Article | 20 December 2019

Why economic growth is like a bicycle

In some Asian countries, GDP growth in recent years has been extremely stable, leading some to suggest that the numbers are not what they seem. We take a hard look at the data - maybe speed is the answer?

The Jakarta skyline

GDP - volatility is normal

There is nothing too surprising about GDP volatility. It's one of the reasons why we don't get very excited about a single quarter's results. On their own, they don't mean that much.

The components that go into the GDP calculation are themselves very prone to volatility. Private fixed capital formation provides the bulk of variance in GDP as the principal moving part in every business cycle. Consumer spending may account for the bulk of GDP, but in contrast, it is far less volatile. Swings in inventories often account for sizeable movements in GDP, and this can be reinforced, or subsumed by net exports, where swings also have a tendency to be large.

In short, GDP volatility is normal. Stability appears unlikely.

Developed nations more or less stable than their developing counterparts?

Some of Asia's economies are not only growing quickly, but their growth seems extremely stable. In contrast, many developed economies exhibit not only slower growth, but more volatile figures. For example, the United States, a country that you would imagine operates state-of-the-art statistical operation for measuring national accounts, has seen growth since 2016 drop as low as 1.3%YoY (2Q16) and as high as 4% (1Q14), a range of 2.7 percentage points – many times larger than a lot of Asian economies.

This raises a number of questions. Firstly, would you expect fast-growing economies to exhibit more volatility in growth than slower-growing developed economies, or less? Equally, would you expect less developed economies to be more, or less volatile than their developing counterparts?

This note takes a look at these questions and uncovers a few surprising answers.

What does the data show?

Our expectation before examining the data was that fast-growing economies would show more volatility in GDP than slower-growing ones. The rough-logic for this was simply a thought that if you managed GDP growth of only 2% on average, than a percentage point swing would be a far bigger deal than for a country where the growth rate typically averaged five or 6%.

To test this hypothesis, we took Asian Pacific economies, together with some developed economies which we will call the "G7 plus". We plotted their average GDP growth against the standard deviation of that growth. The results are shown in the charts below.

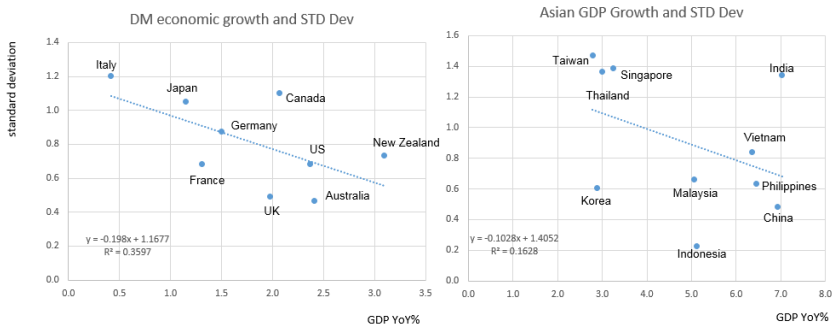
> *Our expectation before examining the data was that fast-growing economies would show more volatility in GDP than slower-growing ones*

First, a bit of detail. We defined growth in year-on-year terms. This removes much of the seasonality that is embedded in Asian data, especially with respect to the Chinese New Year, which plagues much of the data here. It is also the only practical way of including data on China for which no other comparable quarterly real GDP data is available.

We also restricted the sample for this experiment to the period from 1Q13 onwards, since we didn't want the data dominated by the global financial crisis. This still left us with 26 observations for each country, close to what is usually regarded as a sufficient sample for approximating a normal distribution.

The charts are surprising. Although the fit isn't great, for the full population of countries, there is a clear negative relationship between average growth and the standard deviation of that growth. That observation remains even when we split the countries up into a G7-plus and an Asia-Pacific group. So it looks fairly robust. Interestingly, this relationship is stronger for the G7-plus group than it is for the Asia Pacific group.

Average GDP growth and standard deviation



Source: ING

Slow growers are more volatile

For the G7 plus group, the R-squared is a fairly respectable 0.35, which drops to 0.17 for the Asia Pacific group, reflecting some much bigger outliers.

For the G7 group, there are really very few remarkable observations. Slow-growing Italy also exhibits the largest standard deviation, and Japan is close behind.

In contrast, New Zealand, which averages growth of more than 3% over this period, is in the bottom half of the group as far as volatility is concerned, whilst the UK and Australia provide the floor as far as volatility goes. Germany and the United States sit exactly where the line of best fit suggests they should in terms of growth and volatility.

It is a different story for Asia-Pacific. Firstly, although the Philippines and Vietnam sit roughly where you would expect, with low volatility reflecting their higher average growth rates, so too does China. Given the scepticism with which Chinese GDP is often regarded, at least on this measure, its' behaviour looks more credible.

At the other end, slow-growing Singapore and Taiwan show higher GDP volatility along with another growth sloth, Thailand.

The outliers are perhaps more interesting though. Indonesia is by far the biggest outlier in absolute terms with a standard deviation of only just over 0.2.

South Korea also exhibits far less volatility than would be typical for an economy that grows at a shade under 3%.

At the other end of the spectrum, India shows far more volatility than would be expected for an economy averaging 7% growth.

[1] The Most and Least volatile economies of the 21st Century – Dan Kopf, February 23, 2019.

Why might this be happening?

One explanation for why fast-growing economies might be less volatile than slower-growing economies concerns causation. It is quite possible that low volatility helps an economy to grow

faster. So for example, by good management and sound institutions, some economies may avoid the excesses and distortions that lead to recession and average faster growth rates overall. So what we have done next is to look at the factors that might result in a more stable economy, and considered whether this is what is driving the result.

One explanation for why fast-growing economies might be less volatile than slower-growing economies concerns causation

Let's start by considering why an economy might exhibit economic stability. The following list represents five key variables we believe would be instrumental in delivering a low volatility economy.

1. It is large – so shows a degree of "self-insurance". Bits of the economy that do well are offset by other bits that do badly, and so on. "Large" is defined in all ways, geographic and economic. Basically, size brings diversity. Such considerations should help China, the US, and India. They don't help Singapore or Hong Kong.
2. It has a low agricultural content – agriculture is prone to weather shocks, price and volume fluctuations. This will create volatility in India, (monsoon), Philippines (typhoons), and Indonesia[1].
3. It has a low reliance on commodities – either as a supplier or as a consumer – this adds to volatility in oil-importing India, and to volatility in commodity-exporting Malaysia and Indonesia.
4. It has a large service sector – services are less prone to business cycle fluctuations than manufacturing – helpful for low volatility in high-income Taiwan and Singapore.
5. It is well-governed / politically stable: Singapore scores high on such measures [2]

We can't test these qualitative factors statistically; we don't have enough degrees of freedom for that sort of estimation. But we can construct an index for each country based on their relative global rankings for the factors outlined above, and we can infer from that whether an economy ought to exhibit more or less stability once we have accounted for their different growth rates.

The table below ranks each of our Asian economies on the five criteria above and then constructs a composite ranking from a simple unweighted average of the scores.

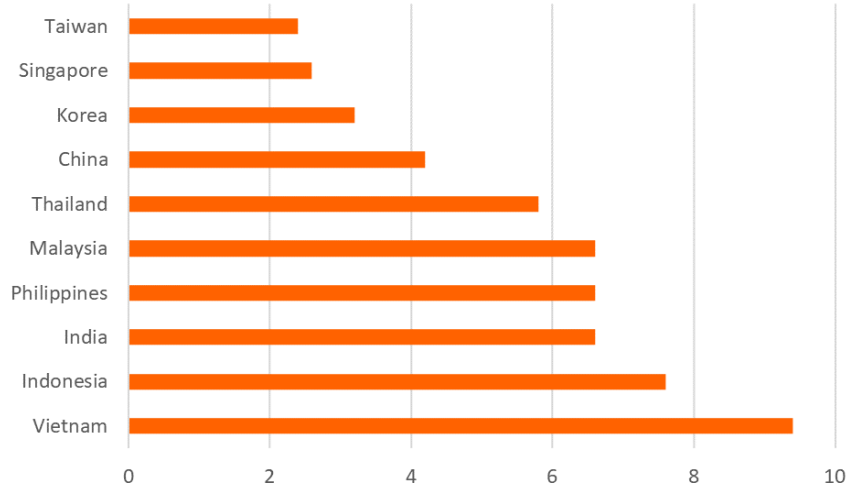
[1] https://www.theglobaleconomy.com/rankings/Share_of_agriculture/

[2] https://www.theglobaleconomy.com/rankings/wb_political_stability/

What might contribute to economic stability?

	Size	Agriculture	Commodities	Services	Governance	Average
India	2	9	7	8	7	6.6
China	1	4	5	6	5	4.2
Philippines	9	7	4	3	10	6.6
Taiwan	5	2	2	1	2	2.4
Thailand	6	6	6	5	6	5.8
Singapore	8	1	1	2	1	2.6
Korea	3	3	3	4	3	3.2
Malaysia	7	5	10	7	4	6.6
Indonesia	4	8	9	9	8	7.6
Vietnam	10	10	8	10	9	9.4

Composite index of stability factors



Source: ING

Conclusions

It looks like we have uncovered a number of factors linking growth and growth-volatility.

In the first place, faster growth in itself does seem to be a crucial factor contributing to reduced growth volatility. How might this work? One analogy might be riding a bicycle. It is much easier to stay upright when you ride quickly than when you ride slowly. At low growth rates, economies may be more prone to shocks than if their growth momentum enables them to shrug them off like a bike-rider on a gusty day.

> *At low growth rates, economies may be more prone to shocks than if their growth momentum enables them to shrug them off like a bike-rider on a gusty day*

But there are structural factors too. If one assumes that our lines of best fit represent where we would imagine the growth/volatility relationship to hold, divergences from this are

accounted for predominantly by these structural factors. These inform why Korean growth is more stable than you would expect for a relatively slow-growing developed economy, and why India is more volatile for an economy that has averaged 7% growth in recent years.

There are still some economies which don't seem to fit either explanation, such as Indonesia - and more work will be needed to account for these outliers.

Author

Amrita Naik Nimbalkar
Junior Economist, Global Macro
amrita.naik.nimbalkar@ing.com

Alissa Lefebre
Economist
alissa.lefebre@ing.com

Deepali Bhargava
Regional Head of Research, Asia-Pacific
Deepali.Bhargava@ing.com

Ruben Dewitte
Economist
+32495364780
ruben.dewitte@ing.com

Kinga Havasi
Economic research trainee
kinga.havasi@ing.com

Marten van Garderen
Consumer Economist, Netherlands
marten.van.garderen@ing.com

David Havrlant
Chief Economist, Czech Republic
420 770 321 486
david.havrlant@ing.com

Sander Burgers
Senior Economist, Dutch Housing
sander.burgers@ing.com

Lynn Song
Chief Economist, Greater China

lynn.song@asia.ing.com

Michiel Tukker
Senior European Rates Strategist
michiel.tukker@ing.com

Michal Rubaszek
Senior Economist, Poland
michal.rubaszek@ing.pl

This is a test author

Stefan Posea
Economist, Romania
tiberiu-stefan.posea@ing.com

Marine Leleux
Sector Strategist, Financials
marine.leleux2@ing.com

Jesse Norcross
Senior Sector Strategist, Real Estate
jesse.norcross@ing.com

Teise Stellema
Research Assistant, Energy Transition
teise.stellema@ing.com

Diederik Stadig
Sector Economist, TMT & Healthcare
diederik.stadig@ing.com

Diogo Gouveia
Sector Economist
diogo.duarte.vieira.de.gouveia@ing.com

Marine Leleux
Sector Strategist, Financials
marine.leleux2@ing.com

Ewa Manthey
Commodities Strategist
ewa.manthey@ing.com

ING Analysts

James Wilson
EM Sovereign Strategist
James.wilson@ing.com

Sophie Smith
Digital Editor
sophie.smith@ing.com

Frantisek Taborsky
EMEA FX & FI Strategist
frantisek.taborsky@ing.com

Adam Antoniak
Senior Economist, Poland
adam.antoniak@ing.pl

Min Joo Kang
Senior Economist, South Korea and Japan
min.joo.kang@asia.ing.com

Coco Zhang
ESG Research
coco.zhang@ing.com

Jan Frederik Slijkerman
Senior Sector Strategist, TMT
jan.frederik.slijkerman@ing.com

Katinka Jongkind
Senior Economist, Services and Leisure
Katinka.Jongkind@ing.com

Marina Le Blanc
Sector Strategist, Financials
Marina.Le.Blanc@ing.com

Samuel Abettan
Junior Economist
samuel.abettan@ing.com

Franziska Biehl
Senior Economist, Germany
Franziska.Marie.Biehl@ing.de

Rebecca Byrne
Senior Editor and Supervisory Analyst
rebecca.byrne@ing.com

Mirjam Bani
Sector Economist, Commercial Real Estate & Public Sector (Netherlands)
mirjam.bani@ing.com

Timothy Rahill
Credit Strategist
timothy.rahill@ing.com

Leszek Kasek
Senior Economist, Poland
leszek.kasek@ing.pl

Oleksiy Soroka, CFA
Senior High Yield Credit Strategist
oleksiy.soroka@ing.com

Antoine Bouvet
Head of European Rates Strategy
antoine.bouvet@ing.com

Jeroen van den Broek
Global Head of Sector Research
jeroen.van.den.broek@ing.com

Edse Dantuma
Senior Sector Economist, Industry and Healthcare
edse.dantuma@ing.com

Francesco Pesole
FX Strategist
francesco.pesole@ing.com

Rico Luman
Senior Sector Economist, Transport and Logistics
Rico.Luman@ing.com

Jurjen Witteveen
Sector Economist
jurjen.witteveen@ing.com

Dmitry Dolgin
Chief Economist, CIS
dmitry.dolgin@ing.de

Nicholas Mapa
Senior Economist, Philippines
nicholas.antonio.mapa@asia.ing.com

Egor Fedorov
Senior Credit Analyst
egor.fedorov@ing.com

Sebastian Franke
Consumer Economist
sebastian.franke@ing.de

Gerben Hieminga
Senior Sector Economist, Energy
gerben.hieminga@ing.com

Nadège Tillier
Head of Corporates Sector Strategy
nadege.tillier@ing.com

Charlotte de Montpellier
Senior Economist, France and Switzerland
charlotte.de.montpellier@ing.com

Laura Straeter
Behavioural Scientist
+31(0)611172684
laura.Straeter@ing.com

Valentin Tataru
Chief Economist, Romania
valentin.tataru@ing.com

James Smith
Developed Markets Economist, UK
james.smith@ing.com

Suvi Platerink Kosonen
Senior Sector Strategist, Financials
suvi.platerink-kosonen@ing.com

Thijs Geijer
Senior Sector Economist, Food & Agri
thijs.geijer@ing.com

Maurice van Sante
Senior Economist Construction & Team Lead Sectors
maurice.van.sante@ing.com

Marcel Klok
Senior Economist, Netherlands
marcel.klok@ing.com

Piotr Poplawski
Senior Economist, Poland
piotr.poplawski@ing.pl

Paolo Pizzoli
Senior Economist, Italy, Greece
paolo.pizzoli@ing.com

Marieke Blom
Chief Economist and Global Head of Research
marieke.blom@ing.com

Raoul Leering
Senior Macro Economist
raoul.leering@ing.com

Maarten Leen
Head of Global IFRS9 ME Scenarios
maarten.leen@ing.com

Maureen Schuller
Head of Financials Sector Strategy
Maureen.Schuller@ing.com

Warren Patterson
Head of Commodities Strategy
Warren.Patterson@asia.ing.com

Rafal Benecki
Chief Economist, Poland
rafal.benecki@ing.pl

Philippe Ledent
Senior Economist, Belgium, Luxembourg
philippe.ledent@ing.com

Peter Virovacz
Senior Economist, Hungary
peter.virovacz@ing.com

Inga Fechner
Senior Economist, Germany, Global Trade
inga.fechner@ing.de

Dimitry Fleming
Senior Data Analyst, Netherlands
Dimitry.Fleming@ing.com

Ciprian Dascalu
Chief Economist, Romania
+40 31 406 8990
ciprian.dascalu@ing.com

Muhammet Mercan
Chief Economist, Turkey
muhammet.mercan@ingbank.com.tr

Iris Pang
Chief Economist, Greater China
iris.pang@asia.ing.com

Sophie Freeman
Writer, Group Research
+44 20 7767 6209
Sophie.Freeman@uk.ing.com

Padhraic Garvey, CFA
Regional Head of Research, Americas
padhraic.garvey@ing.com

James Knightley
Chief International Economist, US
james.knightley@ing.com

Tim Condon
Asia Chief Economist
+65 6232-6020

Martin van Vliet
Senior Interest Rate Strategist
+31 20 563 8801
martin.van.vliet@ing.com

Karol Pogorzelski
Senior Economist, Poland
Karol.Pogorzelski@ing.pl

Carsten Brzeski
Global Head of Macro
carsten.brzeski@ing.de

Viraj Patel
Foreign Exchange Strategist
+44 20 7767 6405
viraj.patel@ing.com

Owen Thomas
Global Head of Editorial Content
+44 (0) 207 767 5331
owen.thomas@ing.com

Bert Colijn
Chief Economist, Netherlands
bert.colijn@ing.com

Peter Vanden Houte
Chief Economist, Belgium, Luxembourg, Eurozone
peter.vandenhoute@ing.com

Benjamin Schroeder
Senior Rates Strategist
benjamin.schroder@ing.com

Chris Turner
Global Head of Markets and Regional Head of Research for UK & CEE
chris.turner@ing.com

Gustavo Rangel
Chief Economist, LATAM
+1 646 424 6464
gustavo.rangel@ing.com

Carlo Cocuzzo
Economist, Digital Finance
+44 20 7767 5306
carlo.cocuzzo@ing.com