

# Chapter 8

## Financial and Insurance Services



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**Abstract** In this chapter, the authors focus on the impact of artificial intelligence (AI) and associated technological changes on work and jobs in Australia's Financial and Insurance Services industry sector. Extensive commentary on the cumulative effects of AI, a term that incorporates machine learning, big data, blockchain, chatbots and financial technology (fintech) and other technological advances, are distilled for consideration. The intention in this chapter is to attempt to predict vocational areas in this specific industry sector that may diminish, noting that it is a challenging task amidst wide-ranging views. The commentary primarily focuses on disruptive technology in a relatively broad context to complement knowledge contributed within other chapters that focus on different industry sectors.

**Keywords** Artificial intelligence · Disruption · Jobs · Financial and insurance services industry sector

### Introduction

This chapter focuses on the impact of artificial intelligence (AI) and associated technological changes on work and jobs in Australia's Financial and Insurance Services sector. Scholarly commentary on AI, machine learning, big data, blockchain, chatbots and financial technology (fintech), has been increasing recently. The commentary and analysis has primarily focused on disruptive technology in a relatively broad context – an area where this chapter intends to contribute to current understanding.

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Climate change, globalisation, increasing urbanisation, an ageing population, and high-tech development are cumulatively transforming Australia and other countries across the globe faster than ever before. Such extensive transformation offers excellent opportunities for the advancement of Australia and its industry sectors, although there are considerable insecurity concerns about what may unfold in the future (Nankervis et al. 2019). To cope with this transformation, Australia needs policy measures that offer its citizens a sense of security and confidence in a better future. As outlined in this chapter, the finance and insurance industry sector is pivotal in this process, given its prominence and economic power in the Australian context.

This chapter begins with a brief definition of AI and machine learning. This is followed by defining the industry sector, the number of workers and capital generated, and basic demographics. Issues related to government policy will also be included with an emphasis on AI and emerging technologies. A review of literature outlining the potential impact of AI on the fintech sector is featured in the context of the possible effects on jobs. Machine learning products and other technological aids that may impact jobs partly or wholly are also explored.

The imperative for profits in the face of practices deemed to be unethical (Hayne 2019) is also covered briefly in the context of the potential impact on jobs in the sector. The Hayne (2019) Royal Commission into Misconduct in the Banking, Superannuation and Financial Services Industry reported an element of greed, and that bonuses were driven by allegedly illegal activities aimed at increasing profits and delivering higher share market results and dividends representing a significant problem in the sector. This is of particular relevance, as it follows that this sector, in particular, may have a culture that is conducive to its arguably hyperactive appetite for profits by using technology to further reduce costs through slashing its human resources (Boobier 2020). Increasing profit margins using AI and machine learning, as opposed to staff salaries and on-costs, is an issue that is also discussed in the chapter. The literature review will explore the new technologies that are being implemented and are expected to be deployed in the next decade to “disrupt” existing jobs in the sector for profit maximisation. Emphasis is placed on the anticipated impacts on the labour market in this sector concerning jobs, skills and workplaces, and projected training needs for both new recruits and existing staff. The effects of AI and technological change on productivity, competitiveness and future jobs in the sector will also be considered. Observations on the disruption that the COVID-19 pandemic has wrought are also briefly covered, concerning how this disruption is affecting the current workforce as well as future implications for AI. The chapter will conclude with a synthesis of the critical consequences of the issues discussed.

## Industry Overview

The Financial and Insurance Services sector has many subdivisions (Australian Bureau of Statistics 2020a).

The 2006 Australian and New Zealand Standard Industrial Classification (ANZSIC) provides a structure for managing and organising data about

enterprises – by facilitating the alignment of business units conducting similar activities in the context of productivity (ABS 2008). Division K, the Financial and Insurance Services Division, includes entities principally engaged in financial transactions involving the establishment, liquidation, or transformation in ownership of financial assets and facilitating financial transactions where required (ABS 2008).

The range of activities is extensive. They include ‘raising funds by taking deposits and/or issuing securities and, in the process, incurring liabilities; units investing their own funds in a range of financial assets; pooling risk by underwriting insurance and annuities; separately constituted funds engaged in the provision of retirement incomes; and specialised services facilitating or supporting financial intermediation, insurance and employee benefit programs’ (ABS 2008: webpage). Central banking, regulation and monetary control of financial activities are all embedded in this division. Table 8.1 below, adapted from the RBA (2020), provides an example of the magnitude of this multilayered Financial and Insurance Services Division in Australia.

The high performing financial sector is crucial to Australia’s economy (Hayne 2019). It acts as an intermediary between savers and borrowers, and along with other financial services illustrates the importance of the sector for economic and social sustainability in Australian society (Burns et al. 2019).

Hayne’s (2019:8–9) Final Royal Commission report stated:

At their most basic, the underlying principles reflect the six norms of conduct I identified in the Interim Report:

- obey the law;
  - do not mislead or deceive;
  - act fairly;
  - provide services that are fit for purpose;
  - deliver services with reasonable care and skill; and
  - when acting for another, act in the best interests of that other.
- These norms of conduct are fundamental precepts. Each is well-established, widely accepted, and easily understood.

The report made it clear what the role of the banking and finance industry sector should be. However, the findings called each of the points listed above into question as compelling evidence that emerged from the Royal Commission showed that some banks had allegedly flouted their social and economic responsibilities being driven by greed and bonuses.

In the finance and insurance sector, the largest business comprises the banks in terms of income compared with insurance companies (RBA 2020). There are 147 authorised deposit-taking institutions in which fifty-five per cent of Australia’s financial institutions’ assets are held. In Australia, banking is dominated by four leading banks (referred to as the ‘Big 4’): the Commonwealth Bank of Australia, the Westpac Banking Corporation, the Australia and New Zealand Banking Group and the National Australia Bank (Hayne 2019; Wu 2020). Several foreign banks based in Australia, but few have retail banking (Commonwealth of Australia 2018). Retail banking assists consumers in managing their money through credit and depositing

**Table 8.1** Main characteristics of finance and insurance industry Australia

Type of intermediary	Main characteristics
Banks	Provide financial services to all sectors, including (through subsidiaries) funds management and insurance services. Foreign banks authorised to operate as branches in Australia need to confine their deposit-taking activities to wholesale markets.
Building societies	Raise funds primarily by accepting deposits from households, provide loans (mainly mortgage finance for owner-occupied housing) and payments services. Traditionally mutually owned institutions, building societies increasingly are issuing share capital.
Credit unions	Mutually owned institutions, provide deposit, personal/housing loans, and payments services to members.
Money market corporations	Operate primarily in wholesale markets, borrowing from, and lending to, large corporations and government agencies. Other services, including advisory, relate to corporate finance, capital markets, foreign exchange, and investment management.
Finance companies	Provide loans to households and small to medium-sized businesses. Finance companies raise funds from wholesale markets and, using debentures and unsecured notes, from retail investors.
Securitisation vehicles	Special purpose vehicles that issue securities backed by pools of assets (e.g. mortgage-based housing loans). The securities are usually credit enhanced (e.g. through use of guarantees from third parties).
Life insurance companies	Provide life, accident and disability insurance, annuities, investment and superannuation products. Assets are managed in statutory funds on a fiduciary basis, and are mostly invested in equities and debt securities.
Superannuation and approved deposit funds (ADFs)	Superannuation funds accept and manage contributions from employers (including self-employed) and/or employees to provide retirement income benefits. Funds are controlled by trustees and fund managers/advisers. ADFs are generally managed by professional funds managers. Like superannuation funds ADFs may accept superannuation lump sums and eligible redundancy payments. Both these structures invest equities, property, debt securities and deposits).
Public unit trusts	Unit trusts pool investors' funds, usually into specific types of assets (e.g. cash, equities, property, money market investments, mortgages and overseas securities). Most unit trusts are managed by subsidiaries of banks, insurance companies or money market corporations.
Cash management trusts	Cash management trusts are unit trusts which are governed by a trust deed and open to the public and generally confine their investments (as authorised by the trust deed) to financial securities available through the short-term money market.
Trustee companies (common funds)	Trustee companies pool into common funds money received from the general public or held on behalf of estates or under powers of attorney. Funds are usually invested in specific types of assets (e.g. money market investments, equities and mortgages).
Friendly societies	These bodies represent mutually owned co-operative financial institutions offering benefits to members through a trust-like structure. Benefits and services include investment products through insurance or education bonds, funeral, accident, sickness, or other allowances.

(continued)

**Table 8.1** (continued)

Type of intermediary	Main characteristics
General insurance companies	Provide insurance, including for property, motor vehicles and employers' liability. Assets are invested mainly in deposits and loans, government securities and equities.

Source: Adapted by the authors based on RBA [2020](#)

money securely. Services offered by retail banks consist of cheque and savings accounts, mortgages, personal loans, credit cards, and certificates of deposit. The finance industry covers businesses that offer banking, lending services and investment trusts in Australia (Wu [2020](#)). The most prominent industry subsectors in the Finance subdivision include 'domestic banks, foreign banks, non-depository financiers and financial asset investors' (Wu [2020](#): 4). In December 2017, 'banks, credit unions, building societies, general insurance and reinsurance companies, life insurance, private health insurance, friendly societies and the superannuation industry held a combined \$7.6 trillion in assets' (Productivity Commission [2018](#): 57).

### *Workforce Characteristics & Trends*

In May 2020, the number of employees in this sector comprised 489,800 within a total workforce of 12,214,700 people or 4.0% of the Australian workforce (ABS [2020b](#)). The 'Big 4' banks together account for approximately 40% of total sector employment (ABS [2020a](#)) and have already made moves to reduce workforce numbers. It is estimated that job losses will be in the order of forty thousand over the next 5 years (Reuters [2018](#)).

As only one example of this trend, in late 2017, the National Australia Bank (NAB) announced that it would cut about 6000 jobs while recruiting 2000 technically savvy staff (Ziffer [2018](#)). In 2020 further disruption has been reported, as over 2600 staff at the bank will need to reapply for jobs to maintain their employment in three divisions, as this financial giant restructures and reacts to the fallout from the coronavirus pandemic, with a further retrenchment estimated to involve 350 more staff (Bonyhady and Yeates [2020](#)).

Australia's insurance industry comprises general insurers and reinsurers. 'General insurers underwrite insurance policies to cover individuals and businesses' financial loss associated with property, casualty, liability and other risks. Underwriting involves assuming risks and assigning premiums. Reinsurers assume all or part of the risk associated with existing insurance policies underwritten by other insurers' (Thomson [2019](#): 3).

The following table provides a snapshot of forecasts for the Finance sector prior to the COVID-19 pandemic wreaked havoc (Table [8.2](#)).

The curious aspect is that the wages share of revenue may have declined as the employment growth increased by 59,400 or 14.6 per cent between 2015–2020

**Table 8.2** Pre COVID-19 forecasts

2020 Forecast to have a total revenue	\$AUD204.6 billion
2020 forecast profit margin	\$AUD 613.8 billion
Annual growth 2015–2020	Decline .05 per cent
Growth forecast for 2020–2025	Growth 3.8 per cent
Staff wages as a share of revenue in 2020	Decline by 15.7 per cent in 2020
Increased number of businesses in the sector	Growth 2.6 per cent between 2015–2020

Source: Adapted by the authors from Wu [2020](#)

**Table 8.3** Profile of the insurance industry subsector

Female/Male employment	Female 48.6% Male 49.4%
Fulltime employment	83.6%
Projected employment May 2019–May 2020	Anticipated growth 4.6%

Source: Adapted by the authors from Australian Government [2020](#)

(Australian Government [2020](#)). This chapter aims to determine why this occurred through reviewing relevant literature and scrutinising the insights from experts in the field.

From February 2016 to February 2020, employment in the Financial and Insurance Services industry increased by 14.6 per cent (Australian Government [2020](#)). The Australian Government ([2020](#)) estimated that, in 2020, the median age for people employed in this industry sector was 38 years, with median annual earnings being around \$AUD\$78,000, compared with \$AUD89,700 across all industry sectors (Salaryexplorer [2020](#)).

A further profile of the insurance industry subsector is outlined in [Table 8.3](#) below.

The impact of COVID-19 and its continued influence inhibits accurate forecasts of growth in the insurance and finance sector (Wu [2020](#)).

### *Australian Government's Policies on AI in Finance and Insurance Services*

Domestic policy covers priorities that affect the lives of all Australians. Our work involves advising the Prime Minister, the Cabinet and Portfolio Ministers on issues such as jobs and economic growth, the budget, industry, infrastructure, agriculture, innovation, health, education and the environment. (Department of the Prime Minister and Cabinet [2020](#): webpage).

Having well-formulated government policies to strategically address both the positive and negative impacts that AI poses would seem logical, given the prominence of AI in the finance and insurance sectors. The effect of AI on the workforce and future ways of working within all the Australian industry sectors, as well as Australia's economic position in a global market, are key issues that confront

Australia (Hajkowicz et al. 2019). This is of concern as policies are needed to safeguard jobs, particularly in this sector (Deloitte 2020; Hajkowicz et al. 2019).

Government policy is a difficult concept to define (Bacchi 1999) and policy-making processes require insight through visionary constructs and discourse (Bacchi 1999). The development of policy into “constructive schemes” involves numerous dimensions of discourse to determine policy problems (Bacchi 1999). This process then progresses to the formulation of policy generated by useful research to implement funded processes, and procedures built into strategies that produce solutions for the population (Bessant et al. 2006). Government policy signifies the implementation of activity in a society that is well funded and researched and designed to benefit most of the population. Along similar lines, Bacchi (1999) viewed government policy as a principle, or on occasion, a law, that aims to guide decisions with strategic thinking culminating in positive outcomes that enhance society. Government policies contain the reasons things are to be done in a certain way and why. Policies are not laws, but they can lead to laws.

It is important to note that information on the Australian Government’s AI policies within the Finance and Insurance Services sector yields very little in terms of academic or government commentary. Hence, it is not surprising that Australia is lagging well behind other developed countries in this regard (Deloitte 2020; Hajkowicz et al. 2019, Loucks et al. 2019, Smith 2019a, b).

It is quite revealing how limited policy development in Australia is compared with other developed countries. The Australian Information Computer Technology (ICT) industry in its missive to a broad membership signalled problems stating that ‘currently {Australia} lacks access to relevant local skills, and is not supported by an effective Research and Development Taxation Incentive (R&DTI) program that fosters an environment of innovation, commercialisation and export of high-quality Australian AI products and services’ (Anonymous 2019: webpage).

Loucks et al. (2019) reported that Australian industry, including the finance and insurance sector, was ranked highly among industry adopters among developed countries, but revealed the government policies were inadequate:

While there is not yet a dedicated national AI strategy, the government recently published “Australia’s Tech Future.” The plan touches upon the economic importance of AI, as well as skills shortages in AI and data science, as part of a broader discussion of opportunities presented by digital technologies. The 2018–19 national budget allocated AU\$29.9 million over 4 years to boost the country’s AI capabilities, including the development of a technology road map and frameworks for standards and AI ethics. However, AI experts are issuing warnings that greater levels of spending will be needed for Australia to keep up with other countries that are lavishing public funds on AI initiatives (Loucks et al. 2019: 10).

Deloitte (2020: webpage) highlighted the lack of government policy with clarity in these words: ‘No national strategy or proper funding.’ It claimed that Australia did not have a ‘dedicated national AI strategy’ despite several ‘prominent Australian business and industry leaders ... urgently pushing for {a} national debate on the policies needed to address AI risks (Deloitte 2020: webpage). The same report cited industry leader comments critical of the meagre ‘2018-19 federal budget’ allocation

of ‘AU\$29.9 million over four years to boost the country’s AI capabilities, including the development of a technology roadmap to build standards and ethics’ (Deloitte 2020: webpage).

The report further stated that AI experts have warned that significantly increased levels of spending are required for Australia to keep pace with other countries. ‘China for example ... has a comprehensive national AI strategy and plans to spend billions to become a world-leading AI innovator. Beijing announced a US\$2.1 billion AI-centric technology park, and Tianjin plans to set up a US\$16 billion AI fund (Deloitte 2020: webpage).

Smith (Smith 2019a, b) reflected the concerns expressed by Deloitte (2020) and Loucks et al. (2019) and revealed added detail on what can be described as a paltry AI policy commitment by government. He stated that ‘Australia’s funding for AI-related initiatives has been comparatively thin’ when compared with other developed countries’ (p.5). In policy announcements before the last federal election, the Coalition government did not raise the AI challenges. The Minister for Industry, Science and Technology at the time and also and still occupying this position as this chapter is penned, The Honourable Karen Andrews MP said that ‘the government had invested \$29.9 million in artificial intelligence development under the 2018-19 budget’ (Smith 2019a, b, p. webpage). But this was not reported. Deloitte (2020), however, reported that this money was spread over 4 years, which further dilutes the impact of this meagre investment. The policy on AI in terms of expenditure is out of fiscal context. Hajkowicz et al. (2019) outlined a catalogue of statistics emanating from compelling research which showed that ‘digital technologies, including AI, is potentially worth AU\$315 billion to the Australian economy by 2028 and AI could be worth AU\$22.17 trillion to the global economy by 2030’ (p.v). To state the obvious, the \$29.9 million in artificial intelligence development under the 2018–19 budget spread over 4 years represents such a small fiscal commitment that Australia may arguably be destined for an economic state of disadvantage.

Smith (2019a, b) provided further insights into government policy inactivity by stating that the Minister for Industry, Science and Technology” admitted that political leadership in the area has been limited, but said she recognised that AI had the potential to provide significant social, economic and environmental benefits.’

In the past, I think politicians have been hesitant to talk about artificial intelligence because of the genuine concern in the community around the future of work,“ she said. “I want to assure Australians that AI will be a job creator, particularly if we get ahead of the curve and maximise Australia’s role. (Smith 2019a, b, p.5, citing Minister Karen Andrews).

To summarise this section, fears that Australia will be left behind due to minimal AI spending and policy commitment appear to have some merit.

France has committed €1.5 billion (\$2.4 billion) over 5 years leading up to 2022. The South Korean government committed to 2.2 trillion won (\$2.7 billion) over the same period. India and the European Union also published ambitious AI strategies. Canada pledged \$C125 million (\$131 million) over 5 years starting in 2017. Singapore committed \$S150 million (\$155 million) from 2017 to 2022. Despite Australia’s \$29.9 million being almost fully committed already, Ms. Andrews told



The Australian Financial Review she didn't believe Australia was under-investing in AI initiatives. (Seo 2019: webpage).

## **Key Technologies**

Five areas are outlined below where AI is expected to be influential. The examples mostly refer to banks, but similar examples will also apply to insurance.

### *AI Aided Customers and Self-Service*

First, in the customer interface, this decision-making technology and other IT software can be made accessible for customers to produce services themselves (De Keyser et al. 2019; Larivière et al. 2017; Wirtz et al. 2018) with the effect of reducing the number of branch offices to the bare minimum and leading to the replacement of humans with robots call centres. Robo-advisors, which involves using software that enables customers to interact via a web interface to receive investment advice, moves this back-office activity to the front-office. Robo-advisors reduce fees and provide around the clock access to financial advice (Park et al. 2016). Robo-advisors have been embraced mostly by early adopters to date (Jung et al. 2018; Ryu 2018).

### *AI and Lending Decisions*

Second, lending decisions are a typical application of standard machine learning. Decision support with regard to lending would, first of all, use the information that the manual banker uses for lending decisions, although many other data sources may be utilised such as the: online behaviour of potential clients, online ratings for small business (Sigrist and Hirschnall 2019), account-level credit card data, credit bureau data (Butaru et al. 2016), internal due diligence reports (Zhang et al. 2015), social media data, utility bills and telecom data (Onay and Öztürk 2018). Credit scoring with machine learning is sold by AI developers, who make tailored applications according to the data the financial institutions have. Where credit scoring has been undertaken with statistics (for example, logistical regression), it can be improved with the integration of various technologies, or as demonstrated by a recent finding, with Grabit. Grabit uses a combination of methods (Sigrist and Hirschnall 2019). Grabit can extract mega data from multiple file types that are readable and convert data sets into matrices that significantly improve predictions on likely defaults with business loans methods (Sigrist and Hirschnall 2019). This is because these methods can make more efficient use of data as well as data that has

been found to be unsuitable for statistical methods (Khandani et al. 2010; Li et al. 2016).

### ***AI – Deposits and Payments***

Third, deposits and payments are computerised but require surveillance due to customer security needs and loss reduction. However, financial regulation and surveillance are expensive. A large fraction of the staff in banks and insurance companies work directly or indirectly with internal controls to ensure compliance with the regulations. The advantage of using AI for monitoring compliance in financial institutions is that computers can monitor all transactions all of the time and react to non-compliance instantly (Shilts 2017). In contrast, human surveillance uses sampling, and there is a time lag of weeks or months between the occurrence of a breach and corrective action (Alles et al. 2006; Sahin et al. 2013). Another benefit is that AI is more efficient. Its application in fraud prevention and it can detect more complex, nuanced, fraudulent attempts, predominantly due to the increased capacity of calculating and even predicting possible fraud. Software such as RegTech for banks is available that ensures that processes are compliant with regulations. There are modules for specific parts of banking such as investment management which is an application dominated by a few software suppliers (Butler and O'Brien 2019). The potential for the technology to survey regulatory compliance, referred to as RegTech, is large and a majority of large firms have had plans to use machine learning in continuous internal control which shows that constant auditing and similar applications will be used when applications are available (Baker 2009). AI is used in two predominant ways when detecting fraud and reducing losses. This includes front-end and back-end implementations (Choi and Lee 2018), which incorporates two stages that compare incoming transaction history to check for anomalies, use machine learning algorithms and resolve false alarms that identify suspected irregularities that are further checked via fraud history databases. Choi and Lee (2018) showed evidence supporting the conclusions that machine learning shows more efficiency in predicting and detecting fraudulent transactions than statistical methods. Machine learning is the standard approach in commercial applications of fraud detection and loss reduction (Choi and Lee 2018; Soviany 2018).

### ***AI and Credit Card Fraud***

Fourth, credit card fraud is a vitally important aspect in finance firms' fight against fraud. The massive increase in E-Commerce, and the use of credit cards online for purchasing, has led to more resources being used by financial firms to increase

security on their financial instruments, such as credit cards. The previous strategy of simple data matching techniques is deemed insufficient in this age of online transactions. Methods related to new ways to prevent fraud and loss include data mining, fuzzy logic, sequence alignment and genetic programming. Sequence alignment and genetic programming involve the development of algorithms to signal suspicious transactions and identify patterns of behaviour warranting further investigation at a level beyond human capability as it applies to massive data sets. (Raj and Portia 2011). Such AI methods apply to insurance fraud monitoring, and accomplished fraud detection using the same technique (Raj and Portia 2011; Pathak et al. 2005).

### ***Business Planning***

Fifth, AI can assist top management with business planning as per its use by researchers and for the development of credit scores. Cash flows in ATMs can be predicted with an Artificial Neural Network (ANN) (Serengil and Ozpinar 2019). The number of cash transports related to ATMs and branch offices will be estimated with higher accuracy with machine learning than manual calculations (López Lázaro et al. 2018). Finally, marketing managers will use data to make targeted offers to customers in similar ways to those used in internet-based firms (Martens et al. 2016).

In something akin to a game of ‘follow the leader’, we can expect the testing of the processes implemented to achieve the desired outcomes viewed voraciously by competitor organisations as they learn which practices will be accepted by major stakeholders, such as the government, unions and society in general and what will and what will not be accepted, before embarking on what may be ‘job-slashing expeditions’.

### **Employment Impact**

A summary of the jobs that will be affected by AI is outlined in this section as well as some predictions concerning the impact of AI on finance jobs in the future.

Commissioner Hayne’s (2019) final report on the Australian Royal Commission into Misconduct in the Banking, Superannuation and Financial Services Industry was released to the public on 4 February 2019. The findings from Hayne’s (2019) report provide an interesting perspective on the ethics, governance, leadership and management within this sector. Specifically of interest is how the increased integration of AI within the sector, due to its cost-effectiveness and efficiency, might

provide a strong impetus for change to occur much sooner than adequate policies and frameworks are developed to address malpractice and greed around AI integration. The final Hayne report detailed seventy-six recommendations and twenty-four referrals to the judiciary for criminal conduct among three of the four biggest Australian banks (Hayne 2019). There were also prominent recommendations that the senior figures in one bank were worthy of serious review, which resulted in resignations (Hayne 2019).

So the question arises as to whether the implementation of AI, given the apparent zeal for increased profits in this sector, will result in many redundancies? Jobs under the most significant danger from automation include those that are described as routine, repetitive tasks conducted physically and cognitively (Frey and Osborne 2017; Manpower Group 2018; O'Neill 2017; Susskind 2020; WEF 2016). The finance insurance industry is not immune to this problem. Frey and Osborne (2017) examined 702 occupations and identified significant risks for office and administrative support workers, and labour in production occupations – many of which permeate the insurance and finance industry. Manyika et al. (2017) also pointed to numerous large-scale studies which asserted that many jobs were at risk. They contended that the fourth industrial revolution, propelled by emerging technologies would “obliterate” activities that involve work of a routine nature. Susskind (2020), however, concluded that over the next two to three decades, as long as the pace of change is not too fast, employees will move to other jobs using many skills they already possess with a need to adapt to new tasks due to technological disruption.

Huang and Rust (2018) described AI as a source of innovation that will gradually replace human jobs in the future. They estimated that technology would develop through phases with mechanical intelligence first, then analytical capacity (for example, robo-advisors) and, in the distant future, intuitive and even empathetic intelligence (Huang and Rust 2018). These researchers reflected Susskind's (2020) research which asserted that the jobs requiring creativity, innovation and empathy were destined to be marginally impacted upon for well beyond three decades. The mechanical intelligence positions that Huang and Rust (2018) referred to would be at risk significantly within the next two decades. In the finance and insurance sector, these jobs would include accounts and bank clerks, secretaries, receptionists, call centre staff, credit and loans officers, debt collectors, financial dealers, financial investment managers and advisers, general clerks, and information officers and insurance, money market and statistical clerks, keyboard operators, and personal assistants would either decline or experience limited growth (Job Outlook 2020), for further details see Figs. 8.1 and 8.2 below.

## **The Following Case Study Illustrates the Effects of AI on Employment in One Key Australian Bank**

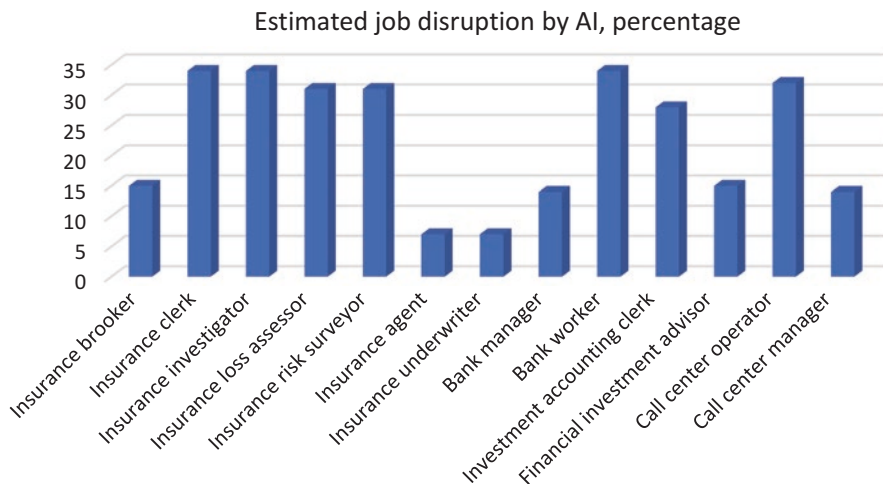
### **Case Study 8.1 – National Australia Bank (NAB)**

A point-to-case within the banking sector is NAB, as outlined above. NAB retrenchments began in February 2018 and were comprised mainly from the head office in Melbourne, where artificially charged software is now focused on tasks that were once considered too complicated (Ziffer 2018).

Primarily, the job losses were linked to the digitalisation and robotics of banking services, the loss of retail staff due to online banking and ATMs, and the loss of administrative support staff due to technological change and the offshoring of services (Ziffer 2018). Despite NAB being very profitable, in February 2018 the National Australia Bank (NAB) commenced departing with 6000 people as jobs were slashed (Ziffer 2018). The staff cuts represented 20 per cent of NAB's labour force (Ziffer 2018). The massive number of redundancies that occurred mainly in February 2018 was announced in November 2017 on the same date the bank announced its annual net profit of A\$5.3 billion for the fiscal 2016/2017 year (Ziffer 2018).

Circumstances indicate the pressure is on for banks to reduce costs, increase productivity and eliminate jobs (Reuters News 2018). The question is, where is this "pressure" coming from? Internationally the sector was planning transformation in its production and service processes, and significant job losses are occurring with further job cuts projected (Reuters News 2018). New banks were predicted to emerge based on mobile phone technology and automated services with minimal local staffing requirements, leading to predictions that half of all jobs in the sector would disappear (Fletcher and Kreps 2017). At the same time, it was projected that new jobs, mainly in IT management would be generated; in the case of NAB, the forecast is for an additional 2000 jobs in this area (Ziffer 2018). While NAB had indicated that it would have a consultative and supportive approach to the process of managing the redundancies, the main union representing employees in the sector, the Finance Sector Union, had criticised the approach of NAB over its program of managing the redundancy process (Han 2018). 'NAB has since hired more than 2000 staff, almost exclusively in roles dealing with new technology, like augmented reality, artificial intelligence and machine learning' (Ziffer 2019: webpage).

Further disruption to NAB jobs is occurring as over 2600 staff reapply for jobs in three divisions as this 'financial giant restructures itself as it deals with the fallout from the coronavirus pandemic' (Bonyhady and Yeates 2020: webpage). In 2020 350 more NAB staff are facing likely redundancy (Bonyhady and Yeates 2020).



**Fig. 8.1** AI disruption: Jobs in the finance/insurance sector “At Risk” (Byrd et al 2017)  
Source: Developed by authors based on data from Bertomeu et al. (2020)

## Challenges & Opportunities

We suggest that comparisons with previous technological changes may lead to false conclusions. The rationalisation of jobs that is now at our doorstep will create an effect on employment in a much more profound way than the automation of manufacturing because AI mechanises the minds, not the hands of skilled workers. The combination of two circumstances is why we anticipate that the broad entry of AI to the finance sector will be a discontinuity to the employment on a never-before-seen scale. The first circumstance is the general versatility of AI: AI is predominantly a set of techniques for making decisions automatically (Agrawal et al. 2019). As long as tasks can be described as decisions and as long as decision premises are made on data that can be made available in databases, there are a good chance that some AI applications will be useful. The second circumstance is that most activities in banks and insurance companies are decision-making or can be rephrased as such. In addition, the data are, or soon will be, stored in databases.

The Economic modelling firm AlphaBeta have developed estimates for anticipated job disruption from AI adoption in Australian businesses (AlphaBeta 2017). Their estimates were derived from an analysis of the existing US government database ONET, which describes tasks in every occupation. The calculations were developed by converting the US data so that it would fit the Australian context. For example, a factory worker operates equipment and monitors facilities. The database contains more than 2000 such work-related activities covering a substantial number of jobs in the finance sector.

Tasks were placed into one of six groups depending on the type of work they represent. Tasks requiring interaction with other people were assigned to a group

Occupation	Susceptibility to Automation %
<ul style="list-style-type: none"> <li>• <b>Typist</b></li> <li>• <b>Keyboard Operators</b></li> <li>• <b>Data Entry Operators</b></li> <li>• <b>Machine Shorthand Reporter</b></li> </ul>	52%
<ul style="list-style-type: none"> <li>• <b>Receptionist (General)</b></li> </ul>	35%
<ul style="list-style-type: none"> <li>• <b>Call Centre Supervisor</b></li> <li>• <b>Call or Contact Centre Information Clerks</b></li> <li>• <b>Information Officer</b></li> </ul>	32%
<ul style="list-style-type: none"> <li>• <b>Debt Collector</b></li> <li>• <b>Insurance Investigator</b></li> <li>• <b>Insurance Loss Adjuster</b></li> <li>• <b>Insurance Risk Surveyor</b></li> <li>• <b>(Miscellaneous Clerical and Administrative Workers)</b></li> </ul>	31%
<ul style="list-style-type: none"> <li>• <b>ICT Quality Assurance Engineer</b></li> <li>• <b>ICT Test Analyst</b></li> <li>• <b>(and ICT Network and Support Professionals)</b></li> </ul>	25%
<ul style="list-style-type: none"> <li>• <b>General Clerk</b></li> </ul>	21%
<ul style="list-style-type: none"> <li>• <b>Business Systems Analyst</b></li> <li>• <b>Business and Systems Analysts</b></li> <li>• <b>Programmers</b></li> <li>• <b>Software Programmer</b></li> <li>• <b>(Business and Systems Analysts, and Programmers)</b></li> </ul>	17%
<ul style="list-style-type: none"> <li>• <b>Sales and Marketing Manager</b></li> <li>• <b>Advertising, Public Relations and Sales Managers</b></li> <li>• <b>Finance Manager</b></li> </ul>	14%
<ul style="list-style-type: none"> <li>• <b>Insurance Agent</b></li> <li>• <b>Insurance Agents and Sales Representatives</b></li> </ul>	7%

**Fig. 8.2** Can a robot perform jobs in finance and insurance?

Source: Created by the authors using occupations listed in the finance and insurance industry by Job Outlook (2020) and job susceptibility due to automation forecasts by Byrd et al. (2017)

named “interpersonal” and tasks such as reviewing documents or monitoring facilities were assigned to a group named “information analysis.” Each of those groups of tasks was rated as “difficult to automate” or “automatable.” Researchers could then calculate how much of any job was “difficult to automate” and how much was “automatable” (AlphaBeta 2017).

From Fig. 8.1 the estimate indicates that approximately twenty per cent of tasks for this sample of jobs can be automated. Because technological development is so rapid in the finance area, perceptions of what can be automated may change in just one or 2 years. Notably, insurance broker and financial investment advisor positions

should probably be reassessed in the light of the recent deployment of robot advisors, despite these jobs involving empathy and interpersonal understanding. Moreover, several jobs are professional and require substantial education and would, therefore, traditionally not be the first to be replaced by machines.

Nevertheless, 14% of bank managers' jobs were labelled as automatable (AlphaBeta 2017). Several highly analytical jobs in insurance companies, e.g. insurance risk surveyor, which is an entirely analytical back-office job, and an insurance investigator involving the inspection and assessment of damage and loss to insured property and business may be hit by more than a 30 per cent decrease. The job of an insurance risk surveyor who assesses the potential financial risk posed by offering insurance cover, providing underwriters with information about how to reduce risk or whether insurance cover should be offered, may be even worse off because this job requires computerised data and ultimately comprises numerically supported decisions much like credit rating or fraud detection, which is exactly what a machine learning application can do better than most humans (Bertomeu et al. 2020). Call centre operator positions will also suffer more in the coming 10 years from the impact of chatbots. Figure 8.2 illustrates estimates of a selection of key roles in the finance and insurance industry.

If an occupational area is going to be disrupted by AI, by a certain percentage, this could signal redundancy. If computer technology, for example, can in time perform a third (33.3%) of a person's job this could mean that three people in the same job could be replaced by two people as one person may be surplus to needs and could face redundancy unless they can migrate to a new position with an organisation. Figure 8.2 provides an estimate of job disruption in the sector.

### ***Impact on the Sector Due to COVID-19***

The certainty of COVID-19 having a substantial negative impact on labour market activity in Australia in the next year or more is apparent (Australian Government 2020). There is considerable uncertainty around the economic implications of the virus and the magnitude of the changes to employment that will result (Australia Government 2020). While the overall finance industry subdivision is not directly affected in terms of trade and supply chain disruptions, it is projected that it can be indirectly impacted by movements in the financial markets and adjustments to the cash rate (Wu 2020). Furthermore, lender's profitability and net interest margins are likely to be squeezed with a significant impact on employment. However, the extent of this disruption is too complex to forecast, particularly given the volatility in financial markets both locally and abroad (Wu 2020).



## Conclusion

This overview of the potential impact of AI on jobs and opportunities in the Australian finance sector suggests three conclusions.

First, we find that jobs will likely be substantially impacted in the foreseeable future, and most likely, 15–30 per cent of employment will be in the risk zone. Although some jobs may be even more in demand, the net effect will be that many tens of thousands of people will face the challenge of finding something else to do because their jobs will become redundant. It is anticipated that many of those employed in the finance and insurance sector will be professionals who never imagined that they would 1 day suffer the same fate as maybe their grandparents did who worked in factories or farming. Losses will occur repetitive jobs and in analytical and decision-making jobs that may currently be well-paid and highly regarded. If the Australian Government does not work to address the situation, we predict that many people are unlikely to manage a transition to the new finance sector.

Consequently, it is recommended that the Australian Government revise its policy when the COVID-19 pandemic subsides. It is essential for this nation's prosperous and productive finance sector to work to ensure that the positive aspects of the impending AI revolution are emphasised for the Australian people, their banks, insurance companies and the staff employed in the sector. The pandemic has shown that national and state leadership is essential for Australians, which means that tackling the AI revolution in finance should be approached with an effective and well-planned national policy which is currently conspicuous through absence.

Second, most of the potential for AI in banks and insurance companies is in places where it cannot be seen as it is invisible. The visible applications are in customer service, but while it is not impossible to make a chatbot that answers many questions, we are not the only customers who have felt frustration when dealing with a machine that will not comprehend the issue that requires resolution. Therefore, we assert that the myriad relegated tasks to the “back-office” are more at risk of being automated. Back-office automation may connect a human insurance salesperson with a sales support system that consists of purely AI-type software that every second computes optimum insurance terms for thousands of insurance policies. Based on the research in this brief chapter, the indications are that lending decisions, insurance policy agreements, deposits and payments, internal controls such as loss prevention and fraud detection are among an array of transactions that will be automated with machine learning applications within a foreseeable future.

Our third and final point is brief and concerns the Hayne (2019) Royal Commission into Misconduct in the Banking, Superannuation and Financial Services Industry. This report indicated that an element of greed and bonuses was driven by illegal activities to increase profits and deliver higher share market results and dividends in the sector. This industry sector allegedly indulged in a litany of misdemeanours leading to a crucial question. As banks and insurance companies have been exposed for their repeated practices of mistreating their customers, flouting regulations and the law and consequently have faced many financial penalties,

will they now respect the work of their staff and strive to maintain people as employees? The track record of the four major banks in Australia suggests otherwise. The quest for profit and bonuses in such toxic cultures, as uncovered by the Royal Commission (Hayne 2019), means that it may be difficult for such a culture to change. Hence, as pointed out previously, embracing AI at the expense of people's jobs may be a problem needing government policy intervention, particularly in this sector.

Although the impact on jobs in the finance sector is difficult to predict, research suggests that many positions may be obliterated and disrupted in this industry sector to a level unimagined and unprecedented.

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