GS1 Australia

The Contribution of Industry to Australia's Productivity, Competitiveness and Resilience through Supply Chain Efficiency

INDEPENDENT ECONOMIC ANALYSIS OF THE NATIONAL IMPACT OF SUPPLY CHAIN STANDARDS USE

Prepared by GS1 Australia

June 2025

Unlocking productivity, competitiveness, trade and resilience through global data standards

Foreword

I am pleased to announce the release of a comprehensive and independent report analysing the national economic impact of supply chain standards' use in Australia.

GS1 Australia commissioned the Centre for International Economics (CIE), a respected Australian economic research organisation, to evaluate and quantify the value and benefits that arise from the use of supply chain data standards by Australian industry.

This document provides a summary version of that report, designed for clarity and ease of reading. It highlights key findings drawn from the full analysis. Readers are encouraged to consult the complete CIE report for a detailed explanation of the economic modelling, assumptions, and data sources that underpin the results.

GS1 Australia's objective in commissioning this work is to contribute to a shared, evidence-based understanding of **how industry adoption of supply chain standards supports national productivity, competitiveness, and resilience**. In doing so, we aim to recognise and support the important work Australian businesses are doing to ensure that our supply chains are efficient, effective, safe, and sustainable.

Across all sectors, businesses understand the productivity challenges created by inconsistent, duplicated, or misaligned data and the costs that flow from them. GS1 standards (now ISO and Australian National Standards) help address these challenges by enabling structured, interoperable data exchange between trading partners, regulators, and consumers. **This is a critical foundation of digital transformation and economic development**.

Establishing a robust evidence base is essential for good industry and government policy development. But the findings in this report go beyond economic efficiency. They speak to our ability as a nation to respond to crises, manage cost-of-living pressures, adapt to change and reduce vulnerabilities in an increasingly complex world of commerce and trade.

For those familiar with GS1 standards, the report helps explain how something as simple as consistent product and location identification and digital labelling can generate substantial national benefits. For others, we hope it opens a conversation about the practical enablers of digital transformation, simplified trade and a circular economy.

Finally, and most importantly, the report recognises the contribution GS1 members make every day to the development, adoption, and application of open, global standards.

We thank the CIE team for their rigorous analysis and look forward to building on this evidence base as we continue our shared journey toward a more productive, digital, and sustainable world.

Warm regards,

Maria Palazzolo
CEO, GS1 Australia

The Contribution of Industry to Australia's **Productivity, Competitiveness and Resilience** through Supply Chain Efficiency

Independent Economic Analysis of the National Impact of Supply Chain Standards Use

Economic Contribution

GDP UPLIFT

$19B – $27B
per year

EXPORT TRADE

$6.4B – $9B
per year

COST OF LIVING

0.4% – 0.6%
permanently lower prices

Impact Pathways

REDUCED
administration and duplication costs

SIMPLIFIED
trade and regulatory compliance

ENHANCED
traceability and trust

LOWER
prices through enhanced competition

Key Results and CIE Report

$3.5B – $5B
in government revenue per year

$833 – $1,194
per capita real wage growth

$9.7B – $13.7B
in household consumption

$12B – $16B
potential increase in export earnings

$36B – $50B
potential GDP uplift

0.6% – 0.9%
future inflation reduction

"Unlocking productivity, competitiveness, trade growth and resilience through supply chain data standards"

1 Introduction

Australian industry faces rising and constant demands for efficiency, sustainability, and global competitiveness. This summary outlines how the implementation of supply chain data standards supports national productivity and trade performance. The focus is on real-world impacts for businesses and the broader economy, drawing from independent analysis, case studies, and published evidence.

What are supply chain data standards?

Supply chain data standards define how information about materials and products, locations, and events is captured and shared across businesses and jurisdictions. These standards are used to identify and trace items as they move through global and domestic supply chains. They underpin everything from barcodes scanned at checkout to the digital documentation required for international trade.

In 2025, Standards Australia formally adopted ISO supply chain standards as Australian standards. These 50-year-old standards are managed by GS1 and used by more than 2.5 million international businesses, including tens of thousands of large and small Australian companies, across sectors such as retail, agriculture, healthcare, logistics, and manufacturing.

What is GS1?

GS1 is a global, not-for-profit standards organisation. It is technology-neutral and proactively supports its members in leveraging standards through national and international registries and related services and via a community of solution providers. Its role is to maintain and support the use of global standards that help industry and governments improve supply chain efficiency, traceability, and data interoperability.

GS1 standards enable businesses to uniquely identify products and locations, capture data at key steps in the supply chain, and share information with trading partners and authorities in a consistent, reliable way. This supports trade, reduces duplication, and enhances data quality and transparency across global supply chains.

This report provides a summary of key findings of an independent economic analysis to evaluate and quantify the value and benefits that arise from the use of GS1 supply chain data standards by Australian industry.

For more information about GS1 and its standards, including frequently asked questions, please visit **www.gs1au.org**.

2 Why Supply Chain Standards Matter

Modern supply chains rely on accurate, interoperable data. Global data standards provide a shared language that allows different businesses, systems, and jurisdictions to exchange information efficiently. For Australian industry, standards:

- Reduce manual processes and data processing errors
- Avoid duplication and enable data sharing between supply chain partners
- Deliver efficiency and productivity gains to drive competitiveness
- Enhance traceability, transparency and trust – claims and compliance
- Enable digital transformation and trade modernisation

Who uses supply chain data standards?

A wide variety of businesses use supply chain data standards. In the retail sector, manufacturers, distributors, and logistics providers use barcodes and product master data to ensure accurate delivery and visibility of goods. In agriculture, producers and exporters apply standards to meet traceability and certification requirements. Healthcare suppliers use them to manage inventory and ensure patient safety.

Examples include:

- A beef exporter labelling meat cartons to ensure rapid customs clearance.
- A pharmaceutical company using serialised barcodes to prevent counterfeiting.
- A manufacturer using data synchronisation to ensure product recalls are accurate and swift.

While downstream businesses and consumers benefit from improved transparency, producers benefit from greater efficiency, reduced duplication, and easier integration with diverse customers, platforms, and sales channels. It's easier, for example, for an international wine buyer to order more product if there is a consistent way of identifying a specific vintage. Easier ordering means reduced complexity and cost of doing business.

Why does this matter for trade and the economy?

Standards use makes Australian businesses more competitive and improves access to international markets. Digital economy agreements, mutual recognition arrangements, and Australia's Simplified Trade System agenda all depend on shared identifiers and structured data. The 2023 Productivity Commission report noted that low productivity growth is being driven in part by poor data quality and inefficient workflows in key sectors.[1] The Commission and Treasury have both pointed to digital transformation as a critical enabler of future productivity gains.

Supply chain data standards that support the digitalisation of trade systems are a critical enabler of industry productivity. This is well defined in the Australian Government's Digital Trade Strategy[2] and related digital economy initiatives.

3 Economic Contribution

Governments often use economic modelling to assess how change, such as new technologies, regulations, or standards, will impact the economy. These models simulate the economy's interlinked sectors and trace how improvements in one area flow through others.

Using a Computable General Equilibrium (CGE) model calibrated to Treasury assumptions, the CIE assessed how industry use of GS1 and related standards affects GDP, productivity, and trade.

The modelling examined key impacts (shocks) of industry use of GS1 standards, including:

- Reduced administrative and duplication costs across multiple sectors
- Lower losses due to improved inventory accuracy and traceability
- Faster, more predictable border and logistics processes

The CGE model simulates the real-world economy using data on industry linkages, employment, trade, and consumption. Scenarios were designed to answer the question: ***What would the economy look like without supply chain data standards?*** By removing key efficiency mechanisms, the model estimates the net benefit of current practices.

> Productivity isn't everything, but in the long-run it's almost everything.
>
> **Paul Krugman**
> Nobel Prize-Winning Economist

Impact pathways:

The CIE analysis models microeconomic (business and sector level) inputs and outputs to quantify macroeconomic outcomes and impacts at a whole-of-economy level. It draws on independent Australian and international studies investigating how, for example:

- Improved inventory accuracy in retail supports just-in-time logistics
- Traceability in food improves access to premium export markets
- Streamlined product data reduces compliance costs across the value chain

The analysis shows that even in sectors with lower adoption of standards, such as mining and parts of manufacturing, businesses still benefit through improved efficiency and greater transparency in upstream and downstream processes.

Key Results from CIE Report:

- $19 to $27 billion per year in GDP uplift
- Competition benefits – consumer prices permanently 0.4% to 0.6% lower
- $6.4 to 9 billion/yr export trade uplift from productivity increases and competitiveness
- Real wage growth of between $833 to $1,194 per capita/yr
- Government revenue - $3.5 to $5 billion per annum

Supply chain standards make a significant contribution to Australia's economic performance

Want to explore the results further?

The full CIE report is available via **www.gs1au.org/economicimpact** and **www.thecie.com.au**

[1] https://www.pc.gov.au/inquiries/completed/productivity#report
[2] https://www.dfat.gov.au/trade/services-and-digital-trade/e-commerce-and-digital-trade/digital-trade-strategy

4 Sector Insights

The CIE report focuses on key sectors of the economy, including industries like retail, healthcare and manufacturing, where supply chain data standards are extensively used, along with sectors where GS1 standards' use is emerging or nascent – agriculture, building and construction and rail. Some of the findings are noted below.

Retail

Retailers using barcoding, RFID, and electronic messaging (EDI) report that supply chain data standards enable:

- Improvement in stock accuracy
- Avoiding stock waste – by up to 40% for fresh produce
- Faster checkouts and better online-offline integration

Retail benefits are driven by improved stock accuracy, reduced shrinkage, and faster replenishment. GS1 standards support scan-based trading, real-time data exchange, and digital shelf management.

Example: Large national retailers use GS1 barcodes and synchronised product data to manage millions of stock-keeping units (SKUs) across thousands of stores and distribution centres. RFID pilots in apparel have cut inventory write-offs by 40% and supported more responsive fulfilment.

Retailers are now trialling and implementing next-generation, 2D barcodes and the GS1 Digital Link standard to deliver richer product information, enable self-checkout innovation, and meet consumer demand for sustainability claims (and broader ESG) transparency.

Producers of Consumer Goods – including Agriculture

Manufacturers of packaged goods benefit from standardised identification and data sharing:

- Lower costs from labelling, recall, and product master data errors
- Increased on-shelf availability through improved forecasting
- Enhanced market access due to traceability

CIE modelling quantifies gains from eliminating data misalignment between manufacturers and retailers, especially in promotions, product onboarding, and compliance documentation. Benefits also arise from faster product design cycles and recall readiness.

Example: FMCG brands use GS1 Global Trade Item Numbers (GTINs) and product registries such as the National Product Catalogue (NPC), to publish consistent product data across retail, online, and distributor platforms - reducing duplication and enabling traceability.

Primary producers are increasingly embracing international standards for product identification to differentiate their offerings, linking credentials and claims of market relevance to capture premiums and ensure access to strategic growth markets. CIE modelling indicates the use of supply chain standards contributes between $6 to $9 billion to Australian export trade.

While most consumer goods companies have used conventional barcodes for years, they are now expanding the use of 2D barcodes for traceability, brand protection, and product authentication, particularly for health, personal care, and food items.

Non-Retail Goods Distribution

Industrial and capital goods sectors benefit from better traceability, location tracking, and inventory control:

- Reduced downtime from misidentified parts and components
- Lower holding costs from improved inventory visibility
- Streamlined asset management across complex sites

CIE modelling reflects reduced procurement costs, fewer stockouts, and better MRO (maintenance, repair, operations) scheduling through standardised part and location identifiers.

Example: Rail and energy operators now use GS1 barcoding to manage spares and consumables across large, remote operations. Integration with ERP and asset management systems enables automated reordering, verification, and site-level visibility.

These sectors are exploring GS1 standards for equipment lifecycle tracking, safety certifications, and carbon and ESG reporting linked to products and suppliers.

Healthcare

Hospitals and pharmaceutical suppliers benefit from product-level identification:

- Improved accuracy in medicines and inventory
- Reduced errors and better patient safety
- $695 million in annual savings

Benefits in the healthcare sector are derived from reduced medication errors, inventory waste, and labour costs related to manual tracking. GS1 standards enable bedside scanning, real-time stock visibility, and efficient recall processes.

Example: The Australian Commission on Safety and Quality in Health Care found that barcode-enabled bedside scanning reduced medication administration errors by 41%. GS1 standards have been adopted in over 20 countries' national health systems, including the NHS in the UK.

Hospitals are moving toward national adoption of GS1 identifiers for medicines, implants, and devices, aligned with international Unique Device Identification (UDI) and patient safety regulations.

Construction and Heavy Industries

Construction and building product suppliers benefit from standardised materials tracking:

- Reduced material waste and rework from inaccurate deliveries
- Improved safety and efficiency through harmonised standards
- Improved supply planning and project coordination
- Enhanced asset traceability and digital compliance

Productivity gains in construction stem from improved delivery accuracy, better alignment of materials with site workflows, and fewer delays due to mislabelled parts. Benefits are amplified in prefabrication and modular components.

Harmonisation of standards across national rail systems and a record $155 billion investment in public infrastructure over the next 15 years is critical for improved interoperability, more competitive, efficient and safe public transport and freight logistics.

Example: Construction suppliers tag structural steel, rolling stock, piping, and prefabricated parts with GS1 barcodes, supporting electronic proof of delivery, chain-of-custody documentation, and digital recordkeeping.

The sector is trialling 2D barcodes for digital material passports, emissions reporting, and integration with building information modelling (BIM) and digital twins.

Government

While Government is not considered specifically as a sector in the CIE report, federal and state agencies have embraced global supply chain data standards to:

- Leverage industry data for improved public policy
- Address resource recovery and materials reuse – container returns, etc
- Simplify trade systems and transition to a digital and circular economy

Maintaining long-term productivity growth is critical for the national economy and for maintaining industry competitiveness and quality of life for the everyday Australian. Similarly, pressing issues, not limited to cost of living and inflation, maintenance of real wages and helping transition to a more sustainable and resilient economy are enabled through digital supply chains.

Example: Application of supply chain standards to enhance materials recovery and reuse of plastics by the Department of Climate Change, Energy, the Environment and Water (DCCEEW), leverages existing industry use of GS1 standards and mitigates risks and cost of multiple and different approaches being applied to product and location identification.

There is increasing recognition that the use of international standards enables open and fair trade between nations. Export market access is critical for Australia, and the CIE analysis notes that standards use currently contributes between $6.5 to $9 billion in revenue attributed to supply chain productivity improvements.

Government also benefits directly from industry use of GS1 standards, collecting an additional $3.5–$5 billion per year in tax revenues.

5 Future Impact Scenario

The CIE report models a future adoption scenario in which supply chain standards are more widely implemented across sectors, including planned industry uptake of next-generation barcodes, enhanced data interoperability across public and private systems, and structured identifiers embedded in trade, safety, and regulatory frameworks.

Modelled Results:

Future state scenarios (not predictions) indicate:

- ***Growth*** - an **additional $17-$23 billion/year in GDP** beyond baseline, driven by greater supply chain coordination and data-driven efficiencies.
- ***Exports*** – an **additional $5 to 7.5 billion** in exports.
- ***Productivity*** - Higher national productivity and reduced business inefficiency are associated with modest real wage growth, especially in logistics, warehousing, and advanced manufacturing.
- ***Cost of living and competitiveness*** - lower supply chain costs (an **additional 0.2 to 0.3 percentage point reduction**) translate to more competitive pricing, improved availability of goods, and reduced inflationary pressure.
- ***Tax revenue*** - Increased taxable business output results in stronger fiscal capacity, with indirect gains to public budgets through reduced compliance costs and more efficient procurement. An **additional $3.3 billion to $4.3 billion in tax revenue per** annum.

A whole-of-economy transformation is possible when governments and industries coordinate to digitise and standardise core supply chain processes. The opportunity is not only economic - it is structural, strategic, and systemic.

Potential future macroeconomic impact of GS1 Standards in Australia

FUTURE IMPACT	LOW $ / (CHANGE)	HIGH $ / (CHANGE)
Gross domestic product	$36B (1.4%)	$50B (1.9%)
Household consumption	$17.1B (1.3%)	$23.7B (1.8%)
Exports	$11.6B (1.6%)	$16.3B (2.3%)
Inflation	-0.6%	-0.9%
Real wage growth	$1,488 (1.5%)	$2,078 (2%)
Government revenue	$6.8B (0.9%)	$9.5B (1.3%)

Data Source - Refer CIE Report

These outcomes reflect the contribution of Australian industry. Businesses that adopt and use global data standards are driving national efficiency, competitiveness, and sustainability - benefits that are measurable, scalable, and essential for the future. The evidence is clear: standards are a key enabler of economic transformation and growth.

6 Implications and Role of Government

The following section draws on the CIE analysis and reflects GS1 insight from Australian and international interactions with government and multi-jurisdictional agencies, including the United Nations, OECD, APEC and other bodies that are increasingly focused on standards as a way of delivering sustainable global development outcomes.

Governments can amplify industry gains by:

- Aligning regulatory systems with global standards
- Using standards in trade documentation and customs systems
- Supporting industry through digital infrastructure and simplified compliance

> The reported national benefit of current GS1 Standards use is the same order of magnitude as 26 National Competition Policy Reforms identified by Australian, state and territory governments across five themes.

National Competition Policy:
Modelling proposed reforms Study report - Nov 2024

APEC and other research support CIE modelling, highlighting the opportunity for governments to reduce regulatory burden and administrative costs, particularly in customs processing, compliance verification, and procurement, by adopting interoperable, standards-based data systems.

Examples:

Supply chain data standards are highly relevant for key national and international initiatives and public policies, including:

- Digital Economy and Supply Chain Resilience Strategy
- The Five Pillars National Productivity Agenda
- Digital Trade Strategy and Simplified Trade Systems
- Extra-jurisdictional supply chain regulations - EU digital product passports, etc.
- International trade facilitations – paperless trade reform
- GS1 identifiers are embedded in global trade facilitation frameworks maintained by the WTO, WCO, and UN/CEFACT.

Australian government agencies are already exploring the application of GS1 standards in food regulation, recycled materials traceability, product safety surveillance, and cross-border trade modernisation through the Simplified Trade System agenda.

Supply chains as an instrument of public policy

The extensive reach of supply chains, touching all businesses and citizens, is increasingly moving governments towards ‘whole of economy’ rather than sector or department-specific public policy interventions. Simple measures like goods and services taxes, scope 3 CO^2 emissions and other policies depend on simple industry foundations that support interoperability, traceability and common, simple approaches to the identification of products, places, parties and processes – in Australia and abroad.

Further details about GS1 standards use by governments around the world are available at GS1 Australia and GS1 Global websites.

7 National Benefit

The CIE analysis identifies and quantifies substantial benefits for both business and government from the use of supply chain standards. It also highlights a national GDP uplift opportunity of up to $50 billion per year.

Industry-led adoption of supply chain standards contributes to:

- National productivity and growth through digital transformation
- Workforce development, with demand for digital and logistics skills
- Sustainability goals, via data for the circular economy, waste reduction, and emissions tracking

The CIE attributes these broader benefits to the cumulative effects of data consistency, improved interoperability, and systemic efficiency across the economy.

> Supply chain data standards are a practical enabler of national productivity — supporting innovation, digital transformation, skilled jobs, and more competitive, resilient industries.

Maria Palazzolo
CEO, GS1 Australia

So What?

Yes, it's the obvious next question. What does this mean for Australia, for government, industry leaders, business managers and you and me as family members, consumers and sometimes patients?

There is still much to unpack in the CIE analysis and GS1 Australia welcomes the opportunity to challenge and improve the approach, build on models, refine and tune the accuracy of estimates provided.

Key areas of opportunity to explore moving forward include:

1. Developing supply chain policy as a mechanism for driving digital transformation, in line with the Australian government's digital economy and digital trade strategy.
2. Embrace digital labelling and the benefits of newly adopted Australian standards. We invite feedback on GS1 Australia's policy paper on digital labelling, developed to support regulators and governments.
3. Lastly, maintaining a whole-of-government approach to supply chain management to ensure traceability and related reforms to support our transition to a more circular economy is not unnecessarily complicated by industry, territory or department-specific regulations.

Strong partnerships between government and industry are essential to unlock these benefits. Together, we can turn digital infrastructure into real-world outcomes - boosting productivity, advancing sustainability, and delivering smarter public policy for all Australians.

8 Summary of Impacts

Please refer to the CIE Report for full details of the analysis and results noted below.

National (Macroeconomic) Impacts

Data Source - Refer CIE Report

AREA	CURRENT BENEFIT/PA.	FUTURE BENEFIT/PA.
Gross domestic product	$19B to $27B	$36B to $50B
Household consumption	$9.7B to $13.7B	$17B to $23.7B
Exports	$6.4B to $9B	$11.6B to $16B
Inflation	-0.41% to -0.58%	-0.6% to -0.9%
Real wage growth	$833 to $1,194	$1,488 to $2,078
Government revenue	$3.47B to $5.20B	$6.75B to $9.5B

Industry and Business (microeconomic) impacts

These outcomes reflect the contribution of Australian industry. Businesses that adopt and use global data standards are driving national efficiency, competitiveness, and sustainability - benefits that are measurable, scalable, and essential for the future. The evidence is clear: standards are a key enabler of economic transformation.

Key industry impacts (shock variables*) are noted below

(*) Refer to the CIE report for all analysis results and independent source data and related information used to determine shock variables.

IMPACT SECTOR	CURRENT BENEFIT/PA.	FUTURE BENEFIT/PA.
Retail cost savings	5 to 7%	7 to 9%
Wholesale cost savings	1.1 to 1.5%	1.8 to 2.9%
Export (food) market access	0.16%	2.4%
Reduced transport costs	2 to 8%	3 to 11%
Reduced cost of food recall	0.01%	0.015%
Reduced counterfeiting losses	0.001 to 0.003%	0.008 to 0.02%
Food service cost savings	0.4 to 0.5%	0.7 to 1.8%
Health cost savings	0.37%	0.56%
Rail freight stocktaking costs	0.13 to 0.18%	1.24 to 7.4%
Construction – data entry	0.003 to 0.004%	1.7 to 2%

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