Economic Value of NATA Accreditation in Australia

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NATA

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Foreword

NATA accreditation is an integral part of Australia's technical infrastructure and contributes to the Australian economy as well as adds value to the members' business.

In order to demonstrate the quantitative and qualitative aspect of NATA accreditation's contribution to the welfare, safety, and economic well-being of Australia, NATA commissioned University of Technology Sydney (UTS) to undertake the research and prepare this Report *"Economic Value of NATA Accreditation in Australia."* (Report)

According to the Report, the estimated economic value of NATA accreditation to Australia is between $315M and $421M per year, including a $14.3M contribution by our volunteers who serve in their respective role as technical assessors, technical advisers, and Board members.

The average of the estimated economic values equates to approximately $1M a day.

As a not-for-profit member owned organisation, NATA believes it is important for the Government, stakeholders, members, and the community to be informed of the economic value of the contribution made by NATA and its volunteers to Australia.

NATA is also gratified with our members' pride and commitment to NATA as reflected in the following quote from one of our members:

"Becoming NATA accredited shall never be deemed as a right, but as a privilege and recognition of deserving excellence in testing, superior reporting and keeping abreast of becoming an industry leader."

I thank the UTS team for its high quality scholarly research and significant contribution to the understanding of the economic value of NATA accreditation in Australia.

I have enjoyed reading this Report and hope readers will find the Report informative, relevant, and useful.

Geoff Hogg
Chair, NATA

Preface

There is general recognition that the National Association of Testing Authorities, Australia (NATA) adds significant value to the Australian economy through its accreditation services for laboratories, inspection bodies and proficiency testing scheme providers. But how much value in quantitative terms has never been properly assessed, until now.

The University of Technology Sydney is pleased to have been given the opportunity to make such an assessment across NATA's five sectors of accreditation – Inspection, Infrastructure, Calibration, Life Sciences and Legal and Clinical. And in doing so we have applied a combined survey and interview-based research methodology in five key areas of impact – Importance of Recognition, Standards and Quality, Efficiency and Productivity, Innovation, and Organisational Culture.

We conclude that the direct value of NATA's contribution to the Australian economy is somewhere between AUD $315-421 million. However, this is necessarily a conservative estimate as it is impossible to put a value on the intangible benefits of accreditation. What is clear is that accreditation in this context provides both direct and indirect benefits to consumers of intermediate and final goods and services, and hence to the economy and society more widely.

Emeritus Professor Roy Green
University of Technology Sydney

Executive Summary

The National Association of Testing Authorities, Australia (NATA) is Australia's national authority for the accreditation of laboratories and producers of reference materials, and a peak body for the accreditation of inspection bodies and proficiency testing scheme providers. NATA believes that Australia has an effective and internationally recognised conformance infrastructure and as such, its activities have a 'whole of society' or Australia wide national impact. However, to date, there has been no robust analysis of the economic value of the contribution that NATA's accreditation service provides to the Australian economy.

To provide a quantifiable measure of this economic value to the national economy, NATA has commissioned the University of Technology Sydney (UTS) to conduct research to address this gap focused on NATA's five sectors of accreditation: Inspection, Infrastructure, Calibration, Life Sciences and Legal and Clinical. The five phases of project delivery included:

- A literary overview introducing the economic role of technical infrastructure in an economy and the role of NATA's accreditation as part of the technical infrastructure. The literature review draws specifically on three scholarly pieces of accreditation value research (Frenz and Lambert 2014; Swann 2010 and Deloitte 2011) to develop the foundations for configuring the economic model and to design the blended quantitative and qualitative empirical data collection,
- Development of an economic model and rationale for measuring economic benefit of accreditation in the Australian economy and NATA's contribution in safe-guarding community safety from non-conforming products and services, redressing information asymmetry between sellers and buyers of products and services, reducing transaction costs, encouraging innovation, and facilitating reduction of technical and regulatory trade barriers. The model explains accreditation as a derived benefit to the economy and identifies the limitations in quantifying the economic value of its contribution to the Australian economy,
- Data collection using two survey instruments with NATA member organisations. Firstly, a preliminary quantitative online survey using survey software which captured responses from 253 of the 1919 NATA member organisations. The online survey data gathering was followed by semi-structured interview discussions with 24 member organisations from each of the five sectors, to develop organisational stories to complement the survey data, and
- Analysis and findings involving a cross-case analysis of the qualitative data gathered and presentation of the research findings.

As a result of this thorough research design approach, this report presents the attributes of a quality accreditation infrastructure system at a micro (company), meso (industry) and macro (global) level. More specifically, it analyses the attributes of NATA accreditation distributed across five key themes exploring the benefits of NATA accreditation – Importance of Recognition, Standards and Quality, Efficiency and Productivity, Innovation, and Organisational Culture.

Economic Value of NATA Accreditation in Australia

NATA accreditation provides indirect but real benefits to the **community and consumers**

NATA volunteers contribution is estimated at **AUD $14.3M**

Total economic value estimated between **AUD $315M and AUD $421M**

Importance of Recognition

- A total of 81% of online survey respondents view NATA accreditation as quite important to their business operations.
- The most common factor for pursuing NATA accreditation relates to the increased recognition levels it creates at the micro (organisation) level when meeting customer expectations, in providing a competitive advantage and for marketing and branding purposes.
- For the meso (industry) level, NATA accreditation contributes to creating a level playing field across the industry more generally and by promoting best practice as a collective industry group.
- Nationally and globally, at the macro level, NATA accreditation generates collaboration that stimulates new knowledge, builds credibility, opens new markets and increases trade opportunities.

Standards and Quality

- NATA accreditation improved internal confidence at the micro and meso levels for 58% of online survey respondents, enabling organisations to maintain consistency and quality, receive external feedback from an independent third-party assessor, thus allowing them to meet regulatory requirements where mandated to do so.
- As a result of NATA accreditation, the total estimated economic value of standards and quality to the Australian economy is estimated within the range of AUD $108.2m and AUD $130.7m.

Efficiency and Productivity

- NATA accreditation made a significant contribution to efficiency for 22% of online survey respondents.
- The total estimated economic value of the cost efficiencies arising from NATA accreditation are estimated to be in the range of AUD $38.1m and AUD $46.3m.

Innovation

- Just over half (56%) of online survey respondents indicated accreditation positively impacted organisational innovation levels.
- The remainder of the online survey respondents suggested that NATA accreditation had no impact (36%) with (8%) reporting a negative impact on organisational innovation levels.
- Where accreditation provided a positive impact, this mainly contributed to improvements in efficiency levels, building new knowledge and process innovation.
- The estimated economic contribution accreditation brings in the form of innovation is estimated between AUD $154.5m and AUD $229.2m.

Organisational Culture

- NATA accreditation was found to be of most value in firms that displayed qualities of vision, leadership, collaborative learning, had a strategy for innovation in place and focussed on quality and customer satisfaction.
- The role of volunteers and their technical assessment was considered a valuable contribution to the firm and industry.
- The estimated economic value of technical assessors primarily arising from volunteer services to the Australian economy is estimated at AUD $14.3m.

Overall, the estimated value of NATA's contribution to the Australian economy is between AUD $315m and AUD $421m.

In conclusion, accreditation provides indirect but real benefits for the community and consumers of intermediate and final goods and services. This research report highlights the measureable and intangible attributes of NATA accreditation as a contributor to the Australian economy. Whilst the estimated measureable economic worth represents a value of between AUD $315m and AUD $421m, to place a value on the intangible attributes of accreditation is impossible as the services NATA provides are intrinsically woven within the fabric of the Australian business, economy, and society.

Glossary of Terms

AAC	Accreditation Advisory Committee
BMTA	British Measurement and Testing Accreditation
BSI	British Standards Institute
CAB	Conformity Assessment Body
CAL	Calibration
CPI	Consumer Price Index
GDP	Gross Domestic Product
INSP	Inspection
ISO	International Organization for Standardization
JAS-ANZ	Joint Accreditation System of Australia and New Zealand
NATA	National Association of Testing Authorities
R&D	Research and Development
UKAS	United Kingdom Accreditation Service
UTS	University of Technology Sydney
SME	Small to Medium Enterprise
TA	Technical Assessor
TEST	Testing

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Introduction

1 Introduction

Established in 1947, the National Association of Testing Authorities, Australia (NATA) is Australia's national authority for the accreditation of laboratories and producers of reference materials, and a peak body for the accreditation of inspection bodies and proficiency testing scheme providers. NATA believes that Australia has an effective and internationally recognised conformance infrastructure and as such, its activities have this 'whole of society' impact.

To date, there has been no analysis of the economic value of NATA's contribution to the Australian economy. In 2013, a research project was commissioned by the Department of Business, Innovation, and Skills – Gov. UK to determine the Economics of Accreditation in UK (Frenz and Lambert 2014).

The results of the UK study highlighted that supporting a quality infrastructure enabled higher quality, more innovative and safer economic activity. In addition, the study calculated the immediate value to users, as measured in consumers' willingness to pay and service quality benefits, at an estimated £295m per annum, and innovation activity supported growth and productivity attributable to the rest of the infrastructure added a further estimated value of £320m per annum. Therefore, the total measureable benefits of accreditation and technical infrastructure were estimated to be approximately £600m per annum. Similarly, in 2011, Deloitte Australia undertook a qualitative evaluation of the economic contribution of the Joint Accreditation System of Australia and New Zealand (JAS-ANZ) which presented case studies on the basis of consultation with organisations engaged in conformance assessment activities and services. However, no similar study to the UK report on the economic value of NATA accreditation has been undertaken to quantify the economic value of accreditation to the Australian economy.

NATA has commissioned researchers at the University of Technology Sydney (UTS) to conduct research to address this gap. This report determines the economic value of accreditation in Australia covering five NATA designated accreditation sectors: life sciences, legal and clinical, infrastructure, calibration and inspection. This report provides:

- an economic value of accreditation in Australia, and
- insight into the economic benefits of accreditation.

1.1 Background

Conformity assessment bodies evaluate whether a product, service, business process or an organisation conforms to a specific standard in quality, health or safety, to name a few. Thus, rather than an organisation self-declaring that its own product, service or process meets a specific standard, a third-party, typically an external assessor, performs this service on behalf of the organisation. This assessment verifies conformity with the standard and alleviates any ambiguities on the side of the end user that the standard has been adequately met (Swann 2010). External assessors are referred to as 'conformity assessment bodies' (CABs) which can be self-appointed organisations, created by a trade association or the outcome of an agreement between several businesses in an industry. Each CAB can carry out tasks such as calibration, testing, inspection and certification. Thus, accreditation is the attestation of CAB's technical competence for a defined set of testing, measurements, calibrations, certification and inspections. In short, accreditation can be viewed as a third-party endorsement of the competence of CABs to carry out a defined set of tests.

In Australia and New Zealand, JAS-ANZ provides accreditation for CABs for certification and inspection. NATA provides accreditation in Australia for laboratories and producers of reference materials, and is a peak body for the accreditation of inspection bodies and proficiency testing scheme providers in Australia.

The research literature describes accreditation as the external validation of CABs and the impartial evaluation of the effectiveness of external assessors (Frenz and Lambert 2014).

Plainly put, it is about 'assessing the assessors' or as defined in ISO/IEC 17011, it is the 'third party attestation related to a conformity assessment body conveying formal demonstration of its competence to carry out specific conformity assessment tasks' (International Organization for Standardization 2004). NATA proposes that the important meanings in this definition are 'competence' and 'specific tasks' (NATA 2006).

The fundamental purpose of accreditation is to determine technical competence and to have such competence recognised for a defined scope of activity, rather than to provide blanket acceptance of capability.

Hence, for NATA in an Australian context, the primary accreditation roles are to formally recognise the competence of testing, measurement and calibration laboratories for specific tests or types of tests, inspection bodies for specific inspection functions and producers of certified reference materials to assign 'certified' values to the specific materials or types of materials that they produce (Stanton and Davies 1998).

1.2 NATA – An organisational snapshot

NATA is the Australian accreditation authority responsible for assessing and ensuring competence of the relevant CABs. NATA's role is to ensure that members' accredited facilities are competent in providing consistently reliable testing, calibration, measurement and inspection data to government, industry and the wider community, through expert independent third-party assessments. NATA proposes that it benefits the Australian economy by (NATA 2016):

- supporting customers with effective accreditation services to promote growth,
- facilitating community understanding,
- achieving the public interest goals and meeting stakeholders' expectations,
- providing quality services and meets customer needs at a competitive price,
- adapting practices, systems and technology to better serve NATA stakeholders,
- ensuring staff are motivated, skilled and committed to high performance, and
- ensuring volunteer technical assessors and members of the Technical Committee remain an integral part of NATA and their contributions recognised and valued by NATA and the community.

NATA's strategic areas of importance include leadership, stakeholder engagement, operational excellence and skills and knowledge as per the NATA Mission and Strategic Plan 2016, highlighted in Table 1.1.

Table 1.1: Strategic areas of importance (NATA Mission and Strategic Plan 2016-2018)

Leadership & Profile	Stakeholder Engagement	Operational Excellence	People	Innovation and Technology	Growth and Security
Public safety, productivity and technical infrastructure improvements	Provide accreditation programs and related activities that meet stakeholder needs	Deliver a quality service at a reasonable cost	Staff have technical knowledge, customer service skills and motivation to deliver quality services	Maintain a contemporary technology infrastructure to support the interface with stakeholders, clients, volunteers and community	Develop and maintain functional capability and operational capacity to meet the needs and growth of stakeholders, customers and provide opportunity for people
Representation in international accreditation dialogue	Consultation and collaboration	Innovative business model that meets client's needs	Volunteer technical assessors and committee members recognised for technical expertise	Deploy technology supporting product innovation, business process transformation and improvements in service delivery	Maintain a prudent risk management framework
Promotion of trade through reduction in technical barriers to trade	Transparent and efficient	Responsive to future client requirements	Staff and volunteers have appropriate mix of skill, experience and expertise, and are maintained by effective succession planning	People equipped with appropriate technology to enhance contributions to NATA's objectives	Maintain a sound financial structure and adequate reserve to secure NATA's future

NATA is a not-for-profit organisation and provides accreditation through the expertise of over 3000 technical volunteers for a wide range of facilities in such areas as pathology, diagnostic imaging, environmental analysis, food, water, pharmaceuticals, concrete, asbestos, toxicology, electrical equipment, IT, biotechnology, and many more.

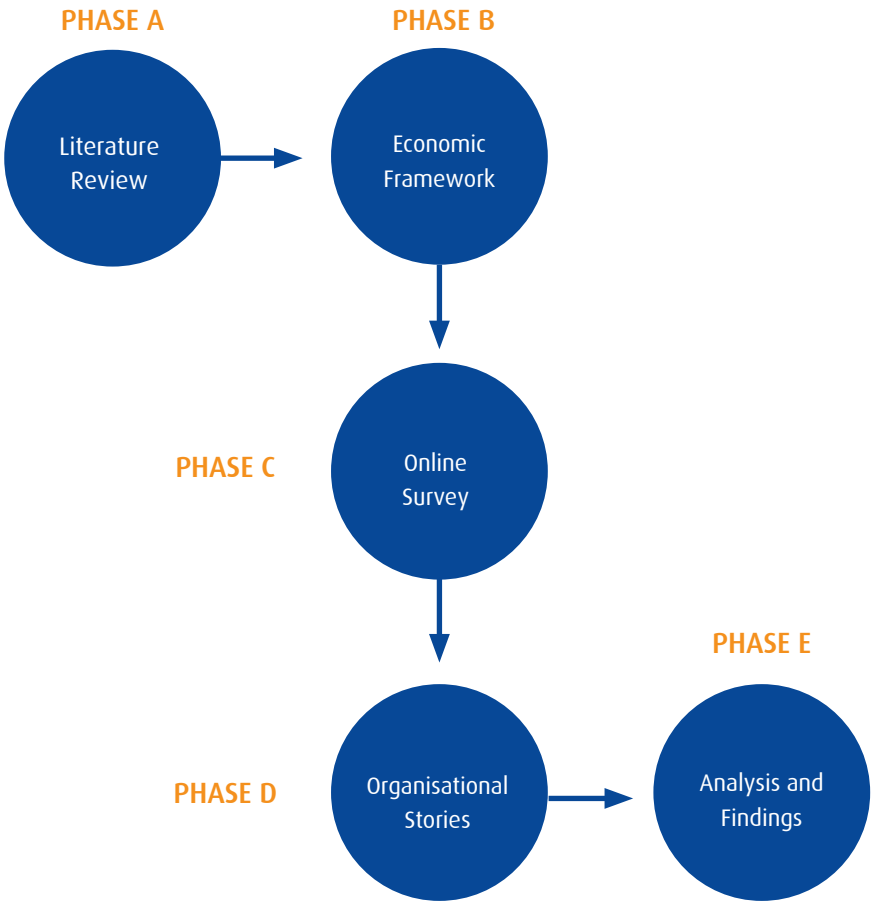
Against this background, this report is guided by two research aims:

1) How does NATA accreditation benefit the Australian economy?

2) What is the value-add (economic value) of NATA's accreditation services to Australian businesses?

The report delivers these insights by employing five phases of research design illustrated in Figure 1.1. Phase A involved conducting a desktop literature search that provided an overview and an introduction to the economic role of technical infrastructure in an economy including the role of NATA's accreditation as part of the technical infrastructure. Phase B involved the development of an economic model to determine the economic value of accreditation and NATA's role in this process. These steps were supported by Phases C and D, the quantitative (online survey) and qualitative (organisational stories) methodology for assessing the specific contribution of NATA to Australia's national accreditation industry. Following these four phases, Phase E involved a cross case analysis of the data gathered and presentation of the research findings (Appendix A provides a detailed overview of the methodology).

Figure 1.1: Research design and methodology



This report provides the following:

An economic model and rationale for accreditation in an economy and NATA's contribution in:

Safe-guarding community safety from non-conforming products and service. Redressing information asymmetry between sellers and buyers of products and services. Reducing transaction costs, and Facilitating reduction of technical and regulatory trade barriers.

An explanation of accreditation as a derived benefit to the economy and the challenges in quantifying the economic value of its contribution to the Australian economy,

Design and methodology of the research study, and

Estimated economic value of NATA's accreditation towards value creation.

The next section positions the research within the context of existing literature to specifically validate the research methodology and economic framework proposed in section 3. It presents the literature on accreditation and standardisation as it relates to the economic value of accreditation in the national context.

Section 3 describes the economic valuation model used in this study.

Section 4 outlines the findings of the study in determining the economic value of accreditation to Australia and NATA's role in that, with organisational stories gathered to support the key findings, before concluding in section 5.

2

A Literary Snapshot - importance of accreditation

2 A Literary Snapshot - importance of accreditation

Over the last decade, there has been an increase in inter-disciplinary literature surrounding the economics of accreditation . Whilst the academic literature on accreditation is centred within law, strategy, economics, engineering, operations and science policy, to name a few, practitioner literature focuses more on the process of accreditation for individual companies and their associated industry, but is limited in analysing the benefits of accreditation for the economy as a whole. Therefore, this literary overview captures a holistic analysis of the role and benefits of accreditation at the micro (company), meso (industry), macro (global) and end user context.

According to the academic literature, accreditation is a critical component 'of a country's quality infrastructure', incorporating the 'soft' infrastructure of public goods as opposed to the hard infrastructure (roads and rail) (Frenz and Lambert 2014). These contributions imply a critical role for government is to ensure the soft infrastructure is preserved, remains open and impartial to all who apply them in the same way critical physical infrastructure is maintained (Swann 2000).

Viewed through an economic lens, a government's involvement and motivation for maintaining a strong technical infrastructure including a robust accreditation practices are critically based on its assessment of the probability of market failure and 'the public good character of standards'. That is to say a government may intervene if it believes in the absence of assistance or guidance, market failure might result in the production of either limited, irrelevant or too much standardization (Swann 2000). Furthermore, a government would take a more proactive and strategic approach when it considers it can add value to a country's quality infrastructure by systematically identifying its strengths and weaknesses.

Scholarly contributions (Swann 2010) propose that a 'systems innovation' analysis plays an essential role in identifying a variety of institutions, actors and intermediaries within the system that contribute to a strengthening or weakening of the accreditation process and overall economic benefit, considered further in section 2.3.

At a micro (organisation) level, the traditional view of outputs as a function of physical and human capital as well as productivity have been the key drivers for economic growth (Standards Australia 2016). Productivity measures the technological progress of the economy and represents the efficiency with which resources are utilised.

Accreditation plays a decisive role in driving productivity at the organisational level as it delivers confidence in the data and test results in assessment reports, certificates and conformity statements. It underpins the quality and credibility of results to the end-user by ensuring their traceability, comparability, validity and commutability.

Whilst certification by conformance assessment body (CAB) focuses on an organisation's compliance with systems and product standards, accreditation focuses on a CAB's technical competence and conformity in performing specific activities. This is based on a peer-review process made possible by experts who conduct facility assessment. The criteria for determining a facility's competence are based on the relevant international standard (e.g. ISO/IEC 17025, ISO 15189, ISO/IEC 17020) and include: the qualifications, training and experience of staff, correct equipment that is properly calibrated and maintained, adequate quality assurance procedures, appropriate sampling practices, and so on (NATA 2016).

This report will provide valuable insights into the relationship between NATA accreditation and economic growth in a way that can be compared to research undertaken in other countries.

[1] Accreditation provides a means of determining, formally recognising and promoting that an organisation is competent to perform specific types of conformity assessment activities including but not limited to testing, inspection, calibration, and other related activities in a reliable credible and accurate manner. The activities for which accreditation is granted, which may not be all activities the facility performs, are described in a scope of accreditation (NATA 2016)

2.1 Role of accreditation

The main role of accreditation is to assess the competence of CABs - organisations carrying out conformity assessments - resulting in a building of trust in the quality infrastructure (Swann 2010). This role strengthens the effects of each conformity assessment service and thus of the system as a whole.

For example, producers can gain greater commercial benefits from the products and services offered, as accreditation increases the credibility of test reports and certificates. Accreditation is therefore a means of building confidence in the work and the findings of conformity assessment bodies.

Accreditation applies for a set period of time and includes regular reassessments. When products, services, processes or organisations are evaluated by an independent CAB, accreditation provides the added value of a top layer of quality assurance by ensuring the capability and independence of the CAB.

This is achieved by accrediting the CAB to an established standard. For example, in the case of laboratories, the standard to be achieved is ISO/IEC 17025 'General requirements for the competence of testing and calibration laboratories', and for inspection bodies, ISO/IEC 17020 'Conformity assessment -- Requirements for the operation of various types of bodies performing inspection'.

From a systems innovation perspective, a conformity assessment in a quality system is a value adding contributor (Swann 2010). Whilst the assessment determines whether goods and services conform to a standard, it then has a scaling up effect on the economic benefits from metrology, standardisation and management systems certification by clearly labelling the services that meet the internationally agreed standards. Thus, accreditation of CABs stands out from other assessment processes by increasing the information for consumers on the competence of CABs, subsequently building confidence and creating incentives for producers to upgrade processes and innovate in goods and services. The previous 'whole of system' review of Australia's Standards and Conformance Infrastructure made the following observation (Wilson 1997):

> 'The standards and conformance infrastructure is a crucial element of the commercial and scientific fabric of a modern community. An efficient and effective system will encourage innovation and underpin competitive advantage. It is vital to the integration of Australian industries into the world economy. It helps to ensure that Australian products comply with international specifications and gives buyers confidence that the products will perform as claimed and are fit for purpose'

Figure 2.1 highlights the intersecting attributes comprising a comprehensive quality infrastructure system are as follows:

- Services to develop written standards and access to physical, chemical and biological standards of measurement,
- Provision of a legal metrology (weights and measures) service,
- Availability of inspection, testing and calibration services at a level of sophistication commensurate with the industrial needs and aspirations of each nation,
- Availability of third-party certification services to meet the needs of regulatory bodies, both at home and internationally, and those of customers who require some third-party oversight of the provision of goods and services, and
- Accreditation mechanisms to ensure that all conformance assessment service providers are competent (accreditation services).

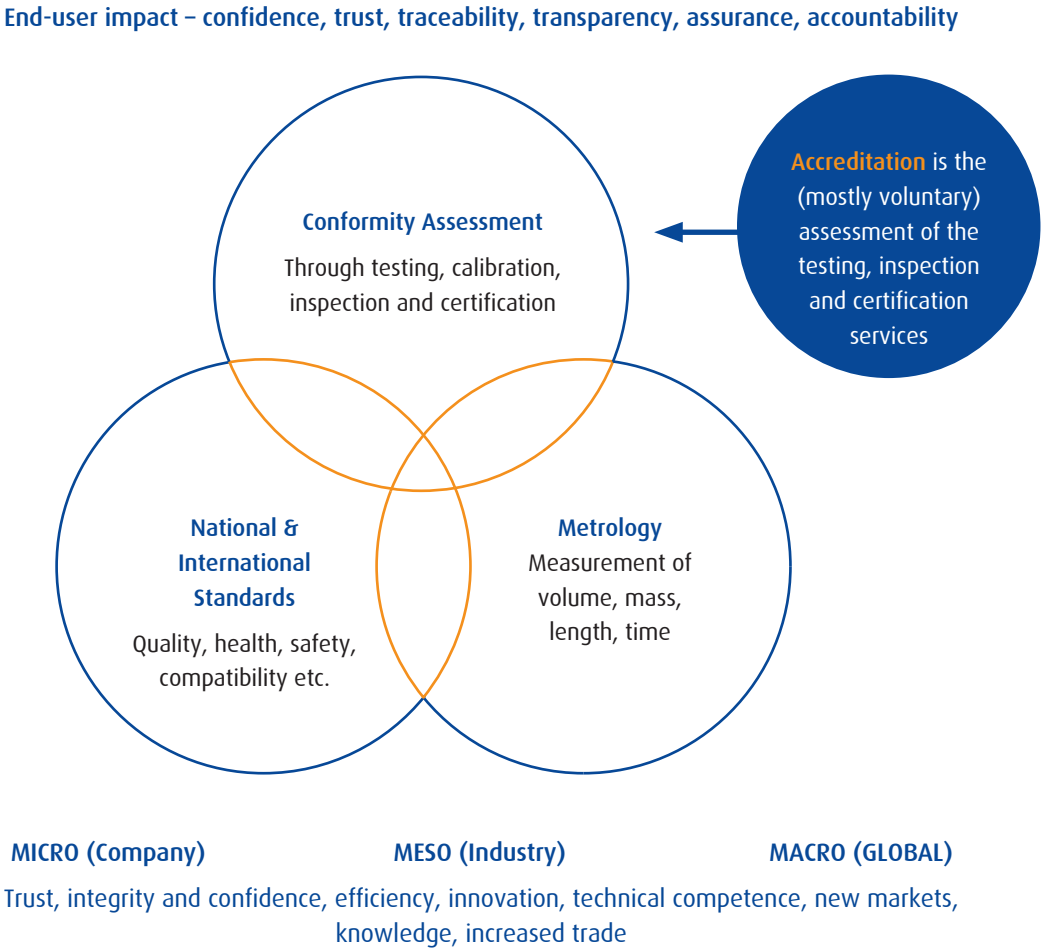


Figure 2.1 presents the four key elements comprising a quality infrastructure system delivering benefits at the end-user, micro, meso, macro and end-user levels. The next section details ten benefits that a successful quality infrastructure system generates.

2.2 Benefits of Accreditation

Drawing upon scholarly and practitioner contributions (Frenz and Lambert 2014; Swann 2010; Centre for Economics and Business Research 2016) a successful quality infrastructure generates the following benefits across the micro, meso, macro and end-user level: **a) integrity and confidence** that the product or service conforms to its stated characteristics, reducing information asymmetry and transaction costs borne by businesses and consumers, leading to increased efficiency across the economy, **b) reliability and trust** in the measurement units and procedures used in the assessment, **c) comparability** of products and services across countries and regions, **d) traceability** across the assessment chain to ensure accountability and consistency, **e) technical competence** in the institutions of the quality system, **f) conformity** ensuring products and processes meet the requirements of a standard, **g) transparency** across all practices and procedures, **h) impartiality** to protect the process from political and commercial influence, **i) linkages** that assist CABs and governments with international market access affected by conformity assessment and champion the interests of Australia and reduce barriers to trade, and **j) raising industry standards** that derive from non-accredited providers competing not only on price but also on quality. In recognising these benefits, it has been estimated that the growth of the accreditation sector over recent years accounts for between one eighth and one quarter of productivity growth (Swann 2010).

2.2.1 Accreditation benefits the micro (company) level:

First and foremost, accreditation contributes to productivity and efficiency at the organisational level. When quality standards were introduced in the UK in 1903, manufacturing sectors dramatically increased production levels. For example, the building of trams was hindered by duplication of standards and specifications leading to larger project development times for tram rail construction. However, standardisation reduced the number of tram gauge specifications from 75 to 5, ensuring quality, removing duplication and increasing efficiency (Swann 2000). Consequently, the accreditation process that ensures technical competence against relevant standards, also solves a variety of economic challenges including reducing the cost of producing goods and services, increasing revenue by opening up new markets, or increasing the efficiency of goods and service production (Department of Trade and Industry 2005). How these benefits are attributed to the micro level is outlined next.

- **Switching costs**

  Standards have helped to reduce 'switching costs' when a customer chooses to change supplier. The barriers to switching lock the customer into buying from a single firm as it is too expensive to purchase from multiple suppliers and hence, limits competition in the market. Standards make it simpler for the customer to move between suppliers, improving choice and reducing the cost of investment to the customer (Swann 2010).

  This benefit would be enhanced when compliance of standard is certified by a third party conformance assessment body whose competence is in turn assessed by an independent accreditation body. However, the benefit may be diluted when non-accredited providers are introduced to the market, shifting the competition to focus on price rather than quality (Swann 2000). Therefore, accreditation assists in ensuring the customer knows which facilities are accredited to provide a product or service to a certain standard.

- **Ensuring quality and promoting efficiency**

  NATA accreditation provides benefits to accredited facilities by attesting on their competence in performing their work correctly according to the requirements of appropriate standards. Many facilities operate in isolation to their peers, and would rarely, if ever, receive any independent technical evaluation as a measure of their performance (Centre for Business and Research 2015). Therefore, accreditation provides a benchmark for performance as it is a means of assessing the technical competence and integrity of organisations offering testing, calibration, examination and inspection services. Accreditation can highlight gaps in capability, thereby providing the opportunity for improved organisational efficiency and outputs.

Standards such as Quality Management Standards (QMS), including ISO 9001, help companies to ensure quality and boost efficiency. The accreditation process provides independent assurance that conformance assessment body staff are competent to assess compliance to standards by companies responsible for delivering products and services to their customers. Such frameworks are designed to identify more efficient and time saving procedures and to proactively reduce errors and defects. The accreditation process highlights the gaps in capability and enables the organisation to improve its process and efficiencies prior to the next assessment round.

At the same time, the accreditation process provides assurance to customers that they are purchasing a quality product or service, satisfying customer quality needs and ensuring compliance with the relevant regulations (Swann 2010).

Accreditation also addresses economic problems that arise due to information asymmetry (a scenario where the seller has more information than the buyer about the quality of the product). For NATA, accrediting organisations against a specific quality standard is a way of signaling to the customer that the quality of a product or service has been tested by an organisation with the necessary competence. This in turn gives the customers' confidence that they can rely on the test result in assessing the quality of the product or service they receive.

- **Distribute technical information to reduce transaction costs**

  Technical standard conformance provides information that aligns the expectations of suppliers and customers (Swann 2010). The accreditation process of standards distributes technical or codified knowledge (Frenz and Lambert 2014) by making information accessible to all firms. This enables a less costly and more efficient inter-firm exchange of information and therefore, reduces the cost of each transaction. Standardising information is important in large and complex industries. Manufacturers such as Boral (cement) and Boeing (aerospace) use both internal and external standards to effectively communicate technical requirements to suppliers. However, inefficiency in cost and duplicated efforts may arise if the manufacturer does not accept the test result of an accredited laboratory used by the supplier and the supplier has to meet the internal standard requirements of the manufacturer as well as external standards required by the accreditation process.

  Accreditation also plays an important role within society as a whole, rather than on purely influencing productivity or efficiency standards of companies. Many firms are accredited to ensure they meet the standards and regulations designed to reduce public costs such as organisations in the water and energy sector or roads infrastructure who need to meet requirements under health and safety or environmental regulations.

- **Stimulating Innovation**

  Innovation theory suggests that the relationship between standardisation and innovation is complex, with the potential to impede innovation as well as to enable it (Frenz and Lambert 2012).

  As a provider of information, standards have an important role in stimulating a knowledge intensive activity such as innovation. However, standards can also hinder innovation as a result of timing. When applied too rigidly and/or at the too early stage of the innovation cycle, a standard may effectively shut out promising and ultimately superior technologies. If a standard is applied too late and the costs of transition to comply with the applicable standard may be too high, it may revent diffusion. A perceived shortening of product cycles suggest that the latter problem may be increasingly important (Department of Trade and Industry 2005).

  However, accreditation generally assists in creating a strong, open technological infrastructure to drive and stimulate innovation within a firm. While some firms often consider that accreditation slows down innovative processes, at the same time, they assert that well-designed standards decrease the risk of unfavourable outcomes, path-dependence and drive new technological processes and behaviours (Frenz and Lambert 2012). Six modes of innovation within an accreditation framework are considered in Table 2.1.

Table 2.1: Modes of Innovation within an accreditation framework

Innovation Mode	Underpinning activities
Technological, IP	Use of patents, registered design and copyrights. Internal research and development (R&D).
Investing in intangibles	Internal and external R&D, knowledge, machinery and equipment purchases, training, design and marketing of new products.
Codified knowledge	Use of standards, publications and information from businesses and universities, cooperation on innovation.
Open innovation	New strategy, management technique or organisational
Market-led innovation	Introduction of a new product, marketing expenditures.
External process/Modernizing	External innovation, introduction of a new production process or service delivery method

The most innovative firms seek out accreditation processes which help tailor individual competences and gain a competitive advantage through market and technological adaptation, reducing risk and associated costs (Centre for Business and Research 2015). The existence and use of standards make it easier to produce, sell and buy products and services, thus enabling the creation of a market. They are part of the infrastructure for 'innovation-led growth'. Hence, the ultimate measure of how a standard infrastructure contributes to the economy is the sum of additional innovative products and services (including any cost reductions) that grow on the back of the standards infrastructure.

Additional reasons for proactively implementing the accreditation process across the firm are to:

a) acquire new knowledge and to influence the content of the standard, which in turn increases manufacturing capability and innovation,

b) reduce research and development and other associated costs,

c) access a wider range of quality suppliers,

d) encourage cooperation amongst businesses,

e) improve confidence in the company brand by selecting a conformity assessment body that certifies to local standards signaling the integrity and quality of the product to their own consumers, and

f) overcome technical barriers to trade and access highly regulated international markets (Frenz and Lambert 2012).

A United Kingdom Accreditation Service (UKAS) and British Measurement and Testing Accreditation (BMTA) survey (Frenz and Lambert 2014) conducted in 2013 presented the value of UKAS accreditation to the UK economy, suppliers and uses of its services.

Following a survey of 176 businesses, the report highlights that 45 per cent of the market is covered by accredited conformance assessment services, but with higher shares in calibration and lower shares in inspection. The majority of respondents advocated that prices for accredited services were higher than for non-accredited services, on average by an estimated 8 per cent. This study also confirmed that the advantages of gaining accreditation were commercial rather than deriving from a regulatory objective. For example, 50 per cent of respondents suggested accreditation was a marketing and branding benefit, 16 per cent responded that it was a customer expectation and 20 per cent demonstrated benefits in efficiency and service quality.

In addition, the perceived value of accreditation to service suppliers through the quality infrastructure was around £600m per annum (£225m 'willingness to pay', £70m 'financial value for the business of accredited status' and £320m 'estimated benefit of accreditation to service users') for commercial benefits only. Next, the meso-economic benefits of accreditation will be outlined.

2.2.2 Accreditation benefits the meso (industry) level

According to Deloitte (2011), accreditation enables CABs within the industry to demonstrate their competence and compliance with recognised standards and regulations, thus verifying their ability to provide credible and reliable services. Accreditation provides CABs with access to advice to help understand and comply with international regulatory requirements, reducing transaction costs associated with understanding complicated requirements and expanding their client base to include all export oriented organisations.

The UKAS/BMTA study quantified the added value of UKAS in each area of conformity assessment service positioned within the economic and social system of the service itself. Thus when investigating the 'willingness to pay' for accreditation of a service provider, the benefit of UKAS accreditation to conformity assessment bodies would be approximately £295m per annum.

2.2.3 Accreditation benefits the macro (global) level

Whilst accreditation leads to increased competition (Deloitte 2011) and may simultaneously reduce company profit, the customer and economy as a whole benefit from this increased competition, through greater amounts of imports and exports. International trade is enabled through the assurance of quality and reliability while international mutual recognition of accredited test result, data, and certification reduces potential barriers to trade.

The International Organization for Standardization (ISO) states that the use of ISO standards in conformity assessment procedures enables a synchronized language across the world. This facilitates international trade between countries, and trade within countries, by giving the purchaser of the product or service confidence that it meets requirements.

The World Trade Organisation (2015) particularly focuses on the relevance of conformity assessment for World Trade:

'Exporters are often faced with having to test or certify their products in each of the countries to which they are exporting, but may not rely on an exporting countries' conformity results, leading to exporters incurring the costs of redundant testing and certification for each of the destination markets, risking higher transportation costs if the goods are rejected by the importing country after shipment and increasing the cost in terms of time required for complying with administrative requirements and inspections by the importing country's authorities, severely impacting on profitability and the ability to penetrate the market'.

The academic literature identified four main channels by which accreditation benefits trade (Swann 2010):

- **Provides quality to consumers and trade partners**

  Accreditation delivered by a nationally recognised system measuring levels of standards facilitates non-price competition based on attributes such as product quality, delivery and customer service. In this context, Australian exporters can compete with international companies on the basis of quality accreditation processes that has the potential to increase trade. Additionally, improving transparency assists buyers and sellers to make the best purchasing decisions, which can minimise transaction costs (Deloitte 2011; Swann 2010).

- **Creates a common language between trading partners**

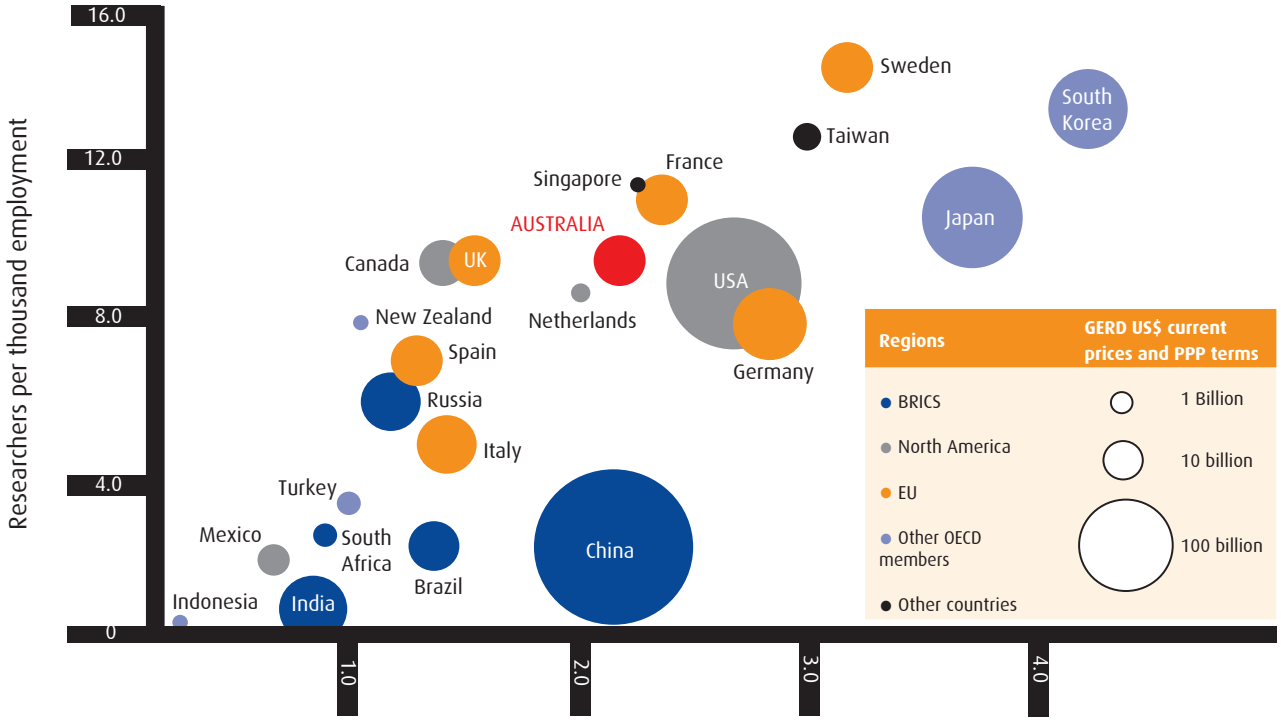
  Where technical differences once were barriers to trade, the introduction of universal quality standards now ensure compatibility and drive trade. Internationally recognised technical characteristics assist in lowering barriers to trade and reduce production costs. These reductions can be passed onto customers in the form of lower prices and enhance competitiveness (Swann 2010).

- **Reduce transaction costs**

  Due to compatibility across standards, firms can outsource or off-shore specific tasks to external providers who has lower input costs to manufacture a product, whilst the outsourcing firm concentrates on the design, sales and marketing of the product and the core strengths of the company (Swann 2010). Similarly, the effects of globalisation and innovation are altering the life-cycle of the product and therefore have increased the need for international standards rather than a reliance on national standards. As a consequence, producers demand quicker accrediting processes but the same level of high quality standardisation.

  Australia has a strong record of innovation, underpinned by its significant government and private sector research and development (R&D) investment and quality enabling ICT infrastructure. The nation's research and development investment positions it among the world's leading innovative countries, including the USA, Japan, France, Germany, Sweden and South Korea, positioning Australia well in the world of innovation as shown in Figure 2.2

Note: size of circle reflects the relative amount of annual gross domestic expenditure on R&D in $US.



Accreditation can therefore be a catalyst or facilitator of innovation rather than directly initiate the development of new products. It promotes the diffusion of innovation which is important for the economic impacts of accreditation and also sets a level playing field that promotes competition and consequently innovation.

However, the literature proposes that accreditation has dual informing and constraining roles in innovation. Companies which say that accreditation informs innovation and that regulations constrain it, tend to be the most innovative. As a result, these companies are active in driving innovation and pushing the innovative barrier and also the most constrained by the pace of the accreditation process. The BSI Standards in Industry survey provides evidence to substantiate this finding, illustrating that where there is a higher pace of technological advancement, in sectors such as life science, firms are more likely to experience a lag between the development of standards and the latest technological developments.

2.2.4 Accreditation benefits the end user/customer

Whilst the previous sections refer to the benefits of accreditation to the micro, meso and macro levels, this section specifically captures the importance of understanding the customer component of the accreditation value chain through ten benefits of accreditation (outlined in section 2.2). As producers become more customer oriented, Deloitte (2011) argues that the 'missing voice' of the end-user in the accreditation process is now being heard. To increase this level of engagement further, Swann (2010) proposes the role of government should be to change the balance of participation in the accreditation process.

Accreditation provides indirect, but real benefits for the consumers of intermediate and final goods.

The customer primarily seeks reassurance of the value of goods and services from the standard. For example, consumers of medical services obtain higher quality medical services in the form of more accurate test results and avoid the risks, expenses and distress by inaccurate test results. The social rate of return of this value was 154 per cent and the immediate value to users measured in 'willingness to pay' and in service quality was estimated at around £295m per annum in the UK (Frenz and Lambert 2014).

The process assists foreign importers to access widely recognised certification services and assist domestic consumers by widening the range of goods and service in the market that have been assessed against widely recognised standards. More specifically accreditation assists in supporting the consumer's choice in ensuring (Frenz and Lambert 2014):

- **Integrity and confidence** that products and services meet their stated characteristics,
- Procedures used by a firm are **reliable**, accurate and can be trusted,
- Products and services are easily and reliably **comparable**,
- Measurement processes are **traceable** throughout the chain of assessment,
- The quality infrastructure is **competent** and displays technical capability,
- Products and processes **conform** to the requirements of a standard,
- Practices and procedures of the product or service assessment process are accessible and **transparent**, and
- Institutions are **impartial**, protected from political and commercial influence.

Ignoring the importance of accreditation requirements can introduce a host of avoidable exposure to adverse events, such as: potential damage, serious injury, loss of life, legal liability such as fines, enforced corrective measures such as recalling products, loss of revenue, lower consumer confidence, and product incompatibility within the supply chain/industry.

An unsafe product or service can impact public perception and consumer confidence in a business and brand. No company wishes to have to recall its product as this is disruptive to operations, costly and damages reputation (Standards Council of Canada 2016). Therefore, accreditation across the supply chain should contribute to a more confident consumer base and safer environment. Products and services that are produced and distributed according to standards against which they are tested or assessed by accredited CABs also contribute to Australia's economic reputation as a supplier of quality goods and services and improve her reputation in the international trade arena.

Whilst this section presents the positives of accreditation, there are challenges and costs associated with the accreditation process. From an economic value perspective, accreditation is only worthwhile if its overall benefits exceed its overall costs. That is, if the gain for the economy and society is enough to outweigh the challenges and costs for firms. This is called the Pareto efficient policy: a policy should only be adopted if those who will gain could fully compensate those who will lose and still be better off (Boardman et al. 2001).

2.3 Accreditation challenges

A review of the literature indicates that there are several challenges impacting accreditation, with the most cited challenges being added costs (Marcos 2005).

- **Added costs**

  Some studies highlight that 90 per cent of accreditation costs are related to employee training and site preparation (Mays 2004). An examination of a sample of treatment sites in the United States found that site preparation accounts for 82 per cent of accreditation costs and that these costs increased in the final months of preparing for accreditation Zarkin et al. (2006).

- **Added workload**

  Accreditation was found to increase the workload of employees (Montagu 2003). Firms undergoing accreditation need to prepare, revise and update policies and procedures and train staff. However, studies have also shown that firms also viewed accreditation as an effective way of organising staff.

- **Conflict between quality assurance and quality improvement**

  Quality improvement generally means continuous improvement and requires continuous effort which is a flow measure. Quality assurance is measured and assessed according to standards established at a given point in time and therefore a stock measure and needs to be recognised, as has been achieved in Australia by rewarding best practice and being transparent about accreditation objectives (Buetow and Wellingham 2003).

- **Organisational differences**

Accreditation standards generally have universal application and do not always account for differences between different organisations and the environment in which they operate.

Scholars express the need for developing 'standards that acknowledge cultural diversity' (Frenz and Lambert 2014). Swann (2010) proposes that a 'systems innovation' analysis plays an essential role in identifying the weaknesses as well as the strengths of the accreditation process leading to a thorough understanding of the economic benefit of accreditation. Such attributes for investigation include identifying:

- Infrastructural failure associated with resource investments and the return on investment within the science and technology infrastructure (universities, research labs, national assets) to ensure sustainable funding models,
- Institutional failure in formal institutions (such as regulatory systems) that constrain innovation activity and informal institutions (political, social cultural and values). Such institutions help to foster a climate of co-operation, risk-bearing and innovation,
- Interaction failure due to limited or too many interactions and cooperative relations between different actors with other firms, customers or researchers,
- Transition failure occurs when firms are unable to adapt to environmental changes, and as a consequence may get locked-in to existing technological paradigms, and

- Capability and learning failures capture competencies and resources (technological, organisational) which restrict the firm's ability to learn and be innovative.

This section has provided a literary overview of the role and benefits of accreditation to the micro, macro and end user level and how accreditation contributes to economic growth through promoting productivity and efficiency in organisations, supporting international trade and by facilitating innovation across firms and sectors. The next section 3 presents the research methodology employed to determine the economic value of NATA accreditation in Australia.

3

Economic Model for Valuing Accreditation

3 Economic Model for Valuing Accreditation

The economic model for valuing accreditation starts by defining the consumer's utility function as comprising a level of satisfaction derived from consumption of a given bundle of goods and services with the knowledge that a select group of goods and services in this consumption bundle is derived from an accredited service provider. That is, we can define the consumer's utility function for this consumption bundle as:

$U = u(q, A, v)$

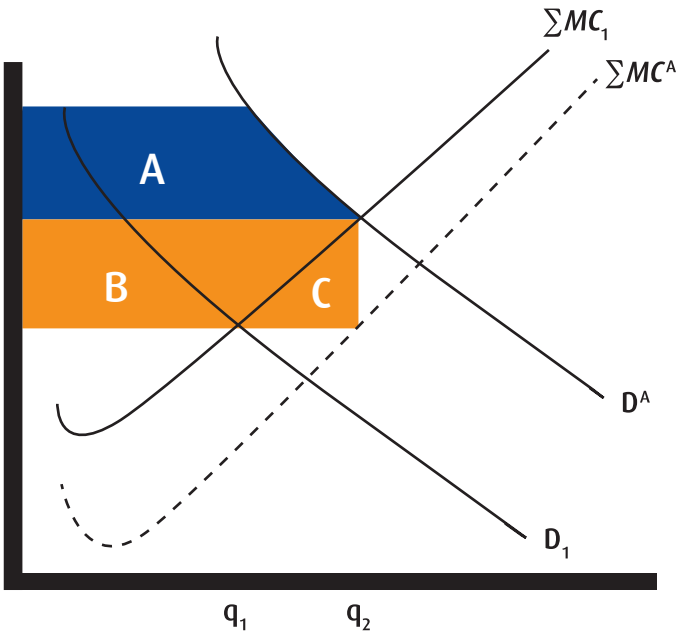
where 'q' represents the level of consumption, 'A' represents accreditation of the consumption bundle q, and 'v' represents all other determinants of demand. Accreditation (A) attests that the services[1] provided by an accredited organisation have been inspected, tested or calibrated (or some combination of each), thus providing the consumer a greater degree of confidence on the quality of the good or service compared with a similar set of goods or services provided by a non-accredited organisation.

In this model, accreditation 'A' is either present or it is not; and is observable through the organisation's membership of the relevant accrediting agency. It is possible however that despite an organisation's membership to an accrediting body, that only subsets of its products and/or services have been inspected, tested or calibrated and therefore accredited.

Consequently, a consumer's utility function is both increasing and concave in consumption (in bundles of q) q [$u'(x) > 0$ and $u''(x) < 0$] and similarly increasing and concave in the volume of accredited services (bundles of A) [$u'(A) > 0$ and $u''(A) < 0$]. The economic benefits arising from accreditation (versus the benefits from a non-accredited industry) can be calibrated using the concept of surplus or efficiency (both in consumption and production).

We can illustrate the economic benefits arising from accreditation by comparing two possible scenarios – the first where the end-user (customer of the organisation) has only the option of consuming non-accredited products and/or services; and the second where the same end-user has the option of purchasing products and/or services from an accredited provider. We provide a comparison of the two scenarios in Figure 3.1.

Figure 3.1: Economic Value of Accreditation



[2] The customers of NATA accredited labs may ask the lab to test their products. However, NATA only attests to the competence of the testing labs in carrying out specific test in the Scope of Accreditation.

In Figure 3.1 we illustrate the market price for non-accredited products and/or services ρ_1 derived by the equilibrium condition, $D_1=\Sigma MC_1$, where *MC* measures the marginal cost of production of the products and/or services provided by the non-accredited organisation. In the case of non-accredited organisations, the level of consumption efficiency is measured by $CE^1 = u(q) - \rho_1 q_1$, where *u(q)* is the level of consumer utility from the consumption of non-accredited consumption bundle q, while production efficiency in a non-accredited industry is measured by $PE^1 = \rho_1 q_1 - c(q)$ where c(q) is the cost of production where costs are both increasing and concave in q [c' (q) > 0 and q c" (q) < 0].

As identified in the research overview, accreditation generates a number of benefits to an industry, in particular:

(i) a greater level of confidence to the consumer that the products and/or services tested by the accredited organisation is of a more consistent and higher standards (and carries lower associated risk) than similar products and/or services tested by an non-accredited organisation;

(ii) the accredited organisation can charge a 'quality' or 'price premium' for its accredited products and/or services when competing with non-accredited providers in the market;

(iii) the accredited organisation may experience an overall reduction in the costs of production if the accreditation results in production efficiency (including efficiencies in service delivery) through innovation (even after taking into account the increase in costs associated with the accreditation services received and membership costs incurred); and

(iv) the accreditation body generates employment for existing technician and other specialists in the relevant fields and consequently results in both a direct (within industry) and indirect (beyond the specific industry) economic effect on national economic activity. The effects (i) – (iii) can be illustrated using Figure 3.1, while effect from (iv) requires a broader macro-economic evaluation that is beyond the scope of this project.

To calibrate the effects from (i) – (iii), we begin by assuming that a number of non-accredited organisations previously pricing at ρ_1 subsequently become accredited and experience an increase in the demand for their products and/or services increases. This is represented in Figure 3.1 as a rightward shift of the demand (from D_1 to D^A) for their products. As a result of this increase in demand, the accredited organisation can charge a price premium (α) over their non-accredited competitors who are pricing their products and/or services at ρ_1. The increase in the consumer's willingness to pay that results from this price premium is measured by $\int_{\rho 1}^{\alpha \rho 1} f(c)$ and shown in Figure 3.1 as Area B.

At the same time, the additional benefits from accredited products and/or services accruing to the consumer (compared to the pre-accreditation equilibrium) is measured by $\int f_{\alpha \rho 1}^{\beta \rho 1}(\rho_1, A, \nu)$ and shown in Figure 3.1 as Area A. This takes into account the consumer's willingness to pay for consumption bundle q_2 which is represented in Figure 3.1 as a factor β over the non-accredited market equilibrium price ρ_1.

The other positive benefits arising from accreditation is the prospect of improvements in productive efficiency (over the costs of accreditation) from having better process or calibration of equipment that reduces production redundancies, wastes and other associated cost. Productive efficiency results in a decline of the organisation's average and marginal cost of production decreases, which in Figure 3.1 is shown as a downward shift in the marginal costs curves.

These improvements in efficiency have the capacity to reduce the competitive market equilibrium price (assuming there are a sufficient number of non-accredited organisations providing the consumer a similar consumption set). In Figure 3.1 we assume (for reasons discussed below) that the accredited market price premium α does not change such that the productive efficiency gain results in increased profit margins. As such, this additional gain (bounded by consumption bundle q_2) is represented by Area C in Figure 3.1.

The final economic benefit from accreditation is the resulting increase in employment that is required to carry out the inspections, testing and calibrations. This economic benefit has a much broader macro-economic affect that cannot be so readily represented in Figure 3.1 as it has a multiplier effect on the economy.

The additional employment generates a multiplied effect on national production both directly through increased activity in the industry in which the organisation is accredited (the direct effect) and indirectly through increased production and consumption activities across other organisations and industries (the indirect effect).

NATA provides an interesting case in point for our analysis in that the employment otherwise generated through the inspections, testing and calibrations is undertaken by volunteers who are experts and technicians in their fields. In this scenario, there is neither an increase in the cost for NATA in the provision of its accreditation services and neither is there a cost borne by the organisation in the form of higher accreditation fees that would come from funding these volunteers . As a result, there is no measurable consumption or production effect on the national accounts in the way they would otherwise occur if these services were paid for.

As we are interested in calibrating the economic value of accreditation, we will impute and add the economic value of this 'voluntary employment' activity to the measures of economic efficiencies described earlier in Figure 3.1.

Despite the simplified model of economic value given in Figure 3.1 (not including the imputation of the value of the work by the volunteers), an accurate calibration of the economic value of accreditation is a rather complex task - requiring the estimation of demand for products and services by the end-user (customer of the accredited organisation) and the organisation's costs of production associated with the provision of these accredited products and services.

The degree of separation between the accreditation body and the end-user (the consumer or client of the accredited organisation) entails a level of detailed data that is not available to NATA or to us for the estimation of value arising from accreditation.

The collection of the required data is therefore beyond the scope of this research project given that detailed pricing, commercial sale and cost data is required to estimate the various demand and cost function across products and services of accredited organisations as implied by Figure 3.1.

[3] There is however an opportunity cost from the volunteer model, particularly when organisations agree to allow their own staff to support NATA through volunteer work. The opportunity cost is the forgone production during which time the volunteer is absent. However, knowledge gain by the volunteer provides value-add for the organisation at which they work, so the opportunity cost is reduced by this amount.

4

Key Results – Attributes of a quality accreditation infrastructure

4 Key Results – Attributes of a quality accreditation infrastructure

The findings presented in this section highlight that the value of accreditation for the combined five key NATA sectors (Calibration, Inspection, Infrastructure, Life Sciences and Legal and Clinical) can be classified across three economic levels - micro, meso and macro. The micro level explores the value of accreditation within the company, the meso level within the industry and the macro level within the global economy. Ultimately, the final value of accreditation culminates as a positive experience for the end-user in building a level of trust, transparency and confidence from the delivery of the accredited good or service. Figure 4.1 illustrates the overall framework guiding the economic value analysis and modelling for NATA's accreditation services in Australia.

Figure 4.1: NATA's Economic value framework

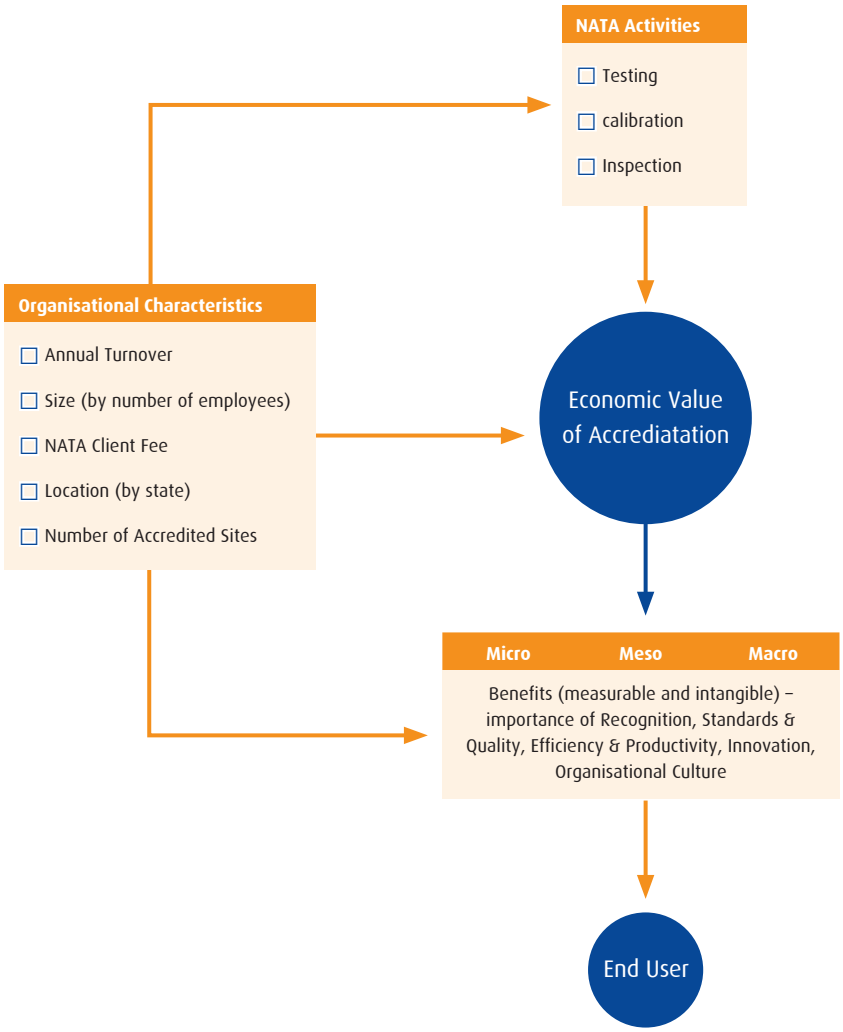


Figure 4.1 demonstrates that across the three micro, meso and macro levels, accreditation attributes incorporate both benefits and challenges which can be measurable and/or intangible. Such attributes are influenced and dependent on individual organisational characteristics including a company's annual turnover, the number of persons employed, the NATA client fee payable, where the company is located and the number of accredited sites and their associated activity across the three NATA activities of testing, calibration or inspection.

The intangible value arising from accreditation includes: (i) the impact of accreditation on the branding and marketing behaviours, (ii) the level of confidence companies and customers have in quality standards, and (iii) knowledge and collaborative alliances generated through changes in organisational culture. The factors that could be directly measured include efficiency and productivity, price premiums and product/service innovation.

This section of the report will outline the key micro, meso and macro-economic attributes of a quality accreditation infrastructure depicted as benefits and challenges in Figure 4.2. Benefits are articulated within five thematic lenses which capture the essence of value at the three levels:

- Importance of Recognition in the marketplace,
- Standards and Quality,
- Efficiency and productivity,
- Innovation, and
- Organisational culture.

These findings from 253 NATA members as a sample, represent the views of the broader 1919 NATA client base.

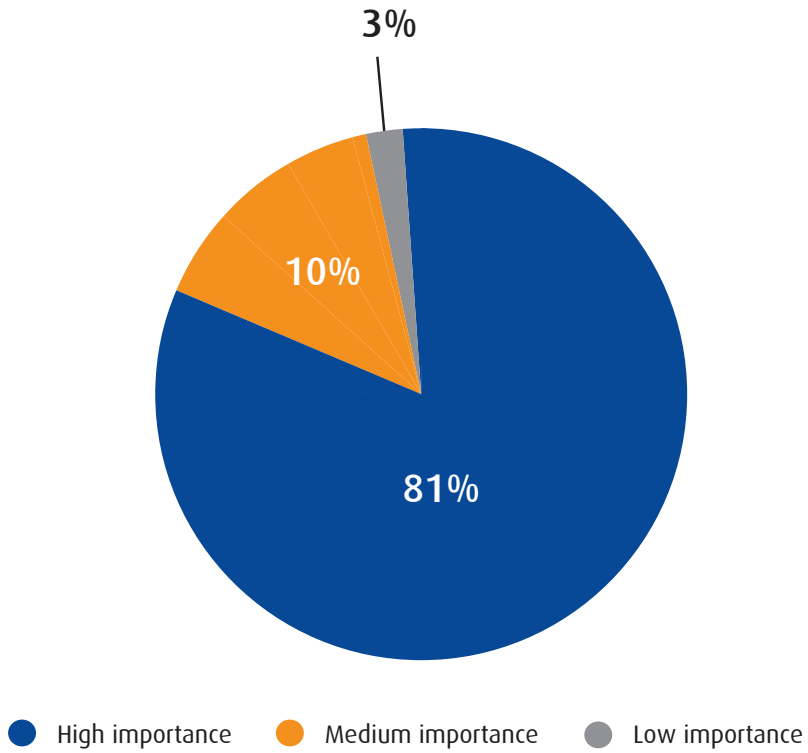
Figure 4.2 Attributes of a quality accreditation infrastructure

Attributes of a Quality Accreditation Infrastructure	Company	Industry	Global	END USER
Importance of Recognition	Meeting customer expectation Competitive/ Marketing advantage	Level Playing field Promotion of industry	Knowledge Credibility New Markets Increased trade	Enhances Confidence & Trust, Traceability. Transparency, Assurance, Accountability
Standards & Quality	Building confidence, supporting conformity & consistency consistency Third-party assessment Regulatory requirement Higher products/service price			
Efficiency & Productivity	Efficiency gains Cost savings			
Innovation	Positive, neutral negative impact			
Organisational Culture	Leadership Knowledge/capability Recruitment Volunteer assessors			

4.1 Benefits of accreditation – micro (company) level

At the micro level, our research findings highlight the overall importance of NATA accreditation rising from a variety of benefits that it brings to those accredited organisations and the society more broadly. For example, Figure 4.3 shows that over three-quarters (81%) of the online survey sample respondents indicated that NATA accreditation was of high importance for their business, 16% suggested it was of medium importance while only 3% said accreditation was of low importance to the business. While 3% is a small amount of the overall sample, 5 out of 7 respondents were from the Infrastructure sector. These respondents mainly suggested that accreditation reinforced current international standards that they were required to meet, it was requested by clients and accreditation was a small component of the overall business.

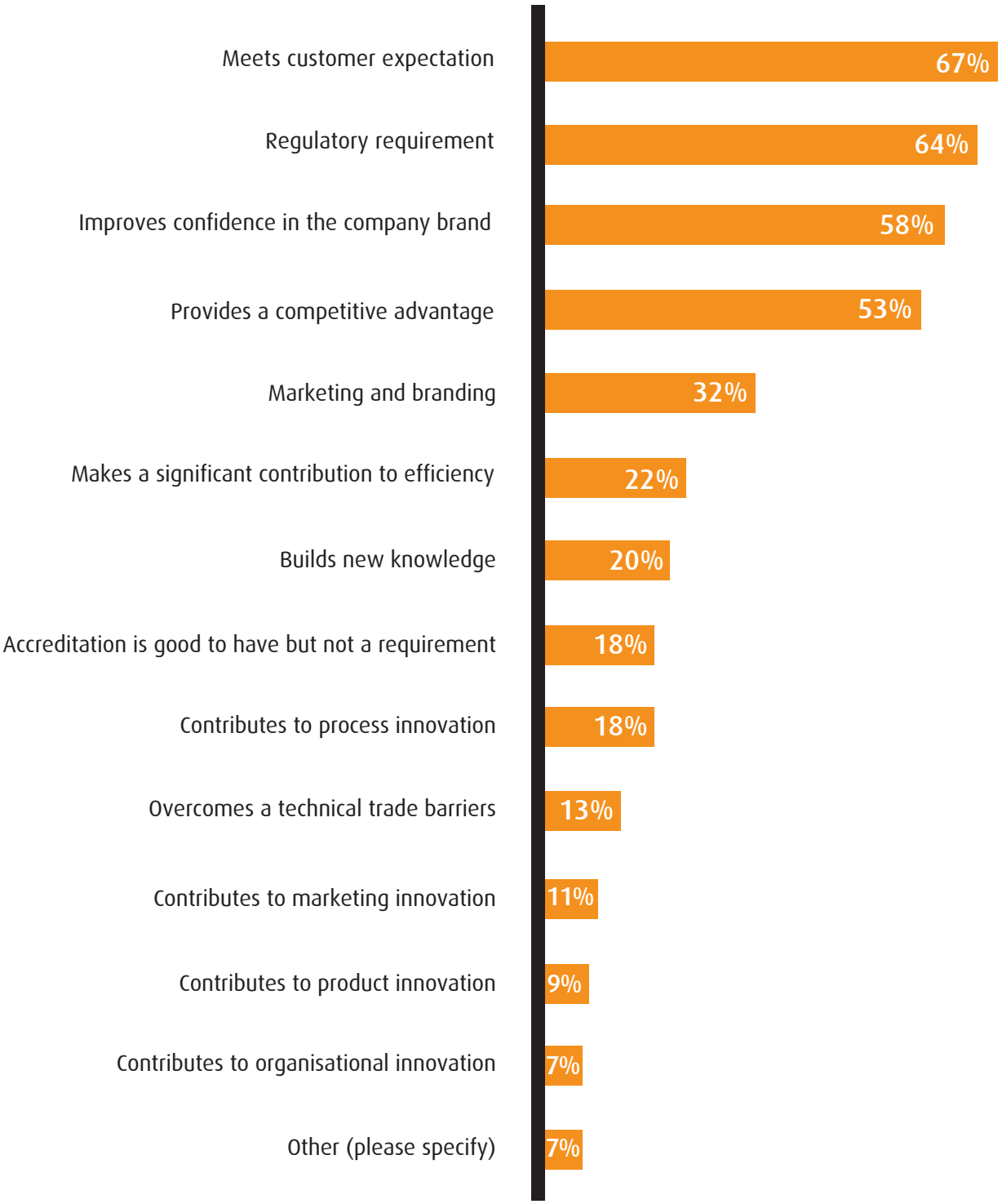
Figure 4.3: Importance of accreditation



Source: NATA Survey, Question 8, Notes: n=253.

Figure 4.4 illustrates 13 reasons why online survey respondents pursued accreditation. The most common response related to increased recognition of NATA services in the marketplace and customer orientation. Such responses were considered as key factors for pursuing accreditation. This finding was attributed to the importance of meeting customer expectations (67%) which was the top reason for pursuing accreditation, providing a competitive advantage (53%) and marketing and branding (32%) benefits which were the fourth and fifth reasons for pursuing accreditation. The second and third most common factor for pursuing accreditation was due to accreditation being a regulatory requirement (64%) and improving confidence in the company brand (58%). Other reasons are illustrated in Figure 4.4:

Figure 4.4: Key factors for pursuing accreditation



Source: NATA Survey, Question 11, Notes: n=253.

Upon further analysis, Figure 4.4 highlights that this diversity of factors for pursuing accreditation and the subsequent benefits gained in supporting a quality infrastructure can be analysed at the micro-level aligning with theoretical contributions in section 2.2.1. A micro level analysis reveals that accreditation contributes to increased levels of Importance of Recognition (Frenz and Lambert 2014) for the organisation in the marketplace, improvements in the organisation's level of Standards and Quality (Swann 2010) and quality, improvements in operational Efficiency and Productivity (Swann 2010), increased levels of Innovation (Frenz and Lambert 2012) and generating an Organisational Culture (Swann 2000) for quality accreditation, illustrated in Figure 4.2.

4.1.1 Importance of Recognition in the market place

Recognition in the market place is the first key benefit attribute of a quality accreditation infrastructure highlighted in Figure 4.2. As the first key attribute, the report findings align with those of the UKAS study that confirmed the advantages of accreditation were commercial rather than derived from a regulatory objective. Meeting the customer's expectation (Swann 2010), providing a competitive advantage and marketing and branding opportunities are three of the key benefits for pursuing accreditation. This externally facilitated recognition attribute is important at the individual business level, as in many instances, providing accredited services and products is not only a customer deliverable, it also positions the company competitively in the market place when seeking out new clients, and when faced with competition from other accredited and non-accredited providers. Figure 4.5 highlights the importance of the three key recognition benefits as a result of NATA services i.e. in meeting customer expectations, providing a competitive and marketing advantage, which were found to be important for both respondents of the online quantitative survey and the qualitative data gathered from interviewees.

Figure 4.5. Importance of recognition – both quantitative and qualitative evidences

Source: NATA survey, Question 11 and NATA client interviews, Notes: Question 11, n= 253.

4.1.1.1 Meeting customer expectations

Meeting the customer's expectation was the most common reason and benefit for pursuing accreditation (67%), compared to UKAS study respondents of 16%. For one interviewee (see Figure 4.5), accreditation enabled the company to achieve a level of accuracy and reliability sought after by customers and thus, providing the customer with a standardised service (Deloitte 2011; Swann 2010):

Customer expectations of accreditation can be complex, but widely recognised as necessary across the entire value chain (Swann 2000). For example, larger corporate and multi-national clients specifically request testing laboratories be accredited to the International Organization for Standardization (ISO) level, and in this case, NATA provide this accreditation assurance. One NATA member outlined the implication of such a requirement:

> The main reason for the business particularly to keep (accreditation) going is that it is a supply chain requirement..... that laboratory analysis is done [by] a facility that is accredited under ... ISO17025.

Ultimately the customer's request for NATA accreditation is built on the condition that the company provides a quality product and/or service. Thus such an expectation embeds implicit integrity between the company and the customer that guarantees an assurance of quality:

> They can market it to their clients....for instance, in a couple of weeks' time...our client company's being audited by the Taiwanese government department and part of it is our inspection procedures that operate, and the fact that we are NATA approved in this instance, is being promoted as part of the integrity of the product that they get.

Similarly, many potential customers expect accreditation criteria to be addressed when tendering for projects. The commercial and government tendering process for individual firms involves a mixture of time consuming paperwork, ability to demonstrate a point of difference from the competition and deciding on price point. Several companies illustrated below signified the process to winning tender bids or having the ability to offer a product is improved by providing evidence of NATA accreditation. This is particularly the case when seeking contracts with larger companies and government entities, ultimately differentiating them as a quality assured and accredited company:

Figure 4.6 highlights that the Calibration and Life Sciences sectors found accreditation was important for meeting customer expectations, with organisations in both sectors responding at higher than the average response rate.

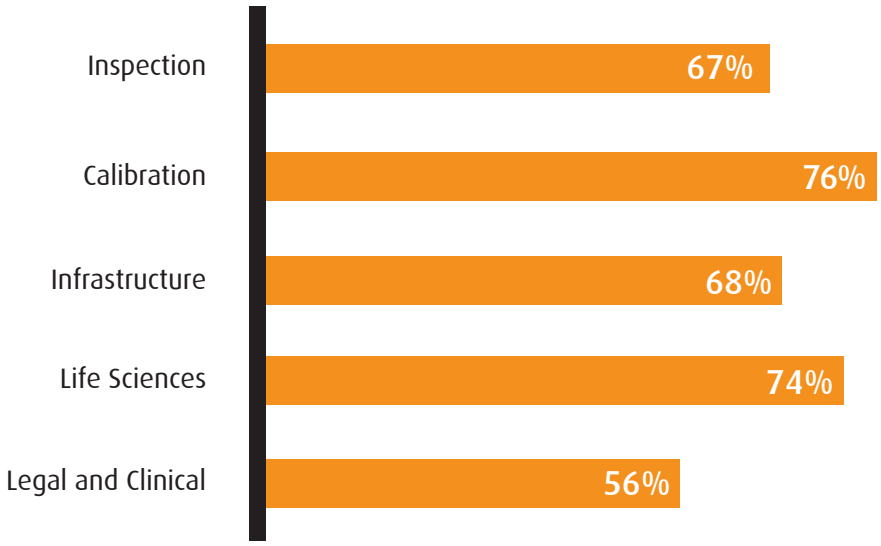
Opening the door to commercial contracts

'..... if we have that (accredited) service available, it gets us in the door with other companies... ... maybe they have a weighbridge or something like that. So that's why we have NATA accreditation, is to add value to our existing services' (Calibration sector).

'...a lot of bigger companies will request that you have NATA accreditation before you can do a tender for them, that's getting back to the marketing ability of your company...bigger businesses want to see that the accreditation is there and it is... being seen as having someone who can enforce those Australian Standards a bit better' (Legal and Clinical sector).

'...It also helps with us when we go to do tendering for bigger companies and when we market our services to...different businesses, then having the NATA accreditation for our drug and alcohol testing is quite important (Legal and Clinical sector).

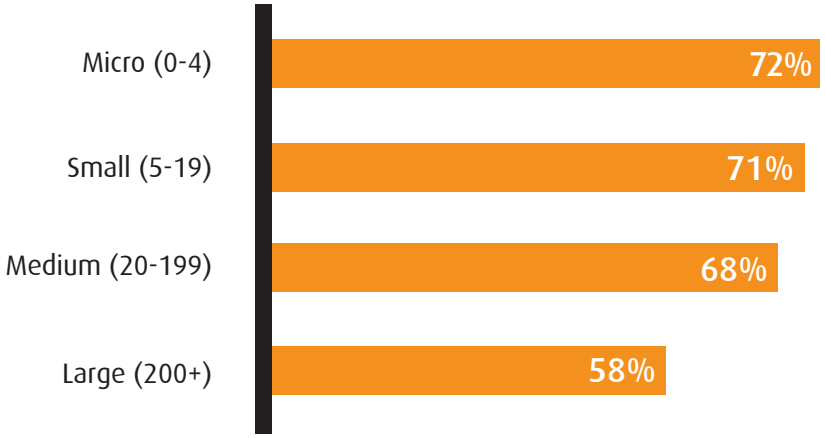
Figure 4.6: Importance of accreditation for meeting customer expectation by NATA sector



Source: NATA survey, Question 7 and 11, Notes: overall, n=253; Inspection, n=33; Calibration, n=59; Infrastructure, n=108; Life Sciences, n=99; Legal and Clinical, n=55.

Figure 4.7 highlights that the micro and smaller organisations found accreditation was important for meeting customer expectations, with organisations in both micro and smaller organisational sizes responding higher than the average response rate. Smaller firms use the accreditation process as a mechanism for meeting customer expectations, along with other business strategies they employ.

Figure 4.7: Importance of accreditation for meeting customer expectation by organisational size



Source: NATA survey, Question 5 and 11, Notes: overall, n=253; Micro, n=46; Small, n=63; Medium, n=87; Large, n=57.

Organisational Story No.1
Sydney Water: Providing accredited services since 1952

Since legislation was passed in 1880 by Sir Henry Parkes as Premier, which constituted the Board of Water Supply and Sewerage, a single authority has been responsible for Sydney's water supply. Today, Sydney Water is Australia's largest water and wastewater service provider. It is a statutory State Owned Corporation, wholly owned by the New South Wales (NSW) Government.

Sydney Water provides safe drinking water to almost five million people across Sydney, the Blue Mountains and the Illawarra. It also maintains numerous wastewater and storm water services to help protect the health of rivers and beaches in NSW. Every day, Sydney Water supply about 1.4 billion litres of water to its customers. Dam water is treated at one of nine water filtration plants and is then supplied to its customers through an extensive network of 21,784 kilometres of water pipes, 243 reservoirs and 150 water pumping stations.

Given this investment, it is essential that Sydney Water maintains a set of comprehensive and rigorous testing laboratories to check water quality before reaching its customers. NATA accreditation has been a significant feature of the testing laboratories within Sydney Water since 1952, hence it is proudly regarded as the minimum standard of quality delivery for its customer base.

Being accredited with NATA for almost 70 years, Sydney Water has become one of the longest serving environmentally accredited organisations in Australia and takes pride in its assessment process. For example, the accreditation spokesperson for this organisational story has been a NATA Technical Assessor since 1991, having previously worked in many accredited labs before joining Sydney Water *'I have gained accreditation for labs that weren't previously accredited...so I've been a big supporter of accreditation even before the current accreditation process came and the previous...'.*

The primary benefit for Sydney Water in gaining NATA accreditation is to ensure that a minimum standard of quality is achieved for its customers....*'customers can know that they (Sydney Water) meet certain specific quality and management obligations....we have a customer centric quality system'.*

With the customer front of mind, it is no coincidence that Sydney Water are also mandated to conduct testing operations under the NATA microscope. Regulators such as the NSW Health department and the NSW Environment Protection Agency require laboratories to hold accreditation. As a result, Sydney Water meet relevant international standards for laboratory management and ensure all laboratories are kept up to date with relevant processes around the world with regards to laboratory management.

As a health and safety requirement of the NSW government, Sydney Water are mandated to maintain strict accreditation requirements. Through the provision of internal testing laboratories, these services are carried out. However, in times of efficiency and cost saving, the financial outlay for maintaining accreditation is often questioned within the organisation and the laboratory staff are quick to point out the value add of upholding their accreditation status as it creates a positive economic and social return to the company and to its customer base. *'Sydney Water always seeks to ensure its internal service continue to provide value for money to its customers ...maintaining a high standard of accreditation is always something that we rely on to provide that confidence'.*

Innovation within the accreditation process is viable. Although maintained within the boundaries and guidelines of NATA, innovation is seen as a means of standardizing a product and service that provides internal and external reliability and assurity. In saying that, when comparing in-house analytical testing methods with those from overseas labs, the process innovation agenda in Sydney Water is high.....*'the analytical market in North America is different from the analytical market here...it is very driven by regulation there and they produce a checklist sort of assessment....here we are more open to innovation and can use different techniques to do testing and reporting and that requires a greater level of expertise.....'.*

Whilst it is a regulatory requirement for Sydney Water to maintain NATA accreditation, internal laboratory organisational culture at the same time maintains that accreditation adds value to its corporate vision. In fact, Sydney Water are seeking to further accredit their laboratories to provide calibration services to ensure they continue to provide a value adding service to its customers.

4.1.1.2 Creating a competitive advantage and a marketing and branding advantage

Figure 4.4 highlighted that survey respondents considered the accreditation process as being a key factor for achieving a competitive advantage (53%) and a marketing and branding advantage (32%). This compares favourably to the UKAS respondents of which 50% indicated competitive advantage was a key driver (Frenz and Lambert 2014). Similarly, interviewees from this study suggested that differentiating themselves from competitors and using accreditation as a marketing tool to increase sales was important. Several companies mentioned that the accreditation process 'helped them stand out in the crowd', particularly in an environment which is increasingly impacted by competition based on price from other accredited and non-accredited providers:

> If we didn't have accreditation in what we did, it becomes a battle of the dollar....it's a race to the bottom.

Another company is pursuing greater levels of accreditation in other testing markets, as a tool to differentiate themselves from the competition:

> We're seeking greater accreditation...we're looking at being accredited for calibration and most labs are just accredited for testing.....doing that for marketing.....we just want to be able to point to something as why we're different than other labs – why we're better.

However, whilst it is still a competitive advantage for some sectors and industries, as more and more laboratories become accredited the market becomes saturated and often may be seen to dilute the perceived value for accreditation:

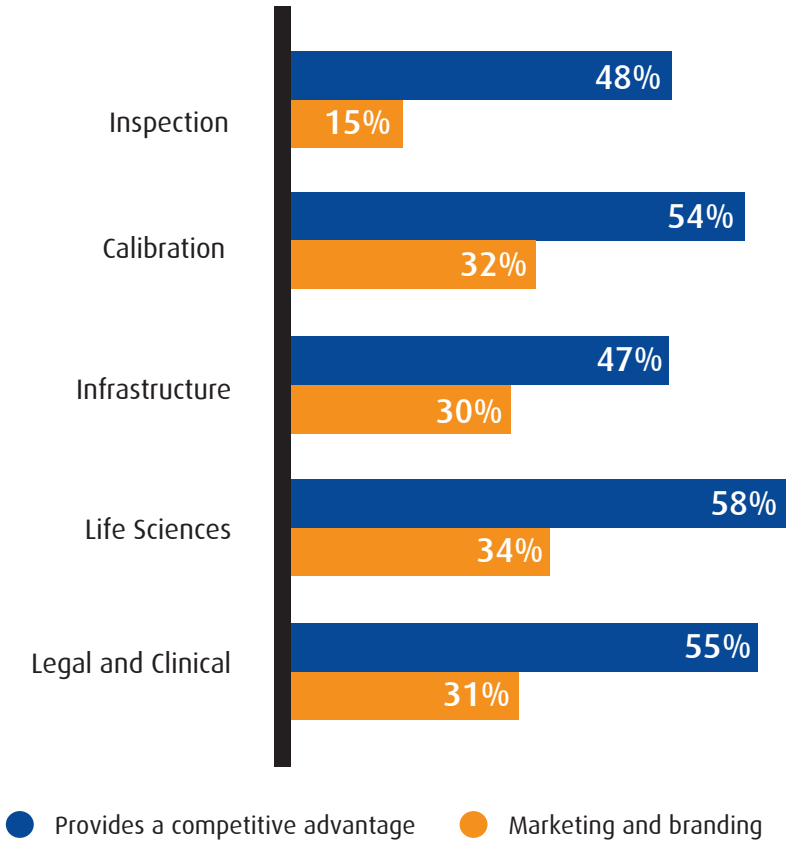
> I think back in the day...the original lab has been accredited since the 1990's and at that point it was seen as a marketing differentiator to our competitors who we knew at the time were not accredited.....now there are just so many labs accredited, it is not a marketing advantage anymore.

Several companies also expressed that a significant benefit of having NATA accreditation was to capture sales and position the company within markets and sectors that would not normally be available to them if they were not NATA accredited, facilitating a market advantage:

> 98% of our work has to have a NATA stamp on it, without that NATA stamp we wouldn't win those contracts.

As noted in one of the quotes in Figure 4.5, accreditation is a condition for fulfilling funding specifications in this Life Sciences NATA sector. In the funding assessment process, evidence is required to demonstrate the commercialisation claims potential of services and/or products as opposed to informal benefits. As a result, it could be argued that the commercialisation benefits experienced by the Life Sciences sector contribute to the sector highlighting the importance of accreditation from marketing and branding (34%) and creating a competitive advantage (58%), highlighted in Figure 4.8. Online survey respondents in the Life Sciences sector indicated higher than average response rates for these importance criteria.

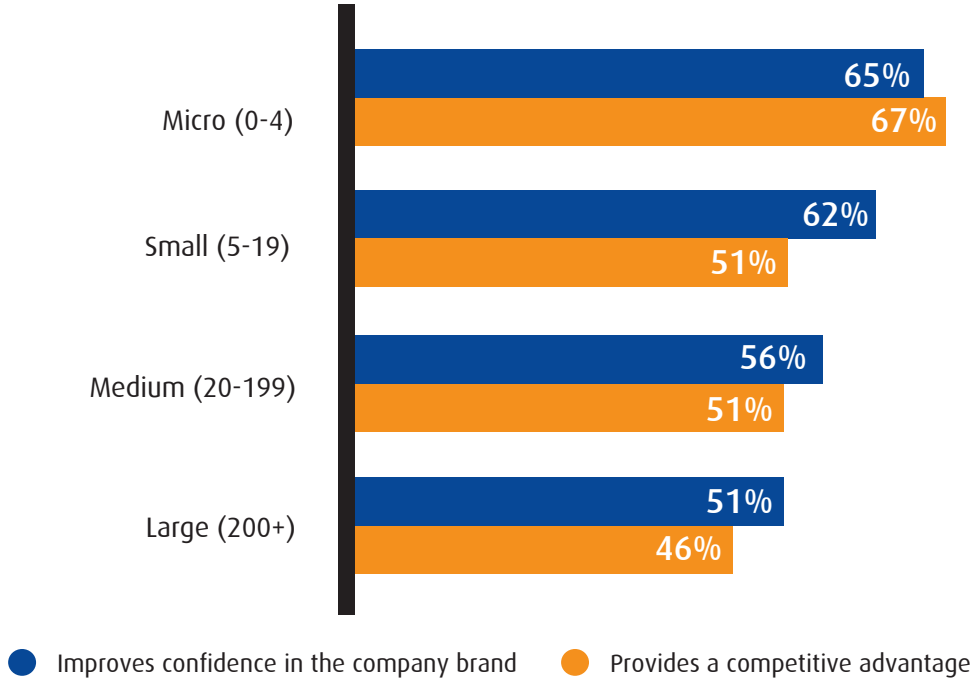
Figure 4.8: Importance of accreditation for marketing and branding and creating a competitive advantage by NATA sector



Source: NATA survey, Question 7 and 11, Notes: Inspection, n=33; Calibration, n=59; Infrastructure, n=108; Life Sciences, n=99; Legal and Clinical, n=55.

When the importance of accreditation was examined by size of the firm, Figure 4.9 shows that the smaller companies found accreditation important for marketing and branding (micro 54%) and achieving a competitive advantage (micro 67%), with micro organisations responding at higher than the average response rate for both benefits. Later in this section, the report highlights the impact of accreditation on firm innovation levels. Findings show that more innovative firms seek out accreditation processes to gain a marketing and competitive edge. The findings also highlight the proactive nature of micro firms in building a marketing advantage and tailoring accreditation processes to suit specific situations, enabling increased recognition benefit as illustrated earlier in Figure 4.2.

Figure 4.9 Importance of accreditation for marketing and branding and creating a competitive advantage by organisational size



Source: NATA survey, Question 5 and 11, Notes: Micro, n=46; Small, n=63; Medium, n=87; Large, n=57.

Organisational Story No.2
KINNECT: 'Accreditation facilitates the 'value-add' to our organisation'

KINNECT was established in 1996 as a provider of occupational injury prevention, injury management, health and medical services. KINNECT has since grown to become the #1 privately owned occupational health company in Australia with a National footprint.

KINNECT have a multi-disciplinary team of medical and allied health professionals who are passionate about making people at work healthy, safe and productive.

The company is a values driven organisation, whereby it's people base their decision making processes upon two principal 'core values':

- **Highly skilled happy people, and**
- **Creating sustainable value.**

KINNECT services include (but are not limited to) rehabilitation and return to work services, pre-employment medicals, onsite drug and alcohol testing, onsite physiotherapy, ergonomic assessments, manual handling training and health surveillance monitoring. NATA provides KINNECT with accreditation in Legal and Clinical Services.

Although established in 1996, KINNECT are a newer member to NATA, becoming accredited in 2015. The primary purpose for becoming NATA accredited was to enable the drug and alcohol testing side of the business to be overseen by an accredited governing body to provide a third part assessment. An additional benefit of NATA accreditation status was a competitive advantage when bidding for large company tenders. Essentially, *'NATA provides a palpable and comprehensive industry benchmark for drug and alcohol testing'.*

KINNECT consider the benefits of being NATA accredited are three-fold:

- Facilitates a marketing advantage,
- Ensures compliance with relevant standards, and
- Provides a minimum benchmark.

The three primary advantages of being NATA accredited are not solely attached to the corporate identity of the business. Rather, it is the intent at KINNECT that the benefits of accreditation are materialized across the organization. *'KINNECT as a private company is focused on achieving best in class standards. Additionally, we ensure our people understand these are a bench mark for Business as Usual.*

KINNECT's accreditation ensures we are maintaining our high standards to Australian drug testing standards as required by a national governing body. Having NATA accreditation helps KINNECT move beyond just 'ticking the box' by safeguarding that the drug and alcohol testing program that they provide is as efficient, equitable and fair as possible, *'they [NATA assessment team] never arrive for an audit and simplistically voice 'congratulations, you've ticked every box'. Consequently, NATA will purposefully seek and ultimately provide quality improvement suggestions pertinent to providing a quality service that KINNECT provide.*

NATA has helped KINNECT to shift from being a 'quality' organization to be a 'high quality' organization with respect to our Drug and Alcohol testing services. Prior to our accreditation KINNECT used the Australian standard guidelines, which while providing a framework, did not provide a quality framework with continuous improvement process to ensure we continue to provide a quality service for our clients.

Although KINNECT does not directly measure the impact accreditation has on the economic bottom line of the business, it does recognise that without it, the organisation's success rate in bidding for specific drug and alcohol service tenders would be lower. *'If KINNECT win the tender or even if we don't win the tender... the generic feedback we mainly receive is that they (the tendering company) noticed that we are a NATA accredited drug and alcohol service'.*

It is KINNECT's opinion that NATA does attach an extra level of value add to the service provided. For example, NATA suggested *'placing thermometers to measure room ambient temperatures, thus ensuring that all the drug testing devices are kept stored at sub 30 degrees, which is important to maintaining quality testing devices'. 'This was really a simple recommendation yet providing a salient improvement'.*

NATA accreditation positions KINNECT to showcase that they are a leader in the drug and alcohol testing industry and are delighted to be an accredited member of NATA.

Organisational story No.3

Eville & Jones Food Safety Operations: A true partnership of quality assurance

EVILLE & JONES

Eville & Jones Food Safety Operations (EJFSO), established in 2013, is an Australian owned, directed and operated company providing third party meat inspection services to the Australian meat industry.

The Directors of EJFSO have been part of the industries continued evolvement over the last 35 years. They have been associated with the meat processors, producers, regulatory authorities and the bodies set up to maintain the integrity of the system while allowing industry to assume greater responsibility.

As an independent employer of Australian Government Authorised Officers, EJFSO offers its customers third party meat inspection services to comply fully with European Union requirements and satisfy Australian industry expectations – working to ISO 17020 standards, as requested by Department of Agriculture and Water Resources.

The service provided by EJFSO is based on a full understanding of the Australian industry, its market/s, international requirements and the standards demanded. EJFSO is accredited by NATA for its inspection services.

EJFSO's Australian operation is a more recent member of the NATA accredited system, and regards NATA approval as essential in order to satisfy the stringent export markets of the European Union. It is a requirement by the overseas market and the Australian Department of Agriculture and Water Resources that the audit process conducted by EJFSO is subject to a quality assured third party assessment.

Regardless of the stringent requirements to comply to NATA accreditation, EJFSO continue to subscribe to a company philosophy of strong quality assurance across their products and services, *'there is no doubt that ongoing contractual obligations are at the top for us, but it does provide us with a management structure... we see value in that...we feel that the NATA program has a bit more integrity and structure than just ISO9000 accreditation'.*

A primary benefit of NATA accreditation for the clients of EJFSO is the flow on effects for marketing a quality product – from the abattoir to the retailer, *'in a couple of weeks' time, our client company is being audited by the relevant Taiwanese government department and part of that is the inspection procedures and the fact that we are NATA approved...that is being promoted as part of the integrity of the product that they get'.*

EJFSO view the relationship they have built with NATA as a partnership. This alliance is key to meeting the regulatory and quality requirements of the client as well as improving domestic exporting activity and growing a sustainable meat and export livestock industry in Australia.

Quality inspection services are pivotal to the successful operations and continued integrity of the Australian industry as perceived around the world. It is necessary on occasions for EJFSO to discuss upcoming niche large scale projects with NATA to ensure the best quality outcome is achieved for both parties, *'there is a large project coming up in Australia that will need accreditation such as NATA...we are being considered to be involved in it and we would like to sit down with NATA to see how they can help...'.* Thus, communication and negotiation has been an integral component of EJFSO's young association with NATA to ensure the company, Australian economy, client and NATA benefit in the name of quality assurance.

The partnership model with NATA is the preferred business approach for EJFSO to not only maintain a high standard of quality in their inspection processes, but also to develop a strong meat export market with other countries around the world, opening up Australian economic development opportunities.

EJFSO has found NATA to be open and flexible in their inspection deliberations and these attributes have been invaluable to progressing the company in Australia, *'the beauty I find with these people who are auditing us is...we can talk to them and we can follow up...whereas some of the other companies we've worked with...don't understand the background... I am pretty happy with the approach NATA has given us'.*

4.1.2 Standards & Quality

In Figure 4.2, the research team illustrated that standards and quality contribute to building a successful quality accreditation infrastructure system (Swann 2010). A quality standards mindset within the organisation was found to be attributed to pursuing accreditation (Swann 2000). Conforming to a standardised infrastructure resulted in: a) building confidence that supports conformity and consistency, b) receiving a third party assessment of products and/or services and c) meeting the regulatory requirements of accreditation.

4.1.2.1 Building confidence that supports conformity and consistency

Building confidence in the company brand was the third key factor for 58% of online survey respondents in pursuing accreditation in Figure 4.4. Interviewees articulated a range of avenues for improving company confidence levels. For example, two interviewees acquired confidence in the accreditation process and what it had achieved for the organisation's quality commitment, from previous employment experiences and working in other accredited facilities. There was a 'will' for this transfer of knowledge and quality philosophy to continue within existing employment scenarios:

> My background prior to having... my own business, I did work for 9 years...for a calibration business, and they were accredited as well.

Another example:

> I've been a technical assessor with NATA since 1991-ish...I worked at 1, 2, 3, 4, 5 NATA accredited laboratories since that time. Two of those labs...they weren't accredited when I started working and I gained NATA accreditation for those labs. So, I've been a big supporter...

Confidence in the NATA accreditation process provides an organisation with an assurance that key value chain components, (from obtaining raw materials all the way to delivering an outcome to the end user), will benefit from quality customer centric processes. Key interviewee's perspectives shown below, describe how NATA has significantly contributed to such a boost in company confidence. For example, a Life Sciences sector interviewee suggests that NATA accreditation ensures the product is safe for consumption and therefore, provides assurance of such a company value add component to management. These assurances are facilitated by the third party assessment process that is a critical part of the accreditation infrastructure. Whilst not suggesting the accreditation process is perfect, it does suggest that it provides a level of confidence to ensure any mistakes encountered can be identified and rectified using a systematic approach (see also, Frenz and Lambert 2014).

Opening the door to commercial contracts

'...we'd have workshops with management...I'd just say we are an organisation that provides a product that can kill people, everybody needs water, if we don't supply a quality product...or we can kill the environment if we discharge stuff that's detrimental...'. (Life Sciences sector).

'... we ourselves thought we were doing a reasonable job with our systems and the way...that we were doing things, we recognised that NATA would give an objective assessment of that. So what we're after was...an independent well recognised accrediting body such as NATA do that for us, and that would give us, quite a robust claim to what we were doing' (Calibration sector).

'.... it does provide a framework for quality...enable an external review of your processes and things..., there's a tendency to get stuck in doing the things the same way, or not thinking outside those areas. So it is a mechanism for improvement.....and that can sometimes provide additional mechanisms of changing processes and things like that (Legal and Clinical sector).

4.1.2.2 Third Party Assessment

Boosting confidence levels was also valued by companies through seeking a level of independence or third party assessment (Swann 2010). These steps ensured an internal process contained rigour, robustness and aimed to build internal capability. In the absence of a second or third pair of eyes, the level of accuracy required can often be neglected. Hence, NATA accreditation was attributed with providing specific levels of confidence in assessment and testing accuracy:

> It also is something that we sell within the company, we have accreditation. So our management looks on that as a positive that they can use when they're pursuing additional work with our customers and prospects.
>
> ..... Whenever they [NATA] come to audit us, they give us their perspective and there's discussion as to how things are done and the latest techniques. Really a requirement of NATA accreditation is to do proficiency testing so just to ensure that your lab is proficient and continues to be proficient looking at various analysts.....just making sure that all of our analysts are competent in all of the analyses that we ask them to do.

4.1.2.3 Regulatory requirement

In Figure 4.4 the research team identified that 64% of online survey respondents pursued accreditation as a mandated regulatory requirement (Standards Australia 2016) and this was the second most important factor for pursuing accreditation. Interviewees provided additional insight into the regulatory requirements of accreditation and the impact accreditation had on the organisation.

Not all firms across the five NATA sectors are mandated to hold NATA accreditation. However, some firms within the Legal and Clinical sector are specifically required to be NATA accredited. For example, medical testing facilities are mandated to have NATA accreditation in order to claim the Medicare rebate for customers and receive payment for these services. The importance of this feature for accreditation was also noted by five respondents in the online survey.

Other examples show that companies outside of the Legal and Clinical sectors and across Australian states and territories are required to also obtain NATA accreditation for pursuing key government infrastructure contracts:

> In those days [our company] was actually physically building the road network and we had our laboratories did the testing to make sure that they met the standards required, but they weren't NATA accredited.... Now....the federal government required that all testing done on contracted projects had to be NATA accredited.

Another government example:

> With our regulators, Department of Health and Office of Water and DPI, they state that the facility doing the testing for the water authority must be accredited.....it's sort of not negotiable.

Often direct measurement of accreditation's economic benefit is considered a challenge if the company is required by legislation to gain accreditation. Instead, the company sees it as a necessary business cost:

> 98% of our work requires the methods that we apply are complying with legislation. So without it, I mean we're not in business, if that makes sense. I can't really measure it because it's an enforced compliance.

Claiming the Medicare rebate

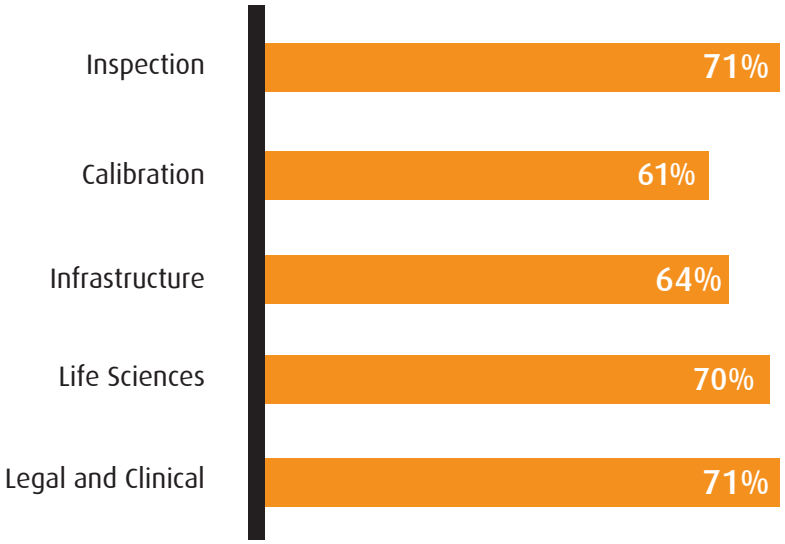
'...if we want to receive Medicare reimbursement for the role that we play and the tests and procedures that we do, we have to be accredited and to the best of my knowledge, NATA is the only pathology accrediting body (Legal and Clinical sector).

'...it's a requirement in Australia if you have a medical pathology lab, to have NATA accreditation, otherwise you can't access Medicare (Legal and Clinical sector).

'...So if you're doing anything that's Medicare relatable, basically you have to have NATA accreditation so that your customers are eligible to receive those benefits (Legal and Clinical sector).

Figure 4.10 highlights that the Legal and Clinical sector (71%), Life Sciences (70%) and Inspection (70%) sectors highlighted it was a key regulatory requirement to have NATA accreditation, with organisations responding higher than the average response rate.

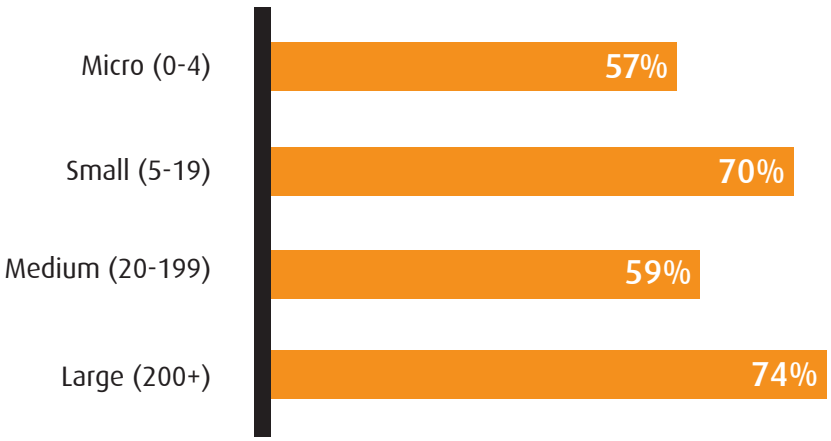
Figure 4.10 Importance of accreditation as a key regulatory requirement by NATA sector



Source: NATA survey, Question 7 and 8, Notes: overall, n=253; Inspection, n=33; Calibration, n=59; Infrastructure, n=108; Life Sciences, n=99; Legal and Clinical, n=55.

Figure 4.11 highlights that larger organisations (74%) consider accreditation as important for meeting regulatory requirements, followed by smaller organisations (70%). Findings show that smaller organsiatons need to meet regulatory requirements particularly when tendering for large company or government contracts. Whereas, larger companies in the Legal and Clinical and Life Sciences sectors are required to be accredited to ensure national quality and safety standards are conformed to and in the benefit of the public interest (Swann 2010), leading to an increased rate of accreditation.

Figure 4.11 Importance of accreditation as a key regulatory requirement by organisational size



Source: NATA survey, Question 5 and 8, Notes: overall, n=253; Micro, n=46; Small, n=63; Medium, n=87; Large, n=57.

4.1.2.4 Measuring the economic contribution in standards and quality

In addition to measuring the intangible benefits of accreditation, Figure 4.1 illustrates the direct measureable value of standards and quality attributes is essential for establishing the economic contribution at the micro level.

For example, organisational interviews highlighted the value organisations placed on the economic benefits of accreditation as being able to charge a premium price for the services and/or products delivered:

> You know our investment in NATA accreditation enable us to get a better margin out of our NATA endorsement on a calibration of a scale. Customers are prepared to pay more for the quality of our work as reflected in our NATA accreditation.

Similarly, the same interviewee linked the accreditation attributes and the ability to be able to charge a premium price to directly result in the organisation being able to afford higher quality facilities to the customer:

> You know, would I have a laboratory running like that if we didn't have NATA? I'd say probably not, because we wouldn't be able to earn the same amount of revenue.

Another two interviewees were able to significantly broaden their markets or seeking funding opportunities that would otherwise not have been available to them in the absence of accreditation:

> So there's a whole raft of labs out there across Australia and around the place that, need traceability and accredited results. So having the NATA accreditation means that the market for us is, much broader.
>
> Our Mass Spectroscopy Facility has had 10 external projects developed since late 2016, of which 3 were developed due to our NATA accreditation.

Thus, on the one hand, accreditation provides the opportunity for organisations to charge a premium price for their quality services. However, these accredited firms have to manage the dual challenge of lower price service from non-accredited competitors and to convince customers or potential customers of the value of their higher quality service.

But I don't want it to be a [simply] price thing. When people ring and say , "Oh I've got this other big quote and they're 30% cheaper", and we're saying in response "Well the only way we can do it properly is by the price we've quoted,"....no one sees the robust quality process that we have and the steps that we follow, customers give us a piece of equipment and we come out and we look at the piece of equipment, and then we walk away and customer gets a sticker and a piece of paper. We have to convince our customer the quality and accredited process behind our service provide assurance that our service is fit for purpose.

Organisational Story No.4
Abstec Calibrations: No substitute for accreditation

Based in Beverley, South Australia, Abstec Calibrations has been providing technical services in the calibration and maintenance of measuring and testing equipment since 1995. Abstec's diversity of product lines include Calibration, limited service and repair. Calibration for electrical, pressure, heat and temperature, force and Torque, dimensional metrology, weighing and masses. Major competitive advantages include Abstec's small team of highly skilled technicians who carry out all calibration, service and repairs and provide equipment services and after sales support to meet our client's needs as well as prolonging the useful life of our client's equipment. Accredited by NATA, all calibrations are carried out using reference equipment where accuracy and precision is traceable to national and/or international measurement standards.

As a privately owned business, Abstec has been built on quality principles driven by the Managing Director's many years of experience in accreditation, *'to be a serious calibration provider, we really had to have NATA accreditation.....there is no substitute'.*

The primary motivation for Abstec seeking NATA accreditation is the need to meet client regulatory requirements, thus without it, the company would not be able to compete for such quality standard contracts. As a result, NATA accreditation differentiates Abstec from other calibration providers in the market who do not pursue such quality standards. In fact, some testing laboratories prefer to utilise the services of overseas accreditation facilities to circumvent such stringent processes....*'this becomes a race to the bottom and a battle for the dollar...' with Abstec having to competing within a market based on cheapest price.*

The calibration testing process is a comparison of measurement values delivered by a device under test with those of a calibration standard of known accuracy. Thus, Abstec ensures the long standing traditions of physical measurements are conducted during testing, which take time, precision and care. *'If we are doing dimensional calibration, it's still a physical measurement on something for size...still very labour intensive...'* NATA accreditation is integral to such a quality organisational culture and provides the firm with the opportunity to position its services within markets of highest value. As a result, the key benefits of accreditation for Abstec Calibrations are to:

- Gain access to higher value markets,
- Seek a marketing advantage, and
- Ensure the customer receives the flow on effects of accreditation.

The value add for Abstec Calibrations is in seeking the higher level equipment calibration contracts which require higher accuracy. However, the Managing Director perceives the value add of accreditation for the firm is embedded within the company's quality philosophy and extends far beyond any price point and difference in profit. For example, Abstec immerses itself in the accreditation process and derives value from many components of the accreditation process itself. These include the value of being a technical assessor in the accreditation process, imparting knowledge and experience across the industry and learning from other firms throughout the process.

Abstec also recognises the value that the accreditation process returns to many Australian people, industry as well as the economy by way of enhancing skills, quality outcomes, accurate services, product assurance and growth of the confidence within the calibration sector.

Abstec Calibrations has employed an innovative mind set since its inception. Innovation within the calibration industry is generally driven by the customer out of necessity. Innovation at Abstec largely involves integrating new calibration methods with the latest equipment along with customer's new technological advances in hardware and software to provide better solutions. '*Customers come to us and look in our lab and they're always like 'wow, look at all the latest equipment you have....but would we have a laboratory like that if we didn't have NATA, I'd say probably not, because we wouldn't be able to support the need for this equipment.*

Ultimately, the benefit of Abstec Calibrations accreditation and partnership with NATA is the outcome it achieves for its clients, as they can be confident of the goods and service, as well as the quality and compliance with relevant national and international standards.

Organisational Story No.5

University of Queensland (UQ) Centre for Clinical Diagnostics: Bridging the gap between accredited research and improved community health

The Centre for Clinical Diagnostics (CCD) is a NATA accredited research, development and evaluation facility within UQ Centre for Clinical Research (CCR).

The Centre forms part of the Queensland Node of Therapeutic Innovation Australia to allow life sciences researchers to translate their discoveries into commercial products faster. NATA accreditation will reduce time-to-market for new in-vitro diagnostics and will provide training for a new generation of industry-ready researchers.

The facility houses a range of state-of-the-art platform technologies including liquid chromatography mass spectrometry, nanoparticle tracking, protein solution arrays and real time live cell monitoring and imaging that are available for domestic and international researchers. Centre facilities and services are available for use by external researchers and clinicians.

The motivation for accrediting the Centre for Clinical Diagnostics was driven by two goals. One was to ensure a rigorous, robust and quality framework was implemented to complement and support the Centre's research and development agenda 'we can now actually have all the traceability we need to make absolute claims and maintain formal structures around project development...most researchers are used to doing this informally'. Therefore, improving the likelihood of research program success, the Centre is confident that the accreditation process provides a formal structure and clear guidelines to achieve quality and credible research objectives.

A second goal was to improve the value of the intellectual property developed within the Centre', if we are looking at developing a diagnostic test and we get something that is really good, we can actually work with a commercial partner to get it FDA or TGA approved and not have to repeat the development data because we have already...complied with NATA'. For the Centre, NATA accreditation facilitates the commercialisation process of existing quality research.

NATA accreditation provides a competitive edge for the Centre. Relevant national and global funding bodies are moving towards requiring documented evidence as proof of research concepts and trials, rather than relying on claims in a funding submission, *'so if we can get a bit of a march on that...get our researchers used to the idea that functioning under a quality system gives them that competitive edge when they're going for grants and seeking commercial collaborations...that is a main advantage point'.*

Similarly, as a clinical research facility, many researchers want to be involved in international clinical trials. To do this, international partners require a comprehensive and rigorous facility audit. NATA accreditation has enabled the Centre to successfully submit the results of independent audits conducted by NATA and, as a result, have formed new international collaborative alliances.

Without NATA accreditation, the Centre would have to request the alliance partner to conduct an external audit on the Centre's systems to demonstrate compliance with the partner's specifications and standards. These actions would have been expensive and time consuming for both parties involved. Instead, NATA accreditation provides credibility and confidence for the Centre and is thus considered a worthy partner and removes the need for duplicating tests, time and resources.

NATA has been able to assist the Centre in facilitating the cultural acceptance of accreditation standards through training and awareness programs. NATA's strict regulatory requirements have challenged the traditional research scientist who is not trained in managing a quality system or providing audit reports. NATA has been able to provide the Centre with a step by step gap analyses to address some of the requirements for further accreditation, which has been a useful exercise for building a culture of accreditation in the research process, *'research scientists have spent their entire career working laissez-faire and we're trying to get them in and adhering to formal processes for documenting their research projects and managing the training of their students in this way...it make it a little interesting'.*

Ultimately, NATA accreditation is a unique model for a specialised university research and development facility. The UQ Centre for Clinical Diagnostics aim to embrace the accreditation model to its full advantage and so far have demonstrated the benefits NATA accreditation can provide, particularly in generating a competitive advantage, attracting funding and commercialising research.

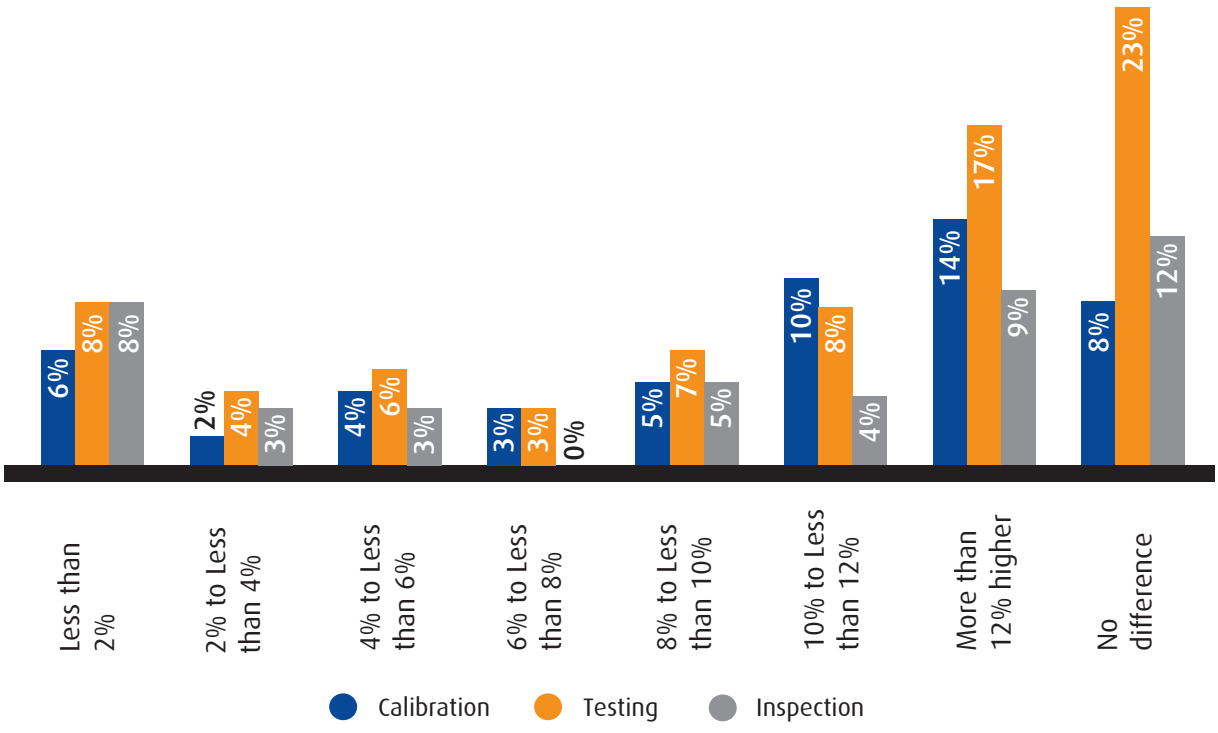
Economic value derived from adopting standards & delivering quality

As outlined earlier, a fundamental benefit of accreditation is the improvement in quality standards associated with the services offered, leading to an increase in consumer confidence when compared to the purchase of services derived from non-accredited organisations. As a consequence of accreditation, the accredited provider may experience an increase in demand, an improvement in production efficiency (Area C in Figure 3.1, section 3), and benefits to the consumer in the form of higher quality products and/or services.

Based on this level of confidence, quality and reduced risk, the consumer's reservation price increases. The reservation price is the maximum price that a buyer would be willing to pay for a good or service. The difference between the reservation price for accredited services and that of the same but non-accredited services is comprised of two components - a price premium that can be charged for quality improvements brought about through the accreditation process and the consumer surplus component (i.e. the difference between the consumer's willingness to pay for accredited services, and the equilibrium price for accredited services) assuming a single non-discriminatory price is charged for a specific accredited product or service. In the remainder of this section the research team provide an estimate of both components.

Price Premium: This price component is the result of introducing accredited product or services that result in an increase in the demand as a result of NATA quality assurance of services and products. Respondents were asked to indicate the price premium that was feasible as a result of having NATA accreditation. This amount is shown in Figure 4.12 for calibration, testing and inspection. On average, respondents noted a price premium of 7.4% for calibration, 5.8% for testing and 5.4% for inspection as a result of availing NATA accreditation services.

Figure 4.12 Price Premium amount per activity



Source: NATA Survey, Question 19, Note: n=240, 'not application' not shown on graph.

A value for price premium on NATA accredited services was calculated at a respondent level, resulting in a median value of $85,674 across all types of accredited services – testing, calibration and inspection. The median price premium value of the sample for each of the three activities – calibration, testing and was applied to NATA's overall client base in order to calculate the overall economic contribution of the price premium component, as shown in Table 4.1.

Table 4.1 Price Premium

Accreditation Activity	Overall
Calibration	$ 3.4m - $4.1m
Testing	$ 92.7m - $113.3m
Inspection	$ 2.8m - $3.3m
	$ 98.9m - $120.6m

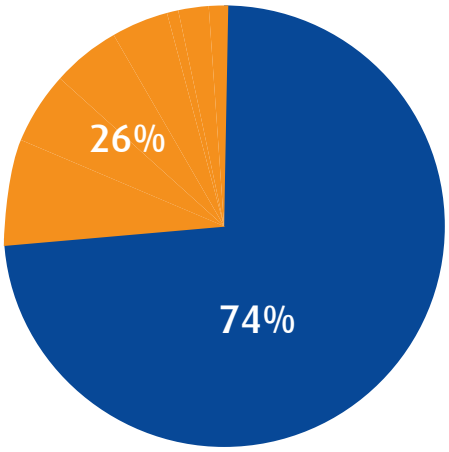
Overall, the economic contribution of accrediting a product or service that increases demand (i.e. the price premium component) is estimated to be in the range of

AUD $98.9 million to AUD $120.6 million.

Consumer Surplus: The second component explaining the reservation price is the consumer surplus. Without the appropriate data on the end user (see earlier limitations in section 3), this component is difficult to measure with accuracy. As a proxy, the NATA survey sought to determine the capacity of the end-consumer to absorb a further price increase for accredited products. The survey respondents were asked to provide these possible price increases as a percentage over the existing price ranging from no increase in price, through to increases by the inflation rate and beyond. A total of 26% of respondents indicated that increases in their prices are likely over the next 12 months, and 74% highlighted that it was unlikely that prices would be increased, shown in Figure 4.13.

The primary reasons for price increases included regular CPI price adjustments and increases in labour costs, while the competitive environment and market conditions were key reasons for not increasing prices.

Figure 4.13 Likelihood of price increase

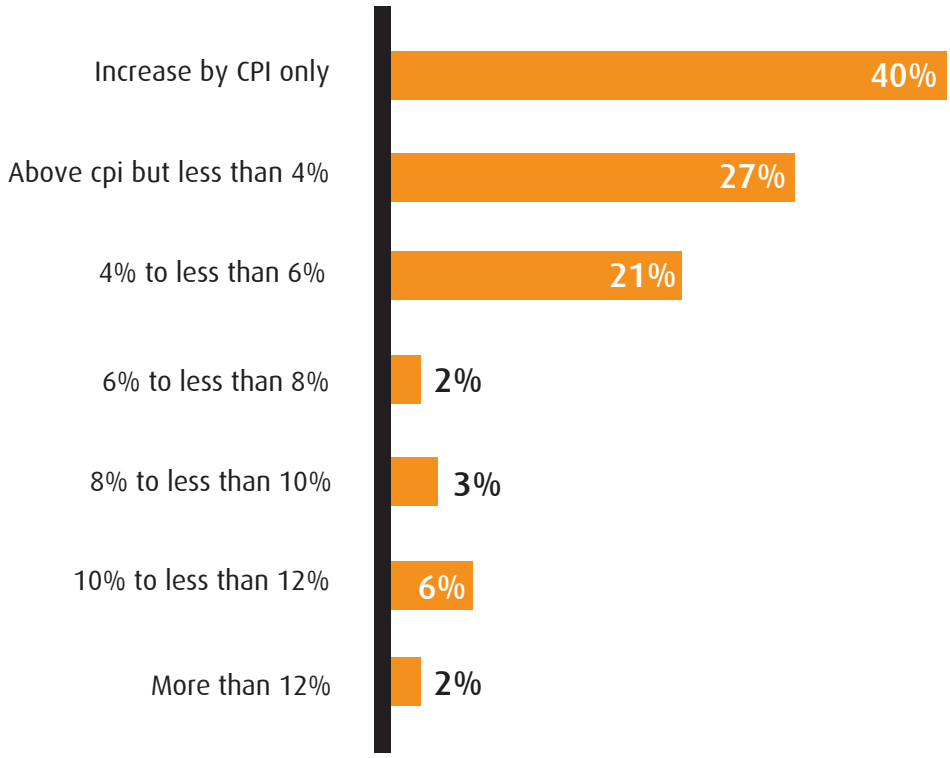


Of those who were likely to increase prices, 40% indicated the increased amount would be by CPI only while the remaining specified an increase above CPI. On average respondents indicated a price increase of 3.9%, highlighted in Figure 4.14.

Likely Unlikely

Source: NATA Survey, Question 20, Notes: n=240.

Figure 4.14 Price increase amount for the next 12 months



Source: NATA Survey, Question 21, Notes: n=63.

The economic contribution for this proxy measure of consumer surplus for calibration, testing and inspection services was determined at a respondent level based on those who indicated a likelihood of price increases above the growth in the CPI. The median value for each type of accreditation activity was applied to NATA's client base to calculate the overall economic contribution of the consumer surplus, shown in Table 4.2.

Table 4.2: Consumer Surplus for each type of NATA activity

Accreditation Activity	Overall
Calibration	$0.1m - $0.2m
Testing	$8.8m - $9.3m
Inspection	$0.4m - $0.6m
	$9.3m - $10.1m

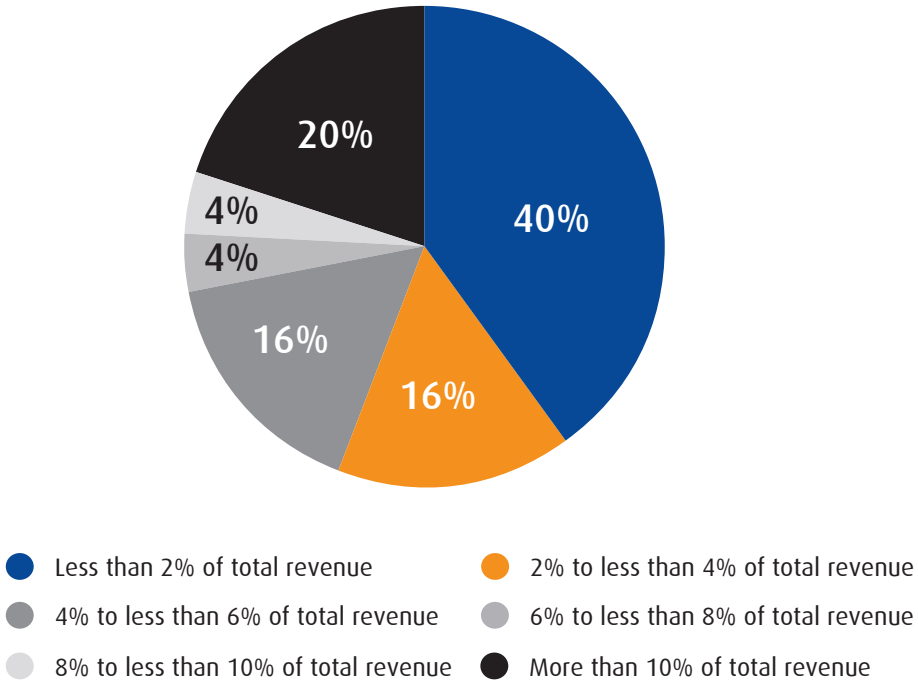
Based on these calculations, the overall economic contribution of the price increase component is estimated to be between AUD $9.3 million and AUD $10.1 million.

4.1.3 Efficiency and Productivity

As a result of pursuing a quality accreditation infrastructure system, Figure 4.2 highlights that organisational efficiency and an increase in productivity were two benefits stipulated by online survey participants as reasons for pursuing accreditation. To measure the direct benefits of efficiency and productivity, the report highlights the cost saving contribution that accreditation made to an organisation's total revenue.

A total of 22% of the survey respondents indicated that accreditation 'makes a significant contribution to the organisation's level of efficiency' and is a key reason for pursuing accreditation. Figure 4.15 illustrates the degree of cost savings as a proportion of revenue. A total of 41% of respondents indicated a cost efficiency dividend of less than 2%, while 20% indicated a value of more than 10%. On average, the efficiency cost savings was estimated at 4.4% of total revenue.

Figure 4.15: Efficiency gains/cost savings are a result of accreditation



Source: NATA Survey, Question 12, Notes: n=56.

Organisational Story No.6
Main Roads Western Australia: Internal culture of quality & standards

Main Roads Western Australia (Main Roads WA) is part of the WA Government's Transport Portfolio. It is responsible for the delivery and management of a safe and efficient main road network in WA through:

- **Managing the state's highway network,**
- **Planning, building and maintaining the state's major government road infrastructure projects,**
- **Enabling technology to manage the network, improve traffic flow and provide real-time travel information, and**
- **Improving amenity by developing roadside stopping places, public art infrastructure and understanding all transport user needs.**

Main Roads also provides guidelines and specifications for road and bridge design and construction, environmental management, surveying methods, and traffic engineering. NATA provides accreditation for Main Roads testing laboratories for calibration and infrastructure.

As an asset manager, Main Roads deliver their infrastructure portfolio through a quality contract management system. To ensure all projects are delivered to the required quality standard, Main Roads requires that all testing be undertaken by NATA accredited laboratories, and undertakes audit testing through its internal material testing laboratories to provide confidence that the works meet specifications.

Main Roads has been accredited since 1985, when the Australian government required all publically funded road projects to be NATA accredited. Today, Main Roads has laboratory and testing capability in each region of the State with the capacity to also conduct equipment calibration. The calibration operation complements the testing side of the business by ensuring equipment used for testing also complies.

The primary objective for Main Roads seeking NATA accreditation is to maintain informed management of the whole design and construction process. Contractors commissioned under specified guidelines from Main Roads, are required to conduct their own testing in accordance with the contract specification that incorporates NATA accreditation status. However, due to past issues associated with contract project safety and quality, Main Roads has found it essential to maintain an assessment responsibility, '*we had some significant failures of the road network, so it was decided that we needed to understand what was going on...so we maintained some capability and that has meant that we've kept our laboratories and our NATA accreditation'.*

By maintaining NATA accreditation, Main Roads are able to provide an assurance that the accreditation tests carried out by the contractor when doing work for Main Roads, are maintained at the highest standard. In the case of a dispute arising, Main Roads are able to apply NATA accredited processes to resolve any system failure. Thus, NATA accreditation provides a level of credibility for the asset manager, which they wouldn't otherwise have.

Main Roads' infrastructure is often constructed in very remote parts of WA, where it is necessary to acquire raw materials from local sources to save time and costs. To be able to employ this technique, materials still need to be rigorously tested. Main Roads' testing laboratories in regional locations enable internal staff to understand the quality of the materials used by contractors and how that material performs. Main Roads also maintain an internal capacity to understand test results, *'if we get results back from a commercial laboratory that don't make sense or they look wrong, we can recognise that because we have the knowledge and skill...so NATA accreditation provides us with a bit more rigour around how people do things'.*

Main Roads often search for new materials and innovative processes to improve asset building efficiencies and safety. For example, Main Roads are working with the Australian Road Research Board and other state authorities to use a new asphalt product that has been successfully used in Europe *'it is not a new product, but it is innovative as it requires a new method of testing to be developed that can be accredited by NATA...so we can't just follow the old empirical tests....we have to do a lot of research to find out if we can use it...'.*

For innovation and trade, Main Roads see the importance of accreditation, *'I have many people who contact me about getting Main Roads to use a product that has been imported from overseas'.* If the imported product can be tested at the source of origin and demonstrates compliance with the equivalent of NATA's accreditation standards, it could be imported, but this is often a stumbling block for importers.

At the end of the day, Main Roads utilise NATA accreditation to ensure a level playing field which involves the contractor and the asset manager using the same testing processes and being assessed by the same accreditation arrangement, '*a test result unless it is done right, means nothing'.*

Economic value of benefits

Based on this background, the cost efficiency dividend measure for NATA services across the three activities is calculated. The efficiency value was calculated at the respondent level, resulting in a median efficiency cost saving of $135,000 across all accreditation activities. Table 4.3 provides an estimate of the cost saving dividend for the NATA client base as a result of accreditation.

Table 4.3: Efficiency Gains for each NATA activity

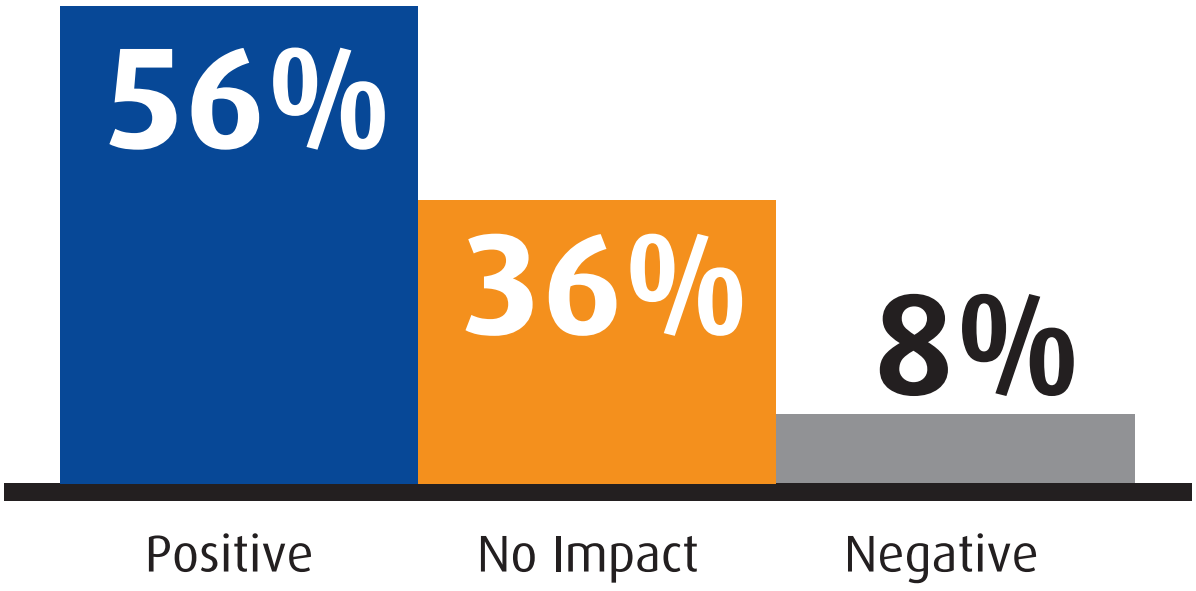
Accreditation Activity	Overall
Calibration	$2.6m - $3.5m
Testing	$34.2m - $40.9m
Inspection	$34.2m - $40.9m
	$38.1m - $46.3m

Overall, the economic value of these cost efficiencies arising from accreditation is estimated to range from AUD **$38.1 million to AUD $46.3 million.**

4.1.4 Attributes of a quality accreditation infrastructure - Innovation

Innovation activity at the micro level was found to be a key attribute in a successful quality accreditation infrastructure, highlighted earlier in Figure 4.2 (aligning with Frenz and Lambert 2014). For example, 56% of online survey respondents confirmed that innovation was positively impacted by accreditation as opposed to 8% who highlighted a negative impact. Another 36% said that accreditation had no impact on the organisation's level of innovation (Figure 4.16).

Figure 4.16: Impact of accreditation on organisation's innovation level



Source: NATA Survey, Question 9, Notes: n=253.

Figure 4.17 highlights some of the comments provided by online survey respondents when describing the positive, neutral and negative impacts accreditation had on organisational innovation levels.

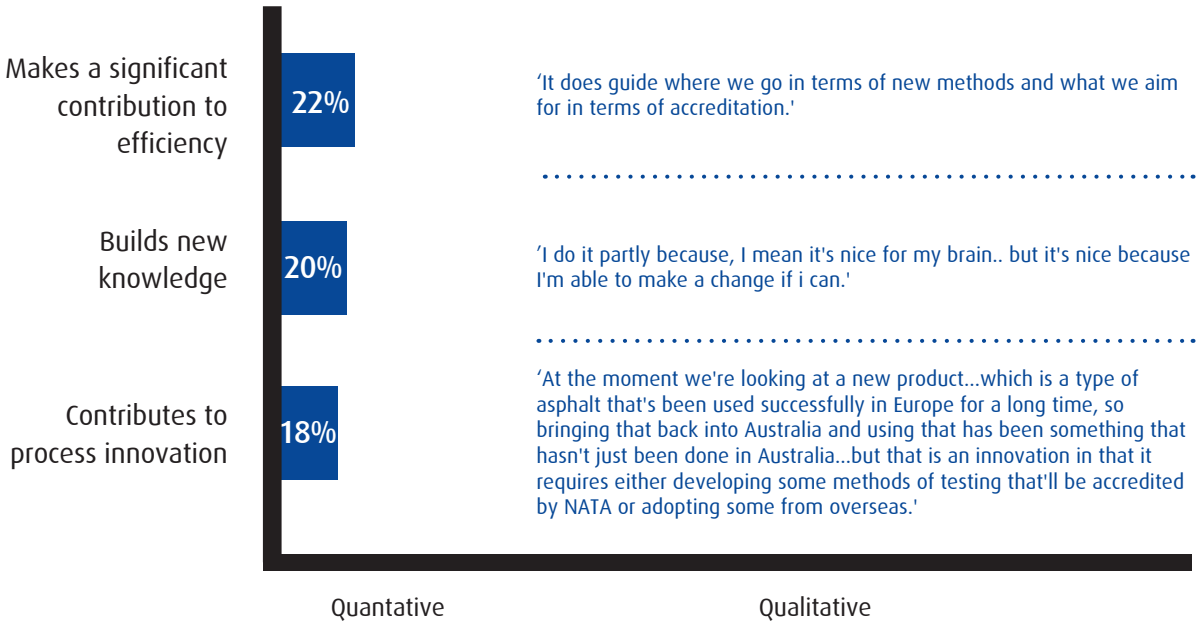
Figure 4.17 Online survey responses based on impact of accreditation on organisational innovation levels

Source: NATA Survey, Questions 9 and Question 11, Notes: n>45; overall sample: positive = 56%; negatively / no impact = 44%.

4.1.4.1 Positive impacts of accreditation on firm innovation levels

Figure 4.18 shows the positive impact of accreditation on innovation levels based on the key factors identified by the online survey respondents earlier in Figure 4.4. Key positive factors most commonly identified included 'makes a significant contribution to efficiency' (22%), 'builds on new knowledge' (20%) and 'contributes to process innovation' (18%). Figure 4.17 also highlights interviewees from the calibration and infrastructure sectors positively aligned with the online survey findings by highlighting that accreditation had impacted on improvements to process innovation and knowledge, aligning with Frenz and Lambert's (2014) modes of innovation contribution.

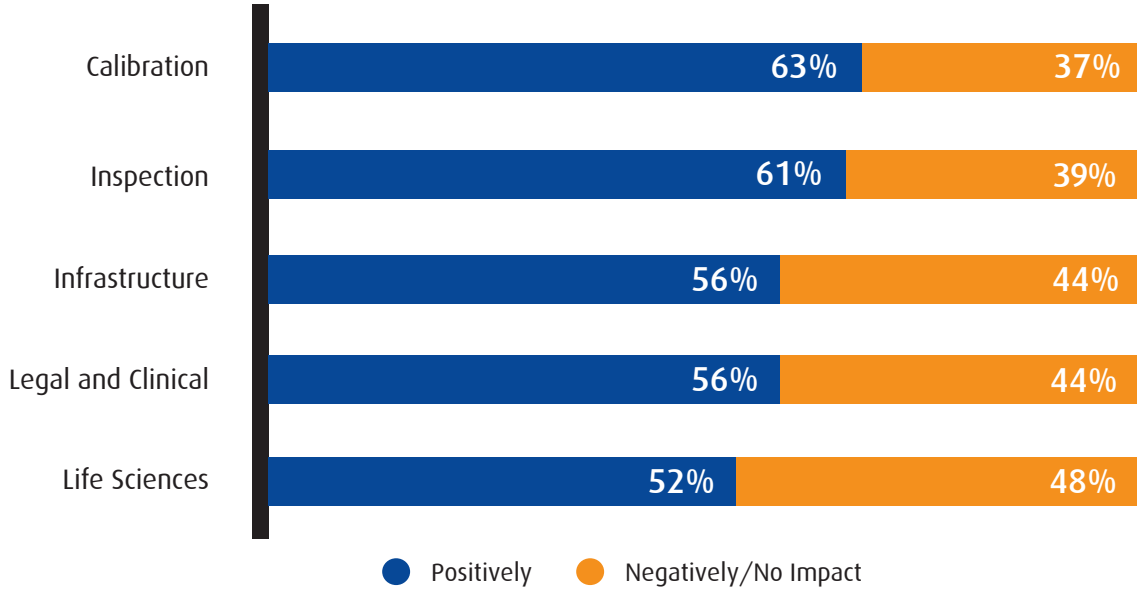
Figure 4.18 Positive impacts of accreditation on organisational innovation levels



Source: NATA survey, Question 11 and NATA client interviews, Notes: Question 11, n= 253.

Figure 4.19 also shows the impact of accreditation on organisational innovation based on the specific NATA program sector. Whilst there is not a large variation between each sector, the Calibration sector had the highest percentage of those who indicated accreditation had a positive impact. It could be argued that the calibration sector contains a larger amount of smaller and micro organisations than medium and large, which increases the likelihood of these firms being more agile and innovative across business processes, thus increasing the sum of innovative products and services on offer (Frenz and Lambert 2014). Whereas, the Life Sciences and Legal and Clinical sectors tend to be bound to the process of accreditation due to regulatory requirements and are thus more unlikely to be innovative.

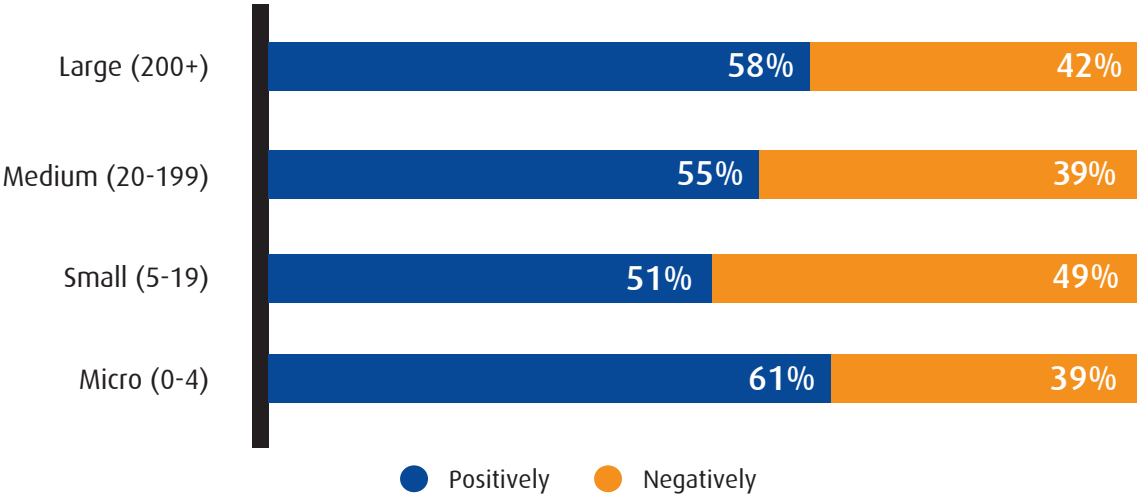
Figure 4.19: Impact of accreditation on innovation level by NATA program sector



Source: NATA Survey, Questions 9 and Question 7, Notes: Calibration, n=59; Inspection, n=33; Infrastructure, n=108; Legal and Clinical, n=55; Life Sciences, n=99; overall sample: positive = 56%; negatively / no impact = 44%.

Figure 4.20 highlights that 61% of micro level organisations said that accreditation had a positive impact on innovation, highlighting the benefit of the accreditation process to smaller firms. It could be argued that smaller firms are more open to innovation activity and thus have greater flexibility to trial new processes and experiment and can therefore, be more creative in fulfilling accreditation requirements.

Figure 4.20: Impact of accreditation on innovation levels by organisational size



Source: NATA survey, Question 5 and 8, Notes: overall, n=253; Micro, n=46; Small, n=63; Medium, n=87; Large, n=57

Economic value of benefit derived from innovation

When a positive impact on organisational innovation levels was perceived, respondents provided the value of such innovation income as a percentage of total revenue. For instance, 32% of respondents indicated income from accreditation that influenced innovation was less than 2% of total revenue, another 40% noted it to be between 2% and 10%, while the remaining 28% of respondents indicated that it is more than 10% of total revenue.

The quantification of innovation as a proportion of total revenue allows the economic contribution to be calculated at a respondent level, based on the percentage of revenue attributed to innovation as a result of accreditation. Table 4.4 shows the median estimate of the contribution accreditation makes to innovation at the orrganisation level across calibration, testing and inspection.

Table 4.4: Innovation Activity for each NATA activity

Accreditation Activity	Overall
Calibration	$7.1m - $7.3m
Testing	$145.4m - $219.7m
Inspection	$2.0m - $2.2m
	$154.5m - $229.2m

Based on these median estimates, the economic contribution accreditation brings in the form of innovation is between **AUD$154.5 million and AUD$229.2 million**.

Organisational story No.7
Bullivants: Technical assessments assure a 'ticket to the game'

For over 120 years Bullivants has provided solutions to the industrial market which allows its customers to lift, restrain and handle loads in a safe manner whilst at the same time meeting all legislative and standards requirements. Bullivants has in place management systems and procedures developed over many years which ensure that:

- **All products & services meet relevant occupational health and safety requirements at job specific levels,**
- **All employees who perform work on any site are adequately trained in all safety requirements in order to perform the job, and**
- **All employees communicate, document and implement the specific safety requirements for the total site and relevant department.**

Bullivants is part of the Wesfarmers group of companies and operates as a separate business under the Industrial Specialists Division. The support provided by the group strengthens Bullivants' ability to provide services and solutions to a range of customers. Bullivants is accredited by NATA in Infrastructure and Inspection.

Maintaining NATA accreditation is largely a requirement of Bullivant's customer base. The large mines and construction companies to which Bullivants supply products and services would not consider the company as a key supplier if they did not have NATA accreditation, *'it's really a ticket to the game ...a lot of them won't even consider you – your products or services- that's the main value for us'.*

Whilst Bullivants consider other accreditation providers in the market, they believe NATA is the most recognised with their customer base and so NATA is the organisational choice for accreditation in Australia and overseas.

Although accreditation is driven by the customer and is the main reason for pursuing NATA accreditation, Bullivants consider the technical assessment provided by NATA as extremely helpful for improving product and service quality across the organisation. The technical assessment component of the accreditation service is what differentiates NATA from other accrediting bodies, *'you're getting experts from the market place coming through and casting their eye across what we are doing and providing advice upfront. That is different from what the other organisations provide – a strictly systems assessment – that is a benefit in using NATA'.*

Bullivants provide height safety and lifting services and products to the construction and mining sectors which are inherently high risk and safety reliant. As such, Bullivants understand that their operation requires the highest quality standards and conformity procedures. Bullivants welcomes the third party assessment process undertaken during the accreditation, to ensure they are *'keeping on top of their game'*. On an annual basis, when management are searching for efficiency gains and cost savings across the company, the requirement for accreditation does come under scrutiny. However, quality and safety employees highlight the value of the technical assessment processes to the organisations ongoing status in providing safe and reliable services to customers. NATA accreditation is accepted and built into the necessary ongoing business costs.

Bullivants value the thorough technical assessment that NATA provide. Being a large, mature and well established organisation, it could be argued that Bullivants *'know all there is to know'*, but staff are quick to point out that they learn from the NATA process, *'it is a thorough process, but we do learn from it. We are able to challenge and discuss findings with some of the technical assessors...they are only human and not always 100% accurate and so it is a collaborative learning process for both parties to improve the quality of the service for Bullivants'.*

Ultimately, the key benefits for Bullivants are the delivery and conduct of the technical assessments that not only facilitate conformity and safety but also add value to employee knowledge and capability and 'helps keep them in the game'. Bullivants believe the quality and safety of their service are enhanced by the additional level of assurance from NATA accreditation.

4.1.4.2 Neutral and negative impact of innovation on firm innovation levels

Findings also highlight that 36% of online survey respondents suggested that accreditation had 'no impact' on innovation levels in the organisation. The interviewee responses aligned with the neutral positioning of the online survey sample, highlighting that accreditation neither hindered nor stimulated innovation levels. Many interviewees outlined that innovation was driven by the customer and therefore, it was the customer who stipulated the conditions under which innovation would be would be undertaken:

I think it neither hinders nor helps innovation...right now we're developing an NDMA method to replace our older method and we know what NATA's requirements are to gain accreditation, so when we do our validation we focus on those requirements to validate the method and so it helps us develop our plan on what we need to do.

I think what it has done is to make sure that any innovation that we do is within the boundaries of acceptable practice.

Neither, really – it's not rocket science in any way. It's just – as far as what we do, it's pretty basic level stuff and I don't think that the technology or innovation around it has changed much over the years nor will it...pretty strictly set by standards and procedures.

There might be some improvements but not to the level of what you would categorise as innovation – certainly not in our industry.

Only 8% of online survey respondents indicated that accreditation has a negative impact on the innovation levels of the organisation, mainly drawn from Life Sciences and Legal and Clinical sector in Figure 4.16 and due to regulatory impacts and lack of ability to change processes (Department of Trade and Industry 2005). The interviews highlighted negative responses could be due to processes controlled by NATA and thus provide little room for innovation. Several interviewees outlined below that the traditional reporting procedures of industry bodies had not progressed or 'moved with the times' as quickly as the industry had moved forward with innovation (Frenz and Lambert 2012).

Accreditation (eventually) hinders innovation....

' But once we got to that standard, the drive to innovate is less, because every time you change your system or process, you now have to be reaccredited or at least run that through NATA to make sure that you haven't stepped outside the bounds of what your accreditation allows you to do. So think initially it drives innovation, but once you're accredited, it tends to be a bit of a dampener on change (Calibration sector).

'...And I think once we get our scope of practice set, or scope of accreditation given to us in writing, we sort of can't be innovative and jump out of that boundary, because otherwise we can't sort of breach the guidelines of scope (Legal and Clinical sector).

4.1.5 Organisational Culture

The fifth benefit attribute of a quality accreditation infrastructure system outlined earlier in Figure 4.2 is organisational culture. Findings highlight that the culture of the organisation is the key in driving a quality accreditation infrastructure. Interviewees show that where a company displays vision, leadership, a strategy for innovation, quality and customer satisfaction characteristics, these attributes are underpinned by a high standard of quality infrastructure and accreditation values. The value of such an organisational culture has significant value-add and flow on effects in terms of building leadership, generating new knowledge for the company, recruitment of new staff and appointing volunteer technical assessors.

The organisation's cultural mindset that supports the accreditation process can be divided into two categories – those organisations that would ensure systems were accredited regardless of whether it was a regulatory requirement or not, and those organisations that require their laboratories to provide them with a full budgetary cost/benefit analysis of accreditation, in order to fulfil corporate questions of the need for accreditation.

The findings highlight that those organisations which do value accreditation and associated knowledge spillover to the organisation, also support staff becoming volunteer technical assessors generating benefits for the company and personal professional development for the individual employee.

4.1.5.1 Organisational culture valuing accreditation – leadership

On the one hand, findings suggest there is a culture of organisational leaders embracing the benefits of accreditation. For these organisations, accreditation is built into the firm's 'modus operandi':

> "I think we've been accredited now for 5-7 years. The cost to us is not small, we're a very small business, but we believe that we should be looked upon by engineers and professional entities in that we don't just work with an HP calculator or a computer."

> "Becoming NATA accredited shall never be deemed as a right, but as a privilege and a recognition of deserving excellence in testing, superior reporting and keeping abreast of becoming an industry leader. My company name defines our role to work in unison with our clients, and obviously NATA, and this becomes an ongoing development and commitment."

> I suppose, it provides a framework to show that what you're doing is a good ... quality ... so that labs I know will, even if they're not required to do, still get NATA accreditation because it shows that the work they're doing is of good quality, and that does have some standing in the wider community.

On the other hand, in some organisations, whilst the value of accreditation is part of the accredited business unit's organisational culture, from a corporate and wider organisational viewpoint, accreditation is usually questioned at the time of year when budgets are organised:

> Our major challenge is our own people and that's because they're research scientists, they're not med lab scientists or people who are trained in quality systems as part of their professional training.

> When we get our people who are in the region who have a really primary role of finding the materials they sometimes will question why it is that we need to have accreditation. ..it does create a little bit more work for people because you have to do things that satisfy an auditor because the auditing process is pretty thorough.....that can be a little bit of a struggle.

Organisational Story No.8
Sullivan Nicolaides Pathology:
Peer to peer learning extends beyond the scope of accreditation

Sullivan Nicolaides Pathology (SNP) is one of the largest members of the Sonic Healthcare group. Sonic Healthcare is an independent, Australian owned, publicly listed company, operating in the specialties of pathology and radiology.

All Sonic practices are medically managed and are thus well placed to appreciate the special needs of doctors and their patients. SNP is a well-respected, established pathology practice, offering comprehensive, high quality pathology services for doctors, private hospitals and nursing homes in Queensland, northern New South Wales and Darwin.

SNP was formed in 1956 when Dr John Sullivan started a small pathology practice to service local families in and around Brisbane. Dr Nick Nicolaides joined him 18 months later, and since then, it has grown to be one of the largest pathology practices in Australia. The practices are managed by doctors for doctors. All department directors are pathologists, and pathologists are represented at all levels of management. NATA provides SNP with the NATA/RCPA* joint accreditation.

*The Royal College of Pathologists Australasia

The Australian Government provide rebates to eligible patients on the cost of medical pathology tests carried out by pathology laboratories accredited by NATA. As patients of medical pathology laboratories without NATA/RCPA joint accreditation are not eligible for Medicare rebates, in practice the overwhelming proportion of medical pathology laboratories in Australia are accredited by NATA/RCPA.

Apart from the regulatory requirement and professional need to obtain accreditation, SNP advocate that an external accreditation process remains an important business strategy for the company in independently assessing quality and safety, *'even if we hadn't been required, we would have sought some sort of accreditation...it is a way of having an external body overseeing what you have done and assessing it from the outside.*

Collaboration and peer to peer learning is an important organisational approach for SNP. NATA technical assessors are embraced within SNP as a valuable third party source that can offer technical advice and improve upon existing quality processes, *'when those technical assessors come...they're seeing other companies as well...its really good having feedback from your peers...from those scientific specialties. So I think the assessors and assessed get something out of that, because they get to hear someone else's point of view about something'.*

Whilst recognising the internal value of the external technical assessment, SNP is also proactive in promoting the benefits of its employees becoming trained NATA technical assessors themselves, and allowing them time away from their own workplace to conduct assessments on other organisations. SNP view such activity as generating new knowledge and capability for the whole organisation, *'quite a large number of staff are voluntary technical assessors, so they always get something out of going to an audit, even if they don't necessarily think the way somebody else does...it makes them rethink at least, and say 'well, is the way we do it right? Are we happy with that?...being a technical assessor to other places has helped me reflect on the process...'.*

SNP recognise the behind the scenes work that goes into providing NATA accreditation for a large pathology laboratory with 23 regional locations. Not only does SNP need to comply with ISO 15189 medical testing accreditation, they also need to comply with standards and documentation that are issued by the Australian Department of Health.

With laboratories dispersed around Australia, SNP and NATA work together to ensure a timely approach to the accreditation process for the benefit of SNP. NATA have assigned SNP with 'corporate accreditation' status, and ensure that one corporate client officer is assigned to maintain consistency in logistics and planning of assessments. SNP are able to provide feedback if there are inconsistencies or issues with the assessment process. The corporate accreditation categorisation assists in standardizing the same procedures and processes across all 23 regional laboratories to enable findings to be addressed at the central department level.

4.1.5.2 Knowledge and capability

As shown in Figure 4.4, 20% of online survey respondents indicated that building new knowledge is a key factor for pursuing accreditation. Aligning with the survey respondents, interviewees saw knowledge and building technical capacity through the accreditation process as a key value and benefit:

> The technical assessments are also helpful because you're getting experts from the market place and having them come through and cast their eye across what we're doing and providing advice on that front... so, that is a benefit to the use of NATA.

There is also value in collaborating at NATA events and member forums to build internal knowledge, which is particularly important for laboratories and facilities based in regional parts of Australia and are more isolated for networking purposes:

> You do get to interact with the staff from NATA and that all helps with that relationship building so that they're not someone outside with a big stick and they're someone that you can collaboratively work with to improve your part of the business.

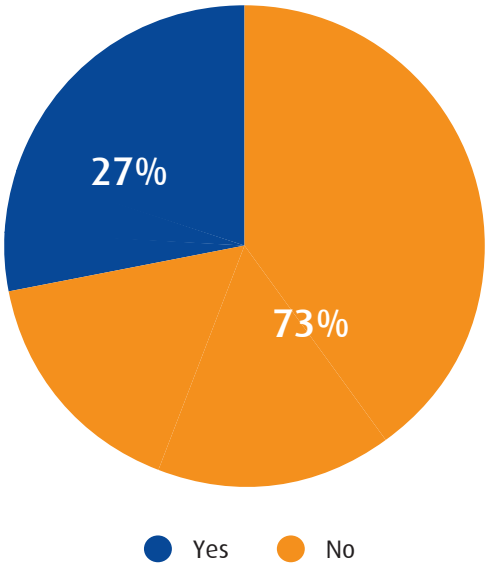
Accreditation knowledge and capacity building extends to building alliances and networks in other parts of the globe:

> ...We did a little bit of work...with a water authority in the Pacific region a couple of years ago, had a couple of visits over there with what they called a twinning program, that was a water industry specific thing. So yeah, all that sort of relationship stuff has been really helpful.

4.1.5.3 Recruitment

There is limited literature on assessing the impact accreditation has on recruitment levels of companies. Almost three-quarters of the sample indicated that they did not recruit new people as a result of undertaking the accreditation process, with 27% indicating they did recruit new people, as shown in Figure 4.21.

Figure 4.21: Recruitment as a result of achieving accreditation



Source: NATA Survey, Question 13, Notes: n=253.

Figure 4.22 shows that the key reasons survey respondents provided for not recruiting and for recruiting additional staff due to accreditation. Of the 73% of survey respondents who indicated they have not recruited new staff, the most common reasons were around a lack of need for new staff due to 'current resources are adequate'; 'additional work not generated'; or 'no additional funding or growth'.

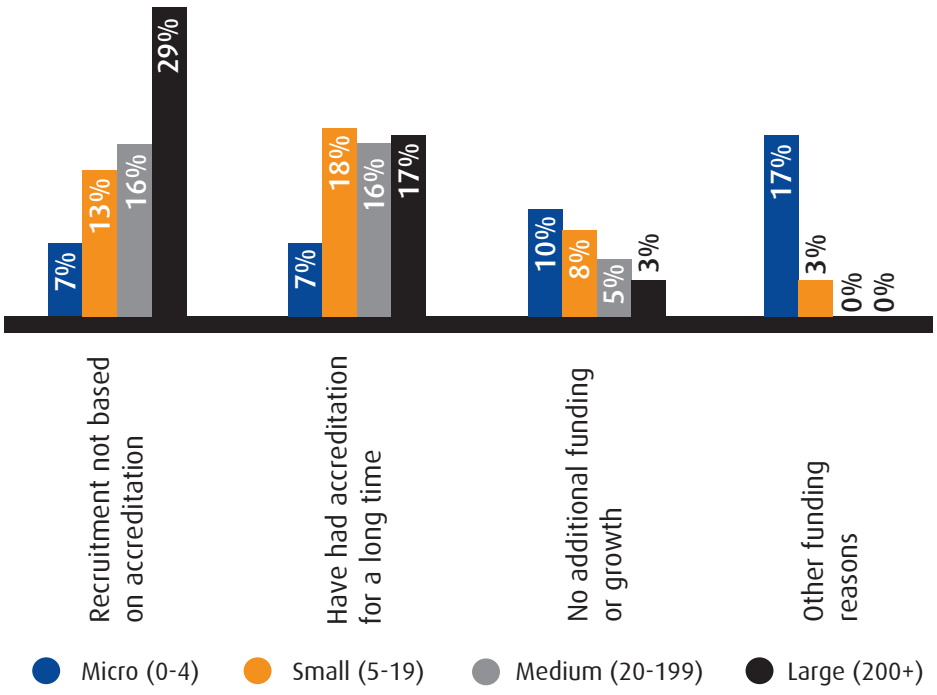
Other reasons include acknowledging that the organisation has held accreditation for a long time, hence have either always had the relevant number of staff needed or would have recruited new staff for accreditation previously however is now difficult to attribute to accreditation. Many also noted that their recruitment activity is not based on accreditation and instead is a factor of business demand or other market forces.

Figure 4.22. Reasons for not recruiting staff

Not needed
Small organisation or proportion of business
Other funding reasons
Have had accreditation for a long time
Recruitment not based on accreditation
Current resources are adequate
Trained existing staff
Additional work not generated
No additional funding or growth

Online survey findings also highlight the reasons organisations did not recruit by their organisational size shown in Figure 4.23. For example, 29% of large businesses who stipulated they were not recruiting staff, indicated that any recruitment they did undertake was not based on the accreditation process.

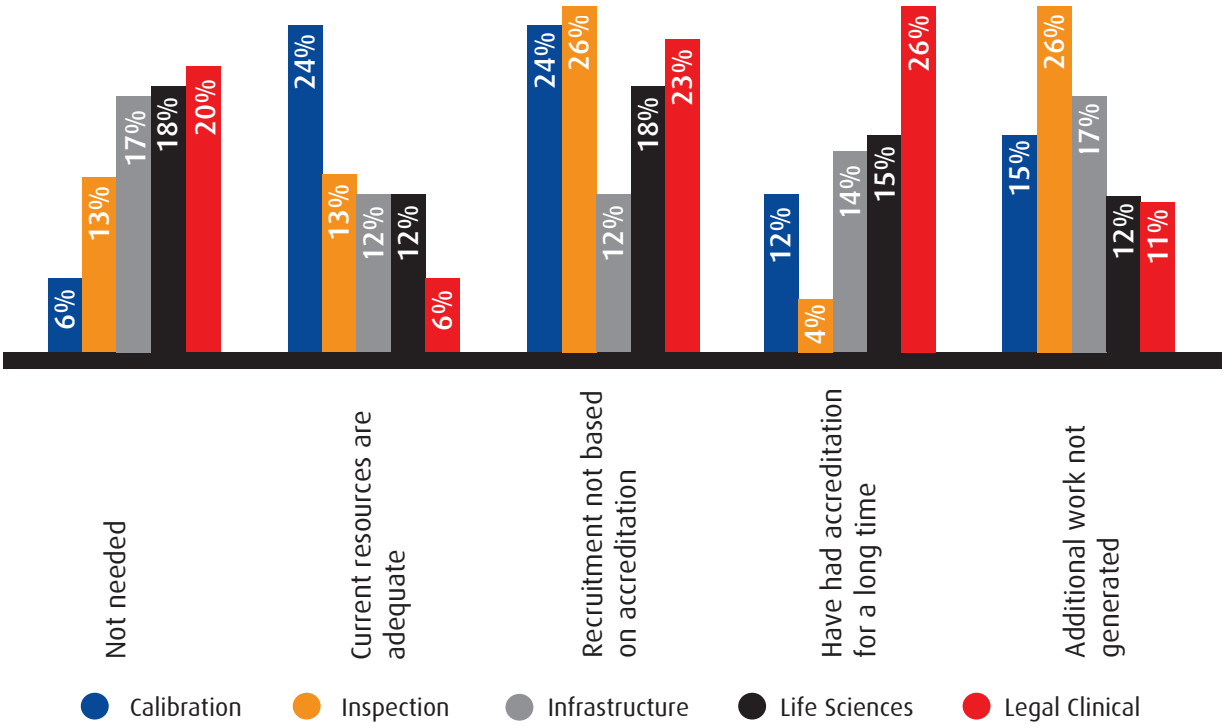
Figure 4.23 Reasons for not recruiting by organisation size



Source: NATA survey, Question 5 and 16, Notes: Micro, n=30; Small, n=39; Medium, n=55; Large, n=35.

Online survey findings illustrate the reasons that organisations did not recruit by sector shown in Figure 4.24. For example, 24% of businesses in the calibration sector who did not recruit new staff indicated that current resources were adequate. Most calibration firms were smaller in size and fulfilled accreditation requirements with existing resources. Online survey respondents from the Legal and Clinical sector indicated that due to regulatory requirements, they have been accredited for a long period of time and hence had not seen the need to recruit specifically for the purpose of accreditation.

Figure 4.24 Reasons for not recruiting by NATA sector



Source: NATA survey, Question 7 and 16, Notes: Calibration, n=34; Inspection, n=23; Infrastructure, n=58; Life Sciences, n=67; Legal and Clinical, n=35.

For those online survey respondents (27%) that did specify that recruitment was associated with accreditation, an increased workload was the most common reason (Figure 4.25) and the most common reason for small and micro sized organisations (Figure 4.26). Other reasons for recruiting included that accreditation resulted in expanding business, hence recruitment was undertaken to meet ongoing growth in staffing requirements. To assist in maintaining and implementing quality systems and adhering to accreditation requirements, were also reasons for recruitment.

Figure 4.25 Reasons for recruiting new staff

Client expectations

Replace staff

Meet staffing needs

Expanding business

Increased work load

Maintain accreditation requirements

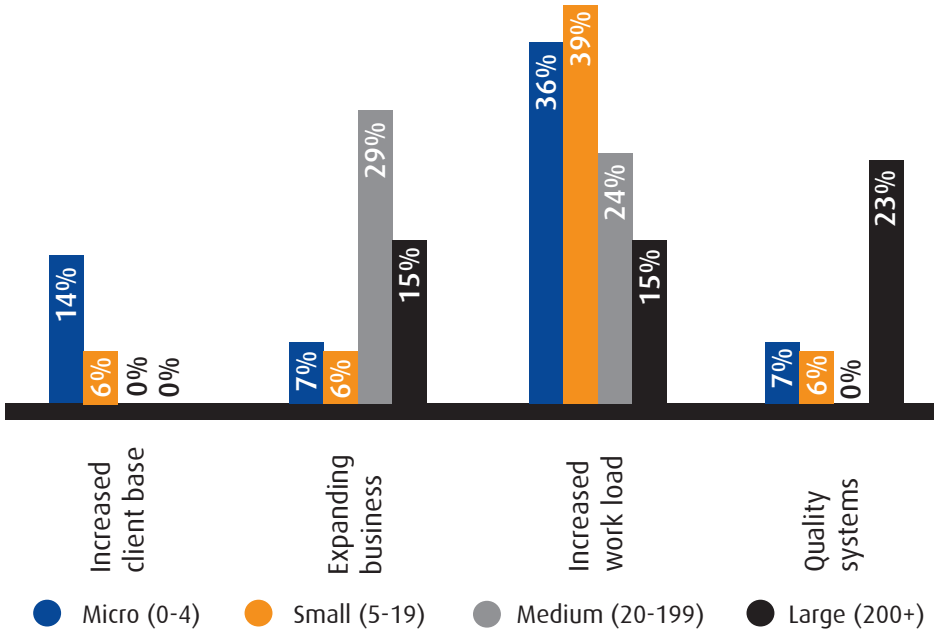
Increased client base

Quality systems

While it is difficult to measure the direct economic contribution of recruitment impacted by accreditation, of those who recruited new staff, 66% indicated they hired one or two additional staff; 24% recruited three to ten; and 6% recruited more than 10. Furthermore, 7% noted that it was difficult to quantify the recruitment attributed to accreditation.

Online survey findings also highlight the reasons that organisations recruited by organisational size shown in Figure 4.26. For example, 14% of micro businesses indicated an increase in their client base provided them an incentive to recruit staff and a need for more focus on accreditation.

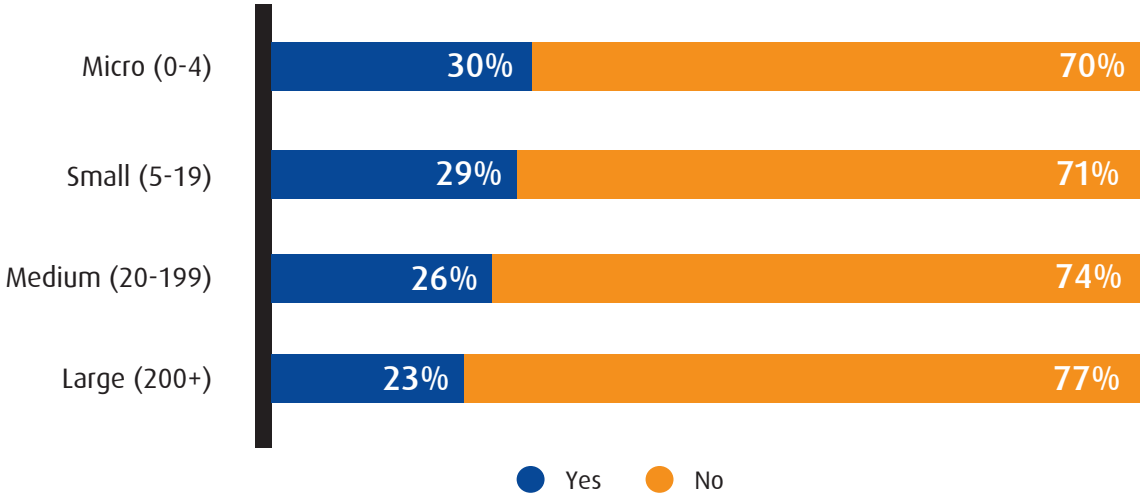
Figure 4.26 Reasons for recruiting by organisational size



Source: NATA survey, Question 5 and 15, Notes: Micro, n=14; Small, n=18; Medium, n=21; Large, n=13.

Figure 4.27 also shows that a larger proportion of micro/small organisations, 30% and 29% respectively, indicated that they recruited new people as a result of accreditation at 30%, compared to 23% of larger organisations. It could be argued that larger organisations have the capacity to absorb accreditation tasks within existing resource allocations. Whereas, smaller organisations are already resource scarce and thus need to recruit to fulfil increased accreditation requirements in instances of increased workload.

Figure 4.27: Recruitment by organisation size



Source: NATA Survey, Question 13 and 5, Notes: n=253.

4.1.6 NATA Technical Assessors

NATA technical assessments are first and foremost a peer review process. As such, NATA relies on the specialised knowledge and experience of its volunteer technical assessors. The volunteer work offered to NATA is recognised within the scientific and technical community, and the support offered by organisations in making their staff available to NATA as volunteers is acknowledged. In some cases, participation in technical assessments is recognised under continuing professional development schemes (NATA 2016).

Technical assessors work under the direction of NATA's lead assessor (NATA staff member) during the assessment of facilities. They provide support by reviewing activities performed by the facility and offering their feedback to the lead assessor. As well as participating in on-site assessments, technical assessors may be asked to provide follow up advice and guidance to NATA on post assessment activities, such as reviewing a facility's response to assessment findings.

The vast majority of technical assessors work in NATA accredited facilities, or are individuals who are well recognised by the profession in their field of expertise including those from academia.

Technical assessors are drawn from individuals who display the following qualities:

- professional expertise and experience,
- knowledge of testing, calibration, inspection or related activities which NATA accredits,
- understanding of management systems,
- analytical approach and an ability to critically evaluate,

- ability to work as a team member, and
- communication skills and commitment to the accreditation process.

The value of being a NATA volunteer technical assessor is not considered equal for all organisations. In many organisations, it is not considered a benefit and in some instances, being audited by a volunteer assessor who may work for an organisation that is in direct competition with the company being assessed also causes concern:

> Traditionally we won't allow staff to volunteer. So the staff actually have to take an annual leave day to go...I think it's only 2 at the moment but we do have a couple of people who consider that is part of us being accredited, we give back our time as well. So we do have a few but probably not to the extent of some of the other bigger labs would have.

> Because they're (accredited assessors) seeing other companies in conjunction with seeing our company as well... that's a concern...

Value of technical assessors?

'Volunteer assessment is a positive outcome for the organisation, so we do actually encourage it' (Life Sciences sector).

' I do it partly because, I mean it's nice for my brain, it's a little bit nice for me feeling a little bit important, but it's nice because I'm able to make a change if I can (Calibration sector)

'So I think the assessors and the assessees get something from that, because they get to hear somebody else's point of view about something' (Infrastructure sector).

While measuring the full economic impact from employment of assessors for the purposes of accreditation is difficult, the research team address the economic contribution of employment imputed from the typical wage costs of these volunteer assessors in the field. This over simplification underestimates the true economic value this employment generates. The employment of technical assessors results in both direct and indirect economic effects on the economy. While difficult to measure, the model includes a calculation on the employment of the volunteers – including technical assessors (TA), the accreditation advisory committee (AAC) and the NATA board – based on the potential wages if the work was paid rather than volunteered, by the hours of work completed.

Economic value of benefits derived from NATA volunteer services

The imputed value of work undertaken as a result of the hours invested by technical assessors primarily arising from volunteer services is AUD $14.3m.

Table 4.6 Calculating Volunteer Economic Contribution

NATA Activity	Average Time (TA and ACC hours)	Total by Activity
CAL	2836	$ 0.9m
TEST	38753	$ 12.1m
INSP	3351	$ 1.0m
NATA Board		$ 0.3m
		$ 14.3m

4.2 Total Value of NATA Accreditation to the Australian economy

This study sought to measure the economic value of NATA's contribution to the Australian economy. While many of the benefits of NATA's accreditation are difficult to precisely measure, the estimates provided in this report give a reasonable lower bound estimate of the economic value of accreditation when applied to all 1919 firms to which NATA provides services to. Bringing together the various components of economic value described within this section, the research team report in Table 4.7 the overall estimate of the economic value of NATA accreditation in Australia. Table 4.7 provides a summary of each components contribution, with a breakdown for each accreditation activity including price premium, price increase, efficiency savings, innovation income and volunteer value.

Economic value of NATA accreditation to the Australian economy

Overall, the estimated economic value of NATA's contribution to the Australian economy is between **AUD $344 and AUD $391 million.**

Figure 4.7 Overall measured value of accreditation

Contribution	Calibration	Testing	Inspection	Total by Activity
Price Premium	$3.4m - $4.1m	$92.7m - $113.3m	$2.8m - $3.3m	$98.9m - $120.6m
Price Increase	$0.1m - $0.2m	$8.8m - $9.3m	$0.4m - $0.6m	$9.3m - $10.1m
Efficiency Savings	$2.6m - $3.5m	34.2m - $40.9m	$1.3m - $1.9m	$38.1m - $46.3m
Innovation Income	$7.1m - $7.3m	$145.4m - $219.7m	$2.0m - $2.2m	$154.5m - $229.2m
Volunteers	$0.9m	$12.1m	$1.0m	$14.3m
				$315.1m - $420.5m

A similar study set in the UK (Frenz and Lambert 2014), calculated a contribution of £295m (approximately AUD $500m at 4th December 2017) due to accreditation. The willingness to pay based on accreditation made up £200m of this (approximately AUD $350m as at 4th December 2017) value. A comparison of the results found in this Australian study to that of the UK research, as a % of Gross Domestic Product (GDP) has been undertaken. The comparison shows that the two studies find economic contribution as a percentage of each country's GDP (0.01% of GDP). NATA's accreditation contribution to GDP ranges, based on Willingness to Pay value, is 0.006 - 0.008% of GDP compared to 0.01% for the UK study. This range is between two-thirds and three-quarters of the size of the contribution made by UKAS to the UK economy.

4.3 Benefits of accreditation – meso (industry) level

The benefits of accreditation at the micro level are equally applied to the meso (industry) level. However, for the purpose of measuring the value of accreditation to the Australian economy, it is important to acknowledge specific attributes of accreditation relevant to the meso level only and in particular, identify the wider role and intangible benefits attained when aggregated across the relevant industry sector in Australia, illustrated earlier in Figure 4.2. Identifying the benefits of accreditation for the meso level are important in the attribute of 'Importance of Recognition'. Although the other four attributes are shown to be relevant across the meso level, the importance of recognition has two specific qualities attribute to industry. Recognising the intangible benefits of accreditation for the industry sector as a whole is relevant for ensuring a 'level playing field' is achieved and in promoting good practice across the industry:

4.3.1.1 Importance of Recognition – 'Level Playing Field'

Findings highlight that accreditation was essential for ensuring a level playing was maintained across all five NATA sectors. A level playing field ensured that the company was competing in an equal setting to other facilities within the sector and ultimately, the end user had a fair choice in selecting on price and quality:

> It sort of creates a level playing field for all laboratories that are competing in our area to deliver quality products and services to prescribed test methods.
>
> It puts us as a...laboratory on the same footing as everybody else in the commercial era.
>
> It is trying to set a standard where everyone has to line up to.
>
> So it's got to be a level playing field...because at the end of the day a test result, unless it's done right it means nothing, it's got to be done.
>
> Your technical authority has to approve all your procedures, I think that's great because it regulates...it doesn't allow other people to compete in that same space as you without having...that organisational support.

4.3.1.2 Importance of Recognition - Good practice and promotion of the industry:

NATA accreditation brings with it, a recognised level of quality and standard that relevant industry stakeholders are aware of. This level of recognition not only extends regionally and nationally but also internationally when considering new markets:

> I think the reputation in the industry, in the market and the level of technical expertise they bring into the equation is also pretty good.
>
> For the companies that come over...to try and give them faith in the fact that the Australian industry, meat industry is having an involvement in the delivery of inspection service...
>
> I think Nata provides sort of a benchmark, an industry benchmark, I guess, for drug and alcohol testing.
>
> My PDF reports that we send out, we have the NATA logo, any of our quotes carry it, all our quotes carry the NATA logo and on the front page of our quote we actually say...up front and centre, we're accredited with NATA and give them our accreditation numbers, and if I'm taking any visitors through the lab, or any customers roll up at the front door, if they ring up, and they're making enquiries, one of the first things I tell them is that we're a NATA accredited lab.
>
> So that's how we go from a standard perspective...recognition with a lot of countries by going through the accreditation process you are ... recognised and approved by industry and other customers also.

4.4 Benefits of accreditation – macro (global) level

Together with the benefits of accreditation at the micro and meso level, findings also highlight benefits of accreditation at the macro (global) level focusing on the accreditation attribute of Importance of Recognition, illustrated in Figure 4.2. Although the other four attributes are shown to be relevant across the micro and meso levels, for the purpose of this report, the importance of recognition at the macro level is presented as three benefits, including the creation of new knowledge, generating credibility on a global scale, access to new markets and increased trade.

4.4.1.1 Importance of Recognition - New Knowledge

NATA accreditation is recognised worldwide. Such recognition enables accredited facilities to network on an international scale and generate new knowledge and key learnings:

From an international point of view, it keeps our labs up to date with what's happening in the rest of the world in terms of laboratory management.

Groups here work to get involved within international clinical trials and they almost inevitably want to do facility audits.

4.4.1.2 Importance of Recognition - Generating Credibility

NATA accreditation is recognised nationally and internationally as a safe and quality brand. It positions accredited facilities strongly in the marketplace and opens up opportunities that may not have been available without NATA accreditation:

This extends to the international area. When we do work...for New Zealand, New Guinea, and some of the Asian countries having NATA accreditation gives us the integrity that we're a quality laboratory, this type of perception is valuable to the Australian economy.

Internationally, NATA accreditation is asked for most often....Australian, American owned companies or internationally owned companies – companies from Europe as well – if they've got a base here, they usually ask for accreditation because their head office is telling them that's what they want and that they're only going to accept results from laboratories that have that accreditation.

I do see value in it, general value, but in this instance it was a requirement of the overseas country.

4.4.1.3 Importance of Recognition - Access to new markets and increased trade

NATA accreditation has opened up new markets and trade windows to several companies, through the recognition that NATA accreditation is a quality and international brand:

The other benefit now that – a lot of our products...are being noticed by markets overseas. A lot of their requirements are satisfied by our lab because of the NATA accreditation,.....there are a lot of what I would call technical trade barriers. It could be a stumbling block if the market wasn't really willing to accept your product.

5

Conclusion

5 Conclusion

This research report has explored the attributes of conformance assessment bodies accreditation infrastructure system provided by NATA, specifically the benefits of NATA accreditation services at a micro (company), meso (industry) and macro (global) level. In particular, the report reinforces NATA's role in the accreditation process and attempts to quantify economic value generated by NATA accreditation services to the wider economy in an Australian context.

To carry out this investigation, an economic model to measure the economic value of NATA accreditation was developed. To support this modelling analysis, a desktop literary search was conducted and the research team drew upon data collected from two survey instruments – a quantitative online questionnaire and semi-structured interviews administered by NATA with its member organisations, to elicit information on the economic value to the consumer and the economic value to organisations. From the findings, the report presents some useful conclusions in addressing the two key research aims:

1) **How does NATA accreditation benefit the Australian economy?**

2) **What is the value-add (economic value) of NATA's accreditation services to Australian businesses?**

NATA accreditation attests to the competence of conformance assessment bodies (CABs) and adds value by providing indirect but real benefit to the community, and end users of goods and services assessed by the CABs. However, since the accreditation process is a dynamic web of auditing, measuring and administration, much of which occurs 'behind the scenes', a true value of accreditation within the Australian economy is not so simple to quantify. Whereas standards and certification clearly stipulate the conforming requirements of quality and safety, accreditation on the other hand assesses the technical competence of organisations in providing reliable testing, calibration, measurement and inspection data to government, industry and the wider community (NATA 2006), which can be a more ambiguous and demanding activity.

As such, literary contributions propose that in order to present a holistic perspective of the economic value of accreditation, a systems based approach to analysing quality accreditation infrastructure is required to ensure an examination of the system strengths and weaknesses. This report analyses the attributes of a quality accreditation infrastructure system distributed across five key themes exploring the benefits of accreditation – Importance of Recognition, Standards and Quality, Efficiency and Productivity, Innovation, and Organisational Culture.

Overall, the estimated economic value of NATA's contribution to the Australian economy is estimated between AUD $315 million and AUD $421 million.

Importance of Recognition:

The benefits of accreditation dwarf the challenges according to 81% of online survey respondents, who view accreditation as important to their business operations. The most common factor for pursuing accreditation relates to the increased recognition levels it creates for the organisation (micro) when meeting customer expectations, in providing a competitive advantage and for marketing and branding. For the industry (meso), accreditation contributes to a collective recognition of multiple organisations contributing to a quality infrastructure by creating a level playing field and promoting best practice across the whole industry. For the global level (macro), accreditation generates collaboration that stimulates new knowledge, builds credibility, opens new markets and increased trade opportunities.

- Micro – Customers expect accreditation standards to be met to guarantee a level of accuracy and reliability, facilitate consistency in service delivery and to fulfil tender requirements, enabling an implicit recognition of quality and integrity across the value chain. Smaller firms tend to value the accreditation process more than larger firms as a result of the marketing and competitive advantages it generates for a growing industry base.

  Firms perceive accreditation as a strong competitive and marketing advantage in an ever changing and competitive marketplace. Such a benefit assists firms to differentiate themselves from non-accredited providers and to reposition efforts into new niche markets. In saying this, such competitive advantage will require ongoing efforts to maintain as other players in industries catch up and obtain accreditation status. However, the customers and the economy should continue to benefit from better quality of goods and services from the high level of competency.
- Meso – Recognition gained from accreditation is essential for the industry as a whole. It ensures there is a 'level playing field' of consistency, price and quality across the marketplace benefitting the end user and enabling overall positive perceptions to be generated for the industry at a regional, national and international level.
- Macro – Recognition across the global economy as a result of accreditation introduces the firm to new collaborative networks and knowledge that would not have been available if an accreditation infrastructure had not been in place. Thus, the recognition benefits of accreditation generate credibility across the individual organisation, the industry and within exporting activity through the adoption of recognised international standards and therefore, opening up new markets and trade opportunities.

Standards and Quality

Conforming to a standardised quality infrastructure should improve internal confidence at the micro and meso level, enabling organisations to maintain consistency and quality, be monitored by external third-party peers and meet regulatory requirements where mandated.

Building confidence in the company brand is advocated through the transfer of knowledge and an understanding of the importance of an accreditation infrastructure to their next place of employment. More generally, the unique third-party assessments conducted by NATA technical volunteers is viewed as an independent and objective tool and a very valuable component of the quality system, and without it, standards might not be maintained at the consistent level across the organisation.

NATA accreditation is a regulatory requirement for over half of the online survey respondents and meeting regulatory requirement is the second most important factor for pursuing accreditation. This is particularly the case for accredited facilities in the Life Sciences and Legal and Clinical sectors. In saying this, respondents were keen to point out the commercial benefits of accreditation regardless of it being a regulatory requirement in some instances, reporting that they would still acquire accreditation regardless of whether it was a mandatory requirement or not.

Organisations suggested that as a result of accreditation standards and quality, they were able to charge a premium price for products and services. **Hence the total estimated economic value of standards and quality to the Australian economy is within the range of AUD $108.2m – AUD $130.7m.**

Efficiency and Productivity

The total estimated economic value of the cost efficiencies arising from accreditation are estimated to be in the range of AUD $38.1m and AUD $46.3m.

Innovation

Accreditation was found to positively impact organisational innovation levels for just over half of the firms, with the remainder suggesting that innovation has little or negative impact. Where organisations experience positive impact, innovation made a significant contribution to efficiency levels, building new knowledge and contributed towards process innovation.

Several organisations found that the initial stages of the accreditation process enabled them to be innovative in designing and redesigning processes, but then as the accreditation system becomes more mature and locked-in to the current process, the ability to be innovative was reduced.

A total of 36% of online survey respondents highlighted that accreditation had no impact on innovation levels and that innovation within the firm was driven by the customer. As such, if a customer requested a change in service or product, this would be the trigger for change rather than internal innovation activity.

The estimated economic contribution accreditation brings in the form of innovation is between AUD $154.5m and AUD $229.2m.

Organisational Culture

Accreditation contributes towards building an organisational culture of quality leadership, knowledge and capability and valuing the role of volunteer assessors. Where accreditation was found to be of most value was in firms that displayed qualities of vision, leadership, strategy for innovation and quality and customer satisfaction. The independent technical assessment process was considered a valuable asset across the organisation to build further internal knowledge, technical capability and collaboration and furthering business improvement processes.

NATA's technical assessment is built on the foundation of its 3,000 volunteer technical assessors. Whilst firms recognised a series of future challenges associated with this model, these were offset by the value assessors bring to the firm, industry and quality infrastructure based on their technical assessment knowledge and value add.

The imputed value of work undertaken by technical assessors primarily arising from volunteer services is AUD $14.3m.

In summary, the estimated measureable economic value of NATA accreditation in Australia is represented in a range between AUD $315m and AUD $421m. It is impossible to place a value on the intangible attributes of accreditation as the services NATA provides are intrinsically woven within the fabric of the Australian business, economy, and society.

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