ECONOMIC SIGNIFICANCE OF INDEPENDENT SCHOOLS TO THE WESTERN AUSTRALIAN ECONOMY

A REPORT PREPARED FOR THE ASSOCIATION OF INDEPENDENT SCHOOLS OF WESTERN AUSTRALIA
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EXECUTIVE SUMMARY

QUICK STATS

Indicator	2017-18
Students (Enrolments)	70,201
General Teaching Staff (FTEs[1])	5,434.4
Other Independent School Staff (FTEs[1])	3,411.9
Contribution[2] to GSP ($M)	$2,871.1
Contribution[2] to WA Jobs (FTEs[1])	18,569.3
Contribution[2] to WA Wages and Salaries ($M)	$1,734.7
Savings Delivered to Taxpayers ($M)	$784.0
Annual Value of Enhanced Educational Outcomes ($M)	$181.1

Notes: (1) Full Time Equivalents. (2) Contribution includes direct and flow-on impacts.

BACKGROUND

The Association of Independent Schools of Western Australia (AISWA) is the peak body representing Independent Schools in Western Australia (WA). In 2018 AISWA represented 139 member schools (covering more than 170 campuses) in WA, with over 70,200 student enrolments. Membership encompasses schools of many different types, sizes and educational philosophies. AISWA provides a wide range of services and support to its member schools contributing to the high quality of education provided by the Independent Schools sector of WA.

Independent Schools have a legal status in their own right and are owned and operated by a separately constituted association or organisation and as such, determine the strategic directions of the school whilst meeting all legislative requirements. Some Independent Schools are part of a small system within the sector and these have an independent governing body that makes determinations for the schools in that small system. In WA there is a category of 'independent public schools' and these schools are still public schools and thus not part of the Independent Schools sector.

In 2017, AISWA engaged AEC Group Pty Ltd (AEC) to analyse and quantify the important contribution Independent Schools made to Western Australia (WA) in 2014-15 in terms of their contribution to WA Gross State Product (GSP), employment and household incomes, as well as the savings they deliver to governments and therefore taxpayers and the economic value that flows from the enhanced education outcomes achieved by Independent School students. AISWA engaged AEC to provide an update of the study based on the most recent available information.

In undertaking the analysis, AEC used Input-Output modelling techniques within an economic significance framework. This is a recognised and standard modelling approach to assess the economic contribution of an existing industry. Verified data from AISWA for 2018 was used (the most recent year that validated data was available for all required data sets) as well as published financial year data from the Australian Bureau of Statistics (ABS) and other agencies to produce the estimates in this report for the 2017-18 year.

KEY FINDINGS

Economic Contribution of Independent Schools

In 2017-18 Independent Schools in WA represented by AISWA:

- **Contributed approximately $2.87 billion to WA's Gross State Product (GSP)** through direct and flow-on contributions. This accounted for 1.1 percent of the total contribution to GSP by all industries in WA for the year. Of note:
    - Independent Schools' total contribution to GSP was **comprised of $1.225 billion directly** through activities such as school operations, capital expenditure of Independent Schools and expenditure of overseas students in the broader economy, and **$1.645 billion through flow-on demand for goods and services** by Independent Schools for the delivery of their education services (e.g. utilities, teaching

materials, equipment), subsequent flow-on production-induced activity for the production of these goods and services, and household consumption from Independent School employees.

  - The direct contribution of Independent Schools was greater than the contribution of key WA industries such as the air transport industry, the structural metal product manufacturing industry, the automotive repair and maintenance industry, the basic chemical manufacturing industry, and the accommodation industry (including all hotels, motels, serviced apartments, caravan parks and other accommodation establishments).

- **Made significant contributions to the local and regional economies in which they operate**. For example, including direct and flow-on activity, Independent Schools contributed:
  - $2.44 billion to Greater Perth Gross Regional Product (GRP) (1.6 percent of total Greater Perth GRP for the year), $1.47 billion in incomes (or 2.0 percent of total Greater Perth), and approximately 15,600 full time equivalent (FTE) jobs (or 1.8 percent of total Greater Perth employment) in 2017-18.
  - 20 percent or more of total economic activity (i.e. GRP, incomes and employment) in three LGAs within Greater Perth in 2017-18 (Claremont, Mosman Park and Peppermint Grove).
  - Over five percent of total economic activity in the LGAs of Armadale and South Perth.
  - Approximately three percent or more of total economic activity in the LGAs of Joondalup, Mundaring, Serpentine-Jarrahdale, Stirling and Wanneroo.
  - Approximately 1.5 percent or more of total economic activity in the LGAs of Gosnells, Kalamunda, Kwinana, Melville, Rockingham and Swan.
  - $434.8 million (or 0.4 percent) to regional WA GRP, $261.6 million (or 0.9 percent) to incomes, and approximately 3,000 FTE jobs (or 1.0 percent of total employment).
- **Supported jobs for nearly 18,600 full-time equivalent (FTE) employees**, which equated to around 1.6 percent of total jobs in WA in 2017-18. Of note:
  - The employment contribution by Independent Schools was comprised of 9,141 direct FTE jobs supported by activities of Independent Schools (including 8,846 FTE employees at Independent Schools plus a further 295 FTE jobs directly supported by Independent Schools through capital works activity and expenditure of overseas students) and 9,428 FTE jobs supported through flow-on activity.
  - Independent Schools supported approximately one full-time job in the WA economy for every 3.8 students enrolled (including direct and flow on jobs supported).
  - The direct contribution of Independent Schools to employment was greater than the individual contribution to WA employment made by each of the industries of accommodation, heritage, creative and performing arts, postal and courier delivery services, and air transport.
- **Contributed $1.73 billion in employee wages and salaries**, which represented approximately 1.6 percent of total wages and salaries paid to workers in WA. Approximately $943.7 was paid by Independent Schools directly to school employees, representing more than 75 percent of total Independent Schools' operational expenditure for the year. This is reflective of the large labour component in service delivery and the important role Independent Schools play in providing jobs and incomes to WA. It is worth noting that **jobs in WA Independent Schools are predominantly highly skilled, service sector positions and are key to growing the WA economy**. A further $39.7 million in employee wages and salaries was directly contributed to the WA economy by Independent Schools through capital works and expenditure of overseas students and approximately $751.4 million was also paid to workers as a result of flow-on activity.

Savings to Governments and Tax Payers

There were more than 70,200 school children in WA enrolled in Independent Schools in 2018 that were entitled to but did not take up a place in a government school. In 2017-18, the WA Independent School system **saved the Australian and WA Governments approximately $784.0 million in expenditure**. This was comprised of $661.9

million in recurrent education cost savings and $122.1 million in infrastructure cost savings, representing a significant and ongoing saving to tax payers.

The Economic Value of Enhanced Education Outcomes

Enhanced educational outcomes provided by Independent Schools can be linked to an estimated **contribution to growth in WA GSP of around $181.1 million in 2017-18**. This economic benefit is estimated to be provided annually by the enhanced education outcomes delivered by Independent Schools.

The quality of learning and teaching provided by WA Independent Schools support students in achieving excellent outcomes across a range of educational measures:

- Students attending Independent Schools are estimated to have contributed to an increase of approximately four points in the mean PISA test score for the WA's overall student body in 2018. Whilst this is only an indicative estimate, based on national data from ACER (2019), it is reflective of the enhanced education outcomes supported by Independent Schools.
- Australian Independent Schools recorded a mean PISA test score of 536 for each of reading literacy and scientific literacy, and 524 for mathematical literacy (ACER, 2019). These scores were well above the overall mean PISA test scores for all Australian schools, as well as the OECD average.
- In 2019, 20 of the top 50 (40 percent) median Australian Tertiary Admission Rank (ATAR) scores for WA schools were achieved by Independent Schools (WA SCSA, 2020). The ATAR is an assessment used to rank school-leaving university applicants.
- Independent Schools accounted for 28 of the top 50 (56 percent) schools in proportion of eligible students that achieved the Western Australian Certificate of Education (WACE) in 2019 (WA SCSA, 2020).

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1. INTRODUCTION

1.1 BACKGROUND AND PURPOSE OF THE REPORT

Independent Schools are autonomous education providers and are not run by government. They have earned a reputation for providing high quality education services and are a vital part of the Western Australian (WA) education system serving a wide range of communities, including some of Western Australia's most remote and disadvantaged Indigenous communities, communities in regional towns and diverse communities in Perth.

The Association of Independent Schools of Western Australia (AISWA) is the peak body representing Independent Schools in Western Australia. AISWA is a non-profit body whose members are not-for-profit Independent Schools located in WA. It provides a wide range of services to member schools and administers and manages a range of government funded programs for WA Independent Schools.

In 2018, AISWA represented 139 member schools (covering more than 170 campuses) in WA, with over 70,200 student enrolments. Membership encompasses schools of many different types, sizes and educational philosophies. AISWA provides a wide range of services and support to its member schools contributing to the high quality of education provided by the Independent Schools sector of WA.

Independent Schools have a legal status in their own right and are owned and operated by a separately constituted association or organisation and as such, determine the strategic directions of the school whilst meeting all legislative requirements. Some Independent Schools are part of a small system within the sector and these have an independent governing body that makes determinations for the schools in that small system. In WA there is a category of 'independent public schools' and these schools are still public schools and thus not part of the Independent Schools sector.

In 2017, AISWA engaged AEC Group Pty Ltd (AEC) to analyse and quantify the important contribution Independent Schools made to WA in 2014-15 in terms of their contribution to WA Gross State Product (GSP), employment and household incomes, as well as the savings they deliver to governments and therefore taxpayers and the economic value that flows from the enhanced education outcomes achieved by Independent School students.

AISWA has engaged AEC to provide an update of the study for 2017-18 based on the most recent available information.

1.2 SCOPE OF THE REPORT

1.2.1 Geographic Scope

The scope of this report covers the economic significance of Independent Schools to WA. Modelling was also undertaken to assess the economic contribution of Independent Schools to regional and local economies, across all local government areas (LGAs) as well as State and Federal Electorates.

1.2.2 Independent Schooling Sector

For the purposes of this report, the Independent Schools sector is considered to include all member schools represented by AISWA. In 2018, more than 70,200 students were enrolled at the 139 member schools, representing approximately 17 percent of WA's total student body. This included 35,653 primary students and 34,548 secondary students.

1.3 METHODOLOGY

1.3.1 Measuring the Economic Contribution of Independent Schools

The estimates in this report were produced using Input-Output transaction tables and models developed by AEC, within an economic significance framework. This is a recognised and standard modelling approach to assessing the economic contribution of an existing industry.

Verified data from AISWA for 2018 was used (the most recent year that validated data was available for all required data sets) to produce the estimates in this report. Other data sources used include State and National Accounts and industry specific Australian Bureau of Statistics (ABS) and other agency data. The significance model was developed based on a 2017-18 Input-Output transaction table from the Australian Bureau of Statistics. The Input-Output significance model was used to produce estimates of the direct and flow-on contributions of Independent Schools to the WA economy, as well as all LGA's, State Electorates and Federal Electorates in WA.

Measures used in this report include industry output, Gross State Product (GSP), employment, and income (i.e. wages and salaries). Appendix A presents a detailed description of the methodology. Appendix B provides definitions and explanations of the terms and measures used.

1.3.2 Quantifying the Savings to Tax Payers from Independent Schools

Estimates of tax payer savings were developed across two key components:

- Cost savings in terms of recurrent education costs, including expenditure on user costs of capital.
- Cost savings in terms of contributions made by parents and other private benefactors to capital infrastructure and improvements.

To identify the cost savings in recurrent education costs, data from the Productivity Commission (Productivity Commission, 2020) regarding average Commonwealth and WA Government expenditure per state school student in 2017-18 was used and applied to the number of Independent School students. This was then compared to data from AISWA (unpublished(1)) regarding the level of government funding received to provide a net difference in government funding required if Independent School students were enrolled in state schools.

To estimate the capital cost saving, school capital income data by source of income AISWA (unpublished(1)) was analysed to determine the total amount and proportion of capital contributions made by parents and the community to WA Independent Schools.

1.3.3 Identifying the Benefits of Independent Schools' Enhanced Education Outcomes

Desktop research was undertaken to review academic studies, reports and the latest industry discourse on the enhanced educational outcomes provided by Independent Schools. This included a review of the academic benefits as well as the vocational, social and interpersonal development of students. It also examined AISWA school programs focusing on teacher quality and the provision of education services by Independent Schools' in servicing the full spectrum of Australian society.

The enhanced educational outcomes provided by Independent Schools have a beneficial economic impact for WA. Estimates of the benefits Independent Schools provide to WA GSP are estimated using the difference in PISA scores between Australian Independent Schools and state schools and research identifying a relationship between education performance and economic growth (using PISA scores).

2. CONTRIBUTION TO WA'S ECONOMY

This chapter describes the economic contribution of Independent Schools to the WA economy.[1] It includes estimates of direct and flow-on contributions to other industries where relevant. The approach used in identifying the economic contribution, and measures used, are detailed in Appendix A.

2.1 DIRECT CONTRIBUTION OF INDEPENDENT SCHOOLS TO WA

Independent Schools directly contributed to the WA economy through their provision of education services to more than 70,200 full time equivalent (FTE) students in 2018. In providing these services, Independent Schools:

- Undertook operating activities and expenditure, including:
    - Employing staff, such as teaching staff, administrative/ clerical staff, and operations and maintenance staff.
    - Generating turnover (or revenue), including revenue from student fees and charges, income from excursions/ trips, and private and government grants and funding.
    - Purchasing goods and services for operational activities, for example on education/ class materials, and building and grounds maintenance.
- Made capital purchases and expended money directly on items such as land acquisition, building/ facility construction and other capital purchases.

Independent Schools also contribute to the WA economy through the attraction of fee-paying overseas school students. These students would otherwise not be expected to live in WA during the course of their studies.

In addition to overseas students, domestic boarding students also contribute to the local economies in which they are staying. However, the activity of domestic boarders has been excluded as boarding students with a usual place of residence elsewhere in WA represent a transfer of activity from one WA locality to another, rather than generating an overall increase in economic activity in WA. Living expenses of interstate boarding students does provide an increase in WA's economic activity that would not otherwise occur, however, there was insufficient data available to identify the total number and expenditure of interstate boarders. Interstate boarders have therefore been excluded from the assessment. The effect of this exclusion will be to underestimate the value of Independent Schools to WA, but this is expected to be relatively modest.

Estimates of the direct economic activity associated with operational activities and capital expenditure of Independent Schools, as well as overseas student expenditure, are outlined below. Note that all data for Independent Schools provided are for the 2018 calendar year. However, the Input-Output models and other data used are compiled and presented by financial years. While it is acknowledged there is a discrepancy in data sets, Independent Schools data was assessed and compared against 2017-18 economic data, and has been reported as reflecting the economic contribution of Independent Schools in 2017-18 throughout the report.

Operational Activities

In 2017-18 Independent Schools generated approximately $1.45 billion in turnover (similar to industry output – see Appendix B for a description) and spent approximately $292.6 million on goods and services for operational activities. Subtracting Independent Schools' operational expenditure from turnover provides an estimate of the value Independent Schools' operational activities added to the WA economy in 2017-18. This equates to a direct contribution of approximately $1.15 billion to WA's Gross State Product (GSP).

[1] The estimates presented are likely an underestimate of the total contribution of Independent Schools as the financial data provided does not include Independent School revenue and expenditure derived through some avenues, for example study tours. Living expenses of interstate boarding students within the WA economy was also unable to be estimated due to insufficient data.

Independent Schools employed 8,846.3 FTE staff in 2017-18 comprised of:

- 156.3 FTE principals.
- 282.7 FTE specialist support staff.
- 5,434.4 FTE general teaching staff.
- 2,446.6 FTE administrative/ clerical services staff.
- 526.3 FTE building operations and maintenance staff.

Staff at Independent Schools were paid a total of around $943.7 million in wages, salaries and other compensation in 2017-18. This equates to expenditure on salary and wages of approximately $106,700 per FTE employee. As the majority of this expenditure was on teaching staff it highlights the sector's focus on the provision of high quality educators.

Capital Expenditure

Independent Schools spent $182.3 million on capital expenditure in 2017-18, including $142.6 million for land and buildings works/ acquisitions and $39.6 million in purchases of other capital items. Capital expenditure was allocated to relevant Input-Output transaction tables as outlined in Table 2.1. Whilst this is expected to vary year to year, it is provided as an indicative estimate for this study.

Table 2.1. Capital Expenditure of Independent Schools by Industry, 2017-18

Expenditure Item/ IO Industry	% of Expenditure Item	Estimated Capital Expenditure ($M)
Land and Building Capital Expenditure		
Non-Residential Building Construction	70%	$99.8
Heavy and Civil Engineering Construction	30%	$42.8
Other Capital Expenditure		
Wholesale Trade	100%	$39.6
Total	**-**	**$182.3**

Note: Total may not sum due to rounding.
Sources: AISWA (unpublished(1)), AEC.

In estimating the direct economic contribution of this capital expenditure, standard Input-Output production functions for the industries outlined in Table 2.1 were assumed, using a WA transaction table developed as outlined in Appendix A. Based on these production functions, Independent Schools' capital expenditure is estimated to have directly generated the following economic activity for WA businesses in 2017-18:

- $66.8 million in GSP.
- $36.3 million in incomes.
- 238.5 FTE jobs.

Overseas Student Expenditure

Independent Schools attract international students to study in WA in a range of individual or group programs. Independent Schools received $10.4 million in revenues from overseas students in 2017-18, through student fees and charges as well as for boarding. Overseas students also spend money in the broader WA economy (i.e. outside of expenditure for school tuition and boarding).

Information identifying the expenditure of overseas students in the broader WA economy is not available. In order to develop an indicative estimate of their expenditure on goods and services, data from the ABS (2019e) regarding expenditure of international school students on tuition fees compared to goods and services was used. This data indicates around 55 percent to 60 percent of overseas school student expenditure between 2000-01 and 2018-19 was on goods and services, compared to 40 percent to 45 percent on tuition fees.

The above estimates include overseas students at all education services, not just Independent Schools. For the purposes of this assessment approximately 50 percent of overseas Independent School student expenditure has

been assumed to be for tuition fees and boarding (with the remainder on goods and services) to account for higher fees at Independent Schools compared with public schools. This equates to a conservative estimate of the Independent School overseas student expenditure on goods and services, other than tuition and boarding, in the WA economy of $10.4 million in 2017-18. Expenditure of overseas students on tuition and boarding is not included in this section as this represents revenue of Independent Schools and is therefore already captured within the operational activity of Independent Schools estimated above.

To allocate expenditure on goods and services to Input-Output industries, allocations of average expenditure from the most recent household expenditure survey (ABS, 2017b) were used and allocated to their most relevant Input-Output industry. Expenditure on education and housing costs were excluded, as this expenditure is already accounted for in tuition fees and boarding. A summary of expenditure by overseas students is presented in Table 2.2.

Table 2.2. Expenditure on Goods and Services by Independent School Overseas Students, 2017-18

IO Industry	% of Expenditure Item	Estimated Expenditure ($M)
Retail trade	48.9%	$5.1
Accommodation	0.1%	$0.0
Food and Beverage Services	7.6%	$0.8
Road Transport	0.6%	$0.1
Rail Transport	0.1%	$0.0
Water, Pipeline and Other Transport	0.1%	$0.0
Air and Space Transport	0.4%	$0.0
Postal and Courier Pick-up and Delivery Service	0.1%	$0.0
Motion Picture and Sound Recording	0.2%	$0.0
Broadcasting (except Internet)	0.4%	$0.0
Internet Services and Data Processing	0.8%	$0.1
Telecommunication Services	3.2%	$0.3
Finance	0.2%	$0.0
Auxiliary Finance and Insurance Services	17.5%	$1.8
Insurance and Superannuation Funds	0.1%	$0.0
Rental and Hiring Services (except Real Estate)	1.5%	$0.2
Non-residential Property Operators and Real Estate Services	0.2%	$0.0
Professional, Scientific and Technical Services	1.3%	$0.1
Building Cleaning, Pest Control and Other Support Services	0.6%	$0.1
Public Administration and Regulatory Services	5.5%	$0.6
Health Care Services	3.2%	$0.3
Heritage, Creative and Performing Arts	0.6%	$0.1
Sports and Recreation	1.6%	$0.2
Gambling	0.6%	$0.1
Automotive Repair and Maintenance	1.9%	$0.2
Other Repair and Maintenance	0.5%	$0.1
Personal Services	1.9%	$0.2
Other Services	0.2%	$0.0
Total	**100.0%**	**$10.4**

Sources: ABS (2019e), ABS (2017b), AISWA (unpublished(1)), AEC.

In estimating the direct economic contribution of this expenditure on goods and services by overseas students, standard Input-Output production functions for the industries outlined in Table 2.2 were assumed, using a WA transaction table developed as outlined in Appendix A.

Based on these production functions, expenditure on goods and services by Independent School overseas students is estimated to have directly generated the following economic activity for WA businesses in 2017-18:

- $5.4 million in GSP.
- $3.4 million in incomes.
- 56.4 FTE jobs.

Summary of Direct Contribution of Independent Schools to WA

A summary of the direct economic contribution of Independent Schools to the WA economy in 2017-18 is presented in Table 2.3. In total, Independent Schools directly contributed approximately $1.225 billion to WA GSP.

Importantly, Independent Schools are largely a labour driven service provider, directly supporting 9,141.2 FTE jobs in 2017-18. More than 75 percent of total operational expenditure by Independent Schools in 2017-18 was spent on staff wages and salaries ($943.7 million), with a further $39.7 million in incomes delivered through capital expenditure and expenditure of overseas students. These incomes represented more than 80 percent of Independent Schools' total direct contribution to GSP. This is indicative of the important role Independent Schools play in providing jobs for Western Australians.

Table 2.3. Direct Contribution of Independent Schools to WA, 2017-18

Economic Contribution	Gross State Product ($M)	Incomes ($M)	Employment (FTEs)
Operational Activity	$1,153.2	$943.7	8,846.3
Capital Expenditure	$66.8	$36.3	238.5
Overseas Student Expenditure	$5.4	$3.4	56.4
Total Direct Contribution	**$1,225.4**	**$983.4**	**9,141.2**

Note: Total may not sum due to rounding.
Sources: ABS (2020a; 2019a; 2019b; 2019c; 2019d; 2019e), ABS (2017a; 2017b), ABS (2012), ABS (2007), DoESSFB (2019), AISWA (unpublished(1)), AISWA (unpublished(2)), AEC.

2.2 FLOW-ON CONTRIBUTION OF INDEPENDENT SCHOOLS TO WA

The flow-on (or indirect) contribution of Independent Schools to WA has been estimated using Input-Output models, as outlined in Appendix A. In undertaking the modelling, direct operational activity, capital expenditure and expenditure on goods and services by overseas students outlined in section 2.1 was allocated to relevant industries in the Input-Output model:

- For operational activity, this process is based on estimating the inter-industry purchases of goods and services by Independent Schools, which was done using financial data for Independent Schools (AISWA, unpublished(1)) broken down to 114 Input-Output industries using the structure for the 'Primary and Secondary Education Services (incl Pre-Schools and Special Schools)' industry.
- For capital expenditure and expenditure on goods and services by overseas students, standard industry purchasing patterns were applied for expenditure by industry outlined in Table 2.1 and Table 2.2.

The above process provides the multipliers used for estimating Type I flow-on activity (or production induced impacts). Financial data for Independent Schools (AISWA, unpublished(1)) was also used to estimate the total purchases of Independent School services by households. This is used in developing multipliers for estimating Type II flow-on activity (or household consumption induced impacts). Refer to Appendix B for additional descriptions of Type I (i.e. production induced) and Type II (i.e. consumption induced) flow-on impacts.

In total, Independent Schools are estimated to have contributed approximately $1.65 billion to WA GSP through flow-on activity in 2017-18, including both production induced (type I) and consumption induced (type II) impacts (Table 2.4). Flow-on activity supported over 9,400 FTE jobs in WA in 2017-18, paying more than $750 million in wages, salaries and other employee compensation for the year.

Table 2.4. Estimated Flow-On Contribution of Independent Schools to WA, 2017-18

Economic Contribution	Gross State Product ($M)	Incomes ($M)	Employment (FTEs)
Production Induced Contribution	$237.1	$136.9	1,491.0
Consumption Induced Contribution	$1,408.5	$614.4	7,937.2
Total Flow-On Contribution	**$1,645.6**	**$751.4**	**9,428.1**

Note: Total may not sum due to rounding.
Sources: ABS (2020a; 2019a; 2019b; 2019c; 2019d; 2019e), ABS (2017a; 2017b), ABS (2012), ABS (2007), DoESSFB (2019), AISWA (unpublished(1)), AISWA (unpublished(2)), AEC.

2.3 TOTAL CONTRIBUTION OF INDEPENDENT SCHOOLS TO WA

Including direct and flow-on activity, Independent Schools are estimated to have contributed almost $2.9 billion to WA GSP in 2017-18, representing 1.1 percent of the total contribution to WA GSP by all industries for the year[2]. For every dollar of gross product directly produced by Independent Schools (through operational activity, capital expenditure and overseas student expenditure), an additional $1.34 is produced elsewhere in the WA economy through supply chain and household consumption impacts.

Activities of Independent Schools also supported nearly 18,600 FTE jobs in 2017-18, including direct and flow-on activity, paying a total of $1.73 billion in total employee compensation. This equated to 1.6 percent of total jobs and total employee compensation in WA in 2017-18. Jobs in WA Independent Schools are predominantly highly skilled, service sector positions as indicated by the higher percentage of wages than employees in WA. More than 75 percent of operating expenditure at Independent Schools is allocated to staff salaries.

Table 2.5. Estimated Direct and Flow-On Contribution of Independent Schools to WA, 2017-18

Value of Economic Contribution	Gross State Product ($M)	Incomes ($M)	Employment (FTEs)
Direct Contribution	$1,225.4	$983.4	9,141.2
Production Induced Contribution	$237.1	$136.9	1,491.0
Consumption Induced Contribution	$1,408.5	$614.4	7,937.2
Total Contribution	**$2,871.1**	**$1,734.7**	**18,569.3**
Percent of WA Total Economy	**Gross State Product (%)**	**Incomes (%)**	**Employment (%)**
Direct Contribution	0.5%	0.9%	0.8%
Production Induced Contribution	0.1%	0.1%	0.1%
Consumption Induced Contribution	0.6%	0.6%	0.7%
Total Contribution	**1.1%**	**1.6%**	**1.6%**

Note: Total may not sum due to rounding.
Sources: ABS (2020a; 2019a; 2019b; 2019c; 2019d; 2019e), ABS (2017a; 2017b), ABS (2012), ABS (2007), DoESSFB (2019), AISWA (unpublished(1)), AISWA (unpublished(2)), AEC.

2.4 REGIONAL CONTRIBUTION OF INDEPENDENT SCHOOLS

Independent Schools are key contributors to many of the largest local and regional economies in WA, providing high quality education options in many of the most populous areas of WA. They are also key education providers to some of WA's indigenous and remote communities. The contribution of Independent Schools in some regions is greater proportionally than to WA as a whole.

The majority of WA Independent Schools are located in the Greater Perth region[3], where the vast majority of the State's economic activity occurs. Approximately 80 percent of Independent School students in 2018 were enrolled at Independent Schools in Greater Perth, and these schools contributed more than 80 percent of total Independent

[2] Total industry contribution to WA GSP in 2017-18 was $249.66 billion. An additional $8.46 billion in GSP was contributed through taxes less subsidies on final demand (e.g. demand by households) rather than production by industry. Only the industry contribution to GSP has been examined in the economic contribution assessment.

[3] For the purposes of this study, regions have been defined based on Australian Bureau of Statistics Statistical Divisions using aggregates of local government areas (ABS, 2011). The Greater Perth region has been defined as encompassing the same geography as the Perth Statistical Division.

Schools economic activity within WA in 2017-18. Including direct and flow-on activity, Independent Schools contributed:

- $2.44 billion to Greater Perth Gross Regional Product (GRP) (1.6 percent of total Greater Perth GRP for the year).
- $1.47 billion in incomes (or 2.0 percent of total Greater Perth).
- Approximately 15,600 FTE jobs (or 1.8 percent of total Greater Perth employment) in 2017-18.

Three LGAs within Greater Perth recorded a contribution to GRP, incomes and employment from Independent Schools of around 20 percent or more in 2017-18 (Claremont, Mosman Park and Peppermint Grove). The LGAs of Armadale and South Perth recorded over five percent contributions by Independent Schools to these economic measures, the LGAs of Joondalup, Mundaring, Serpentine-Jarrahdale, Stirling and Wanneroo recorded contributions of approximately three percent or more, while the LGAs of Gosnells, Kalamunda, Kwinana, Melville, Rockingham and Swan all recorded contributions of approximately 1.5 percent or more.

Independent Schools are also important contributors to regional WA, contributing $434.8 million (or 0.4 percent) to regional WA GRP, $261.6 million (or 0.9 percent) to incomes, and approximately 3,000 FTE jobs (or 1.0 percent of total employment). Outside of Greater Perth, the most significant contributions of Independent Schools were in the:

- South West region, where Independent Schools contributed $255.6 million (or 1.4 percent) of GRP, $150.9 million (or 1.8 percent) of incomes, and approximately 1,700 FTE employees (or 1.6 percent of employment). The contribution of Independent Schools within the South West region was strongest in the LGAs of Busselton, Capel and Mandurah.
- Lower Great Southern region, where Independent Schools contributed $73.2 million (or 1.8 percent) of GRP, $43.0 million (or 2.2 percent) of incomes, and approximately 500 FTE employees (or 2.0 percent of employment). The contribution of independents schools within the Lower Great Southern region was strongest in Albany LGA.

2.5 COMPARISON WITH OTHER INDUSTRIES

Economic modelling presented in the sections above highlights the important contribution WA's Independent Schools make to the state economy. The significance of this contribution to the WA economy can best be outlined through comparisons with other, recognisable WA industries.

The following sections present comparisons of the direct contribution Independent Schools make to the WA economy against other industries modelled within the significance model developed for this project.[4] This section only presents the **direct** contribution of Independent Schools compared to the **direct** contribution of other industries. Flow-on contributions cannot be presented as this would introduce double counting across WA economic activity (as flow-on contributions of Independent Schools represent direct activity of the industries it purchases from, and vice versa).

While a total of 115 industries were modelled, including WA Independent Schools, the figures below present comparisons between Independent Schools and a selection of 24 other industries (to provide 25 in total). This was done in order to provide a meaningful and manageable presentation of data. The industries selected provide a cross section ranging in size from some of the largest contributors to the WA economy to some of the smallest.

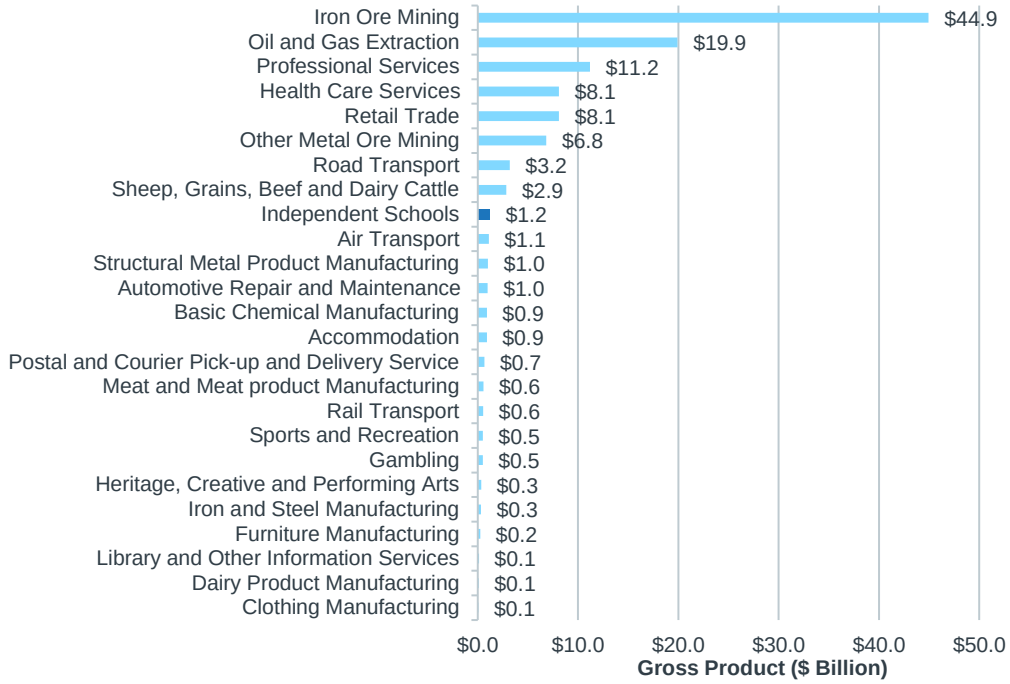
2.5.1 Gross State Product

Total GSP in WA was $258.1 billion in 2017-18, of which $249.66 billion was contributed by WA industries (with the remainder comprising taxes less subsidies on final demand rather than production by industry). Of this, Independent Schools directly contributed approximately $1.225 billion. This was greater than the contribution of key WA industries such as the air transport industry, the structural metal product manufacturing industry, the

[4] A total of 115 industries were modelled – the 114 industries classified in the Input-Output transaction table produced by the ABS (2020) plus Independent Schools. Additional details are provided in in Appendix A.

automotive repair and maintenance industry, the basic chemical manufacturing industry, and the accommodation industry (including all hotels, motels, serviced apartments, caravan parks and other accommodation establishments). Overall, Independent Schools ranked 38th of the 115 industries modelled in terms of contribution to GSP.

Figure 2.1. Direct Contribution of Select Industries to Gross State Product, 2017-18 ($ Billion)

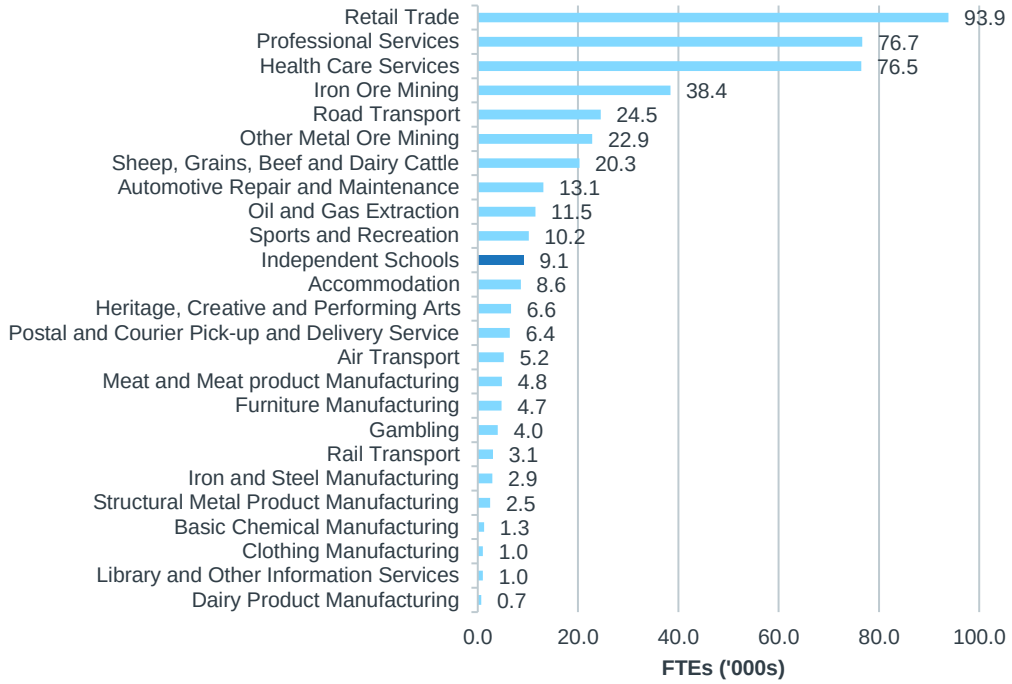


Sources: ABS (2020a; 2019a; 2019b; 2019c; 2019d; 2019e), ABS (2017a; 2017b), ABS (2012), ABS (2007), DoESSFB (2019), AISWA (unpublished(1)), AISWA (unpublished(2)), AEC.

2.5.2 Employment

There were approximately 1.12 million FTE workers in WA in 2017-18, of which 9,141 were employed directly as a result of the operational activities and capital works or Independent Schools, or through expenditure of overseas students studying at Independent Schools. Independent Schools were the 29th largest contributor overall to WA jobs of the 115 industries modelled, employing more people than WA's accommodation industry, heritage, creative and performing arts industry, postal and courier delivery services industry, and the air transport industry.

Figure 2.2. Direct Contribution of Select Industries to Employment, 2017-18 ('000 FTEs)

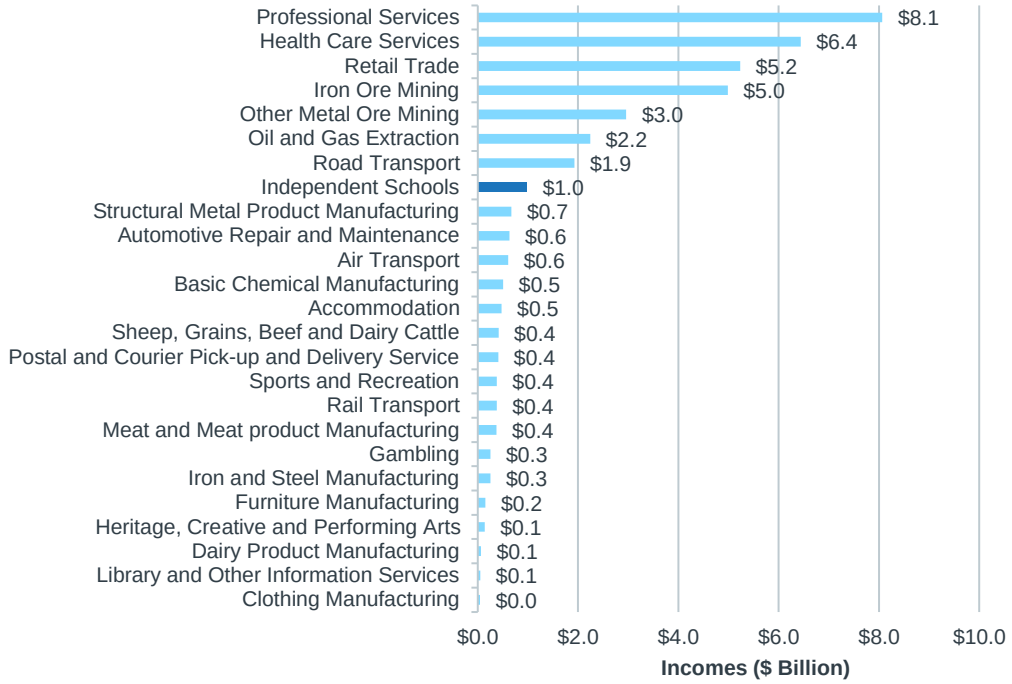


Sources: ABS (2020a; 2019a; 2019b; 2019c; 2019d; 2019e), ABS (2017a; 2017b), ABS (2012), ABS (2007), DoESSFB (2019), AISWA (unpublished(1)), AISWA (unpublished(2)), AEC.

2.5.3 Employee Incomes

Independent Schools contributed approximately $1.2 billion in incomes to WA workers in 2017-18, ranking the industry as the 24th largest contributor overall to WA employee incomes of the 115 industries modelled. Independent Schools provided more incomes to Western Australians than industries such as structural metal product manufacturing, automotive repair and maintenance, air transport, basic chemical manufacturing and accommodation.

Figure 2.3. Direct Contribution of Select Industries to Employee Incomes, 2017-18 ($ Billion)



Sources: ABS (2020a; 2019a; 2019b; 2019c; 2019d; 2019e), ABS (2017a; 2017b), ABS (2012), ABS (2007), DoESSFB (2019), AISWA (unpublished(1)), AISWA (unpublished(2)), AEC.

3. SAVINGS TO GOVERNMENTS AND TAX PAYERS

This chapter provides an indicative estimate of the savings Independent Schools deliver to WA and federal governments, and therefore tax payers, as a result of the education services they provide to WA students.

Students at Independent Schools are entitled to a place at a government school, however, all Independent Schools in WA receive a lower rate of government funding per student than government schools. By providing tuition to Independent School students who would otherwise be enrolled in a government school, Independent Schools deliver direct savings to governments, and therefore tax payers.

In estimating the savings generated by Independent Schools, two categories have been examined:

- Cost savings in terms of recurrent education costs, including expenditure on user costs of capital (which effectively refers to the cost for accessing capital assets, and can be considered to encompass the ongoing maintenance and upkeep of school assets).
- Cost savings in terms of contributions made by parents to capital infrastructure and improvements.

3.1 RECURRENT EDUCATION COSTS

In estimating the recurrent education cost savings delivered by Independent Schools, Productivity Commission (2020) data was used detailing the average recurrent costs to the Commonwealth and WA Governments (including user costs of capital) per government school student. The data indicates approximately $19,406 in government funding per government school student in WA in 2017-18, with $17,139 in funding per primary school student and $21,023 per secondary school student.

Data from the National Schools Statistics Collection (2018 Commonwealth August Collection) (AISWA, unpublished(2)) indicates there were 70,201 FTE school students at Independent Schools in 2018, of which 35,653 were primary school students and 34,548 were secondary school students. Applying the above average government expenditure per government primary and secondary school student provides an estimate in government funding required for recurrent education if Independent School students were enrolled in government schools of $1.34 billion for the year.

By comparison, Independent Schools received an estimated $675.4 million in combined Commonwealth and WA Government funding for recurrent education expenses in 2017-18 (AISWA, unpublished(1)). This equates to a difference of $661.9 million in government funding received by Independent Schools for recurrent education expenses compared to what governments would pay if Independent School students were enrolled in government schools or more than $9,400 per student educated through the Independent School system. This is indicative of the savings to tax payers provided by Independent Schools in terms of recurrent education costs.

3.2 CAPITAL EXPENDITURE

Independent Schools provide education facilities and infrastructure that are primarily paid for through private contributions, reducing the overall tax burden on WA households that would otherwise be incurred if all school infrastructure was required to be paid for in full by public funds from the WA and Australian Governments.

Financial data from AISWA (unpublished(2)) indicates that in 2018 approximately $122.1 million was contributed by parents of WA Independent School children and the community to fund capital infrastructure and improvements. This is representative of the savings to WA and Australian Governments resulting from private funding for the provision of Independent Schools.

3.3 SUMMARY OF SAVINGS TO GOVERNMENTS AND TAX PAYERS

Independent Schools are estimated to have saved tax payers a total of $784.0 million in 2017-18, through a combination of savings of $661.9 million in recurrent education costs and $122.1 million in capital costs.

4. THE ECONOMIC VALUE OF ENHANCED EDUCATION OUTCOMES

Research by the OECD (2010) indicates that the enhanced educational outcomes provided by Independent Schools can be linked to a contribution to growth in WA GSP of around $181.1 million in 2017-18 (see Appendix C). This economic benefit is estimated to be provided annually by the enhanced education outcomes delivered by Independent Schools.

The quality of learning and teaching provided by WA Independent Schools support students in achieving excellent outcomes across a range of educational measures:

- Students attending Independent Schools are estimated to have contributed to an increase of approximately four points in the mean PISA test score for the WA's overall student body in 2018. Whilst this is only an indicative estimate, based on national data from ACER (2019) (see section 4.1 below for more details), it is reflective of the enhanced education outcomes supported by Independent Schools.
- Australian Independent Schools recorded a mean PISA test score of 536 for each of reading literacy and scientific literacy, and 524 for mathematical literacy (ACER, 2019). These scores were well above the overall mean PISA test scores for all Australian schools, as well as the OECD average (see Table 4.1).
- Comparing to other countries, only school students in B-S-J-Z (China) and Singapore recorded higher mean PISA scores for reading literacy than Australia's Independent Schools. Only those same countries plus Macao (China) scored higher for scientific literacy, while only seven countries scored higher mathematical literacy scores (ACER, 2019).
- In 2019, 20 of the top 50 (40 percent) median Australian Tertiary Admission Rank (ATAR) scores for WA schools were achieved by Independent Schools (WA SCSA, 2020). The ATAR is an assessment used to rank school-leaving university applicants.
- Independent Schools accounted for 28 of the top 50 (56 percent) schools in proportion of eligible students that achieved the Western Australian Certificate of Education (WACE) in 2019 (WA SCSA, 2020).

Table 4.1. PISA Scores, Australian Independent Schools versus Australian and OECD Means, 2018

PISA Scores	Reading	Mathematics	Science
Australian Independent Schools Mean	536	524	536
Australian Schools Mean	503	491	503
OECD Schools Mean	487	489	489

Source: ACER (2019).

4.1 CONTRIBUTION TO ECONOMIC GROWTH

Education is a fundamental building block for economic growth. It empowers new generations to build upon the collective knowledge, infrastructure and technology of society, and advance economies and communities through new and innovative practices.

The contribution Independent Schools make to WA's economic growth through enhanced education outcomes was estimated based on research by the OECD (2010), which found a causal relationship between academic performance and economic growth (using standardised PISA test scores[5] against economic performance over 40 years across 23 OECD countries), and results of the 2018 PISA scores (ACER, 2019) for Australian Independent Schools compared to Australian state schools[6]. The approach (and findings) to estimating economic growth is presented in Appendix C.

[5] PISA tests 15-years olds on Reading, Mathematics and Science.

[6] Assuming the difference between national Independent Schools and state schools PISA scores applies to WA.

Without Independent Schools, it can be indicatively estimated that WA's mean PISA score would have been 4.03 points lower than that recorded in 2018. Based on the OECD's findings, this would have equated to a reduction in WA growth of approximately 0.07 percentage points, which is equivalent to approximately $181.1 million in GSP for 2017-18. Whilst this is only an indicative estimate, based on national data from ACER (2019) and OECD research regarding links between PISA scores and economic growth (see Appendix C for more details), it is reflective of the enhanced education outcomes supported by Independent Schools.

This economic benefit is estimated to be provided annually by the enhanced education outcomes delivered by Independent Schools. They also deliver legacy benefits with the increased activity and productivity delivered by enhanced education outcomes being carried forward to subsequent years.

4.2 MEASURES OF ACHIEVEMENT

Western Australia's Independent Schools cater for a diversity of students from a range of backgrounds. Whilst variations in academic performance generally relate to individual student characteristics as well as the characteristics of schools and school systems, schools with a high degree of autonomy, such as Independent Schools, generally have been shown to achieve higher levels of performance in academic outcomes, even after adjusting for students' socio-economic background.

At a national level, results of the 2018 PISA scores (ACER, 2019) show that students from Australian Independent Schools on average recorded higher PISA scores than students from Australian state schools in each category (reading, mathematics and science), by an average score of around 48 points. Adjusting for socio-economic background, Australian Independent Schools still outperformed state schools by around 24 points on average across reading, mathematics and science (see Table 4.2).

Table 4.2. Difference in PISA Scores, Australian Independent Schools versus State Schools, 2018

PISA Scores	Reading	Mathematics	Science	Average
Base Scores	49	47	47	48
Adjusted for Socio-Economic Background	23	25	23	24

Source: ACER (2019).

While 2018 PISA results for Western Australian Independent Schools relative to other schools were not available, the results achieved by students within Independent Schools in WA in other measures provides strong evidence of the quality teaching and learning provided by Independent Schools. For example, Year 12 Independent School students had high performances in the following:

- The Australian Tertiary Admission Rank (ATAR) is an assessment used to rank school-leaving university applicants. In 2019, 20 of the top 50 (40 percent) median ATAR scores were achieved by Independent Schools (WA SCSA, 2020).
- 25,783 Year 12 WA students took courses toward a Western Australian Certificate of Education (WACE) in 2019 (WA SCSA, 2020). In 2019, Independent Schools accounted for 28 of the top 50 (56 percent) schools in proportion of eligible students that achieved the WACE.

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APPENDIX A: SIGNIFICANCE ASSESSMENT METHODOLOGY

The economic significance estimates in this report are produced using Input-Output transaction tables and models developed by AEC for the purposes of this assessment, combined with data from a range of sources, including State and National Accounts data, other industry data from the ABS, and data on AISWA member schools from AISWA. The Input-Output models were used to produce estimates of the direct and flow-on contribution of AISWA schools to the WA economy, WA LGAs, and WA State and Federal Electorate economies in terms of output, gross product, employment and income (i.e., wages and salaries).

OVERVIEW OF IO MODELLING

Input-Output (IO) analysis demonstrates inter-industry relationships within an economy, depicting how the output of one industry is purchased by other industries, households, the government and external parties (i.e. exports), as well as expenditure on other factors of production such as labour, capital and imports. IO analysis shows the direct and indirect (flow-on) effects of one industry on other industries and the general economy. As such, IO modelling can be used to demonstrate the economic contribution of an industry on the overall economy and how much the economy relies on this industry or to examine a change in final demand of any one industry and the resultant change in activity of its supporting industries.

SIGNIFICANCE ASSESSMENT VERSUS IMPACT ASSESSMENT

The framework employed in significance assessment **differs from that employed in traditional economic impact analysis** in that economic significance assessment primarily seeks the contribution of an existing industry as opposed to the impact of a "stimulus" (or expansion) in a particular industry or in several industries (West, 1993). The usual approach of comparing what the economy would be with and without the industries whose contributions are to be assessed does not work because the inter-relationship between industries means whether or not the industries to be assessed exist, there will still be demand for their outputs (e.g., a complete vehicle needs tyres so that whether or not the entire tyre manufacturer is closed down, the car manufacturer's demand for tyres still exists). From a modelling stance, this problem is solved by assuming that demand for outputs of the industries to be assessed will instead be met by imports.

MODEL DEVELOPMENT

The models used in this assessment are derived from sub-regional transaction tables developed specifically for this project. The process of developing a sub-regional transaction table involves developing regional estimates of gross production and purchasing patterns based on a parent table, in this case the 2017-18 Australian transaction table (ABS, 2020).

Indicative estimates of gross production (by industry) in the study areas (WA, each LGA and each State and Federal Electorate) were developed based on the percent contribution to employment (by place of work) of the study areas to the Australian economy for the base model year of 2017-18. This is based on AEC's annual employment estimates by industry by small area (AEC, unpublished(1)) applied to Australian gross output identified in the 2017-18 Australian table. Modelled indicative estimates for 2017-18 activity in WA were then re-based to actual estimates of activity using a range of data sets, including:

- GRP from AEC's in-house estimates of GRP by small area (AEC, unpublished(2)), as well as Gross State Product and Gross Domestic Product (ABS, 2019a).
- 2017-18 employment by industry estimates from AEC's in-house employment by industry by small area model (AEC, unpublished(1)).

Additional details regarding AEC's in-house GRP and employment estimates models are provided in Appendix D.

Industry purchasing patterns within study areas were estimated using a process of cross industry location quotients and demand-supply pool production functions as described in West (1993). These were then adjusted based on

differences in industry value added activity per employee between the State/ region and Australia, as estimated using AEC's GRP and employment estimates models.

KEY ASSUMPTIONS AND LIMITATIONS OF IO MODELLING

The key assumptions and limitations of IO analysis include:

- **Lack of supply-side constraints**: The most significant limitation of economic impact analysis using IO multipliers is the implicit assumption that the economy has no supply-side constraints so the supply of each good is perfectly elastic. That is, it is assumed that extra output can be produced in one area without taking resources away from other activities, thus overstating economic impacts. The actual impact is likely to be dependent on the extent to which the economy is operating at or near capacity.
- **Fixed prices**: Constraints on the availability of inputs, such as skilled labour, require prices to act as a rationing device. In assessments using IO multipliers, where factors of production are assumed to be limitless, this rationing response is assumed not to occur. The system is in equilibrium at given prices, and prices are assumed to be unaffected by policy and any crowding out effects are not captured. This is not the case in an economic system subject to external influences.
- **Fixed ratios for intermediate inputs and production (linear production function)**: Economic impact analysis using IO multipliers implicitly assumes that there is a fixed input structure in each industry and fixed ratios for production. That is, the input function is generally assumed linear and homogenous of degree one (which implies constant returns to scale and no substitution between inputs). As such, impact analysis using IO multipliers can be seen to describe average effects, not marginal effects. For example, increased demand for a product is assumed to imply an equal increase in production for that product. In reality, however, it may be more efficient to increase imports or divert some exports to local consumption rather than increasing local production by the full amount. Further, it is assumed each commodity (or group of commodities) is supplied by a single industry or sector of production. This implies there is only one method used to produce each commodity and that each sector has only one primary output.
- **No allowance for economies of scope**: The total effect of carrying on several types of production is the sum of the separate effects. This rules out external economies and diseconomies and is known simply as the "additivity assumption". This generally does not reflect real world operations.
- **No allowance for purchasers' marginal responses to change**: Economic impact analysis using multipliers assumes that households consume goods and services in exact proportions to their initial budget shares. For example, the household budget share of some goods might increase as household income increases. This equally applies to industrial consumption of intermediate inputs and factors of production.
- **Absence of budget constraints**: Assessments of economic impacts using multipliers that consider consumption induced effects (type two multipliers) implicitly assume that household and government consumption is not subject to budget constraints.

Despite these limitations, IO techniques provide a solid approach for taking account of the inter-relationships between the various sectors of the economy in the short-term and provide useful insight into the quantum of final demand for goods and services, both directly and indirectly, likely to be generated by a project.

In addition to the general limitations of Input-Output analysis, there are two other factors that need to be considered when assessing the outputs of sub-regional transaction tables:

- It is assumed the sub-region has similar technology and demand/ consumption patterns as the parent (Australia) table (e.g. the ratio of employee compensation to employees for each industry is held constant).
- Intra-regional cross-industry purchasing patterns for a given sector vary from the national tables depending on the prominence of the sector in the regional economy compared to its input sectors. Typically, sectors that are more prominent in the region (compared to the national economy) will be assessed as purchasing a higher proportion of imports from input sectors than at the national level, and vice versa.

To assist in accounting for these limitations, AEC's approach has applied results from our internal GRP and employment models to the Input-Output models to more appropriately reflect the differences in production functions between the region examined and the national economy.

SIGNIFICANCE ASSESSMENT APPROACH

Contribution to WA

Input-Output tables utilise an aggregated system of industry classifications based on the ANZSIC system. In total, the 2017-18 Input-Output tables produced by the ABS (2020) define 114 distinct industries. In assessing the contribution of Independent Schools, the activities of Independent Schools were extracted from the relevant Input-Output aggregated industries.

In practical terms this is achieved in the model by splitting each of the 114 industries represented in the Input-Output transaction tables into an "Independent Schools" and "Non-Independent Schools" component based on financial and employment data provided by AISWA (unpublished(1) and unpublished(2)) on their operating activities and capital expenditure, and attributing these to their most relevant industry in the transaction tables. Assumptions regarding expenditure of overseas students were also developed and allocated to relevant industries. An overview of the aggregate expenditure and industry allocation is presented in section 2.1.

Once the transaction tables were complete, the significance models were developed through the development of coefficients as per West (1993). The significance assessment is undertaken for the 2017-18 financial year.

Data Consistency

Data provided regarding Independent School revenues, expenditure and employment are for the 2018 calendar year. However, the IO models and GSP data used are compiled and presented by financial years. While it is acknowledged there is a discrepancy in data sets, Independent Schools data was assessed and compared against 2017-18 economic data, and has been reported as reflecting the economic contribution of Independent Schools in 2017-18 throughout the report.

Contribution to WA's Regions

Regional allocation of the direct and flow-on effects is performed as follows.

1 Individual IO transaction tables and significance assessment models were developed for each LGA and State and Federal Electorate (as described in the 'Model Development' section of this Appendix). This approach produces regional estimates of direct and flow-on Independent School contributions assuming each region operates in isolation, and therefore does not account for any inter-regional flow-on relationships.

2 To account for inter-regional flows of demand for goods and services between regions, the difference between the total WA flow-on effects and the sum of flow-on effects for each region by industry (the "inter-regional" flow-on effects) has been redistributed to each region based on the proportion that each region contributes to total WA activity in each industry (i.e., if the Brisbane LGA accounts for 50% of total WA output in retail trade, then 50% of the inter-regional retail trade flow-on effects have been allocated to Brisbane LGA).

In undertaking modelling for State and Federal electorates, while expenditure and employment data was available and used from AISWA, other data required to undertake economic modelling for State and Federal Electoral divisions was not available from the Australian Bureau of Statistics. To undertake analysis for the State and Federal Electorates correspondence files (based on area) between State/ Federal Electorates and Statistical Area 2 (SA2) geographic boundaries from the Australian Bureau of Statistics were utilised to convert ABS data at the SA2 geography to State/ Federal Electorates. All estimates of Independent School activity at the State and Federal Electorate level are therefore subject to a softer confidence due to any inconsistencies introduced by transforming data using these correspondence files.

APPENDIX B: MEASURES USED IN MODELLING

The contribution of Independent Schools to the WA economy is estimated across the following three key measures:

- **Gross Product**: Refers to the value of all outputs of an industry, including taxes/ subsidies on its final products, after deducting the cost of goods and services inputs in the production process. Gross product (e.g., Gross State Product/ Gross Regional Product) defines a true net economic contribution of a State/ Region and is subsequently the preferred measure for assessing economic impacts.
- **Incomes**: Measures the level of wages and salaries paid to employees of each industry.
- **Employment**: Refers to the part-time and full-time employment positions supported by an industry, and is expressed in terms of full time equivalent (FTE) positions[7].

An additional measure is also referenced:

- **Industry output (or turnover)**: Refers to the total dollar value of all goods and services produced during the year, thereby including the costs of goods and services used in the development and provision of the final product. This measure overstates the true economic contribution of the industry as it double counts the value of material and services inputs used in the production of an industry's goods and services.

The economic contribution is measured in terms of:

- **Direct impacts**, which represents the economic activity of the Independent Schools themselves, as well as activity from their capital expenditure and from overseas student expenditure.
- **Flow-on impacts**, comprising:
    - **Production Induced (Type I)**, which represent the effects from direct expenditure on goods and services by Independent Schools and overseas students, as well as the second and subsequent round effects of increased purchases by suppliers in response to increased sales.
    - **Household Consumption Induced (Type II)**, which represent the consumption induced activity from household expenditure on goods and services resulting from wages and salaries being paid to Independent School employees and those within the Independent Schools' supply chain.

[7] Where one FTE equates to one person employed full time for a period of one year.

APPENDIX C: CONTRIBUTION TO ECONOMIC GROWTH

The enhanced educational outcomes provided by Independent Schools have economic impacts for WA. Estimates of the contribution to economic growth by Independent Schools in WA were developed using research findings from the OECD (2010) and differences in PISA scores that can be attributed to Independent Schools per data from ACER (2019).

The approach used is consistent with that used in estimating the contribution of WA's Independent Schools in 2014-15 (AEC, 2017), as well as that applied by Oxford Economics (2014) in their study of the contribution of Independent Schools to the British economy.

ACADEMIC PERFORMANCE AND ECONOMIC GROWTH

Research by the OECD (2010) found a relationship between academic performance and economic growth. The study, which examined standardised PISA test scores[8] against economic performance over 40 years across 23 OECD countries (including Australia), found that a one standard deviation increase in PISA scores (which equates to 100 points on the PISA scale) correlates with a 1.74 percentage point increase in GDP growth.

This relationship was used to identify the contribution of WA's Independent Schools to economic growth, by identifying the enhanced academic performance of Independent Schools compared to state schools.

DIFFERENCE IN PISA SCORES

Results of the 2018 PISA scores (ACER, 2019) show that students from Australian Independent Schools on average recorded higher PISA scores than students from Australian state schools in each category (reading, mathematics and science), by an average score of around 48 points.

However, it is important to recognise the effect that family and socio-economic background have on student performance. ACER present PISA scores accounting for variance in socio-economic background, and found Australian Independent Schools still outperformed state schools by around 24 points on average across reading, mathematics and science.

In estimating the benefit to economic growth derived from Independent Schools, the difference in PISA scores of 24 points has been used to ensure results are not influenced by variance in socio-economic background of students between Independent Schools and state schools.

Table C. 1. Difference in PISA Scores, Australian Independent Schools versus State Schools, 2018

PISA Scores	Reading	Mathematics	Science	Average
Base Scores	49	47	47	48
Adjusted for Socio-Economic Background	23	25	23	24

Source: ACER (2019).

In assessing the contribution of WA's Independent Schools to economic growth, the difference in PISA scores (accounting for socio-economic background) of 24 points between Australian Independent Schools and Australian state schools has been assumed to also apply in WA.

[8] PISA tests 15-years olds on Reading, Mathematics and Science.

OVERALL INCREASE IN WA PISA SCORE BY INDEPENDENT SCHOOLS

Without Independent Schools, it can be assumed the 70,201 students enrolled at Independent Schools would otherwise be educated in WA's state school system. Based on ACER (2019) findings, it can further be assumed that the PISA scores received by these students enrolled at Independent Schools in WA would otherwise be approximately 24 points lower on average if they were enrolled in state schools.

WA's Independent Schools account for an approximate share of 16.8 percent of WA's total student body. It can thereby be estimated that if WA's Independent School students were enrolled at state schools, it would result in 16.8 percent of WA's overall student body receiving a PISA score 24 points lower than was actually recorded in 2018 (or alternatively, by having Independent Schools, PISA scores received were 24 points higher than they would have otherwise been in 2018 for 16.8 percent of WA's overall student body).

Without Independent Schools, WA's mean PISA score across all students can therefore indicatively be estimated to have been 4.03 points lower than that recorded in 2018 (i.e., 24 points multiplied by 16.8 percent of WA's overall student body).

CONTRIBUTION TO ECONOMIC GROWTH

OECD's research findings regarding the change in economic growth of 1.74 percentage points for every 100 point increase on the PISA scale, combined with an estimated overall difference in WA's mean PISA score of 4.03 points as a result of Independent Schools, suggests that without Independent Schools WA's economic growth would be approximately 0.07 percentage points lower.

WA recorded Gross State Product of $258.1 billion in 2017-18 (ABS, 2019a). A reduction in economic growth of 0.07 percentage points is equivalent to approximately $181.1 million in GSP for 2017-18. This economic benefit is estimated to be provided annually by the enhanced education outcomes delivered by Independent Schools. Even if the enhanced outcome was half that indicatively estimated above, it would still represent a significant contribution to GSP each year.

Independent Schools also deliver legacy benefits with the increased activity and productivity delivered by enhanced education outcomes being carried forward to subsequent years.

APPENDIX D: AEC'S GRP AND EMPLOYMENT MODELS

Every year AEC produces annual estimates of Gross Regional Product and employment by industry for small areas across Australia (Statistical Area 2 (SA2) and Local Government Area (LGA)). This appendix provides an overview of the approach used in modelling GRP and employment by industry.

GROSS REGIONAL PRODUCT

Background

Gross Domestic Product (GDP) and Gross State Product (GSP) figures are produced on a regular basis and published by the Australian Bureau of Statistics and the relevant State and Territory Government departments. However, regular official estimates of production for sub-State regions do not exist (Gross Regional Product, GRP[9]).

The Australian Bureau of Statistics (ABS) use three approaches to calculate GDP/ GSP:

- **Value added approach (or Production approach)**: represents the difference between taking the market value of the goods and services produced by an industry (gross output) and deducting the cost of goods and services used up by the industry in the productive process (intermediate consumption);
- **Income approach**: calculates the cost of producing GRP by summing the incomes accruing from domestic production. These income components can be viewed as the market costs of production consisting of the compensation of employees (wages, salaries and supplements), provision for the consumption of fixed capital (depreciation), net operating surplus, and net indirect taxes; and
- **Expenditure approach**: sums all final expenditures (ignoring expenditure on intermediate consumption) on goods and services, add on the contribution of exports and deduct the value of imports. Final expenditures are known as final demand and include final consumption expenditure by households, gross fixed capital expenditure by producers (i.e. durable assets), investment stocks and exports to the rest of the world.

Due to data limitations it is not possible to calculate GRP using the same approach as national or State values. AEC estimates of GRP at factor cost use an indirect method to disaggregate official State GSP totals. As such, all GRP estimates will be subject to a combination of any errors in the State GSP estimates as well as those introduced by the methodology and data limitations used to allocate GSP to the constituent regions.

AEC Approach

AEC's GRP model utilises the ABS's national Input-Output (IO) transaction tables to develop GRP estimates by 114 industries for each LGA and SA2 in Australia for the latest IO release year at time of development (for the 2018-19 GRP estimates used in this study, the 2016-17 IO transaction tables were used (ABS, 2019b)). Development of LGA and SA2 estimates is based on AEC's IO model regionalisation process, as described in the "General Overview" of the "Model Development" section of Appendix A. The estimates are aggregated to the 19 industry classifications listed in ANZSIC, plus ownership of dwellings, and rebased to State Accounts estimates of value add by industry (ABS, 2019a).

Estimates of GRP for other years are developed based on industry growth in GVA at the State level, disaggregated to an LGA/ SA2 level primarily based on AEC's employment by industry estimates (described separately below). Key exceptions to this are:

[9] GRP at factor cost is that part of the cost of producing the gross regional product which consists of gross payments to factors of production (labour, land, capital and enterprise). It represents the value added by these factors in the process of production and is equivalent to gross regional product less indirect taxes plus subsidies.

- Agriculture, forestry and fishing, which is based on small area commodity production value data from the ABS (2019c).
- Ownership of dwellings, which uses data on the number of rented properties and average rental value for each small area based on Census of Population and Housing Data (ABS, 2017a).

Adjustments are also made to the mining industry to allocate a greater value per employee to where resources are located (versus office-based employment) based on occupation groupings.

EMPLOYMENT BY INDUSTRY

Background

Data outlining employment by industry by place of work (i.e. where the jobs are located) for small areas is only available every five years from the Census of Population and Housing. While other data sets exist providing more regular and up-to-date estimates of employment, these typically suffer from some combination of the following:

- Are not available for small areas.
- Are based on place of usual residence rather than place of work.
- Do not provide a breakdown of employment across industry.

Economic activity in a region is typically based on where jobs are located. To assist in providing more relevant and up-to-date statistics and analysis of economic activity at small regional levels, AEC has sought to address these data limitations by developing in-house estimates of annual employment by industry for LGA and SA2 geographies across Australia.

AEC Approach

AEC's approach to modelling employment by place of work uses 2006, 2011 and 2016 Census of Population and Housing employment by industry by place of work data as a starting point (ABS, 2007; ABS, 2012; ABS, 2017a). Modelling for other years is, in the first instance, undertaken at a Statistical Area 4 (SA4) geographic level using data from the ABS quarterly Labour Force Survey (LFS) (ABS, 2019d), using regression techniques to smooth this data. Smoothed estimates are converted from place of usual residence to place of work estimates using Census differences for each SA4 between place of usual residence and place of work in 2006, 2011 and 2016 (straight line change assumed). Annual changes in the LFS are then applied to Census place of work data for the SA4s.

Small area (SA2) data from the Census as well as Department of Employment, Small Business and Training (DoESSFB, 2019) is then used to assist in splitting SA4 estimates to constituent SA2s across years, based on Census year shares and annual total employment change by SA2.

All estimates are rebalanced to ensure internal consistency between SA2s, SA4s, States and Australian totals. Estimates by LGA are developed using correspondence files between SA2s and LGAs.

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