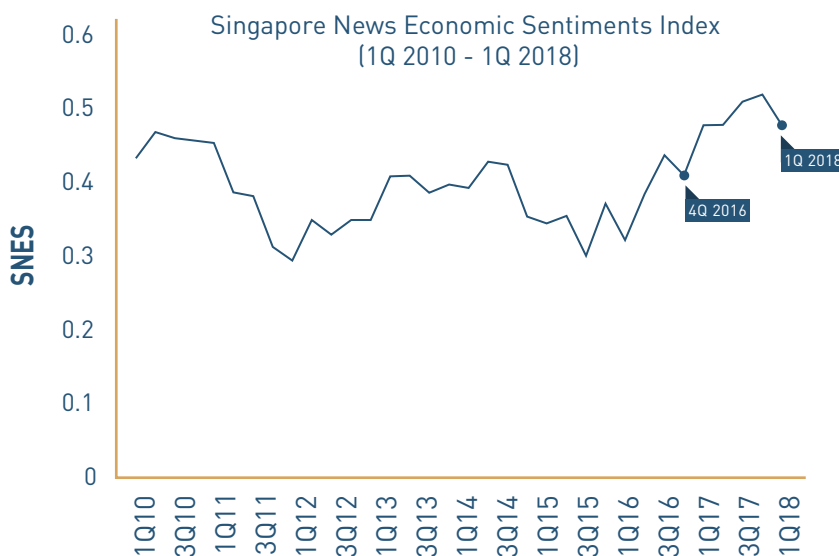


BOX
ARTICLE
1.1Recent Trends in Singapore News
Economic Sentiments

INTRODUCTION

The Singapore News Economic Sentiments Index (SNES) is a measure of economic sentiments in Singapore. It is constructed by scoring local newspaper articles for economic sentiments. The SNES was high in 2017, but was sandwiched by dips in both 4Q 2016 and 1Q 2018.



Singapore News Economic Sentiments Index

Private-sector **ECONOMISTS** have raised their **GROWTH** forecast for the year, in what has been their **MOST UPBEAT** prediction since late.

- topic cluster
- positive sentiments
- amplifies positive sentiments

FINDINGS

► FINDING 1

The strong sentiments in 2017 were primarily due to (i) digital transformation, (ii) employment-support schemes and (iii) external cooperation and linkages



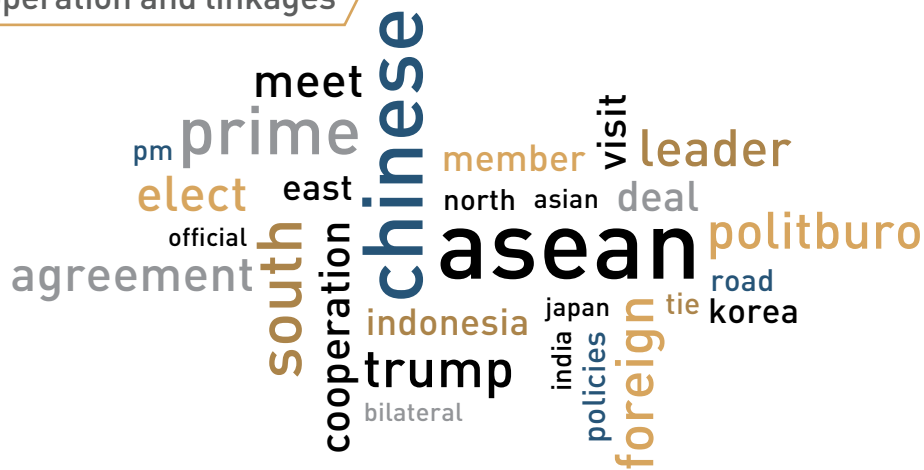
digital transformation



employment-support schemes



external cooperation and linkages



Note: The size of each term is proportional to its frequency.

► FINDING 2

Trade tensions contributed to the fall in economic sentiments in both 4Q 2016 and 1Q 2018.



POLICY TAKEAWAY

The SNES with its real-time and high-frequency properties can provide a useful tool monitoring the changing economic landscape. On top of that, the rich textual data, combined with innovative text mining methods allow deeper insights to be gleaned.



The Singapore News Economic Sentiments Index (SNES), developed by the Ministry of Trade and Industry, measures economic sentiments as reflected in local newspaper articles. Specifically, it taps on daily newspaper articles to provide a high-frequency and real-time indication of economic sentiments in Singapore. This article highlights recent trends in the SNES, and explores the key drivers of these trends.

The SNES: A Recap

The SNES is constructed by first identifying economic-related articles in local newspapers. The news articles are then analysed at the sentence level using a proprietary polarity lexicon to determine the sentiments reflected in the sentence. Specifically, a numerical score is generated for each sentence to determine if it conveys positive (i.e., larger than 0), negative (i.e., smaller than 0) or neutral (i.e., equal to 0) sentiments. Contextual valence shifters are taken into account, to adjust for the effects of negators and amplifiers. For instance, words like “very” or “extremely” amplify the sentiment score, while words like “not” negate the score. The scores of all the sentiments-bearing sentences in an article are then averaged, and the scores for all the articles are aggregated based on the desired time frequency (e.g., daily, monthly or quarterly) to generate the corresponding SNES index.

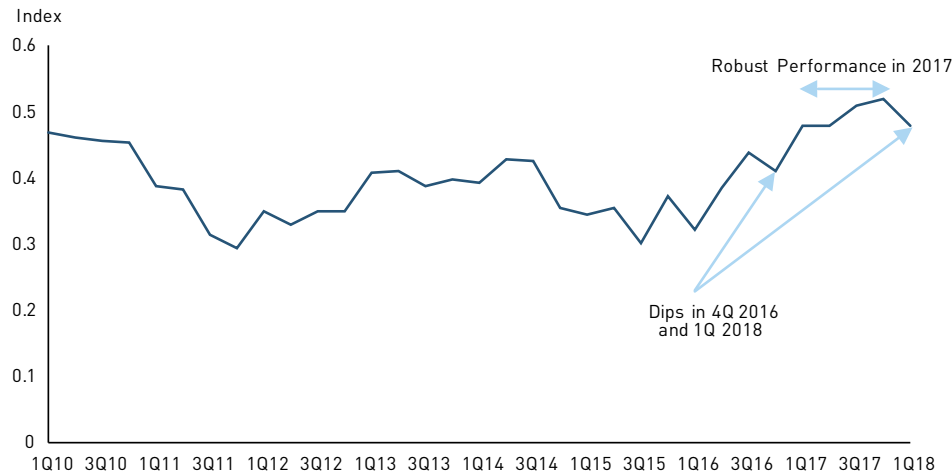
Apart from the SNES, there are also other indices that are derived from newspaper articles. An example is the Singapore Economic Policy Uncertainty (EPU) Index, which is compiled by Baker, Bloom and Davis using the trade-weighted average of 19 other national EPU indices.¹ Each constituent country’s EPU index gauges the level of economic policy uncertainty in the country by tracking the proportion of articles related to policy, economics and uncertainty found within the constituent country’s own newspaper sources (Baker, Bloom and Davis, 2016).² Unlike the Singapore EPU, the SNES focuses on articles in Singapore-based newspapers, and distils general economic sentiments from these articles.

For the SNES, Lam (2016) had previously examined its correlation with major economic events from 2001 to 2016, as well as its correlation with quarterly GDP growth rates. This article extends the analysis to major economic events post-2016. Exhibit 1 plots the SNES from 1Q 2010 to 1Q 2018. Notably, we find that economic sentiments as derived from local newspaper articles were robust across 2017, although these were sandwiched by dips in sentiments in 4Q 2016 and 1Q 2018. The next two sections will explore these trends in greater detail.

¹ The reference countries are Australia, Brazil, Canada, Chile, China, France, Germany, India, Ireland, Italy, Japan, Mexico, the Netherlands, Russia, South Korea, Spain, Sweden, the United Kingdom, and the United States.

² Feng (2014) applied a similar methodology on Singapore-based newspapers.

Exhibit 1: Singapore News Economic Sentiments Index (1Q 2010 to 1Q 2018)



Source: Ministry of Trade and Industry

Improving News Economic Sentiments in 2017

Economic sentiments as depicted by the SNES picked up in 2017 (Exhibit 1). For the full year, the average of the SNES over all 4 quarters stood at 0.50. This was much higher than the quarterly average of 0.39 since the start of the series in 2001. Notably, the SNES started to rise at the start of 2017 and continued to improve to reach a peak of 0.52 in 4Q 2017. The positive sentiments in 2017 also coincided with strong economic growth in the year, with full-year GDP growth coming in at 3.6 per cent, higher than the 2.4 per cent in 2016.

Using topic modelling techniques, the SNES can be further broken down so that the main drivers of the changes in sentiments can be explored.³ In particular, we are able to classify all the articles that were captured by the SNES for 2017 into 10 topic clusters based on the overarching themes of the articles.⁴ The sentiment scores of the articles within a topic cluster are then averaged to derive a sentiment score for each topic cluster.

Our findings show that the 3 themes with the most positive sentiment scores in 2017 were (i) digital transformation, (ii) employment-support schemes, and (iii) external cooperation and linkages (Exhibit 2). Compared to the overall sentiment score for 2017 (0.50), the sentiment scores for these 3 topic clusters were 32 per cent, 32 per cent and 14 per cent higher respectively, and were hence key drivers of the pickup in sentiments in 2017.

³ In particular, we use Latent Dirichlet Allocation (LDA) to identify topic clusters. LDA learns the mixture of topics for each newspaper article and the words associated with each topic.

⁴ The 10 topic clusters identified were: (1) infrastructural developments, (2) external cooperation and linkages, (3) financial market performance, (4) natural resources (e.g., energy, water), (5) real estate, (6) corporate performance, (7) business regulatory issues, (8) digital transformation, (9) employment-support schemes (e.g., training, skills development), and (10) social support initiatives.

Exhibit 2: 2017 Strong Positive Themes

Theme	Word Cloud	Illustrative Headlines
<p>Digital transformation</p> <p>With rapid technological progress, more efforts are introduced from both the public and private sectors to ride on these technologies and increase efficiency</p>		<ul style="list-style-type: none"> • Blockchain tech for inter-bank payments – The New Paper, 6 Oct 2017 • Telcos, lenders to spur SME digital adoption – The Straits Times, 17 Aug 2017 • Siemens opens its first global fully integrated digitalisation hub in Singapore – Business Times, 12 Jul 2017
<p>Employment-support schemes</p> <p>Training programmes rolled out to help Singaporeans stay relevant in the labour market</p>		<ul style="list-style-type: none"> • More people in Singapore took up subsidised training courses in 2016 – The Straits Times, 14 Sep 2017 • Firms can tap new state scheme to help local workers learn from overseas experts – Business Times Singapore, 11 Oct 2017 • New schemes to help PMETs find jobs in manufacturing industry – The Straits Times, 27 Apr 2017
<p>External cooperation and linkages</p> <p>High level meetings between leaders of Singapore and our regional and international partners, to reaffirm our friendship</p>		<ul style="list-style-type: none"> • Singapore, China to strengthen Belt and Road Initiative (BRI) cooperation in three areas – Today Singapore, 13 Jun 2017 • Singapore, UK renew economic-business pact with new areas of cooperation – Business Times Singapore, 22 Feb 2017 • Singapore, Indonesia celebrate 50 years of bilateral relations – Business Times Singapore, 18 Jan 2017

Protectionism and Trade Tensions: A drag on sentiments in 4Q 2016 and 1Q 2018

While improved regional and international cooperation was one of the key drivers of the pickup in economic sentiments as reflected in news articles in 2017, topic modelling suggests that a shift in attitude towards greater protectionism among major global players, most notably the US, posed a drag on sentiments in 4Q 2016 and 1Q 2018.

In particular, 4Q 2016 saw the election of US President Donald Trump, who had espoused anti-trade and anti-globalisation views on his campaign trail. Likewise, 1Q 2018 saw trade tensions ratcheting up with the US' imposition of steel and aluminium tariffs. The resulting exchanges between the US and China sparked fears of a trade war and its impact on a trade-dependent economy like Singapore. The sentiment scores of these two topic clusters were 34 per cent and 50 per cent lower than the overall sentiment scores in 4Q 2016 (0.41) and 1Q 2018 (0.48) respectively.

However, even though trade tensions between the US and China rose in 1Q 2018, bright spots remained given news reports of a continued appetite for increased cooperation among other economies. These included news of the signing of the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) on 8 March 2018 by 11 countries, including Singapore, as well as news of efforts to push through other trade deals such as the Regional Comprehensive Economic Partnership (RCEP). Such developments had a countervailing effect on the overall negative trade sentiments brought about by the US-China trade tensions.

Conclusion

While economic sentiments as reflected in local newspaper articles dipped in 1Q 2018, our monthly SNES series show that sentiments have since recovered. In particular, the SNES rebounded in the month of April, supported by our work in cultivating good relations with international partners.

Overall, the SNES with its real-time and high-frequency properties provides an additional tool for us to monitor the changing economic landscape in Singapore. Advanced text mining methods can also be applied to help explain the changes in sentiments, thus allowing for deeper insights to be gleaned.

Contributed by:

Mr Chia Keat Loong, Economist
Ms Jessica Foo, Economist
Economics Division
Ministry of Trade and Industry

References

Lam, Yan Tung. 2016. "Box 1.1: Economic Sentiments in Singapore", Economic Survey of Singapore Second Quarter 2016.

Baker, Scott R., Nicholas Bloom and Steven J. Davis. 2016. "Measuring Economic Policy Uncertainty". *The Quarterly Journal of Economics*, 131(4): 1593-1636.

Feng, Andy. 2014. "Economic policy uncertainty in Singapore", Economic Survey of Singapore, Third Quarter 2014.

Economic Policy Uncertainty. 2018. Economic Policy Uncertainty. www.policyuncertainty.com (accessed May 4, 2018).