

## BOX ARTICLE 2.1

# Trends in Productivity Growth as Measured by Real Value-Added (VA) Per Actual Hour Worked (AHW)

## INTRODUCTION

Since 2015, MTI has compiled statistics on real VA per actual hour worked (AHW) on an annual basis. To facilitate more timely surveillance of labour input intensity and productivity, MTI has worked with DOS and MOM to compile AHW data on a quarterly basis.



## TRENDS IN REAL VALUE-ADDED PER ACTUAL HOUR WORKED

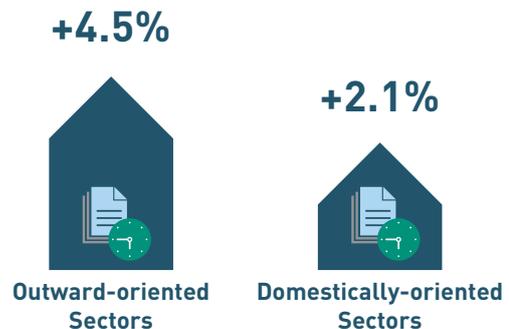
**Productivity growth slowed in the second half of 2018 but full-year productivity growth remained healthy.**

Real VA per AHW registered stronger growth in the first and second quarters of 2018, at 5.9 per cent and 6.3 per cent respectively. However, on the back of a moderation in economic growth, productivity growth slowed to 1.6 per cent and 1.4 per cent in the third and fourth quarters of 2018 respectively.



**Overall productivity growth in 2018 was primarily driven by outward-oriented sectors**

Collectively, outward-oriented sectors were the main contributor to overall productivity growth in 2018, posting real VA per AHW growth of 4.5 per cent in the year. By contrast, productivity growth in the domestically-oriented sectors increased at a more moderate pace.



## POLICY TAKEAWAY

In 2018, productivity growth remained healthy, even though there was unevenness across sectors. Over the longer term, it is important that we continue to press on with industry transformation efforts to ensure that productivity growth continues to drive Singapore's economic growth.

## TRENDS IN PRODUCTIVITY GROWTH AS MEASURED BY REAL VALUE-ADDED (VA) PER ACTUAL HOUR WORKED (AHW)

### Introduction

Internationally, labour productivity can be measured using real value-added (VA) per worker or real VA per hour worked. In Singapore, the more commonly used measure of productivity has been real VA per worker, as both VA and employment data are readily available on a quarterly and annual basis.

Since 2015, MTI has compiled statistics on real VA per actual hour worked (AHW) on an annual basis. This measure is recognised internationally, including by the International Labour Organisation, to be a better measure of labour productivity as AHW captures the intensity of labour input more accurately. Specifically, the measure accounts for changes in employment patterns, such as a rise in part-time work and cyclical changes in the number of hours worked by full-time employees. With these trends having been observed in Singapore in recent years, the measurement of labour input using AHW has become more pertinent in our context (Goh & Lin, 2015).

Previously, AHW statistics were estimated by MTI using data on usual hours worked (UHW) and paid hours worked (PHW) collected by the Ministry of Manpower (MOM), with further adjustments to account for public holidays, annual and sick leave.<sup>1</sup> As UHW data is only available annually, real VA per AHW was thus published on an annual basis.

In order to monitor the intensity of labour input and productivity trends at a higher frequency, MOM, in consultation with MTI and the Department of Statistics (DOS), has started to compile AHW statistics directly through Labour Force Surveys. The quarterly AHW data is available from the first quarter of 2017 onwards, meaning that year-on-year changes in real VA per AHW every quarter can be computed from the first quarter of 2018 onwards.

This article introduces the quarterly real VA per AHW series, and also briefly describes our real VA per AHW performance in 2018. Going forward, real VA per AHW data will be published alongside real VA per worker data on both a quarterly and annual basis.

### New quarterly VA per AHW series shows that productivity growth slowed in the second half of 2018...

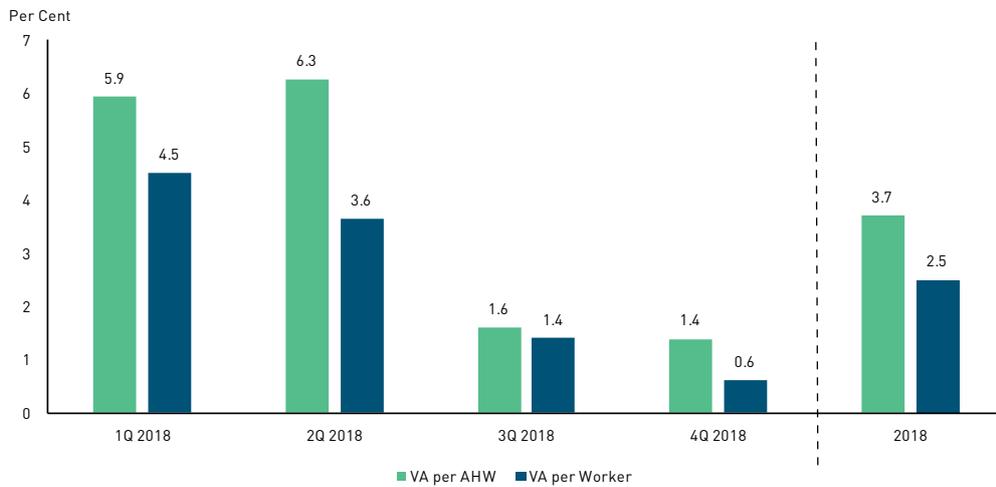
Exhibit 1 shows the changes in real VA per AHW on a year-on-year basis in the four quarters of 2018, along with the changes in real VA per worker over the same period.<sup>2</sup>

It can be seen that similar to real VA per worker, real VA per AHW registered stronger growth in the first two quarters of 2018, at 5.9 per cent and 6.3 per cent respectively, before slowing to 1.6 per cent and 1.4 per cent in the third and fourth quarters of 2018 respectively, on the back of a moderation in economic growth.

<sup>1</sup> UHW is defined as the number of hours a person usually works in a typical week, regardless of whether he or she is paid for it, while PHW is defined as the hours for which employees receive payment from their employer, regardless of whether the hours are actually worked. Neither of the measures comprehensively reflects the number of hours worked by the average worker in the economy due to various gaps in coverage. To estimate AHW previously, UHW was used to measure the hours worked by local employees and self-employed, while PHW was used to proxy the hours worked by foreign employees. The data was also adjusted to account for public holidays, annual and sick leave. For more details on the computation of AHW, see Goh & Lin (2015).

<sup>2</sup> Real VA per AHW growth is higher than real VA per worker growth during this period because of a fall in AHW per worker. See Annex A for a comparison of real VA per AHW growth and real VA per worker growth over the past five years (i.e., for the period of 2013–2018).

Exhibit 1: Real VA per AHW Growth and Real VA per Worker Growth, 2018



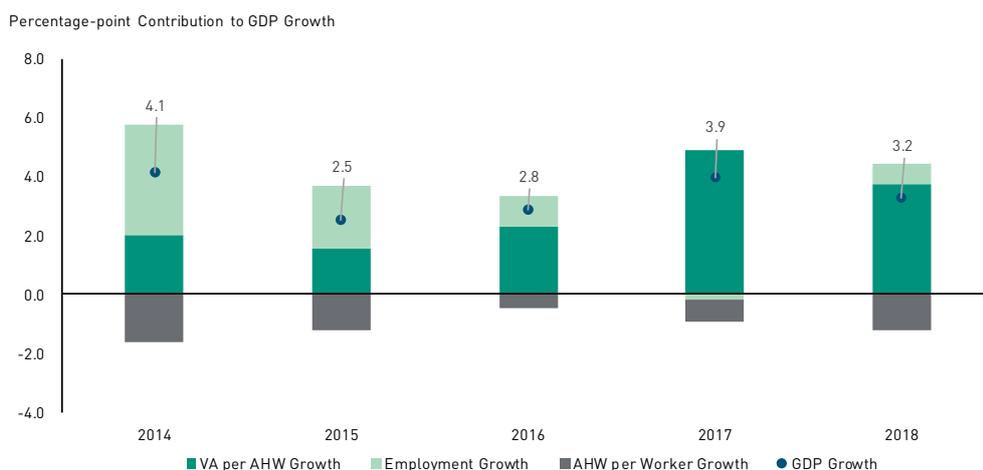
Source: Singapore Department of Statistics and MTI Staff Estimates

### ...but full-year productivity growth remained healthy and was the main driver of GDP growth in 2018

For 2018 as a whole, real VA per AHW grew at a healthy pace of 3.7 per cent. While this was lower than the 4.9 per cent recorded in 2017, it was higher than the average growth achieved in the preceding five years (1.4 per cent per annum (p.a.) between 2011 and 2016).

In line with this, productivity (real VA per AHW) growth was the main driver of GDP growth in 2018, extending recent trends (see Teo & Ong, 2018).<sup>3</sup> Specifically, we decompose the 2018 GDP growth of 3.2 per cent and find that GDP growth was largely supported by the strong increase in productivity (3.7 per cent) and to a lesser extent, the slight pickup in employment (0.7 per cent) (Exhibit 2). On the other hand, AHW per worker continued to decline in 2018 (-1.2 per cent).

Exhibit 2: Decomposition of GDP Growth, 2014-2018



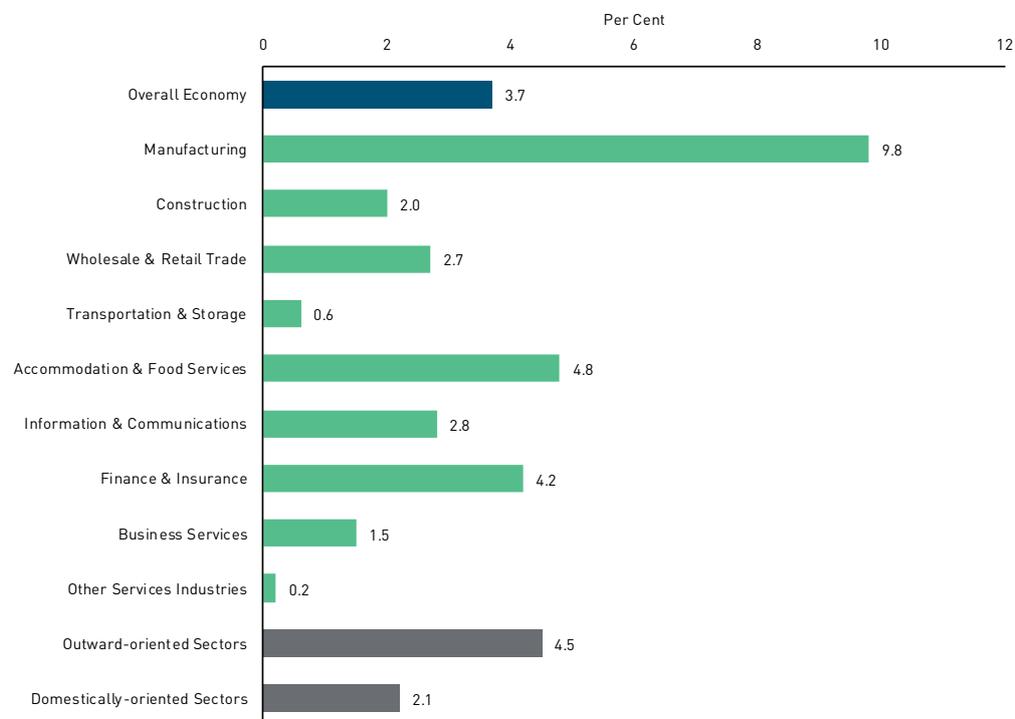
Source: MTI Staff Estimates

<sup>3</sup> GDP growth is approximately the summation of employment growth, labour intensity (AHW per worker) growth and labour productivity (VA per AHW) growth.

## Productivity growth in 2018 was uneven across sectors

In 2018, productivity (real VA per AHW) growth was the strongest in Manufacturing (9.8 per cent), outstripping growth in overall Services (2.2 per cent) and Construction (2.0 per cent). Amongst the Services sectors, the Accommodation & Food Services<sup>4</sup> (4.8 per cent) and Finance & Insurance (4.2 per cent) sectors had the fastest growth. Collectively, outward-oriented sectors were the main contributor to overall productivity growth in 2018, posting real VA per AHW growth of 4.5 per cent during the year (Exhibit 3).<sup>5</sup> By contrast, the productivity of domestically-oriented sectors increased at a more moderate pace of 2.1 per cent, weighed down by Other Services Industries and Retail Trade<sup>6</sup>.

Exhibit 3: Broad Sectoral Real VA per AHW Growth, 2018



Source: MTI Staff Estimates

A similar trend was observed over the longer period of 2013 to 2018, where productivity growth of the outward-oriented sectors came in at 3.8 per cent p.a., higher than the 1.7 per cent p.a. registered in the domestically-oriented sectors.

<sup>4</sup> For the Accommodation & Food Services sector, Accommodation (an outward-oriented sector) recorded productivity growth of 6.3 per cent while Food Services (a domestically-oriented sector) registered productivity growth of 2.7 per cent in 2018. Taken over a longer time period, VA per AHW for Accommodation and Food Services grew by 4.4 per cent p.a. and 1.4 per cent p.a. respectively between 2013 and 2018.

<sup>5</sup> Outward-oriented sectors refer to Manufacturing, Wholesale Trade, Transportation & Storage, Accommodation, Information & Communications, Finance & Insurance and Professional Services. Domestically-oriented sectors refer to Construction, Retail Trade, Food Services, Other Business Services and Other Services Industries.

<sup>6</sup> For the Wholesale & Retail Trade sector, productivity in Wholesale Trade (an outward-oriented sector) and Retail Trade (a domestically-oriented sector) grew by 2.7 per cent and 1.1 per cent respectively in 2018.

## Conclusion

The release of the new quarterly real VA per AHW series facilitates the timely monitoring of the intensity of labour input and productivity trends, and supplements the existing quarterly real VA per worker series.

In 2018, productivity growth remained healthy, even though there was unevenness across sectors. Overall productivity growth was primarily driven by the outward-oriented sectors. The healthy productivity growth has in turn supported GDP growth. Over the longer term, it is important that we continue to press on with industry transformation efforts to ensure that productivity growth continues to drive Singapore's economic growth.

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## References

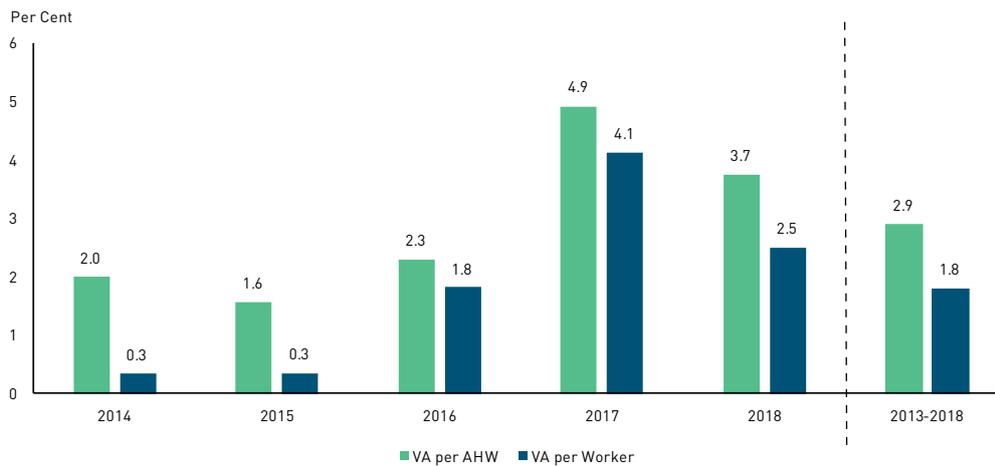
Goh, K., & Lin, T. (2015). Trends in Actual Hours Worked and Implications for Labour Productivity. *Economic Survey of Singapore Second Quarter 2016*, 16-23.

Teo, M., & Ong, M. J. (2018). A Shift-Share Decomposition Analysis of Labour Productivity Growth in Singapore. *Economic Survey of Singapore 2017*, 18-27.

### Annex A: Comparison of Real VA per AHW and Real VA per Worker

Between 2013 and 2018, the growth of real VA per AHW (2.9 per cent p.a.) outstripped that of real VA per worker (1.8 per cent p.a.), due to a sustained decline in AHW per worker since 2013 (Exhibit A-1). During this period, AHW per worker fell by 1.1 per cent p.a..

Exhibit A-1: Real VA per AHW Growth and Real VA per Worker Growth, 2013-2018

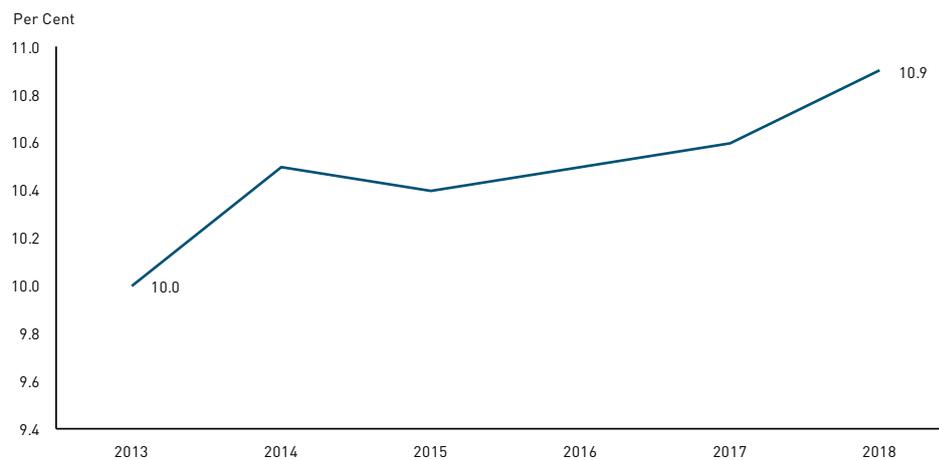


Source: Singapore Department of Statistics and MTI Staff Estimates

The decline in AHW per worker over this period can broadly be attributed to two factors:

- First, the share of part-time employed residents in Singapore’s workforce has increased. Between 2013 and 2018, the share of part-time employed residents rose by 0.9 percentage-point (pp), from 10.0 per cent to 10.9 per cent (Exhibit A-2).

Exhibit A-2: Incidence of Part-time Employment among Employed Residents, 2013-2018



Source: Ministry of Manpower

- Second, workers have experienced a fall in the number of hours worked per week on average. Between 2013 and 2018, UHW for resident full-time workers fell from 48.0 hours to 45.8 hours, while that for resident part-time workers declined from 21.5 hours to 20.9 hours. Similarly, PHW, which covers both resident and foreign workers, fell from 46.2 hours in 2013 to 44.9 hours in 2018<sup>7</sup>.

7 Based on PHW in the first nine months of 2018.