Box 1.1: Economic Policy Uncertainty in Singapore[1]

Measuring Economic Policy Uncertainty in Singapore

In the US, economic policy uncertainty in the aftermath of the Global Financial Crisis (GFC) rose to historically high levels because of uncertainty about tax, spending, regulatory and monetary policies. Some analysts have argued that this uncertainty had in turn slowed the US' recovery from the recession by causing businesses and households to cutback or postpone investment, hiring and consumption.[2]

In this study, we construct an economic policy uncertainty index for Singapore (SG-EPU) to examine the trends in economic policy uncertainty in Singapore, as well as their key drivers. Following the methodology used by Baker, Bloom and Davis (2012) for countries like the US and China, the SG-EPU index comprises a news-based component and a forecaster disagreement component.

For the news-based component, we use text analytics to identify SG-EPU related articles published in local newspapers, including the Straits Times and Business Times, between January 2002 and October 2014.[3] A news article is considered to be SG-EPU related if it contains all the following key words: "Singapore", "economic", "uncertainty", and any phrase in a list of over 200 policy-related terms like "regulation", "employment pass", and so on. We then compute the number of SG-EPU related articles as a share of all the articles published in the newspapers each month, and construct a news-based component index that is normalised to 100. A value larger than 100 in any month indicates heightened economic policy uncertainty as relatively more SG-EPU articles appeared in the news that month. On average, 72 of 6,690 articles each month (or around 1 per cent) were SG-EPU related.[4]

The second component of the SG-EPU index is based on professional forecasters' disagreements over Singapore's GDP growth and inflation forecasts. Taking the year-ahead forecasts of professional forecasters each month, we calculate the percentage-point difference between the forecasts at the 75th and 25th percentiles.[5] As before, this component is normalised to 100, with a value above 100 indicating greater uncertainty because there is more disagreement among forecasters on the direction of the Singapore economy.[6]

The SG-EPU index is then formed by combining the two component indices using equal weights.

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[1] The author would like to thank Abigail-Joy Low, Ajinkya Chougule and Bali Sodhi for their work on this project. All remaining errors remain with the author. The views expressed herein are those of the author and do not necessarily reflect the views of the Ministry of Trade and Industry.

[2] A vast literature examines and clarifies the various concepts related to uncertainty and risk (Knight, 1921). In particular, "uncertainty" is usually defined as peoples' inability to forecast the likelihood of events happening. As this definition is broad, there is no perfect measure of uncertainty but instead a broad range of proxies (Bloom, 2014). In this study, we adopt a methodology that was recently developed for other economies like the US, EU, China and India.

[3] Six local newspapers were used: Straits Times, Business Times, The Edge Singapore, Today, MyPaper and The New Paper.

[4] A human audit was conducted to validate this approach. News articles for a few selected months were classified manually into whether they represented economic policy uncertainty or not. This manually selected list was then compared against the set chosen by the text analytics algorithm. There were very few articles selected by the text analytics algorithm that were falsely classified as SG-EPU and even fewer articles that the algorithm failed to identify.
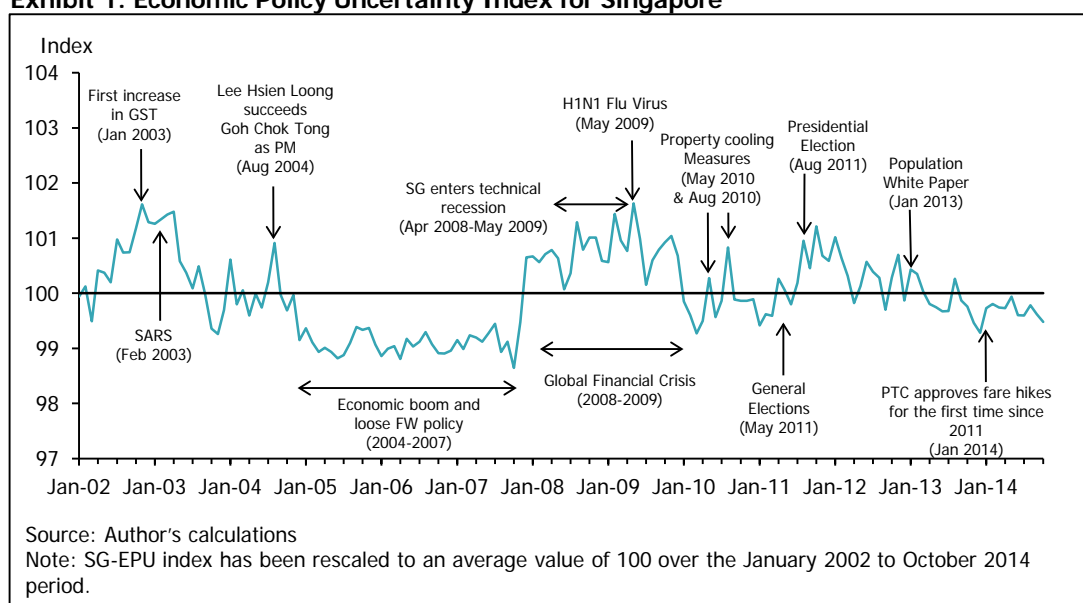
[5] For example, in October 2014, we take the inter-quartile range of GDP forecasts for 2015. Taking forecasts for the year-ahead avoids the mechanical improvement in forecasts for the current year as more data becomes available. As a further robustness measure against seasonal factors, the series were also seasonally adjusted.

[6] It is important to note that this is not a measure of Singapore's economic prospects, but a measure of how uncertain professional analysts are over future outcomes. For example, if there is consensus among forecasters that the economy will be weak, then this will not show up as heightened economic policy uncertainty.

The SG-EPU index correlates well with several important events in Singapore's timeline

As shown in Exhibit 1, the SG-EPU index correlates well with several important events in Singapore's timeline. For instance, we see uncertainty rising alongside the first increase in the Goods & Services Tax in January 2003, during epidemics such as SARS and H1N1, as well as periods around significant political events. Similar to the case in the US, economic policy uncertainty also spiked during the GFC in 2008/2009, although the level of uncertainty seemed to have come down and remained low in the last two years.

Exhibit 1: Economic Policy Uncertainty Index for Singapore

Source: Author's calculations
Note: SG-EPU index has been rescaled to an average value of 100 over the January 2002 to October 2014 period.

Higher values of SG-EPU are associated with lower employment and production

One possible concern with the SG-EPU index is that it may only be capturing news-worthy uncertainty that has little bearing on the real economy. To show that the SG-EPU index has economic content, we estimate vector autoregressive (VAR) models of the SG-EPU index with the index of industrial production (IIP) and employment.[7] Our VAR estimates suggest that a spike in economic policy uncertainty of the magnitude experienced during the GFC in 2008/2009 is associated with a 3.2 per cent and 1.6 per cent fall in production and employment respectively at the peak. While these results should not be interpreted as the causal effects of uncertainty on the real economy, it does suggest that the SG-EPU index is not merely picking up noise.

*The SG-EPU is not entirely driven by global factors*

Next, we explore the drivers of fluctuations in the SG-EPU index. Given that Singapore is a small open economy, a pertinent question is whether the fluctuations in the index are mainly driven by global factors. To shed light on this, we use the EPU indices for the US, EU, Japan, China, India and Canada to proxy for the influence of global factors, on the assumption that uncertainty in these major economies is closely associated with macroeconomic uncertainties in the global economy.[8] We then run a regression of the SG-EPU index on the EPU indices of these economies to form predicted values of the SG-EPU index.

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[7] The model is estimated using quarterly data and a three-month average for the SG-EPU index is used for the reference quarter. Our model adapts the model used in Baker, Bloom and Davis (2012) and includes measures of stock market activity (STI) and interest rates (SIBOR).

[8] These data were downloaded from http://www.policyuncertainty.com/. Refer to the website for further details on the construction of these EPU indices. For the other economies, data was only available up to September 2014.

As shown in Exhibit 2, the EPU indices of the other economies predict the SG-EPU index reasonably well, with the adjusted R-squared of the regression at 0.39. This suggests that global factors are important determinants of economic policy uncertainty in Singapore. However, as the difference between the actual and predicted values of the SG-EPU index – i.e., what is unexplained by global factors – shows non-random fluctuations, it also suggests that the SG-EPU may be partly driven by domestic factors.

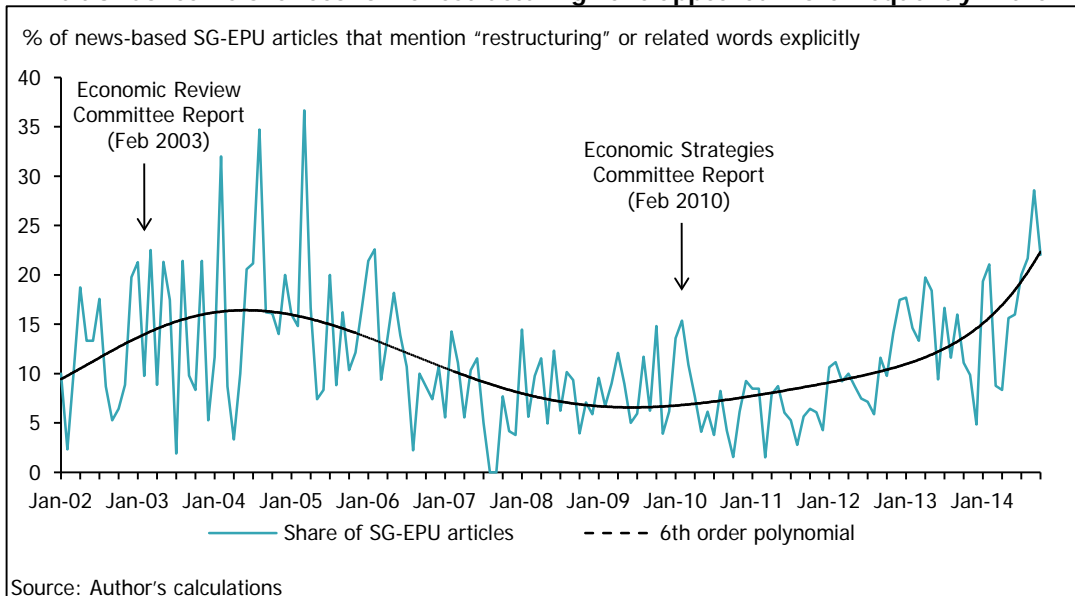**Exhibit 2: The SG-EPU is not driven entirely by global factors**

Source: Author's calculations
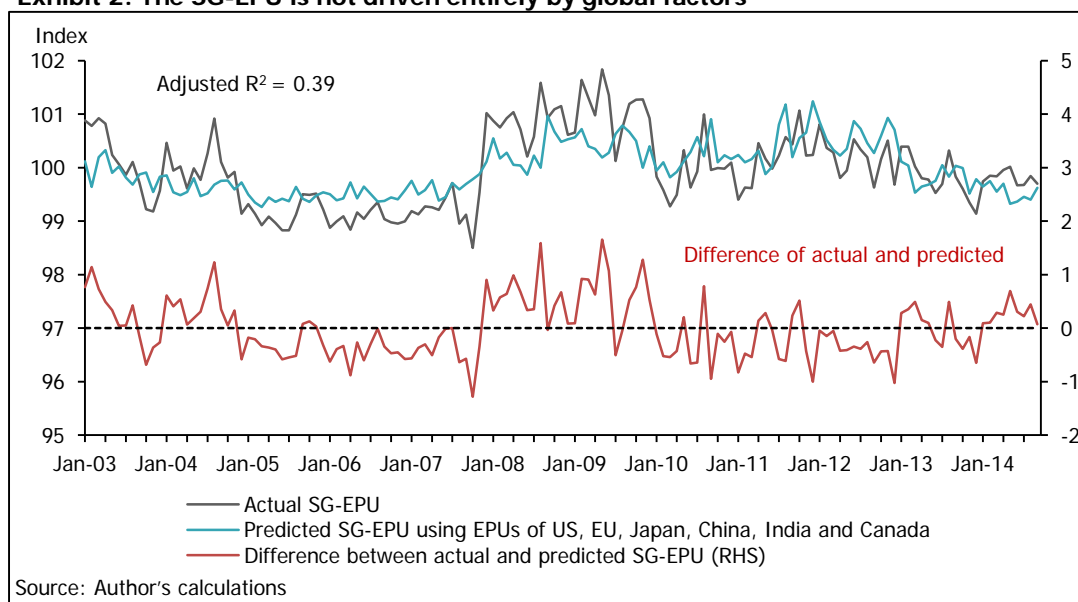
Concerns over economic restructuring have appeared more frequently in the news recently

Given that there is a domestic component to Singapore's uncertainty, we ask if there could be specific factors driving this component of the SG-EPU. In particular, we investigate if concerns over economic restructuring could have an impact on the SG-EPU index. Here, we focus exclusively on the news-based component of the index. Specifically, we count the fraction of SG-EPU related news articles that made explicit mention of "restructuring" and related words.[9]

We find that between January 2002 and October 2014, 11 per cent of the SG-EPU related articles on average made explicit mention of restructuring, although this share fluctuated significantly from month to month (Exhibit 3). For instance, during the periods around and after the Economic Review Committee released its report in February 2003, the share rose and became more volatile. More recently, following the release of the Economic Strategies Committee report in February 2010, the share also started to trend upwards. It is thus likely that concerns about economic restructuring have contributed to uncertainty in the Singapore economy, although as noted earlier, the overall level of uncertainty in Singapore has generally remained low in recent years.

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[9] Synonyms for "restructuring", like "transition", were also used in the search terms.

Exhibit 3: Concerns over economic restructuring have appeared more frequently in the news

% of news-based SG-EPU articles that mention "restructuring" or related words explicitly

Source: Author's calculations

The SG-EPU displays much less volatility than other countries'

Comparing the SG-EPU with other countries' EPU, we find that the overall level of volatility in the SG-EPU is much lower. In Exhibit 4, we compare the SG-EPU against the EPUs of the US, EU and China. As can be seen, the SG-EPU index is practically flat as compared to the EPU indices of these economies.[10] Specifically, between January 2002 and October 2014, the SG-EPU index fluctuated within a tight range of 98 to 102. By contrast, the US' EPU index ranged from 57 to 245 over the same period, while China's index ranged from 26 to 363. This suggests that while economic policy uncertainty in Singapore increases around major policy changes or periods of economic stress, the level of uncertainty is still very low when compared to the experiences of other countries.

Exhibit 4: SG-EPU index displays much less volatility than other countries'

Source: Author's calculations

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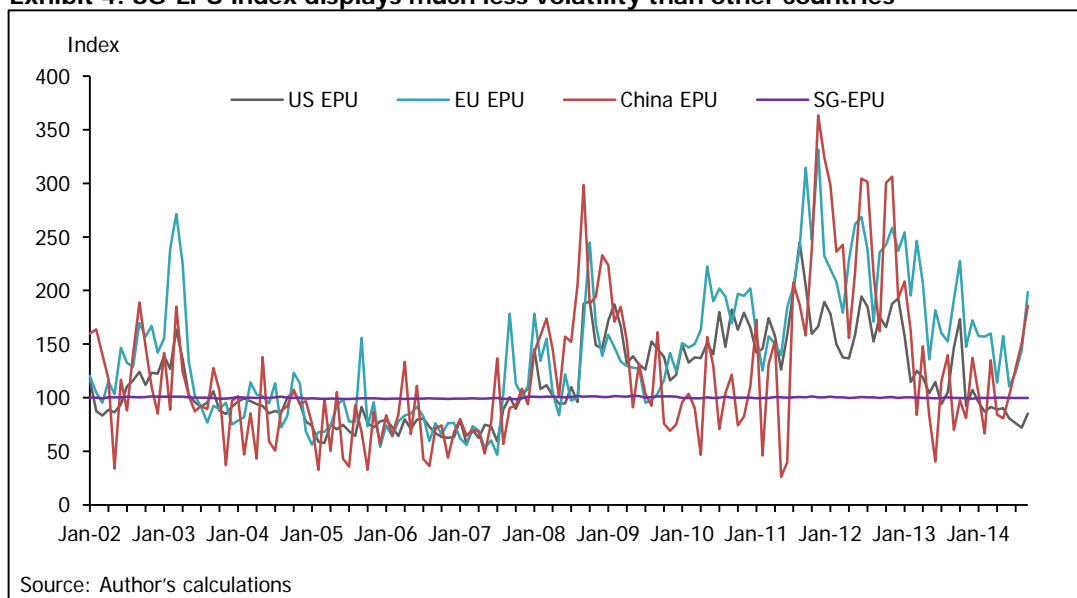
[10] The conclusions do not change when we include Japan, India and Canada.

There is potential for using text analytical methods to monitor economic developments

In this study, we have constructed a measure of economic policy uncertainty in Singapore using the approach of text-analysing news articles and measuring forecaster disagreements. We find that uncertainty in Singapore is much lower compared to other countries, notwithstanding recent concerns over economic restructuring. The use of text analytics in this study also represents a continuation of our effort to tap on Big Data and unconventional data sources to monitor economic developments in Singapore.[11]

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[11] For example, see Goh and Leong (2013) who used Google searches to forecast Singapore's visitor arrivals.