

# Issues with the Australian and New Zealand Standard Industrial Classification (ANZSIC06) - New Zealand context

## Introduction

The future of producing industrial statistics is becoming increasingly problematic with the changing nature of the world economy. The traditional industrial concepts of environment, manufacturing, wholesale, retail, financial and services are undergoing major transformations in the real world and this poses problems for statistical classifications and associated processes. This accompanied by the rapidly changing and dynamic area of Information and Communication Technologies (ICTs) highlights the diminishing relevance of industrial classifications for enabling and providing an accurate portrayal of industrial statistics within the global data ecosystem.

**NB:** This paper should not be treated as a formal position paper from Stats NZ – it is an information paper outlining the issues that have been identified from a classification’s perspective in the New Zealand context. Whilst ANZSIC06 is a joint classification owned by both Stats NZ and the Australian Bureau of Statistics (ABS), the New Zealand issues do pose anecdotal similarities to Australian issues but are not exhaustive of, nor representative of, regional issues with the joint classification.

## Background

As part of the Closer Economic Relations agreement between Australia and New Zealand, it has been the practice of both statistical agencies to harmonise their approaches to collecting statistics. This practice includes using joint or closely related classification wherever possible and with the proposed development of ANZSIC in the 1990s, it was recognised that the two statistical agencies had used similar principles to create their national industrial classifications. This highlighted that it was possible to agree on the principles and strategy for development of a single classification for trans-Tasman usage i.e. ANZSIC.

The benefits of creating a joint industry classification were seen as the ability to produce an up-to-date, relevant, and conceptually sound classification, and to provide improved capacity for analysis of trans-Tasman industry statistical data. The single labour market and an almost single economy were drivers and justification for producing a regional joint classification.

Consequently, the Australian and New Zealand Standard Industrial Classification (ANZSIC) was introduced in 1993 to replace the existing Australian Standard Industrial Classification (ASIC) and the New Zealand Standard Industrial Classification (NZSIC).

In 1996, a New Zealand use version (ANZSIC96) was produced by Statistics New Zealand. This contained minor revisions of the original ANZSIC93 in order to better meet the specific needs of New Zealand users. Further minor revisions were subsequently made to reflect new economic activities that emerged. The ABS then proposed reviewing ANZSIC93 with a view to producing a new classification in 2006, and a review project commenced in early 2000 to achieve this.

Stats NZ uses the Australian and New Zealand Standard Industrial 2006 (ANZSIC06) as the framework for the compilation, analysis, and dissemination of industry statistics. The use of the ANZSIC06 classification is additionally supplemented through the use of the New Zealand Standard Industrial Output Classification (NZSIOC) which is only used for the production of all aggregated industry statistical data, and which is the basis for all sample surveys. NZSIOC is a New Zealand only classification which has not been updated since its inception and does not enable trans-Tasman aggregated data to be compiled as a result.

However, since its original release in 1993, and more so since the release of ANZSIC06, there have been significant changes in the structure, composition, and organisation of industrial activities in Australia and New Zealand. In addition, new industries and activities have emerged that require another look at the continued viability and relevance of ANZSIC06 as an appropriate measure to produce official statistics.

Due to the significant costs in time, resource, and money to develop and maintain a joint industry classification, Stats NZ is modernising its approach to classification development including greater adoption of international standards, if possible, and assessment of the use of semantic web technology. It is also considering a move to adopting ISIC using modern technologies and approaches.

The current situation of a joint classification is challenging due to the practice of following a traditional cyclical and timetabled classification review process with the associated production of a sequentially numbered, hierarchically structured classification. This traditional practice is a constraint in understanding and identifying future measures for classifying industry data and for enabling dynamic and timely real-world data to be produced.

Whilst Australia and New Zealand are similar in their economies, they are not identical and this poses issues for ensuring New Zealand content that is relevant and contemporary, and for when and how the classification can be amended. New Zealand stakeholders perceive that they are not in control of their own destiny as change is very much reliant on agreement between the two statistical agencies, the strategic priorities of both agencies, and a revision timing that is more often driven by Australia than New Zealand.

ANZSIC06 conceptually aligns as far as practicable with the International Standard Industrial Classification of All Economic Activities (ISIC Rev 4), and the North American Industry Classification System (NAICS) at the subdivision level. Alignment with these classifications was undertaken to enhance the international comparability of New Zealand industry statistics.

## **Purpose of ANZSIC**

ANZSIC provides a framework in which economic units undertaking similar economic activities can be grouped together. Each grouping is referred to as an industry. In developing ANZSIC it was essential that the classification:

- facilitated the collection, analysis, dissemination, and production of industry statistics;
- reflected the structure of the economy in both Australia and New Zealand;
- adopted and applied best practice classification principles; and
- ensured that industry statistics were comparable over time and internationally.

These bullet points provided the philosophical rationale for developing a joint classification back in 1993 and again when the ANZSIC06 development was initiated but the reality is that the world and economy has moved on, and therefore these ideals are perhaps not as relevant now as they once were.

The purpose of any classification is now to dynamically reflect the real world of data relevant to the modern economy. Most of our statistical classifications suffer from the adherence to traditional viewpoints in terms of structure and review processes that are more in keeping with hardcopy publication principles than modern thinking around concepts and data relationships, and semantic web and metadata modelling ideals.

Consequently, the adherence to the principles underpinning ANZSIC have limited the thinking in terms of updating and reflecting modern terminology and content. This has resulted in the perception that to bring an industrial classification into the 21<sup>st</sup> century is really in the too hard

basket as it is becoming increasingly pointless, costly and time-consuming to pursue a traditional classification development and review model. Adopting an international standard can be seen as a simpler solution but this is not always the case.

## Conceptual Basis of ANZSIC

The aim in producing ANZSIC06 was to develop a revised industry classification that reflected the current structure of the Australian and New Zealand economies, recognising the need to incorporate future economic change if possible.

The primary concept behind ANZSIC06 is a supply-side basis to industry definitions and groupings. The supply-side concept prescribes that categories will be based on aspects of commonality of the productive activities of the producers of goods and services, focussing on the underlying production function.

A supply-side, or production-oriented approach, groups together units which engage in similar production or service delivery processes and generally use similar technology. Production involves an activity, or series of activities in which inputs are used to produce a good or render a service. The production function describes how the good or service depends on all the inputs used in its production, and describes the transformation of intermediate inputs, through the application of labour and capital, to produce outputs. The supply-side approach also provides a more reliable methodology for recognising new industries because these are identified through the recognition of new production processes.

So, for ANZSIC06, at the lowest level of the classification, all industrial activities that use similar inputs and production processes to produce similar outputs are grouped together. It should be noted that as classes are grouped into higher levels of aggregation, the level that the units exhibit similar production functions generally diminishes. This means that at the higher levels of ANZSIC06, the emphasis moves increasingly to the output side of the production function and therefore the division level is created and defined by looking at what is produced and less around the activities undertaken to produce that output.

## ANZSIC Structure

ANZSIC 2006 is a hierarchical classification with four levels: divisions (the broadest level), subdivisions, groups and classes (the finest level). The divisional level provides a limited number of categories that show a broad picture of the economy suitable for the publication of summary tables in official statistics. The subdivision, group and class levels provide increasingly detailed dissections of these categories for the compilation of more specific and detailed statistics.

The hierarchical structure of the ANZSIC is illustrated below:

Division	C	Manufacturing
Subdivision	C11	Food Product Manufacturing
Group	C111	Meat and Meat Product Manufacturing
Class	C1111	Meat Processing

The full classification can be found on the Stats NZ website at <http://aria.stats.govt.nz/aria/#ClassificationView:uri=http://stats.govt.nz/cms/ClassificationVersion/CARS5587>

## New Zealand Standard Industrial Output Classification (NZSIOC)

NZSIOC is an output view of the ANZSIC classification designed for the production of aggregated industry statistics.

A major principle that drove the design of the NZSIOC output classification was around balancing the goal of standardisation with that of flexibility. Classification design over recent years, particularly in the development of ANZSIC06, has emphasised standardisation using a single classification as a means of achieving better comparability of data across different outputs both internally and internationally, as well as historically. However, a 'one-size-fits all' approach does not always work well given the wide variety of outputs produced using ANZSIC and their different requirements. The NZSIOC output classification, therefore, was introduced to provide a series of options which, at the time of introduction, tended to meet the needs of Stats NZ collections, and which were intended to easily be linked back to the original ANZSIC06 design to facilitate standardisation.

A key principle of the NZSIOC classification was to ensure that the format of published industry statistics reflected the structure of the current New Zealand economy and recognised the significance of particular New Zealand industries such as primary food product manufacturing - which can be constrained by the international alignment of ANZSIC06. Another key principle was to ensure that the ANZSIC06 structure was not broken unless necessary. However, an overarching consideration for NZSIOC was the desire to have a level one structure that could be output on a single page, hence some ANZSIC06 divisions were combined. NZSIOC consists of four levels:

#### Level One

High level aggregation intended for use in one-page summary statistics. This level also supports a high-level overview of the entire economy. There are sixteen categories at this level. They match with the ANZSIC06 Division level, except for three categories which combine two divisions together.

#### Level Two

The standard minimum level required for all quarterly statistics. Quarterly GDP and a range of supporting statistics are available at this level. There are 31 categories at this level. They generally match with the ANZSIC06 division level, except that Agriculture and Manufacturing are split in ANZSIC06 subdivisions or combinations of subdivisions to reflect the importance of agriculture and primary product manufacturing in the New Zealand economy. Local Government Administration is split out from Division O Public Administration and Safety to support the widespread interest in the local government activity.

#### Level Three

This is the standard for annual statistics. The annual National Accounts and the Annual Enterprise Survey are published at this level. Supporting series of wage and price indexes are also available for most of these categories. There are 55 categories at this level. This level generally matches an ANZSIC06 subdivision or consists of several smaller subdivisions combined. Subdivisions 01 Agriculture and 11 Food Product Manufacturing are broken down further to better reflect their importance in the New Zealand economy

#### Level Four

This is the level at which National Accounts are compiled and analysed for Working Industries. The Annual Enterprise Survey is designed at this level.

Having an additional hybrid output classification adds complexity to any decisions to revise or update ANZSIC06 itself, or in adopting ISIC. No longer is the review process limited to just working with the ABS on a single joint ANZSIC classification for New Zealand but having to take into consideration any structural or content changes and their impact on aggregation of data and the flow-on effect to both NZSIOC and/or BIC, combined with international reporting to any revised ISIC.

Any review of ANZSIC becomes much longer and more resource intensive. Noting that the ANZSIC classification took six years to develop and a further seven years to fully implement in the National Accounts, and that the NZSIOC was created as an afterthought, that is, its purpose and/or need was not actually considered during the ANZSIC06 review, time needs to be spent considering

whether having a stand-alone hybrid output classification is still relevant, or could it be incorporated back into a single standard classification.

## **Business Industry Classification (BIC)**

The New Zealand context is further complicated by the use of the Business Industry Classification (BIC) with the New Zealand Inland Revenue Department, Accident Compensation Corporation and the Companies Office.

The Business Industry Classification (BIC) was introduced at a time when the underlying ANZSIC and ACC Classification Units were out of date, and ACC need a system that could map to ANZSIC and the ACC CU list separately. The use of BIC was through a self-selection as part of the Inland Revenue tax process, from a schedule that could subsequently populate both ACC and IRD systems. BIC is used to classify a self-employed person or business by their main activity and each BIC code corresponds to an Accident Compensation Corporation classification unit (CU) code and description. These CUs are used to group together businesses or individuals to ensure that the levies they pay are fair but also each CU has a levy rate to enable employers to calculate their ACC levies.

As businesses have become more complex, with many niche activities, and many full-service activities, trying to match the BICs has become more complex as the selection website doesn't meet the needs of a taxpayer trying to quickly complete an Inland Revenue tax form, nor for the ACC experts to make quick and accurate selections. The dated nature of ANZSIC is a barrier to assisting users find and assign the appropriate codes.

BIC is a flat classification which provides a greater level of detail below the ANZSIC06 class level i.e. ANZSIC06 classes may be replicated or split into more detailed categories based on ACC needs – usually to recognise different risk levels, and the code is extended by the addition of two extra digits on the classification code. The ACC codes are easily mapped to ANZSIC, but the reverse is not the case. In addition, the coverage of the code names (or category descriptors) is not clearly recognised by the general public prompting the need for an up-to-date plain English approach. Having said that, the ACC note that the expanded commentary, language and class descriptions contained in ISIC are much better than those used within ANZSIC06.

BIC codes are then assigned by Inland Revenue when a new business is identified, and the allocated code is then supplied to Stats NZ for inclusion on the Statistical Business Register with the relevant ANZSIC06 code.

Stats NZ provides advice and direction on the definition and labelling of categories within the BIC classification but the ultimate control, usage and application of BIC lies with the external agencies. This may result in discrepancies in the interpretation and definition of classes between BIC and ANZSIC06 thus challenging any data comparability.

Both ANZSIC06 and BIC are falling behind commerce in not identifying the placement of niche technology, in not recognising multiformat trading (concurrent online, retail, wholesale), and in not coping with the complexity and increasing specificity of emerging service industries. There is also speculation that the continued use of the BIC will lead the two classifications of ANZSIC06 and BIC to further separate themselves when defining and separating risk profiles such that bringing them back together will be quite difficult.

## **Implementation of ANZSIC06**

ANZSIC06 was officially released in early 2006 with the transition to the new classification by Stats NZ being scheduled over the period 2006 to 2011. However, this extended to 2013.

ANZSIC06 implementation had significant impact for all producers and users of industry statistics. The key issues surrounding the implementation of the new classification were ensuring that:

- Users and providers of statistical data understood the reasons for the new ANZSIC and supported the changes – however these were not well documented
- Users understood the implications of the changes for the data they were using;
- Stats NZ was aware of user concerns and the implications for planning implementation; and
- All tasks associated with the ANZSIC implementation were identified, communicated, timed and costed, and adequate resources were available to ensure as smooth a transition as possible.

The first introduction of ANZSIC06 occurred with the dual coding of the New Zealand Business Frame (now Statistical Business Register) whereby all businesses contained in the frame were assigned an ANZSIC06 code alongside their existing ANZSIC96 code. The dual coding of the Stats NZ Business Frame then enabled the 2006 Census of Population and Dwellings to be the first survey to code industry data on both an ANZSIC96 and ANZSIC06 basis. This allowed for a population census output of industry on a 1996 basis for time-series purposes whilst utilising the new ANZSIC at the same time.

A critical issue for the implementation of ANZSIC06 was the extent to which data compiled on an ANZSIC06 basis would be back cast to provide long-term time-series data.

## **Comparison with ISIC Rev 4 – New Zealand Context**

As stated above, the national industrial classification in New Zealand, ANZSIC06, closely aligns conceptually with ISIC Rev 4. A comparison with the revised ISIC Rev 5 structure has not yet been done, whilst the draft ISIC Rev 5 structure is finalised, and therefore is not considered in the discussion that follows.

Traditionally, Stats NZ has modified international classifications to suit the New Zealand context. This often means that not all categories of an international classification are utilised, however the conceptual basis of the international classification is usually adhered to. Sometimes a different application of the concepts may be applied so that whilst the New Zealand and international classifications are conceptual the same, the application of the concepts leads to different classification structures.

In terms of the concepts used to develop the International Standard Industrial Classification (ISIC Rev.4) and ANZSIC06, there is little difference between how the two classifications define the overarching concepts used.

ISIC: The set of all production units engaged primarily in the same or similar kinds of productive activity.

ANZSIC06: Units exhibit similar production functions (a term used to describe the transformation of intermediate inputs, through the application of labour and capital, to produce outputs).

The application of the concepts and supporting criteria results in slightly different classifications structures as there are other classification criteria that are applied. Also, the ANZSIC06 approach took into consideration the principles and concepts of the North American Industrial Classification (NAICS) which primarily had influence at the subdivision level.

In terms of the overall structures that ensue, ANZSIC has four levels: Division (19), Subdivisions (86), Groups (214) and Classes (506); whilst ISIC has four levels: Sections (21), Divisions (88), Groups (238) and Classes (419)

All ANZSIC06 classes map to an ISIC class albeit the concordance often being a many to one relationship

## Key Content Issues for the New Zealand context

ANZSIC now faces issues of relevance in that the real world has changed and the content of the classification is dated and makes assignment of classification categories to emerging industrial activities difficult. Adoption of a new ISIC will not necessarily resolve these issues. For example, issues include:

- The changing nature of the traditional manufacturing concept due to increased outsourcing/subcontracting and globalisation, and the emerging issue of factoryless goods production. The need to change the interpretation of manufacturing as a concept, combined with the need to redefine the treatment of services and outsourcing has significant impacts for the current industrial classification. The resolution of this would result in a completely different structure and be an expensive exercise to undertake if the end product was deemed to be a continuation of a traditional classification approach.
- The convergence of the traditional wholesale/retail concepts making the ability to clearly and distinctly classify an economic unit into one or the other difficult. The flow-on effect is that considerable time is spent evaluating the role of businesses and units in relation to their participation in wholesale trade or retail trade, and then in which survey process they must take part.

As with the manufacturing concept, to fully appreciate and apply appropriate criteria to address the convergence between traditional wholesale activities with traditional retail will be an expensive and time-consuming exercise resulting in significant classification change. However, the real world has changed and this distinction is no longer a relevant nor easy distinction to maintain especially with greater online activity.

- The dynamic nature of ICT such as changes in publishing from hardcopy to digital, increased use of multimedia, increased use of social media and the variety of ways in which industrial statistics are available i.e. big data, highlights that the current classification does not represent the reality, nor does it enable support for the government's ICT strategy.

The current ANZSIC06 classification concepts and categories are so out of date in relation to the current and emerging technology that it is extremely difficult to accurately classify ICT related activities. Again, this would require a significant and costly classification restructuring.

- The lack of coverage of emerging areas of official statistics such as aspects of environmental statistics including carbon trading, environmental protection.

There is a need to more fully expand the current classification to deal with the emerging area of environmental activities and in particular consideration to producing a 'green' view of industry. Addressing these issues would be within the normal scope of a major classification review but would be very dependent on the other changes mentioned above taking place. Greater alignment with the System of Economic and Environmental Accounting (SEEA) and other related classifications could be achieved.

- The inability of the current classification to reflect Māori needs and activities

Māori business models and specific industrial activities are not acknowledged in ANZSIC just

as indigenous activities are not classified or separately identified in ISIC. The challenges are that the underlying statistical unit model does not necessarily equate to Māori business and how that is defined, there are no uniquely Māori activities identifiable in either the classification classes, primary activities or definition text.

- The reduced ability to produce and analyse trans-Tasman data given the introduction of NZSIOC for aggregated outputs.

The introduction of a New Zealand specific output classification has made trans-Tasman comparability virtually non-existent as there is no Australian equivalent output classification. Consideration of the ongoing need for a regional joint classification would impact any decision around NZSIOC but also there is the current overhead to be faced if changes are made to ANZSIC which then must be copied into or addressed in NZSIOC.

- The need to revisit NZSIOC and its purpose and dated content.

Any review of ANZSIC requires a significant rethink around the need for and purpose of NZSIOC and whether the output approach can be accommodated in a new classification structure. The likelihood is that NZSIOC will need to remain as a separate stand-alone classification if ANZSIC is retained, as it is not a usable or comparable classification for Australia. This does mean a cost overhead in redevelopment and in maintenance of two classifications covering the same topic.

The use of NZSIOC implies the need for alternative views of different sectors, something ISIC currently does in a limited way, but alternative, aggregated output views from ISIC would be very useful. This can be better addressed through a more modern semantic web approach and can be addressed in the Stats NZ Ariā system model.

## **Moving to ISIC**

Industry classifications are complex and a critical component of economic statistics, national accounts and business data. Consequently, there is a lot to consider in terms of the impact of reviewing and changing a classification, with its associated costs, on a long-term cycle (estimated at a total cost of NZ\$1.2m for ANZSIC06 when this work was originally done in the 2000-2006 period).

The need to maintain a regional, related industrial classification is no longer cost-effective for the statistical agencies given the costs in resourcing and capability required to develop and maintain such a classification. Adoption of the international standard is seen as one way to reduce the burden on stakeholders around consultation on issues and would make international comparability of data easier. It should also be recognised that there are few (if any) unique industries in the Australian and New Zealand economies that are not covered by the international standard.

The use of semantic web technology and metadata modelling approaches which are supported by the Stats NZ Ariā system means that adoption of international standards is much easier, especially when taking an api or machine-to-machine approach, rather than traditional human consumption and the need for a detailed book approach. The scale and scope of adoption becomes easier, as does the inclusion of New Zealand specific content – whether country specific definition text, alternative category labels, or inclusions and/or exclusions.

Any move to adopting a revised ISIC is in all reality a cheaper more effective exercise than undertaking a full or even piecemeal revision of ANZSIC06 and/or creating a new joint (or New Zealand specific) classification. Technology makes it easier to dual-code content to maintain time-series. Implementation of a revised classification into IT systems is easier using consumable apis from a centralised repository such as Ariā.



However, Stats NZ is only at the beginning of the process of determining what to do with its industry classifications. Initial consultation is taking place within Stats NZ on what it may mean to move of the existing ANZSIC06 classification. Discussions with key external stakeholders such as Reserve Bank, Treasury, Inland Revenue and the Accident Compensation Commission will take place to get a perspective on their needs and desires but nothing is timetabled as yet.

A basic evaluation of the changes being introduced by ISIC Rev 5 in comparison with ANZSIC06 has been done, which highlights not too many, if any, real issues with replacing one classification with another.

But conversations both internally and externally about IT system change, the impact for the Statistical Business Register and the greater issue of implementation still need to be considered.

Stats NZ has actively participated in the previous Technical Subgroup for ISIC and the current Task Team for the Revision of ISIC which has been operating under the direction of the UN Committee of Experts on International Statistical Classifications. Whilst most issues covered by the revision are suitable for New Zealand adoption, there is still the major issue of coverage for Māori and/or content being in te Reo Māori and whether adopting ISIC is a suitable approach for the full New Zealand Data System.

Lastly, any decision on future direction still needs comprehensive discussion between Statistics New Zealand and the Australian Bureau of Statistics. The options going forward are:

- Adopt ISIC as is to replace ANZSIC
- Adopt ISIC and embed New Zealand content rather than a traditional region-specific version
- Review ANZSIC as a joint classification with Australia or continue with a New Zealand use version, noting that Stats NZ has a preference to move away from joint classifications.

## **Conclusion**

There is a real cost in maintaining ANZSIC as the framework for industrial statistics in New Zealand - the financial cost in maintaining two statistical classifications (ANZSIC06 and NZSIOC) is inefficient; the scope of change required to the classifications is conceptually and structurally enormous to enable the classifications to reflect the current real world and to be used into the future.

What the current joint review processes for ANZSIC06 have highlighted is that lengthy discussion on structure and content result in over-elaborate, costly and time-consuming reviews with content out of date upon publication. Having two countries work collaboratively to produce a joint classification that may/may not full meet the individual country needs is no longer sensible.

The burden on stakeholders and the statistical agencies to consult, agree on scope and content, update and change is significant. This coupled with the need to assess the impact on the data (whether through maintaining ANZSIC or adopting a new approach, whether ISIC or semantic web approaches) makes for a difficult decision. It is not just about the classification, it is the impact on everything that relates to it, whether this be the Statistical Business Register, Census of Population and Dwellings, and/or economic statistical outputs. There are issues of back-casting to also consider and IT system redevelopment – all expensive under a traditional review approach. Use of apis and semantic web technology based off a new ISIC may be the way forward.