



Full length article

Why has economic growth slowed down in Indonesia? An investigation into the Indonesian business cycle using an estimated DSGE model[☆]



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ARTICLE INFO

Article history:

Received 11 September 2015

Received in revised form 13 June 2016

Accepted 14 June 2016

Available online 22 June 2016

Keywords:

Indonesia

Business cycle

DSGE

Monetary policy

Productivity

Growth

ABSTRACT

Economic growth in Indonesia has been trending down from about 6.5% in 2010 to less than 5% recently. Calibrating and estimating a dynamic stochastic general equilibrium (DSGE) model of Indonesia, we show that most of Indonesia's growth over the last decade has been driven by supply factors, especially rising multi-factor productivity (MFP) as Indonesia reaped the benefits of post-Asian-crisis structural reforms. The pace of multi-factor productivity growth has slowed since 2010, however, a decelerating trend reinforced by slower world growth. A series of interest rate cuts has successfully managed to offset some of those headwinds. However, absent further structural reforms to revive productivity growth, supportive monetary policy will not be sufficient to sustain long-term growth and poses inflation risks.

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1. Introduction

Indonesia has made great strides in improving the quality of life of its people. Between 1960 and 2015, life expectancy at birth increased from around 49–69 years, and infant mortality (per 1 000 births) fell from 148 to 23. Likewise, the \$1.90 (2011 purchasing power parity) per day poverty rate has dropped from 72% in 1984 to 16% in 2010. This was facilitated by strong economic growth that raised GDP per capita from USD 330 in 1970 to USD 1853 in 2014 (constant 2005 USD). In particular, between 1984 and 1996, the economy grew on average by 6.8% per annum, driven by strong growth in the industrial and service sectors (7.3% and 7.2% per annum respectively). The agricultural sector also grew, albeit at a slower pace of 4.7% per annum, enabling millions of people to exit poverty in rural areas (Suryahadi, Hadiwidjaja, & Sumarto, 2012).

But Indonesia experienced a major crisis in 1997–1998. As financial woes were spreading in South East Asia, structural weaknesses in the Indonesian financial sector became apparent. Combined with heavy borrowing from abroad by banks and companies, the crisis precipitated bank runs and capital flights that led to GDP plummeting by 13.7% in 1998, inflation reaching 80%, and the rupiah falling from about 2500/USD in the summer of 1997 to around 12,000/USD a few months later.

[☆] *Disclaimer:* Research assistance was provided by Anne Legendre. The author is thankful to Stéphane Adjemian, Balász Egert, Robert Ford, Peter Jarrett, Ferhat Mihoubi, and Petar Vujanovic for helpful discussions and comments. The opinions expressed or arguments employed herein are solely those of the author and do not necessarily reflect the official views of the OECD or its member countries.

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The economy rebounded swiftly, however, to record average annual growth of 5.1% between 1999 and 2008. The industrial sector lost its position as a driver of economic growth during that period, however, growing by only 3.9% annually, as much of the following expansion was driven by the services sector, which grew by 6.5% per annum (Suryahadi et al., 2012).

While some of that rebound can be attributed to robust global economic growth, the implementation of structural reforms after the crisis in Indonesia has been identified as a key contributor. Many sectors were positively affected, such as telecommunications and the financial system where modern banking supervision and payment systems were put in place, together with an independent central bank, the privatisation of state-owned banks and the development of a capital and bond market. Changes in competition policy also increased scrutiny of collusive inter-firm relations while campaigns to combat corruption helped improve the business environment.

While today's economic growth remains robust (GDP increased by 4.79% in 2015), there appears a clear decelerating trend since about 2010 when growth was hovering at about 6.5%. Little explanation for this slowdown has been put forward, however. The goal of this paper is to look back on the last 10–15 years of economic growth since the recovery from the Asian crisis to assess the sources of economic growth and what accounts for the observed slowdown since 2010. We fit an open economy dynamic stochastic general equilibrium (DSGE) model to Indonesia as a way to extract information on the determinants of its business cycle fluctuations. A DSGE model treats the economy as growing along its balanced growth path while being hit by shocks that trigger fluctuations around that path. In this paper we use the model to identify which shocks can account for fluctuations in Indonesia's GDP over the period 2004–14. In doing so we also aim at better understanding the Indonesian economy via the estimation of certain key parameters of the model, such as the degree of price stickiness in various sectors of the economy, and comparing them with other countries. Finally, we contrast the model's forecasting ability with those of a simple vector autoregressive (VAR) model of Indonesia's GDP.

The modelling is based on an open-economy New Keynesian DSGE model as developed by Adolfson, Laséen, Lindé, and Villani (2007), henceforth ALLV. The economy is populated with working and saving households, firms producing domestic goods, firms importing consumption and investment goods, exporting firms, a government, a central bank, and an exogenous global economy modelled as a VAR of G20 GDP, inflation and interest rates. Incomplete exchange rate pass-through for both imports and exports is introduced via nominal price rigidities (i.e. there is local currency price stickiness). Within each manufacturing sector there is a continuum of firms that each produces a differentiated good and sets prices according to an indexation variant of the Calvo model. Domestic as well as global production grows with technology that contains a stochastic unit-root.

ALLV is a rich model with a sizeable number of frictions and rigidities, and therefore with complex interactions between its many components. For instance, by contrast to simpler small open-economy models (e.g. Monacelli, 2005), ALLV features a role for capital, imperfectly competitive goods and labour markets, somewhat rigid wages, habit formation, and wages indexation. While there are advantages in terms of tractability of using smaller models, there are obvious disadvantages too as too simple a model may overlook some important interactions in the economy. While first applied to the Euro area, ALLV is primarily a small, open-economy flexible exchange rate model. It is then suited to study economies that have no impact on the rest of the world. Versions of the model have been used to study other small open economies such as Sweden (Adolfson, Laséen, Lindé, & Svensson, 2014) and Australia (Jääskelä & Nimark, 2011). In this paper we adapt the model to Indonesia, which fits the description of a small open economy with a flexible exchange rate system.¹

Bayesian methods together with Indonesian business cycle time series are used to estimate most of the model's parameters. For instance, it is found that households are more forward looking than backward looking when setting their prices. We also calibrate several key parameters to the underlying balanced growth path of Indonesia. Smets and Wouters (2003, 2007) have showed that forecasting performance of large-scale Bayesian-estimated DSGE models are as good as, if not better than VAR and Bayesian VAR models. In the last section of this paper it is shown that the DSGE model developed here has higher forecast direction accuracy than a simple VAR model.

There is a small but expanding literature on DSGE modelling for Indonesia. In government, the implementation in 2005 by Bank Indonesia of a full-fledged Inflation Targeting Framework (ITF) necessitated the development of rigorous models to inform the Board in its monetary policy decision making process. To that end, Bank Indonesia developed a small open-economy New Keynesian DSGE model with real and nominal rigidities (Munandar, 2009). While close to the one used in this paper, details have yet to emerge on its performance and how it is used. By contrast we provide several statistics and diagnostics to assess the fit of the model and its forecasting accuracy. More recently, Harmanta, Purwanto, Rachmanto, and Oktiyanto (2013) developed a DSGE model, also for Bank Indonesia, incorporating financial frictions in the form of collateral constraints amongst households and a financial accelerator amongst firms. The model is used to simulate the effect of monetary and macroprudential policy. The model used in this paper does not feature financial frictions, so it is simpler in that respect. It is not necessarily a problem since, by contrast to the last 1990s, Indonesia did not encounter major financial troubles during the period under investigation (2004–2014). Other work includes Ramayandi (2008) who fits the open-economy model in Monacelli (2005) to Indonesia and four other ASEAN countries, namely Malaysia, the Philippines,

¹ At nearly USD 1 billion PPP the Indonesian economy is by no means small, but it remains price taker at the world level, which is what is meant by small here.

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