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INDONESIA

Selected Issues

Prepared by Laura Lipscomb, Uma Ramakrishnan (both APD),
Gustavo Adler (SPR), Nina Budina (FAD), and Xiangming Li (MCM)

Approved by the Asia and Pacific Department

August 2, 2010

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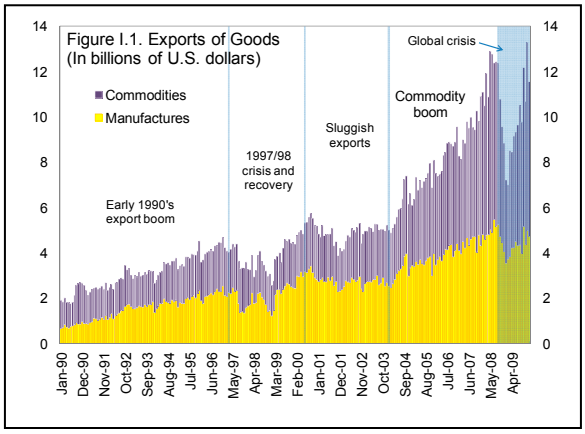
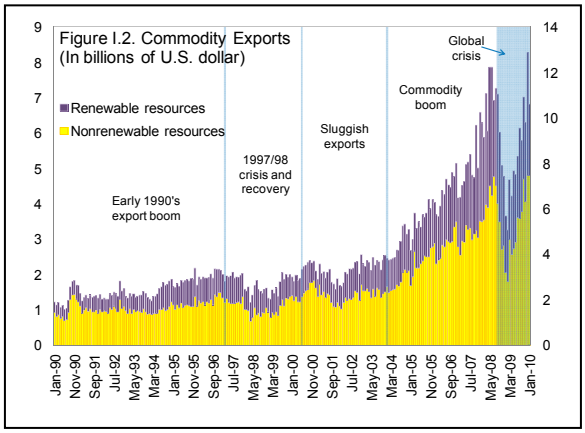
I. Indonesia's Commodity Boom: Dutch Disease in the Making?[1]

Indonesia experienced a remarkable export boom in the years preceding the 2008 global crisis, driven mainly by surging commodity exports. While helping to sustain high economic growth, the commodity boom and the accompanying real appreciation has raised questions about the effect on the manufacturing sector (Dutch Disease) and the growing vulnerability to volatile commodity prices. This paper takes an in-depth look into recent trade patterns to assess the extent of such concerns. It is found that (i) there is no strong evidence of Dutch Disease; (ii) weak performance in some sectors, so far, does not appear to be linked to the commodity boom; and (iii) while further reliance on commodities has increased Indonesia's vulnerability to export price volatility, the terms of trade have actually been rather stable as import and export prices co-move markedly, mitigating such vulnerability.

A. Background

1. **Indonesia went through an impressive period of export growth in the five years preceding the 2008−09 global crisis**. Following somewhat stagnant export growth early in this decade, exports accelerated sharply, increasing by about 120 percent from 2003 to 2008 (until the crisis). This remarkable growth is noticeably stronger than the already impressive performance seen in the early 1990's. After being interrupted by the collapse in trade in late 2008 and early 2009, the export boom seems to have continued despite a still modest recovery in global activity, with exports rebounding to near pre-crisis levels by late 2009 (Figure I.1).



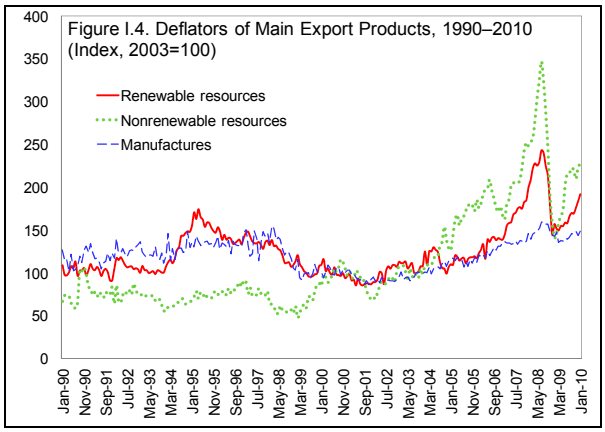


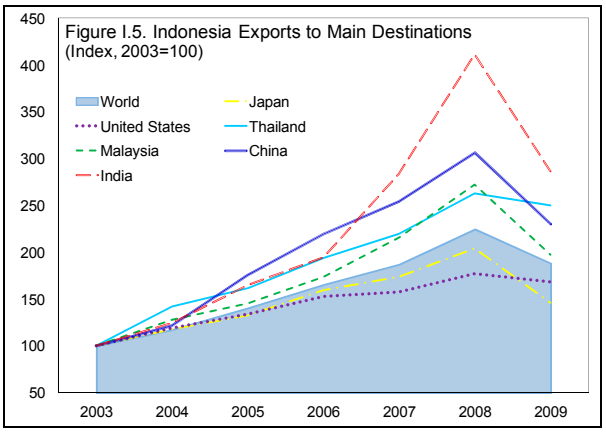
2. **Much of this extraordinary performance reflected a booming commodity sector** (Figure I.2). Commodity exports grew by 180 percent during this period—notably faster than manufacturing (75 percent). This is noticeably different from the export boom of the early 1990's, which was solely driven by rapidly growing manufacturing exports. Both renewable resource commodities (most noticeably, vegetable oils and

[1] Prepared by Gustavo Adler, with research assistance from Agnes Isnawangsih.

rubber) and nonrenewable resource commodities (mainly oil and gas) contributed to the sharp increase in exports, although the former reflected the combination of rapidly increasing volumes and prices, while the latter mainly reflected a sharp increase in prices.[23] Manufacturing exports, meanwhile, displayed decent but significantly lower volume growth (Figure I.3).

3. **High commodity prices were accompanied by sharply accelerating intra-regional demand**. The increase in commodity prices, both renewable and nonrenewable resources, (Figure I.4) was accompanied by sharply accelerating demand from neighboring countries. Most noticeable was the quadrupling of exports to India, the tripling of exports to China and, because of its already high starting level, the doubling of exports to Japan (Figure I.5). As a result, exposure to neighboring emerging market countries increased markedly although the overall exposure to the region remained broadly stable (Box I.1 discusses recent trends and potential vulnerabilities related to the composition of trading partner countries).



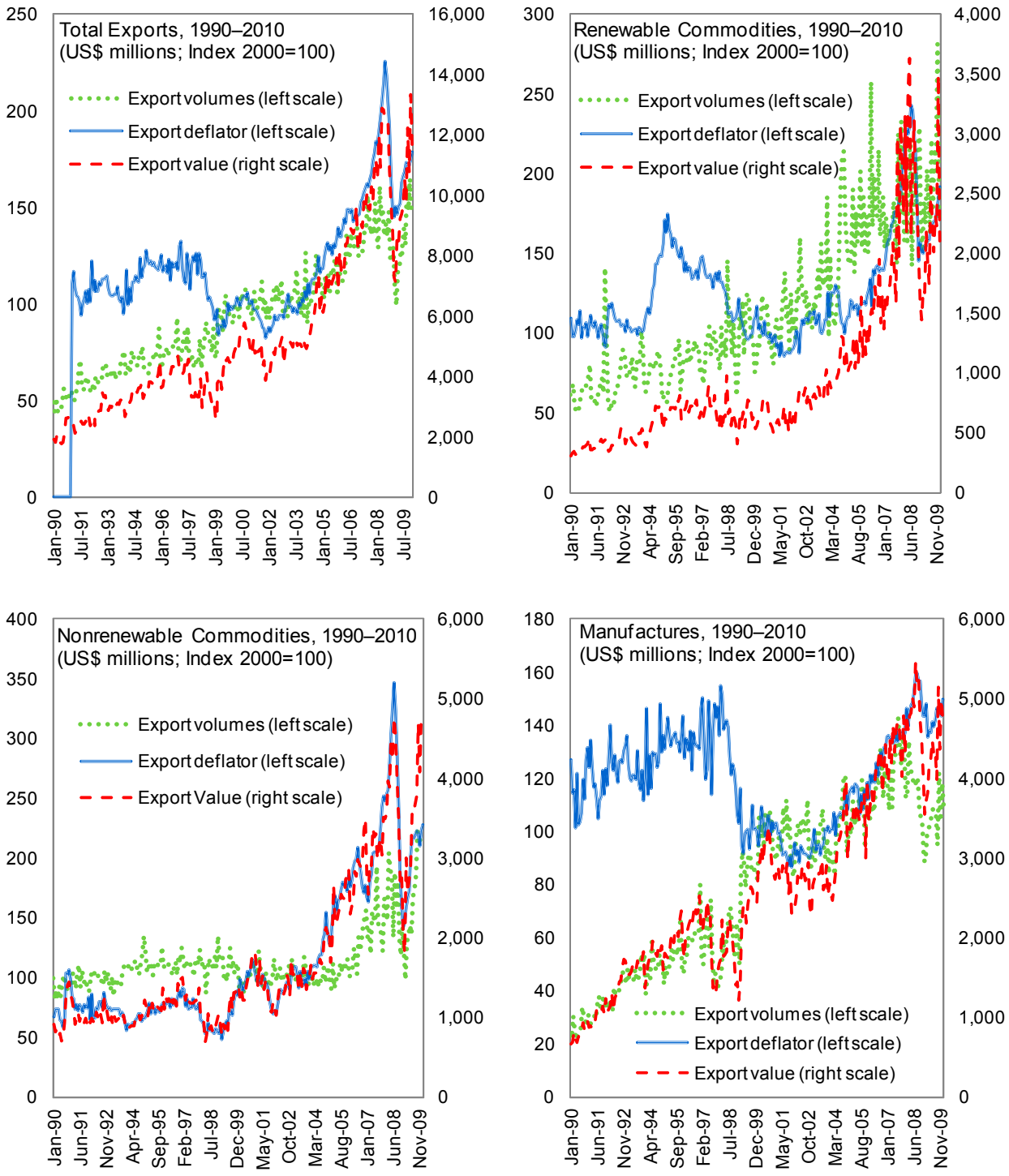


4. **But an appreciating real exchange rate and a sharp pickup in imports have raised questions about the effect on other sectors and the increasing vulnerability to external shocks**. Driven mainly by marked upward pressures on the rupiah, the real exchange rate appreciated by about 14 percent from late-2003 to mid-2008. The sharp depreciation following Lehman's collapse reverted most of the previous appreciation, but the subsequent rebound quickly brought the real exchange rate to above pre-crisis levels and 20 percent

[2] Commodities labeled as renewable resources refer mainly to agriculture, animal, fishery and forestry related activities, while nonrenewable resource commodities refer mainly to mining activities.

[3] Volume and deflators are estimated by staff, based on value and volume data for export and import groups corresponding to SITC 2 digit level disaggregation, as aggregate official statistics do not weight subgroups by their economic value.

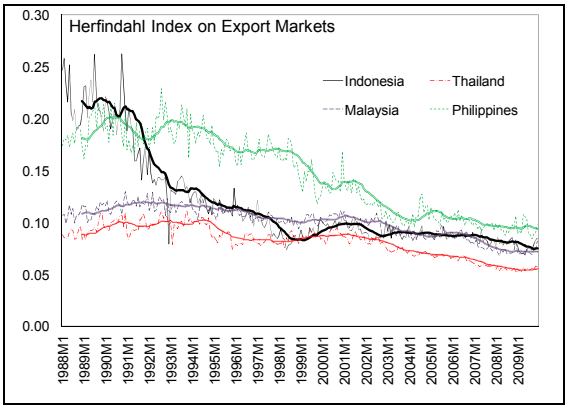
Figure I.3. Export Performance by Main Products, 1990–2010

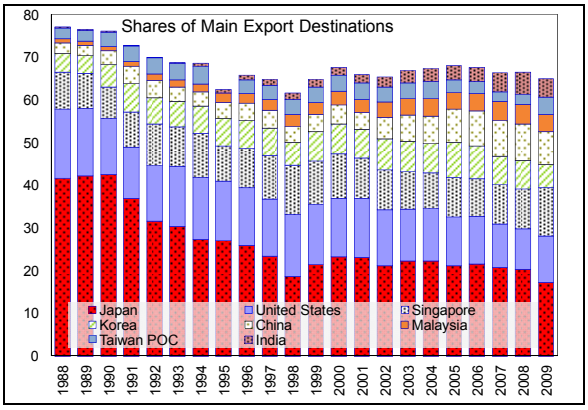


Sources: CEIC Data Co., Ltd.; and staff estimates.

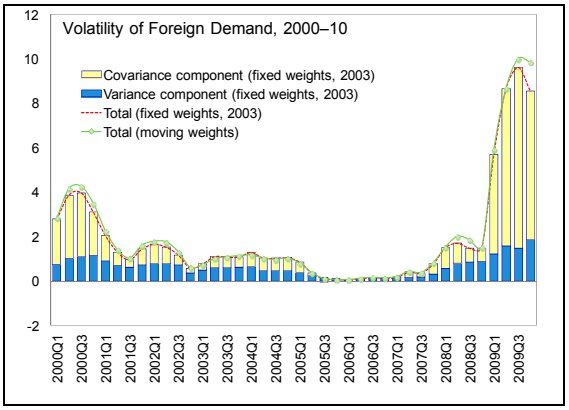
Box I.1. Trading Partner Diversification

The composition of trading partner countries has changed markedly in recent years, shifting towards rapidly growing emerging and developing economies. The overall exposure (export share) to advanced countries fell from 73 percent in 2003 (and an average of 81 percent during the 1990's) to 65 percent in 2008. While this has helped diversify export destinations somewhat and gain market share in rapidly growing economies, partner concentration has remained somewhat high, with 5 countries accounting for more than 50 percent of total exports. A group of 10 countries has retained about 75 percent of export share for more than a decade, although China, India and Malaysia have gained ground at the expense of Japan and the United States. The result has been a sustained downward trend in Indonesia' Herfindahl index of trading partner concentration. Despite the sharp acceleration in demand from neighboring countries, exposure to the region as a whole has increased only marginally from 60 percent of total exports in 2003 to 62 percent in 2008, as increases in the share of exports to China, India, and Malaysia have been offset by a declining share to Japan.



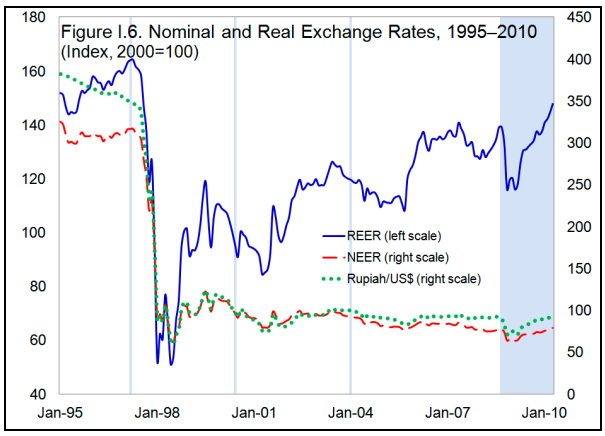


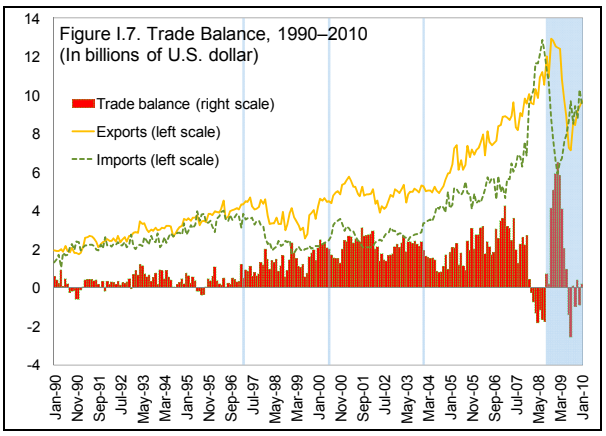
This shift has been accompanied by heightened vulnerability to foreign demand shocks, reflecting primarily increased co-movement across trading partners. We construct a measure of foreign demand volatility as a weighted average of trading partners' domestic demand volatility, with weights given by the trading partner's share in Indonesia's exports.[1/] This index, depicted below, points to a sharp increase in foreign demand volatility in the last couple of years after a prolonged period of very low volatility (consistent with the phenomenon often referred to as the "Great Moderation"). Heightened volatility of foreign demand, also affecting other countries, reflects mainly a sharp increase in correlations across trading partners rather than their changing shares in Indonesia's exports (as suggested by the negligible gap between the index with fixed and moving weights). At the same time, covariance with trading partners picked up recently, after a long period of negative or nil correlation, although, again, the changing structure of trading partners has play no significant role.



1/ The index is computed as $\sigma^D = \sum_i var(d_i) w_i^2 + 2\sum_i \sum_{j<i} covar(d_i, d_j) w_i w_j$, where d_i denotes domestic demand in country in i, w_i is country i's share in Indonesia's total exports and σ^D is the variance of overall foreign demand (D). Weights are fixed or moving depending on the desired information. The variance is measured on a seasonally-adjusted and (HP-filter) detrended series of domestic demand.

above the pre-commodity boom levels (Figure I.6). Notwithstanding appreciating pressures, fast growing exports allowed Indonesia to maintain trade (and current account) surpluses for a prolonged period of time. However, after a prolonged period of sluggish import growth, a rapid catch up in 2007−08, mainly reflecting capital and intermediate goods, led to trade deficits for the first time in more than a decade (Figure I.7). Against this backdrop of weakening external balances, the increased reliance on commodity exports could be a source of vulnerability as their prices tend to be highly volatile, potentially exposing the economy to large terms of trade shocks that could rapidly translate into mounting external imbalances. This is of particular concern if the commodity boom comes at the expense of growth in the manufacturing sector (a phenomenon often referred to as *Dutch Disease*), as the latter sector is unlikely to recover quickly in the event of a turnaround in commodity exports. The next section assesses whether there is evidence of *Dutch Disease* in Indonesia.





B. Dutch Disease in the Making?

5. **Commodity booms often lead to '*Dutch Disease*.'** As extensively documented, first by Corden (1984) and Corden and Neary (1982) and later by an extensive literature,[4] commodity booms—resulting from sharp increases in production (e.g., following the discovery of new sources) or in prices—often have pervasive affects on other sectors (see Box I.2). Dutch Disease is normally associated with (i) real appreciation, (ii) a slowdown in manufacturing exports, output and employment, and (iii) an increase in wages.

[4] Recently studied cases of Dutch Disease include Bolivia (Cerutti & Mansilla, 2008), Russia (Oomes & Kalcheva, 2008) and many oil exporting countries (Ismail, 2010).

Box I.2. The Dutch Disease Hypothesis

The Dutch Disease phenomenon is normally associated with two main effects:

- A **resource movement effect** that refers to the reallocation of factors from other sectors of the economy (e.g., manufacturing) to the natural resource booming sector. This effect reflects increased demand in the resource intense sector that tends to attract labor from other sectors of the economy by means of higher wages. That is, if labor is mobile across sectors, higher wages in the export booming sector would cause a movement of labor toward this sector, leading to lower output in other sector (if the economy is operating at full capacity). This process of resource reallocation often leads also to an appreciating real exchange rate. Lower production in the nonbooming sector (including nontradable) results in a loss of production giving rise to excess demand for nontradables, and leading to an increase in the relative price of nontradables (thus, the real exchange rate).
- A **spending effect** that relates to the appreciation of the real exchange rate as a result of increased spending of (at least part of) the booming sector's extra income. Increased demand of nontradables leads to exchange rate appreciation, as nontradable prices need to adjust upwards to induce higher production in response to higher demand. The magnitude of this effect normally depends on the propensity to consume nontradable goods, which tends to be higher when large parts of the additional income is received by the government, as the latter tends to have a high propensity to consume nontradable goods.

Combining the two effects, the Dutch Disease hypothesis generates three unambiguous predictions: (i) since the relative price of nontradable goods increases, the real exchange rate appreciates; (ii) manufacturing output and employment fall due to factor reallocation; (iii) the overall wage level increases (possibly starting with higher wages in the booming sector) in response to higher demand for labor. The combined effect on output and employment in the nontradable sector is ambiguous, as the spending and resource movement effects push in opposite directions.

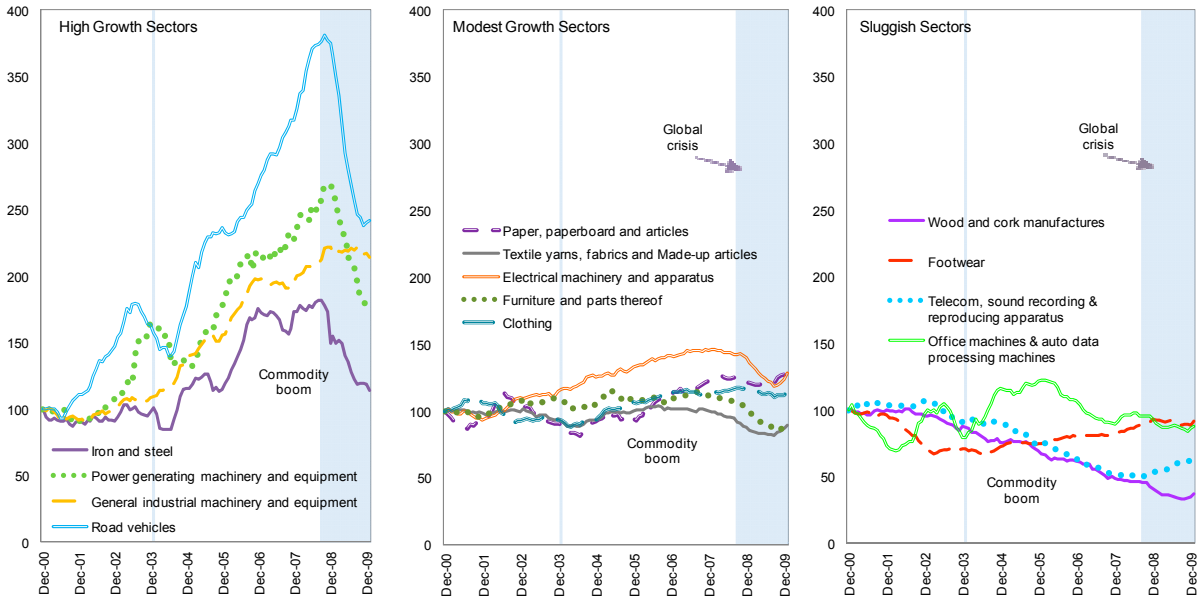
6. **In Indonesia, the commodity boom in recent years has been accompanied by significant real exchange rate appreciation, although there is no evidence of overvaluation**. Marked appreciation in recent years followed rapid income and productivity gains—mainly earlier in this decade—and served to revert much of the overshooting experienced during the 1997/98 crisis. As a result, today, the exchange rate is broadly in equilibrium with economic fundamentals, as suggested by the different CGER[5] methodologies.

7. **Evidence of manufacturing exports being affected is mixed, with significant heterogeneity within the group**. While manufacturing exports have been markedly outpaced by commodity exports in recent years, its growth has still been robust at an

[5] Consultative Group on Exchange Rates.

aggregate level (Figure I.3). Some traditional industries (mainly textiles, wood manufactures and paper products) have performed poorly, while others (e.g., chemicals and machinery and apparatus) have showed remarkable growth. Still, most of the sectors that witnessed sluggish growth in recent years seem to have been on that path long before the commodity boom manifested itself (Figure I.8).

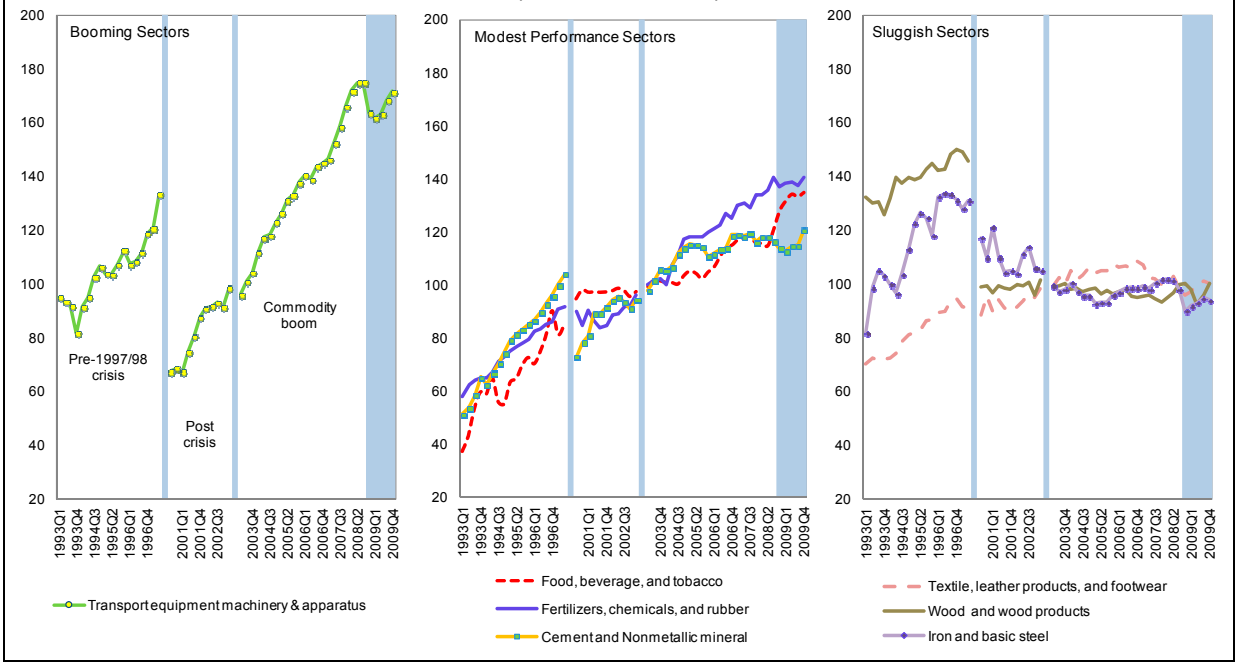
Figure I.8. Manufacturing Exports by Main Products, 1990–2009
(Volumes, Index 2000=100)



8. **GDP data confirms that sectoral performance has been uneven, and weak output does not appear to be linked to the recent commodity boom**. A long-term view of sectoral output reveals that sectors that have been sluggish in recent years have displayed weak performance long before the commodity boom, suggesting that real appreciation may not have been the main factor behind these sectoral weaknesses (Figure I.9). This is particularly clear for textiles, wood manufactures, and iron and steel industries, which have shown sluggish growth since 2000. At the same time, sectors closely linked to commodities (e.g., food, fertilizers, chemical rubber, cement) have witnessed decent, although slowing, economic performance in recent years. And other capital-intensive industries (e.g., automotive and machinery) have actually been booming in recent years—like in the period preceding the commodity boom—arguably suggesting that long standing labor market frictions may have been a constraint on growth in some labor-intensive industries.[6]

[6] In particular, high severance payments have been a mayor constraint on labor-intensive industries (see Thacker, 2005, "*Labor Market Policies and Job Creation*."

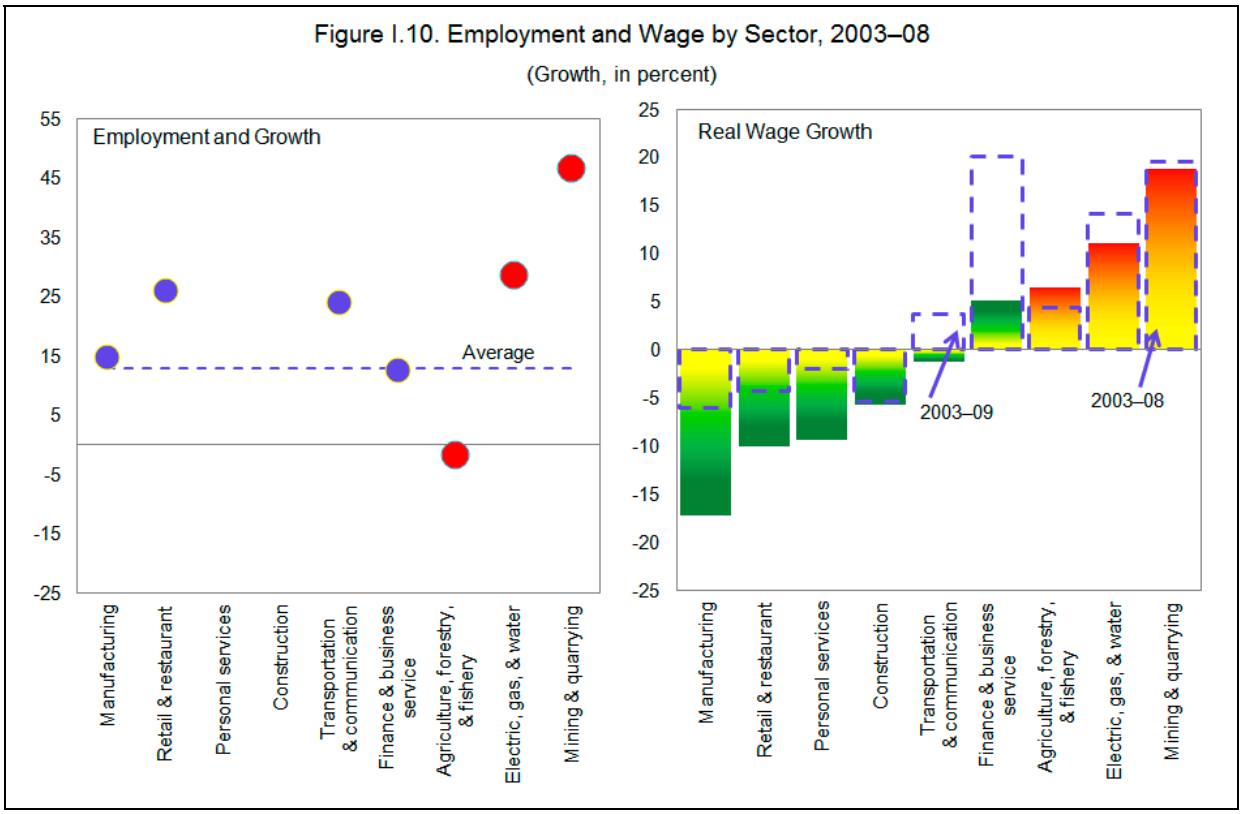
Figure I.9. Real GDP by Sector, 1993–2003
(Index 2003=100)



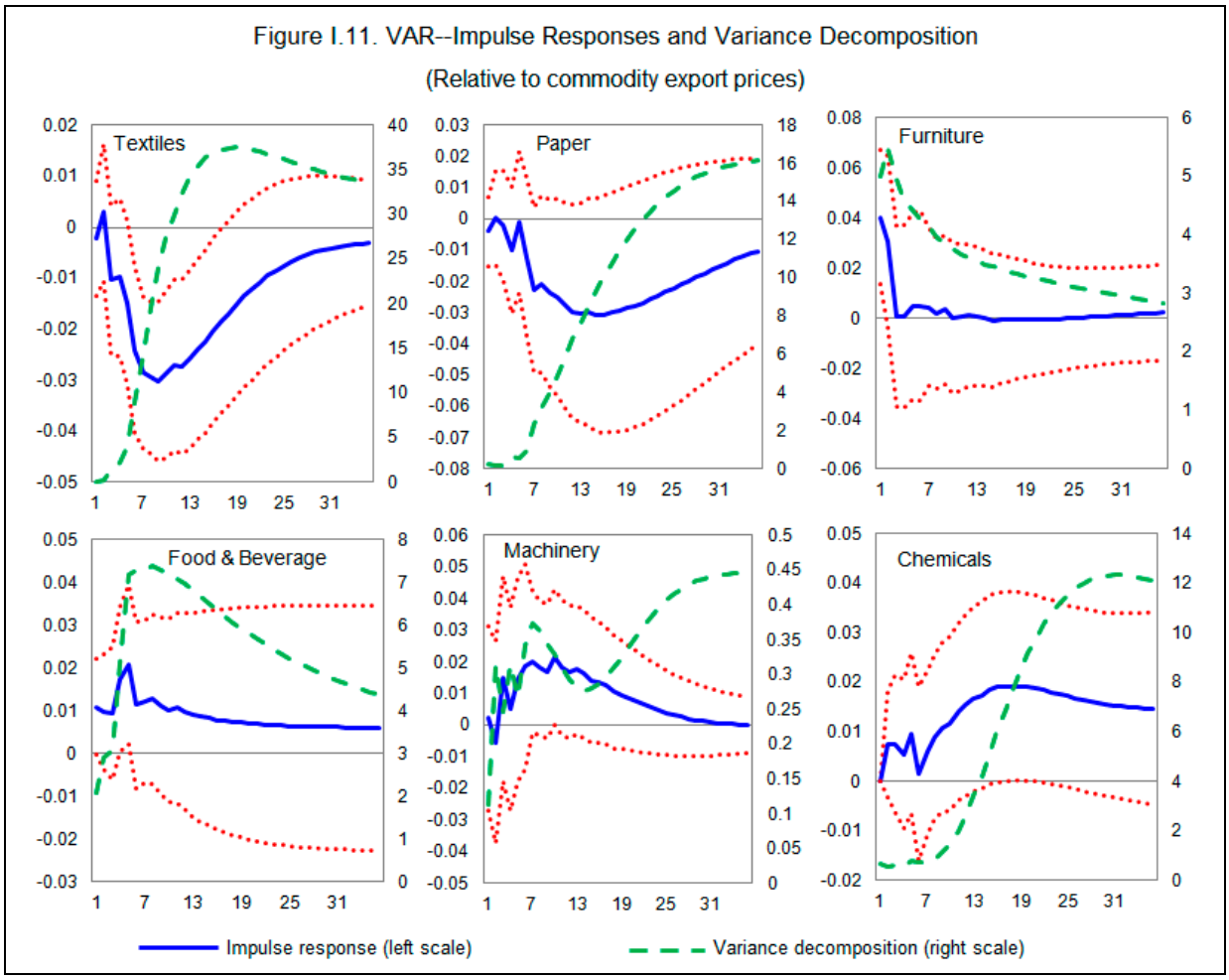
9. **Only recently, wages pressures have started to appear in the manufacturing sector**.[7] Consistent with the Dutch Disease hypothesis, wages in the commodity sectors (particularly in mining) have grown rapidly and outpaced those in other sectors in recent years. Employment in these sectors (except in agriculture, forestry and fishery) has also grown fast, and faster than in the manufacturing sector. Still, until 2008, wage pressures on the manufacturing sector had not materialized, partly reflecting one-off reforms that helped to lower wages in the sector.[8] In fact, wages in this sector decreased by about 15 percent in real terms during 2003−08, along with somewhat smaller decreases in service sectors, while real wages in the mining sector grew by 19 percent (Figure I.10). More recently, however, wage pressures have appeared in the service and manufacturing sectors, with the later showing real wage increases of about 13 percent during 2009 alone.

[7] Serious data limitations on wages and employment prevented more in-depth analysis of sectoral trends.

[8] Minimum wage setting was decentralized to the provinces, giving rise to inter-province wage competition in recent years.



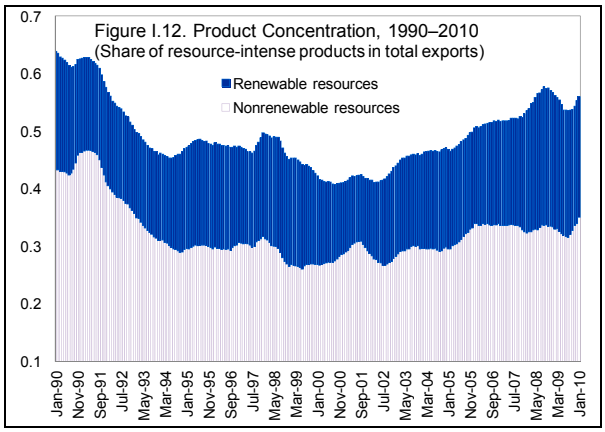
10. **Finally, econometric analysis also suggests there is little evidence of Dutch Disease**. A standard vector autoregressive (VAR) model is estimated to gauge the effect of commodity price shocks on output of key manufacturing sectors. The model is estimated for each sector with monthly data for the period 1993−2008 (until Lehman's crisis). Sectoral output is measured by the corresponding industrial production index. To control for possible correlation between commodity and sectoral manufacturing prices, the sectoral export price deflator is also included in the model. Finally, an index of total imports in trading partners—weighted by their share in Indonesia's exports—is introduced to control for external demand shocks. Results (Figure I.11) suggest that only the textile sector may have been affected by commodity price shocks (as indicated by the negative and statistically significant impulse response and the 35 percent of the variance explained by commodity prices). Other sectors do not display any statistically significant evidence of Dutch Disease. In fact, if any, the effect of higher commodity prices seems to be positive, reflecting some correlation of commodity and industry specific export prices, as well as likely inter-sectoral complementarities (e.g., machinery and chemical industries are closely linked to production in the commodity sector), although the role of commodity prices in explaining the variance in output is limited.

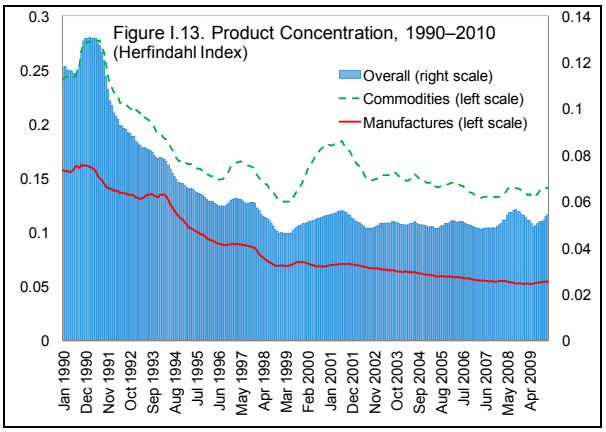


C. Is Increased Reliance on Commodity Exports a Source of Concern?

11. **Although there is no clear evidence of Dutch Disease, greater reliance on commodities raises questions about increasing vulnerability to terms of trade shocks** (Figure I.12). Despite increasing diversification within manufacturing exports, and to some extent within the commodity group as well, overall diversification has remained broadly constant for more than a decade—as indicated by the overall Herfindahl index of product concentration[9]—reverting the trend seen in the 1990's and early 2000. This reflected the fact that greater within-group diversification has been offset by increased reliance on commodities, which have a lower degree of diversification (higher Herfindahl index) than the manufacturing sector (Figure I.13).

[9] The Herfindahl index of product concentration is constructed from SITC 2-digit disaggregation groups.

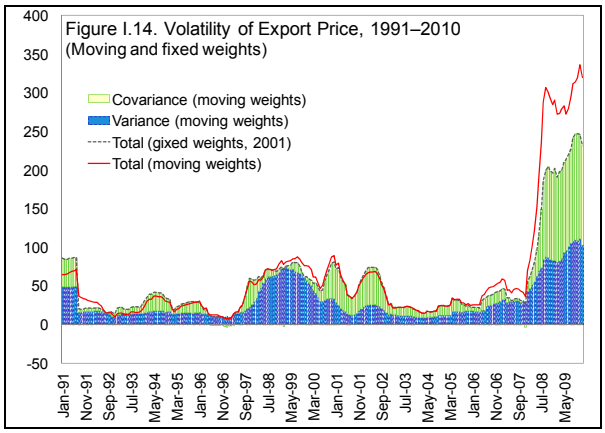


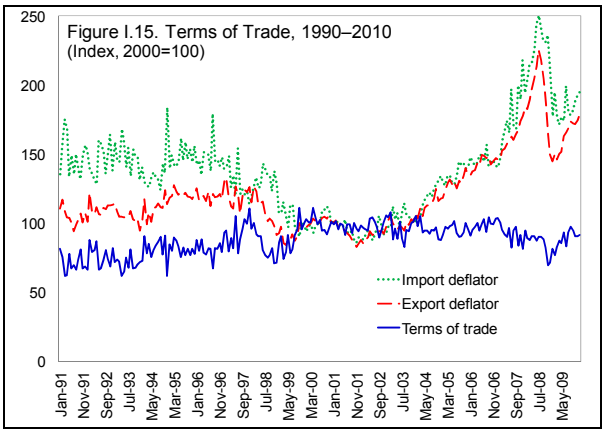


12. **Export price volatility has increased significantly, reflecting increased volatility in international prices as well as increased concentration in price-volatile products**. We construct an index of export price volatility that tracks the variance of main export prices over time, weighting them by their share in total exports (Figure I.14).[10] As expected, the index shows that volatility has increased significantly in the last couple of years, even before the sharp and generalized fall in commodity prices associated with the collapse in trade (after Lehman). This increase is explained both by heightened variance of underlying prices as well as increased correlation among them. As suggested by the difference between the index with fixed weights and the index with moving weights, increased reliance on commodity exports has significantly contributed to Indonesia's export price volatility, precisely because commodities display higher volatility than manufacturing products (even after detrending and seasonally adjusting them).

13. **However, Indonesia's terms of trade have displayed limited volatility**. Being also a significant importer of raw materials, Indonesia's import prices have also fluctuated sharply in recent years, and closely co-moved with export prices (Figure I.15). As a result, terms of trade have actually remained quite stable over the commodity boom period, as well as during the commodity price bust of the 2008 global crisis. This suggests that, despite significant exposure to commodities, Indonesia's external balances are likely to remain quite resilient to external price shocks.

[10] Based on the construction of the overall export deflator $(P = \sum_{i=1}^{N} p_i w_i)$, the vulnerability index is computed as $\sigma^P = \sum var(p_i) w_i^2 + 2\sum_i \sum_{j \neq i} covar(p_j, p_i)\, w_i\, w_j$, where P is the export deflator, p_i is product i's price deflator, w_i is product i's share in total exports and σ^P is the variance of P. As before, weights are fixed or allowed to move over time depending on the desired information. Variances and co-variances are measured on seasonally-adjusted and (HP-filter) detrended series of export deflators.





D. Conclusions

14. The unprecedented export boom preceding the 2008/09 global crisis, and the associated marked real appreciation and import boom, have raised questions about the impact of the commodity boom on other sectors of the economy, as a turnaround on commodity prices (and demand) could quickly lead to mounting external imbalances. An in-depth look at recent trade patterns, sectoral output and labor markets, however, does not point to an obvious case of Dutch Disease at this point, although there is evidence of pressures building in some sectors. While there is evidence of some stagnating manufacturing sectors, this does not seem to relate to the recent commodity boom, suggesting that other structural factors (e.g., infrastructure bottlenecks and labor market frictions) may have played a role. Still, increasing reliance on commodity exports could make the economy vulnerable to external price shocks, although the high correlation between export and import prices (reflecting a high commodity content in imports) go a long way in mitigating price shocks. Addressing structural problems will be key to foster growth in the manufacturing sector and diversifying the economy away from commodities, while still exploiting its comparative advantage.

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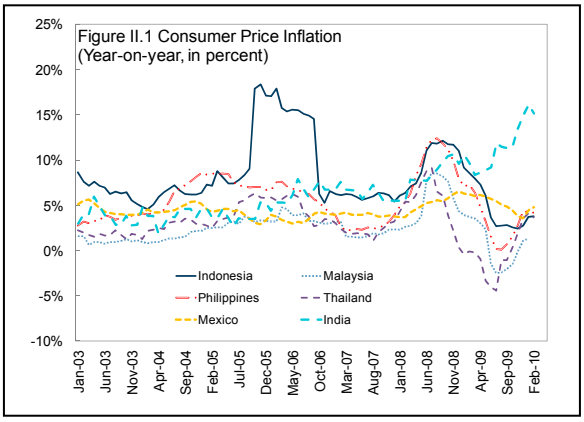
II. Inflation Uncertainty and the Term Premium: A Cross-Country Comparison[1]

Based on the term structure model for determining nominal bond yields, this paper identifies the impact on the cost of borrowing of Indonesia's relatively higher inflation level and volatility relative to its peers. The higher inflation volatility in Indonesia creates greater uncertainty in forecasting inflation, resulting in a relatively higher inflation risk premium.

A. Introduction

1. **Indonesia's consumer price inflation level and volatility have been historically higher than some of its peer emerging market economies**.

- Indonesia's consumer price (CPI) inflation has averaged nearly 12 percent since 1997 and 8½ percent since the formal adoption of the inflation targeting framework in July 2005 (Figure II.1). By comparison, inflation rates for some of Indonesia's Asian peers, such as Malaysia, Thailand, and the Philippines, have averaged about 3−6 percent since July 2005, while Mexico and Brazil had about 4−5 percent average inflation in this period.



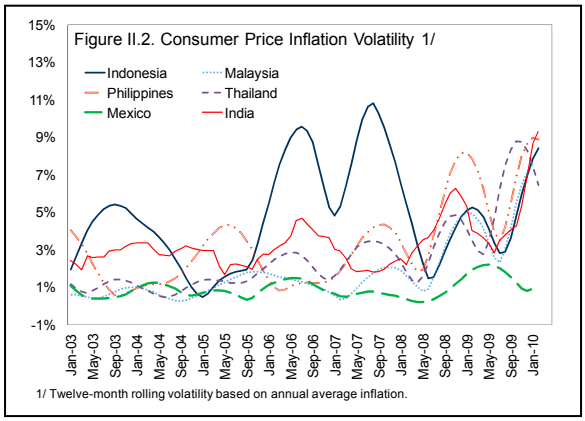
- Average inflation volatility in Indonesia has also been significantly higher than that of peers (Figure II.2). The spikes in Indonesia's inflation volatility are correlated with administrative price adjustments (Table II.1). Even core inflation in Indonesia has been highly volatile, as second round effects from administered energy price increases pass through to the broader economy (correlation coefficient between core and energy inflation=0.75).

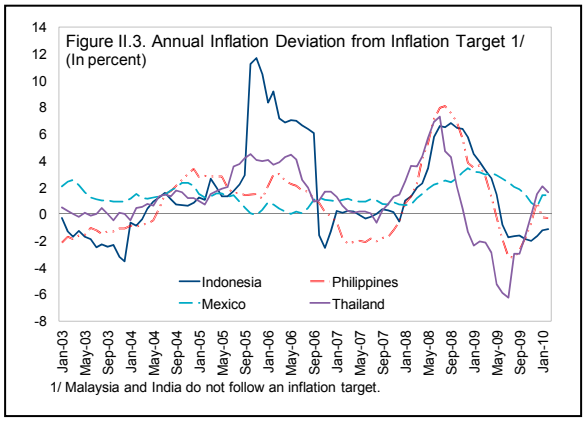
Table I.1. Administrative Price Adjustment
(In percent)

	Feb-05	Oct-05	Jun-08	Dec-08	Jan-09
Gasoline 88	32.6	87.5	33.3	-12.5	-14.3
Kerosene	0.0	185.7	25.0	0.0	0.0
Auto diesel	27.3	104.8	27.9	-6.4	-6.8

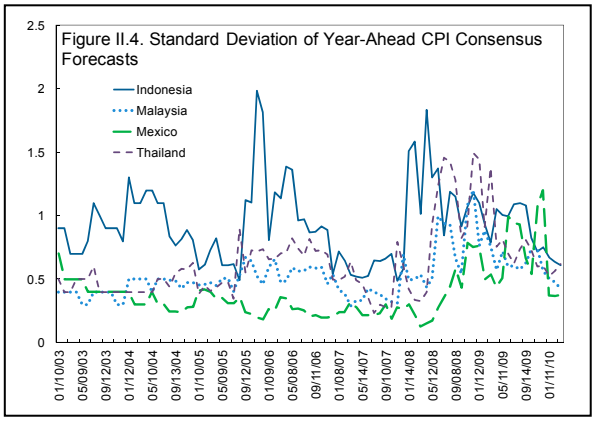
[1] Prepared by Laura Lipscomb and Uma Ramakrishnan.

Deviations of the inflation outcome relative to annual inflation targets—which have typically been adjusted in anticipation of administrative price increases—are higher on average than those of the comparator group (Figure II.3).





2. **Historical volatility of Indonesia's inflation appears to contriubte to uncertainty over estimates of its future inflation**. The dispersion of CPI survey forecasts can be used as a proxy for uncertainty about these forecasts.[2] Based on Consensus Forecasts, the 12-month moving average standard deviation of forecasts for Indonesia's year ahead CPI has been historically much higher than those for Malaysia, Mexico, and Thailand (Figure II.4).[3]



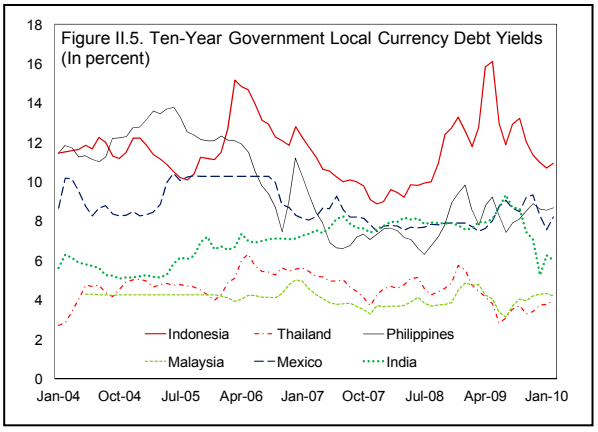
3. **Theoretical and empirical evidence show that high volatility and unpredictability of inflation create economic costs**. Studies have identified a negative relationship between both the inflation level and its volatility relative to income growth.[4] Among the channels through which high and volatile inflation create economic costs, is

[2] Wright (2009) and Durham (2006), among others.

[3] Dispersion for the Philippines is not shown due to lack of a long time series in Consensus Forecasts.

[4] For example, see Judson and Orphanides (1999).

a higher cost of capital.[5] Indeed, Indonesia's domestic (and international) borrowing costs have been higher than those of comparable emerging market economies (Figure II.5).[6]



4. **Against this background, this paper examines the term premium on Indonesia's domestic government yields relative to that of peers to illustrate the impact of inflation uncertainty on borrowing costs**. The term premium—i.e., the nominal premium sought by investors to compensate for delaying consumption (real term premium) and for inflation uncertainty (inflation risk premium) as explained in more detail in the next section—is calculated using two methodologies for Indonesia relative to other countries. The paper finds Indonesia's distant-horizon forward rates (which abstract from the near-term monetary policy stance) are consistently above those of its peers. The findings suggest that Indonesia's term premium is on average higher than its peers, as would be expected given higher inflation uncertainty. The results carry useful information for policymakers since enhanced monetary policy credibility has been found to lower term premiums on developed country government yield curves and, by extension, borrowing costs to the wider economy.

B. Literature and Framework

Literature

5. **A domestic economy's benchmark borrowing cost is usually determined by government borrowing rates**. Government bond yields comprise an average expected future real short-term interest rate over the length of the bond, expected inflation over the length of the bond, and a nominal term premium. The nominal term premium is made up of a real term premium and an inflation risk premium. The real term premium is what investors demand for tying up their funds and delaying consumption. The inflation risk premium is what they demand as additional compensation for their uncertainty over expected inflation.

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[5] While a high level of inflation and volatility can be welfare reducing, it does not imply that low inflation and price stability are sufficient conditions to achieve higher growth, especially if the supporting economic and institutional environment is weak (see Acemoglu, and others, 2003).

[6] See Goyal R. and M. Ruiz-Arranz, "Explaining Indonesia's Sovereign Spreads," in IMF Country Report No. 09/231 (http://www.imf.org/external/pubs/cat/longres.cfm?sk=23147.0) for factors determining Indonesia's sovereign external spreads relative to its peers.

6. **Recent studies have used developed country yield curves to estimate term premiums and explain downward shifts in long-term borrowing costs**. These studies have grown out of the "conundrum" question as to why long-term interest rates in the U.S. and euro area countries underwent a sustained decline in the middle of the last decade. Kim and Wright (2005) show that much of the fall in long-term U.S. Treasury yields to 2004 can be explained by a fall in term premiums. Among the factors, they suggest as possibly leading to a fall in the term premium include increased attractiveness of longer-maturity obligations due to better anchored inflation expectations and a decline in the volatility of real activity, foreign official reserve purchases of developed country government debt, regulations that encourage pension funds to better match assets and liabilities, reduced home bias of foreign investors, and demographic trends. Likewise, in a cross-country study of developed country yields, Wright (2009) finds that those countries that reduced inflation uncertainty saw a decline in term premiums.

7. **These studies, however, note the difficulty of isolating the factor—either the real term premium or the inflation risk premium—driving down the nominal term premium**. For countries that issue inflation-indexed bonds, it is theoretically possible to isolate the inflation risk premium from the term premium, although, the relative liquidity of nominal versus inflation-indexed notes is a major factor distorting estimates. The difference between the distant-horizon forward rate derived from yields on a nominal government bond curve and a similarly derived forward real rate from the inflation-indexed government bond curve comprises expected inflation, a (forward) inflation risk premium, minus a liquidity premium that investors charge to purchase less liquid inflation-indexed securities.[7] With well developed surveys of inflation expectations for these countries, it is possible to identify the value of the inflation risk premium minus the liquidity premium. Given the lack of inflation-indexed bonds in a majority of emerging markets, so far such studies are limited.

Framework

8. **The analysis in this paper is based on a term structure model for determining nominal bond yields**. The basic relationship is defined as follows: the nominal forward interest rate (i) derived from government bond yields equals the sum of the expected short-term real rate (r^e), expected inflation (π^e), real term premium (r^{TP}), and inflation risk premium (π^{RP}). The sum of real term premium and inflation risk premium equals the nominal term premium ($r^{TP} + \pi^{RP}$). Thus, for a one-year forward rate:

[7] See Durham (2006) and Hordahl (2008) and their references therein for a review of previous studies.

$$i - (r^e + \pi^e) + (r^{TP} + \pi^{RP}) \quad (1)$$

As discussed above, the real term premium compensates investors for delaying consumption for one additional year, and the inflation risk premium is the additional premium investors demand to compensate them for inflation uncertainty.

Rearranging equation (1) gives a simple measure of the term premium:

$$(r^{TP} + \pi^{RP}) = (\text{nominal forward rate} - \text{expected real short rate}) - \pi^e \quad (2)$$

The term premium is estimated as the n-year forward rate less the expected future short rate less expected inflation. The advantage of using distant-horizon forward rates is that they abstract from the current monetary policy stance and near-term monetary policy expectations.

9. **For the countries in the study, a number of data approximations were made to estimate the term premium**.[8] Accordingly, two methodologies are applied to extract term premium estimates from nominal bond yields. In both methodologies, distant-horizon nominal forward rates are calculated using local currency government debt yields. Given data limitations, the findings are best interpreted as a relative measure—i.e., the level of Indonesia's term premium relative to other comparators—rather than an absolute estimate of the term premium for each country (see also footnote 10).

- **Methodology I**: The term premium identified in equation (2) is estimated using monthly data as follows.

  - The distant horizon forward rate is calculated as the one-year rate, nine years forward, which is called the "one-year forward rate" for simplicity. It is calculated using 9- and 10-year government debt yields.[9] The forward rate formula is

    $$f(m,n)= (D(n)*Y(n)-D(m)*Y(m))/ (D(n)-D(m)),$$

    where f(m,n) is the forward rate between m- and n- period bonds, D(n) is the duration of the n-period bond, D(m) is the duration of the m-period bond, Y(n) is the yield on the n-period bond, and Y(m) is the yield on the m-period bond.[10] For

[8] In addition to Indonesia, the paper estimates term premiums for Malaysia, India, Philippines, Thailand, and Mexico. Methodology I is not applied to India because of the absence of bond yield data of contiguous maturities necessary to estimate a one-year forward yield.

[9] Generic government yield time series are used as constructed by Bloomberg (i.e., each benchmark 10-year bond yield rolls into the new issue).

[10] In the absence of zero-coupon yields, it is assumed that duration equals maturity, i.e., D(n)=n and D(m)=m, for the 9- and 10-year bonds. A test was done using precise duration calculations for several data points and the

(continued…)

this study, the maturities used were n=10 years and m=9 years.[11] As already noted, a distant horizon one-year forward rate, rather than a one-year government bond yield, is used because distant horizon rates abstract from the short-term monetary policy stance relative to the cyclical position. If the bond yield under consideration were to include short-term monetary policy expectations, isolating the term premium would be rendered even more difficult.[12]

- ♦ The short-term expected real interest rate is proxied by a time-invariant rate that reflects the underlying real interest rate in the economy. To calculate this rate, the one-month central bank bill rate and actual annual core inflation are used.[13] [14] The monthly real rate is then averaged for the period from January 2001 to February 2010.[15]

- ♦ As a proxy for expected inflation, it is assumed that investors have perfect foresight: i.e., expected inflation was assumed to equal the 12-month ahead actual core inflation.

- **Methodology II**: This method offers an alternative estimate of Indonesia's term premium relative to its peers. For this method, it is assumed that the expected real

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magnitude of the difference in the forward rates was small. As this simplification is applied across all the countries in the study, the comparative findings have greater meaning than absolute estimates of the term premium. For a detailed derivation of this formula, see Campbell and MacKinlay (1997).

[11] In the absence of a complete data series on the 9- and 10-year government yields for the Philippines, the implied forward rate is calculated on the 4- and 5-year government yields.

[12] For example, the one-year government bond yield will comprise the actual current short-term rate (say one-month) and average expected short-term rates out to one-year plus a term premium. The one-month rate will be determined almost entirely by the current monetary stance, and expected future short-term interest rates will be determined almost entirely by expected monetary policy moves. The distant-horizon forward rate abstracts from monetary policy expectations and is comprised of a real return to capital (the time-invariant real rate used here), expected inflation, and a term premium.

[13] Using headline inflation is likely to bias inflation expectations upward and real rates downward due to the large spikes arising from the administered price changes. Using core inflation corrects this problem. Moreover, since the paper uses distant-horizon forward rates, future changes in core inflation are a better approximation of expected inflation over time.

[14] A time-variant real rate was not used because sporadic negative real rates during periods of high inflation distort the underlying long-term economic real interest rate. In addition, the real return to capital adjusts slowly based on the capital/labor ratio and thus a long-term average is more appropriate than monthly observations.

[15] In line with the explanation in footnote 14, the sporadic negative real rates are removed because they would otherwise bias the real rate downward.

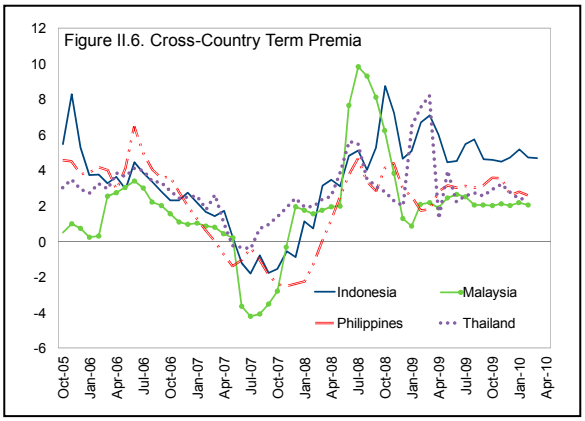
short-term interest rate is the same across comparator countries.[16] Thus, the following equation gives the *difference* in the five-year term premiums between Indonesia and a comparator country. The equation does not give the *level* of term premium for each country.

$$(\text{Yield}^{IDN} - E(\Pi)^{IDN}) - (\text{Yield}^{\text{Country Y}} - E(\Pi)^{\text{Country Y}}) \quad (3)$$

where Yield^{IDN} is the nominal five-year rate five years forward (or the five-year forward rate, to simplify) for Indonesia, $\text{Yield}^{\text{Country Y}}$ is the five-year forward rate for the comparator country, $E(\Pi)$ is expected inflation five- to 10-years ahead as reported in Consensus Forecast survey results.[17] The sample period runs from 2003 to present.

C. Results

10. **Analysis of forward rates based on Methodology I illustrates that Indonesia has a relatively higher term premium than its peers**. For the period June 2005 to February 2010, Indonesia's term premium has on average been higher than those for Malaysia, Philippines, and Thailand. Focusing on broad trends, although the term premiums for all the countries, including Indonesia, were trending down until about late-2007, Indonesia's term premium subsequently rose substantially more than those of other countries and has stayed at a somewhat elevated level relative to the comparator group (Figure II.6). Despite an increase in inflation volatility for all the sampled countries after the second half of 2008—when they were struck by the global food and fuel price shock of 2008 and the financial crisis in 2009—implying generally uniform shocks to all countries, Indonesia's term premium

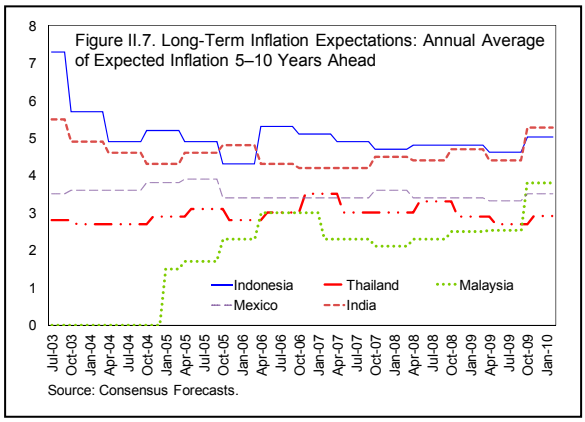


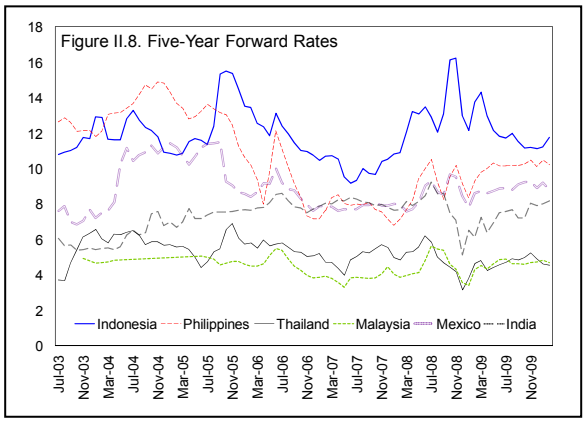
[16] Such an assumption is suitable for emerging market countries at broadly similar stages of economic and market development.

[17] The benefit of using long-term inflation expectations (e.g., average expected inflation 5−10 years ahead) is that these abstract from near-term factors that impact inflation expectations, such as administered price increases and commodity price pass through. Instead, long-term inflation expectations get to the level of inflation expected to be targeted/managed by monetary policy on average, over time. Five-year forward rates are used instead of one-year forward rates in Methodology II, because the five-year forward rate matches up with the 5−10 years ahead annual inflation expectations as reported by Consensus Forecasts. Forward rates are calculated as described under Methodology I.

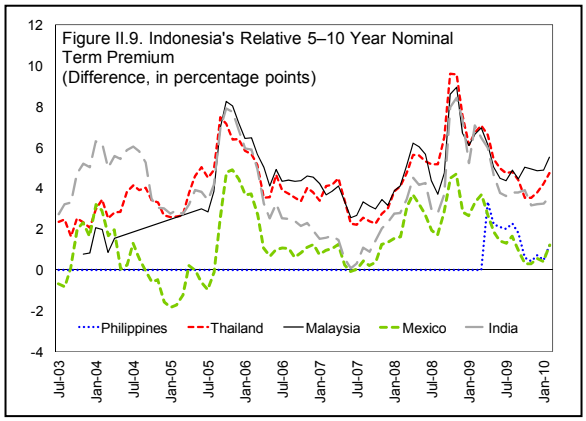
increase has remained persistently higher.[18] A simple regression of the term premium on core inflation volatility, with controls for seasonal movements, indicates that nearly two-thirds of the change in term premium during the selected time period arises from inflation volatility, suggesting that a higher inflation risk premium could be driving Indonesia's higher term premiums.

11. **Analysis of forward rates based on Methodology II also suggests that, on average, Indonesia has a higher term premium than its peer countries**. Through the period examined, Indonesia almost always had higher long-term inflation expectations than the peer group (Figure II.7). Indonesia also had higher forward rates than comparator countries (Figure II.8).





12. **The results from Methodology II also illustrate the extent to which higher expected inflation rates alone do not explain Indonesia's higher forward rates**. The additional returns that investors perpetually require in Indonesia in excess of the higher expected inflation ($E(\Pi)^{IDN}$) relative to the peer country ($E(\Pi)^{Y}$) are reflected in Indonesia's higher term premium relative to comparator countries (Figure II.9). With the exception of Mexico, whose five-year forward term premium sometimes exceeded that of Indonesia, the relative term premium for Indonesia has remained either broadly unchanged or slightly rising over the six-year sample period.



[18] This was also the time when the second round inflationary effects related to Indonesia's 2008 administrative price increase took hold.

D. Policy Implications

13. **Indonesia's perpetually higher term premium illustrates the cost to the government, and by extension to the wider economy, of investor uncertainty over inflation risk**. The higher term premium is not simply because investors expect higher inflation in Indonesia (estimating the term premium already accounts for the higher expected inflation using the actual 12-month ahead inflation in Methodology I, and survey expectations in Methodology II). Term premium estimates quantify the compensation investors require, on top of their expectations for inflation, for their relative inability to predict inflation, which poses an additional risk to their real returns.

14. **The term premium imbedded in the yield curve could be useful for judging the extent to which monetary policy is anchoring inflation expectations**. Large and persistent inflation fluctuations increase investor uncertainty about future inflation, and they demand a higher premium as compensation for this risk. If a government is paying a large term premium due to a high inflation risk premium, financing costs could be lowered by issuing inflation-indexed bonds.[19]

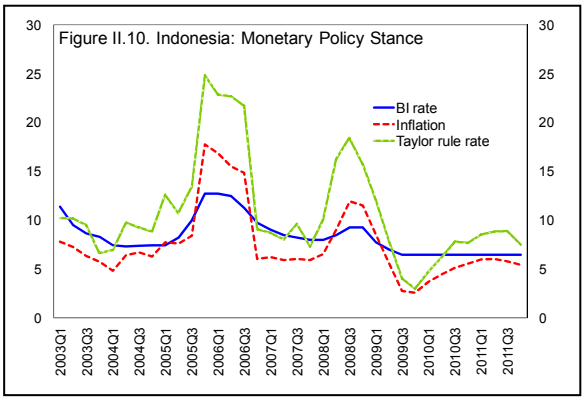
- The relatively higher inflation volatility for Indonesia and larger deviation of actual inflation from forecasts compared with other countries suggest that investors have a higher degree of inflation uncertainty for Indonesia. In addition, the dispersion of survey forecasts indicates that survey participants are more uncertain about their forecasts of inflation in Indonesia than for the comparator countries.

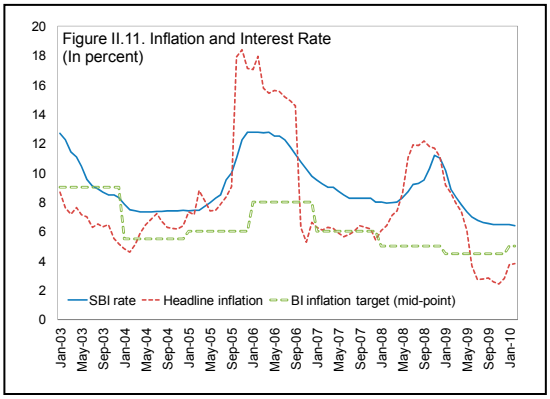
- An explanation for higher inflation uncertainty in Indonesia is that monetary policy has not anchored inflation expectations as successfully as monetary policy in the peer group. More specifically, ahead of the inflation bout in 2005/06—when one round of administrative price adjustments occurred—policy rates were low compared to Taylor rule estimates (Figure II.10).[20] This stance may have exacerbated the subsequent inflation pressures rising from the administrative price hikes, and there was a large miss relative to the inflation target. In 2008, while policy accommodation was likely

[19] The caveats are, however, that governments will have to pay out relatively more on inflation-indexed bonds if actual inflation ends up higher than inflation expectations imbedded in nominal bond yields, and also the liquidity premium demanded by investors to buy less liquid inflation-index bonds may erode savings from eliminating inflation risk premium. Of course, issuing a greater proportion of short-term debt would lessen the term premium the government pays, but doing so would raise rollover risks, reduce liquidity in remaining longer-dated issues, and eliminate an important benchmark for private sector long-term borrowing.

[20] Taylor rule estimates are derived using potential output measures based on the H-P filtering technique, and BI's annual inflation targets.

appropriate given external conditions, there was another large miss of inflation relative to target, when an administrative price hike occurred in tandem with the global food and fuel price shock (Figure II.11). Notwithstanding the limitations of the estimated Taylor rule, these two episodes combined with ongoing political discussions about the timing and extent of future administrative price hikes, could be contributing to higher perceived inflation risks. Even in the current low global and domestic inflation environment, Indonesia's term premium remains higher than comparator countries. This difference is likely related to investors' continued uncertainty over the likelihood that an appropriate level of inflation will be realized on average over time.





15. **How to anchor inflation expectations and lower the inflation risk premium?**

- As discussed in the literature, countries that established higher levels of monetary policy credibility saw a decline in the term premium on their domestic government debt. A relatively aggressive monetary policy response to emerging inflation pressures has a near-term cost to the economy in terms of dampening growth. However, in the long run, well anchored inflation expectations will help depress the nominal cost of capital by lowering both expected inflation and the inflation risk premium, supporting long-term growth. Greater monetary policy credibility will be established with a track record of meeting inflation targets.

- In addition, effective communication with market participants about how inflation targets will be set and met is also necessary to better anchor expectations. In particular, BI could improve the signaling of adjustments to the monetary stance, clarifying the monetary policy reaction function. For example, in recent communication, BI has announced its intent to remove accommodation only after inflation climbs outside the inflation target range. A communication that BI is

committed to meeting the middle of the inflation target band on average, over time would be more effective in dampening expected inflation volatility and the inflation risk premium. Targeting progressively lower levels of inflation going forward, in line with its trade partners, could help lower volatility and reduce Indonesia's borrowing costs.

- Gaining policy credibility also requires that monetary operations be consistent with the announced monetary stance. In recent months, although BI has been communicating a holding stance, the one-month SBI rate and the interbank rate have both been lower than the policy rate, suggesting at least some operational accommodation. Consistency and transparency of monetary operations in line with the announced stance are necessary to achieve policy credibility.[21] In this regard, the recent set of measures announced for liquidity management and interbank market development are steps in the right direction to help improve monetary operations.[22]

[21] Poirson (2008) delves into these issues in the discussion of monetary policy communication for India.

[22] On June 16, 2010 Bank Indonesia announced measures which include a one-month minimum holding period on SBI's, lengthening of SBI maturity including the introduction of 9- and 12-month bills, a widening of the interest rate corridor by a 100 basis points to 200 basis points, a one-month term deposit facility, and an initiative to facilitate tri-party repo trading.

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III. ENHANCING FINANCIAL STABILITY[1]

1. **Indonesia has made great strides since the Asian crisis in improving macroeconomic and financial stability**. As a result, the financial system has withstood the contagion from the global financial crisis and Indonesia was one of the best performing economies in 2009. Nevertheless, the FSAP team identified a number of vulnerabilities and recommended key measures to boost financial stability in the following three areas: bank regulation and supervision, crisis prevention and resolution, and BI's financial autonomy (Appendix III.1). Above and beyond specific financial sector issues, progress in enforcing the rule of law, especially creditors' rights, is an overarching consideration to improve the performance of the Indonesian economy with critical implications for the ability of the financial system to function efficiently. This paper summarizes the main recommendations and conclusions of the recently completed review of the financial sector under the Financial Sector Assessment Program (FSAP). These conclusions are placed in a broader context by describing the substantial improvements in financial stability achieved over the last ten years and drawing on cross-country experience in key areas.

A. Major Achievements Since the Late 1990s

2. **Since the late 1990s, bank regulation and supervision have been strengthened substantially in Indonesia**. Improvements include stricter loan classification and provisioning, tightened related-party lending limits, a higher capital adequacy requirement, and a tightened foreign exchange open position limit. In particular, the capital requirement was raised from 4 percent to 8 percent of risk-weighted assets by 2001. Empowered by the 1999 BI Act, BI has taken measures to improve banks' transparency and corporate governance; enhance on-site and off-site supervision; and institute fit-and-proper tests for controlling shareholders and bank management (Morales, 2007). More recently, BI launched a "second generation" of reforms. These initiatives include the development of a new rating system architecture and methodology to support individual bank risk assessments; the implementation of consolidated supervision; and a progressive move toward Basel II.

3. **The improvements in banking regulations and supervision are also reflected in banks' financial position.** Despite a mild slowdown in economic activities in 2009, preliminary data show that banks reported a robust 1.8 percent return on assets after tax. The capital adequacy ratio stood at 17.5 percent, well above the regulatory minimum of 8 percent and BI's informal target of 12 percent. The NPL ratio stood at 3.3 percent with reserve coverage of 62 percent.

[1] Prepared by Xiangming Li.

4. **The authorities have also introduced the main components of a comprehensive financial safety net (FSN**). These include: (i) a deposit insurance scheme, a deposit guarantee agency (LPS), and a bank resolution framework; and (ii) a Financial Stability Forum (FSF), with participation of BI, the Ministry of Finance (MOF) and the LPS to coordinate the government's actions regarding systemically important institutions. Nevertheless, it is important to further strengthen the FSN by passing the FSN law as noted in Section C.

B. Strengthening Banking Regulations and Supervision

5. The recently completed FSAP recommended strengthening the definition and calculation of regulatory capital and regulating interest rate risks. The FSAP's recommendations are informed and supported by the stress test results.

Stress Test Results

6. **In the stress test exercises, the banking system was put under a set of extreme shocks, representing tail risks, and proved to be resilient to all but the most extreme shocks owing to the existence of significant capital and liquidity buffers**. The stress tests included a scenario of a severe economic downturn and a number of shocks to market risk factors. The results show that the banking system is generally robust with banks most vulnerable to credit risk, followed by interest risk. While some banks are vulnerable to liquidity shocks, a few large banks are susceptible to concentration risk. However, exchange rate and contagion risks are not major concerns.[2]

Prudent Banking Regulations and Supervision

7. **The stress test underlines the importance of prudent banking regulations and supervision**. Given that credit risk remains the most potent, it is crucial to follow international best practices in asset classification and provisioning, and to ensure the quality of banks' capital. Banks' vulnerability to interest rate risk highlights the importance of issuing a regulation on interest rates to limit the sensitivity of banks' portfolios to this risk.

8. **While the quality of banking supervision has increased significantly in recent years, the assessment of compliance with the Basel Core Principles for Effective Banking Supervision (BCP) has identified a number of areas for improvement** (Appendix III.2):

[2] A full discussion of the stress test scenarios is contained in the staff report for the 2010 Article IV Consultation.

- Progress should be made by ensuring that all items included in capital meet the required permanence and availability to cover losses and that risk weights properly reflect the quality of banks exposures.

- Strengthen the regulatory definition of exposure and eliminate exemptions from prudential limits, including related party exposure.

- Upgrade asset classification and provisioning norms, including the treatment of restructured loans.

9. **In addition, the authorities need to address deficiencies arising from application of nonstandard risk weights to ensure that there are no capital shortfalls on this account during the transition to Basel II**. BI plans to implement Basel II in the next five years, deploying Pillar 1 in 2011, Pillar 2 in 2012–2014, and Pillar 3 in 2011–2014. Initially a simplified approach will be adopted. Basel II is a complex framework with three mutually reinforcing Pillars. Pillar 1 minimum capital requirements need to be complemented by Pillars 2 and 3. Any revisions to the Basel II framework by the Basel Committee on Banking Supervision (BCBS) would also need to be properly reflected. Consistent with the BCP assessment findings, BI also needs to improve its supervisory capacity with regard to the oversight of banks' risk management systems. In addition, Indonesia's adoption of new accounting standards based on IAS 32 and IAS 39 should be managed and implemented carefully as they potentially affect banks' capital.

C. Crisis Prevention and Resolution

10. The FSAP recommends that Indonesia adopt a prompt corrective action regime to reduce undue delays in resolving problem banks, strengthen the financial safety net law, and ensure coordination of macro-micro supervision.

Prompt Corrective Actions

11. **Through the establishment of a prompt corrective action (PCA) regime, emerging problems can be quickly contained**. However, such a regime must be grounded in law to give it legal power. Currently, there is no time limit for a problem bank to remain under intensive supervision before being transferred to special surveillance, under which it must be rehabilitated or have its license withdrawn within nine months. With protracted action plans and weak legal protection for supervisors, a bank tends to remain troubled for an extended period and is rarely placed under special surveillance. This process raises the expected cost when the bank finally fails. PCA, which mandates corrective actions when a problem emerges, has the added benefit of giving supervisors additional protection by making explicit the required actions when certain trigger points are breached.

12. **Besides curtailing supervisors' discretion and reducing political interference, the PCA provides banks with incentives to maintain high capital and reduce risk exposures**. Because measures for capital restoration and resolving failing banks are mandated, PCA limits the scope for forbearance and provides some insulation from political pressure against taking tough measures. In terms of incentives to banks, moderately well capitalized banks have the incentive to strive for a higher capital level so as to reduce the intensity of supervision; struggling banks are encouraged to improve their capital level to avoid being placed, at least temporarily, under the control of regulators, or, worse, being closed or merged with other institutions.

13. **The U.S. experience with PCA implementation has been viewed as effective in promoting financial stability**. Benston and Kaufman (1997) noted that regulators acted in a more timely manner to impose corrective action against poorly performing institutions and to resolve failing institutions in the 1990s following the enactment of the FDICIA. As a result, the level of NPLs and the number of troubled banks declined significantly. The ratio of book value capital to assets for the banking sector climbed above 8 percent at the end of 1993 for the first time since 1963.[3] Aggarwal and Jacques (2001) show that PCA standards, along with restrictions on the activities of undercapitalized banks, have reduced the risk level in both the adequately capitalized and undercapitalized banks. Both groups have increased their capital ratios, and accelerated their adjustment to the desired leverage ratio.

14. **PCA has been adopted by many countries, including some Asian countries** (Appendix III.3). Evidence from the experience of the United States in the 1980s and early 1990s suggests that PCA was effective in promoting financial stability. In addition, although not politically popular, quicker sales and resolutions, on average, achieve higher present values than delayed sales and resolutions. Therefore, following its banking crisis, Japan enacted PCA in 1998, as did Korea. Most recently, Thailand implemented PCA when the Financial Institution Business Act was adopted in 2008. PCA has been implemented in many Latin American countries such as Brazil, Mexico, and Peru, and its adoption is also being considered by many European countries (Eisenbeis and Kaufman, 2007, and Mayes, 2009).

Strengthen the Financial Safety Net

15. **Many elements of a financial safety net (FSN) have been put in place**. These include a lender-of-last-resort (LOLR) facility, an explicitly limited deposit insurance scheme, and a Financial Stability Forum (FSF) with the participation of BI, the Ministry of Finance (MOF), and the deposit guarantee agency (LSP). However, in light of the potential

[3] Measured by market value, the capital to asset ratio increased even more as stocks were traded at about 80 percent of book value in 1990, and at close to150 percent of book value in 1996.

establishment of an integrated supervisory authority (OJK), it is urgent to pass a new FSN law that clearly defines a framework for dealing with banking and broader financial sector problems and the role of each authority. This law should be introduced together with any law establishing the OJK to ensure that a proper legal framework is in place for financial crisis prevention and resolution. In addition, the deposit insurance fund needs to be increased in proportion to its recently increased deposit coverage.

16. **An FSN law needs to address the following issues**:

- **Roles of BI and MOF as lenders of last resort and the access criteria to LOLR facilities**.

- **Crisis management framework**. The decision-making framework and procedures were introduced during the global financial crisis by a Presidential decree, which has since lapsed. Therefore, it is important to explicitly establish triggers for different types of enforcement and crisis prevention actions, including rules and procedures for dealing with both systemic and nonsystemic banks to increase transparency and promote timely decision-making.[4] In addition, with the possible establishment of OJK, the roles of the different authorities also need to be redelineated.

- **Legal protection for staff dealing with the resolution of problem banks**. Staff needs better legal protection against "second guessing" of their decisions as managing a failing bank is inherently risky. Concerns regarding the strength of the legal protection may inhibit the full use of the resolution powers contained in the LPS Act.

17. **The LPS fund needs to be increased in proportion to its increased coverage**. During the global financial crisis in late 2008, coverage of deposits was increased twenty fold to provide depositors with the appropriate assurance regarding the safety of their deposits. Similar measures were implemented by many countries across the world. As a result of this expanded coverage, the ratio of the LPS fund to insured deposits has declined substantially. Even though LPS can seek a loan from the government when facing liquidity difficulties and an allocation of funds if capital falls below the original capital level, international experience shows that in countries where a deposit insurance fund is under-capitalized, problem banks tend to be bailed out or kept open.

[4] It is important to note that whether a bank is systemic or nonsystemic may depends on the environment. For instance, at a time of high financial uncertainty, some normally nonsystemic banks could become systemic.

Ensure Coordination of Macro and Micro Supervision

18. **The recent global financial turmoil highlights the importance of complementing micro-prudential supervision with macro-prudential supervision**. The common exposure of financial institutions to risks and hence the covariance of such macroeconomic risks can create systemic events, as occurred in some countries in response to a run-up in real estate prices. The objective of micro-prudential supervision is to limit the likelihood of the failure of individual institutions, or to reduce "idiosyncratic risk." It cannot capture the common exposure of the system. In contrast, macro-prudential supervision aims to limit the costs to the economy resulting from financial distress, and to lessen the likelihood of the failure, and corresponding costs, of significant portions of the financial system. This is often loosely referred to as limiting "systemic risk." Monitoring the potential impact of individual institutions' behavior on financial system stability and financial infrastructure, as well as the linkage between financial institutions and financial markets, is an integral part of macro-prudential supervision.

19. **Macro and micro supervisions share common aspects, but also can have conflicts**. For example, by insuring that individual institutions are "safe and sound," micro supervision should reduce the system-wide risks or the risk of failure of a financial institution that has systemic implications. In addition, the two approaches share some common tools such as liquidity requirements, minimum capital standards, and loan provisioning requirements. However, micro-supervision, which is intended to reduce an individual institution's risk, could amplify institutions' tendency to over-expose themselves during financial booms and become overly risk-averse during financial downturns, with a resultant drop in lending and herding into assets deemed safe, leading to overvaluation of such assets.

20. **Central banks are well suited for assuming responsibility for macro-prudential supervision**. This is because of their expertise and analytical capabilities in monetary and financial stability analysis, as well as their closeness to the money and financial markets. The linkages between monetary policy and prudential policy, as well as the interactions between the financial system and the real sector further strengthen this rationale.

21. **Ensuring macro and micro coordination will be essential for financial stability before and after the establishment of the OJK**. A permanent coordination mechanisms would cover the following aspects:

- **Clear legal mandate**: To the extent possible, the responsibilities of BI in macro prudential supervision and OJK in micro supervision should be delineated in their respective laws. To monitor macro financial stability, BI must be able to continuously monitor large banks and financial conglomerates that are systemically important. Therefore, there would need to be some overlap in BI's and OJK's responsibilities.

- **Coordinated regulatory policies**: As noted above, the macro and micro regulations share some policy instruments, and their objectives might be in conflict at times. Therefore, it is important that macro and micro policy be coordinated and any differences be settled in the Financial Sector Coordinating Committee (KSSK) chaired by the Minister of Finance, as envisaged under the FSN Law.

- **Fluid information flows**: Safeguarding financial stability will require fluid two-way communication and coordination between OJK and BI. BI needs to continuously monitor individual banks' liquidity, including their balance sheets and their participation in the payments system and the interbank and foreign exchange markets. BI will need access to this data on a continuous real-time basis; OJK will need data with regularity but typically with less frequency. BI also needs to continue monitoring individual large banks and financial conglomerates that are systemically important; this need is recognized in the draft OJK Law. The protocols to facilitate the coordination should be established by law.

- **Coordinated crisis management**: BI can use monetary and prudential policies to deal with emerging systemic problems. It needs to be able to spot weaknesses in bank liquidity and solvency, and prepare to take action that is both bank-specific and systemic in its LOLR capacity. OJK and BI need to cooperate closely to prevent a banking crisis from occurring and to deal effectively with any crisis if it were to happen. This will require a new legal framework for an FSN, as discussed in the previous section.

D. Promoting Bank Indonesia's Financial Autonomy

22. **The IMF/World Bank technical assistance on assets and liabilities management and FSAP team recommends that the nontradable government bonds held by BI be restructured into tradable bonds at market terms to enhance BI's financial independence**. Supported by prudent fiscal policy, BI has been successful in improving macro stability. However, the large stock of noninterest bearing government bonds on BI's balance sheet and the need to undertake extensive liquidity absorption could, in the extreme, potentially create a conflict of interest in BI's monetary policy implementation, and should be rectified. Setting BI on a sound financial footing will promote continued improvement in macro stability, which is essential for a healthy financial system.

The Impact of Nonmarketable Government Debt on BI's Operations

23. **Corresponding to the large excess liquidity in the banking system, BI's balance sheet holds a large amount of nonmarketable government debt** (Table III.1). On the asset side, BI holds Rp 254 trillion nonmarketable government bonds (SUPs) that pay close to zero interest rate. These are bonds that BI received in exchange for the liquidity provisions to

banks during the crisis in the 1990s, and they account for more than one quarter of its assets. On the liability side, the stock of SBIs is Rp. 259 trillion, roughly matching the stock of SUPs. The interest cost of SBIs forms the lion's share of BI's expenses, leading to a deficit in some years (Tables III.2 and III.3).

Table III.1. Simplified Balance Sheet of Bank Indonesia, End-2009

(In trillions of rupiah)

Assets		Liabilities	
International reserves	620	Currency in circulation	279
Government bonds, marketable	25	Bank deposits	157
Other claims on government	254	SBI	259
(Nonmarketable bonds)		FASBI	86
Other assets (net)	16	Other liabilities	42
		Unrealized valuation gains/losses	9
		Capital and reserves	84
Total assets	916	Total Liabilities	916

Source: Bank Indonesia, Annual Financial Statements, 2009.

Table III.2. Simplified Income Statement of Bank Indonesia, 2009

(In trillions of rupiah)

	Amount
Revenue	29.7
Foreign reserves	25.6
Money market and credit and financing	2.6
Payment system	0.2
Banking supervisions	0.2
Others	1.1
Expenditure	30.8
Monetary operations	22.5
Payment system operations	4.0
Banking regulation and supervision	0.1
General and others	4.2

Source: Bank Indonesia, Annual Financial Statements, 2009.

Table III.3. Bank Indonesia Profit and Loss Outcome, 2005–08

(In trillions of rupiah)

	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Total profit/loss	2.6	17.6	2.9	1.5	0.7	16.2	31	-1.4	17.3	-1.0
Without extraordinary income/expenditure	27.1	7.6	2.9	-7.2	0.7	16.2	-6.9	-1.4	17.3	-1.0
In percent of GDP	1.9	1.1	0.2	-0.4	0.0	0.6	-0.2	0.0	0.3	0.0

Source: Bank Indonesia, Annual Financial Statements, 2003−2009.

24. **This large volume of nonincome bearing assets and stocks of SBIs can potentially compromise the effectiveness of BI's monetary operations**. The large stock of SBIs makes BI a net borrower from the domestic financial system, which may create a conflict of interest in BI's conduct of monetary policy. When a central bank is a net debtor with a weak balance sheet, financial considerations create a disincentive to raise interest rates when warranted by macroeconomic developments, especially when the central bank is subject to reputational risk if its operational balance were to deteriorate further. In extreme cases, the central bank could be tempted to subordinate its policy target to debt servicing considerations.

25. **Strengthening BI's balance sheet by a swap of SUPs with tradable bonds bearing a market interest rate not only enhances BI's operational independence, but also promotes capital market development**. Such an exchange requires no legislative changes and will have no impact on the consolidated sovereign balance sheet of the government and BI, holding maturity structure constant. The central bank's domestic debt is part of public domestic debt. From this vantage point, accumulated losses on the central bank balance sheet represent interest free credit to the government. Eliminating this financing source sets the correct policy incentive and, hence, touches on the core of central bank operational independence. In addition, with more tradable government securities on its balance sheet, BI would be able to use repos for liquidity absorption and, therefore, have greater flexibility in implementing monetary policy. Such a swap also provides an opportunity to develop an integrated strategy for managing public debt and, hence, promote market development, as it is beneficial to have only one issuer of bills and bonds.

APPENDIX III.1: FSAP RECOMMENDATIONS

1. **The FSAP made a series of recommendations designed to address the vulnerabilities that were identified during the assessment**:

- **Improve micro-macro prudential coordination while reforming the financial supervisory framework**. An integrated financial stability board is under consideration. While its form, along with the assignment of macro and micro prudential responsibilities, is still being debated in Indonesia, the recent financial crisis underscores the importance of close coordination among regulators.

- **Amend the BI Act and the Capital Markets Law to strengthen and enhance the scope of legal protection for bank supervisors and securities regulators**. The current law protects supervisory staff from any decisions taken in good faith. However, the onerous proof of "good faith" can nullify the protection in practice. Consequently, the threat of legal prosecution inhibits supervisors from taking timely corrective actions.

- **Enact crisis management legislation including protection for officials involved.** The Crisis Management Protocol, which was established by a presidential decree, functioned well during the crisis, but it has lapsed. Therefore, it is crucial to adopt a law ensuring prompt responses in times of crisis. The continued political wrangling over the decision to rescue a medium-sized bank at the height of the financial crisis underscores the importance of legally protecting decision makers and supervisors in discharging their duties.

- **Increase the deposit insurance fund to adequately handle the failure of at least two mid-sized banks through higher premiums or capital injection**. The deposit coverage was increased twenty-fold in 2008 to counter the contagion from the global financial crisis. As a result, the ratio of the fund's resources to insured deposits has declined substantially.

- **Submit to the House of Representatives (DPR) draft prompt corrective action (PCA) legislation to promote timely corrective measures**. PCA legislation has been enacted in a number of countries, including the United States and several Latin American countries, as a way for parliaments to limit supervisory discretion and restore confidence. Such rules have the added benefit of giving supervisors additional protection by making explicit that certain actions must be taken when specified trigger points are breached.

- **Issue and enforce regulations on interest rate risk in the banking book**. Stress testing shows that besides credit risk, banks are most vulnerable to interest rate risk.

- **Deal with insolvent insurance companies to avoid a systemic failure**. At least five insurance companies are insolvent. While the insurance industry is small, immediate and prudent corrective action against the insolvent companies is needed to forestall a systemic failure in the insurance sector, which could potentially spill over to the broader financial sector.

- **Strengthen the payments system legal framework**. The current framework poses a systemic risk in the event of a bank's bankruptcy. The law ought to clarify, among other things, who has access to the payments system. In addition, the concepts of netting, finality, and delivery-versus-payment (DVP) should be included for all types of transactions in the law rather than in regulations.

- **Strengthen BI's balance sheet by restructuring zero interest government debt into interest bearing debt**. This would set BI on a sound financial footing.

2. **Some gaps and weaknesses are not an immediate threat to financial stability, but could pose a risk in a sharp economic downturn**. Accordingly, the team recommends the following measures:

- Ensure adequate capital and provisions by (a) addressing deficiencies arising from application of nonstandard risk weights and tightening accounting definitions of Tier 1 capital; (b) strengthening the regulatory definition of exposure and eliminate exemptions from prudential limits, including related party exposure; and (c) improving asset classification and provisioning norms, including the treatment of restructured loans.

- Establish regular contact with domestic and foreign supervisors to strengthen consolidated supervision.

- Maintain capital adequacy requirements in line with the Basel I norms until Pillar 2 and Pillar 3 of the Basel II framework are operational; more generally, handle carefully the transition to Basel II and new accounting standards to ensure the right balance between various interactive elements.

3. **To promote financial development and provide adequate financing to the real economy, the FSAP also made a number of recommendations on improving governance, promoting capital markets, and developing market infrastructure**.

- Improve the selection process of BI's Board members. The current practice of drawing up a list of multiple candidates amongst whom the parliament designates the winner opens up competition on undisclosed criteria, frequently perceived as only partly related to the professional competency of the candidates.

- Amend the capital market law to augment regulators' independence and enforcement powers, including authority to assist foreign regulators, and to give them more expeditious access to bank accounts.

- Improve the price discovery mechanism of government bond trading. This will help develop bond markets, and provide a source of long-term financing to meet investment needs.

- Pass an insurance law to provide the insurance regulator with the power to seize control of insolvent companies' assets to protect policyholders.

- Improve the data quality and coverage of the national credit bureau; consider private credit bureaus.

- Ensure banks' compliance with PSAK 55 (IAS 39).

- Improve the certainty and speed of execution of collateral and of bankruptcy proceedings.

- Enact new financial reporting and accounting laws to regulate the accountancy profession, including qualifications for licensing and compliance with an internationally accepted code of ethics for accountants and auditors.

- Enforce the law requiring audited consolidated accounts for major corporations.

APPENDIX III.2: STRENGTHENING CAPITAL, ASSET CLASSIFICATION, AND EXPOSURE REGULATION

1. **The FSAP notes that the risk weights and the accounting definition of Tier 1 capital are not in line with Basel I levels**. Since March 31, 2006, BI has lowered the applicable risk weights for certain categories of assets below those prescribed under the Basel I rules. Applying risk weights consistent with Basel I would lower the CAR for the banking system by about 150 basis points to 16 percent from the current average level of 17.5 percent. In addition, the BI Tier 1 capital regulation allows for unrealized foreign currency transaction gains. No deduction is required for cross holding of equity and the equity holding of subsidiaries as part of credit restructuring.

2. **While there is no internationally agreed norm, it is advisable to exclude the following from Tier 1 capital to improve its quality and certainty**: (i) specific (designated for certain liabilities) reserves that neither the bank management nor BI had the authority to appropriate for meeting losses on an ongoing basis, and (ii) unaudited profit for the current year. Since net head-office and net inter-office funds of foreign banks can be fairly volatile and change from day-to-day, it would be useful to report system CAR excluding foreign branches. It is also prudent to require the Tier 1 innovative capital and Tier 3 bonds to meet certain standards, for example requiring the bonds to meet at least a certain maturity.

3. **The assets classification regime can be improved in the following ways**:

- Abolish the exemption limit (currently about US$1 million) for application of the uniform asset classification norm;

- Reduce considerably the exemption limit (currently about US$2 million) for asset classification determined by the three Pillar approach;

- Disallow the immediate upgrading of restructured doubtful or loss loans. Although the level of required provisions may be unaffected by the upgrade, it would still understate the severity of the reported loan classification within the NPL category;

- Provide disincentives for repeatedly restructured accounts in terms of asset classification, provisioning, and risk weights. Current regulations and implementation of provision requirements may produce a bias toward restructuring rather than a critical assessment of repayment likelihood, which could lead to serial restructuring. Some jurisdictions limit restructurings to two over a five-year period. BI may wish to review its policies to ensure conservative application of restructuring standards;

- Regulations may need to be enhanced to ensure the Board of Commission is actively managing troubled assets; and

- Consider requiring provisions for the secured exposure in light of the low loan and collateral recovery rate.

- BI may also consider whether additional criteria, such as a longer timeframe (rather than the current requirement of three payments) should be considered in judging whether banks are permitted to upgrade the asset classification status of restructured accounts to ‘current’ category.

4. **Definition of exposures can be strengthened in the following areas**:

- Undrawn balances on sanctioned loans;

- Interbank placements within Indonesia up to 14 days;

- Export bills of exchange under a issuance letter of credit accepted by a prime bank;

- Exposures covered by a prime bank guarantee that meets the specified norms;

- Placements at prime banks;

- Exposures guaranteed by the Multilateral Development Agency; and

- Temporary equity participation as a part of the restructuring package. For related parties, the definition of ‘exposure’ should be aligned with the above and any exemptions should be eliminated.

APPENDIX III.3: PROMPT CORRECTIVE ACTIONS IN THE UNITED STATES, JAPAN, KOREA, AND THAILAND

1. PCAs were first enacted in the United States in response to the savings and loans crisis in the late 1980s and early 1990s. Between 1980 and 1994, 2,912 banks and thrifts failed, costing the taxpayer $150 billion or 2.1 percent of 1994 GDP (Garcia, 2008). After Congress and the public had lost confidence in the supervisors, Congress passed the Federal Deposit Insurance Corporation Improvement Act (FDICIA) in 1991, instructing supervisors to take PCA and requiring FDIC to take the least cost method to resolve failed banks and to adopt a risk-based deposit insurance scheme, which imposes higher premiums on riskier banks. Mandatory PCA and least cost resolution are intended to minimize forbearance and political interference

2. Like the United States, Japan uses capital adequacy as the sole criterion for PCA (Tables III.3.1−III.3.3). However, the Japanese PCA is less stringent as no actions are mandated until a bank's capital falls below the mandatory minimum. In addition, no closure is required before capital reaches zero.

3. PCA in Korea and Thailand has two types of triggers: quantitative triggers tied to capital and qualitative triggers (Tables III.3.4 and III.3.5). The capital triggers in Korea share similar characteristics with Japan, but they also classify banks into categories based on qualitative assessment. The capital triggers in Thailand start at the minimum capital requirement, but closure is required before capital is exhausted. In addition, corrective measures are required in Thailand when banks violate other regulations.

A. United States

4. **The PCA in the United States has eight attributes**.

- Required measures become increasingly stringent as a bank's capital declines.
- Corrective measures are mandated by law.
- Banks are classified into 5 categories (Table III.3.2).
- Three capital measures are used: leverage ratio, Tier 1 capital, and risk-based capital, with the first two specified in the law and the third one added by regulation.
- Banks in the bottom three categories are required to take increasingly stringent measures.
- Closure within 90 days (can be extended twice) is mandated when the leverage ratio falls below 2 percent.

- Supervisors are held accountable by the inspector general, Congress, and the Government Accountability Office (GAO). Supervisors appear before Congress periodically and are audited by GAO. The Congress also investigates deficiencies in supervision.

- There is a systemic risk exception that would allow the FDIC to protect uninsured creditors. However, invoking this exception requires a two-thirds majority in the boards of both the FDIC and the Federal Reserve and the approval of the Secretary of the Treasury after he has consulted with the President. In addition, banks are required to pay a special assessment proportional to their total liabilities to recoup the additional costs incurred by this exception (Garcia, 2008).

Appendix Table III.3.1. United States: PCA Triggers 1/

	Total Risk-Based Capital 2/	Tier 1 Risk-Based Ratio 3/	Tier 1 Leverage Ratio 4/
Well capitalized	. 10	. 6	. 5
Adequately capitalized	. 8	. 4	. 4
Undercapitalized	< 8	< 4	< 4
Significantly undercapitalized	< 6	< 3	< 3
Critically undercapitalized		Tangible equity 5/	. 2

1/ See Table 1 in Aggarwal and Jacques (2001).
2/ Total capital is the sum of Tier 1 and Tier 2 capital. Tier 1 mainly comprises permanent shareholders' equity, i.e., common stock and disclosed reserves or retained earnings. Tier 2 comprises loan loss reserves, subordinated debts, asset revaluation reserves, hybrid capital instruments, etc. Total risk-based capital ratio is the ratio of total capital to risk-weighted assets.
3/ Tier 1 risk-based ratio is the ratio of Tier 1 capital to risk-weighted assets.
4/ Tier 1 leverage ratio is the ratio of Tier 1 capital to total assets.

Appendix Table III.3.2. United States: Measures Required Under Prompt Corrective Measures

Mandatory Provisions	Discretionary
Well capitalized (Zone 1)	
Adequately capitalized (Zone 2) 1. No brokered deposits, except with FDIC approval. 2. Risk-based deposit premiums increase.	
Undercapitalized (Zone 3) 1. No brokered deposits 2. Suspend dividends and management fees 3. Require capital restoration plan 4. Restrict asset growth 5. Approval required for acquisitions, branching and new activities 6. Limit access to the Federal Reserve's discount window	1. Order recapitalization 2. Restrict inter-affiliate transactions 3. Restrict deposit interest rates 4. Restrict certain other activities 5. Any other action that would better carry out prompt corrective action
Significantly undercapitalized (Zone 4) 1. Same as for Zone 3 2. Order recapitalization 1/ 3. Restrict inter-affiliate transactions 4. Restrict deposit interest rates 1/ 5. Pay of officers restricted 1/ 6. Prohibit the payment of subordinated debt.	1. Any Zone 3 discretionary actions 2. Conservatorship or receivership if fails to submit or implement plan or recapitalize. 3. Any other Zone 5 provision, if such action is necessary to carry out prompt corrective 7. Improve management. 8. Require divestitures.
Critically undercapitalized (Zone 5) 1. Same as for Zone 4 2. Receiver/conservator within 90 days 1/ 3. Receiver if still in Zone 5 four quarters 4. Suspend payments on subordinated debt 1/ 5. Restrict certain other activities 6. If a bank is, on average, critically undercapitalized for 270 days, then a receiver must be appointed unless it (i) has positive net worth, (ii) in substantial compliance with an approved capital restoration plan, (iii) is profitable, (iv) is reducing its ratio of nonperforming loans to total loans, and (v) the FDIC chairperson and the regulators certify that the bank is both viable and not expected to fail.	

Source: Benston and Kaufman, 1997; Weinstock, 2009.

1/ Not required if primary supervisor determines action would not serve purpose of prompt corrective "action" or if certain other conditions are met.

B. Japan

5. Following the bursting of the real estate and equity bubbles in the early 1990s, banks in Japan suffered from a rapid rise in nonperforming assets, leading to the failure of three major banks in 1997–98. All the other major banks also suffered severe losses. The banking crisis exposed hidden losses that were disguised previously. The authorities had to issue an explicit guarantee covering all bank liabilities and intervened in the three large banks and a number of smaller banks. In response to this crisis, Japan adopted the PCA as outlined in the amendment to the Banking Act and detailed in a regulation.

Appendix Table III.3.3. Japan: Outline of the Prompt Corrective Action (PCA) 1/

Class	Capital Adequacy Ratio		Actions
	With International Operations	Pure Domestic Operations	
1	Less than 8 percent	Less than 4 percent	To order the formulation of a management improvement plan (in principle includes measures to increase capital) and its implementation
2	Less than 4 percent	Less than 2 percent	To order such measures as below: Formulation of a capital increase plan Restraint or prohibition on paying dividends, or on paying bonuses to directors and senior overseers Restraint on the increase of total assets, and reduction of total assets Restraint or prohibition on receiving deposits at a high interest rate Prohibition on entering new business fields Curtailment of currently performing businesses Prohibition on opening new offices and curtailment of existing offices Curtailment of business activities of subsidiaries and overseas affiliate companies, and prohibition on establishing or holding such entities
2-2	Less than 2 percent	Less than 1 percent	To order to implement measures selected from the following: Significant increase in capital Drastic curtailment of business Merger or closure
3	Less than 0 percent	Less than 0 percent	To order to suspend the whole or a part of a banking business. However, the 2-2 class of actions can be taken in the following cases. (1) If the net value of assets, as with unrealized gains of financial institutions, is positive. (2) Even when the net value as with unrealized gains is negative, if the net value becomes clearly expected to be positive. Furthermore, even if a financial institution does not belong to this class, a business suspension order can be issued when the net value of assets, including unrealized losses, is negative or when it is clearly expected to become negative.

Sources: Paragraph 2, Article 26, Japan Banking Act; and Order on Providing Classification of FSA; and Ministry of Finance.

1/Actions for higher categories can be applied to financial institutions in category 2, 2-2 or 3 if they have already formulated management improvement plans that are deemed rational and also expected to achieve their goals in a relatively short time.

C. Korea

Appendix Table III.3.4. Korea: Prompt Corrective Framework

Triggers	Category 1	Category 2	Category 3
Quantitative Trigger			
Banks (CAR) Mutual savings (CAR) Insurance companies (solvency margin ratio) Securities companies (equity capital ratio)	Below BIS level(8 percent) Below BIS level (5 percent) 100 percent 150 percent	Below 6 percent Below 3 percent Below 50 percent Below 120 percent	Below 2 percent Below 1 percent Below 0 percent Below 100 percent
Qualitative Triggers			
Management evaluation	• Overall rating: 3rd grade or above and • Rating for asset quality or capital adequacy is 4th or 5th grade as a result of the management status evaluation.	• Overall rating: below 4th • (Same as left-hand column).	• Failing financial institutions provided by Article 2, Item 3 of the Act on Structural Improvement of Financial Industry • If judged as a distressed financial institution.
Others	• If obviously adjudged to meet the above-mentioned requirements due to serious financial incidents or bad loans.	• If it fails to faithfully implement its management improvement plan.	• If deemed either to be unable to or not to be implementing its management improvement plan
Corrective measures 1/	• Improvement in manpower and management. • Cost reduction • Restrictions on investments in fixed assets, entries into new business areas, and new capital investments; • Dispose of nonperforming assets • Increases in, or reductions of paid-in capital • Restriction on dividends • Allocation special allowance for credit loss	• Closure, consolidation, or restriction on the establishment of new business office • Downsizing • Restrictions on holding risk assets and disposals of assets • Divesture of subsidiaries • Demand replacement of officers • Partial suspension of business • Setting up plans on mergers, entries as a subsidiary under a financial holding company under the Financial Holding Companies Act, acquisitions by third parties, or transfers of all or parts of businesses; • Measures applicable to category three institutions	• Retirements of all or parts of the issued stocks; • Suspension of duties against officers and new appointments of administrators; • Mergers or entries into as a subsidiary under a financial holding company (including cases of being subsidiaries after establishing the FHC independently or jointly with other financial institutions); • Transfers of all or parts of businesses; • Acquisition of financial institutions by a third party; • Suspension of business within six (6) months; • Transfers of all or parts of contracts; and • Measures applicable to category two institutions.
Time line for measures	• Submit improvement plan in 60 days • Implement the plan within a year • Submit the quarterly implementation result of its plan	• Submit improvement plan in 60 days • Implement the plan within 1.5 year • Submit the quarterly implementation result of its plan	• Submit improvement plan in 60 days • Implementation period prescribed by FSC. • Implementation checked within 2 month

Source: Korea Banking Act Article 45-(4), Regulation on Supervision of Banking Business.

1/ Measures, such as suspension of all businesses, the assignment of all businesses, the transfer of all contracts and the retirement of all stocks, for Category 3 shall be limited to the case where the financial institution is a failing financial institution. A failing institution meets one of the following criteria: a) financial institutions whose liabilities exceed their assets; Financial Services Commission (FSC) or the Deposit Insurance Committee may determine that because of a massive financial scandal or nonperforming claims, the institutions' liabilities exceed their assets. In this case, the liabilities and assets are valued according to the standards set by the FSC in advance; (b) financial institutions which are under suspension of payment of claims such as deposits or redemption of money borrowed from other financial institutions; and (c) financial institutions which are deemed unable to pay claims such as deposits or redeem borrowed money without support from outside, including the Financial Services Commission or the Deposit Insurance Committee referred.

D. Thailand

Appendix Table III.3.5. Thailand: Prompt Corrective Actions

Categories and Actions	Article of FIA
When banks violate the FIA or regulations, Band of Thailand (BOT) could order banks to stop the violation and dismiss management	89
When a financial institution's actions or positions may cause damage to the public, BOT has the power to order corrective actions, order to increase or reduce capital within 90 days of receiving the notice, order to stop doing any or all activities temporarily within a given deadline, order to dismiss management, take control of the institution or close the institution	90
When a financial institution causes damage to the public, that is: (i) refuses to take corrective actions to comply with the FIA and regulations, (iii) in violation of prudential regulations such as capital requirement, securities holding, related party transactions, large exposure, assets classification, and provisioning (ii) falsifies financial reports, (iii) makes a loss, or (iv) BOT has reason to believe that the bank cannot maintain its capital level	92
BOT has the power to close banks that default on their payments	93
A financial institution should not pay a dividend and bonus when its capital level could fall below the minimum	94
When capital falls below the minimum requirement, the institution needs to submit a plan to BOT within 60 days. The plan needs to outline quarterly target that will increase the capital level to the minimum level within a year. The plan needs to be approved by BOT	95
When capital is lower than 60 percent of the minimum, BOT issues an order to control the financial institution. If such order causes a negative impact on the economy or the financial institution takes prompt actions to increase the capital to the minimum level, BOT may not have to issue a control order. If a subsidiary of the institution is insolvent or misses three regular payments in three consecutive months, BOT can order the institution to liquidate the subsidiary	96
When capital is lower than 35 percent of minimum capital, BOT should issue an order to close the business, unless such order causes a negative impact on the economy	97

Source: *Thailand Financial Institution Business Act B.E. 2551* (A.D. 2008).

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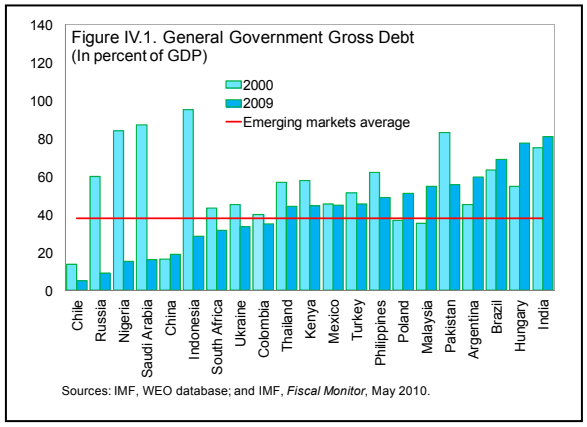
IV. Maintaining Fiscal Sustainability Under Uncertainty in Indonesia[1]

Indonesia's public debt outlook is stronger than in many advanced and emerging economies. Nevertheless, Indonesia, like many other emerging economies with relatively low debt levels, is still exposed to shocks. This paper presents considerations for setting up a fiscal strategy, aimed at maintaining sustainability, while managing uncertainties and risks. Stochastic simulations confirm that a medium-term fiscal consolidation strategy, based on subsidy reduction and revenue administration reforms in line with the authorities' framework, is robust to macroeconomic and oil price shocks. However, delaying subsidy reforms could increase fiscal vulnerabilities in the context of rising fuel consumption, volatile oil prices, and oil production shocks.

A. Introduction

1. **Indonesia's public debt outlook is stronger than in many advanced and emerging economies**. The public debt-to-GDP ratio has been on a declining trend over the last decade and fell to 29 percent in 2009, well below the average for emerging and advanced countries (Figure IV.1). Prudent fiscal management, resulting in sustained primary fiscal surpluses (1.6 percent of GDP per year on average over last decade), combined with favorable debt dynamics supported continuous reduction in the debt ratio, which in 2009 stood at about a third of its 2000 level. Foreign-currency debt has also been reduced to less than half of total debt, as the improved fiscal position facilitated domestic capital market access. The authorities' medium-term fiscal strategy targets further gradual fiscal consolidation and reductions in public debt. This strategy is based on improvements in tax administration and other base broadening with a reorientation of spending toward development of infrastructure with energy subsidies being phased out.



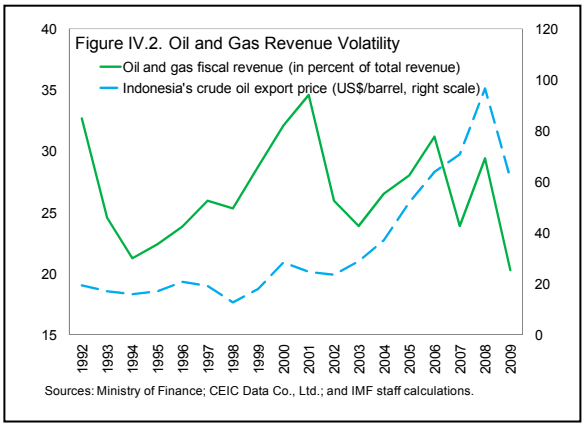
2. **Planning further reductions in debt/GDP over the medium term is a prudent strategy as the crisis has shown that even emerging economies with relatively low debt levels, like Indonesia, are still exposed to shocks and have low debt tolerance**.[2]

[1] Prepared by Nina Budina.

[2] Rogoff (2003) argued that "safe" external debt levels for emerging market countries with default and inflation history are rather low (as low as 15 percent of GNP in some countries).

- Maintaining a relatively low debt level may be needed given the potential for increased capital flow volatility.[3] For example, an increase in global risk aversion can trigger a sudden reversal of capital flows (as happened in late 2008), possibly dampening growth and leading to spikes in borrowing costs and high exchange rate volatility. For example, recent econometric evidence suggests that higher debt levels in advanced countries are likely to be accompanied by higher long-term real interest rates, which could adversely affect financing conditions in emerging markets.[4]

- Maintaining low debt levels is also needed given the narrow revenue base and still high exposure to shocks from volatile oil and gas revenue. Fluctuating between 35 percent and 20 percent of total revenues, oil and gas revenue remains a significant, but volatile source of income (Figure IV.2): the standard deviation of the annual real growth rate was more than five times the annual average real growth rate over 2000−2009, which cannot be explained with oil price volatility alone. Recent turmoil in commodity markets has highlighted the volatility of natural resource revenue. Uncertainty about relative prices also acts like a tax on investment decisions that imply a sectoral commitment (like building a steel plant).[5] This is particularly important in countries with relatively underdeveloped financial sectors, where risk sharing and obtaining bank financing during periods of illiquidity may be difficult to arrange. [6]



- Spending on fuel subsidies lowers fiscal policy effectiveness and can exacerbate the impact of oil price volatility on the economy. First, fuel price subsidies still comprise

[3] Rogoff (2008) used new data set to illustrate vulnerabilities of emerging markets, in particular, the fact that sovereign debt defaults are quite sensitive to global capital flow cycle.

[4] See IMF (2010), *Fiscal Monitor*. High debt ratios could increase long-term real interest rates by almost 2 percentage points, affecting negatively emerging markets financing conditions. In addition, high debt ratios are also likely to affect negatively potential growth in advanced economies, with possible consequences for emerging markets.

[5] See van Wijnbergen (1986).

[6] Recent literature highlights potentially negative impact of natural resource revenue volatility on growth in countries highly dependent on natural resources (Van der Ploeg and Poelhekke, 2009). Aghion and others (2006) have shown empirically that high volatility slows down productivity growth by a substantial margin in countries with a relatively underdeveloped financial sector.

a rather high share of total spending (about one third of total central government spending was spent on fuel subsidies over the last decade). Second, fuel subsidies are inefficient, inequitable, and environmentally unfriendly.[7] Third, spending on fuel subsidies is highly volatile and procyclically linked to energy prices—in fact, the standard deviation of their annual real growth rate was more than 4 times their annual average real growth rate during 2000−2009, well above the volatility of the oil price growth over the same period. In 2010, the government has discussed putting a ceiling on the amount of product that can be purchased at a subsidized price. But country experience has shown that rationing quantity may not be the best way to reduce subsidies as such an approach has high administrative costs, could possibly create a black market for fuel products and would require a mechanism for identifying and reaching target groups.[8]

3. **Assessing risks from these types of shocks is important when designing a medium term fiscal strategy amining at maintaining sustainability and managing risks**. Increased volatility in macroeconomic variables has the potential to increase uncertainty around projected public debt dynamics. In addition, the experience of many oil-exporting countries shows that high dependence on volatile natural resource revenue can lead to debt problems if markets become inaccessible in downturns. Finally, fiscal policy can help smooth rather than exacerbate oil price and revenue volatility therefore minimizing its potential negative impact on growth.

B. A Framework for Assessing Sustainability Under Uncertainty

4. **Risks from potential shocks have been assessed by using a framework for assessing fiscal sustainability under uncertainty, which also incorporates oil and gas revenue volatility**. This framework utilizes a stochastic simulation approach that derives the probability distribution of future debt stocks based on stochastic simulations of key risk variables (Box IV.1). The framework can also be expanded to include an endogenous fiscal policy reaction rule, whereby there is a partial adjustment of the primary balance to deviations from baseline levels.[9]

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[7] See Coady and others (2010); *Fiscal Monitor*, May 2010 (Annex 5); and Augustina and others (2008).

[8] Kojima (2009) documents Iran's experience with the introduction of smart cards to ration subsidized gasoline in 2007.

[9] For a detailed discussion and estimation of such a reaction function for the United States, see Bohn (1998) and Celasun, Debrun and Ostry (2006) for a panel of emerging markets.

Box IV.1. Framework for Fiscal Sustainability Under Uncertainty[1/]

The first step in such an approach is to create a baseline scenario of the likely future time path of the public debt, using the flow budget constraint equation. This equation updates future debt as a share of GDP, based on macroeconomic projections of key determinants of public debt dynamics: (i) non-oil primary deficit (net of seigniorage), (ii) oil and gas fiscal revenues, which involve projections of the oil and gas extraction profile, prices and taxation regimes, (iii) growth adjusted real interest payments on public debt, (iv) capital gains or losses on net external debt due to changes in the real exchange rate and (v) other factors, that can lead to debt accumulation.

$$\dot{d} = (nopd) - Roil + (r - g)d + e\,\hat{\alpha}d + OF \qquad (1)$$

Where *d-dot* is the (net) public debt-to-GDP ratio, *nopd* is the non-oil primary deficit as a share of GDP (net of revenue from seigniorage), *g* is the real GDP growth rate, *r* is the real interest rate on public debt, *e-hat* is the change in (bilateral, LCU per US$1) real exchange rate where e-hat>0 denotes a real exchange rate depreciation, and *Roil* denotes oil and gas fiscal revenues. Other factors (OF) could include off budget liabilities leading to debt increases—for example, implicit contingent liabilities (bank bailouts) and called guarantees.

The framework incorporates two different approaches to analyze uncertainty. To deal with vulnerability to specific shocks and assess robustness to extreme events, the framework provides a variety of *stress tests* (IMF, 2003). To get a broader view on the riskiness of the basic projections, the framework incorporates *stochastic simulation methods*, using empirical information about the distribution of the input variables (Celasun and others, 2005; Burnside, 2005; IMF, 2008; and Budina and van Wijnbergen, 2008).

The *stochastic simulation approach* to fiscal sustainability involves simulating the entire distribution of future debt stocks, based on stochastic realizations of key debt determinants (real growth rate, real interest rate, real exchange rate), and accounting for their variances and covariance structure. Using estimated parameters of the joint distribution of debt determinants, the distribution of these variables can be simulated jointly using Monte Carlo methods. This implies that for *n* variables and a horizon of *T* years, n x T random numbers are generated repeatedly until the generated and empirical distribution are sufficiently close (by default 5,000 runs are generated). And for each run, the model is applied to derive the full path of debt stocks and transform the generated random numbers in such a way that the resulting distribution conforms to the VAR estimates of the true distribution of the input variables. The default uses multivariate normal, but other distributions can be incorporated too. The probability density of the outcomes of the debt ratio in each year can be plotted from the stochastic simulations, generating a so called "fan chart" for the debt-to-GDP ratio.

1/ See Budina and van Wijnbergen (2008), Bandiera and others (2008), Celasun, Debrun, and Ostry (2006).

5. **This framework can be used to assess the impact of oil and gas revenue volatility on the fiscal accounts**. The model utilizes simulation methods to forecast the distribution and evolution of (net) public debt/assets explicitly accounting for oil and gas revenue volatility and expenditure policy. Projections of the oil and gas revenue stochastic profile can in turn be critical in formulating spending plans out of oil income. For example, fiscal policy in countries with *limited proven oil reserves* (e.g., Mexico) should be very different from the fiscal strategy in countries with vast oil and gas reserves (e.g., Russia and Kazakhstan) where price volatility is a more important challenge.

C. A Risk Assessment of the Medium-Term Fiscal Strategy

6. **This section applies the stochastic simulation approach to assess risks surrounding public debt projections under the authorities' medium-term fiscal strategy. The analysis is undertaken in various stages, with the aim of assessing sustainability of Indonesia's public finance outlook to shocks in oil revenues and fuel subsidies**. The first sub-section checks the short- to medium-term robustness of the baseline fiscal strategy to oil price risks and other macroeconomic risks. The second sub-section expands the analysis by checking the robustness of this strategy to oil/gas production shocks in a longer-term horizon and shows how an endogenous fiscal policy reaction rule can lower the uncertainty around baseline debt projections. The last sub-section illustrates risks of delaying fuel subsidy reforms.

Assessing Fiscal Sustainability and Medium-Term Risks

7. **This section assesses the robustness of the baseline fiscal strategy to shocks from a medium term perspective**. The baseline fiscal strategy is consistent with the authorities' medium-term framework and assumes gradual fiscal consolidation, supported by revenue administration reforms and elimination of fuel subsidies.

8. **The evolution of debt was forecast using the identity equation** (Equation 1, Box IV.1) that relates debt in year *t* to debt in the previous year, the non-oil primary balance and the projected oil and gas fiscal revenues in year *t*, and other stock-flow adjustments in year *t* and existing macroeconomic projections summarized in Table IV.1. As the non-oil primary balance declines in line with the oil revenue, this implies that the overall primary fiscal position will be in balance. The exchange rate is projected broadly constant, and will not contribute substantially to the change in the public sector debt ratio. The decline in public debt ratio is driven mostly by the favorable interest-growth differential.

Table. IV.1. Key Macroeconomic Indicators, 2010–2015

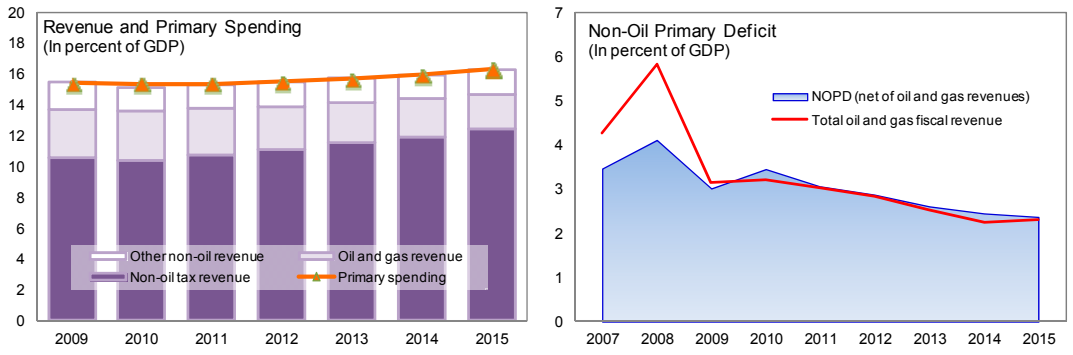
(In percent, unless otherwise indicated)

	2009	2010	2011	2012	2013	2014	2015
Real GDP growth rate (in percent)	4.5	6.0	6.2	6.5	6.7	7.0	7.0
Average inflation rate (in percent)	4.8	4.7	5.7	5.2	4.5	4.2	3.8
Indonesia crude oil price (US$/barrel)	61	75	77	80	82	83	85
Oil production (thousands of barrel/day)	960	965	970	970	974	979	994
Nominal GDP (trillions of rupiah)	5,613	6,288	7,061	7,914	8,827	9,839	10,923

Sources: IMF, *World Economic Outlook Database*; and IMF staff projections.

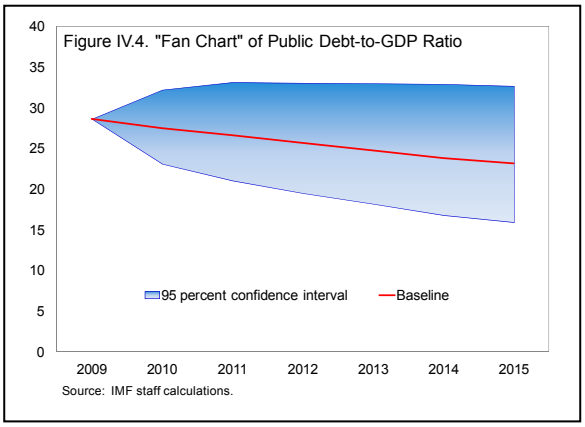
9. **The baseline scenario would lead to a moderate further decline in public sector debt**. Oil and gas revenues are projected to decline as a share of GDP, as oil and gas production is projected to be constant, oil prices are assumed to recover slowly, while nominal GDP will nearly double. The non-oil revenue to GDP ratio is projected to drop in 2010 (largely because of the tax cuts) and to recover later on as a result of revenue administration efforts and strong growth in the tax base. Public debt is likely to fall to about 27 percent of GDP, reflecting rupiah appreciation and robust economic growth. In the medium term, gradual fiscal consolidation—starting in 2011, based on subsidy reduction and tax administration reforms and continued strong economic growth—will support a further decline in public debt to 23 percent of GDP by 2015. Such a strategy will ensure gradual fiscal consolidation of the non-oil primary deficit to GDP ratio, but also accommodate extra resources for development spending (Figure IV.3).

Figure IV.3. Medium-Term Fiscal Strategy, Revenue, Spending, and Non-Oil Primary Deficit



10. **While overall risks from macroeconomic and oil price shocks appear quite limited, the stochastic simulations reveal some risks to the baseline that need to be kept in mind**. The framework runs Monte Carlo (MC) simulations using historical variances of five variables (changes in the real exchange rate, real borrowing costs of external and

domestic debt, the growth rate and the price of oil. The simulations indicate that the maximum likely debt ratio will be below 35 percent of GDP by 2015 within the 95 percent confidence interval (Figure IV.4). Importantly, this scenario assumes that oil/gas production levels will remain relatively stable and that the authorities will allow for gradual fuel subsidy reduction.



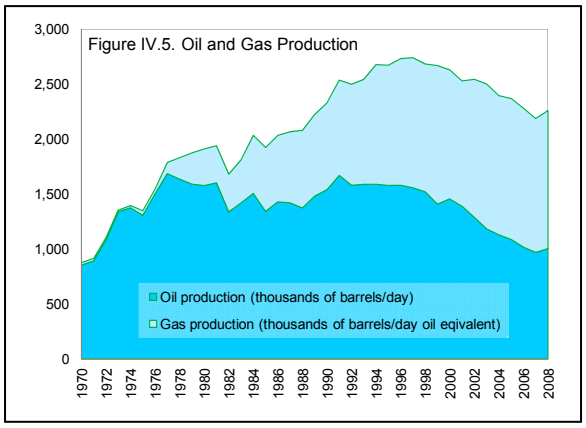
Assessing Fiscal Risks from an Oil/Gas Production Shock

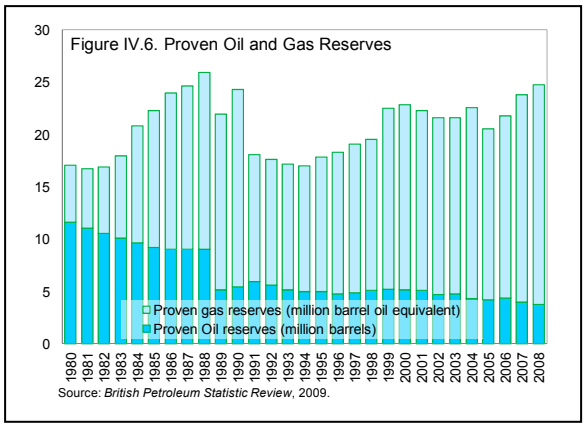
11. **This section extends the projection period to assess fiscal risks from an oil/gas production shock** (e.g., running out of oil reserves), in addition to other stochastic shocks, explored in the previous section. The analysis also extends to show how an endogenous fiscal policy reaction rule could be used to manage uncertainty around baseline debt projections.

12. **Oil and gas wealth in Indonesia is significant, but there is uncertainty around future oil and gas production**. Oil and gas production capacity expanded significantly over 1970−2000. However, since about 2000, oil production started to decline rapidly, while gas production remained relatively constant, possibly due to insufficient investment in the sector (Figure IV.5).[10] Proven oil reserves have declined a lot since the 1980s—from 11 billion barrels to 3.7 billion barrels as of end-2008—but have gone up recently to 4.4 billion barrels as a result of new oil discoveries, which can sustain slightly more than a decade of current oil production. Possible reserves could add another decade of current production. Proven gas reserves (3.18 BCM) can sustain 45 years of current gas production, while possible reserves could lengthen the gas production period further (Figure IV.6).[11] However, at current gas production, the gas fiscal revenue is only a relatively small fraction of total oil and gas revenue, which means that when and if oil reserves would be exhausted, a large expansion in gas supply capacity may be needed to maintain similar levels of oil and gas revenues, While large expansion of the gas supply capacity is possible, significant investment requirements and long gestation periods create considerable uncertainty surrounding the gas extraction profile.

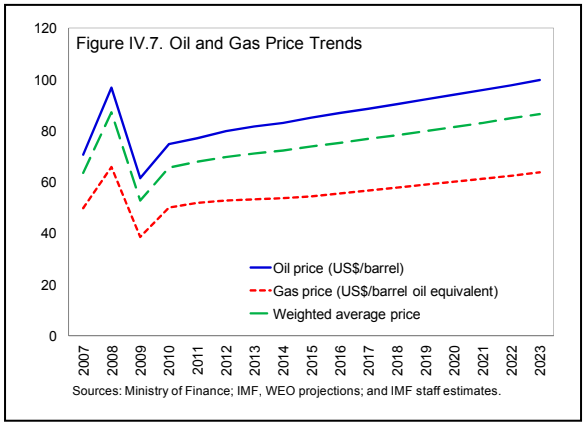
[10] See Augustina and others (2008).

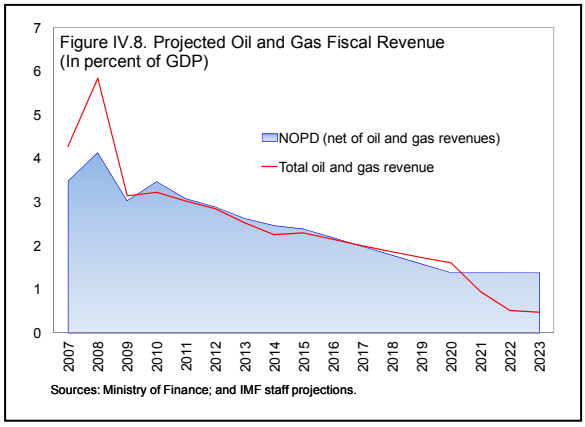
[11] See *BP Statistical Review of World Energy* (2009). Proven and possible gas reserves may be higher (see Embassy of the United States of America, 2008).





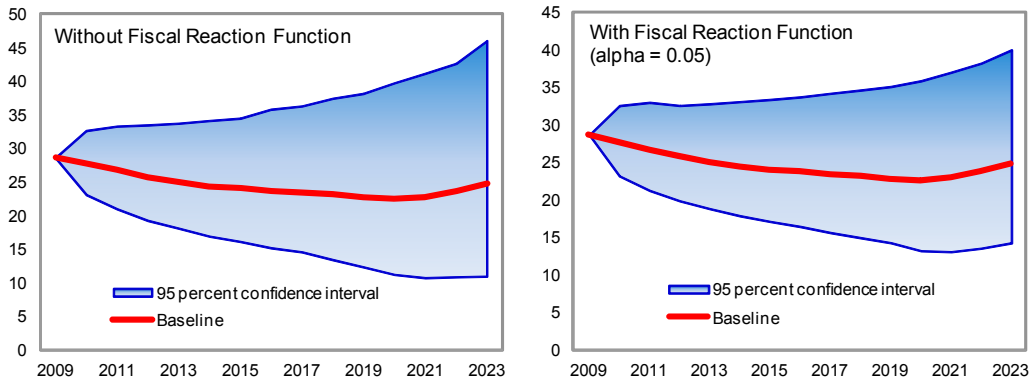
13. **Significant uncertainty surrounding the future oil and gas production profile adds to the challenge of managing oil and gas revenue volatility**. This scenario checks the robustness of the baseline fiscal strategy to a large oil production shock, resulting from oil reserves depletion, which is not compensated by higher gas production. Oil and gas price projections are the same as in the baseline, assuming constant real oil prices beyond 2015 (Figure IV.7). Based on these assumptions, oil and gas fiscal revenues drop sharply in 2021 as a result of the oil production shock (assuming no new oil discoveries, oil reserves are to be depleted by 2020). The simulations are built around the baseline strategy for 2010−2015 but assuming full elimination of energy subsidies and progress with revenue administration reforms. These reforms will support a gradual adjustment of the non-oil primary deficit to GDP (Figure IV.8), in line with declining oil and gas revenues.





14. **The baseline fiscal strategy is likely to be sustainable even after such a large shock to oil and gas production, but there are some risks**. Continuous adjustment in the non-oil primary deficit caused by a gradual reduction of subsidies and revenue administration efforts will prevent sizeable accumulation of public debt even after the oil production shock. However, there are higher uncertainties surrounding public debt projections. While the expected debt ratio is likely to remain below 30 percent of GDP, it is possible that the debt ratio could reach about 45 percent of GDP in 2023 within the 95 percent confidence interval (Figure IV.9).

Figure IV.9. "Fan Chart" for Public Debt-to-GDP Ratio--The Impact of a Fiscal Reaction Rule



Source: IMF staff calculations.

15. **Using an endogenous fiscal reaction rule can help manage uncertainty around the baseline debt projections by lowering the maximum possible debt ratio**. The impact of exogenous shocks will be smaller if the government can commit to take deliberate corrective actions as its debt stock rises. An endogenous fiscal policy reaction rule, adjusting the primary balance to deviations from the baseline debt level could be used to lower risks. An application of the stochastic analysis with such an endogenous fiscal reaction rule narrows the confidence interval around baseline debt projections—the maximum likely debt ratio drops to 40 percent of GDP (compared to about 45 percent before) in the 95 percent confidence interval.

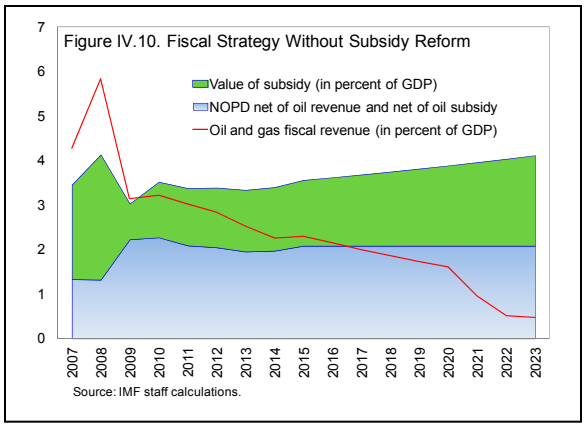
Assessing Fiscal Risks from Delayed Fuel Subsidy Reform

16. **In addition to production uncertainties, this section adds risks from delaying fuel subsidy reforms, in the context of a rapid growth in fuel consumption**.[12] This scenario checks the robustness of a fiscal strategy that is similar to the baseline, but in the absence of fuel subsidy reforms. Subsidies are modeled as a product of the tax-inclusive fuel price gap and fuel consumption. The model benchmarks the tax inclusive price gap—the difference between the tax-inclusive "market" price and the domestic price of subsidized fuel—as a function of the crude oil export price.[13] Furthermore, the demand for subsidized

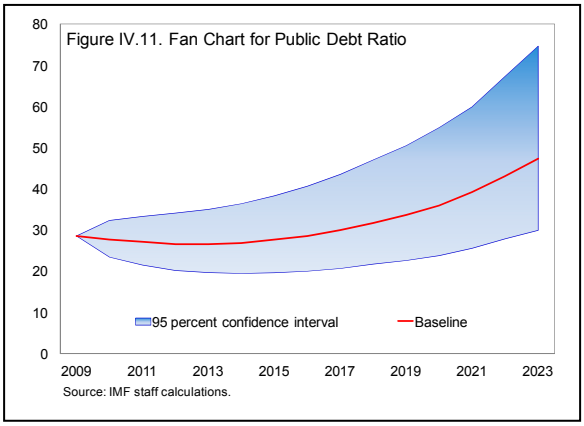
[12] For most recent estimates of fuel subsidies around the world, see Coady and others (2010).

[13] The tax inclusive price gap (the difference between tax-inclusive market price and the domestic subsidized fuel price) is benchmarked using the 2010 values for the benchmark price, the domestic administrative price and the June 2010 assumptions for crude oil prices. The tax-inclusive price gap in 2010 is estimated at about 40 percent of the 2010 crude oil price. Simulations assume that the tax inclusive gap remains at (40 percent) of the crude oil export price, but it will vary with changes in the exchange rate and crude oil prices. Note that an alternative assumption, whereby the administrative prices are fixed and independent of the crude oil price is likely to produce more extreme results but maybe less realistic over long periods.

fuel is assumed to grow faster than real income, outpacing oil and gas production in 2019.[14] Under these assumptions, fuel subsidies are likely to surpass the revenue from oil and gas in 2019. The non-oil primary deficit including subsidies is estimated to increase to about 4 percent of GDP, while oil and gas revenue is projected to drop (relative to GDP) over the projection period (Figure IV.10). This implies that beyond 2010 primary deficits will be steadily increasing, with a big jump in 2020 and beyond if oil reserves run out.



17. **Not surprisingly, simulations reveal that such an alternative scenario would imply an increasing debt accumulation process**. Rising primary deficits lead to increasing debt accumulation in each and every year after 2014, with public debt reaching 47 percent of GDP in 2023. Risks to public debt are large—with maximum possible debt ratio of 75 percent of GDP within the 95 percent confidence interval (Figure IV.11). This scenario shows how a delay in fuel subsidy reform, in combination with shocks to oil and gas revenue, can increase vulnerabilities and risks.



D. Conclusions

18. **Indonesia's fiscal and debt outlook has been remarkably resilient to the recent global financial crisis**. Public finance improvements, combined with relatively modest fiscal stimulus and strong economic growth, has supported a continuous decline in public debt and lowered the economy's dependence on short-term foreign financing. The benefits of this during global financial turmoil over the last two years are obvious. Nevertheless, risks to the public debt outlook still exist; managing these risks could enhance policy credibility further.

19. **This paper used a stochastic simulation approach to assess risks to the public debt outlook**. Specifically, this framework derives the probability distribution of future debt stocks based on stochastic simulations of key risk variables. An endogenous fiscal policy

[14] Fuel consumption is benchmarked to grow faster than real income, in line with the relatively high-income elasticity estimate found in Agustina and others (2008).

reaction function, which adjusts the primary balance to deviations from baseline level debt stocks, can also be used with stochastic simulations. Finally, the impact of oil and gas revenue volatility and the risks from delaying subsidy reforms are also assessed.

20. **The authorities' strategy of gradual fiscal consolidation is sustainable and likely to reduce public debt further in the medium term**. Importantly, such a strategy implies a gradual adjustment of the non-oil primary deficit in line with the declining oil and gas revenue ratio to GDP. This adjustment strategy is supported by revenue enhancements and fuel subsidy reforms.

21. **Risk assessment revealed that**:

- Risks to the debt outlook from macroeconomic and oil price shocks appear manageable in the medium term as the maximum likely debt level under stochastic shocks is relatively moderate**.** The fiscal strategy is robust to macroeconomic and oil price shocks, if supported by revenue administration reforms and fuel subsidy reforms.

- Over the longer term, lack of investments could result in stagnating gas production and declining oil production and an associated revenue drop. Fiscal risks are still manageable in this scenario but uncertainties are higher. Having an endogenous fiscal policy reaction would lower risks.

- These robust outcomes are only possible when the fiscal strategy is supported by fuel subsidy reforms. Fiscal risks from delaying subsidy reforms create fiscal vulnerability in the context of rapid growth in fuel consumption, combined with a negative oil/gas revenue shock from stagnating or even declining oil/gas production.

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