based on the carbon content of that energy. A fixed quantity of perpetual permits would be created that allow a unit of emission every year for 100 years. These are traded in a market with a flexible price. The government would also be able to create additional annual permits in any year at a guaranteed price. Permits which satisfy the annual constraint for energy production can be either a perpetual

permit or an annual permit that is provided by the government at a fixed price. The price of emissions in any year would never be higher than the fixed price set by the government and the amount of emissions in any year would be whatever the market delivers. Thus we have a long term target in terms of emissions but an annual target in terms of the maximum cost of carbon to industry. In a developing country like Indonesia, the annual price would initially be zero if we allow an allocation of perpetual permits well in excess of current emissions. However, the price of perpetual permits would reflect the expectation that Indonesia would eventually reach the emission levels that caused the carbon emission constraint to be binding. Thus the perpetual permit market with positive prices would provide a financial incentive to begin to change Indonesian carbon emissions over time even though the annual cost to industry of a carbon permit would initially be zero.

The attractiveness of the Blueprint for creating institutions to aid in economic development in developing countries should not be underestimated. The ability of investors in energy systems to effectively hedge their investment over a long period of time should be very attractive for the development of energy systems in developing countries. The time frame of the assets we propose to be created (by committing to a global climate regime) is currently unparalleled. Indonesia could use this new asset as a way of attracting foreign investment and enhance the development process by creating what is effectively a futures market in energy. This is far more likely to induce foreign investment than the CDM or other similar mechanisms that face very high administrative costs. Critics might argue that the problem with Indonesia is the inability to create the sorts of institutions the above scheme would require. This is a problem in the near term but it is easier for Indonesia to create property rights and institutions within Indonesia according to the characteristics of Indonesia as a developing country, than it would be to impose within Indonesia the sorts of institutions

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14 The intellectual idea actually dates back to Roberts and Spence (1976) for general environmental policy and

and property rights that would be required under the Kyoto Protocol for Indonesia to be able to sell carbon rights into a global markets. The required synchronization of property rights globally in a form reflecting developed countries practices is exactly why it is difficult to see how the Kyoto Protocol could be implemented outside the small group of industrialized countries with similar institutional structures that are already involved.

A system such as that proposed above could also be adapted within Indonesia to include a mechanism for creating credits for maintaining and enhancing forests. Introducing property rights into forest management and providing a direct market incentive to managing forests is likely to be the only credible way to reduce the startling decline in forest cover in Indonesia[15]. By combining both carbon emissions and forestry directly into a system with clear property rights, substantial progress could be made in solving some of Indonesia's longer term environmental issues while at the same time creating institutions to assist in economic development and in particular in encourage foreign direct investment.

## 5. Summary and Conclusion

This paper has summarized the outlook for the global economy and raised several key potential problems facing Indonesia as well as other countries in the Asia pacific – high oil prices, an adjustment to transpacific trade imbalances and a return of world real interest rates to more reasonable levels. It also highlights several important environmental issues facing Indonesia which have both local and global implications.

A domestic response that Indonesia could work towards that would address the issues of forestry degradation, carbon emissions and black carbon emission reductions within a single framework is also outlined. It is argued in this paper that there are policies such as the

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McKibbin and Wilcoxen (1997) for climate change policy.

15 See Chomitz and Griffiths (1996) for a discussion of the causes of deforestation in Indonesia.

McKibbin-Wilcoxen Blueprint which could be implemented in Indonesia as part of a broader strategy of actions that both price future carbon emissions and encourages more sustainable economic development. The development of institutions to manage risk as well as the clear commitment to taking effective action against future carbon emissions has the potential to be an attractive option for a country like Indonesia. If it was shown to be successful in both stimulating foreign investment in energy development and reducing the trend of greenhouse emissions through market based incentives based on the clear establishment of property rights, the demonstration effect across the developing world would be powerful. It would certainly remove the complaint by countries like the United States and Australia against taking action on carbon emissions because of lack of binding commitments by developing countries. That alone would reduce greenhouse gas emissions significantly in future decades.

The alternative strategy for Indonesia is to wait for a resolution of the stalemate over an effective Kyoto protocol and wait for large sums of financial assistance to accompany the transfer of energy technology from the industrial economies though some other Kyoto-like endeavor. This will be a very long wait if past historical experience of is any guide. But in waiting to take action, decisions are already being made in Indonesia on long term energy investments with very few incentives to move away from reliance on the abundance of low cost fossil fuels within Indonesia. Thus in delaying the creation of a framework for committing to taking action on climate policies, the Indonesian economy could suffer unnecessary future structural shocks caused by an eventual need to adapt to the realities of a world with serious climate problems. The Blueprint could be implemented unilaterally in Indonesia without an international agreement although it could be made consistent with Kyoto style systems over time if necessary. This paper attempts to provide one approach that has many advantages including a great deal of flexibility to adapt as the world learns more about the threats and challenges of climate change.

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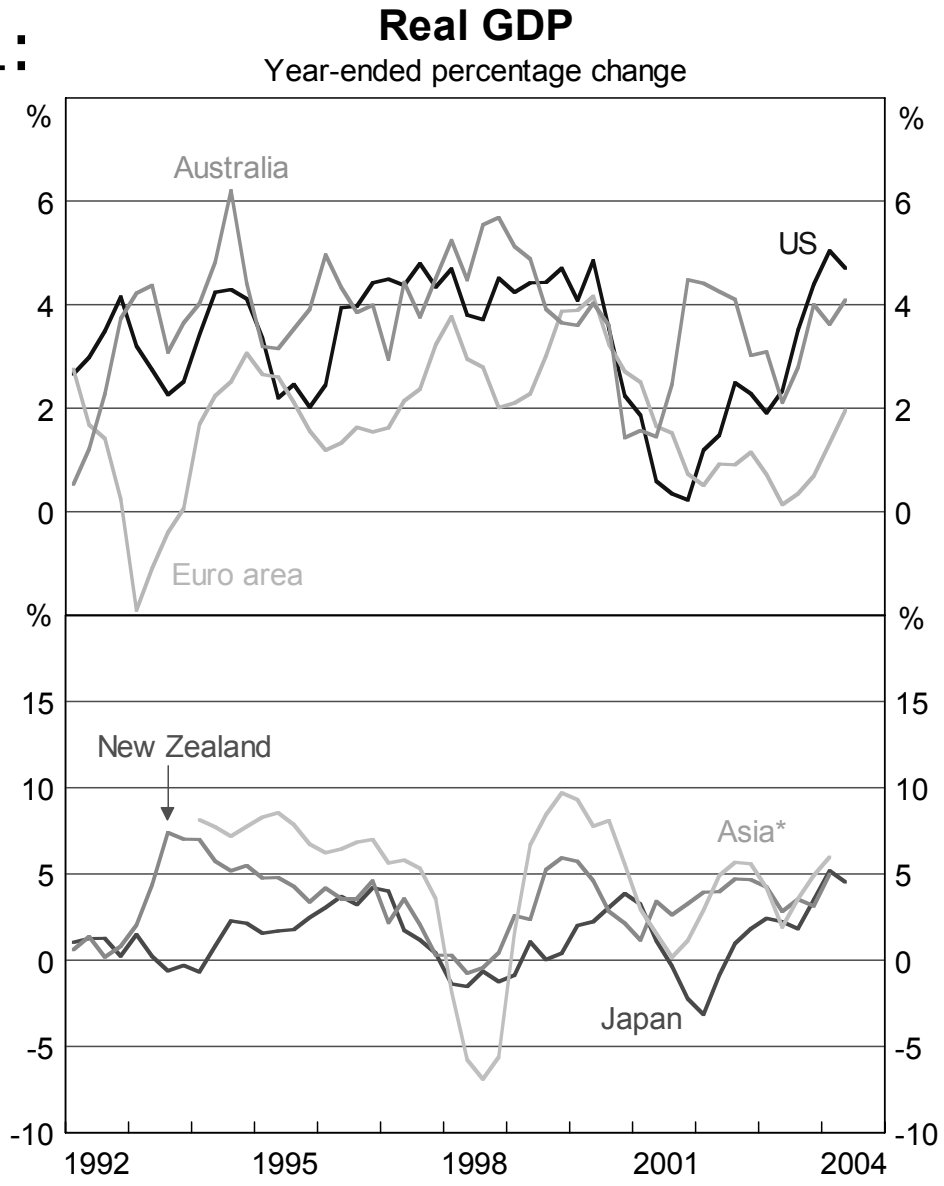
Figure 1:

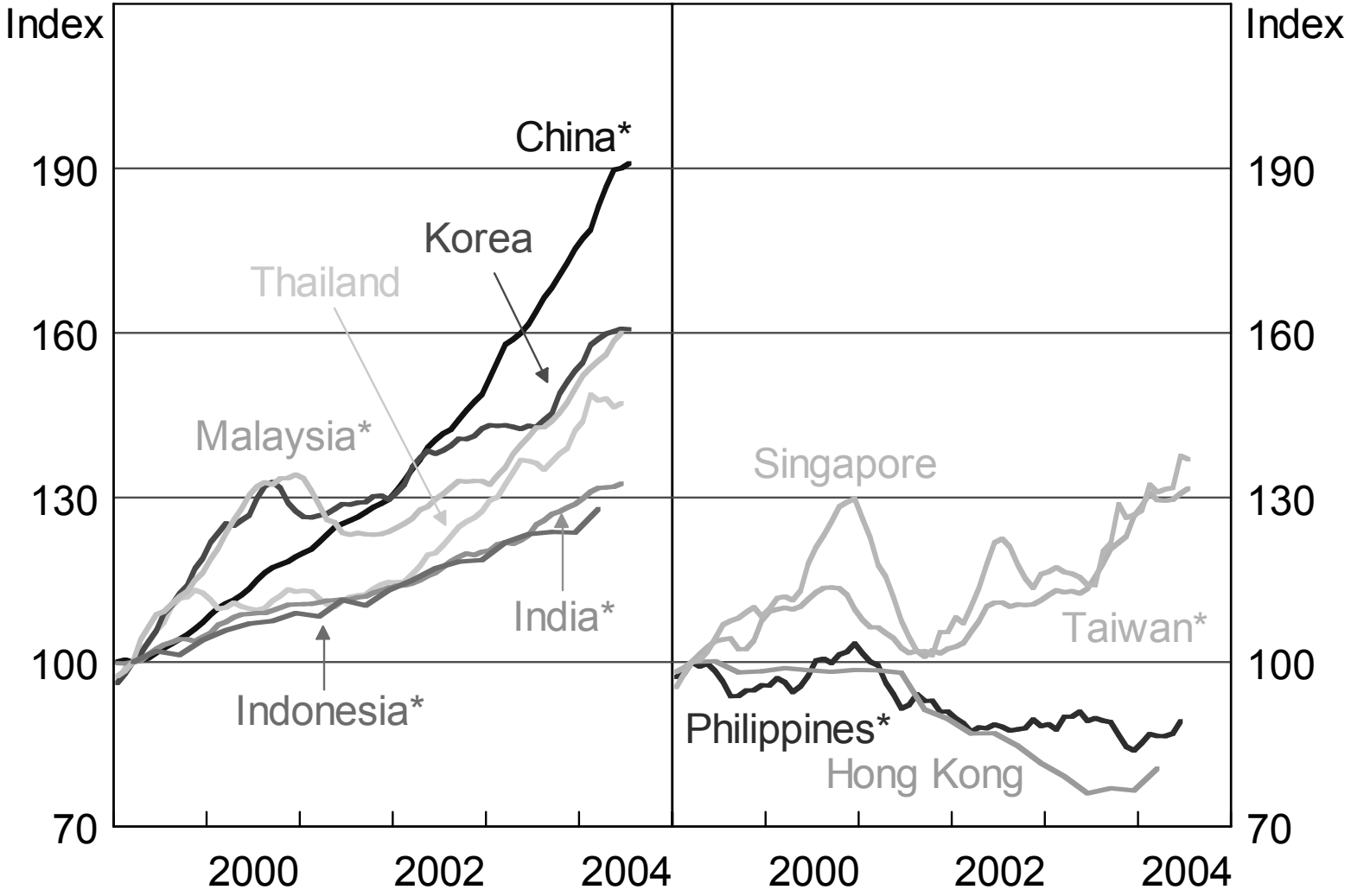



* Hong Kong, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan and Thailand

Sources: ABS; CEIC; Thomson Financial

# Figure 2: **Asia - Industrial Production**

March quarter 1999 = 100, smoothed




* Seasonally adjusted by RBA

Source: CEIC

Figure 3: **Current Account Balances 1995 - 2004**

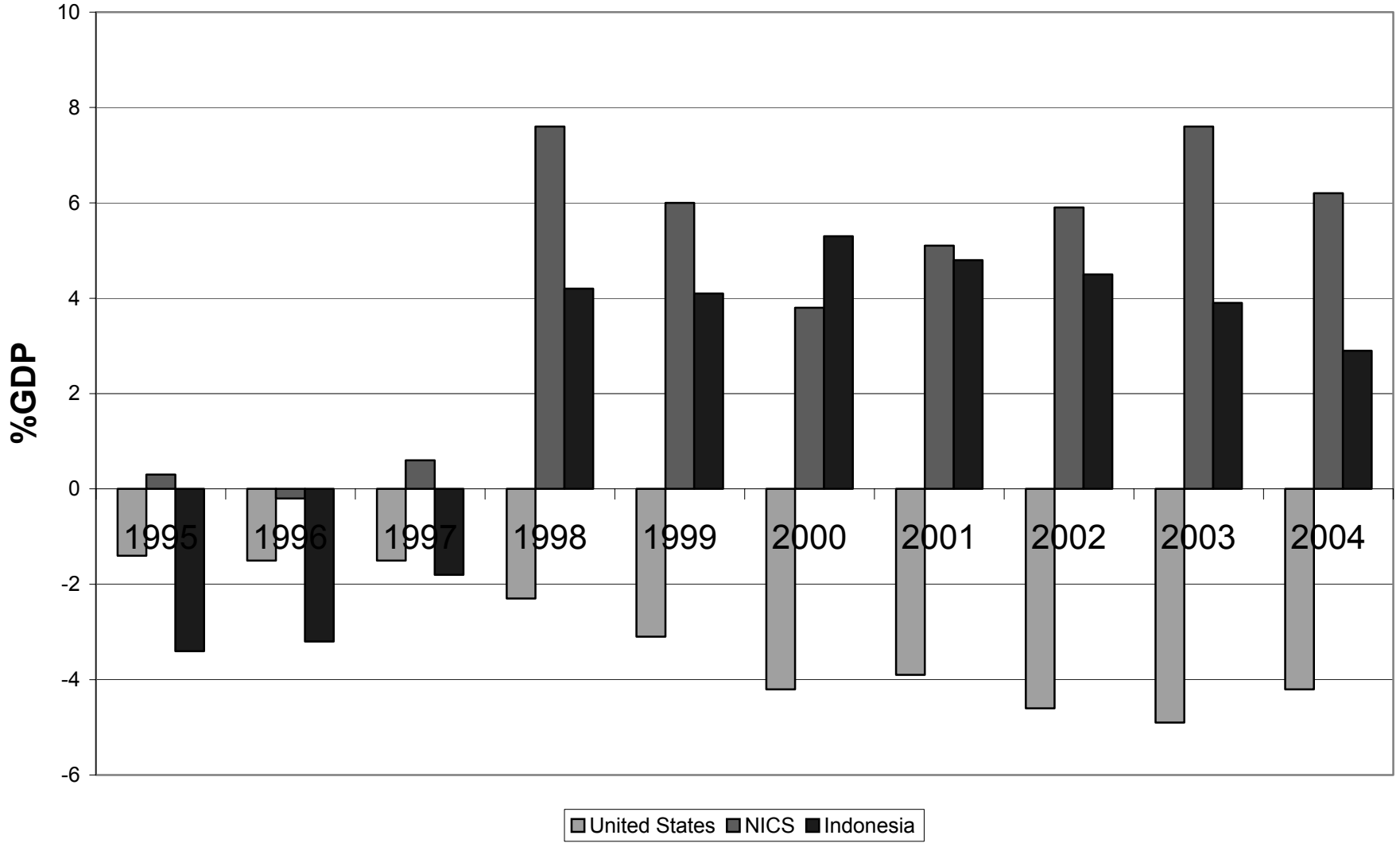


Figure 4:

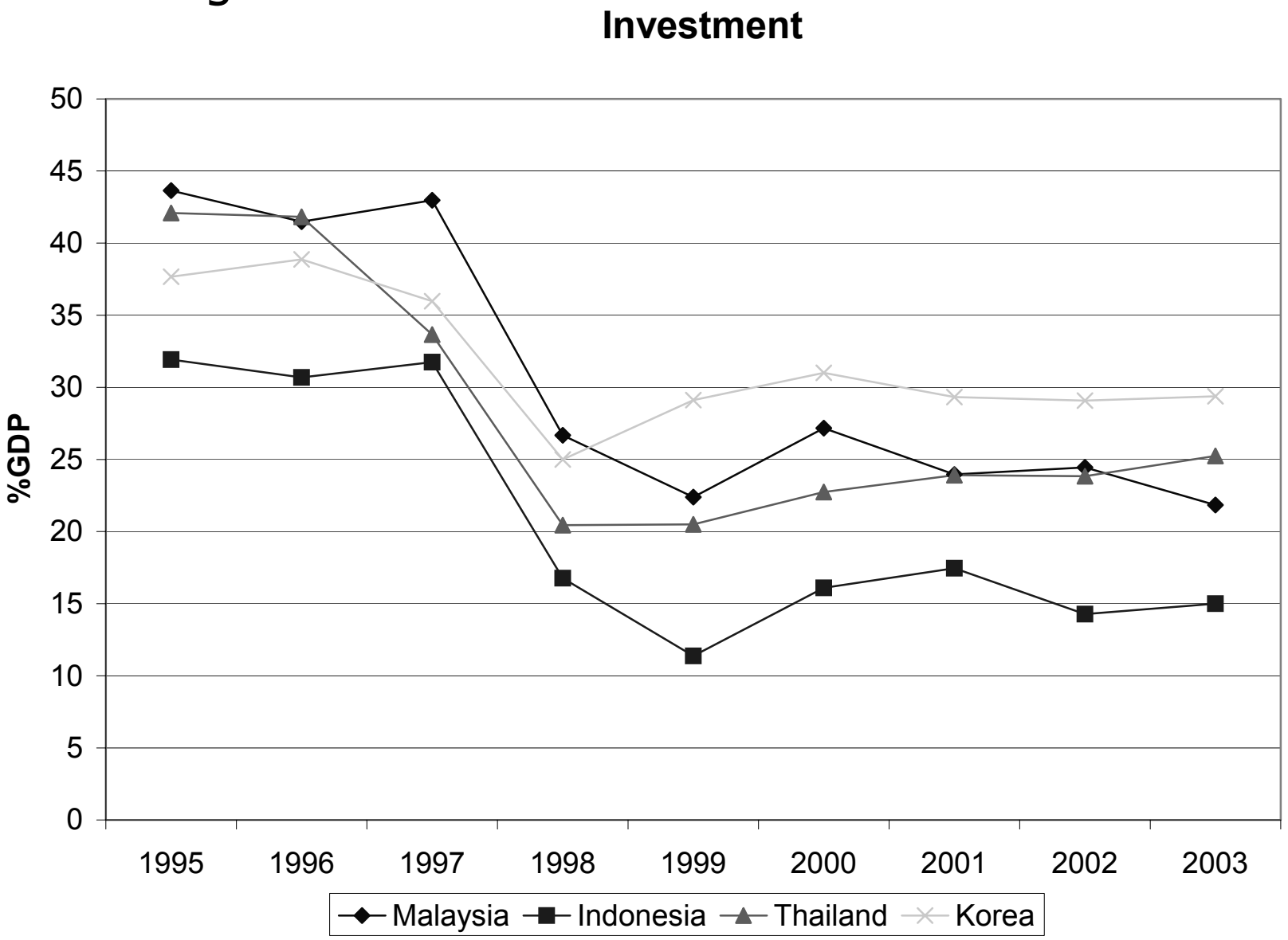
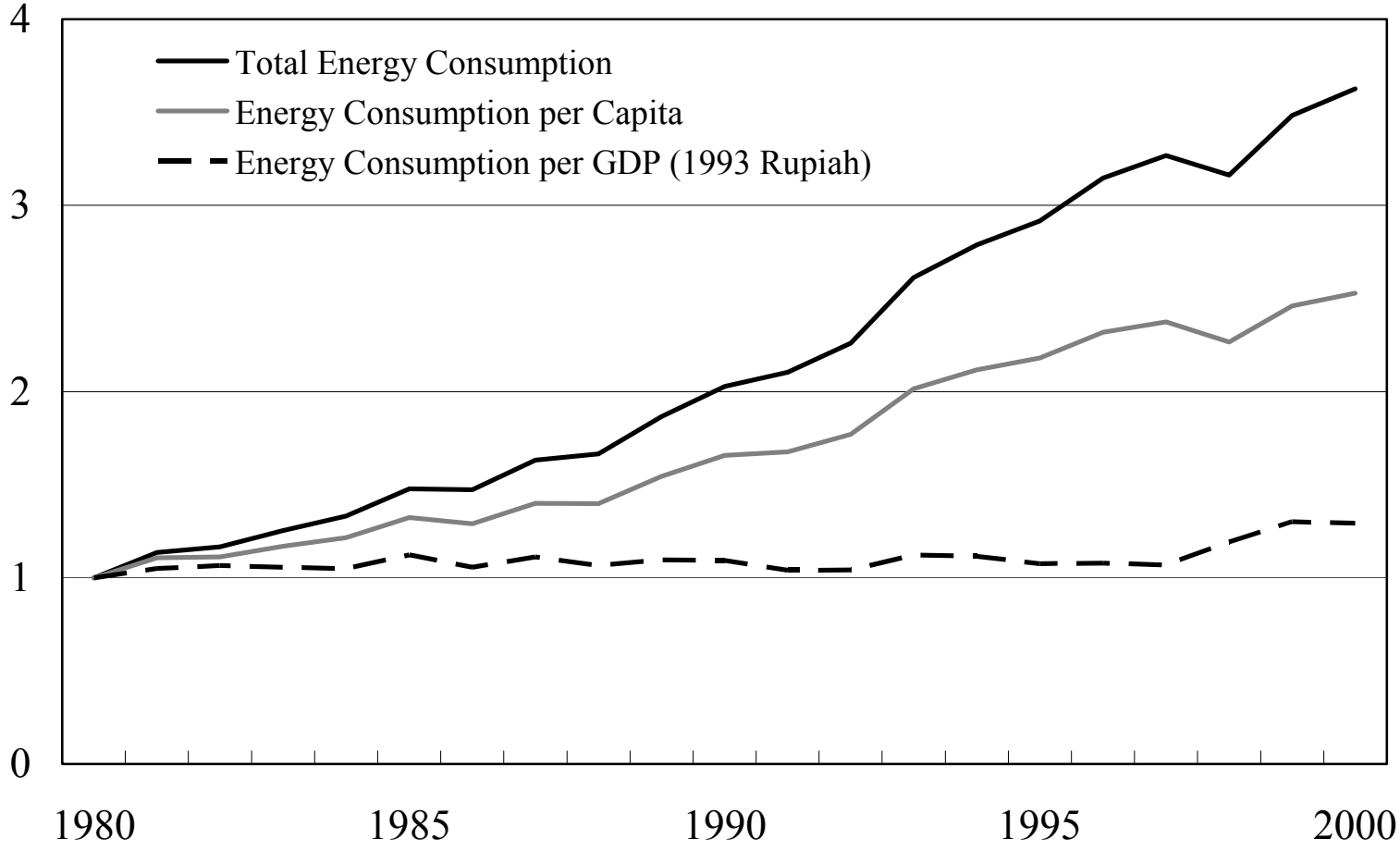

Investment
%GDP
50
45
40
35
30
25
20
15
10
5
0
1995
1996
1997
1998
1999
2000
2001
2002
2003
Malaysia
Indonesia
Thailand
Korea

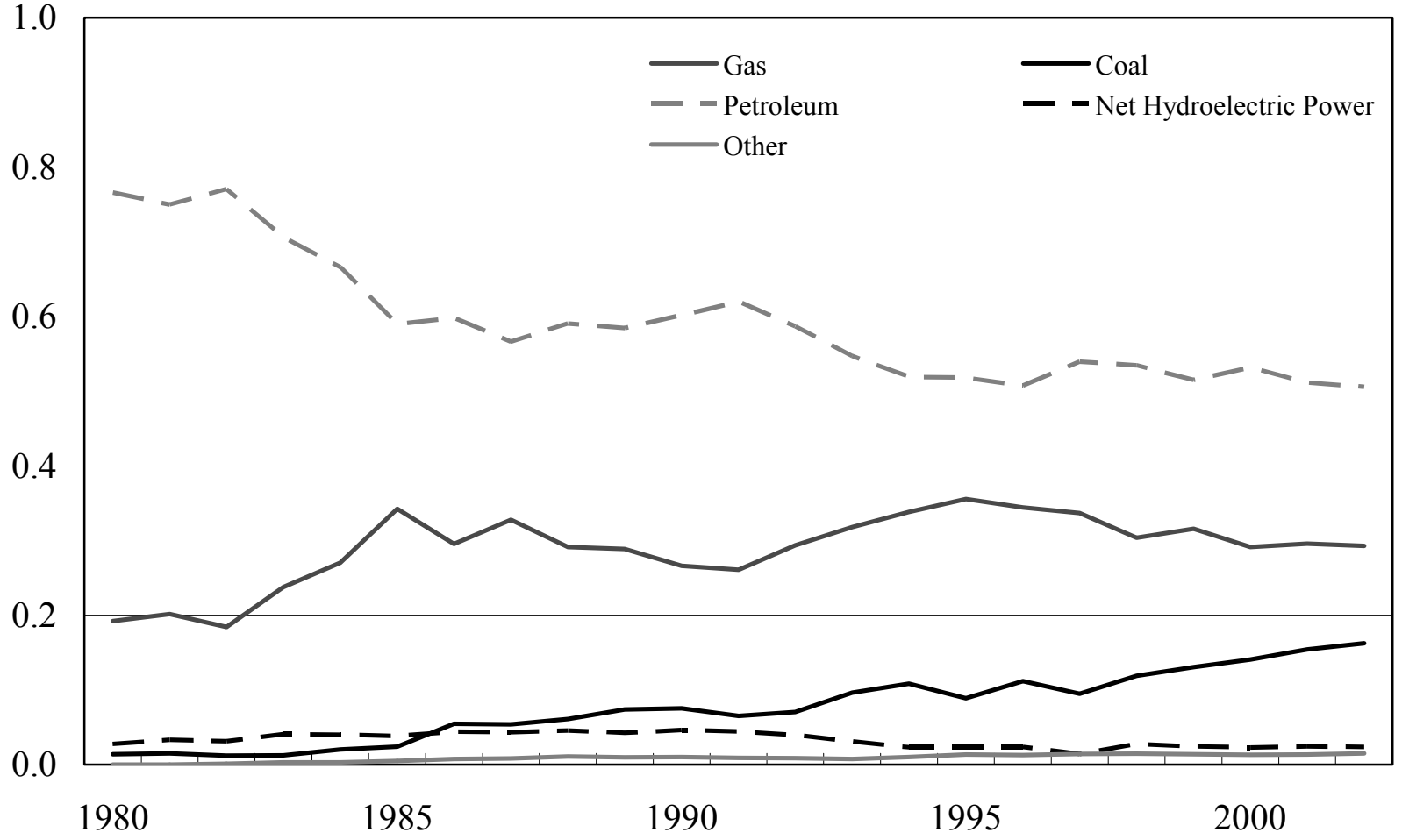
Figure 5: Energy Consumption, Relative Trends, Indonesia




Source: Energy Information Administration, World Development Indicators

# Figure 6: Indonesian Energy Consumption by Source

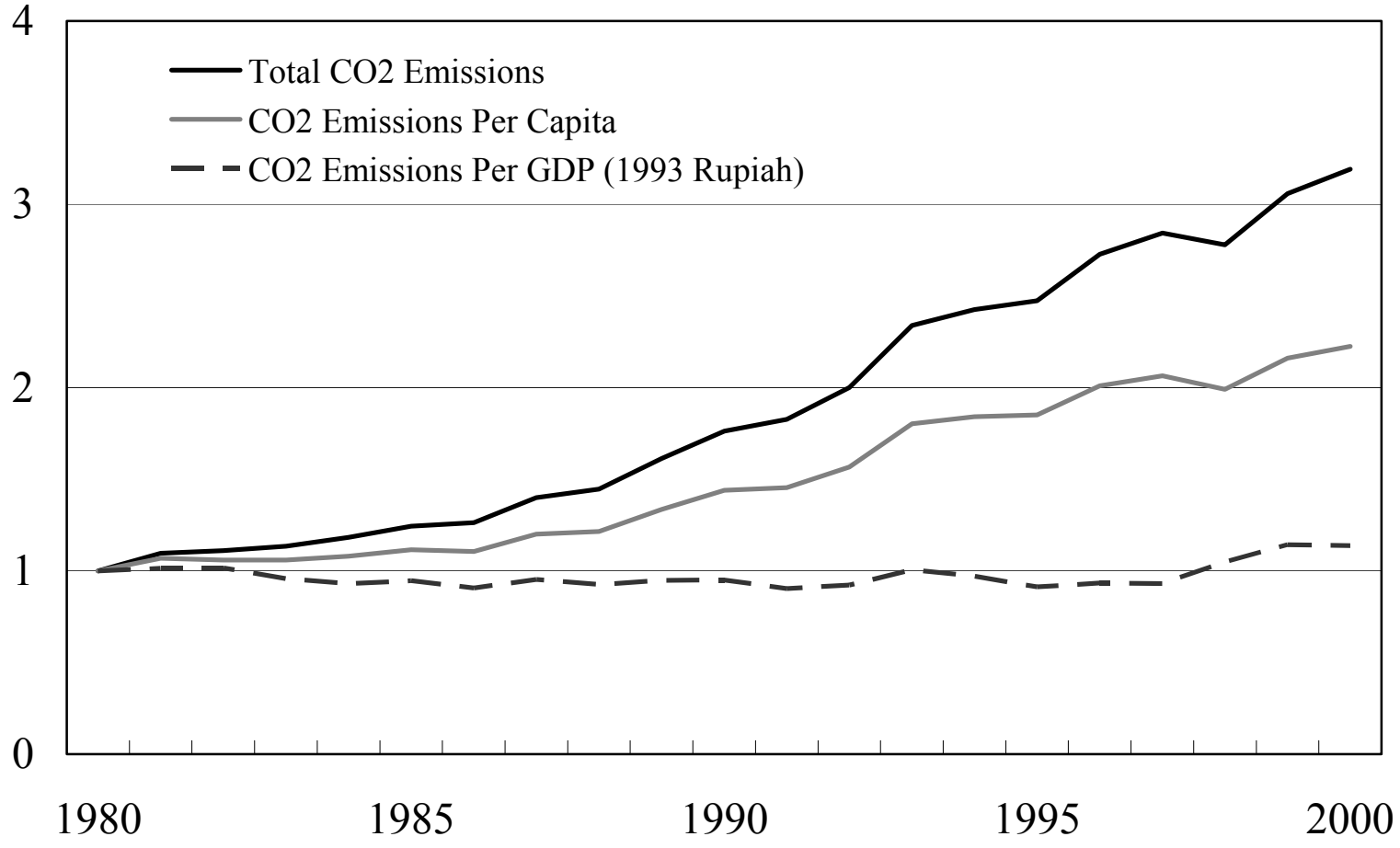
Share of Total Energy Consumption




Source: Energy Information Administration

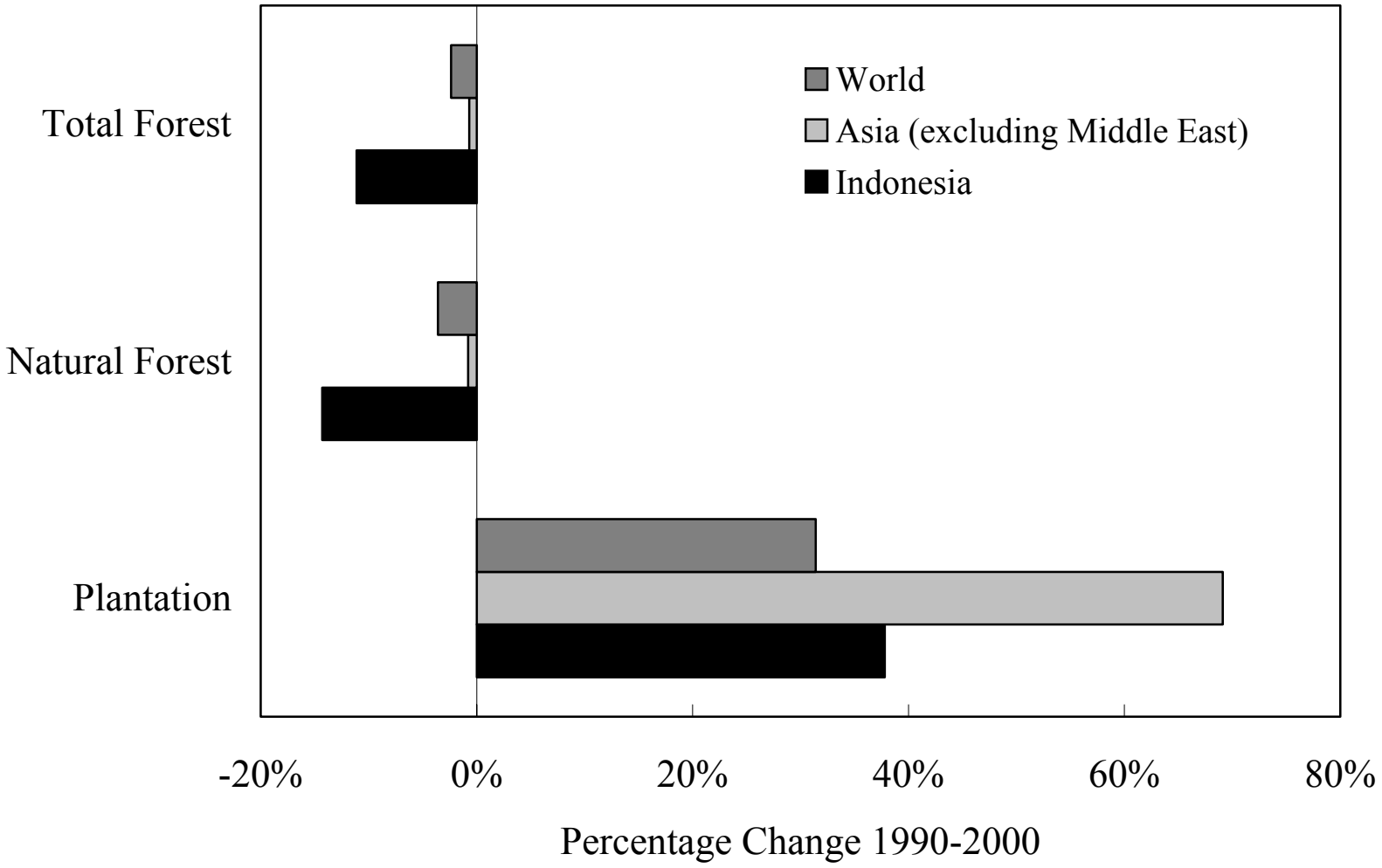
# Figure 7: $CO_2$ Emissions, Relative Trends, Indonesia

Index 1980 = 1




Source: Energy Information Administration, World Development Indicators

Figure 8: Percentage Change in Forest Area by Type, Indonesia, 1990-2000




Source: World Resources Institute