

**INDONESIA'S RESOURCES BOOM IN INTERNATIONAL PERSPECTIVE: POLICY DILEMMAS
AND OPTIONS FOR CONTINUED STRONG GROWTH**

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1. Introduction

The first decade of Indonesian democracy coincided with a virulent global resources boom. Indonesian participation in the boom was helpful to growth in average incomes after a difficult climb out of the financial crisis of the late 1990s. It also encouraged the emergence of economic structure, policies and features of the new democracy's political culture that made sustainable and equitable economic growth more difficult. With the resources boom retreating since 2011, Indonesia faces major challenges—but also the chance to deal with some longstanding problems of policy and development. This is the challenge and opportunity inherited by the Jokowi Presidency in October 2014.

In the eight years from 2003, the prices in real terms for most energy and metals and some agricultural commodities rose to the highest ever. The boom was caused by exceptionally strong and resource-intensive growth in China. The boom continued with only a brief interruption in the global financial crisis until Chinese economic development began to show the influence of a new model of economic growth from 2011.

Until the turning of the China resources boom in 2011, most resource-exporting countries experienced high terms of trade and strong growth in investment in expanding exports of resource-intensive goods. Incomes and sometimes output increased more rapidly. Most resource-exporting countries spent most of the increased income as it arrived, causing export and import-competing industries beyond resources to experience slower growth or decline.

Indonesia has an endowment of natural resources relative to population and capital stock that is intermediate between the low levels of Northeast Asia and the high levels of much of the developing world. But while Indonesia is not one of the most resource-intensive economies, its development was strongly influenced by the global resources boom.

Like all but a few countries, Indonesia was strongly specialized in exports of resource-intensive commodities in the early period of its modern economic development. Petroleum was the mainstay of early export growth under the Soeharto New Order government from 1966, reinforced by the oil price increases of the mid- and late-1970s (Hill 2000). While corruption reduced to some extent the amount of petroleum revenue that was available for public purposes, the balance nevertheless provided substantial support for broadly based development through public provision of education, health and agricultural services and

income support and subsidized provision of agricultural inputs. Substantial contributions were also made by metallic minerals and timber through the 1970s (Manning 1971).

This all changed with the collapse of global oil prices in the mid-1980s. With the withdrawal of opportunities for economic growth based mainly on exports of petroleum, Indonesia embarked successfully on reform to promote internationally-oriented industrialization of a kind that had underpinned development elsewhere in East Asia.

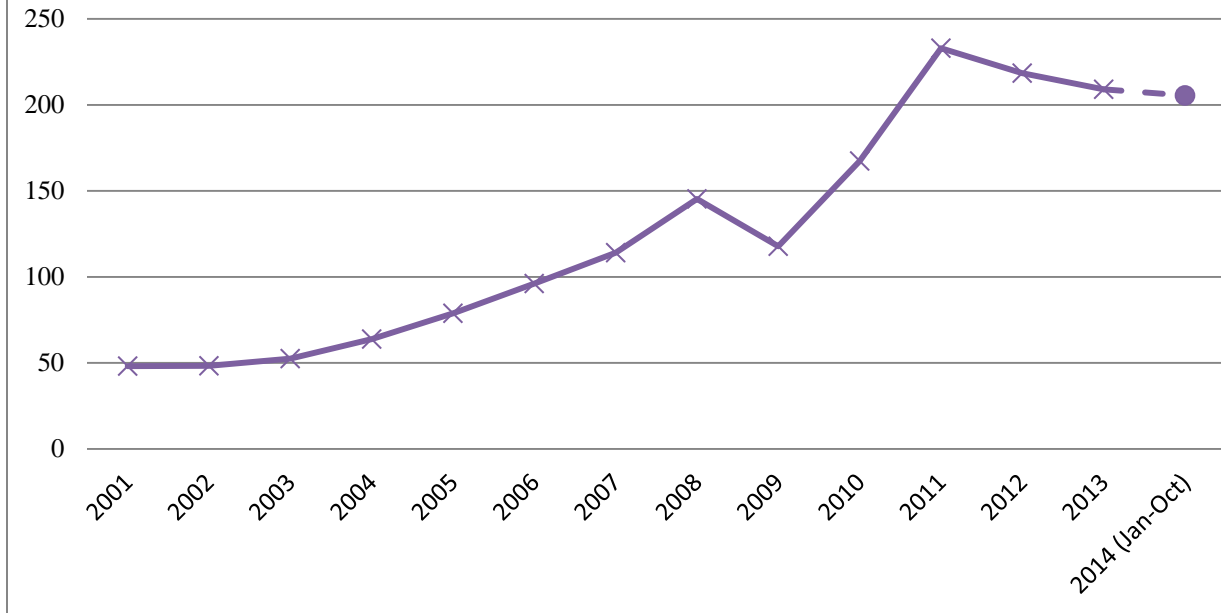
For more than a decade from the mid-1980s, internationally-oriented industrialization supported sustained growth in economic output in the vicinity of 6-7 percent per annum. The benefits were widely distributed through growth in demand for labour and the associated increases in employment and wages, supportive by considerable public expenditure directed at improving rural services.

The political as well as economic foundations of the rapid, broadly based growth from the mid-1980s were destroyed by the Asian Financial Crisis of 1997-9. Total Indonesian output fell by 13% in 1998 and the gains in reduction of poverty of the preceding decade were partially unwound.

The economic policy challenge facing Governments elected within the democratic constitution in the aftermath of the financial crisis was immense. It was a great achievement of President Yudhoyono in his first term of office from 2004 to demonstrate that economic policy to secure stable economic growth was possible in democratic Indonesia. The Yudhoyono economic team was working towards this end when the resources boom offered new opportunities for growth in the resource-intensive style.

There was then a partial reversion to specialization in exports of resource-intensive commodities. Indonesian exports in inflation-adjusted United States dollars more than quadrupled in value between 2003 and 2011 (Chart 1) and the commodities share of exports rose from 52 to 68 percent (World Bank 2015, Box 2). Indonesian average incomes grew strongly for a while without sustained focus on policies to support economic growth. This seems to have contributed to economic policy in President Yudhoyono's second term from 2009, being more heavily compromised than the first by pressures from vested and populist interests.

**Chart 1: Real Value of Indonesian Goods Exports
(US\$ billion; 2007 prices)**



Note: Total agricultural, manufacturing, energy and mining. Source : Indonesia Statistics Department Monthly Exim Report & Bank Indonesia Annual Report. US Goods Deflator from IMF International Financial Statistics (2007\$).

The challenge facing Indonesia now is in important ways similar to that following the fall in petroleum prices in the mid-1980s.

The next section of this paper describes the unusual rate and structure of Chinese growth in the early twenty first century and how this affected demand for energy and industrial raw materials. This period ended with China's adoption of a new model of development after 2011 (Garnaut, Song and Cai 2013).

Section 3 shows how global commodity prices rose to 2011 and then fell as the new Chinese model of growth affected demand. Section 4 examines the Indonesian supply response to changing prices. Section 5 focusses on the macro-economic impact of the resources boom and its aftermath.

Section 6 discusses how the resources boom encouraged interventions in the economy that damaged efficiency in resource allocation and prospects for long term growth. Section 6 also touches upon the emergence of tension between use of coal resources and Indonesia's interest in global climate stability, which could itself become a problem for growth.

Section 7 examines and compares the economic impact of the China resources boom in a number of resource-rich countries. It focusses especially on the macro-economic management of the boom. The focus is most strongly on Australia, since Indonesia and Australia became the

two major suppliers of thermal coal to global markets in general and China and Asia in particular.

The concluding section of the paper discusses whether the resources boom was curse or blessing or some of each. There are opportunities for Indonesia after the resources boom to enter a new era of broadly based development, but only in the context of far-reaching reform. Business as usual would see disappointment of the new Government's hopes for an acceleration of growth, and difficulties even in maintaining the rates of growth of recent years

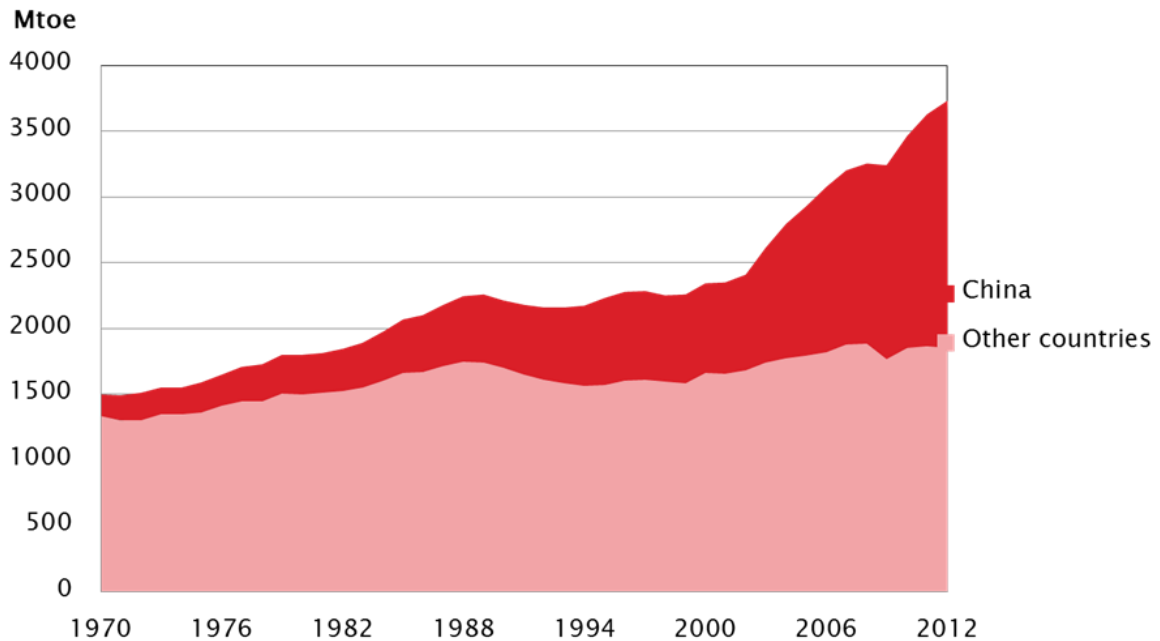
2. The China Resources Boom

In the first eleven years of this century, the world's most populous country experienced economic growth that was faster over a comparably long period and more resource-intensive than the world had ever seen. This underwrote extraordinary rates of growth in demand for almost all commodities. The effects were greatest for energy and metals, which the Chinese pattern of development required in unprecedented dimension. From 2003 until the Great Crash of 2008, exceptionally rapid Chinese expansion was accompanied by strong growth in demand outside China—in developed and developing countries alike.

The rapid increase in Chinese and global demand for energy and metals was broken briefly by the Great Crash in 2008 extending into 2009. However, China's immense fiscal and monetary expansion in response to the financial crisis returned the world to strong growth in demand from late 2009. From 2008, China accounted for virtually the whole of the increase in global demand for energy and metals: the global resources boom was a China boom (Garnaut 2012; 2014).

For the commodity that turned out to be most important in Indonesia's resources boom, coal, China accounted for most of the increase in global demand from the late 1980s to 2011, including for nearly all of the more rapid growth in demand from the beginning of the twenty first century (Chart 2). Fairly rapid rates of growth in demand in some other developing countries, most importantly Indonesia itself and India, were from a much lower base and were offset more or less completely by declines in demand in developed countries.

Chart 2: Coal consumption of China compared to other countries



Source: BP Statistical Review of World Energy 2013, International Energy Agency.

Chinese economic growth decelerated moderately after 2011. More importantly for the global resources boom, China came to use much less energy, especially coal, and metals, per unit of economic output.

Growing scarcity of labour and rapidly rising wage rates for unskilled workers in coastal cities from 2005 were an early sign that the old pattern of economic growth was under pressure (Garnaut 2010; Huang and Jiang 2010; Garnaut and Song 2006). Public discussion of economic policy from about this time saw increasing recognition that the old model of growth was generating increasingly unacceptable widening of income inequality and pressure on the local and global natural environment (Yu 2009; Huang et al 2013).

The Great Crash of 2008 eased for a while the pressures for a new model of economic growth. Pressures for change re-emerged when strong growth resumed in China late in 2009.

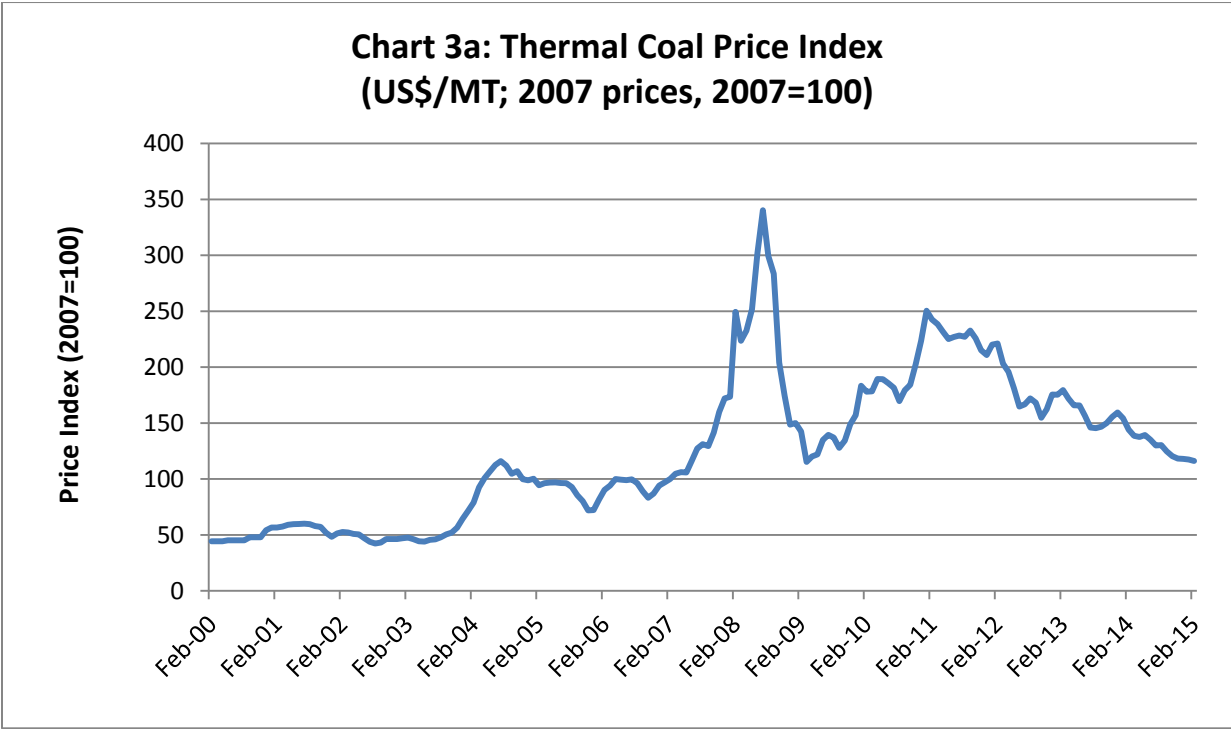
The 12th Five Year Plan 2011-15 became the overarching instrument for embodiment of new objectives into policy. By 2012, the new model's effect on energy and metals demand was apparent in the statistics on economic performance. The investment share of GDP began to fall. The standard measures of inequality began to fall after rising from the mid-1980s (Wang and Zhou 2014). Many fiscal and regulatory interventions encouraged greater efficiency in the use of energy and the substitution of all alternatives for coal in electricity generation. The publication in 2013 of a major study by the United States and Chinese Academies of Science showing that life expectancy was markedly lower in Chinese regions of intensive coal use intensified pressure for switching away from coal (Chen et al 2013).

After more than a decade of double digit increases, the growth in the amount of thermal coal used in Chinese power plants slumped to only a few percent in 2012 and 2013 and then a few percent negative in 2014 (Green and Stern 2015).

The shift of emphasis from investment to consumption within the new Chinese model of development means that moderately slower growth has much less effect on agricultural and services than on energy and metals demand. Total Chinese expenditure growth will settle a few percentage points below the giddy heights of the first eleven years of the century, but the share of consumption will rise. China will be a source of continuing strong increases in demand for high-value foodstuffs and services.

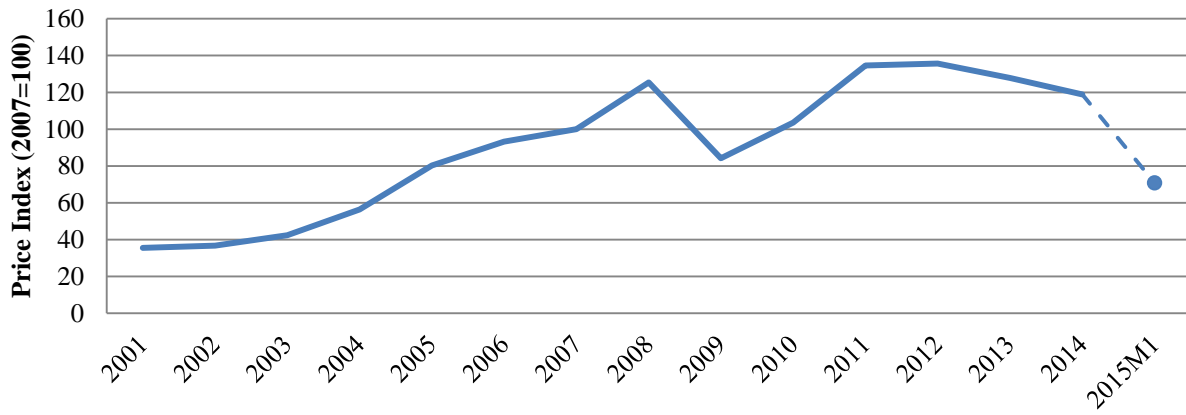
3. Global Prices

The strong growth in global demand that was led by China until 2008 and dominated by China after that caused global prices for energy and metals to rise rapidly from 2003 to 2011, with a brief interlude in the immediate aftermath of the Great Crash. The pattern was similar across all energy and metals as well as most agricultural raw materials: persistent large increases to 2011, broken by a dip in 2009, with a substantial fall from 2011 that continues today (Charts 3a, 3b, 3c, 3d and 3e).



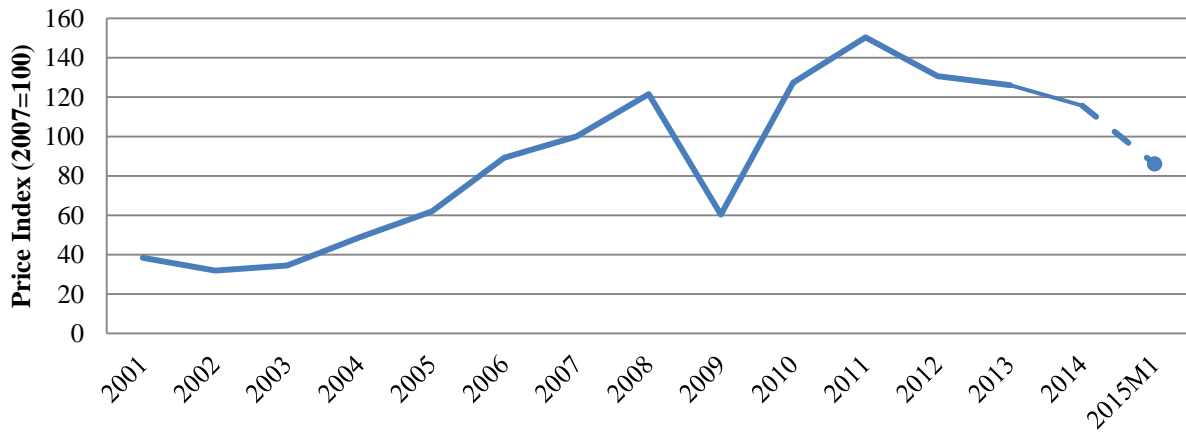
Note: FOB Newcastle/Port Kembla. Source: <http://www.indexmundi.com/commodities/?commodity=coal-australian>.

**Chart 3b: Crude Oil Price Index
(US\$/Bbl; 2007 prices, 2007=100)**



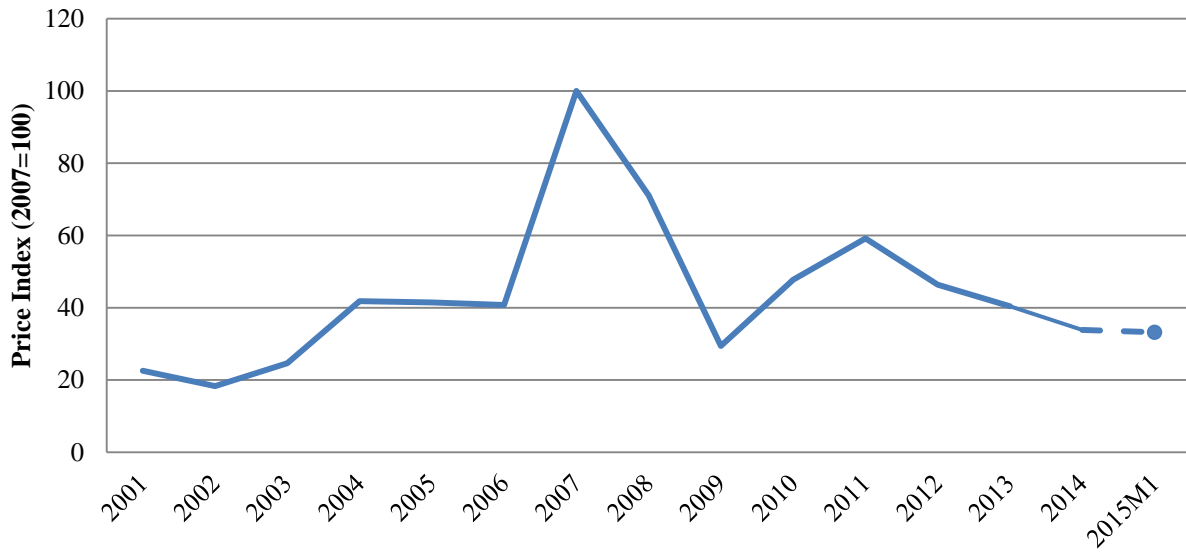
Source: Price data from World Bank & EIA; US Goods Deflator from IMF International Financial Statistics (2007\$).

**Chart 3c: Liquefied Natural Gas* Price Index
(US\$/MMBTU; 2007 prices, 2007=100)**



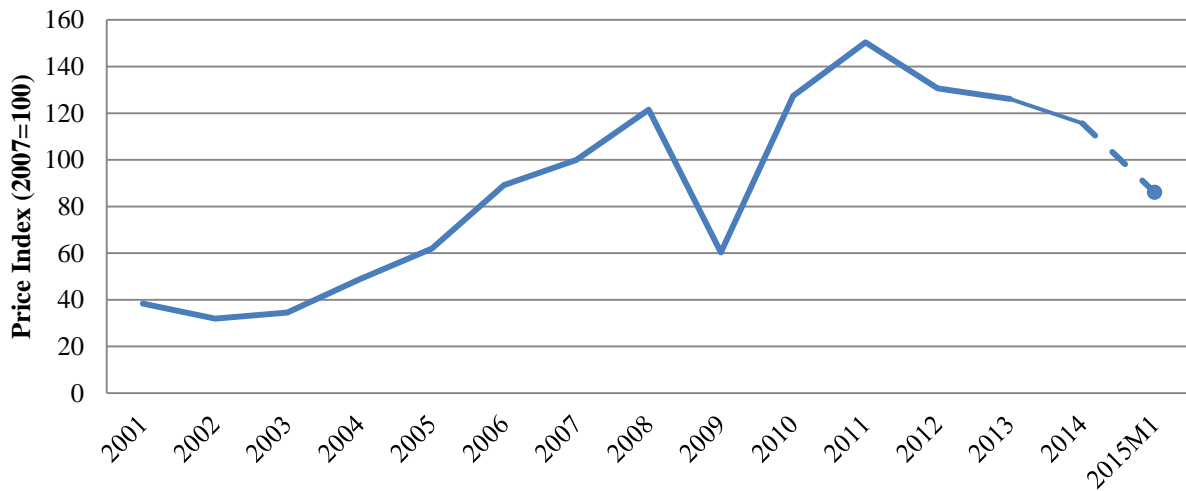
Source: Price data from World Bank Commodity Price Data (The Pink Sheets); US Goods Deflator from IMF International Financial Statistics (2007\$).

**Chart 3d: Nickel Price Index
(US\$/MT; 2007 prices, 2007=100)**



Source: Price data from London Metal Exchange via Datastream; US Goods Deflator from IMF International Financial Statistics (2007\$).

**Chart 3e: Copper Price Index
(US\$/MT; 2007 prices, 2007=100)**



Source: Price data from London Metal Exchange via Datastream; US Goods Deflator from IMF International Financial Statistics (2007\$)

Prices for nickel and coal never regained the heights reached immediately before the Great Crash of 2008. Prices for oil, gas, copper and palm oil rose to all-time peaks in 2011, before settling into declines which continue through early 2015.

Private suppliers of resource-based commodities had been taken by surprise by the acceleration of demand in the early twenty first century, leading to the shortfalls in supply that drove the increases in prices. Higher prices eventually encouraged investment to expand global supply of commodities. Global supply of agricultural commodities that were produced through annual crops (for example, maize, soybeans, sugar) increased quickly, so that there was some moderation of prices after a year or two. It took longer to increase supply of commodities produced through perennial trees (for example, palm oil and rubber). For agricultural oils, the expansion of annual crops of soy beans and maize affected prices for substitutes produced from tree crops, notably palm oil.

It took longer still--up to a decade--for supplies of metallic minerals and fossil energy to respond strongly to higher prices. This was because it took time for mining companies to recognise that market conditions had changed for long enough to justify investment, to plan new supply capacity, and to build facilities to expand production (Radetzki 1980).

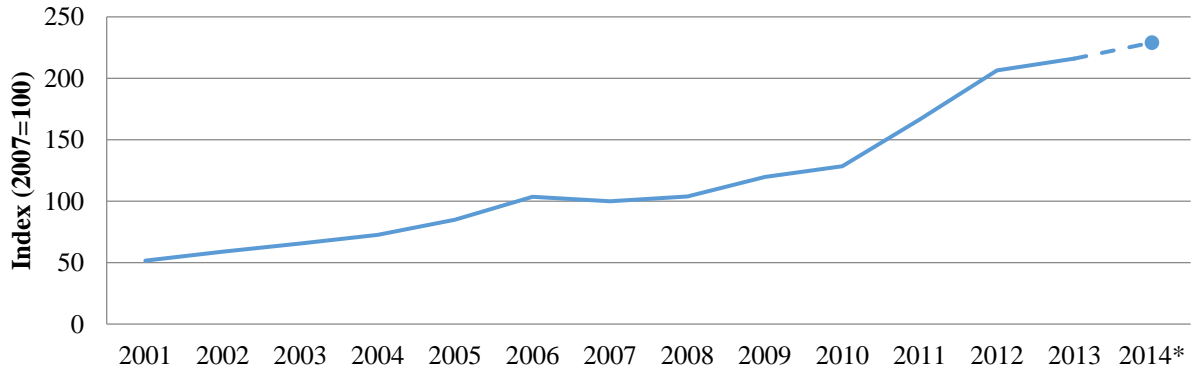
From 2011 onwards there were immense increases in the amount of oil, coal and many metals coming onto world markets. The acceleration in growth in supply coincided with the end of the rapid growth in Chinese demand. The result was rapidly falling prices in a massive commodity market adjustment.

4. Indonesian Supply Response

Indonesia participated in the global supply response only for a few commodities, notably coal and palm oil. Nickel supply also increased strongly until restrictions on exports of unprocessed ore precipitated rapid decline. Domestic policies and institutions inhibited expansion of output in other commodities.

For coal, laws requiring foreign enterprises to divest the majority of their equity to local parties that came into effect prior to the boom led to Indonesian enterprises quickly becoming deeply engaged in production for export. The Indonesian Constitution, like that of most countries including Australia, assigns ownership of natural resources to the State. Large Indonesian businesses were built around the State's assignment of mining rights to leading military, business and political figures—at the time when those rights were rapidly increasing in value, and with minimal payments to the State to reflect the value being transferred to private interests. The supply response was especially rapid for coal because production did not make heavy demands on complex mining and processing technology. Expansion of coal production was also supported by the provision of capital at low cost through arrangements with Chinese or Indian purchasers of the product.

**Chart 4a: Indonesian Thermal Coal Production Index
(Ton; 2007=100)**



Note: The 2014 value is based on the average of values for the period January - July 2014. Source: Statistics Indonesia via Datastream.

The main coal entrepreneurs became central players in the political economy of the new Indonesian democracy. They funded and played leading roles in political parties and were well placed to protect their new ventures from unfavourable policy change. This was to become a challenge to effective regulation and taxation of the mining industry in the Indonesian public interest.

Apprehension that possession of mining rights on favourable terms was dependent on official decisions that might turn with the political wheel encouraged rapid development and depletion of known coal resources. It also discouraged long term investment in exploration, mine development and environmental management. (For the collapse after 1998 in oil and gas exploration expenditure, see World Bank 2015, Figure 45).

Rapid expansion of production from known coal resources was encouraged by entry of small-scale, informal miners. They increased in numbers during the economic crisis 2008-09. From 2003, high prices made small-scale production highly profitable. While the national government had sovereign powers over mineral leasing, and all mineral deposits that were known to have substantial value were subject to mining rights allocated from Jakarta, the national government delegated powers to local governments. Decisions were taken and partially implemented early in the century but not given full legislative effect until 2009 (World Bank 2015). In 2009, the system of contract-based concessions issued at the centre was replaced by licensing-based mining administered locally. Something of a free-for-all ensued, with provincial and district governments allocating rights to new, smaller players—often rights over mineral deposits already allocated by the national government to large corporations. The World Bank estimates that the market share of smaller producers of coal increased from 26 percent in 2005 to 37 percent in 2012, when a moratorium was placed on new licences.

Box 1: Informal Mining in South Sumatra

On one national mining lease that we visited in South Sumatra in October 2014, a State-owned company, P.T Bukit Assam, was extracting about 15 million tonnes of coal per annum. Senior managers estimated that small-scale miners had been extracting almost that amount at the peak of the coal boom, but that lower prices from 2012 had caused them to pull back to about half of the volume of large-scale production. On a property that we visited in South Kalimantan operated by a private company P.T. Arutmin, small-scale operators were extracting an estimated 6-7 million tonnes per annum alongside 23 million tonnes by the large-scale miner operating the lease from the national government.

In South Sumatra, the small-scale mining is undertaken with mechanical shovels scraping off overburden to obtain access to the coal seam at places where it is not far below the surface, and then extracting coal. Many hands place it in plastic bags of 'sugar bag' size, each holding 20kg or so of coal. The bags are collected and taken on minor roads by individuals on motorcycles to roads large enough to take 10 tonne trucks. Thousands of these trucks—we estimated about 4,000 travelling between the mine and Palembang at the time of our visit—carry the bags to collection points in Palembang where their contents are aggregated and transported by barge to coal users in Java.

The small-scale mining reduces the potential value of the main lease, as it removes high grade and easily accessible and therefore more valuable material, and increases the unit cost of mining the remainder of the deposit. It transfers a large amount of value from the owners of the large mine to the small miners, their suppliers and organisers, and the people in government who facilitate mining and trade.

There is often legal ambiguity. While the large companies have prior claims deriving from national government leases, the small-scale producers sometimes (but not always) have licences allocated through apparently valid exercise of powers delegated to local authorities.

We asked the managers of the large mine what they thought about the informal activity and what they could do about it. They reported that there was little recognition anywhere in Government that there was a problem. The managers noted that when small miners were asked about the possible illegality of their activities, they would declare confidently that "Allah has given our country these natural riches and He would want them to be shared equitably".

Whether smallholder mining is illegal or the subject of conflict of jurisdiction, the weakness of property rights has led to accelerated depletion of known coal deposits. If production is profitable now, no-one—even the large enterprises—has much interest in holding production over to tomorrow simply because it is expected to be more profitable then.

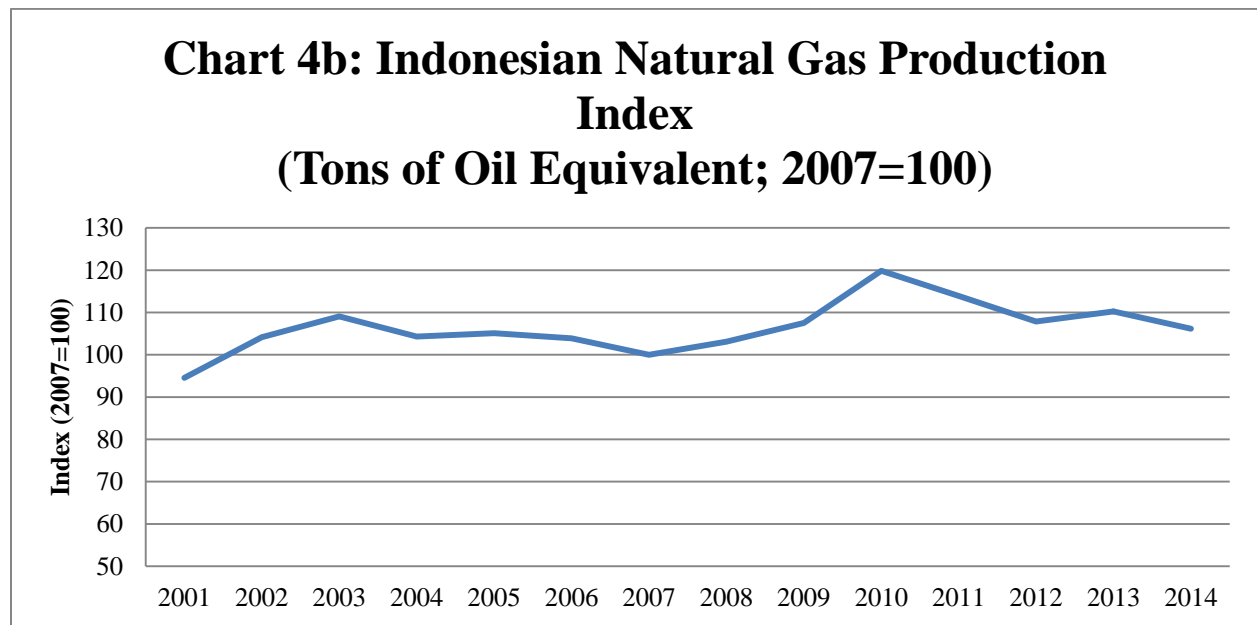
The weakness of title and conflict between regulatory powers of different levels of government unambiguously discourages exploration and long-term investment to expand production later. It also discourages forward-looking expenditure on training, safety and management of the environmental consequences of mining.

Small-scale mining is also important for gold in alluvial and other easily extracted forms. It has a much smaller presence where more sophisticated technology in exploration, mining and processing is required. In these commodities, expertise from large foreign enterprises is

necessary for substantial resource development. Technological complexity excludes most of the non-ferrous metals, and usually petroleum. The exception for petroleum is near Bjonogoro in East Java, where small scale miners using inexpensive, make-shift equipment have reopened old and previously abandoned fields.

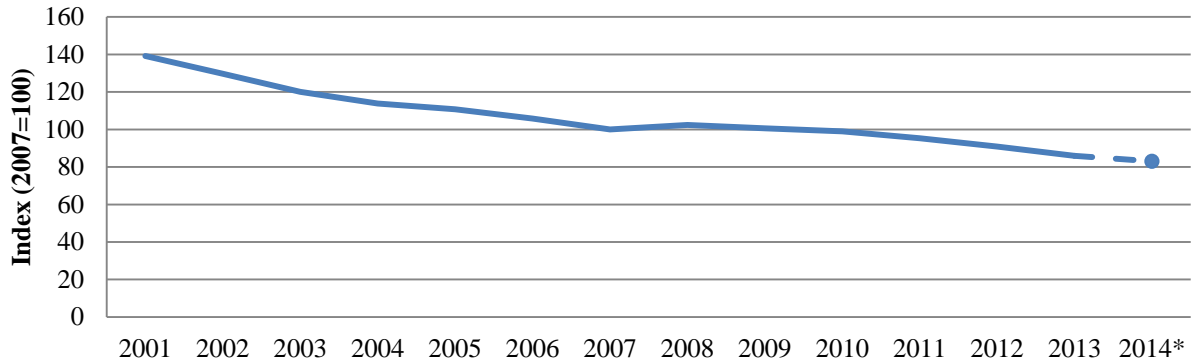
Foreign enterprises have been required to divest a majority of equity in resource projects since the turn of the century. New direct investment in exploration and development of petroleum and non-ferrous metal ores by large foreign enterprises has shrunk to low levels.

While oil and gas production is technologically complex, long experience has helped the state-owned company Pertamina to establish commercial access to major multinational companies' intellectual property. The old and well developed 'production sharing agreement' has proven to be a workable instrument for foreign investors to recoup outlays with an acceptable return on investment while the State takes a high proportion of mineral rent (Garnaut, Emerson and Clunies Ross 1984). Nevertheless, unusually amongst the world's large producers of oil and gas, Indonesia had no substantial increase in gas production and a large fall in oil production through the extraordinarily high petroleum prices (Charts 4b and 4c). Indonesia's resource base would have supported a substantial increase in gas and probably oil production with less restricted access to international expertise and capital.



Source: US Energy Information Administration (EIA) via Datastream.

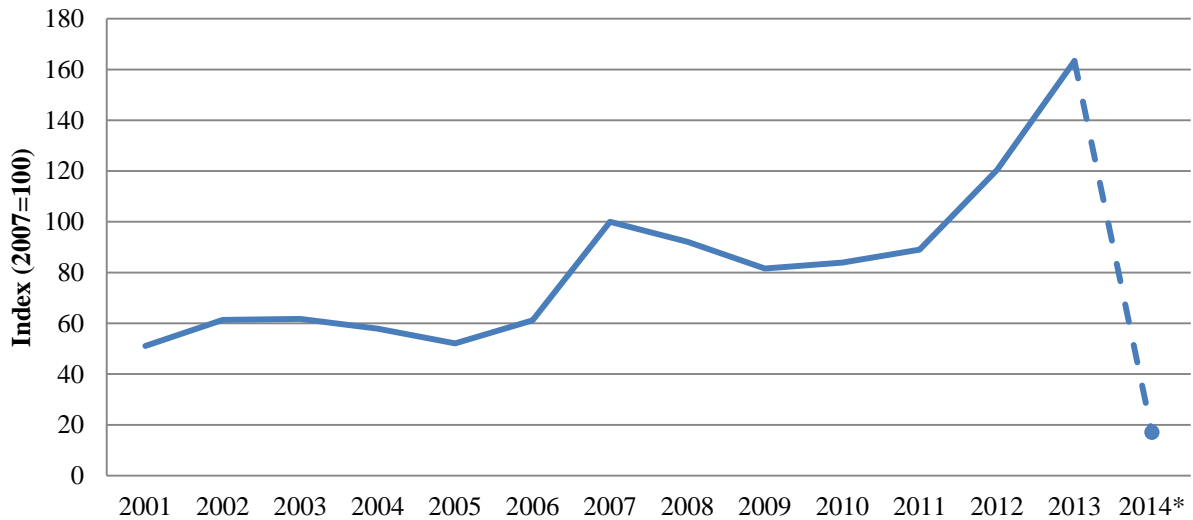
**Chart 4c: Indonesian Crude Oil Production Index
(Bbl/day; 2007=100)**



Note: The 2014 value is based on the average of values for the period January - September 2014. Source: US Energy Information Administration (EIA) via Datastream.

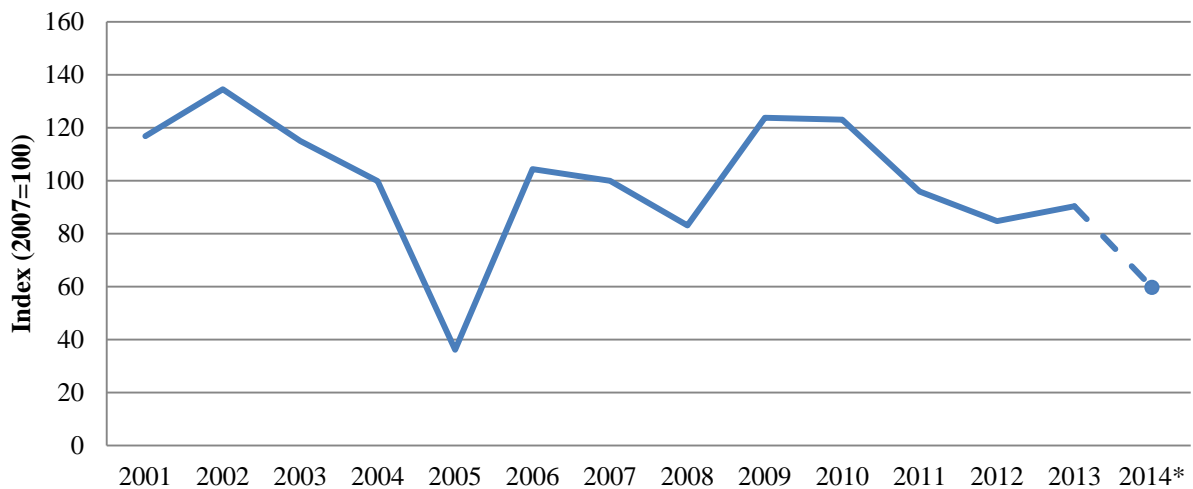
For the non-ferrous metals, the conflict between national, provincial and local government jurisdictions, the weak administration of provincial and local government leasing powers, the requirements for divestment of majority ownership by foreign enterprises and the requirements on local processing that came into effect at the beginning of 2014 have together caused production to fall in established mines and have stopped investment in large-scale exploration and building new mines. Production of nickel and copper fell sharply in 2014 (Charts 4d and 4e). These barriers to development have been large enough to cause the potential investment and production effects of the early twenty first century resources boom beyond coal and agriculture mostly to pass Indonesia by.

**Chart 4d: Indonesian Nickel Production Index
(Ton; 2007=100)**



Note: The 2014 value is based on the average of values for the period January - July 2014. Source: Statistics Indonesia via Datastream.

**Chart 4e: Indonesian Copper Production Index
(Ton; 2007=100)**



Note: The 2014 value is based on the average of values for the period January - July 2014. Source: Statistics Indonesia via Datastream.

Coal was different. Indonesian thermal coal exports grew more rapidly than from any other major producer and by a larger quantity than from any other country, with Indonesia overtaking Australia as the world's largest exporter. The greatest supply response in Australia and Indonesia came from 2011—when Chinese demand growth decelerated and then went into reverse. Chart 3, drawn from official data, probably understates Indonesian production and exports of coal. The World Bank estimates that 22-46% of coal revenues required by law are not collected—a reality that would be matched to some extent by under-reporting of export volumes (2015: 44).

Much of the coal production in Indonesia, Australia and China—and a high proportion of capacity installed from 2011-- does not operate profitably at the prices of early 2015. Prices will continue to fall until global supply has shrunk enough to bring supply and demand into balance at lower prices. Producers everywhere are seeking to lower costs. Their success reduces the prices at which supply and demand eventually come into balance. Producers everywhere are hoping that they can hold on long enough for the downward adjustment of supply capacity to be borne by others. The result is likely to be a long period of low prices and slow attrition of supply capacity.

Our interlocuteurs in South Sumatra and South Kalimantan spoke of small-scale production having been significantly larger in 2010, 2011 and 2012 when prices were higher. Attrition amongst large-scale producers with their proportionately larger fixed costs is more difficult. In Australia, 'take or pay' provisions for transport increase fixed costs and encourage continued production.

Rupiah depreciation helps to lower costs and to hold up the Indonesian share of global supply. Here the question is how far Indonesian costs can fall relative to Australian and Chinese. Australia, too, is experiencing a falling real exchange rate and producers are under great pressure to reduce costs after the boom. The much larger Chinese production is battling with a rising real exchange rate and producers have to accept a large share of the decline in global capacity unless they are favoured by local protective measures.

Coal producers everywhere are hoping that growth in import demand in India and Southeast Asia will ease adjustment in the exporting countries. Indian imports contributed to the coal boom. India has substantial coal reserves and backlogs of excess demand for power, but poor capacity to expand domestic coal and electricity output. Imported coal has been a quick path to easing one of these bottlenecks, often involving financing by Indian enterprises in Australia and Indonesia. Indian enterprises have suffered losses on overseas investments in coal since 2011. Rupee depreciation since mid-2013 has meant that import prices have fallen less than prices on global markets. The new Modi Government elected in 2014 has made strong commitments to reduce bottlenecks in domestic coal supply and has elevated the priority of renewable energy for supplying power to rural communities in particular. In November 2014, the Indian Energy Minister announced that Indian imports would fall to zero within a few years.

Growth in domestic is more likely than export demand for Indonesian coal, giving rise to the climate change policy dilemmas discussed in Section 6 of this paper. Indonesia is better placed than Australia and other competitors in other Southeast Asian countries that will continue to

grow for some time. So Indonesian suppliers may do better than Australian in maintaining profitable production in a deteriorating regional and global market environment.

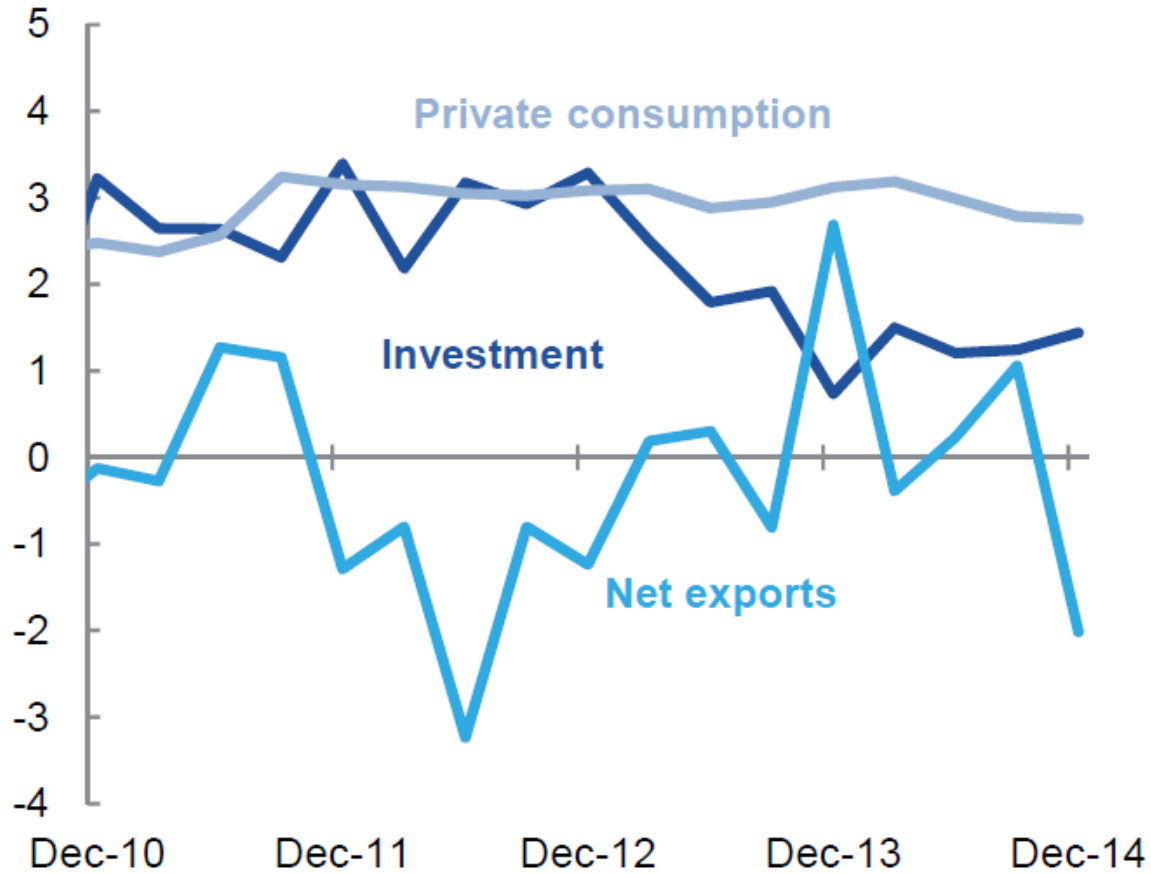
The extraordinary China resources boom of the early twenty first century has run its course, but it will be some time before global markets for energy and metals have found a new balance in its aftermath.

5. Macroeconomic Impact of Resources Boom

The resources boom influenced the Indonesian economy first of all through the increase in prices of established exports (Chart 3) and in the terms of trade. The World Bank estimates that the terms of trade increased by a massive 74% from 2002 to 2013 (World Bank 2015: 42). Developments in the resources sector helped total business investment to contribute several percentage points to GDP growth at and immediately after the height of the resources boom 2010-2, but less than half of that in the years after that (Chart 4).

After a lag, export volumes rose (Chart 4a). Chart 1 captures price and volume effects, with the total falling considerably from 2011. The fall in export revenues and business investment together had a powerful contractionary effect on GDP after 2012. The contractionary effect on incomes was larger.

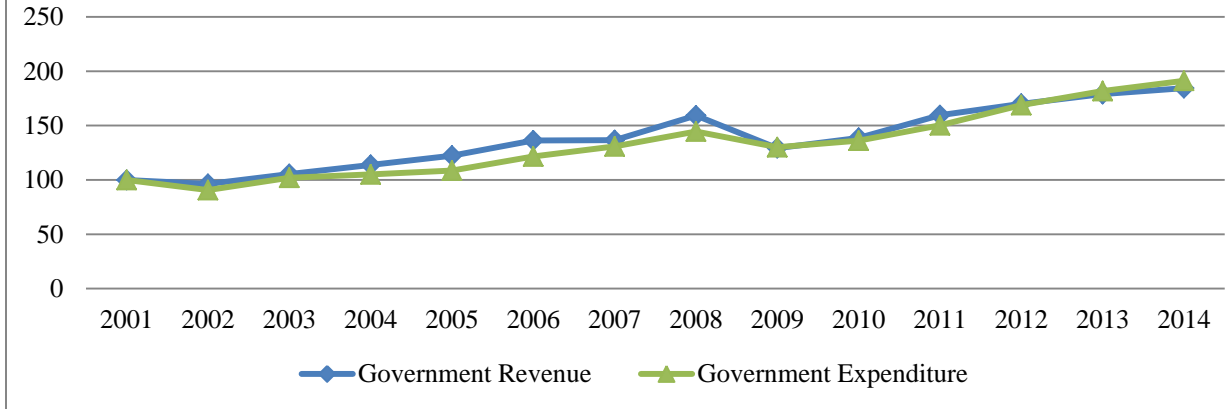
Chart 5: Indonesian Private Consumption, Investment and Net Exports (contributions to year-on-year GDP growth, percentage points)



Source: World Bank 2015: 4.

Higher export incomes from prices and volumes directly lifted domestic incomes by over \$US 200 billion (2007 prices), equivalent to a quarter of national income, between 2003 and 2011. Increased resources investment added more. Much of the increased income accrued to private parties, who spent all and more of it on consumption and investment. Higher government revenue was mostly spent as it arrived, so total government expenditure rose (Chart 6)—although government debt as a share of GDP fell gradually until export prices started to fall in 2011. The increased domestic expenditure was the main cause of a large appreciation of the real exchange rate (Chart 6).

Chart 6: Real Indonesian Government Revenue and Expenditure (2007 prices, 2001=100)



Source: International Monetary Fund (IMF), Government Finance Statistics (GFS)/national statistics/Eurostat; GDP Deflator from Badan Pusat Statistik via EIU database (2007\$).

Real appreciation can occur through a rise in the nominal exchange rate or higher inflation than in other countries. Indonesian monetary policy through the boom was sufficiently accommodating for the real appreciation to be manifested more as higher inflation than in other countries than as an increase in the nominal value of the rupiah.

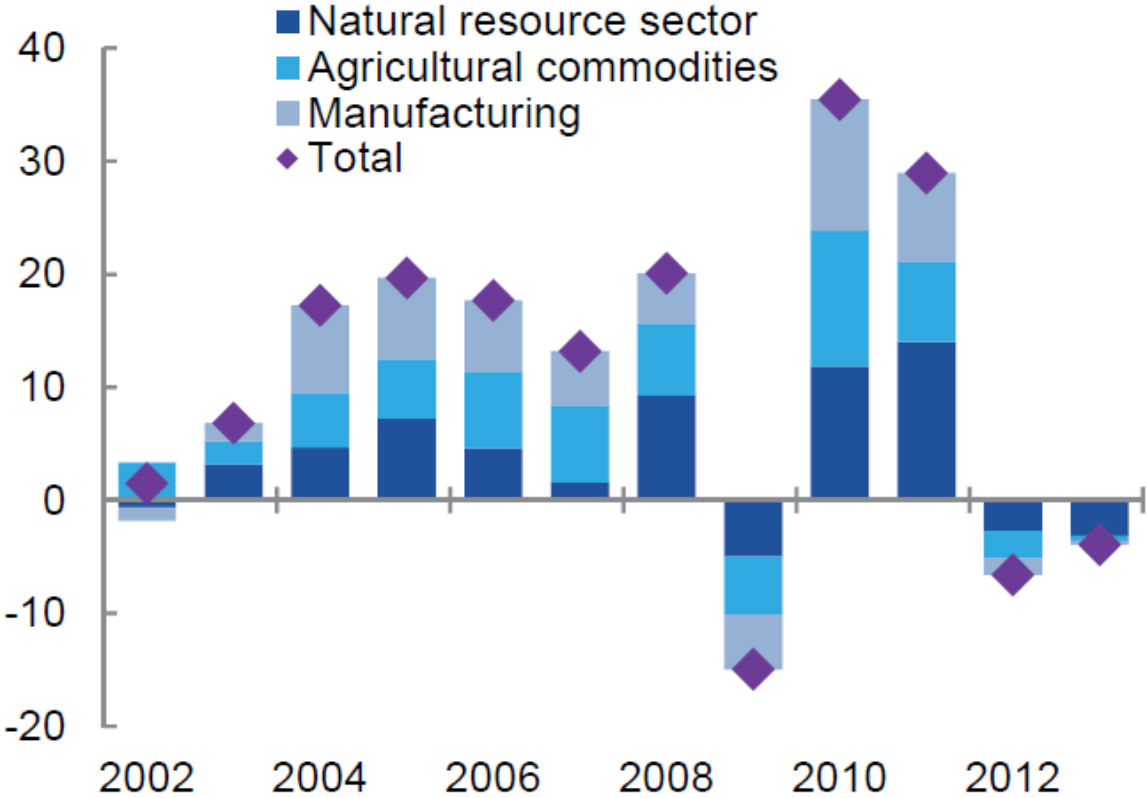
The contribution of Indonesia's persistently high inflation to real exchange rate appreciation is of critical importance to the adjustment that is required to maintain growth after the resources boom. A substantial nominal depreciation against the United States dollar since 2011, mainly in 2013, has been offset to a considerable extent by nominal appreciation against third currencies and by higher Indonesian inflation (Chart 6). Much larger nominal depreciation supported by moderation of inflation differentials is required if competitiveness is to be restored. The restoration of competitiveness, in turn, is a condition for maintaining reasonably strong economic growth without running the risk of external financing crisis.

The real rupiah appreciation during the resources boom discouraged investment and production in other tradables industries. The share of manufactures and agricultural exports fell markedly.

The net effect was that the years of the boom saw a moderate acceleration of overall growth in output to a bit over 6 percent per annum from the low levels immediately following Indonesia's financial crisis. As the resources boom began to recede from 2011, real export growth and business investment went into decline and output growth decelerated moderately. Declining export prices affected nominal income more than GDP, and this fed back into lower output growth through pressure on private consumption and the budget.

The decline in the real purchasing power of resource exports has further to run and it is unlikely to be balanced by increased exports of other kinds without a large increase in competitiveness. The value of manufactured and agricultural as well as resource exports actually fell in 2012 and 2013.

Chart 7: Manufactures and Commodities, Export Growth (\$US, percent)



Source: World Bank 2015: 43.

What we have seen in Indonesia in the twenty first century so far is the standard economic response to large increases in prices and volumes for booming export industries. Expansion of the booming sector leads to real appreciation and decline of other tradables industries and adjustment problems problems after the boom recedes (Gregory 1976; Snape 1977; Corden and Neary 1982). Many studies explore the effects for particular countries (Chowdhury 2004 for Indonesia, Nigeria and Papua New Guinea; Garnaut 2013 for Australia).

The Indonesian resources boom was not as large as it would have been if uncertainties about property rights, barriers to direct foreign investment and the new requirements on local metals processing had not discouraged investment and exports for petroleum and metals. Regulatory interventions that reduce production and investment, however, are highly inefficient ways of moderating a boom and stabilizing the economy. Better to run regulatory and taxation policies that maximize economic value and support them with countercyclical

budget surpluses during the boom, which would allow higher levels of public expenditure in productivity-raising activities after the boom.

More effective mechanisms for taxing resource rents and the saving of the increased revenue until after the boom would have had a larger stabilization effect at lower cost. The ideal of mineral rent taxation is to collect for the public revenue a high proportion of value in excess of the level necessary to attract investment, without deterring marginal investments (Garnaut and Clunies Ross 1983; Garnaut, Emerson and Clunies Ross 1984). Outside petroleum, Indonesia's mineral leasing and taxation policies are poorly designed to collect the economic value of resources made available for development. Worse, in the coal sector at least, legal obligations to pay taxation and leasing charges are avoided to an extent that has macro-economic consequences (World Bank 2015).

What would effective stabilization policies during the boom have looked like? Ideal stabilization policy has two elements. One is to minimize the temporary contraction of non-resource industries that will have to be reversed after the boom. The other is to avoid real expenditure and incomes rising so high in the boom that they later have to be reduced—since adjustment to lower real incomes or even to markedly lower growth in incomes reduces welfare and generates political tension.

The ideal would have required substantially larger budget surpluses at the height of the boom. Larger surpluses still would have been required if there had been more effective mineral rent taxation regimes. These surpluses would be available to support economic growth after the resources boom through public investment in infrastructure and other productivity-raising activities.

It is difficult for policy-makers during a resources boom to judge whether higher commodity prices and the incomes and revenues which come with them are temporary—allowing increases in expenditure and costs on a sustainable basis—or permanent. Historical experience urges caution: large increases in commodity prices have always been temporary in the past. It is always tempting to think that this time is different. One can never be certain that this time will not be different. However, the economic cost and political difficulty of having to reverse a large real appreciation that turns out to be temporary are much greater than the cost and difficulty of unnecessarily delaying expenditure of large new revenues from the resources sector. It is always sound policy to be cautious, and to plan on the reversal of increases in the terms of trade until the passing of time has proven that this time really is different.

Indonesia after the boom must manage a tendency for budget deficits to drift beyond prudent limits, while maintaining public expenditure on activities that are crucial to a new pattern of growth. A good start has been made on the budget challenge with the decisive early action on fuel subsidies. But that is only a start.

Three developments are required now to support Indonesia's movement to a new growth strategy built on non-resource exports: continued discipline in budget policy to support higher levels of productivity-raising public expenditure including in infrastructure; large real

depreciation; and removal of policy interventions—some in the resources sector—which are reducing economic efficiency and investment for no good reason.

Some circumstances in the domestic and international macro-economic environment are favourable to this adjustment.

The beginnings of tightening of United States monetary policy from 2013 is supporting depreciation against that currency. This is further reinforced by China's real appreciation within the new model of economic growth. China's real appreciation is opening new opportunities in global markets for labour-intensive manufacturing and in China itself for high-value consumer goods and services.

However, the currencies of many other countries are tending to weaken against the US dollar and the yuan by as much or more as the Indonesian rupiah, so that the overall depreciation of the Indonesian rupiah is much less impressive. Of special importance is the depreciation in Indonesia's main competitors in global markets both for the old commodity exports and for the manufactures and high-value agricultural products and services that must become the new locus of export expansion. Indonesia's competitiveness has gone backwards against its competitors for exports of resources, manufactures, agricultural products and services since the retreat in the resources boom began in 2011.

Nominal depreciation can be facilitated by running a combination of tighter budgets and easier monetary policy. Nominal depreciation can be converted into real depreciation only if domestic costs are insulated from the price-increasing effects of depreciation itself. Tighter fiscal policy allows lower interest rates without increasing inflation.

The political culture after the resources boom is not conducive either to restraint in regulated wages nor to confronting the widespread monopoly and protection that supports the passing through of rising import costs from currency depreciation. This is an area where clear recognition of the need for reform, effective leadership and strong support for good policy from independent participants in the policy discussion are going to be necessary for success.

How much real depreciation is required? Incentives for investment in the tradeable goods and services industries are going to have to be high for a while to dispel pessimism about manufactured export prospects after a long period of sluggish growth and decline. A return towards the competitiveness levels of the early years of the boom 2002-5 may turn out to be necessary. Full return would involve an increase in international relative to purely domestic prices of around half from 2014. Early real depreciation would be smaller than that. Assessments of the investment and export responses to more limited early real depreciation would form the basis of judgements about how much more is necessary.

6. Structural Change and the Resources Boom: the Need for Reform

The economic structure that emerged in the twenty first century to 2011 is in several ways inimical to strong growth after the boom.

We do not have comprehensive data on total factor productivity for the years covering the whole of the boom to compare with the years that went before. Three quantitative analyses

over the early years of the boom come to broadly similar conclusions: total factor productivity growth was moderately strong through the first 7 or 8 years of the century by historical standards and in comparison with other Asian economies (Van der Eng 2008; Asian Productivity Organisation 2011; Alisjahbana 2009).

Comprehensive data on total factor productivity growth are not yet available for the years since the global financial crisis. It would be no surprise, however, if productivity growth has been low since 2008, as it has been in most countries and especially those experiencing a resources boom (Garnaut 2013). Early indications support that view. Growth in labour productivity, a partial measure, slumped across all sectors in Indonesia between the early (2004-5) and late (2011-2) years of the boom. Labour productivity growth in manufacturing fell from around 6 percent per annum to near zero over these years. This was a period of high investment, so total factor productivity growth could be expected to have declined more than labour productivity (World Bank 2014). Azis (2015) has recently presented data indicating that Indonesian total factor productivity in 2011 remained below the levels of the mid-1990s, with slower recovery from the blow from the Asian Financial crisis than in other ASEAN countries.

High prices and expectations that they would continue led to wasteful overinvestment in coal, with investments being made late in the boom that are unlikely to return the cost of capital. The resources boom encouraged large increases in minimum wages and other labour market interventions (Manning and Miranti forthcoming 2015). The stronger real exchange rate increased pressure to raise protection of various kinds against import competition (Aswicahyono, Bird and Hill 2009; Indonesia-Australia High Level Policy Dialogue 2015). The boom expended investment-inhibiting interventions in the resources sector. And it provided the context for vested interests playing a larger role in policy-making at a formative time for Indonesian democracy.

Section 4 discussed the effects on investment and production in the resources sector of restrictions on foreign ownership, of decentralization of administrative authority, and of restrictions on exports of unprocessed minerals. This section discusses these and two other effects of developments during the boom: pressure on the budget from increased energy subsidies; and intensification of tensions between Indonesian patterns of growth and commitments to the international community on climate change mitigation.

The announcement early in the century of mandatory requirements to process non-ferrous mineral resources into metals contributed to the low levels of investment in expanding capacity during the resources boom. The legislation of the requirements with effect from 2014 led to a sharp reduction of output from established bauxite, nickel and copper mines. The new rules led to a standoff between multinational mining companies with operations in Indonesia that has been slowly resolved by negotiations through 2014 and early 2015. The overall effect was to diminish the extent of the resources boom and to reinforce the downturn in national business investment after 2012.

Forcing domestic processing can lead to higher investment. But it dissipates economic value. For highly profitable projects—such as the Freeport McMoran and Newmont copper and gold mines in eastern Indonesia—the requirement transformed untaxed mineral rents into subsidies for domestic processing. For projects that are closer to the margin of profitability—

of which there are more with the decline in world prices after 2011—the effect is to reduce investment, output and economic value. The increased investment and output in manufacturing itself is welcome during the adjustment after the boom. The real depreciation and domestic reform that is part of Indonesia's adjustment reduces the costs of the domestic processing requirements. But it is unlikely that the increased investment from now on outweighs the mining value foregone as a result of the processing requirements.

Any economic case for requiring local processing depends on the absence of effective mechanisms for taxing mineral rents. Where there are large untaxed rents, investors—in the metal mining industries mostly foreign owners and not Indonesians—carry the cost of the reduction in economic value that accompanies mandatory domestic processing. Economic analysis establishes that it is better from a national point of view to allow economically efficient use of the resource and to tax mineral rents efficiently than to force domestic processing where investors do not think that there is a commercial case for doing so (Garnaut, Emerson and Clunies Ross 1984).

Requirements for local processing have been negotiated with the largest established producers of non-ferrous metals. The loss of economic value associated with the local processing requirements for these projects is now largely water under the bridge. To the extent that there is an indelible commitment to local processing in future, it would be more efficient to collect mineral rent as taxation and to allocate part of it to development of infrastructure to lower the cost of manufacturing activity, including minerals processing, at favourable locations.

Energy subsidies rose with global oil prices during the boom. Until late in 2014, subsidies for domestic fuel users were set at whatever level was necessary to support a fixed domestic price to users. Subsidies for electricity were influenced by global energy prices amongst other factors.

Energy subsidies have been a major budget problem for a long time. Some reductions against an automatically rising tendency were achieved from time to time, but with huge diversion of economic policy effort and until late 2014 with little long-term impact on the problem. The fall in global oil prices in 2014 and early 2015 established a congenial environment for a new President to deal with the problem in more permanent ways (Damuri and Day 2015; World Bank 2015).

Under longstanding arrangements, the commitments to fixed prices for petroleum products was a treadmill, as Indonesia habitually runs inflation at rates above its major trading partners and competitors and so requires currency depreciation from time to time. Indonesia's macro-economic adjustment after the resources boom is going to require substantial currency depreciation, so that the treadmill has a considerable upward slope. The slope was reversed as petroleum prices on world markets fell in the second half of 2014 and the first quarter of 2015, but this would have been a temporary respite.

By 2005, subsidies absorbed 3.8% of GDP and 20.5% of Government expenditure. Discretionary increases in controlled prices reduced the percentages for a while, but on the eve of the Great Crash rose to 4.5% of GDP and 22.6% of Government expenditure in 2008.

Politically painful reductions in prices and again hauled in the subsidies for a while, but they drifted back out to around 3.5% of GDP and 19.7% of the Budget from 2011 (CEIC and EIU data bases). The effects of falling international prices after the peak of the boom were significantly offset by rupiah depreciation.

The big fall in global fossil fuel prices from mid-2014 created an opportunity for a decisive reduction in prices and for the removing the treadmill. In the months after his election in September 2014, President Jokowi announced the abolition of the petrol subsidy and the restructuring of the diesel subsidy so that it was a fixed amount per unit of fuel. Henceforth, the prices of both diesel and petrol will fluctuate with international prices.

The reform of fuel subsidies is a major step towards the budget adjustment that is required if Indonesia is to maintain momentum in development after the resources boom. It frees budgetary resources for investment in development infrastructure and services. It frees leadership resources from the treadmill of periodic adjustment in energy prices, for the immense task of economic reform that lies ahead. And it greatly reduces an artificial encouragement of greater petroleum use that has had unfortunate effects on energy efficiency and Indonesia's contribution to the global climate change mitigation effort.

The size of the electricity subsidy has been typically about one quarter or one fifth of total energy subsidies. The lower costs of electricity generation associated with the fall in global prices for fossil fuels provides a favourable opportunity for reducing the quantitative importance and changing the form of this subsidy as well.

The Indonesian Government has played a leading and respected role in international discussion of climate change mitigation, especially since President Yudhoyono's hosting of the 2007 meeting in Bali of the United Nations Framework Convention on Climate Change (UNFCCC). Indonesia has made specific commitments to the UNFCCC on reduction of its emissions. At the UNFCCC meeting in Cancun in 2008, Indonesia formally pledged to reduce emissions in 2020 by 26 percent below 'business as usual', or by 41 percent if there were substantial international financial support.

While 'business as usual' is an elusive concept, the rapid increase in Indonesian emissions since 2008 is impossible to reconcile with the pledge. The national electricity company, PLN, expects most of the rapid increase in electricity supply over the next decade to come from coal (PLN 2015:7). Much of this is coal with low calorific content and high carbon dioxide emissions per unit of electricity generated. Such coal has been unacceptable in Japan, Korea or Taiwan in the twenty first century and became unacceptable in China as environmental standards strengthened after 2011. The low quality coal can be sold in India but at a low price. The disproportionate use at home of low quality coal intensifies the problem of reconciling development and climate change objectives.

So far, Indonesia is one of only a few G20 countries that have yet to make noticeable progress on the commitments for 2020. The rapid growth in coal use for electricity generation is the largest single contributor to the divergence between reality and the pledge to the United Nations.

This discordance between good intention and weak outcomes has resulted partly from policy distortions that accumulated and increased during the resources boom: the energy subsidies that discourage energy efficiency and discourage development of low-emissions alternatives, and now the local processing requirements that artificially promote industries that happen to use energy intensively.

But even after correction of these distortions Indonesia, like all countries but more acutely, would face dilemmas in reconciling provision of energy for development with climate change realities. The issue is especially important because Indonesia is more than usually vulnerable to the effects of unmitigated climate change (Garnaut 2009), and because indigenous coal resources are exceptionally abundant and cheap. The quick, cheap and easy way to make electricity available in larger amounts to Indonesians in the most populous islands is to burn more Indonesian coal—available more abundantly following the overinvestment during the boom.

How to reconcile rapidly growing demand for electricity, including meeting pent-up demand in locations that have not had access to adequate electricity supply, with making a fair contribution to the global mitigation effort?

The state-owned elements of the Indonesian energy industry are acutely aware of the dilemma. The electricity utility, PLN, has sought to reduce the greenhouse gas output per unit of electricity by offering higher prices for wholesale power produced with low-emissions technology. These higher ‘feed-in tariffs’ have been most important for geo-thermal and hydro-electric power. The feed-in tariffs are negotiated case by case when private entities have expressed interest in investment. This discretionary process is associated with high uncertainty and therefore an unnecessarily high supply price of investment, with uneven incentives across alternative technologies and sometimes projects, and opportunities for political economy distortions in the policy-making process.

The policy challenge is to provide an optimal quantum of energy for development at the lowest possible cost consistent with Indonesia contributing its fair share to global climate change mitigation. In meeting the challenge, Indonesia has some opportunities to supply power from low emissions sources at little or no or even negative cost above centralized generation through burning coal.

More efficient use of energy sometimes reduces greenhouse gas emissions at no cost—indeed, often with economic gain. Indonesia’s use of energy per unit of GDP is high by any standards. Economic pricing of energy contributes to greater energy efficiency. Many other countries have generated high returns from provision of information to users on efficient use of energy.

The costs of solar and wind power have fallen dramatically in the past half dozen years as the scale of deployment has increased. This has been greatest in relation to solar power, where the cost of photovoltaic panels made in China has fallen by around 80 percent since 2008. In some parts of Indonesia, relatively small-scale decentralized generation of solar, wind and hydro-electric power for local use is considerably less expensive than extending transmission and distribution networks to provide access to large, centralized generators.

For the most part, Indonesia's large potential for low-cost generation of hydro-electric and geo-thermal energy is located away from the main centres of power demand in Java. Costs of high voltage direct current transmission of electricity have fallen considerably in recent years, justifying systematic study of the costs and benefits of linking low-cost renewable generation demand in Sumatra, Kalimantan and perhaps eventually Papua with demand in Java. Provision of infrastructure to support energy-intensive minerals processing close to low-cost renewable energy sources rather than in Java is likely to improve the economics of such activity. To make good use of opportunities to reduce greenhouse gas emissions at low and sometimes zero negative cost requires policy innovation. To fail to keep up with other countries' efforts in reducing emissions is to risk high costs from catching up within compressed timetables at some future time.

7. Resource Booms Compared

Many other countries experienced lifts and then declines in their real export values through the early twenty first century resources boom and its early aftermath. The comparison with Australia is especially interesting, as Indonesia and Australia emerged from the boom as by far the world's largest exporters of coal, and were each other's main competitors in the Chinese and other Asian markets.

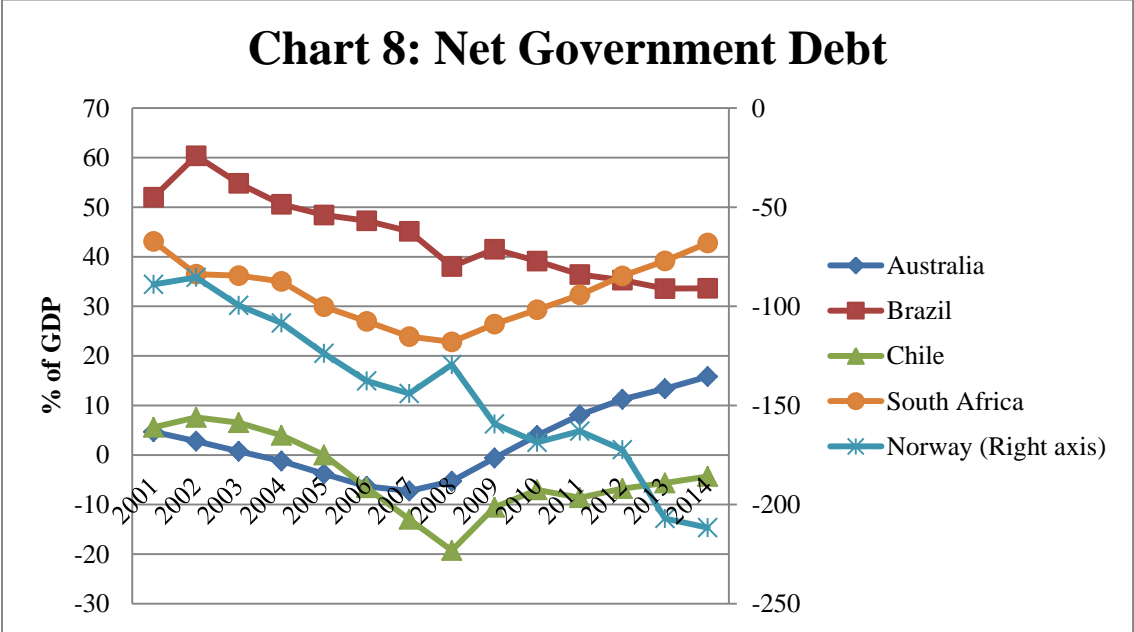
Indonesia was different from Australia in three ways. First, Indonesia's natural resource endowment per person is smaller, so there is a weaker tendency for the economy to be strongly specialized in exports of energy and metals. Second, Australian export capacities are more complementary with Chinese import specialization, with Chinese demand for steel-making raw materials meshing with Australian resources to an exceptional degree. Third, Indonesian institutional arrangements and policy discourage investment and production of most resources commodities except coal, whereas Australia uninhibitedly encourages expansion. These considerations made both the boom and the adjustment challenge of its aftermath greater in Australia.

There was little systematic attempt to hold back temporarily larger incomes for use after the boom in either Australia or Indonesia. Both countries spent most of the enhanced government revenues of the resources boom more or less as they came in. Government debt as a share of GDP in Australia and Indonesia fell steadily through the early years of the boom until the Great Crash of 2008, despite considerable discretionary loosening of fiscal policy in Australia. Australia but not Indonesia engaged in a major and discretionary fiscal expansion to counteract the recessionary pressures of the Great Crash, and so experienced an increase in public debt as a proportion of GDP from 2009. The declines in the Government debt share of GDP continued in Indonesia until export prices retreated from 2011.

Comparing Indonesia with other resource-exporting countries, Brazil and South Africa went a step further in pro-cyclical fiscal policy so that debt as a share of GDP hardly fell in the early years of the boom and rose more strongly as the boom receded. Indonesia, Australia, Brazil and South Africa can be contrasted with two other resource-exporting countries, Norway and Chile, which used sovereign wealth (Norway) or stabilization (Chile) funds to save a high proportion of the lift in Government revenues for future use.

Chart 8 reveals that Australia and Indonesia stood midway between the big savers through the boom—Norway and Chile—and the ‘spend as you earn’ approach of South Africa and Brazil.

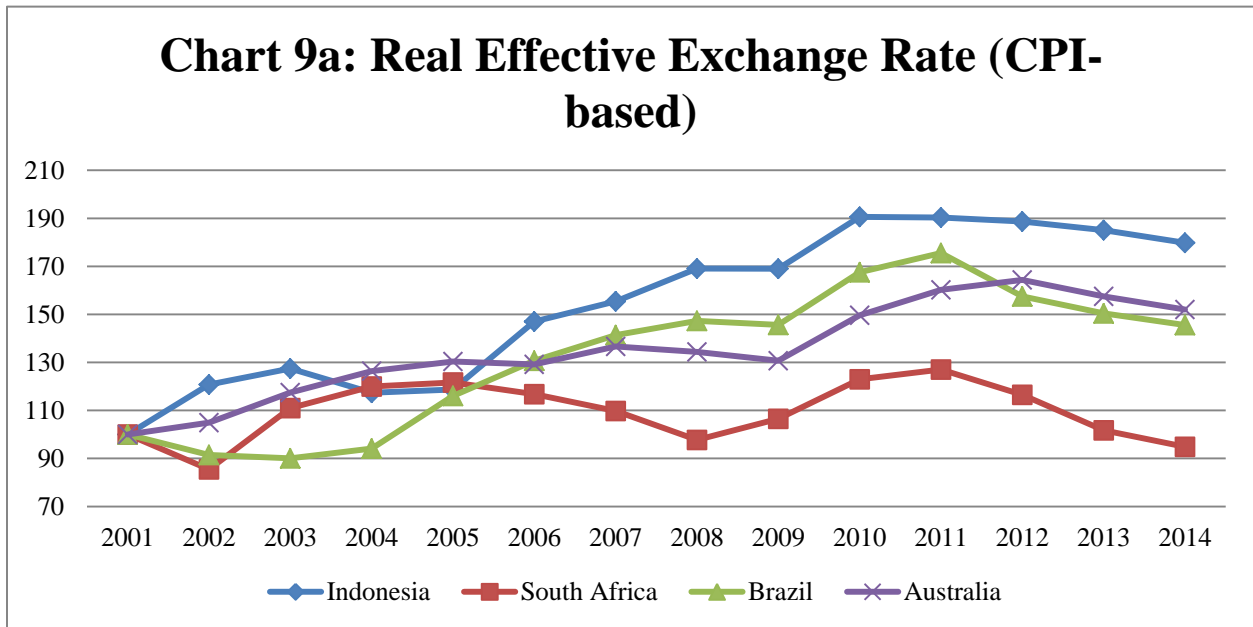
Chart 8: Net Government Debt in Australia, Brazil, Chile, South Africa, and Norway



Source: EIU database.

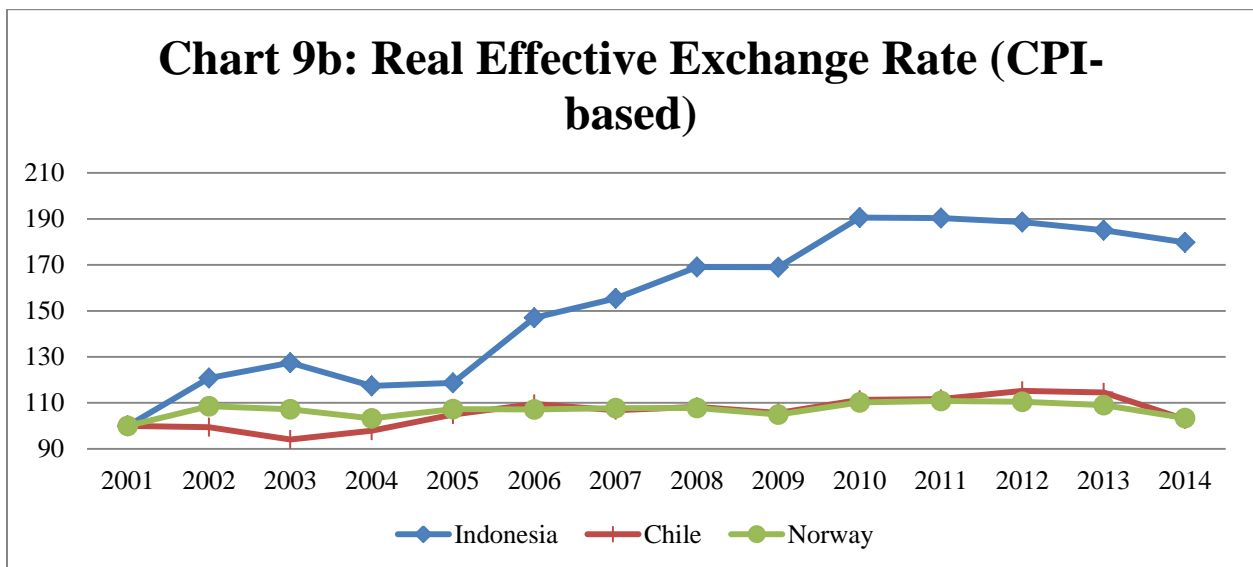
Spending the proceeds of higher terms of trade as they arrived put upward pressure on the real exchange rate. Again, this went further in the three comparator countries than in Indonesia—partly reflecting moderately greater restraint in Indonesia and partly the lesser resource intensity of the economy (Charts 9a and 9b). The Indonesian experience was distinctly more moderate than the Australian. Nevertheless, the general decline of international competitiveness contributed to ending the growth in Indonesian exports of labour-intensive exports and sending it into reverse in 2012 and 2013—a reversal that must be quickly corrected if strong growth is to be maintained after the boom (Chart 7). The restoration of export growth outside the resource industries is a big challenge for Indonesia—the deterioration in competitiveness through the resources boom is even larger than in Australia, South Africa and Brazil.

Chart 9a: Real Effective Exchange Rate Indonesia, South Africa, Brazil and Australia



Source: EIU database

Chart 9b: Real Effective Exchange Rate Indonesia, Chile and Norway



Source: EIU database

Australia has a well-designed resource rent tax for offshore petroleum, now extended to onshore gas. In other commodities, it shares with Indonesia weaknesses in approaches to

taxation of mineral rents that diminished the return to the community of the increase in value and accelerated depletion of natural resources owned by the State. Nevertheless, the higher export prices generated much higher total government revenue in both countries through standard taxation and royalty mechanisms in the early years of the boom.

The mineral tax (as distinct from general income tax) regimes for most Australian resources are defined by State Governments, which mainly apply ad valorem royalties. The main exceptions are on-shore gas, in which state royalties are supplemented by a Federal Resource Rent Tax, and offshore oil and gas, in which only a Federal Resource Rent Tax applies. Indonesian mineral taxation is mainly applied by the national Government in the form of specific and ad valorem royalties for hard minerals and effectively profits-based taxes through production sharing arrangements for petroleum. Indonesian revenues from coal at least were curtailed by widespread under-reporting of production volumes, under-invoicing and other evasion mechanisms (World Bank 2015:44).

At the same time as Australian and Indonesian fiscal imposts on hard minerals were poorly designed to generate high levels of revenue when prices were high, they increased costs and reduced competitiveness when prices retreated from 2011. With resource markets oversupplied after the boom, royalty costs play a role in determining which producers survive, and which become part of the contraction of production capacity that is necessary to bring global demand and supply back into balance. Australia and Indonesia are the main competing exporters of coal to Asian markets, so the fact that they both have inefficient taxation mechanisms may introduce some rough competitive neutrality.

The Australian Federal Government sought to introduce economically more efficient profit-based royalty systems in 2011, but was defeated by the poor design and novelty of the proposed arrangements and poor management of an extreme episode in rent-seeking behavior by affected companies (Garnaut 2013). An efficient resource rent tax along the lines of that applied for the past quarter century to offshore petroleum would have generated much higher revenues when prices were high, and probably from the highest quality mines at other times. At the same time, it would have reduced imposts on high-cost mines when prices were low, allowing more Australian mines to escape contraction or closure through the restructuring of global supply after the boom.

Australia and Indonesia adopted contrasting policies on processing and on supply of energy to domestic users.

Australia has recently completed a long transition from domestic to international pricing of fossil fuels for domestic use. This has led to large increases in costs to domestic users as coal and gas resources that had once been reserved by transport economics or policy for domestic use saw prices rise towards export parity. This put massive additional pressure for contraction on domestic processing and manufacturing industries (Adams 2014).

Indonesia's policies on domestic pricing of exportable minerals went in two contrasting directions over this period. The big step towards international pricing of petroleum fuels removed an artificial incentive to expansion of energy-intensive activities. In this, it was similar to the effects of the emergence in Australia of a gas export industry on the east coast. The

coincidence of the radical change of policy on fuel subsidies in Indonesia with the slump in global oil prices removed the domestic economic impact—in contrast with Australia, where the price effect of movement from a domestic-oriented to an international gas supply industry was much larger than the fall in international prices. Indonesia's new mandatory processing of metal ores went in the opposite direction, and created powerful incentives for domestic use of locally mined ores.

Australia and Indonesia face similar adjustment challenges after the boom: continued strong economic growth requires large real currency depreciation and removal of barriers to efficient expansion of trade-exposed industries outside resources. That Indonesia's resources boom was proportionately smaller than Australia's means that the adjustment challenge at the end of the boom is correspondingly smaller. For Indonesia, the prospect is for subdued growth for a considerable while—and postponement until after the completion of adjustment of the new President's ambition to raise the growth trajectory to around seven percent per annum. For Australia, the prospect is for a considerable period of stagnant or declining average incomes.

To the negative side of the ledger, we should add the pressures on disrupted communities and the environmental pressures generated by poorly administered resource developments through the boom (Ahmad 2015).

The resources boom has left both countries with domestic political culture and institutions that are poorly structured for productivity-raising reform. This is a major challenge to leadership in both countries.

8. Resources Curse or Blessing?

There is now a large economic literature suggesting that strong specialization in exports of resource-based commodities is rarely unambiguously a blessing, and can be a curse for development (Sachs and Warner 1997; Humphreys, Sachs and Stiglitz 2007; Collier 2007; Collier 2008). Countries with rich endowments of natural resources relative to population and capital have tended to grow more slowly, experience larger and more damaging fluctuations in rates of economic growth, and ultimately have more corrupt government and less equitable distribution of the fruits of development.

There are exceptions. Several of the currently developed countries, including Norway, Australia and Canada, have strong specialization in exports of resource-based commodities. The recent Australian experience, however, cautions against complacency even in longstanding democracies with highly developed economies (Garnaut 2013). A number of developing countries experiencing sustained strong growth were helped in the early years of their 'catching up' by use of public revenues from judicious taxation of mineral rents to support broadly based development. Indonesia through the petroleum booms of the 1970s and early 1980s (Hill 2000; Chowdhury 2004) and Botswana since Independence in the 1960s (Collier 2007) are examples. Countries with unusually high resource shares in exports were over-represented in Paul Collier's 'Bottom Billion' and tended to be particularly vulnerable to corruption of the political culture and institutions through resources development.

Resource booms are temporary and subject an economy to large adjustment stresses when they come to an end. The test of the 'resources curse' is how a country responds to the end of the boom. Indonesia passed this test in the sharp decline in petroleum prices in the mid-eighties (Hill 2000; Pardede 2015). National policy supported adjustment to internationally-oriented industrialization built on diverse exports with a large component of labour-intensive manufactured goods.

The successful economic strategy descended into incoherence in the Asian financial crisis 1997-8. By the time that political order was restored within a new, democratic framework in the early twenty first century, the international economic environment had changed fundamentally. Global and especially Asia Pacific markets for manufactured goods embodying standard technology were now dominated to a much larger extent by China. And the China resources boom was lifting international prices for resource-based products to unprecedented levels. These two related developments together shifted Indonesia's comparative advantage in international trade back towards resource-based commodities.

The evidence to date says that the China resources boom was an ambiguous influence on Indonesian development. At best, it allowed reasonably strong economic growth to proceed through the first decade of democratic government which was bound in any case to be fraught with difficulties for economic management (Aswicahyono, Bird and Hill 2009). At worst, it lulled the newly democratic polity into a false confidence that reasonable economic outcomes could be achieved despite weaknesses in economic policy; burdened the young democracy with rent-seeking practices that would make good policy less likely in future; and raised the cost structure and introduced or extended regulatory interventions that require painful and costly readjustment now the boom is over.

The final balance sheet will depend on what happens next.

The international environment after the resources boom is generally helpful to the macro-economic adjustment that Indonesia has to make if it is to maintain growth without risking external financial crisis. The end of the China resources boom and the shift towards normalisation of United States monetary policy are helpful to exchange rate depreciation. The new pattern of growth in China offers expanded opportunities for exports of manufactures, high-value foodstuffs and services. The dramatic fall in global oil and gas prices from mid-2014 has provided a congenial environment for removal of energy subsidies, providing fiscal room for a large expansion of public expenditure on productivity-raising infrastructure and other public goods. The markedly lower international real interest rates on sovereign debt this century and especially since the Great Crash of 2008 offer strong support for a government committed to increased expenditure on infrastructure. Intentions to increase Chinese funding of infrastructure in developing countries are reflected by the commitment to fund the Asian Infrastructure Investment Bank.

The hard part is what Indonesians must do themselves.

The complete unwinding of the subsidies for petrol and the substantial reductions and change in the structure of continuing diesel subsidies are a big step towards successful adjustment

after the boom. There are pressures for at least partially unwinding these reforms. It is essential that the pressures be resisted, and the energy reforms extended.

The budget adjustment that still remains after the fuel subsidy reforms is daunting. Taxation revenues have grown less rapidly than the economy for several years and, with nominal income growth unusually low after the boom, are likely to do so for several years. Major public investments in productivity-raising infrastructure are necessary elements of the economic adjustment. It will not be easy to accommodate these within firm budgets. The domestic macro-economic and external conditions would warrant funding more public investment in infrastructure from long-term external loans.

The maintenance of sound budgets through the adjustment depends above all on the restoration of reasonably strong growth in output and incomes. That requires substantial real exchange rate depreciation. Reform to accelerate productivity growth can assist real depreciation. However, policy reform and reflection of reform in higher productivity take time. Firmer budgets and correspondingly easier monetary policy supported by domestic cost and income restraint are therefore the main supports for early exchange rate depreciation.

The maintenance of reasonably strong productivity growth as a foundation for higher growth into the future requires the unwinding of distortions in the operation of markets (Manning and Miranti 2015). It also requires reform of the political system that shapes economic regulation and policy. The agenda here is long, and includes unwinding new distortions introduced into the resources sector during the boom. The political economy pressures for maintenance of inefficient taxation and leasing regimes in coal require the unwinding of privileges that have been conferred on private investors. Sound policy in the new circumstances also requires reduced imposts on investment in marginally profitable activities—for example through divestment of foreign equity and domestic processing requirements.

The biggest challenges relate to the political economy of policy-making in Indonesia's democratic polity (Aswicahyono, Bird and Hill 2009). The coincidence of the flow of easy money from transfer of state mineral and especially coal resource into private hands with the formative years of democracy underwrote what would in any case have been powerful tendencies for private wealth to weigh excessively in contests over definition of the public interest in economic policy. The active discussion of constraints on business funding of political parties and campaigns in the lead-up to and since the 2014 elections is encouraging. Reform in these areas is likely to be a precondition for successful policy adjustment to sustain and to accelerate economic growth after the resources boom. Active discussion of policy choice amongst Indonesians who are concerned about policy because it is important to their country, and not because they want to assist some business or partisan political interest, is essential to the success of policy reform in the public interest in the difficult years that lie ahead.

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