

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.

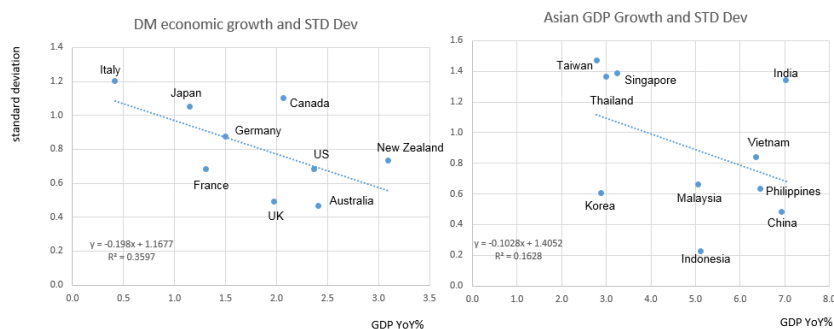
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First, a bit of detail. We defined growth in year-on-year terms. This removes much of the seasonality that is embedded in Asian data, especially with respect to the Chinese New Year, which plagues much of the data here. It is also the only practical 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.

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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.

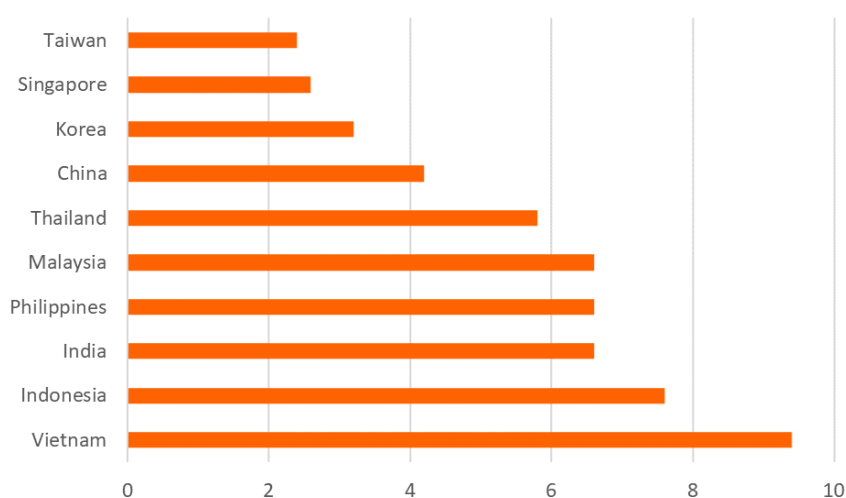
[1] https://www.theglobaleconomy.com/rankings/Share_of_agriculture/

[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.

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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.

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