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Growth in Indonesia: Is it sustainable?

Drivers of Recent Economic Growth

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Preface

Oxford Policy Management Ltd. (OPML) is delighted to present the study entitled 'Growth in Indonesia: is it sustainable?' The study present analysis on the sustainability of Indonesia's economic growth model conducted for the UK Climate Change Unit (UKCCU) in Jakarta.

This paper reviews the drivers of recent economic growth as part of our study of whether Indonesia's growth is sustainable. Our other papers review the environmental sustainability of growth, the political economy of deforestation, the impact of the commodity boom, and. We use the World Bank's 'adjusted net savings' framework to integrate these papers in an overview paper.

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Any errors or omissions are, of course, the responsibility of the authors. For more information about OPML please visit www.opml.co.uk/.

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Executive Summary

Indonesia has had strong economic growth since the Asian Financial Crisis (AFC). Since 2002, Indonesia's growth has been comparable to other East Asian economies though has not matched growth the high performing BRICS[1] economies. The economy also proved resilient to the global financial crisis (GFC). Only China and India grew faster than Indonesia in the G20 group in 2009. However, while Indonesian economic growth has been strong in aggregate, the level of income per person remains low relative to its neighbours.

This paper unpacks Indonesian growth to help understand whether it is 'sustainable' in terms of economic growth. We start out by decomposing growth by sector, expenditure component and geographical region.

Large parts of growth have been driven by the services sector. After recovery from the AFC, the services sector has grown strongly and increased its share of gross domestic product (GDP) growth. During the same period, agriculture and industry showed a slow decline in contributions to growth. Average annual service sector growth has been 7.4% since 2002. In comparison, the industry sector grew at an average annual growth rate of 4.3%. The industry and service sectors both make up large parts of the economy.

The increased importance of the services sector has translated into increased reliance for growth on the expanding non-tradable sectors. Tradable sectors have shown stagnant contributions to growth; with slow growth rates in output, Indonesian manufacturing industry is falling behind that of regional peers. In our review of the *Impact of the Commodity Boom*, we explore the weak performance of manufacturing and find inconclusive evidence of a 'Dutch disease' effect.

Weak non-commodity exports have been a key characteristic of Indonesia's growth since the AFC. Exports have declined share of GDP, although the contribution of net exports to GDP has been positive. Total export growth has been driven by the commodity price boom while manufacturing exports have shown slow growth and a falling share of total exports. Compared to the BRICS, and regional peers, Indonesia's manufacturing exports as a share of GDP is low. Manufacturing exports are associated with higher growth contributions as they typically integrate the economy into the global production and supply chain which allows Indonesian firms to benefit from learning spill overs – facilitating technical progress and quality improvement in the wider economy.

In terms of patterns of expenditure, private consumption has provided the largest single contribution to GDP growth since 2002. At the same time, it seems likely that commodity exports have played an important role in driving private consumption. Recovery of investment has also been a key driver of recent growth, but did not reach pre-AFC levels until 2007. Investment is predominantly private investment and financed domestically. As with the drivers of domestic consumption, growth in private investment may have been a result of the commodity boom – a linkage explored in a separate paper.

Strong aggregate economic growth has not led to strong reductions in poverty. Although national headcount poverty rates have fallen from 18% in 2002 to 13% in 2011, almost half of Indonesia's population continue to live on less than 2 dollars a day. Income distribution data shows that inequality has increased since the AFC, especially in recent years. Economic growth has benefitted richer people more than the poorer ones. There are regional differences in human development and inequality, but as much variation within provinces as between provinces.

[1] Brazil, Russia, India, China and South Africa.

Concentration of growth in Java and Bali has continued, as growth in Java and Bali account for 62% of GDP with an average annual growth rate of 6.0% since 2005. This is higher than the second richest region, Sumatra, which contributes 21% to the GDP and has grown at an average annual growth rate of 4.6% since 2005. Kalimantan and the Eastern Islands, despite being rich in natural resources, account for only 17% share of national GDP. Economic activity continues to be concentrated in Java. The stagnated composition of regional GDP indicates that specialisation paths set out upon in previous decades have continued. Java and Bali still dominate the manufacturing and service sectors. Kalimantan and Sumatra rely mostly on the extractives sector. These different development patterns hinge on commodity endowments and Indonesia's insufficient infrastructure.

Indonesia's expanding working-age population means that there could be a 'demographic dividend' from growth in the working age population over the next couple of decades. A 'demographic dividend' arises when a growing working-age population supports relatively fewer dependents, with relatively more income available for investment and further economic growth. But such a demographic dividend is not automatic. It mainly depends on the growing numbers of workers acquiring skills and getting jobs. Indonesia's population was 240 million in 2010, with growth of 1% per year and a 'dependency ratio' – which is the ratio of dependents to working people – old or young – of 48%. According to the World Bank's population projections, by 2030 population will be 280 million, with a lower dependency ratio of 44%, in 2030.

In Indonesia, job creation has been limited and restricted to informal jobs in agriculture and services. Data shows that the employment-to-population ratio (among 15+ age category) has broadly remained sticky in the range of 61-63% for the last fifteen years, while the female labour force participation rate was around 50% during the same period. Similarly, the share of workers engaged in informal agricultural and services employment only fell slightly. To understand the prospects of sustained job creation, and the role of various drivers of growth, we look at Indonesia's recent growth through the lens of economic growth theory.

A theoretical application of the exogenous, or neoclassical, growth model suggests that capital investment can sustain growth in the short-run. Investment has risen from 22% of GDP during the period 2002-07 (i.e. during the global commodity price boom) to around 32% in 2010-11. While industrial and manufacturing activities attracted half of all investment, it did not create many new jobs. Most new jobs were concentrated in agriculture and services. One explanation for this seeming conundrum is that most of the manufacturing sector's investments were in technology that improved capital productivity and displaced labour.

The 'endogenous growth model' specifies that the sustainability of long-run growth depends on technology, knowledge externalities, and innovation. Over-reliance on natural resource exports (particularly palm oil and coal) has been associated with a weak manufacturing export performance. Investment in manufacturing has not led to job creation. Indonesia has yet to fully tap into global manufacturing supply chains (particularly compared to neighbours Thailand, Malaysia and the Philippines), and has not created jobs separately from such international opportunities.

It is hard to attract foreign investment and unlock technology transfer owing to weak public investment in infrastructure and poor social indicators. Basic failures of public health and service delivery (for instance, poor child and maternal health) means further investment in human capital (skills development, training, labour productivity-enhancing technologies) will be produce little returns in a country with poor basic social indicators. The quality of physical capital investment (in terms of technological progress, research and development, ideas and externalities) and of human inputs to production (enhanced through education, training, skill development) determines growth in the long-run; as explained by the endogenous growth theory.

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List of Abbreviations

ACDGI	Ash Center for Democratic Governance and Innovation
ADB	Asian Development Bank
AFC	Asian Financial Crisis
BKPM	Indonesia Investment Council
BPS	Badan Pusat Statistik, Indonesia Statistical Office
BRICS	The group of emerging markets: Brazil, Russia, India, China, and South Africa
DDI	Domestic Direct Investment
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GFC	Global Financial Crisis
HDI	Human Development Index
ILO	International Labour Organisation
IMF	International Monetary Fund
MGI	McKinsey Global Institute
OECD	Organisation for Economic Corporation and Development
OPML	Oxford Policy Management Limited
R&D	Research & Development
REER	Real Effective Exchange Rate
TFP	Total Factor Productivity
UKCCU	UK Climate Change Unit
UN	United Nations
WEF	World Economic Forum

Introduction

"The Republic of Indonesia is a nation blessed with almost all of the prerequisites for transformation into a great economic power. With its abundant natural resources, large, production and young population and strategic access to the global mobility network, these assets and access empower Indonesia to establish itself in its rightful place among the leading economies in the world." – President Yudhoyono, Introduction to the Master Plan 2011-25.

Sustained economic growth is a pre-requisite to be a 'great economic power'. Indonesia has succeeded in recovering from the 1997/98 economic and political crisis, and performed strongly during the 2008 world financial and economic crisis. The economy almost doubled in size between 2002 and 2011, with real gross domestic product (GDP) per person rising from US$ 816 in 2002 to US$ 1,206 in 2011. This growth took place during a global commodity price boom.[2] With overall strong performance, and great power ambition, the answer to the question: '*is growth sustainable?*' matters for the policy needed to both maintain rising standards of living, as well as achieving a bold ambition.

In this paper we unpack economic growth to understand whether it has been sustainable. Together with our paper on *Environmental Sustainability*, this paper provides part of the answer to the question: "*is Indonesia growth sustainable?"* Indonesia is the fourth most populous country in the world. It is a big economy abundant with natural resources spread across thousands of islands and growth has been strong. To understand the driving forces behind this growth, we look at economic performance by sectors and expenditure components (i.e. trade, consumption and investment). We also analyse foundation of this growth, by examination of job creation and productivity trends. Altogether it provides insight into the sustainability of the recent performance from an economic perspective.

Our analysis is structured into four main sections. Section 1 examines the performance of recent Indonesian growth. Here we breakdown growth by sector and expenditure components. Section 2 analyses the spatial distribution of growth and its social consequences. Section 3 analyses the demographic dividend and the growth in the labour force, asking the question: how much is growth driven by more labour and more capital? Section 4 discusses productivity trends and drivers of productivity. Section 5 concludes.

[2] We restrict our definition of commodities to minerals, oil and gas as well as palm oil.

1 Economic performance

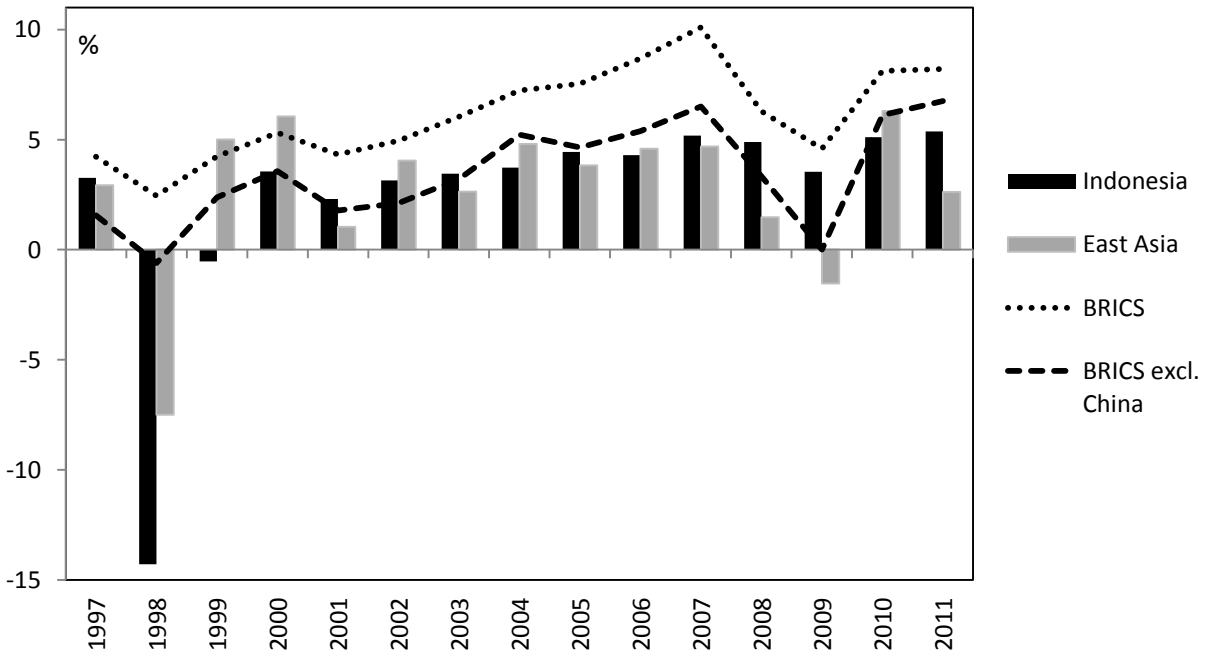
Indonesia is a large and populous lower middle-income economy. It is the fourth largest economy in East and Southeast Asia,[3] after China, Japan, and South Korea – and the 16th largest economy in the world. With a population of 238 million in 2010, the country is the fourth most populous nation in the world and the second most populous nation in East and Southeast Asia after China (IMF, 2012a; UN, 2012; BPS, 2012a).

Indonesia has natural resources, such as natural gas, coal and a variety of metals and minerals and much biodiversity. These endowments have positioned Indonesia as a global commodity producer; the country is the world's largest palm oil producer and the world's second largest exporter of thermal coal (BKPM, 2012a). In recent years Indonesia has experienced moderate and stable economic growth, coinciding with a boom in most commodity prices.

1.1 Economic growth

Indonesia has shown an impressive turnaround since the Asian Financial Crisis (AFC). Since the drop of 14% in real GDP per person in 1998, Indonesia has shown strong economic expansion (see Figure 1). In 15 years, Indonesia has gone from losing its status as an Asian Tiger to becoming a part of the G-20 in 2008.

Figure 1 – Real GDP per capita growth: Indonesia, East Asia and BRICS



Source: World Bank, 2012c.
Note East Asia incl. South Korea, Hong Kong, Singapore, Thailand, Malaysia, and the Philippines.

There are three phases in recent Indonesian growth. The first starts with the recovery from the AFC and ends in 2002, just before the commodity price boom. During this period Indonesian growth was low and unstable but similar to post-crisis East Asian peer economies and BRICS[4] economies. By the beginning of the boom in international commodity prices, the macro economy

[3] East and Southeast Asia: China, Hong Kong, Dem. People's Republic of Korea, Japan, Mongolia, Republic of Korea, Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic, Malaysia, Myanmar, Philippines, Singapore, Thailand, Timor-Leste and Vietnam (UN, 2012).

had stabilised. This indicates the start of the second phase which ends in 2007, just before the global financial crisis (GFC). In this period Indonesian growth performance was strong and comparable to other East Asian economies. However, it did not match the high performance economies of BRICS. The third phase covers the GFC, during which Indonesian growth was resilient to the global economic down-turn. Indonesia was the third fastest growing economy in the G20 group in 2009 – only China and India grew faster (Basri & Hill, 2010). Strong growth has continued in recent years, with economic growth in 2011 hitting a 15 year record high.

While Indonesian economic growth has been strong in aggregate, the level of income per person remains low relative to its neighbours. In 2011, Indonesian GDP was US$292 billion (2000 prices). But income per person is among the lowest in the region. With an average annual growth per capita of 3.9% incurred between 2001 and 2008, it will take Indonesia 23 years to reach the 2008 income per person level of Thailand (ADB, 2010). Indonesia's income per person is also falling behind compared to BRICS economies. At the time of the AFC, income per person in Indonesia was at a similar level to the average in BRICS economies. Today average BRICS income per person is 72% higher than in Indonesia.

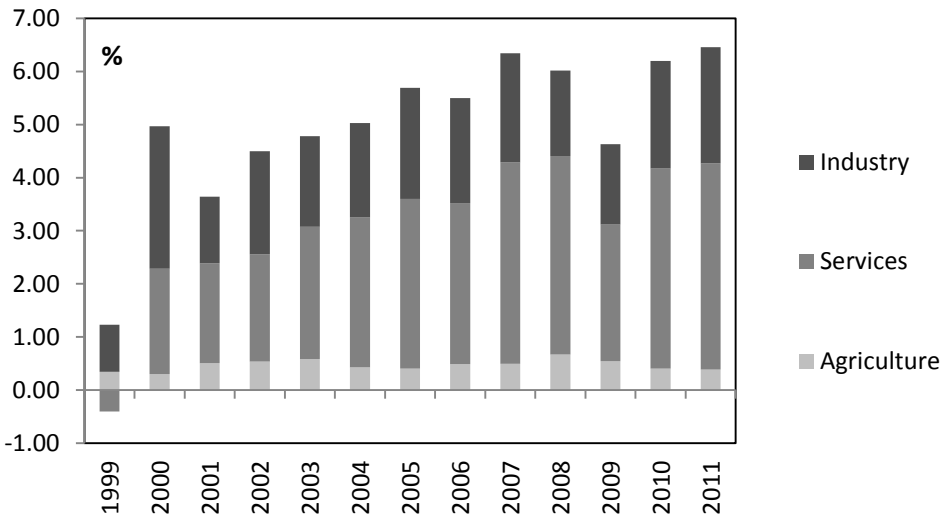
We next decompose growth by sector, expenditure component and geographical origin. This analysis offers an answer to the question we posed earlier – has growth been sustainable?

1.2 Growth by sector

During the commodity price boom, or the second growth phase, the service sector increased its contribution to growth from 45% to 60%. During the same period, agriculture and industry sectors showed a slow decline in contributions to growth (see Figure 2). This development stands in rather sharp contrast to the 1990s, where the manufacturing sector was a key driver of Indonesia's growth (World Bank, 2012b).

However, after the GFC, or in the third growth phase, industry increased contributions to growth while agriculture showed continued decline. After 2008 the industry sector increased its contribution to growth from 27% (in 2008) to 34% (in 2011). The agricultural sector did not show a similar positive development. In fact its contribution to growth fell sharply in 2011 to 6% – down from 11% in 2008.

Figure 2 – Key sectors' contribution to real GDP growth



Source: World Bank, 2012c; authors' calculations.

Big service sector contributions to economic growth reflect strong sector growth. Service and industry sectors accounted for around 40-50% of output between 2002 and 2011. What set apart their contributions to growth is therefore their individual growth performance. Average annual service sector growth was 7.4% during the second and third growth phase. In comparison, the industry sector grew at an average annual growth rate of 4.3% (World Bank, 2012c).

Different sectors fall under the broad headings of agriculture, industry and service. We look at the subsectors to understand the importance of extractive industries and palm oil production, as well as service subsectors.

1.2.1 Agriculture

Slow economic performance characterised all agricultural subsectors apart from fisheries. Food crops, such as soybeans and rice, make up the largest component of the agricultural sector.[4] This subsector's slow growth was the main driver of agriculture's stagnating contribution to growth, especially during the commodity boom. A similar development happened in other smaller subsectors, only fishery was able to sustain its share of GDP from 2002 until 2011 (BPS, 2012a; see Table A.1).

Contributions from estate crops (including palm oil plantations) to GDP growth are small and have not increased since the start of the commodity price boom. In contrast to commonly held perceptions, estate crops,[5] including palm oil plantations, are a small sector in terms of real value-added. On average estate crops accounted for 2.2% of GDP from 2002 until 2011. During the same period, this subsector also showed a falling share of GDP (from 2.3% to 2.0%) – mainly due to decrease in palm oil.[6] This apparent contradiction (a supply response to a commodity boom leading to a real decline) is generated by low quality, low value-added and low productivity in the palm oil industry (Enrique et al., 2010; see also our paper on *Impact of the Commodity Boom*). Lack of contribution to economic growth has been combined with continued deforestation. It is estimated that 1.1 million hectares have been deforested each year the last 20 years – a driver of deforestation has been land use change (see our analysis of *Environmental Sustainability* for further discussion of deforestation).

Table 1 – Overview: agricultural sectors (2002-11)

	Average share of GDP (%)	Average annual real growth rate (%)	Average contribution to real GDP growth (pp)
Agriculture	**14.1**	**3.4**	**0.5**
Food Crops	7.0	3.2	0.2
Estate Crops	2.2	3.4	0.1
Livestock and its Product	1.8	3.8	0.1
Forestry	0.9	0.4	0.0
Fishery	2.2	5.4	0.1

Source: BPS, 2012a; authors' calculations.
See Annex A for table with figures for each of the three growth phases.

[4] Food crops was 6% of GDP and total agriculture 13% of GDP in 2011 (BPS, 2012a).
[5] Including tobacco, rubber and palm oil (BPS, 2012b).
[6] BPS data also shows that palm oil plantations are by far the largest estate crop production in Indonesia. Measured by volume, palm oil production (palm oil and palm kernel) accounts for 91% of estate crop production 2011 (BPS, 2012c).

1.2.2 Industry

Industry subsectors showed different growth performances. Since 2002 the industry sector experienced a slowdown compared to pre-AFC years (Basri & Hill, 2010; Enrique et al., 2010). However, a comparison between different industry subsectors shows different economic performances. Extractive industries, including mining and oil and gas manufacturing industry contributed with close zero to GDP growth. Whereas industry subsectors serving the domestic market contributed positively to GDP growth (see Table 2; Table A.2)

Industry sectors related to commodities performed poorly, resulting in small contributions to GDP growth. Mining and quarrying industries declined as a share of GDP during the last decade – from 12% in 2002 to 8% in 2011 – and grew by only 1.2% per year. In the same period the oil and gas manufacturing industry also declined as a share of GDP – from 3.5% to 2% – and showed negative growth rates (see Table 2). The slow growth in value-added by extractive industries at constant prices links to the lack of increased production volumes (with the exception of the coal industry). This development has been influenced by an unfavourable business climate, leading to low value-added exports and low investment levels (Basri & Hill, 2010; Enrique et al., 2010; BPS 2012b; see our paper *Impact of the Commodity Boom* for more details).

Non-oil and gas manufacturing industries[7] grew faster than extractive industries, but have not managed to keep up with industry subsectors serving the domestic market. However, non-oil and gas manufacturing was the main driver of the industry sectors' contribution to growth, as the largest industry subsector. This growth has in particular been driven by food, beverage & tobacco industries and transport equipment, machinery & apparatus industries whereas export orientated manufacturing industries, such as textiles, clothing and wood products, have been a source of slow growth (BPS, 2012a). With an average growth of 5.4% since the start of the commodity price boom, the non-oil and gas subsector has not kept up with construction and utility subsectors' growth rates. Consequently there has been a decline in its share of GDP (see Table A.2; BPS 2012a).

Growth was generated in construction and utilities: industries primarily serving the domestic market. Construction and utility subsectors saw modest to high growth rates, and especially construction activities have gained increased importance in the economy. However, growth contributions are still fairly small due to the relative size of the subsectors. Owing in part to financing constraints and reduced public sector investments, the performance is far from pre-AFC growth (Basri & Hill, 2010; BPS, 2012a).

[7] Including Food, beverages and tobacco industries, Textile, leather products and footwear industries, Wood and other products industries, Paper and printing products industries, Fertiliser, chemical, rubber product industries, Cement and non-metallic quarrying product industries, Iron and steel basic metal industries, and Transport equipment, machinery and apparatus industries (BPS, 2012b).

Table 2 – Overview: industry sectors (2002-11)

	Average share of GDP (%)	Average annual real growth rate (%)	Average contribution to real GDP growth (pp)
Industry sector	**43.1**	**4.3**	**1.9**
Mining and Quarrying	9.1	1.2	0.1
Manufacturing Industry	27.2	4.8	1.3
- oil and gas	*2.6*	*-0.8*	*0.0*
- non-oil and gas	*24.6*	*5.4*	*1.3*
Utilities: Electricity, Gas & Water Supply	0.7	7.7	0.1
Construction	6.1	7.2	0.4

Source: BPS, 2012a; authors' calculations.
See Annex A for table with figures for each of the three growth phases.

1.2.3 Services

Communication and transport subsectors have been growth engines of the service sector since the start of the community price boom. All service subsectors show growth rates higher than total GDP growth, thereby increasing their share of total output. Trade, hotel and restaurant activities, linked to tourism, comprise the largest part of this growth. However communication and transport sectors have been the real growth engines: despite this subsector being nearly half the size of the trade, hotel and restaurants subsectors, its growth contribution has only been slightly smaller (see Table 3; Table A.3).

The communication subsector has driven growth primarily due to successful deregulation in the telecommunications sector. Communication activities have increased their share of output by four times since 2002 (BPS, 2012a). Indonesia is the world's largest user of mobile phones and has the second largest number of Facebook accounts (Basri & Hill, 2010; Manning & Purnagunawan, 2011).

The air transport subsector has also been a driver of service sector growth. Albeit smaller than the combined communication sectors, its GDP contributions have doubled in the last decade. Successful deregulation has again been a key driving force (Basri & Hill, 2010).

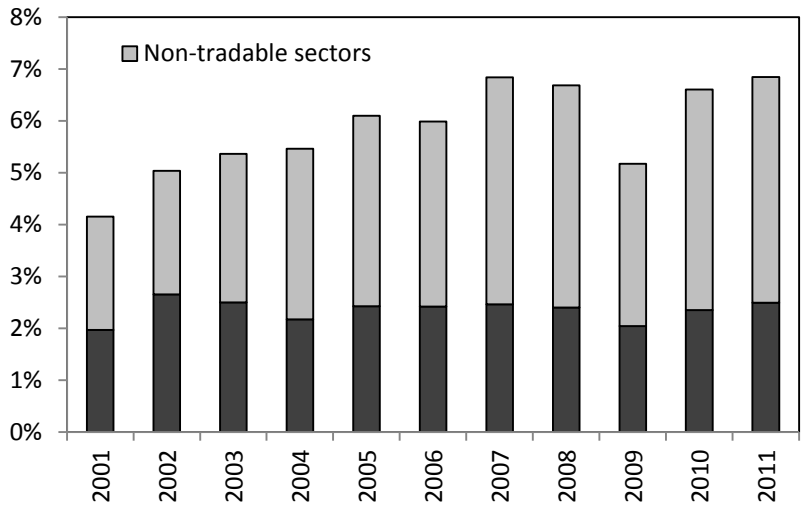
Table 3 – Overview: service sectors (2002-11)

	Average share of GDP (%)	Average annual real growth rate (%)	Average contribution to real GDP growth (pp)
Service sector	**42.8**	**7.4**	**3.1**
Trade, Hotel & Restaurants	16.9	6.5	1.1
Transport and Communication	7.3	13.2	0.9
Finance, Real Estate, Business Services	9.3	6.7	0.6
Services (private and gov)	9.3	5.7	0.5

Source: BPS, 2012a; authors' calculations.
See Annex A for table with figures for each of the three growth phases.

The increased importance of service sectors translates into increased reliance on non-tradable sectors – but there is not strong evidence of 'Dutch Disease'. The large influx of capital generated from a boom in natural resource sectors can lead to appreciation the real effective exchange rate (REER). 'Dutch Disease' is when an appreciation of the REER causes a contraction of tradable sectors. During the peak of the commodity boom, non-tradable sectors have grown at twice the speed of tradable sectors, and after 2007 non-tradable sectors accounted for a larger share of GDP (See Figure 3). In other words, growth has been driven by sectors delivering goods and services to Indonesia's domestic market. In our paper *'Impact of the Commodity Boom'* we explore the 'Dutch Disease' hypothesis, but find no strong evidence of the phenomenon. Instead the poor performance of tradable sectors is likely linked to a decline in profit margins and increased risk after the AFC caused by stagnation in output prices due to higher competition and growing input prices (i.e. commodity prices and insufficient infrastructure) (World Bank, 2012b; see discussion under Section 1.3.3 on Exports).

Figure 3 – Tradable & Non-tradable sectors importance[8]

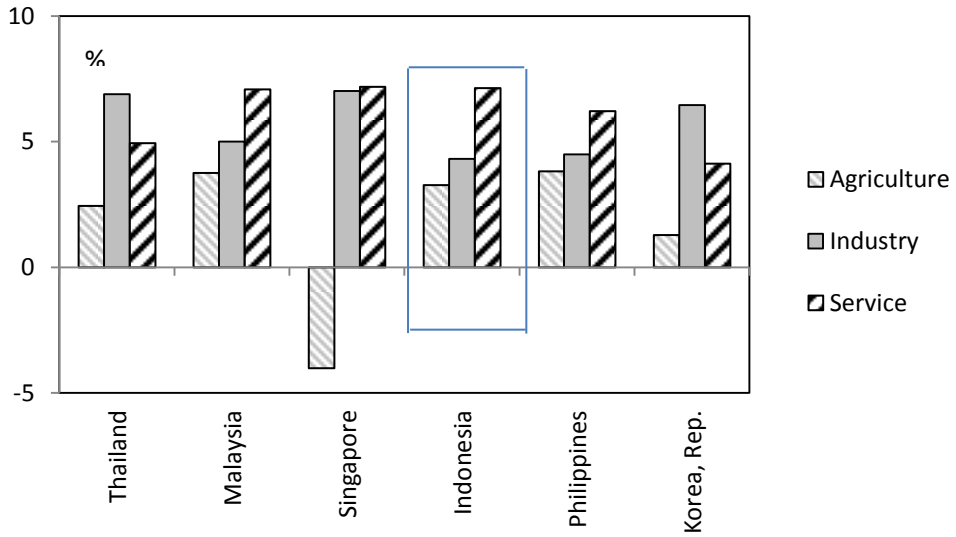


Source: BPS, 2012a; authors' calculations.

Indonesian manufacturing industry is falling behind that of regional peers. Under-performance of the Indonesian manufacturing sector is in sharp contrast to other manufacturing sectors in the region (World Bank, 2012b). Indonesia stands out with a large growth difference between service and industry (including manufacturing) sectors. It is in fact the country with the lowest growth rate in industry during the commodity price boom, although close to the rate of the Philippines (see Figure 4). As mentioned in the above paragraph, this squeeze of manufacturing sectors is a combination of many factors.

[8] *Tradable sectors*: Agriculture, livestock, forestry & fishery, Mining & quarrying, and Manufacturing industry. *Non-tradable sectors*: Construction, Electricity, gas & water supply, Trade, hotel & restaurants, Transport & communication, Finance, real estate & business services, and Services (public and private) (Manning & Purnagunawan, 2011).

Figure 4 – Regional comparison: annual average growth in main sectors (2002-07)



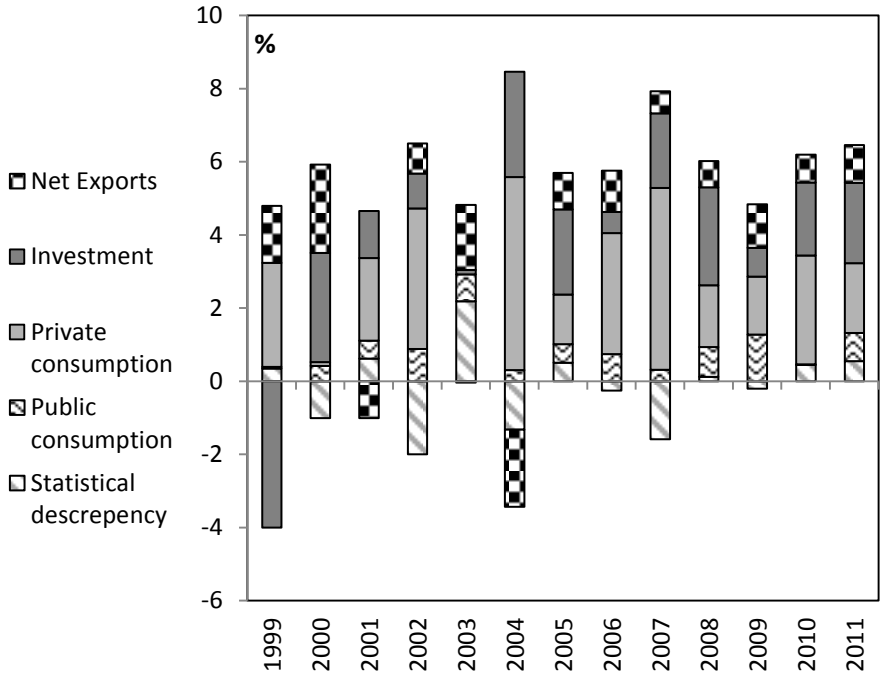
Source: World Bank, 2012c; authors' calculations.

1.3 Growth by expenditure component

We next decompose growth by expenditure component. Based on the national accounting identity, we analyse growth in GDP by analysing changes in private and public consumption, investment and net exports.

Growth shows high dependence on domestic demand, or private consumption and investment (see Figure 5). Reliance on domestic demand, as one of the key drivers of growth, provided the country with resistance to the risks represented by a global economic slowdown. Trading activities' relative small share of GDP meant that the global recession had less direct, wide spread impacts in Indonesia (Basri & Rahardja, 2010).

Figure 5 – Contribution to annual real GDP growth by expenditure component[9]



Source: World Bank, 2012c; authors' calculations.

1.3.1 Consumption

Private consumption is the largest single contribution to GDP growth since 2002. Consumption consists of both a private and public component, with significant dominance of private consumption. With about two-thirds of GDP generated from private consumption, it is a large contributor to economic growth (see Figure 5; Table 4). Since the GFC, private consumption has seen a decrease in its share of GDP, a development that could reflect the beginning of a shift from consumption to investment (IMF, 2010a).

In comparison to private consumption, public consumption has accounted for less than 10% of GDP. This trend has remained unchanged since the start of the commodity boom. However the public consumption share did not contract during the GFC. Instead it doubled its contribution to growth during those years (see Table 4; Table A.4). There are several reasons for this. Indonesia entered the GFC with better fiscal conditions than many Asian countries, or even the US and Europe. Furthermore, the Ministry of Finance introduced a fiscal stimulus package for 2009 – a combination of tax cuts and expenditure expansion (Table A.1; Basri & Rahardja, 2010; IMF, 2010a).

Strong private consumption benefitted from commodity and service exports. Since the commodity price boom many people have moved out of poverty, according to World Bank estimates the middle class grew by over 50%, from 80 to 130 million, from 2003-10 (World Bank, 2011).[10] This development can be linked to commodity export performances. Analysis shows that it is likely that commodity played an important role in driving private consumption (Basri & Rahardja, 2010). As a result there has been a substantial increase in private consumption of, for example,

[9] Public consumption: General government final consumption expenditure, Private consumption: Household final consumption expenditure, etc. Exports: Exports of goods and services, Imports: Imports of goods and services, Investments: Gross fixed capital formation (World Bank, 2012c).
[10] The middle class is defined as those who spend between $2 and $20 a day.

televisions, motor cycles and cars as well as a shift in consumption to higher quality services (ADB, 2010).

Table 4 – Overview: expenditure components (2002-11)

	Average share of GDP	Average annual real growth rate	Average contribution to real GDP growth
Public consumption	8.0	8.3	0.6
Private consumption	60.5	4.5	2.7
Investment	25.7	7.6	1.7
Exports	29.9	8.2	-
Imports	25.6	8.7	-
Net exports	-	-	0.7

Source: World Development Indicators; World Bank; authors' calculations.
See Annex B for table with figures for each of the three growth phases.

1.3.2 Investment

Recovery of investment has been a key driver of recent growth, but total investment did not reach pre-AFC level until 2007. After the AFC, international businesses were cautious to invest in Indonesia. The political changes following the AFC led to the 2001 decentralisation, in which Indonesia underwent big political and administrative changes. Today investment has reached pre-AFC levels and accounts for one third of GDP, compared to one fifth a decade earlier (see Figure A.1; Table 4).

Growth in investment has arisen largely due to an increase in private investment. With an average share of 20% of GDP between 2002 and 2011, private investment has roughly been four times that of the public investment level. During the same period, public investment only accounted for 5% of GDP on average (BPS, 2008; BPS, 2012c; BPS, 2012a). This is a continuation of a historic trend but a distinct feature of the recent decline has been falling infrastructure investments. In 2007 infrastructure investment was only 3.4% of GDP – around half of the pre-AFC level (World Bank, 2007). Our paper *the Impact of the Commodity Boom* shows that a key explanation for the lack of public investment is large volatile public spending on energy subsidies and prioritisation of debt repayments after then AFC leading to less room in the budget for public investment – combined with an insufficient regulatory and institutional setting.

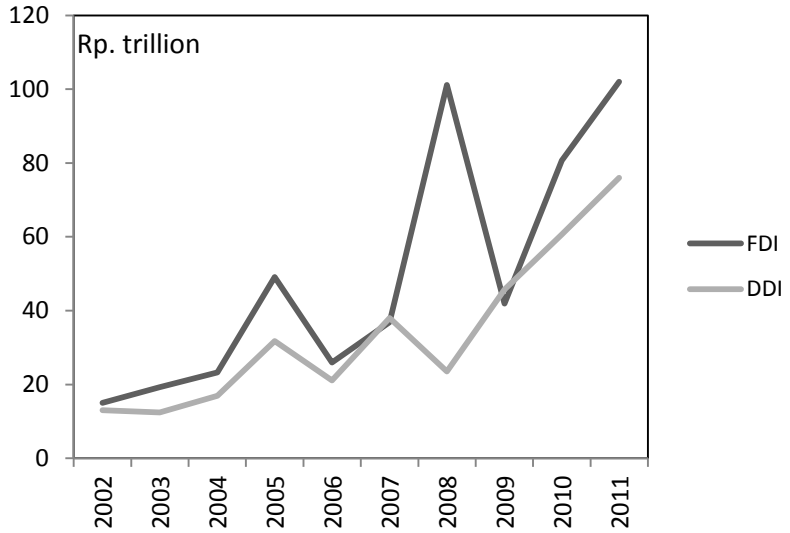
Total investment is dominated by domestic investment. Foreign and domestic investments, mainly private activities, are another way to disentangle high investment growth. The World Bank releases figures of *net inflow* of foreign direct investment (FDI): these show that FDI accounted for around 1.3% of GDP in the last decade – leaving the majority of investment to domestic funding (World Bank, 2012c).

BKPM collect data on *realised domestic direct* investment (DDI) and FDI – excluding divestment and not accounting for household investment, the oil and gas sector and some service sectors.[11] This shows that direct investment is generated from foreign and domestic sources. Since the start of the commodity boom realised FDI has on average accounted for 58% of total realised direct

[11] 1) Realised investment means gross flows of foreign and domestic investment without subtracting disinvestment.
2) Realised domestic and foreign direct investments data are excluding of the investments in Oil & Gas, Banking, Non-bank Financial Institution, Insurance, Leasing, Investment which its licenses issued by technical/sectoral agency, Porto Folio as well as Household Investment (BKPM, 2012).

investment, or 1.2% of GDP compared to 0.8% of GDP for realised DDI (BKPM, 2012c; see Figure 6).

Figure 6 – Realised FDI and DDI[12]



Source: BKPM, 2012b; World Bank, 2012c; authors' calculations.

Throughout the commodity price boom the majority of investment has been directed at the industry sector – both for realised DDI and FDI. During the commodity price boom, the industry sector received 62% and 64% on average of yearly DDI and FDI, respectively. The food industry saw the largest influx of DDI (around one sixth) during that period. Another DDI magnet was the construction subsector. It received an average 6.5% of yearly DDI equal to its share of GDP (BKPM, 2012b). FDI had a different industry focus, as investment primarily went into the chemical & pharmaceutical industry and metal, machinery and electronic industry during the boom years (BKPM, 2012b).

Commodity exporting sectors have primarily attracted DDI, FDI has only recently picked up in the mining sector. DDI in commodities flows to food and estate crop industries, whereas the remaining sectors receive insignificant amounts of investment flows. Since 2005, food and estate crops have accounted for an average 11% of yearly DDI. The subsector only attracted around 3% of yearly FDI for the same period. Data is not available for oil and gas industries, but the mining industry shows that investment has taken place, especially in the last two years where an average 16% of yearly FDI has flown to the sector (BKMP, 2012b).

Deregulated sectors have attracted the majority of FDI since the start of the commodity boom. Transport and communications sectors experienced high growth, as mentioned earlier due to deregulation. This sector received on average of one fourth of yearly FDI, incomparable to any other subsector (BKPM, 2012b).

Industry sectors show higher investment intensity during the commodity price boom than the service sector despite slower growth performances. But the service sector's investment intensity has picked up since the GFC. The size of investment matters but to understand the relative importance of investment in the sector, it is useful to look at investment intensity. Investment intensity (i.e. total investment as a share of sector value-added) in the industry sector has been two to three times the size of the service sectors during the commodity boom. Agriculture has also outperformed the service sector in some years. However, since the GFC, the service

[12] Official exchange rate (LCU per US$, period average) has been used to convert realised FDI.

sector has increased its investment intensity – an increase attributable to investment in transport and communication (BKPM, 2012b); World Bank, 2012c; authors' calculations).

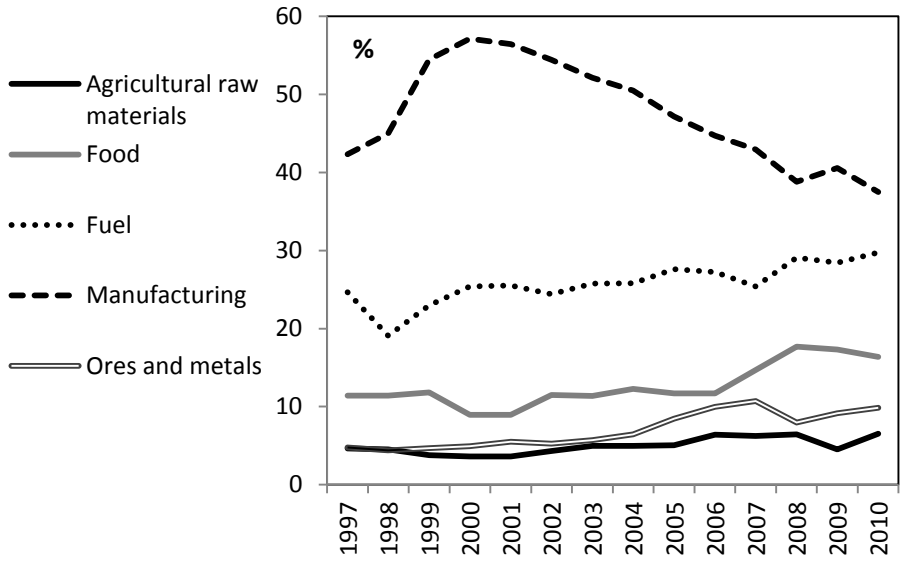
Strong investment growth cannot be disentangled from commodity sector activities. We have seen that investment in construction was strong during the commodity price boom. This development can be traced back to key business structures in the Indonesian economy: large domestic conglomerates. One hypothesis is that Indonesian conglomerates have re-cycled surpluses from the commodity sectors into construction fuelling a real estate boom, especially in Java. We explore the extent to which commodity sectors have indirectly influenced investment in other parts of the economy in our paper *Impact of the Commodity Boom*.

1.3.3 Exports

Export performance has been poor since the AFC, exports and imports have declining shares of GDP since the start of the commodity boom (see Figure A.1). Nevertheless, contributions from net exports to GDP growth have remained positive. Only in 2004 did the relative growth of exports and imports cause a negative contribution to GDP from net exports (Figure 5). The relative contraction in exports and impacts was generated by a real contraction in manufacturing export – the largest component of merchandise exports in 2002 – and a real decrease in service imports. Although fuel and manufacturing imports rose during the commodity boom (World Bank, 2012c). The surplus on the current account was primarily used to bring down external debt which had increased rapidly after the AFC (see our paper on *The Impact of the Commodity Boom*).

Total export growth has been driven by commodity exports while manufacturing exports has suffered. In the 1990s Indonesia successfully started to diversify its export away from primary commodities towards manufacturing exports. This development has been reversed during the commodity price boom and the GFC. Manufacturing exports share of total exports decreased with 20 percentage points in 10 years to 34% in 2011. While commodity exports, such as raw materials, mining and oil & gas, have all showed increasing shares of exports (see Figure 7; World Bank 2012b). Reliance on commodity exports could have repercussions for Indonesia's future export performance, as growth in the majority of commodity exports (a part from coal and palm oil) stems from price increases – not increases in production volume.

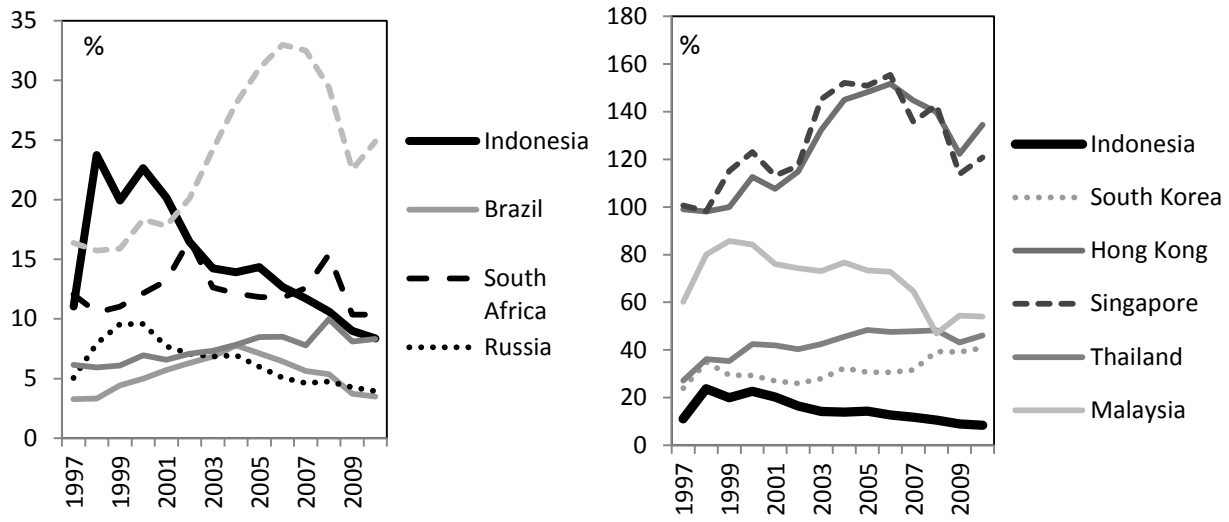
Figure 7 – Composition of merchandise exports



Source: World Bank, 2012c.

Compared to BRICS and regional peers, Indonesia's manufacturing export performance is falling behind. Manufacturing exports have fallen for ten years as a share of GDP. Having been the strongest exporter among BRICS economies, Indonesia's exports have dropped to the level of India. Indonesia has also fallen further behind neighbouring countries in manufacturing export performance (see Figure 8). Exporting manufactured goods is a source of productivity improvements, jobs, and sustained economic growth, in a range of countries. Weak performance is therefore cause for concern.

Figure 8 – Manufacturing exports' share of GDP



Source: World Bank, 2012c; authors' calculations.

The increase in commodity exports and fall in manufacturing exports have been driven by three key factors. Firstly increasing demand by large emerging markets which is implicit in rising commodity prices. Robust demand for raw materials is exemplified by China's ascent to the top ranks of countries importing Indonesia's goods and services. Secondly, China has become an important part of the global supply chain in many manufacturing sectors leading to increased competition for Indonesian exports, particularly in labour-intensive assembled manufacturing goods. Thirdly, Indonesia has lacked policy support to promote and strengthen the country's knowledge and innovation system – especially compared to its Thailand and Malaysia (see Figure A.2; Box 1; Enrique et al., 2010).

Box 1 – China's influence on Indonesia' economy

Indonesia has emerged as the top regional commodity exporter, but has not been successful in becoming part of the Asian manufacturing supply chain. China has influenced the Indonesian economy through commodity prices as well as increases in production and exports volumes. This has been most pronounced in non-oil and gas commodities - namely coal, palm oil and rubber.

A Chinese slowdown would impact Indonesia through direct trade and commodity prices, affecting domestic investment and consumption as well as secondary effects through other trading partners also dependent on China.

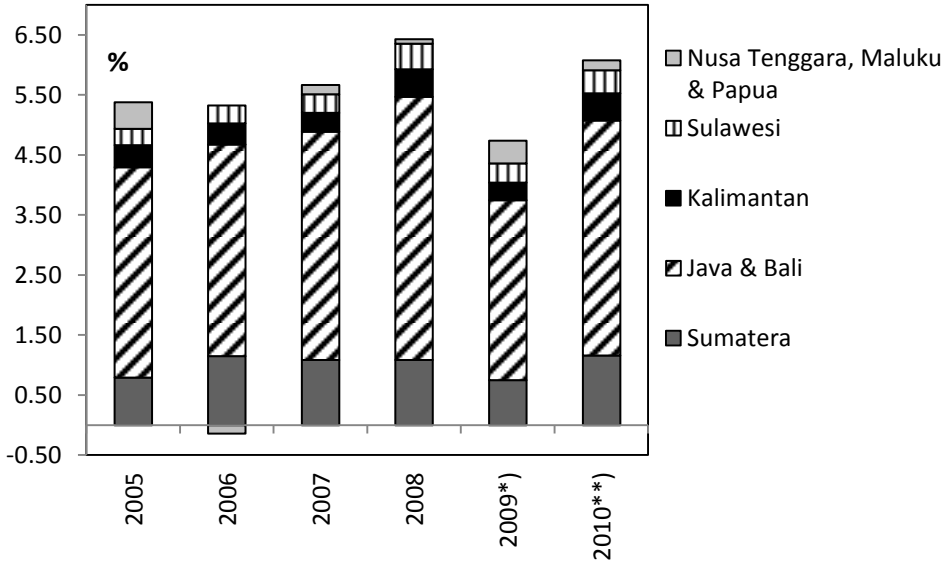
IMF estimates in 2012 suggested that a 1 percentage point reduction in China's growth could lower Indonesia's GDP by up to 0.5 percentage points. However, the impact of global growth on Indonesian growth is lower than for other Asian economies given the greater importance of domestic demand. In other words, the relatively small share of exports in GDP means that a decline has a small impact on GDP growth.

Source: IMF, 2012b.

2 Spatial distribution of GDP growth

Indonesia is the world's largest group of islands with approximately 18,000 islands spanning three time zones. These islands are grouped into 33 provinces in five regions: Java and Bali, Sumatra, Kalimantan, Sulawesi and the Eastern provinces (OECD, 2010).

Figure 9 – Provinces contribution to real GDP growth



Source: BPS, 2012a.
Note *) preliminary **) very preliminary.

Economic activity has continued to be concentrated on Java and Bali. Accounting for around 60% of GDP, Java and Bali dominate growth with Sumatra on a distant second. Kalimantan and the Eastern Islands account for only a small share of GDP despite their rich natural resources. Kalimantan, Sulawesi and the Eastern Islands combined accounted for less than Sumatra's share of GDP in 2011 (see Table 5; BPS, 2012a). Spatial spread in output and GDP growth has not been a main feature of recent economic growth (see Figure 9).

Table 5 – Overview: spatial distribution of growth (2005-11)

	Average share of GDP (%)	Average annual real growth rate (%)	Average contribution to real GDP growth (pp)
Sumatera	21.5	4.0	1.0
Java & Bali	61.9	5.1	3.7
Kalimantan	8.8	3.6	0.4
Sulawesi	4.6	6.3	0.3
Nusa Tenggara, Maluku & Papua	3.2	4.9	0.2
National	**-**	**4.8**	**-**

Source: BPS, 2012a; authors' calculations.

The stagnated composition of regional GDP indicates that specialisation paths set out in previous decades have continued. Java and Bali still dominate the manufacturing and service sectors, having experienced strong patterns of structural transformation. Kalimantan (more precisely East Kalimantan) continues to rely on the mining sector, in particular, oil and gas. Whereas Sumatra relies mostly on the agricultural sector, in particular, palm oil (Enrique et al., 2010). Related to sector performances, discussed in Section 1.2, it is not surprising that growth contributions from Java and Bali are high or that Sumatra's growth contribution outperforms Kalimantan's. More generally agriculture plays a large role outside any of the major cities across provinces, whereas manufacturing activities are concentrated around major cities such as Jakarta, Bandung and Surabaya (World Bank, 2012b).

Different development patterns hinge on commodity endowments and insufficient infrastructure. Natural resources are highly unevenly distributed leading to many region-specific booms. But unchanged regional structures in output is undeniably linked to Indonesia's lack of infrastructure and poor labour mobility across sectors due to limitations to skills up-grading of the labour force and education (Chadari, 2009; Basri & Hill, 2010). In fact Manning & Purnagunawan (2011) argue that the Masterplan 2011-25 is the first serious attempt to develop an economic blueprint that acknowledges Indonesia's physical challenges in connecting the disparate regional economies. Unsuccessful catch up by less developed regions is in part also linked to decentralisation and corruption.[13]

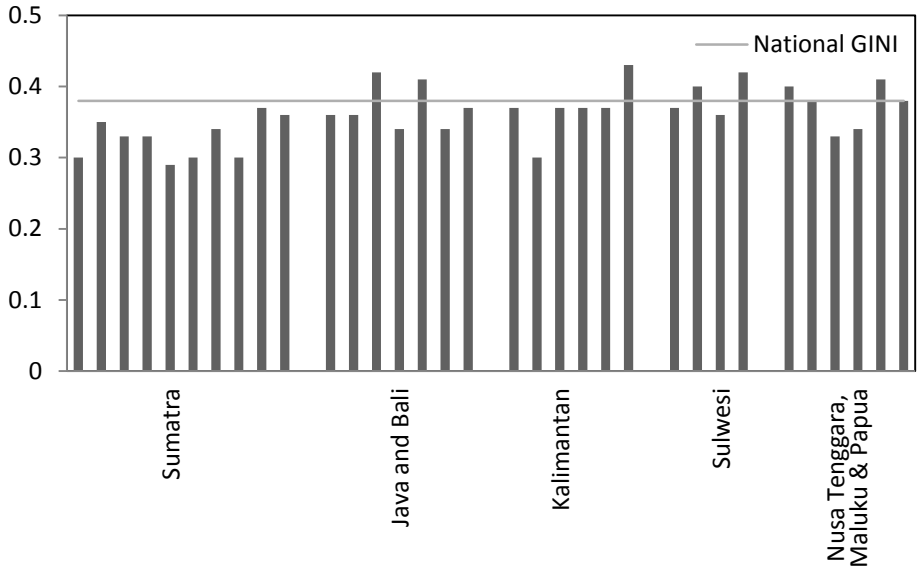
Apart from different regional potentials, the variety in dominance of sectors across regions leads to different drivers of growth. Reliance on manufacturing and service sectors on Java and Bali means that a mix of domestic demand and international competiveness is central to growth generation. Whereas Kalimantan and Sumatra are much more dependent on external factors, such international demand, due to the reliance on extractive industries and palm oil.

Indonesian growth has not been broad-based, as almost half the population still lives in poverty (less than 2 dollar a day). The spatial spread of growth also refers to the distribution of wealth across the population. Social performance and inequality are central to understanding the type of growth generated. National poverty shows declining trends from 18% to 13% between 2002 and 2011, but almost half of Indonesia's population continue to live on less than two dollars a day. Income distribution data shows that national inequality has increased since the AFC, especially in recent years. The 20% of the population with the highest income increased their share of total income (BPS, 2012a; WDI, 2012). Although poverty has been reduced, economic growth has benefitted richer segments proportionally more than the poorer ones. The uneven distribution of economic activity is reflected in large disparities in living conditions and large differences in district poverty rates (Shah, 2012).

Regional data does show spatial variation in human development and inequality, but as much within provinces as between provinces. With different economic activities taking place in Indonesia's five provinces, we would expect the level of human development to show provincial differences. Although Sumatra has a slightly lower average than the other provinces, there are no big provincial differences. Instead data on the 33 regions shows great within province variation in inequality levels (GINI) (see Figure 10). A similar picture is revealed when looking at regional human development index (HDI)-figures (BPS, 2012a).

[13] Decentralisation to inexperienced local governments introduced additional problems of coordination and assignment of responsibility. Land acquisition has emerged as a serious constraint in newly democratic local communities intent on redressing past grievances. Private sector infrastructure suppliers are hesitant to invest owing to the resistance to setting prices at levels that would make such investments economic. The bitter experience of many foreign infrastructure providers during the AFC has also deterred investors (Wells and Ahmad, 2007 from Basri & Hill, 2010).

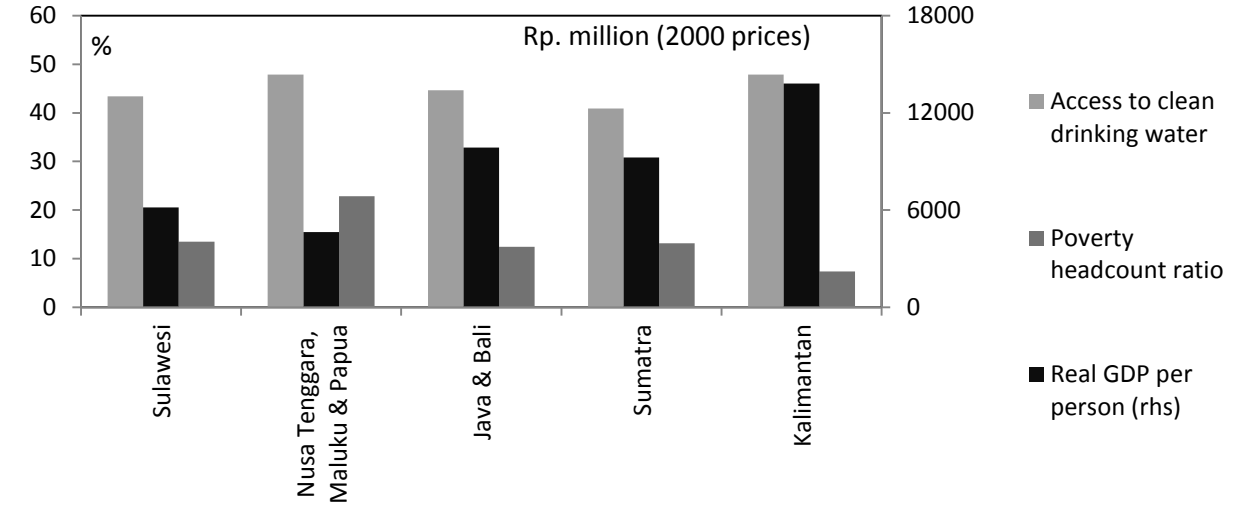
Figure 10 – GINI coefficients across Indonesia (2010)



Source: BPS, 2012b.

There appears to be a positive correlation between income per person and poverty alleviation, whereas human development is rather even across provinces. We attempt to unpack the relationship between per capita income and human development through a brisk comparison. This comparison shows positive correlation between per person income and poverty alleviation. This is positive, but it does not change the fact that inequality in Indonesia has been increasing (BPS, 2012a). Access to clean drinking water, our proxy for human development outcomes, shows no clear relationship with the other indicators. In fact access is fairly even across provinces. Noticeable is Kalimantan, the mining heavy province: it has the highest income per person in 2010 as well as the lowest poverty rate among the five provinces (see Figure 11).

Figure 11 – Provincial comparison of income and human development (2010)



Source: BPS, 2012a; authors' calculations.

2.1 Recent growth: overview of facts

We started by asking the question: *is Indonesian growth sustainable?* We have now unpacked Indonesia's growth in a number of ways.

- Indonesia's growth performance has been strong and shown a significant turnaround since the AFC. It has in fact been resistant to the recent global economic downturn. The growth performance compares to that of regional peers, but cannot quite match that of BRICS economies.

- Heavily endowed with national resources, the role of commodities in Indonesia's output and growth is complex. The direct effects on growth stem from two main sources. When we look at their economic importance and development, we find that:

    - Value-added from commodity-related agriculture and industry sectors has not shown an impressive performance. The share of extractive industries and palm oil accounted for an average of 14% of GDP between 2002 and 20011, but with slow growth, their share of GDP has declined since the start of the commodity price boom.

    - The export performance has been different. Commodities have been the main drivers of exports with manufacturing showing a sharp decline. But the increase in commodity exports has been mainly to due to price increases, which makes it vulnerable to price fluctuations – in 2012 Indonesia experienced a trade deficit due to fall in commodity prices.

- So, the direct impacts of the commodities on growth have been mixed. However, this is not the whole picture. Commodities affect growth directly through export activities and sector value-added, as well as indirectly through proceeds from these sectors (We explore the indirect impacts of commodity sectors in our paper *The Impacts of the Commodity Boom*).

- Looking at other parts of the economy, the service sector expansion explains a large share of recent economic growth. Deregulated sectors in transport and communication have shown especially high growth rates. The manufacturing sector has shown slow growth, leading to a fall in the share of GDP. Indonesia's manufacturing exports are in fact falling behind regional peers and BRICS economies.

- The expenditure decomposition shows that domestic demand makes up the largest expenditure component of GDP. Private consumption is by far the largest part of GDP, but investment has also been a key driver of growth since the AFC. Although it did not reach pre-AFC level before 2007.

- Growth has continued to be concentrated on Java and Bali with the bulk of both service and manufacturing sectors placed there.

- Growth has not been broad-based. Although poverty rates have decreased, inequality has continued to rise. Many people still lack formal jobs and investment in human capital.

Indonesia's growth is a complex matter. It has a great part of domestic demand and service sector growth, as well as a decline in manufacturing industries. The underlying growth dynamics also play a large role in Indonesia growth performance sustainability. We continue our analysis of economic growth by posing additional questions. *What has driven low productivity growth and weak formal job creation in Indonesia?*

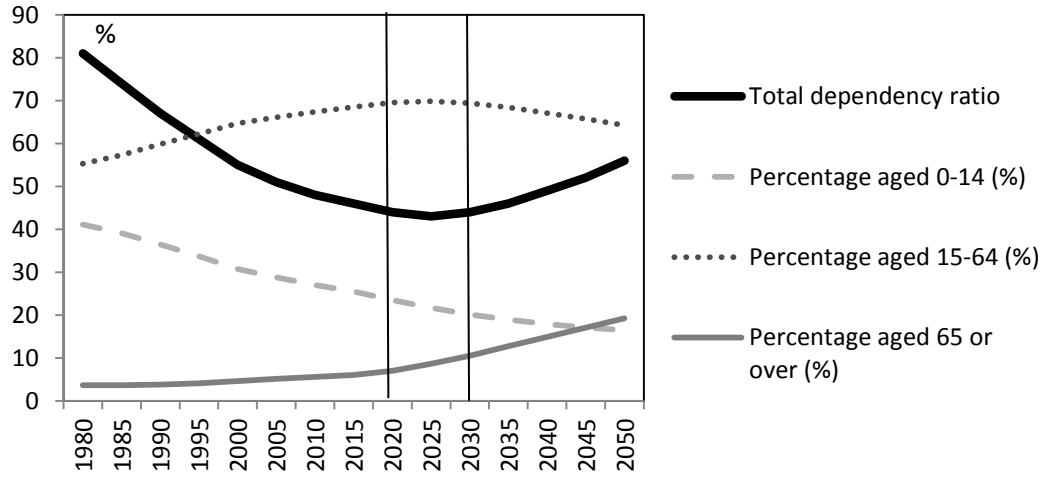
3 Through the lens of growth theory: how strong are Indonesia's economic fundamentals?

We investigate whether promising predictions about Indonesia's growth reflect strong economic fundamentals. Over the last ten years economic growth in Indonesia has been stable and robust, with an average growth of 4% in real GDP per capita. This is impressive given the present recessionary pressures in advanced developed economies. In addition, prospects of Indonesia's growth sustainability have been predicted as 'bright' and comparable to China and India, two of the strongest BRICS nations (WEF, 2011; MGI, 2012).

3.1 The case of population growth, job creation, and demographic dividend

Indonesia's expanding working-age population has led to expectations of a demographic dividend in the next couple of decades. With a population of 240 million in 2010, the country's annual population growth rate stands at 1% per year (World Bank, 2012c) while the total fertility rate is 2.2 birth per women (Global Health Facts, 2012). The dependency ratio[14] for the same period is 48.3%. According to the World Bank's population projections, it is expected that by 2030, the country's population will stand at 280 million with a lower dependency ratio of 43.6% (see Figure 12 for an understanding of Indonesia's demographic window of opportunity). If these projections are to be believed, Indonesia appears reasonably on track to reap demographic dividends from its expanding working-age population in the next two decades.

Figure 12 – Indonesia's demographic window of opportunity has opened since 1990, and will be broadest between 2020 and 2030



Source: UN, 2012.

However, is it inevitable that a country will reap demographic dividends just by increasing the relative size of its working-age population? A growing working-age population can support economic growth when the ratio of people working to dependents – old or young – goes up. But such a 'demographic dividend' is not automatic. It mainly depends on the growing numbers of workers having jobs. A range of public policies can help link such demographic windows of opportunity to faster growth. These include investment in public health, education, and economic

[14] Age dependency ratio is the ratio of dependents--people younger than 15 or older than 64--to the working-age population--those ages 15-64. Data are generally expressed as the proportion of dependents per 100 working-age population.

policies that promote job creation and encourage firm competitiveness. We look more closely at the challenges of job creation in the next section.

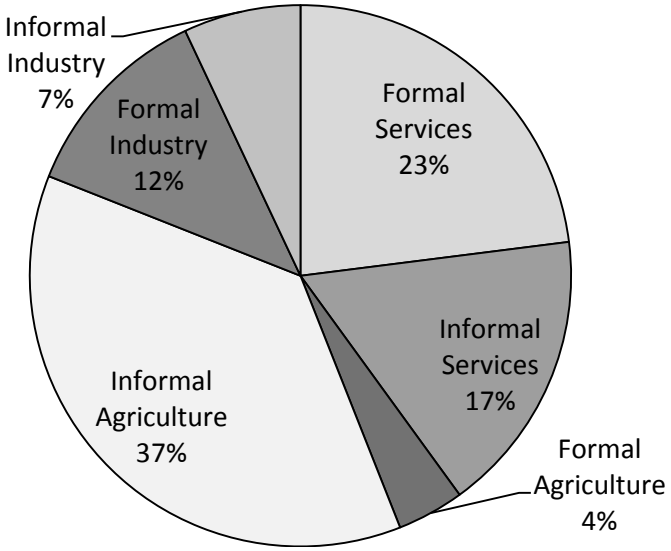
3.1.1 'Jobless growth'?

Indonesia has not created enough jobs, despite employment generation being at the centre of its national policy objectives.[15] According to the International Labour Organisation (ILO), progress has been 'mixed' (ILO, 2011). This is especially so in the form of gender imbalance (i.e. not enough women are in employment). In addition, majority of the jobs in Indonesia are in the informal sectors.[16]

World Bank data shows that employment-to-population ratio (among 15+ age category) has broadly remained sticky in the range of 61-63% for the last fifteen years. Female labour force participation rate also stagnated in the range of 49-51% during the same period (World Bank 2013; UN 2012).

Similarly, only small achievements were made in reducing the share of workers engaged in informal employment. It is noteworthy that 37% of the active workforce in 2009 was engaged in informal agriculture, while a significantly lower percentage (12%) was engagement in formal industrial jobs). Labour regulations, particularly the severance payment system, are still seen as obstacles to doing business in Indonesia (Manning and Purnagunawan, 2011). It signifies that private firms have manoeuvred their way around the high costs of employing regular workers. The Sakernas (National Labour Force Survey) data further shows a decreasing compliance with minimum wages stipulations, and a growing percentage of wage workers earning below minimum wages (ADB, 2011).

Figure 13 – Composition of active workforce by sector (2009)



Source: World Bank, 2009.

It can be further argued that not all those engaged in informal agriculture may be productively engaged. This is because of the high incidence of underemployment in traditional agriculture which is mainly based on family labour.

[15] This has been outlined in Indonesia's National Midterm Development Plan, 2010-2014.
[16] The World Bank's Indonesia Jobs Report offers a useful definition of informal jobs: the report includes any worker without a contract, self-employed workers, and unpaid family workers under this category.

Finally, as far as general employment trends are concerned, open unemployment has indeed decreased but most new jobs were created in the informal sector. In particular, employment has been distributed in the agricultural and services sectors while its share in manufacturing has decreased. More importantly, Indonesia's labour productivity[17] has increased at a moderate annual average rate of 3.3% over the last decade (ILO, 2011; BPS, 2012a) though it still lags behind other Asian economies particularly China and India. More descriptive statistics on employment, productivity and value-added per employee is in Table 6 below.

Table 6 – Labour market conditions (2005 and 2010)

	All ages (15+)		Youth (15-24)	
	2005	2010	2005	2010
Working age population (million)	158	172	42	41
Participation rate (%)	67	68	53	49
Unemployment rate (%)	11	7	33	21
Employed population (million)	94	108	15	16
Formal sector (%)	37	40	41	4
Informal sector (%)	63	60	59	54
Urban (%)	40	42	39	44
By key sectors				
Agriculture (%)	44	38	41	32
Industry (%)	19	19	26	25
Services (%)	37	42	34	43

Source: BPS, 2010 (Sakernas National Labour Force Survey) from Manning & Purnagunawan (2011).

Our analysis shows that Indonesia's growth in terms of GDP has not resulted in sustained employment generation particularly not in the formal sector. Table 7 further shows that gains in value-added per worker have shown slower growth than before the commodity price boom.

[17] Labour productivity is a measure of the amount of real GDP produced by a unit of labour. It depends on investment and saving in physical capital, new technology and human.

Table 7 – Employment, productivity, value-added/employee

					% change	
		1997	2003	2011	1997-2003	2003-2011
Total						
	Employment (million)	87.0	91.0	110.0	0.7	2.4
	Productivity (Rp. million)	17.4	17.4	22.5	0.0	3.3
	Value-added per worker (Rp. million)	7.2	22.2	67.7	20.6	15.0
Agriculture						
	Employment (million)	35.8	42.0	39.3	2.7	-0.8
	Productivity (Rp. million)	5.9	5.7	8.0	-0.5	4.2
	Value-added per worker (Rp. million)	2.8	7.3	27.8	17.1	18.2
Manufacturing						
	Employment (million)	11.2	10.9	14.5	-0.4	3.6
	Productivity (Rp. million)	35.2	40.4	43.6	2.3	1.0
	Value-added per worker (Rp. million)	15.0	52.1	124.0	23.1	11.5
Service						
	Employment (million)	39.1	37.1	54.3	-0.9	4.9
	Productivity (Rp. million)	18.8	19.6	24.4	0.7	2.8
	Value-added per worker (Rp. million)	7.8	26.2	67.1	22.5	12.5

Source: BPS, 2012a; authors' calculations.

While Indonesia may not have undergone overall 'jobless growth' (as has been reported in the World Bank's (2010a) Indonesia Jobs Report), one cannot contend with the fact that open unemployment has decreased and labour productivity has (marginally) increased. The fact still remains that the majority of Indonesia's working population is engaged in informal agricultural and services sectors.

Job creation is not the only one cog in the wheel of Indonesia's economic growth. Similar critical discussions are called for pertaining to issues such as Indonesia's performance on socio-economic indicators; infrastructure; technological progress and investment in R&D to understand whether GDP growth rates can be equated to long-term growth sustainability.

In the next section, we use growth theory to examine recent economic trends in Indonesia and understand what these trends mean for the sustainability of the country's economic growth.

4 Drivers of Indonesia's growth: theory and application

In this sub-section, we further unpack Indonesia's recent growth and discuss its main drivers using theories of economic growth. Models of economic growth can be broadly divided into two categories:[18] (1) models of growth through investment in either buildings or machines;[19] and (2) models of growth through innovation.[20] We discuss these models in turn, followed by their theoretical applications for Indonesia.

4.1 Growth models based on capital accumulation

Our first category of growth models is collectively called the neoclassical model of growth. This model assumes that capital accumulation is the only source of growth. An important assumption underlying this model is that as more capital is accumulated, the marginal productivity of an additional unit of capital falls (also known as diminishing returns to a factor), and eventually chokes off all growth in the long run. So in growth models based on capital accumulation, the only way to enhance growth is to increase capital accumulation through an increased savings rate, which in turn increases the investment rate, and then the rate of capital accumulation.

The neoclassical model of growth can help us understand Indonesia's trends in investment and growth more clearly. As a percentage of GDP, Indonesia's investment (total of private and public) has risen from 22% during the period 2002-07 (i.e. during the global commodity price boom) to around 32% in 2010-11.

Industry and service sectors dominate investment flows (as discussed above). This can be explained at least in part by investors' response to rising per capita incomes and a growing middle class the size of which is expected to almost triple between 2009 and 2014. Thus, investment in these sectors could be based on an expectation of strong growth in demand owing to the relatively rapid increase in middle-class consumer income.

While industrial and manufacturing activities attracted half of all investment, it did not create many new jobs. Most new jobs were concentrated in agriculture and services. One explanation for this seeming conundrum is that most of the manufacturing sector's investments were in capital-productivity enhancing and labour-displacing technologies. Our discussion of growth accounting in Annex C shows that the neoclassical model fails to shed light on what constitutes long run growth.

Our second category of growth models, which are based on innovation and technological progress, plug the weaknesses of the neoclassical models in the sense that they attribute economic growth to ideas, innovation, knowledge externalities, and investment in human capital (unlike the exogenous model which spells out capital accumulation as the determinant of growth).

Where the neoclassical model talks about the interaction of workers and capital, the endogenous growth model combines labour and capital with universities and research laboratories to infuse productivity-enhancing ideas and innovations into the growth matrix. Thus, under the endogenous growth theory, there are a number of policy channels through which growth on the basis of innovation can be influenced: education (particularly tertiary education) policies can determine the investment in skills development and training of individuals entering the labour market. Similarly, policies can be used to incentivise innovation, adapt new technologies and

[18] We omit the mathematical underpinnings of the growth models from this paper.
[19] This model of growth is also known as exogenous or neoclassical models of growth.
[20] Also known as models of endogenous growth.

undertake investment in research and development by firms, further strengthened by sound laws protecting intellectual property rights.

4.1.1 How can innovation-led growth theories be applied to the Indonesian context?

The endogenous growth theory can offer several insights for Indonesia about the path of innovation and technological progress that can lead to sustainable growth.

First, digitalisation, lower transport and communication costs and technological advances in production have revolutionised manufacturing. As a country, without a sufficient level of physical and communication infrastructure, this can mean losing out on the opportunity to receive FDI and gain a foothold in global supply chains. Indonesia's infrastructure, including roads and power supply is inadequate. Per capita availability of power in Indonesia is lower than in Vietnam, and general poor quality of roads, ports and power has only acted as a deterrent to FDI inflows into Indonesia (ACDGI, 2011).

Second, Indonesia's exports have seen increased reliance on natural resources. A more diversified export basket, particularly one based on advanced technologies in manufacturing can compete with neighbouring Asian economies, such as Thailand, Malaysia, and the Philippines in linking with the Chinese global supply chains and strengthened competitive firm capabilities. As a lower middle income country, Indonesia is less likely to operate at the frontier of innovation, rather Indonesian investment will be in capital and labour to imitate advanced technologies, and replicate them to cater to global supply chains. Presently Indonesia's record in exporting manufactured products falls behind in comparison to some of the export-oriented Asian economies listed above.

The growth models in our second category, 'endogenous' growth models, are based on innovation and technological progress. They tackle the weakness of the neoclassical models because they attribute economic growth to ideas, innovation, knowledge externalities, stronger firm capabilities, and investment in human capital. The exogenous model had capital accumulation as the determinant of growth. Thus, when moving from neoclassical to endogenous growth models, we are consequently moving from focussing on the quantity of capital and labour inputs to emphasising on the quality of productive inputs.

Third, it must be acknowledged that Indonesia's basic social indicators particularly those on health are falling behind neighbouring, Southeast Asian countries. Although Indonesia has made some progress in addressing malnutrition – it is on track to meet the MDG 1 of reducing underweight[21] prevalence – it still performs worse relative to many of its neighbours and income peers in addressing this issue. Indonesia still has the fifth highest number of children under-5 who suffers from long term malnutrition, or stunting, globally. On average, 220 women die in Indonesia during pregnancy or childbirth (per 100,000 live births) compared to, a rate of 60 in Vietnam (World Bank, 2012c; World Bank, 2010b; UNICEF, 2009). Progress in providing access to clean water and sanitation has been slow. Some of these basic failures of public health and service delivery have to be acknowledged as they imply that further investment in human capital (skills development, training, labour productivity-enhancing technologies) will be less effective in contributing to economic growth, given the importance of early-life human capital investments (Cunha and Heckman, 2007).

[21] Underweight is low weight for age; and is a composite measure indicating both short term and long term malnutrition

5 Conclusion

Indonesia's growth performance has been strong. Its performance is comparable to regional peers, although it cannot match that of BRICS economies. A large part of this growth is explained by the performance of service sectors and domestic demand. The manufacturing industries as well as manufacturing exports have suffered since the start of the commodity boom. Manufacturing export as a share of GDP is in fact falling behind regional peers and BRICS economies.

We unpack their direct impacts of commodities on growth. Value-added from commodity-related agriculture and industry sectors has not been impressive but commodities have been the main drivers of exports. To present the whole picture of the impact of commodities we explore the indirect impacts in our paper *The Impacts of the Commodity Boom* seeking an answer to the question *what role do commodities play in influencing other parts of the economy?*

We have also looked at the consequences of growth. Growth has been concentrated on Java and Bali with the bulk of both service and manufacturing sectors placed there. Overall recent growth has been not broad-based and inequality has continued to rise.

After we had unpacked growth, we moved on to discuss *what has driven low productivity growth and weak formal job creation in Indonesia?*

We have argued that an increasing working-age population might be a necessary but is certainly not a sufficient condition for realising a demographic dividend. This is particularly true for Indonesia where job creation has been limited and restricted to informal jobs in agriculture and services.

To understand the role of job creation and various other growth determinants (such as investment in machines and human beings; infrastructure; socio-economic indicators among others), we looked at Indonesia's recent growth through the lens of economic growth models.

The exogenous, or neoclassical, growth model showed that Indonesia's significant capital investments (as a % of GDP) cannot sustain growth in the long-run alone – it largely leaves long-run growth unexplained. The endogenous growth model, on the other hand, suggests that the sustainability of growth in the long-run depends on a combination of productivity enhancing technologies, knowledge externalities, and innovations.

We then noted that Indonesia's current state of physical infrastructure may deter FDI inflows and inhibit investment in new technology. In the same vein, reliance on natural resource exports has occurred together with a reduced focus on adapting advanced technologies in manufacturing. As a result, Indonesia lags behind in the process of linking with global manufacturing supply chains. Furthermore, failures of public health and service delivery may affect the contribution to growth from further investment in human capital (skills development, training, labour productivity-enhancing technologies).

In conclusion, by fusing recent Indonesian growth data with theoretical models, it is clear that whilst investment in capital and an expanding population are important for growth (albeit short-run), the quality of physical capital investments (in terms of technological progress, research and development, ideas and externalities) and human inputs to production (enhanced through education, training, skill development) will determine growth in the long-run.

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Annex A Growth by sector

Table A.1 – Overview of agricultural sectors

	2002-2007			2008-09			20010-11		
	Average share of GDP (%)	Average annual real growth rate (%)	Average contribution to real GDP growth (pp)	Average share of GDP (%)	Average annual real growth rate (%)	Average contribution to real GDP growth (pp)	Average share of GDP (%)	Average annual real growth rate (%)	Average contribution to real GDP growth (pp)
Food Crops	7.3	2.9	0.2	6.8	5.5	0.4	6.4	1.4	0.1
Estate Crops	2.3	3.6	0.1	2.1	2.7	0.1	2.0	3.7	0.1
Livestock and its Product	1.9	3.6	0.1	1.7	3.5	0.1	1.6	4.4	0.1
Forestry	1.0	-0.2	0.0	0.8	0.9	0.0	0.7	1.5	0.0
Fishery	2.2	5.4	0.1	2.2	4.6	0.1	2.2	6.4	0.1

Source: BPS, 2012a; authors' calculations.

Table A.2 – Overview of industry subsectors

	2002-2007			2008-09			20010-11		
	Average share of GDP (%)	Average annual real growth rate (%)	Average contribution to real GDP growth (pp)	Average share of GDP (%)	Average annual real growth rate (%)	Average contribution to real GDP growth (pp)	Average share of GDP (%)	Average annual real growth rate (%)	Average contribution to real GDP growth (pp)
Mining and Quarrying	9.8	0.3	0.0	8.3	2.6	0.2	7.9	2.5	0.2
Manufacturing Industry	27.9	5.1	1.4	26.5	2.9	0.8	25.8	5.5	1.4
- oil and gas	*3.0*	*-1.0*	*0.0*	*2.2*	*-0.9*	*0.0*	*2.0*	*-0.2*	*0.0*
- non-oil and gas	*25.0*	*5.9*	*1.5*	*24.3*	*3.3*	*0.8*	*23.8*	*6.0*	*1.4*
Electricity, Gas & Water Supply	0.7	6.9	0.0	0.8	12.6	0.1	0.8	5.1	0.0
Construction	5.9	7.2	0.4	6.4	7.3	0.5	6.5	6.8	0.4

Source: BPS, 2012a; authors' calculations.

Table A.3 – Overview of Service subsectors

	2002-2007			2008-09			20010-11		
	Average share of GDP (%)	Average annual real growth rate (%)	Average contribution to real GDP growth (pp)	Average share of GDP (%)	Average annual real growth rate (%)	Average contribution to real GDP growth (pp)	Average share of GDP (%)	Average annual real growth rate (%)	Average contribution to real GDP growth (pp)
Trade, Hotel & Restaurants	16.6	6.5	1.1	17.2	4.0	0.7	17.5	8.9	1.5
Transport and Communication	6.1	12.5	0.7	8.4	16.2	1.2	9.6	12.0	1.1
Finance, Real Estate, Business Services	9.1	6.9	0.6	9.6	6.7	0.6	9.6	6.2	0.6
Services (private and government)	9.2	5.2	0.5	9.3	6.3	0.6	9.4	6.4	0.6

Source: BPS, 2012a; authors' calculations.

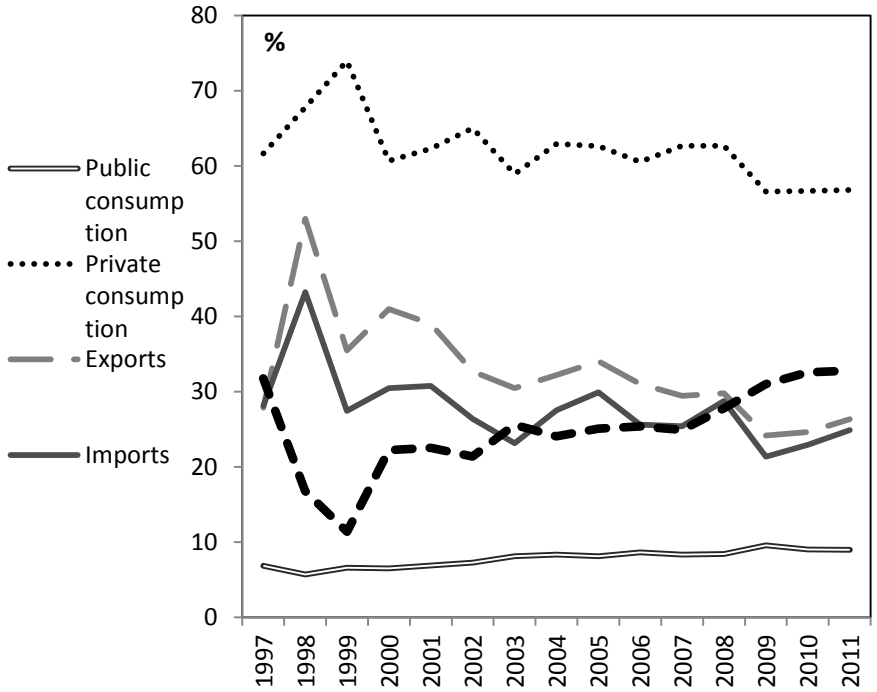
Annex B Growth by expenditure component

Table A.4 – Overview of expenditure components

	2002-2007			2008-09			2010-11		
	Average share of GDP	Average annual real growth rate	Average contribution to real GDP growth	Average share of GDP	Average annual real growth rate	Average contribution to real GDP growth	Average share of GDP	Average annual real growth rate	Average contribution to real GDP growth
Public cons.	8.1	7.9	0.6	9.0	13.1	1.0	6.7	4.7	0.4
Private cons.	62.1	5.2	3.1	59.7	2.8	1.6	56.5	4.3	2.4
Investment	22.4	7.1	1.5	29.4	7.6	1.7	32.2	8.8	2.1
Exports	31.7	8.8	-	27.0	-0.1	-	27.8	14.5	-
Imports	26.3	9.9	-	25.1	-2.5	-	23.9	16.3	-
Net exports	-	-	0.5	-	-	1.0	-	-	0.9

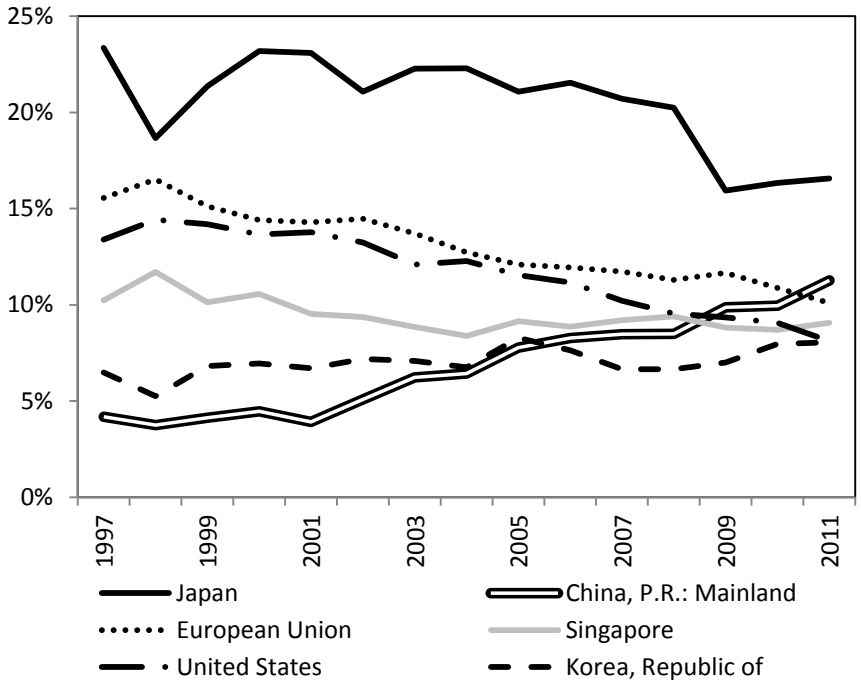
Source: World Bank, 2012c; authors' calculations.

Figure A.1 – Expenditure decomposition of GDP (%)



Source: World Bank, 2012c.

Figure A.2 – Top 6 Indonesian export markets in 2012



Source: IMF, 2012c.

Annex C Neoclassical growth theory

An important application of the neoclassical growth theory is growth accounting. The underlying concept here is straightforward—growth accounting disaggregates the contribution of capital, labour and a 'residue' called total factor productivity (TFP) which has been discussed in the literature as constituting innovative technologies, ideas, socio-political institutions, among other factors.

Much of the literature on the macroeconomic growth in Asia continues to be dominated by discussions about the degree to which Total Factor Productivity (TFP) growth explains the 'Asian economic miracle' of high economic growth in recent decades. It has been argued that the 'miracle' was more the result of the mobilisation of factors of production (labour and capital) than productivity growth, *i.e.* 'perspiration' rather than 'inspiration', as Krugman (1994)[1] summarised the findings. *Could this be true of Indonesia too?*

In Table A.5, we have omitted the mathematical derivations underlying TFP calculations from this section, but have instead discussed the various growth accounting results for Indonesia from existing literature. For more on Indonesia's growth accounting calculations and results, see van der Eng (2009).[1]

The first noticeable aspect of this table is that the TFP calculations vary significantly, from -43% to 42%, attributable to the six revisions that Indonesia's national accounts have gone through since 195.

Table A.5 – TFP Contribution to Economic Growth in Indonesia in Various Studies (annual averages)

Study	Period	TFP
Osade (1994)	1985-1990	-43%
Baier et al. (2006)*	1951-2000	-37%
Sutanto (2004)	1992-2002	-37%
Firdausy (2005)	1961-2000	-27%
Sigit (2004)	1980-2000	-16%
van der Eng (2009)	1971-2007	-4%
Bosworth et at (1996)*	1960-1992	17%
Collins & Bosworth (1996)	1960-1994	24%
Young (1994)*	1970-1985	24%
Kawi (1994)	1970-1990	24%
Sarel (1997)*	1978-1996	24%
World Bank (1993)	1980-1990	29%
Drysdale & Huang (1997)	1962-1990	31%
Ikemoto (1986)	1970-1980	32%
Lindauer & Roemer (1994)	1965-1990	42%

Note: * TFP contribution is to labour productivity growth.
Source: van der Eng, 2009.

In general, after accounting for the growth of capital stock and education-adjusted employment, the residual TFP growth was on average -0.2% per year during 1971-2007. In Van der Eng (2009), capital stock growth and education-augmented employment growth explained 70% and 34%, respectively, and TFP growth -4%.

More recent TFP calculations published by the World Bank (2010c) in Indonesia Economic Quarterly have shown that during the 2000s, average TFP growth stood at 2.3%. Further, using tools of sensitivity analysis, the same publication predicts that TFP growth for 2012-14 will remain in the range of 1.5 to 3%. *What do these results mean?* First, these TFP figures ought to be taken with a pinch of salt since repeated revisions in national income accounting data has meant inconsistencies and lack of comparability of TFP calculations.

Now, if only the evidence presented in van der Eng (2009) is to be considered, the case of Indonesia appears to offer support for Krugman's 'perspiration'-based explanation of economic growth in East Asia. We discuss the importance of the various constituents of TFP such as innovation, human capital investment, knowledge externalities below under 'growth theory based on innovation'. The second noticeable fact from Table A.6 is that manufacturing sector has indeed undergone positive TFP growth. This bolsters our previous discussion that massive productivity-enhancing investments have taken place in the manufacturing sector, however given the lack of commensurate increases in employment in the sector, the productivity gains appear to signify investments in labour displacing innovations. However, more recent calculations (such as those in World Bank, 2010c) appear to show that TFP is a contributor to growth, at least certainly in the short-term.

Table A.6 – TFP growth in Indonesia's manufacturing sector from various studies

Study	Period	TFP
Aswicahyono et at (1996)	1976-1991	11%
Ikhsan (2006)	1988-2000	16%
Hayashi (2005)	1986-1996**	17%
Aswicahyono & Hill (2002)	1975-1993	21%
Timmer (1999)	1975-1995	22%
Osada (1994)	1985-1990	22%
Hayashi (2005)	1986-1996*	22%
Vial (2006)	1976-1996	35%

Note * Large enterprises, ** Small and medium enterprises.
Source: van der Eng, 2009.