ASA University Review, Vol. 11 No. 2, July–December, 2017

Modeling the Consequences of Emerging Markets Slowdown in the Aftermath of Global Financial Crisis: A G-Cubed Approach

Rubayat Chowdhury [*]
Ripon Roy [*]
Rokeya Khatun [**]

Introduction

The two episodes of economic and financial crises over the past two decades have left an important message to regulators: a shift in risk perception can have large real consequences for the global economy. For example, one of the major drivers of the 1997 East Asian financial crisis was a shift in investor confidence which eventually led to a financial panic (Radelet & Sachs 1998). Investor confidence deteriorated significantly towards the Asian market economies which had spillover effects throughout the global financial system (Cabalu1999). Further, the primary source of the 2008 global financial crisis (GFC) was the collapse of Lehman Brothers and the bursting of housing bubbles which slashed household and business confidence, leading to a sharp decline in private investment and consumer spending (McKibbin & Stoeckel 2009).

There was an immediate reappraisal of risk in the aftermath of the GFC. The risk premia on interbank borrowing and corporate bonds which was close to zero rose sharply by more than 5 percent (McKibbin & Stoeckel 2009). Firms postponed investment in large projects and the demand for manufacturing durables collapsed. As a result, the economic growth of advanced economies fell sharply from 2.7 percent in 2007 to 0.1 percent and 3.4 percent in 2008 and 2009 respectively (IMF 2014). While the emerging market economies were initially thought to be insulated from the contagion, lower export demand, higher commodity prices and current account imbalances led to an economic slowdown with the growth of real GDP falling from 8.7 percent in 2007 to 5.9 percent in 2008 and 3.1 percent in 2009 (IMF 2014).

Since then, policy responses and financial adjustments have reduced global risks, although remain elevated (World Bank 2014). Developing economies remain vulnerable to rapid growth of domestic credit fueled by locally issued debt and cheap credit from abroad. Further, a recent announcement of the US monetary policy normalization (tapering of quantitative easing) increases the risks of capital flow reversals and higher cost of capital for the emerging markets (IMF 2014). Growth slowdown in China increases the downside risks for Latin America and East Asia. For developed economies, fiscal sustainability (US, Europe and Japan), sliding inflation (Europe), higher sales tax (Japan), political tensions, and low interest rates remain a concern.
The anticipated policy adjustments such as fiscal and monetary tightening in the high income developed countries over the next few years put the emerging and developing markets into the

[*]Joint Directors, Bangladesh Bank
[**]Deputy General Manager, Bangladesh Bank

risk of higher interest rates, capital outflows, and balance of payment imbalances (Shin 2013). This could have a significant negative impact on investor confidence, leading to another financial and economic turmoil (IMF 2014). Therefore, it is timely to examine what would happen if there is a permanent loss of confidence in emerging economies.

Re-evaluation of risk can lead to severe economic disruption through outflow of financial capital (McKibbin 1998). Carriere-Swallow and Cespedes (2013) find that emerging economies are more vulnerable to uncertainty shocks than the developed economies. Policy prescriptions often advocate for capital controls, particularly for the emerging economies, to lessen the macroeconomic and financial instability risks arising from large capital inflows (IMF 2011). Stiglitz (2014) argues that excessive capital flows can only lead to volatility, not higher economic growth. He suggests that countries should have some form of capital controls to avoid large swings in the exchange rate. However, McKibbin (1998) argues that this would be a very expensive strategy to follow as limiting capital flows would be the same as raising risk premium in the imposing countries. McKibbin (1999) finds that free flow of trade and financial capital in fact stabilizes economic fluctuations when the shock originates from a loss of confidence.

This paper simulates a permanent loss of confidence in emerging economies using a multi-country-multi-sector inter-temporal G-Cubed model. The study attempts to answer the question: what happens to the emerging economies and the rest of the world if there is a permanent increase in the country risk premia in emerging markets by 200 basis points relative to the baseline. The simulation results suggest that a permanent shift in risk perception has significant short and long term impacts on the global economy. As emerging markets are hit by higher risk premia, financial capital immediately flows out of these economies. This leads to a higher short and long term interest rate, and to a lower level of consumption, investment, stock value and desired stock of capital. As a result, the output of emerging economies falls for several years. On the other hand, higher inflows of capital allow significant expansion of the non-emerging economies for more than two decades with a higher level of consumption, investment and capital stock. However, depreciation (appreciation) of the exchange rate improves (deteriorates) the trade and current account balance of emerging markets (developed economies), which partially offsets the negative (positive) financial flow-on effects.

The study finds that open trade and capital markets act as important stabilizers to lessen the global impact of a higher risk premia in emerging markets. While emerging economies need a boost in exports to partially offset the negative financial flow-on effects, developed economies need additional capital to expand their productive capacity in the face of higher domestic demand. This paper therefore suggests that policymakers should not obstruct the mobility of financial capital, rather should focus on monitoring and managing risks with a transparent and accountable financial system. This would require greater coordination across countries as highlighted in various G20 summits (Claessens 2010).

The remainder of this paper is structured as follows. Section 2 provides an overview of the G-Cubed model and explains how a loss of confidence is modeled in the G-Cubed. Section 3 summarizes and discusses the simulation results. Finally, Section 4 concludes.

The G-Cubed model

Overview of the model

Originally developed by McKibbin and Wilcoxen (1992), the G-Cubed model is a dynamic general equilibrium model of the world economy which imposes inter-temporal constraints on households, firms, governments and nations (McKibbin & Wilcoxen 1999). The G-Cubed model is a bridge between the static computable general equilibrium (CGE) models and macroeconomic models, which gives importance to time dimension and agents' expectations and therefore have rich dynamic behavior.

In this model, a mix of backward and forward looking economic agents (households and firms) optimize their behavior dynamically, subject to inter-temporal constraints (Cagliarini & McKibbin 2009). The model allows short run deviations in agents' behavior from an optimal path, due to factors such as myopia or agents' inability to borrow at risk-free bond rate on government debt. However, short run deviations should follow a rule of thumb such that a unique inter-temporal equilibrium is achieved in the long run. Households maximize the present value of lifetime utility, subject to an inter-temporal budget constraint that the present value of lifetime consumption should satisfy the present value of expected after-tax lifetime income. Similarly, price-taking firms make investment decisions to maximize the present value of future dividend streams, subject to production technology and capital adjustment costs.

The G-Cubed model distinguishes between physical and financial capital by assuming that physical capital is immobile within sectors and across countries, but financial capital is perfectly mobile, immediately flowing to the country that offers the highest expected returns. Further, the model embodies 'macroeconomic characteristics' by giving financial assets (including money) explicit treatment and allowing nominal wage rigidity in the short run. Thus, depending on the labor market condition in each economy, unemployment can arise for significant periods in the short to medium term, but full employment should be achieved in the long run. Labor is assumed to be completely mobile between sectors but immobile across regions.

Modeling a permanent loss of confidence in the G-Cubed model

The aim of this study is to quantify the global consequences of a permanent loss of confidence in emerging economies. For this, we need an inter-temporal general equilibrium model which allows both inter-linkages between the real and financial sectors of a country and interconnection across economies. The G-cubed model is well designed to capture such inter-linkages because it includes the international financial markets for bonds and equities, takes into account the trade and financial flow-on effects, and incorporates agents' expectations and wealth effects (McKibbin & Stoeckel 2009).

Incorporating changes in the risk perception is one way of identifying a loss of confidence in the G-Cubed model (McKibbin 1998). There are several areas where risks are reflected in an economy. First, an increase in the equity risk premia drives a wedge between the real interest rate (return on bonds) and the underlying rate of return on equity (McKibbin & Stoeckel 2009). This implies that with a higher equity risk, investors need to be offered a higher return on capital to hold equities over bonds. Higher equity risk can be modeled in the G-Cubed as an increase in the discount rate in the Tobin's q equation, which leads to a lower present value of stocks.
Second, an increase in the household risk is modeled in G-Cubed as an increase in the real interest rate (adjusted by risk premium) that households use to discount their future income streams. A higher risk premia leads to a higher discount rate and therefore, to a lower present value of lifetime income. As households feel poorer than before, they respond by reducing consumption and increasing savings.

Third, an increase in the country risk (which is of our interest) is modeled in the G-Cubed as an increase in the country risk premia (McKibbin 1998). This reflects the excess returns on a country's bonds, relative to the US bonds that investors need to be offered to hold bonds of that country relative to the US bonds. The country risk premia appears in the uncovered interest parity equation:

$$r_t^i = r_t^{us} + ({}_te_{t+1} - e_t) + \mu_t \quad (1)$$

The interest parity condition tells us that the interest rate differential between country-i and the US (r_t^i-r_t^{us}) depends on the expected rate of change in exchange rate (${}_te_{t+1} - e_t$) and the country risk premia(μ_t). If country-i becomes riskier than the US, the interest rate on its bonds is expected to be higher. If investors expect depreciation of the domestic currency (a positive change in e), they need to be offered a higher return on the domestic assets because when the return is converted into the US dollar, it would not worth much.
In the G-Cubed model, exchange rate is determined by the equation:

$$e_t = \sum_{s=t}^{T}(r_s^{us} - r_s^i + \mu_s) + e_{T+1} \quad (2)$$

Equation (2) tells us that the value of exchange rate today (e_t) is the sum of interest rate differentials and the risk premia up to period T, $\sum_{s=t}^{T}(r_s^{us} - r_s^i + \mu_s)$ plus the expected exchange rate in period T+1. It is important to note that a permanent shift in risk is not discounted so that future risk premium is as important as today's risk premium.

The G-Cubed model (version 108V) employed in this study includes 17 economies and 6 sectors of production (energy, mining, agriculture, durable manufacturing, non-durable manufacturing and services). Further, there is a household sector and a capital producing sector. The list of economies is presented in Table 1. The model is solved by a backward induction process to generate a baseline. The baseline is based on a range of assumptions, including the long-run productivity growth (1.8 percent), population growth (World Bank projections), policy rules, and tariff and tax rates (Cagliarini & McKibbin 2009). A permanent loss of confidence is modeled as an increase in the country risk premia by 200 basis points relative to the baseline (2013) from 2014 forever in six emerging economies- China, India, Indonesia, other Asia, Latin America and other developing countries.

Table 1 **Countries/regions**

Emerging economies	Non-emerging economies
China (CHI)	United States (USA)
India (IND)	Japan (JPN)
Indonesia (INO)	United Kingdom (GBR)
Other Asia (OAS)	Germany (DEU)
Latin America (LAM)	Rest of Euro Zone (EUZ)
Other developing countries (ROW)	Canada (CAN)
	Australia (AUS)
	Korea (KOR)
	Rest of OECD (ROECD)
	Eastern Europe and former Soviet Union (EEB)
	Oil Exporting and the Middle East (OPC)

Source: G-Cubed (v108V) model.

The monetary policy rule is defined as the Henderson-McKibbin-Taylor (HMT) rule (Henderson & McKibbin 1993; Taylor 1993), where the central bank of each economy targets the level of nominal income. In response to shocks, central banks adjust policy interest rates to bring the level of nominal income back to the target in the long run. The HMT rule for all economies (except for the Euro area) is defined as:

$$i_t^d = \beta_1 i_{t-1}^d + \beta_2(\pi_t - \pi_t^T) + \beta_3(\Delta y_t - \Delta y_t^T) + \beta_4(ny_t - ny_t^T) + \beta_5(\Delta e_t - \Delta e_t^T) \quad (3a)$$

$$i_t = i_{t-1} + \beta_6(i_t^d - i_t) + i_t^x \quad (3b)$$

Where, i, π, Δy, ny and Δe denote the actual interest rate, inflation rate, output growth, nominal income, and the change in exchange rate respectively. Superscripts d and T denote the desired and target level of the variables and x denote the exogenous component of interest rate. The actual policy interest rate, i adjusts gradually to the desired policy rate, i^d and can be shifted exogenously in the short term by changing the exogenous component, i^x (interest rate target).

The monetary rule for the European economies is defined as: the central bank of Germany is targeting inflation of the rest of the Euro Zone and the central bank of the rest of the Euro Zone is pegging its currency to the German exchange rate. As a result, these two economies are going to have the same interest rate and exchange rate. A summary of the parameters used in the HMT rule is reported in Table 2.

Table 2 **Coefficients in the Henderson-McKibbin-Taylor rule**

	β_1	β_2	β_3	β_4	β_5	β_6
Developed (non-shocked economies)						
USA	1	0	0	2	0	0.1
JPN	1	0	0	2	0	0.1
GBR	1	0	0	2	0	0.1
DEU	1	0	0	2	0	0.1
EUZ	1	0	0	2	-1000	1
CAN	1	0	0	2	0	0.1
AUS	1	0	0	2	0	0.1
KOR	1	0	0	2	-0.1	0.1
ROECD	1	0	0	2	0	0.1
EEB	1	0	0	2	-1	0.1
OPC	1	0	0	2	-1	0.1
Emerging(shocked economies)						
CHI	1	0	0	2	-1	0.1
IND	1	0	0	2	0	0.1
INO	1	0	0	2	-0.1	0.1
OAS	1	0	0	2	-0.1	0.1
LAM	1	0	0	2	-0.1	0.1
ROW	1	0	0	2	-0.1	0.1

Source: G-Cubed (v108V) model.

The US has a coefficient of 2 on nominal income and 0s on inflation, output growth and exchange rate (Table 2). This means that the Federal Reserve Bank (Fed) is targeting nominal income rather than inflation, output growth or exchange rate. The adjustment coefficient for interest rate (β_6) is 0.1 which indicates that the Fed is closing the gap by 10 percent each year. The rest of the Euro Zone has a very large coefficient on exchange rate (β_5), indicating that it is pegging to the German exchange rate. China has a high weight on the exchange rate, relative to other emerging economies because the Chinese Yuan is pegged to the US dollar.

Finally, the fiscal rule is defined as: when the government accumulates fiscal deficits and hence debt, a set of tax rates (including lump-sum tax) is imposed on households and firms to service that debt (McKibbin & Stoeckel 2012). This ensures that the present value of government debt does not explode over time. Fiscal deficit is exogenous and government spending is endogenous in the G-Cubed model.

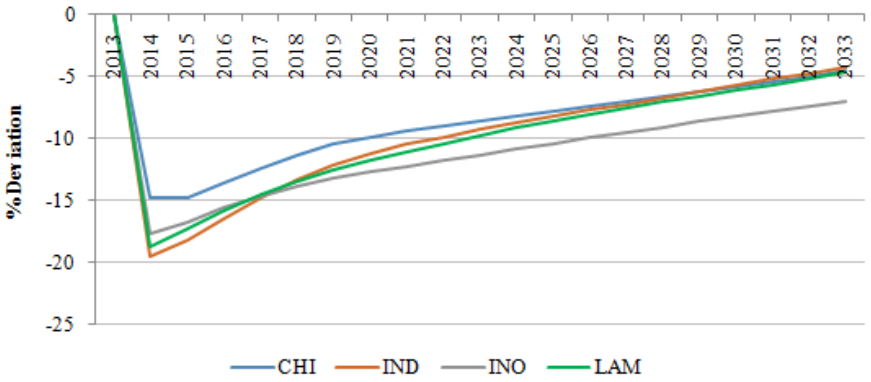
Simulation results

This paper models a permanent loss of confidence in emerging economies as an increase in the country risk premia (μ) by 200 basis points relative to the baseline, from 2014 forever. This is equivalent to a permanent increase in the risk premia of households, firms, and international investors in the emerging markets. The base year is 2013 and all results are expressed as percentage deviation from the baseline. The results are reported for 20 years.

Loss of confidence and the associated higher risk leads to a sharp contraction of the emerging economies and an expansion of the developed (non-shocked) economies. Relative to the baseline, real GDP immediately falls by more than 1.5 percent in China and India and by more than 2 percent in Indonesia and Latin America. China and India recover relatively faster than the other emerging economies. For the next 20 years, the output of emerging markets remains below the baseline. Conversely, developed economies expand significantly in the short run and their level of GDP remains above the baseline for the next 20 years. The US and Korea expand the most in the short run (more than 1 percent) while the oil-exporting and Middle East countries enjoy a relatively higher level of GDP in the long run compared to other non-emerging economies.

Contraction of the emerging markets and expansion of the developed economies can be explained by what happens to their exchange rate, interest rate, stock value, consumption, investment, savings, and other macroeconomic factors. The flow-on effects of financial capital and trade are important in this regard. When emerging markets are shocked with risks, financial capital immediately flows out of these economies to the developed economies, affecting the exchange rate, interest rate, capital stock, and investment. When international investors perceive higher country risk, they shift away from all financial assets of the emerging markets, affecting bond price and real interest rates. Further, when households perceive higher risks, they postpone consumption and increase savings in the short run. These channels are important to analyze the global consequences of a loss of confidence in emerging economies, which are explained below.
A permanent higher risk in the emerging economies leads to a massive capital outflow and hence to a depreciation of their currencies relative to the US dollar (Figure 1). India experiences the highest immediate depreciation in its real exchange rate (19.5 percent) followed by Latin America (18.7 percent), Indonesia (17.7 percent), and China (14.7 percent). It takes more than 20 years for the emerging markets to get their real exchange rate back to the baseline.

Figure 1 **Emerging economies: Real exchange rate**, REXC (US$ per unit of local currency)



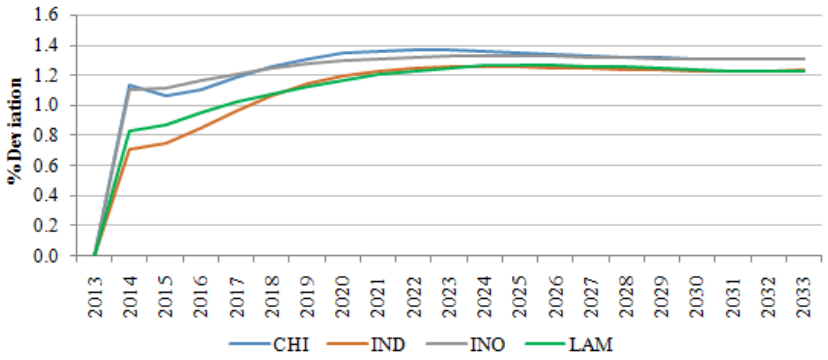
Source: G-Cubed (v108V) model

As investors perceive higher risks, they shift away from all financial assets of the emerging markets, leading to a massive capital outflow and a sharp fall in bond price. In other words, the

real interest rate, which is the inverse of bond price, goes up sharply in the emerging economies. Higher real interest rate, accompanied by higher risk premia, translates to a much higher risk-adjusted short term real interest rate.

The long term real interest rate in the emerging markets (reflected in the 10 year bond rate) rises immediately with the fall in bond price (Figure 2). The largest immediate increase is in China (1.13 percent) followed by Indonesia (1.11 percent), Latin America 0.83 percent) and India (0.71 percent). In the long run, the 10 year bond rate in these economies remains higher (at around 1.2 percent) relative to the baseline.

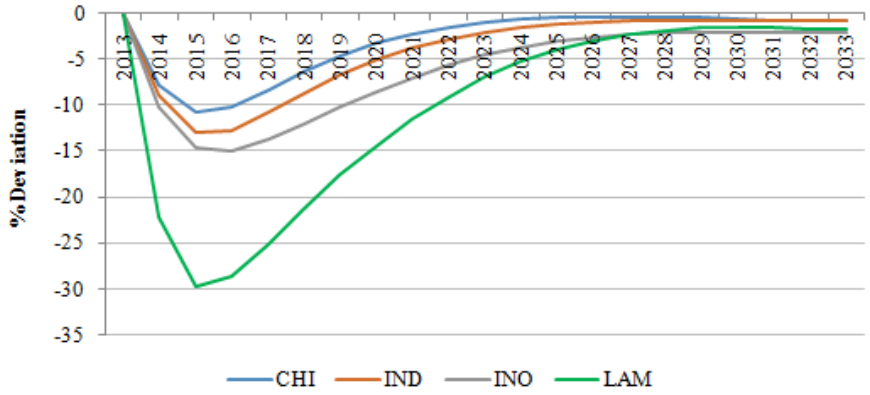
Figure 2 **Emerging economies: Long term real interest rate** (RB10)



Source: G-Cubed (v108V) model

Private investment falls steeply in the emerging markets due to the negative financial flow-on effects, and higher short and long term interest rates (Figure 3). As each extra unit of investment yields a lower rate of return due to higher risk premium, firms postpone investment in the short run. Investment in Latin America falls immediately by more than 20 percent relative to the baseline. China, India, and Indonesia experience a 7.7 percent, 8.8 percent and 10.1 percent immediate decline in investment respectively. Over the next 20 years, the level of investment in emerging markets remains below the baseline.

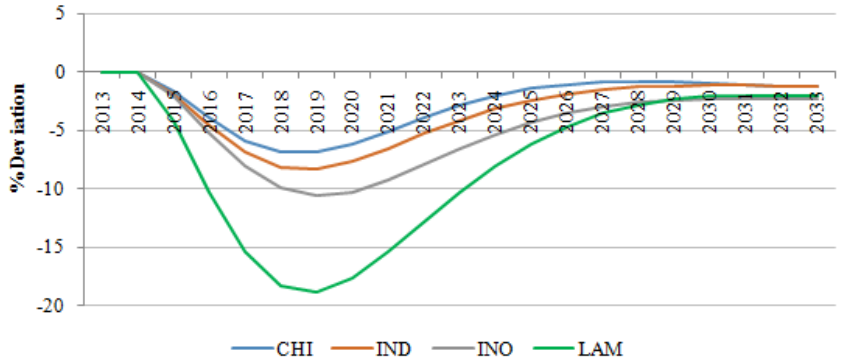
Figure 3 **Emerging economies: Investment** (INVT)



Source: G-Cubed (v108V) model

The rate of return on capital needs to be higher for investors to hold relatively risky financial assets of the emerging markets. This implies that the capital stock must fall significantly (due to diminishing returns) to generate a higher rate of return (Figure 4). The capital stock in emerging economies begins to fall a year after the permanent shock and reaches minimum after 4 years. By the year 2018, capital stock falls by around 18 percent in Latin America, 10 percent in Indonesia, 8 percent in India, and 7 percent in China and remains below the baseline in the long run. The opposite happens to the developed economies.

Figure 4 **Emerging economies: capital stock** (CAPY)

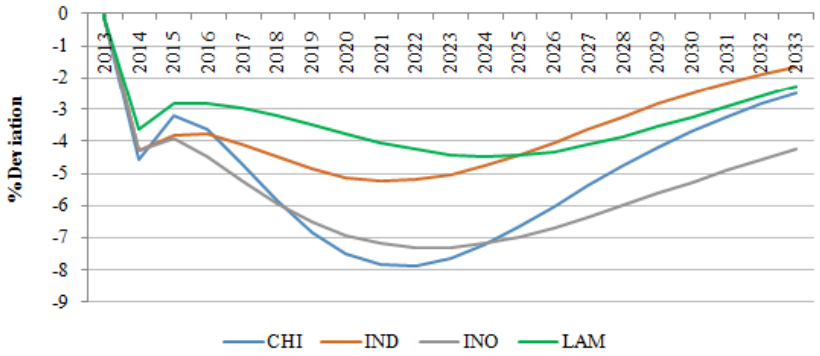


Source: G-Cubed (v108V) model

Loss of confidence in emerging markets leads households to discount their expected future income at a higher rate. As the present value of lifetime wealth falls, households cut back consumption (Figure 5) and increase savings (Figure 6). Relative to the baseline, private consumption in the emerging economies immediately falls by 4.2-5.6 percent with China and

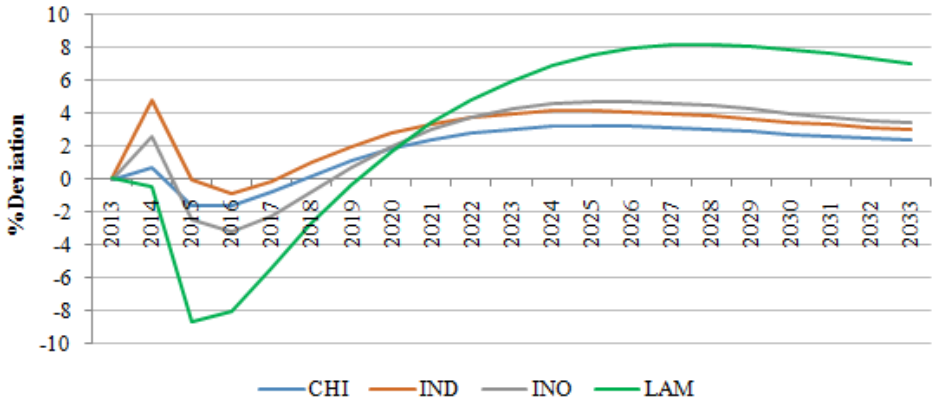
Indonesia experiencing a relatively steep decline over the next 10 years. Private savings immediately jump in all emerging economies except for Latin America.

Figure 5 **Emerging economies: Consumption** (CONP)



Source: G-Cubed (v108V) model

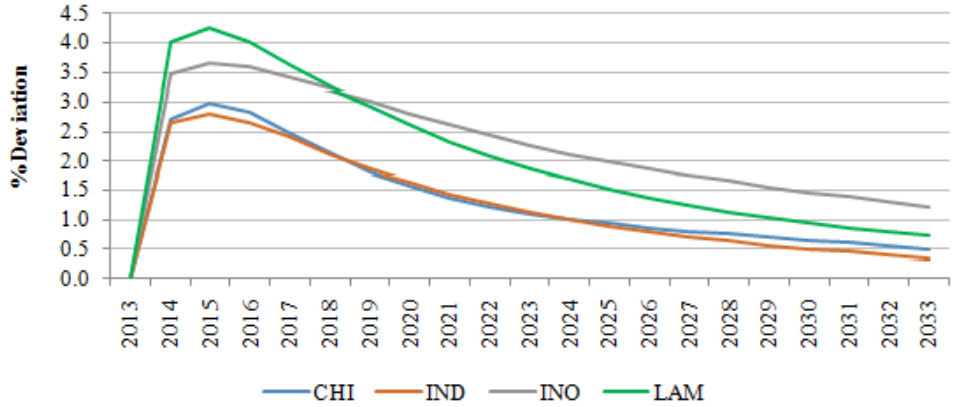
Figure 6 **Emerging economies: Domestic non-government savings** (SAVT)



Source: G-Cubed (v108V) model

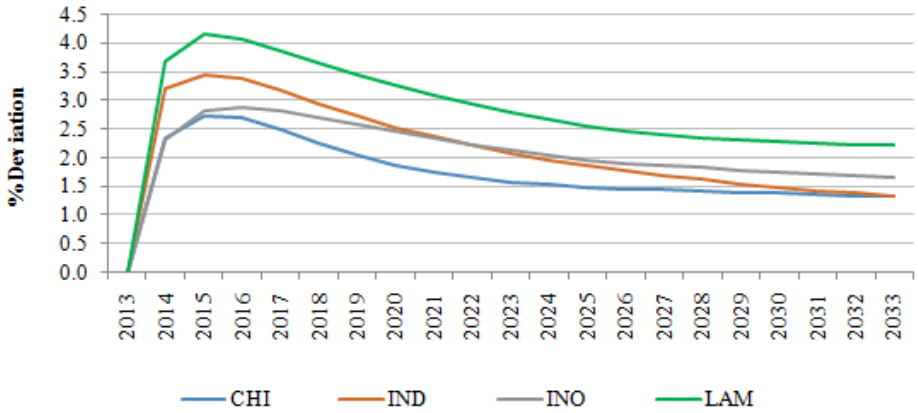
Although emerging markets are hit by the negative financial flow-on effects, massive exchange rate depreciation makes their exports relatively cheaper and imports relatively more expensive. This leads to an improvement in their trade and current account balance over the next two decades (Figure 7 & Figure 8). Latin America enjoys the highest immediate increase in its trade balance (4.1 percent of GDP) followed by Indonesia (3.5 percent), China (2.7 percent), and India (2.6 percent).

Figure 7 **Emerging economies: Trade balance** (TBAL)



Source: G-Cubed (v108V) model

Figure 8 **Emerging economies: Current account balance** (CURR)

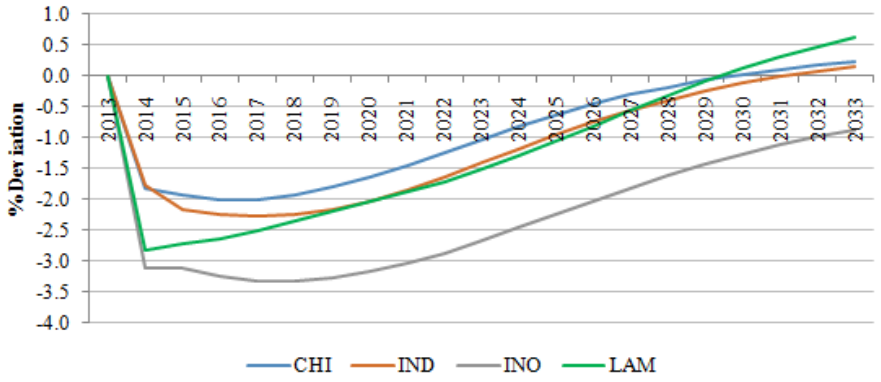


Source: G-Cubed (v108V) model

To summarize, households reduce consumption and investors postpone investment due to higher risks in the emerging markets. As financial capital flows out of these economies, short and long term interest rates go up and the desired stock of capital shrinks. All these negative impacts translate to a sharp fall in real GDP. On the other hand, capital inflow in the developed economies brings down the real interest rates, stimulates consumption and investment, builds up capital stock and therefore, leads to a higher level of GDP in the short and long run.

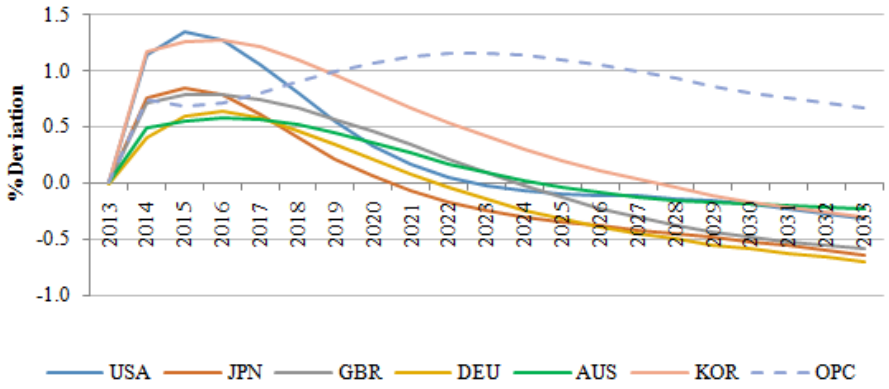
However, GDP only reflects the production side of the economy. A better measure of welfare is the gross national product (GNP) which reflects income earned by all domestic residents, irrespective of their location (McKibbin 1998). Although real GDP of emerging economies remains below the baseline for the next 20 years, the level of real GNP crosses over the baseline after 10-15 years (Figure 9).

Figure 9 **Emerging economies: Real GNP** (GNPR)



Source: G-Cubed (v108V) model

Figure 10 **Non-emerging economies: Real GNP** (GNPR)



Source: G-Cubed (v108V) model.

Conversely, real GNP of the developed economies falls below the baseline in the long run (Figure 10). Thus, the level of income of developed economies does not rise as much as their production. This is due to the fact that part of the financial capital owned by foreigners now earns a lower rate of return.

Conclusion

This paper examined the global consequences of a permanent loss of confidence in emerging economies using an inter-temporal G-Cubed model. The loss of confidence was modeled as an increase in the country risk premia by 200 basis points relative to the baseline from 2014 forever. The simulation results suggest that a permanent upward revision of risk has large real consequences for both emerging and developed economies. Emerging economies contract and

developed economies expand in the short run and it takes more than two decades for the emerging markets to get their consumption, investment and output level back to the baseline.

This paper finds that a permanent shift in risk perception has large effects on the real economy. Capital outflow from the emerging markets raises the cost of capital, leading to disinvestment by firms. As households perceive higher risks, they cut back consumption and increase savings which further accelerates the disinvestment process. As a result, emerging economies contract for several years. However, higher net exports driven by exchange rate depreciation improve their trade and current account balance over time, which partially offsets the contraction of domestic demand. The developed economies experience exactly the opposite effects. While their economies expand with higher inflows of capital, the trade and current account position worsens with appreciation of the exchange rate, which partially offsets the output expansion.
It follows from the analyses that open trade and capital markets act as important stabilizers for the shocked and non-shocked economies. Emerging economies, which are hit by the negative financial flow-on effects, need a temporary boost in exports to avoid a recession. On the other hand, non-emerging economies, which are facing stronger domestic demand, need additional capital to expand their productive capacity. Without these adjustments, the effects on the real economy would be much larger.

This paper therefore suggests that policies should focus on managing risks rather than controlling international capital flows because such controls would hinder important stabilizing channels. A better policy should allow free capital mobility across countries and should try to strengthen the domestic financial system with greater transparency and accountability, for accurate evaluation of risks. The governments should not act as the insurer of last resort for the exchange rate or investment risks rather should try to build a better functioning domestic financial system that minimizes the fluctuation in risks.

References

Cabalu, H., 1999. A review of the Asian crisis: causes, consequences and policy responses. Australian Economic Review, 32(3), pp.304-313.

Cagliarini, A & McKibbin, WJ 2009, 'Global relative price shocks: the role of macroeconomic policies', Research Discussion Paper 2009-10, Reserve Bank of Australia, Canberra, viewed 18 October 2014,

< http://www.rba.gov.au/publications/confs/2009/pdf/conf-vol-2009.pdf#page=310>.

Carriere-Swallow, Y & Cespedes, LF 2013, 'The impact of uncertainty shocks in emerging economies', *Journal of International Economics*, vol. 90, no. 2, pp. 316-325.

Claessens, S 2010, 'The financial crisis policy challenges for emerging markets and developing countries', *The Journal of Applied Economic Research*, vol. 4, no. 2, pp. 177-196.

International Monetary Fund 2011, *Recent experiences in managing capital inflows—cross-cutting themes and possible policy framework*, International Monetary Fund, viewed 4 November 2014,

< http://www.imf.org/external/np/pp/eng/2011/031111.pdf>.

International Monetary Fund 2014, *World economic outlook: recovery strengthens, remains uneven*, viewed 24 October 2014,

< http://www.imf.org/external/pubs/ft/weo/2014/01/pdf/text.pdf >.

McKibbin, WJ 1998, *East Asia in crisis: from being a miracle to needing one?*, Routledge Press, London.

McKibbin, WJ 1999, 'International capital flows, financial reform and consequences of changing risk perception in APEC economies. Brookings Institution, Washington DC, viewed 14 October 2014,

< http://msgpl.com.au/download/apec993.pdf>.

McKibbin, WJ & Wilcoxen, PJ 1999, 'The theoretical and empirical structure of the G-Cubed model', *Economic Modelling*, vol. 16, pp. 123-148.

McKibbin, WJ & Stoeckel, A 2009, 'Modelling the global financial crisis', *Oxford Review of Economic Policy*, vol. 25, no. 4, pp. 581-607.

McKibbin, WJ & Stoeckel, AB 2012, 'Global fiscal consolidation', *Asian Economic Papers*, vol. 11, no. 1, pp. 124-146.

Radelet, S & Sachs, J 1998, 'The onset of the East Asian financial crisis', NBER Working Papers, no. 6680, National Bureau of Economic Research, Cambridge, Massachusetts, viewed 28 October 2014,

< http://www.nber.org/papers/w6680.pdf>.

Shin, HS 2013, 'The second phase of global liquidity and its impact on emerging economies', *Keynote address at the Federal Reserve Bank of San Francisco Asia Economic Policy Conference*, vol. 7, viewed 2 November 2014,

<http://www.iepecdg.com.br/uploads/artigos/FRBSF_2013.pdf>.

Stiglitz, J 2014, 'Tapping the brakes: are less active markets safer and better for the economy?', C*onference on Tuning Financial Regulation for Stability and Efficiency, Atlanta, Georgia*, vol. 15, viewed 3 November 2014,

<https://www0.gsb.columbia.edu/faculty/jstiglitz/download/papers/2014_Tapping_Brakes_pub.pdf>.

Taylor, JB 1993, 'Discretion versus policy rules in practice', Carnegie-Rochester Conference Series on Public Policy, no. 39, North Holland, viewed 15 October 2014,

< http://www.sciencedirect.com/science/article/pii/016722319390009L>.

World Bank 2014, *Global economic prospects: shifting priorities, building for the future*, World Bank, viewed 22 October 2014,

< http://www.worldbank.org/content/dam/Worldbank/GEP/GEP2014b/GEP2014b.pdf >.