Examination of the value created by the advertising technology industry in Australia

September 2021

Report Prepared by PwC Australia
September 2021

Contents

1

Highlights

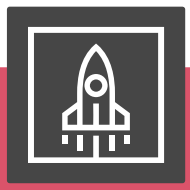
Highlights

Advertising technology provides benefits throughout Australia through its value across a wide supply chain. For the purposes of this report, the advertising technology industry includes any technology involved in connecting a buyer and a seller of online advertising inclusive of transaction, delivery and measurement. Google is a key provider of these products in the industry and facilitates a large portion of these benefits. These include the direct benefits to businesses generated through their use of Google's advertising technology, as well as the flow-on effects facilitated by improved productivity as a result of their use. We estimate that the current level of usage of Google's advertising technology platforms both ***directly*** and ***indirectly*** support:

The equivalent of **23,000** full-time jobs annually across the advertising technology supply chain[1]

Approximately **$2.9 billion** to GVA annually across the advertising technology supply chain[2]

Approximately **22%** of direct benefits supported by the advertising technology industry are realised in regional Australia[3]



Approximately **75%** of Google's advertising technology users are Australian small and medium sized enterprises[4]

72% of businesses report an observed difference between Google advertising technology and other platforms on the market[5]

Advertising technology annually boosts exports by **$1.1 billion** through stimulating economic activity across all industries[6]

The purpose of this report is to determine the economic benefits of advertising technology and Google on Australian businesses

This analysis incorporates the economic value of advertising technology in Australia and the contribution of Google's advertising technology platforms to Australian businesses.

Firstly, this report includes the definition of the advertising technology ecosystem. It also provides an estimate of the economic benefits of advertising technology to the Australian economy. Secondly, this report identifies Google's advertising technology platforms and includes an assessment of the direct and indirect (flow-on) economic benefits of the Google's advertising technology products to the Australian economy.

As such, the remainder of this report is organised in two parts:

- **Section 2** - provides background on the Australian advertising technology industry and details related to the shape of the advertising technology ecosystem for the purposes of this report. In defining and shaping the ecosystem, this section also provides an estimate of the value of the entire advertising technology industry in Australia.
- **Section 3** - includes a comprehensive economic analysis of the contribution of Google's advertising technology platforms to Australian businesses, as well as details about a survey of business decision-makers undertaken to develop personalised insights into the value of the technology.

Finally, Appendix A provides detailed information about the modelling approach taken to develop the economic contribution.

2

Advertising Technology Industry in Australia

Introduction

The recent rise of the advertising technology industry has facilitated substantial economic benefits to the Australian economy that is little understood. This is compounded by the fact that Google's role in the ecosystem is often seen to be neither fully understood nor appreciated. Advertising technology and Google's platforms have seen vast improvements in the delivery and success of advertising campaigns that have led to valuable economic benefits for Australian businesses and the wider economy.

Advertising technology services contribute to the Australian economy in several ways including the contribution to employment and creating business opportunities across the advertising technology supply chain.

Demand for online advertising services by Australian businesses has grown over the past five years as more Australians have been using search engines and other online services to browse and purchase goods and services.[7]

Using online advertising technologies facilitates innovation across businesses of different sizes and locations, and supports productivity and long-term economic growth across the Australian economy. Small and medium-sized enterprises (SMEs) and start-ups can take advantage of online advertising technologies to stay competitive and grow their businesses.

In addition to direct employment and economic activity impacts, using online advertising technologies will stimulate employment indirectly from the backwards linkages through the supply chain and through the flow-on impacts on the economy of additional wages, salaries and employment.

The impact of Google and advertising technology more broadly on consumers has been well documented, yet little analysis has been undertaken regarding its effects on businesses.[8] This report addresses this by identifying and providing estimates for both the direct and indirect benefits of Google's advertising technology platforms to Australian businesses.

The advertising technology industry consists of many constituent technologies

Having researched the advertising technology industry in Australia, and constituent parts therein, it is evident that this is a highly dynamic ecosystem, with a wide range of entities offering services throughout its value chain. In its entirety, we consider the advertising technology industry to consist of the following constituent technologies:

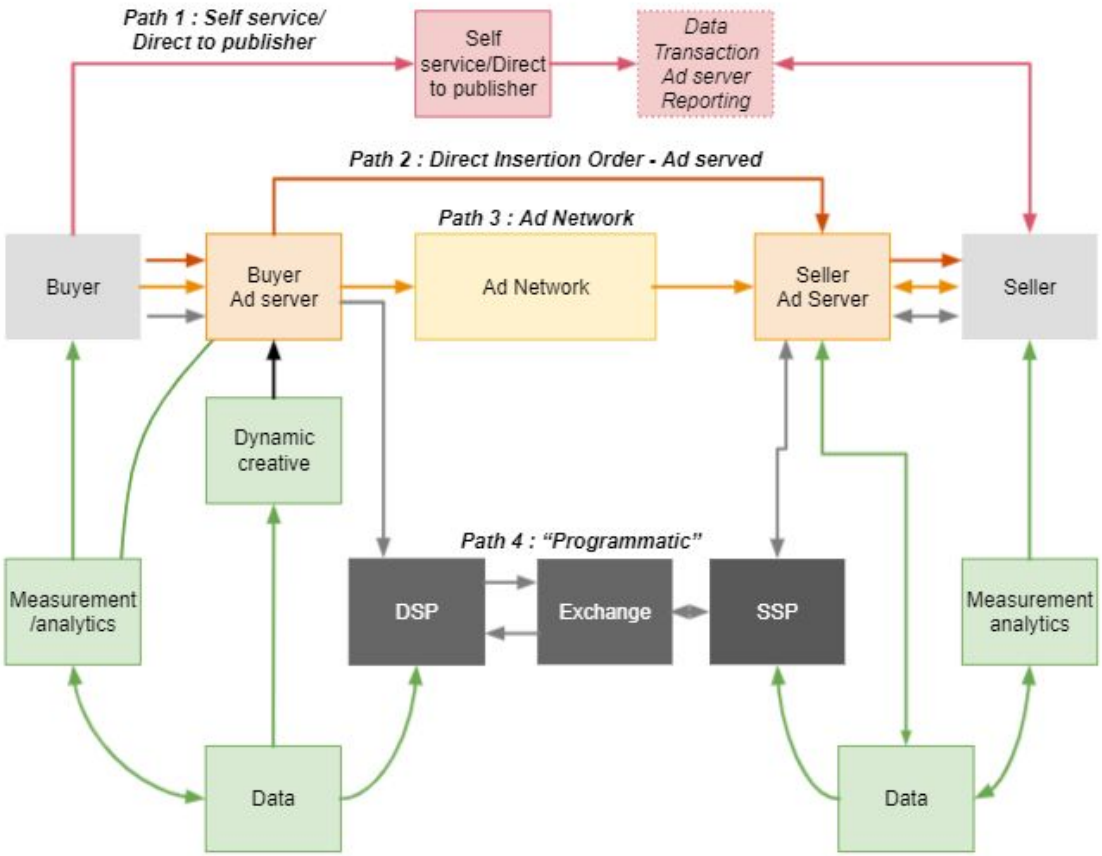
Technology Type	Defined as
Self-Service / Direct to Publisher	A simple form of advertising transaction and delivery - the seller offers a “one stop shop” solution where buyers can access the ad creation, buying, audience targeting and campaign performance reporting for their advertising within the platform, all within a self-service software.
Ad Servers	Decision making engines for the delivery and reporting of ad campaigns. They host ads that are served and are utilized to collect and store data. There are both sell-side and buy-side ad servers.
Ad Networks	A technology platform that serves as a broker between a group of publishers and a group of advertisers or a purchaser of inventory that is then onsold.
Measurement	Measurement services provide additional metrics for advertisers to monitor their advertisement campaigns such as viewability.
DMPs and Data Aggregators	Data Management Platforms (DMPs) are responsible for managing, storing and organising data for publishers and advertisers. Data Aggregators utilise their data to create audience segments for targeting.
Verification	Verification services are used to detect and aim to prevent ad fraud. They also assist with brand safety and viewability.
Dynamic Creative management	A platform used for the live development, or in-flight optimisation, of ad messages such as banners and video. This may also include data-led dynamic creative
Exchanges*	A technology based auction room where real time bidding occurs and inventory is bought and sold programmatically. Campaigns can be guaranteed (agreed $ and volume of impressions) or non-guaranteed in either the open or a private marketplace (via real time bidding or, RTB).
SSPs	Supply Side Platforms are utilised to allow publishers to manage and supply inventory to the exchanges.
DSPs	Demand Side Platforms are utilised to allow advertisers to bid on inventory that is available on the exchanges.

*It should be noted that as the industry has evolved, Exchanges and SSPs have effectively merged into a single entity due to their interchangeable functions.

The advertising technology ecosystem is highly dynamic

Advertising Technology in Australia

Buyers and sellers alike may use multiple combinations of one technology type to help create a competitive advantage and there is no one 'solution' all buyers and sellers may use. While this paper has sought to simplify the role of each technology type, it is also apparent many industry participants may offer multiple services within their technology. When mapped, the flow of both the transaction and the deployment of the advertising unit from buyer through to seller may look like the following:



"Ad Tech"

- Path 1 - Self service
- Path 2 - Direct IO / Ad served
- Path 3 - Ad Network
- Path 4 - Programmatic
- Supportive technology data flow (regardless of path)

It is important to note that not all technologies are used by all buyers and sellers of advertising, nor is it a requirement for them to do so. One of the complexities of the industry is simply this – one advertiser may select a broad suite of tools with the aim of buying a wide array of ad slots relevant to their target audience; whereas others may choose a relatively simple portfolio. In any case, the ultimate result will be an advertisement being delivered to a consumer without any obvious visibility to the end user of the technologies involved, or the level of complexity involved for it to be delivered.

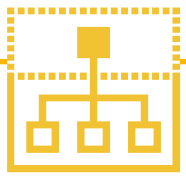
While many advertising transactions could follow multiple pathways, and indeed most advertisers in Australia may use multiple within their overall operations, to simplify, these pathways could described as follows:

Path 1 - Self-service / Direct to publisher buying

Under this pathway the seller offers a “one stop shop” solution where buyers can access the ad creation, buying, audience targeting and campaign performance reporting for their advertising within the platform, all within a self-service software. There are a variety of examples, spanning Facebook, Twitter and TikTok within social media, Spotify within audio and even Nine Entertainment Co’s *Galaxy* for the purpose of buying TV ad inventory.

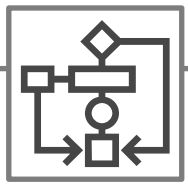
Path 2 - Direct Insertion Order - ad served

This pathway covers buyers and sellers negotiating their deal offline and signing an Insertion Order (IO) contract for the delivery of their campaign. Ad tech is typically then used in the form of an ad server to take the campaign messages from the buyer and have it delivered into the media property by the seller. According to IAB Australia reporting as of June 2021, this remains the dominant inventory buying method for General Display advertising expenditure to content publishers at 41%.[10*]



Path 3 - Ad network

Ad networks offer a further pathway between buyer and seller by conglomerating (typically) sellers, to be accessed by buyers. These ad networks often offer additional services such as data for audience targeting, buying algorithms or creative services in addition to a simple interface for buyers to buy inventory from a range of suppliers. This pathway would likely also make use of ad server technology.



Path 4 - Programmatic trading

The programmatic trading pathway sees buyers and sellers each enacting technology to aid both the transaction and delivery of advertising. Buyers typically use a Demand Side Platform (DSP) to purchase placements sellers have made available through a Supply Side Platform (SSP). This pathway takes a number of subforms, with both real-time bidding (RTB) and guaranteed (PG) variations being available.

As noted above, within advertising campaigns PwC’s research has found many buyers are unlikely to simply use one pathway, often favouring a mix based on, amongst other things:

- Complexity of campaign requirements
- Target audience
- Channel preference
- Variety of campaign parameters
- Capability and experience of buyer (and in many cases the seller)
- Flexibility requirements

*Note: According to the IAB Australia's Online Advertising Expenditure report for FY21, the proportion of expenditure by buying type is calculated using domestic content publishers' expenditure only (i.e. excludes global publishers) and therefore this percentage should not be extrapolated across the total general display expenditure market.

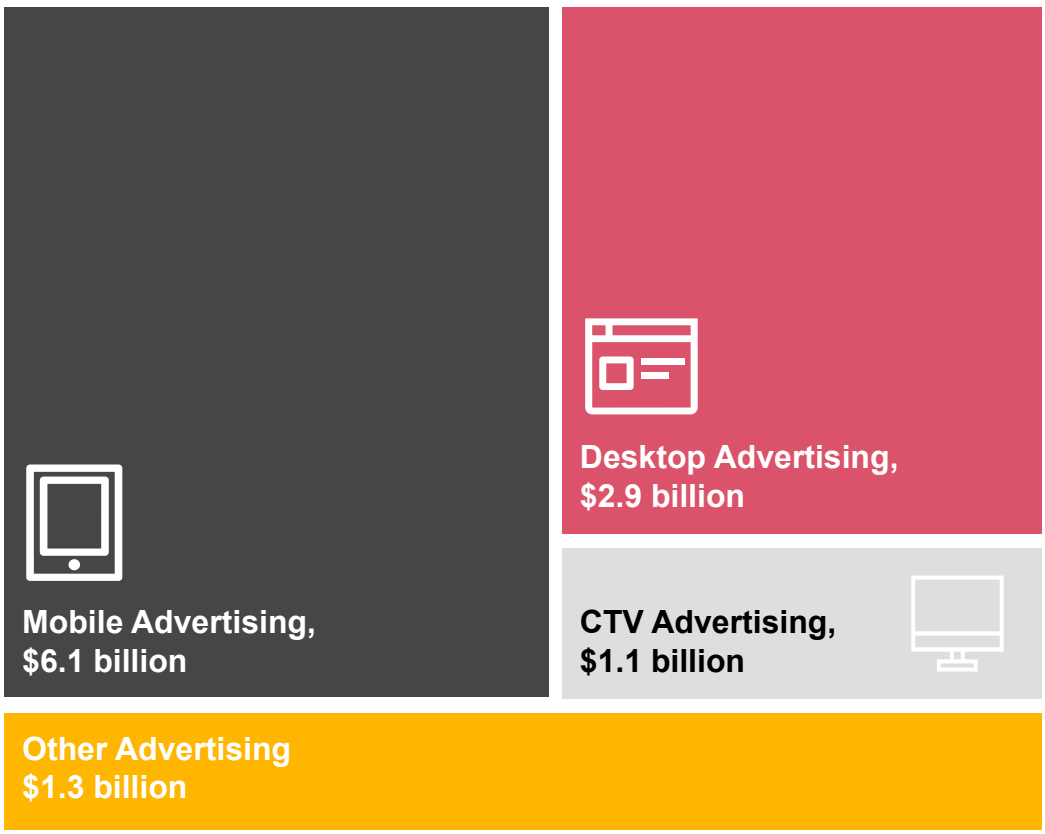
Advertising technology plays an important role within the wider digital advertising industry

The advertising industry as a whole provides large economic benefits to the Australian economy. As a key input of the advertising industry, advertising technology facilitates a large portion of these benefits. To capture the value of advertising technology, we first need to understand the role that it plays in delivering advertising in Australia.

Traditionally, advertising campaigns were largely delivered through broadcasting and print media though as the use of digital media continues to grow, the prevalence of digital advertising follows. In 2020-2021, 51% of advertising campaigns were delivered online.[9] As shown in this report, advertising technology today plays an important role across the supply chain in delivering advertising.

Advertising technology is used to deliver advertising across a wide range of digital media formats. Illustrated below is the total expenditure on digital advertising in Australia by the media format used in financial year 2021. The total expenditure on digital advertising was $11.4 billion, with the highest spending on mobile advertising ($6.1 billion), accounting for over half of total digital advertising spend.[10] Expenditure on connected TV (CTV) digital advertising rose to a high of $1.1 billion as Australian's media consumption patterns continues to develop to new technologies, further indicating the dynamic ecosystem that the advertising technology industry plays in.

Total Expenditure on Digital Advertising in Australia (FY21)



The advertising technology ecosystem provides economic value across Australia

The advertising technology ecosystem is highly dynamic, and provides value to a wide range of participants. Using the definition of the ecosystem as outlined in this report along with supporting evidence on the size and role of the industry, we estimate its value in gross value add (GVA) and employment supported. The advertising technology ecosystem directly provides $4billion in GVA annually, and supports 25,520 full time equivalents (FTE) jobs.[11] This constitutes the value provided to businesses across Australia using the many constituent technologies of the advertising technology industry.

Economic

$4b GVA

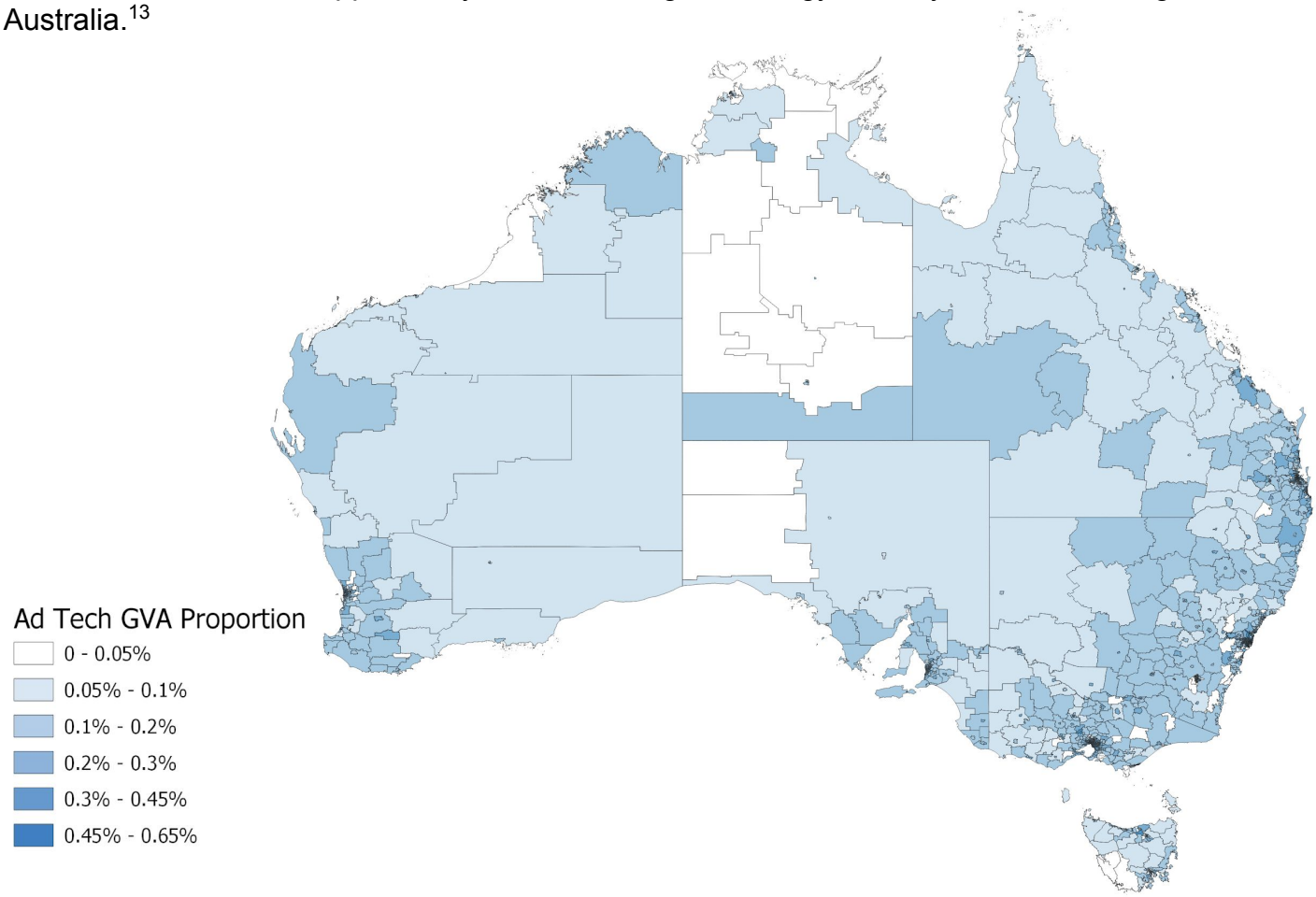
Directly supported

Employment

25,520 FTE

Directly supported

The following map indicates the share of direct GVA supported by the advertising technology industry across the country at Statistical Area 2 (SA2) level.[12] As can be seen, the sector's impact is not limited by location. Whilst the areas with a higher proportion of value supported by the industry are largely located in greater capital city areas, advertising technology GVA is supported across all parts of the country. This is indicated by the value created in regional areas of Australia. 22% of the direct GVA supported by the advertising technology industry is realised in regional Australia.[13]



3

Google's Advertising Technology

The analysis outlined in this report is developed using stakeholder engagement

To address the gap in understanding of the value of Google's advertising technology to Australia, we engaged with businesses across Australia to gather insights into the industry. Specifically, we:

- undertook a survey of business decision-makers, receiving 1,019 responses. The economic impacts of Google's advertising technology platforms outlined in this report are developed using responses gathered in this survey.
- engaged with a number of business decision-makers utilising advertising technology to develop personalised insights into the value of the technology. All quotes used in this report are taken from this stakeholder engagement and illustrate the experiences of Australian businesses in utilising Google's advertising technology platforms.

Google provides a wide range of accessible advertising technology platforms in Australia

Google offers a wide range of advertising technology products, providing value to all types of Australian businesses.

Google provides advertisers with a number of platforms allowing them to purchase inventory from a substantial number of potential publishers, both domestic and international. This includes Google's ad buying products, Display and Video 360, Google Ads and Google Display Network, which allow advertisers to purchase ad space directly from Google as well as third party publishers. These platforms are all integratable with analytics and ad management tools such as Google Analytics and Campaign Manager. Together, these allow advertisers to access rich data and analytics to develop and target their marketing campaigns to their intended audience across a wide range of digital media sources. On the advertising supply side, Google provides publishers with Google Ad Manager, Google AdSense and Google AdMob. These allow publishers of all sizes to connect with a large pool of potential advertisers so that they are able to generate advertising revenue on their online platforms.

70% of surveyed business reported that they chose Google's advertising technology products due to its ease of use, and 45% reported that they chose Google's products due to its greater effectiveness[14]

Display & Video 360 | Google Ads | Google AdSense | Google Ad Manager

Google Analytics | Google AdMob | Campaign Manager

Google's advertising technology platforms offer affordable advertising for SMEs

Australian SMEs are able to access a global consumer base through Google's advertising technology platforms

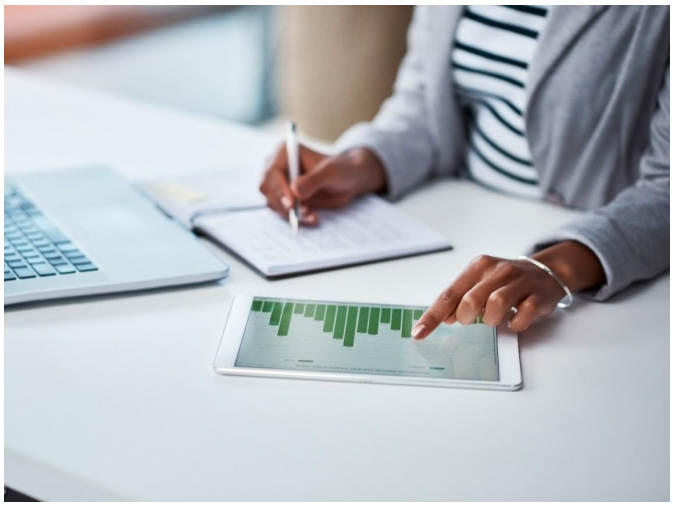
SMEs are a vital component of the Australian economy, employing 7.5 million workers.[15] Google's advertising technology platforms have had greater positive impacts on SMEs than larger organisations.

74% of SME's reported an observed difference in cost savings, time savings or business growth through their use of Google's platforms, compared to 66% of large businesses.[16]

Google's platforms provide these smaller businesses with an accessible and affordable pathway to reach their audiences. Advertisers are able to reach potential customers globally and with far greater efficiency.

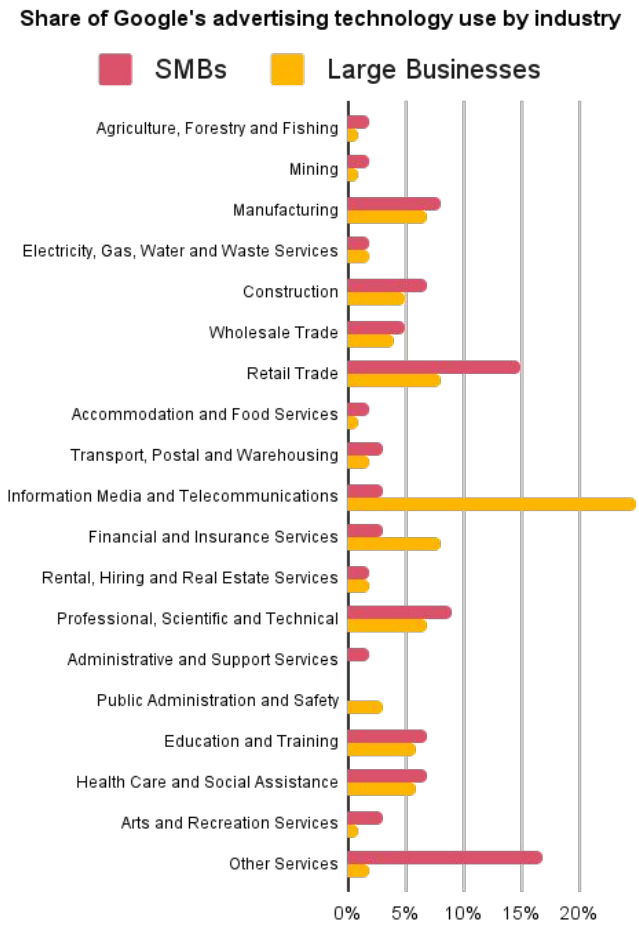
On average, respondents indicated that 28% of their advertising media is targeted to an overseas market.[17]

On the other side of the supply chain, smaller publishers are given access to a large pool of potential advertisers that would otherwise be unavailable to them.



> **"Previously one newspaper ad may have had 100 responses, now [using technology] we get 100s of responses. It's more sophisticated, but 1000% more effective[18]**

Compared to larger businesses, Australian SMEs' use of advertising technology is significantly higher in retail and other services industries.[19] Ad tech has provided a platform for these smaller retailers and service providers to advertise and grow their businesses.



Google's platforms provide both direct and indirect benefits to the Australian economy

To provide a comprehensive economic analysis of the contribution of Google's advertising technology platforms to Australian businesses, it is important to realise that Google's platforms have both direct and indirect (flow-on) impacts on economic activities in Australia. The overall economic benefits of Google's advertising technology products to the Australian economy can be split into the following two major components:

Direct contribution of Google's advertising technology platforms

Which is measured through its direct employment and economic activity impacts (GVA) within the advertising technology supply chain. The GVA generated by Google's advertising technology products is effectively the value of advertising technology activity, and is equivalent to it's direct contribution to Australia's gross domestic product (GDP).

Indirect contribution of Google's advertising technology platforms

Through the stimulation of economic activity up and down the advertising technology supply chain. That is, the existence of Google's advertising technology products provides opportunities for other businesses to reach potential customers with greater efficiency, and stimulates employment and activity across Australian businesses.

Google's advertising technology platforms significantly contribute directly to Australia's advertising technology ecosystem

The survey demonstrated that Google provides tangible value for companies across the advertising technology supply chain. Almost three in every four respondents who utilise Google's advertising technology platforms indicated an observed difference in Google's tools over other available platforms, through tangible cost savings, time savings and business growth.[20] They have reduced the cost of advertising across the supply chain, by further streamlining the transaction between advertiser, publisher and consumer.

We estimate that the existence and use of Google's advertising technology platforms across the advertising technology supply chain ***directly*** supports 15,300 FTE jobs and $2.4 billion in GVA to the Australian economy annually.[21]

This is generated through the use of Google technology by advertisers and publishers across the country. The direct benefits that they provide are not limited to industry, as employment and value is supported across the advertising supply chain.

> **[using advertising technology] has given [us a] platform to change the internal narrative that [digital] marketing is investment for growth, not cost**[22]

15,300 FTE jobs

directly supported

$2.4b GVA

directly supported annually

This is greater than the direct **GVA supported** by...

The **entire** Ships and Boating Manufacturing industry in Australia[23]

and equal to the total **GVA supported** by...

The **entire** Advertising industry (including all sources of advertising) in South Australia[24]

The total value of the Google's advertising technology platforms in Australia is substantial

A computable general equilibrium (CGE) model which incorporates information on linkages across sectors within the broader economy was used to examine the potential economy-wide impacts resulting from the economic activities generated form using Google's advertising technology products.

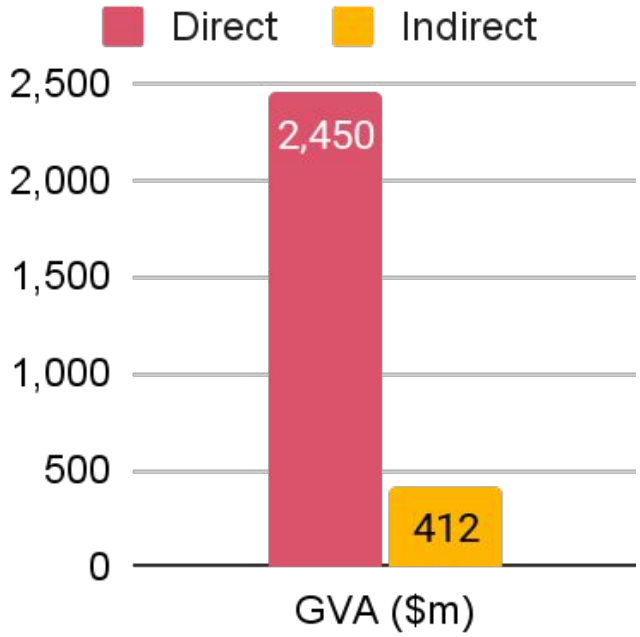
The economic value from the existence of Google's advertising technology platforms goes beyond the direct employment and economic activity impacts within the advertising technology supply chain, and includes indirect (flow-on) impacts.

Macroeconomic Impacts

The existence of Google's advertising technology platforms stimulates economic activity and raise aggregate demand in the Australian economy.

$2.9 billion

Directly and ***indirectly*** contributed to GVA

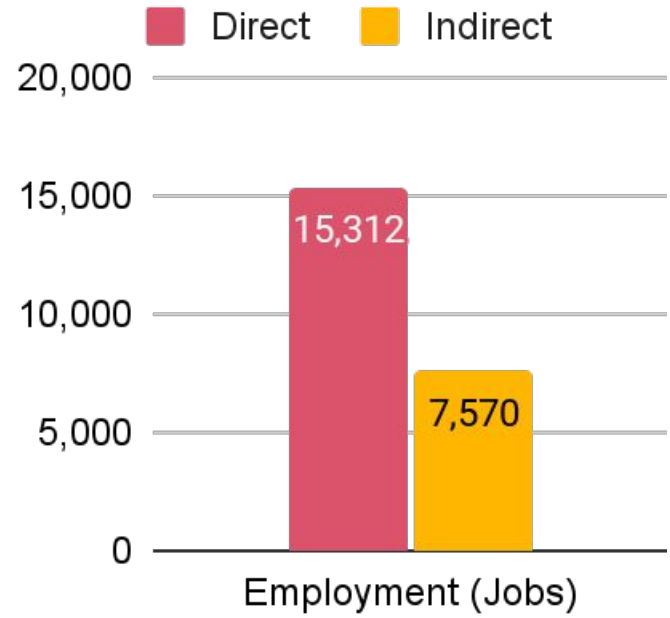


The current level of using Google's platforms by Australian businesses is estimated to have contributed around $2.9 billion to GVA across all industries when the indirect, supply chain impacts are included.[25] In addition to boosting GVA, using Google's advertising technology platforms by publishers and advertisers directly and indirectly supported 23,000 jobs in Australia.[26]

Whilst there are significant indirect benefits provided by Google's platforms, the large majority of its value is created directly. Google's platforms are widely used across Australia, and the direct benefits are indicative of their value to these businesses through their use of Google's advertising technology. The indirect benefits are generated through the use of Google's platforms facilitating cost savings, time savings or employment impacts. This provides businesses with flow-on economic benefits that are attributable to the effectiveness of Google's platforms.

23,000 FTE jobs

Direct and ***indirect***



Google's platforms stimulate activity in other sectors upstream and downstream of the advertising technology ecosystem

While Australian businesses are expected to benefit from Google's advertising technology platforms, these impacts will vary across sectors.

These industry impacts provide an indication of the strength of the economic linkages between the advertising technology industry and other industries in Australia.

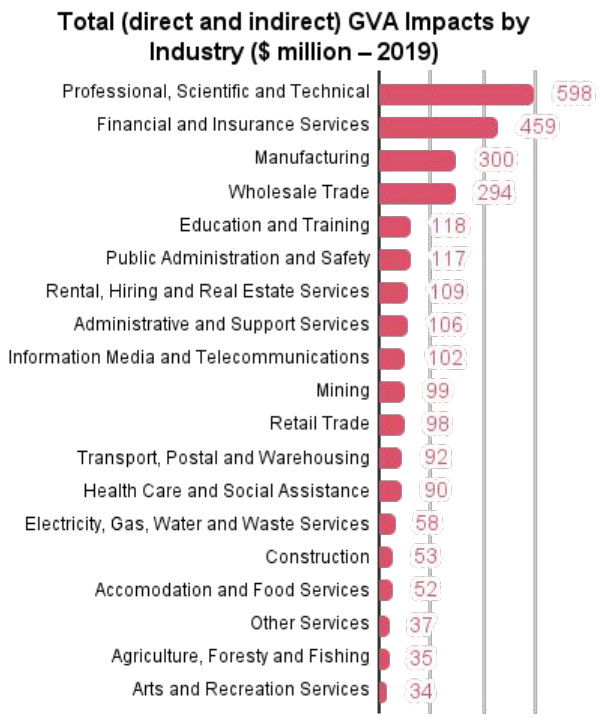
There are significant contributions to Australian businesses from using Google's advertising technology platforms in the Professional, Scientific and Technical Services, Financial and Insurance services, Manufacturing and Wholesale Trade. These are the industries which also are found to have a higher number of jobs supported by the advertising technology industry. Higher GVA impacts in these industries is largely driven by additional business activity and demand for their outputs as a result of using Google's advertising technology platforms.

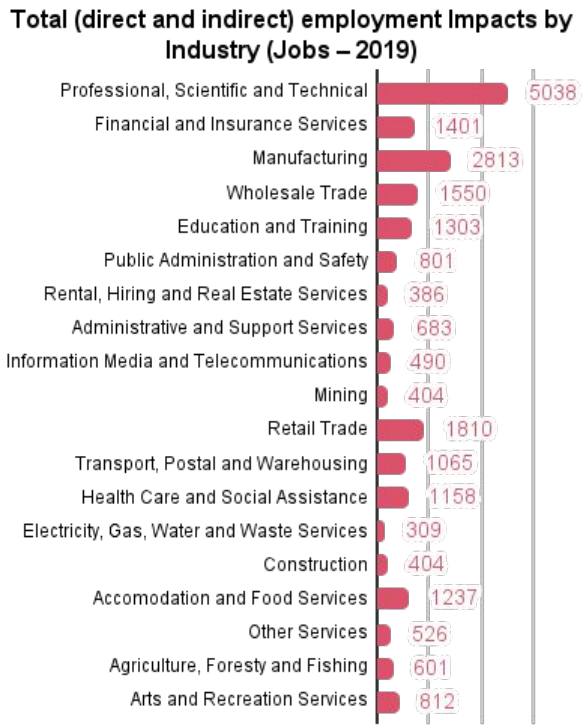
Overall, it is estimated that the existence of Google's advertising technology platforms supports over $1.6 billion in GVA across these four industries in Australia.[27]

In addition to boosting industry activity, Google's advertising technology platforms are also expected to have led to higher employment across all industries in Australia. Using Google's advertising technology platforms stimulates activity in other sectors upstream and downstream of the advertising technology industry in Australia, and, in response, these sectors demand more labour.

The impacts of Google's advertising technology platforms on industry employment has a similar pattern to that observed in the GVA impacts.

The gains in the workforce size and GVA due to the Google's platforms flows through to give an overall $1.1 billion boost to Australia's export.[28]





4

References

References

1. Estimated using PwC CGE Modelling
2. Estimated using PwC CGE Modelling
3. Estimated using PwC's proprietary Geospatial Economic Model (GEM)
4. Taken from PwC Survey of Business Decision Makers in Advertising Technology
5. Taken from "PwC Ad Tech Survey" of Business Decision Makers in Advertising Technology
6. Estimated using PwC CGE Modelling
7. IBISWorld (2021), Digital Advertising Agencies in Australia
8. AlphaBeta (2020), Google's Economic Impact in Australia
9. IBISWorld (2021), Advertising Agencies in Australia
10. IAB Australia (2021), Online Advertising Expenditure Report
11. Estimated using PwC's Geospatial Economic Model (GEM)
12. Estimated using PwC's Geospatial Economic Model (GEM)
13. Estimated using PwC's Geospatial Economic Model (GEM)
14. Taken from PwC Survey of Business Decision Makers in Advertising Technology
15. ABS (2021), Australian Business Performance by size
16. Taken from PwC Survey of Business Decision Makers in Advertising Technology
17. Taken from PwC Survey of Business Decision Makers in Advertising Technology
18. Taken from PwC Survey of Business Decision Makers in Advertising Technology
19. Taken from PwC Survey of Business Decision Makers in Advertising Technology
20. Taken from PwC Survey of Business Decision Makers in Advertising Technology
21. Estimated using PwC's Geospatial Economic Model (GEM)
22. Taken from PwC Survey of Business Decision Makers in Advertising Technology
23. ABS (2021), Australian National Accounts: Input-Output Tables
24. Deloitte Access Economics (2014), Advertising Pays - The economic employment and business value of advertising
25. Estimated using PwC CGE Modelling
26. Estimated using PwC CGE Modelling
27. Estimated using PwC CGE Modelling
28. Estimated using PwC CGE Modelling

5

Appendices

Appendix A – Economic modelling

Approach to measuring Google's economic impact

In order to estimate the number of jobs in the ad tech industry, we begin with analysing detailed information about the employment by industry and by occupation in the Australian economy. The Australian Input-Output tables contain information on labour payments by industry but contain no information on the pattern of labour payments across occupations. This is problematic as information on occupational patterns by industry is required to identify relevant occupations and estimate the number of jobs in the ad tech industry.

The industry-by-occupation matrix from the '2016 Census' which is the latest currently available from the ABS was used to estimate the number of jobs in the ad tech industry. The 2016 industry-by-occupation matrix represents the proportion of total employment accounted for by each detailed occupation in each industry. The 2016 industry-by-occupation matrix is the latest currently available from the ABS as the Census of Population and Housing is conducted every five years. The Labour Force Survey (LFS) on the other hand is released on a monthly basis. The LFS is a household survey that provides Australia's official estimates of employment and unemployment.

Given that an industry-by-occupation matrix for the most recent year is needed to estimate the number of jobs in the ad tech industry, we used the latest LFS data and the RAS method, which is well recognised and widely used in updating input output tables to update the industry-by-occupation matrix to 2019-20.

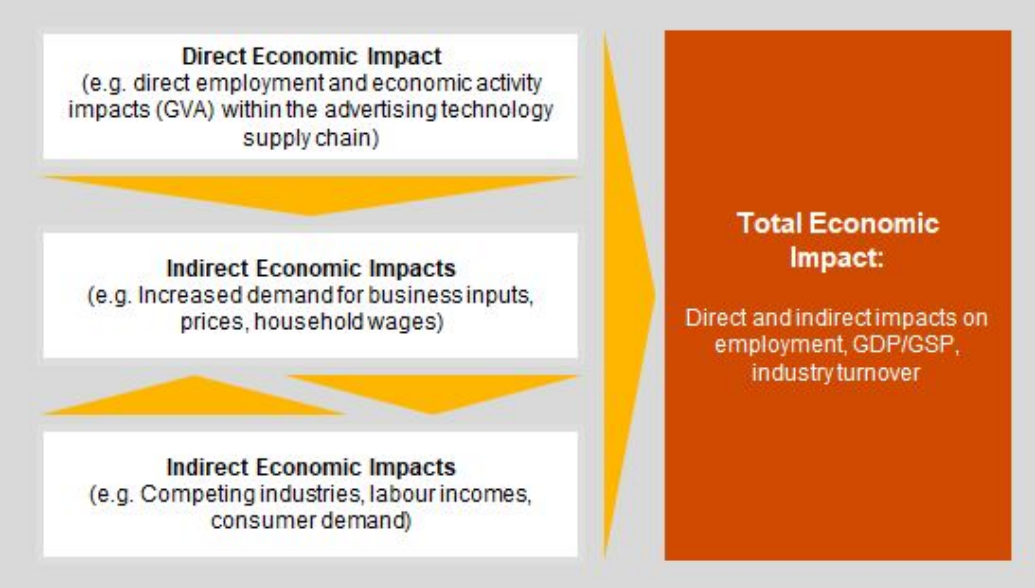
Finally we estimated the number of jobs for relevant occupations within the ad tech industry using the updated 2019-20 industry-by-occupation matrix.

Economy-wide impacts

In order to measure the economy-wide impacts of the contribution of Google's ad tech platforms, we utilised a comparative static computable general equilibrium (CGE) model. A CGE model is a mathematical model of an economy that is capable of capturing economy-wide impacts and inter-sectoral reallocation of resources that may result from a 'shock' (that is, a change in the status quo) to the economy.

CGE models are widely used in economic analysis of policies and projects around the world including in Australia by both government and the private sector.

The core data of a CGE model is an input-output table. An input-output table is a system of accounts which shows, in value terms, the supply and disposal of goods and services within the economy in a particular year. An input-output table captures sales of products to other industries for further processing (intermediate usage) or to the various categories of final demand. It also captures the inputs used in an industry's production, whether they are intermediate or primary inputs (such as labour and capital). The table is balanced such that total inputs to each industry are equal to total outputs from each industry. Essentially, an input-output table is a snapshot of an economy (whether it is a region, state, territory or country) in a particular year.



Appendix A – Economic modelling (Cont.)

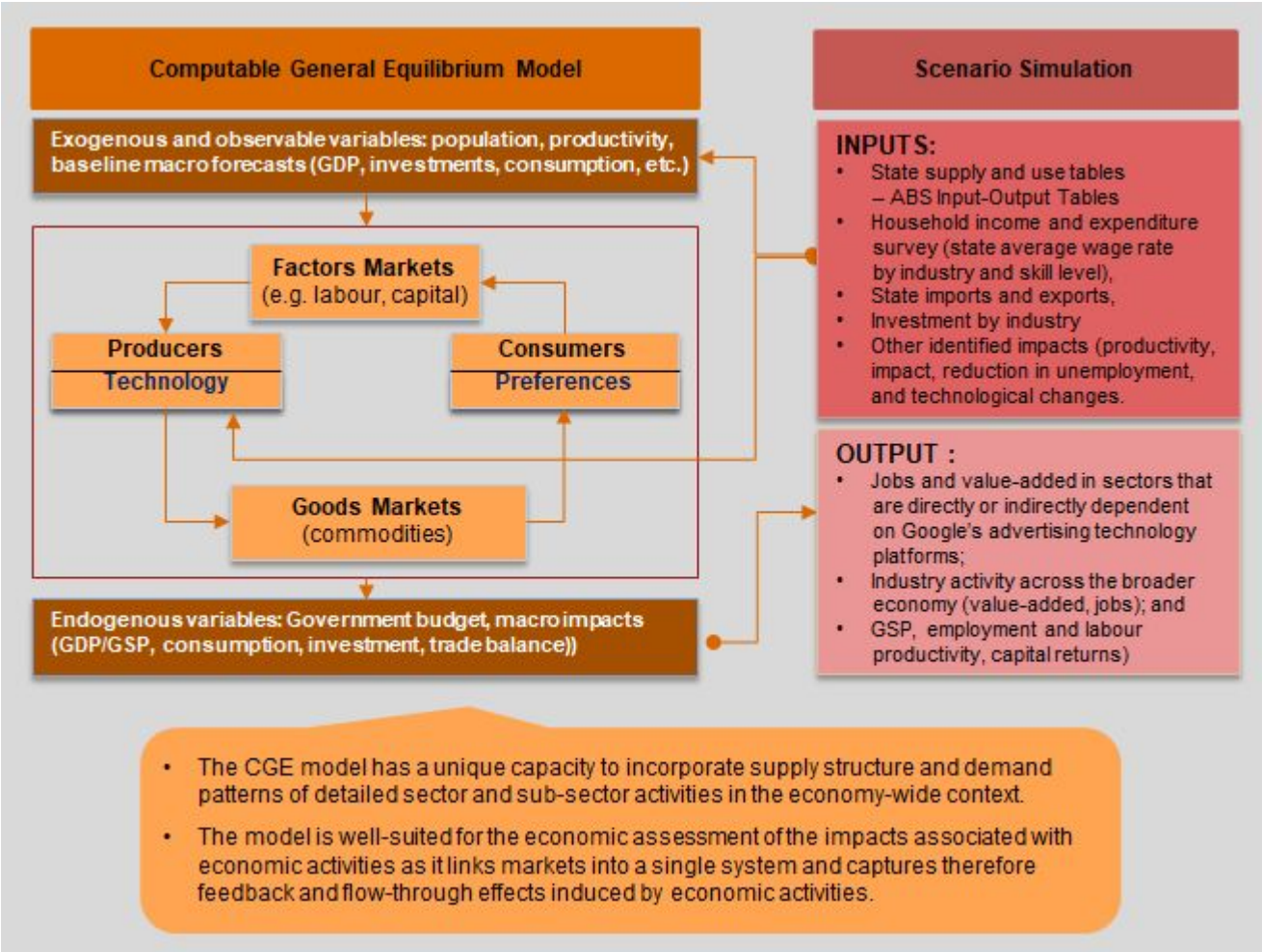
The database is combined with sophisticated economic and behavioural assumptions to capture:

- resource constraints and the responses of businesses and workers through the adjustment of prices and wages;
- substitution between labour and capital (and other factors inputs) in response to changes in the price of labour relative to capital;
- the behavioural responses of consumers, investors and foreigners to price changes ; and
- the effects of technological change and shifts in consumer preferences.

These features of CGE models mean that they capture not only the direct (or first-round) effects of an activity, but also the indirect (or second- and third-round) effects.

The modelling was conducted using PwC's comparative static of the Victoria University Regional Model (VURM), which allowed us to examine state level impacts.

It is a CGE model of the Australian economy initially developed at Monash University and updated by PwC that models short and long-run equilibrium of the Australian economy. This CGE model is widely used by the Australian Government, the Productivity Commission and the Australian Treasury to quantify the total impacts of a policy change.



Appendix A – Economic modelling (Cont.)

VURM models the economy as a system of interrelated economic agents operating in competitive markets. Economic theory is specifies the behaviour and market interactions of economic agents, including consumers, investors, producers and governments operating in domestic and foreign goods, capital and labour markets. Defining features of the theoretical structure of VURM include:

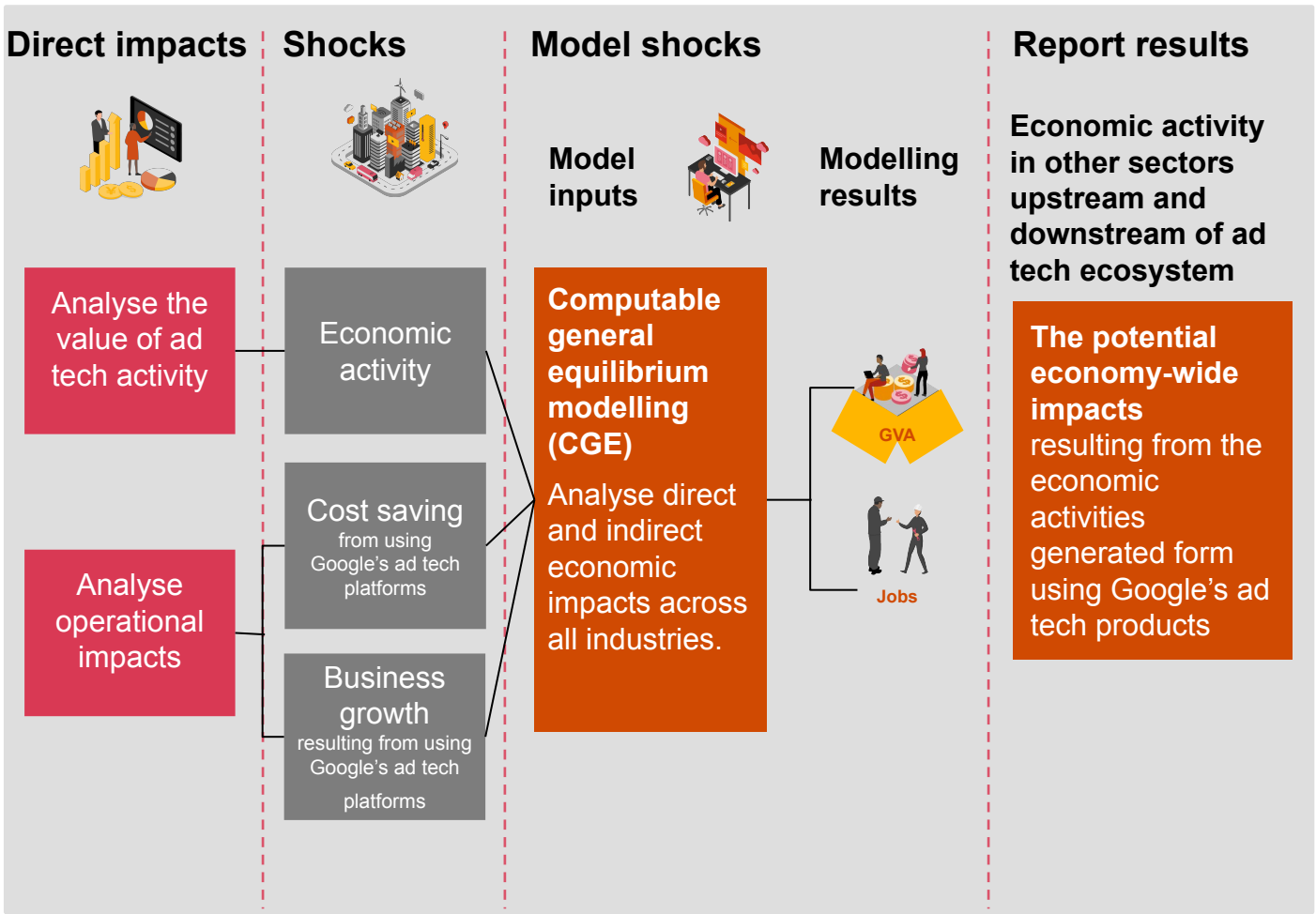
- Optimising behaviour by households and businesses in the context of competitive markets with explicit resource constraints and budget constraints;
- The price mechanism operates to clear markets for goods and factors such as labour and capital (i.e. prices adjust so that supply equals demand); and
- At the margin, costs are equal to revenues in all economic activities.

In estimating the effects of the contribution of Google's ad tech platforms, we implemented a modelling scenario that examined the potential economy-wide impacts resulting from the economic activities generated form using Google's ad tech products. We employed an economic shock to represent cost savings, effectively making the industry more cost effective.

To examine localised economy-wide impacts, we coupled the CGE analysis with PwC's GEM. By blending these two approaches, CGE and GEM, we can look at what the impacts of Google's ad tech platforms mean at a community level, therefore allowing for a more tailored understanding of impacts. Using GEM, we allocated the National results to all SA2s across the state.

Unless otherwise noted, all values in this report are expressed in $2019.

Flow chart illustrating the economic impact assessment methodology



www.pwc.com.au

At PwC Australia our purpose is to build trust in society and solve important problems. We're a network of firms in 158 countries with more than 250,000 people who are committed to delivering quality in assurance, advisory and tax services. Find out more and tell us what matters to you by visiting us at www.pwc.com.au

PWC200305756