

# Industry Snapshot for Auckland: Niche Manufacturing

July 2013

Technical Report 2013/016



**Auckland  
Council**  
Te Kaunihera o Tāmaki Makaurau





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Technical report, TR2013/016

ISSN 2230-4525 (Print)

ISSN 2230-4533 (Online)

ISBN 978-1-927216-59-0 (Print)

ISBN 978-1-927216-60-6 (PDF)

This report has been peer reviewed by the Peer Review Panel using the Panel's terms of reference

Submitted for review on 6 March 2013  
Review completed on 27 June 2013  
Reviewed by three reviewers

Approved for Auckland Council publication by:



Name: Grant Barnes

Position: Manager, Research, Investigations and Monitoring Unit

Date: 27 June 2013

**Recommended citation:**

Wilson, R (2013). Industry snapshot for Auckland: niche manufacturing. Auckland Council technical report, TR2013/016

Front cover photograph by Jay Farnworth for Auckland City Council. Production line machinery at Pernod Ricard in Glen Innes

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# Industry Snapshot for Auckland: Niche Manufacturing

Ross Wilson

Research, Investigations and Monitoring Unit  
Auckland Council



# Executive summary

Auckland Council defines the “niche manufacturing” sector as manufacturing and wholesaling of machinery and equipment (ANZSIC C24 and F34), other than Information and Communication Technology. The sector is highly diverse. The largest sub-sectors (by employment) are wholesalers; next come manufacturers of:

- weighing machines, purifiers, engines, fans and turbines (C2499)<sup>1</sup>
- specialised machinery and equipment: agricultural, mining, machine tools and “other” (e.g. for packing, wrapping, washing, food processing) (C246)
- electronic equipment (excluding ICT, professional and scientific) (C2429)<sup>2</sup>
- electrical equipment (excluding cable and wire and lighting) (C243)
- domestic appliances, including whiteware (C244).

Auckland’s Economic Development Strategy considers niche manufacturing to be a key platform sector for knowledge and technology intensive activities. Niche manufacturing is increasingly integrated with ICT, digital content, health technologies and biotech. The sector is export-intensive in its own right, and also supplies other exporters. Specialised manufacturers often use flexible, short-run production cycles to supply high-value global niches. Increasingly, they also create value in the areas of design, research and development, production and servicing.

Auckland’s niche manufacturing sector:

- generates \$2.22 billion a year of GDP - 3.2 per cent of Auckland’s total GDP<sup>3</sup>
- employs 19,030 people - 3.0 per cent of Auckland’s total employment
- comprises 2,547 business units - 1.6 per cent of Auckland’s total businesses
- exports \$1.35 billion a year – 13.8 per cent of Auckland’s total exports
- generates 63 per cent of its GDP from wholesaling (37% from manufacturing)
- has a fairly constant share of the New Zealand sector’s GDP: a slight rise (+3.6%) in the last ten years, but after a comparable fall (-4.9%) the year before
- has 54 per cent of its jobs in wholesaling (46% are in manufacturing)
- generated all of its growth (2000-2011) from wholesaling of niche manufactures (+1190 ECs); the manufacturing component declined (-990 ECs)
- clusters near Mt Wellington/Penrose, East Tamaki, Albany and the airport
- is one of the main employers for St Mary’s Bay and Rosebank.

Compared to the other sectors of the Auckland economy, firms in Auckland’s niche manufacturing sector:

- export much more (relative to value added)
- are larger - but still mostly small (7 employees; other Auckland sectors have 4)
- have a higher share of the nation’s total employees in the sector (43% vs. 34%)
- have a higher share of the nation’s total GDP in the sector (46% vs. 36%)
- have slightly (10%) lower labour productivity (i.e. value added per employee)
- have much slower value added growth (2001 to 2011: 0.5% pa vs. 2.5% pa)
- have similar labour productivity growth (2001 to 2011: 0.5% pa vs. 0.6% pa)
- have much slower employment growth (2001 to 2011: 0.1% pa vs. 1.9% pa).

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<sup>1</sup> Part of C249 Other Machinery and Equipment Manufacturing

<sup>2</sup> Part of C242 Computer and Electronic Equipment Manufacturing

<sup>3</sup> Available only based on old (ANZSIC 1996) categories, so not fully consistent with other measures

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# Introduction

This report looks at a component of Auckland's manufacturing (and related wholesaling) sector, "niche manufacturing", and its contribution to the Auckland and New Zealand economies. The report defines the niche manufacturing sector as machinery and equipment manufacturing and wholesaling, other than ICT.<sup>4</sup> The sector provides inputs to, and has linkages with, a variety of other manufacturing and processing sectors globally as well as in Auckland and the rest of New Zealand.

## Strategic Framework

Auckland Council has developed an Economic Development Strategy, which has specifically identified niche manufacturing as one of the key sectors having particular competitive strengths and international market potential for Auckland based firms. In 2012 a niche manufacturing sub-sector, Other Machinery and Equipment Manufacturing, had the highest innovation rate of all industries: 74 per cent of all its businesses<sup>5</sup> - well above the average for all industries (46%) and for the total manufacturing sector (55%)<sup>6</sup>.

Similarly, central government's Business Growth Agenda<sup>7</sup> has identified the High Value Manufacturing and Services ("HVMS") sector<sup>8</sup> (including niche manufacturing) as having the potential to drive significant increases in high-value, high-margin exports and to diversify New Zealand's economy. HVMS exports generate high returns to labour and therefore increase the country's productivity.

## Global manufacturing context

Manufacturers worldwide are in the process of transforming their operations to keep pace with rapidly changing conditions. Global engagement requires businesses to be lean, make use of global supply chains, and be innovative in order to remain competitive. Globalisation, increasing competition from China, the Global Financial Crisis and the strong New Zealand dollar have heightened the need for manufacturing in New Zealand to develop new methods and different approaches to address the challenges the sector faces.<sup>9</sup>

Globalisation has been increasing over the last 30 years or so, and its importance continues to grow. The opening up of national boundaries, coupled with technological improvements in transport and communications, have enabled a shift towards global supply chains and global production networks, taking advantage of global flows not only of goods and capital, but also of services, knowledge, labour and information.

Increasing globalisation is linked to increasing specialisation, and there is an important cost differential between developing and developed countries. Developing countries have tended to specialise more in basic commodities and undifferentiated products, pushing developed countries to focus more on higher tech, knowledge intensive sectors where they can achieve

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<sup>4</sup> With some exceptions; see Table 1(b) and the section on "Definitions of the sector" for more details

<sup>5</sup> At the national level. Statistics New Zealand, 2012. *Business Operations Survey Innovation Module 2012*. Cited in Ministry of Business, Innovation and Employment, 2012. *Business Growth Agenda Progress Report Building Innovation*.

<sup>6</sup> (2011 data for total manufacturing sector)

<sup>7</sup> Ministry of Business, Innovation and Employment, 2012. *Business Growth Agenda Progress Report Building Export Markets*.

<sup>8</sup> HVMS includes all manufacturing plus various services – see box below, and Appendix 1 Glossary and Abbreviations for further details

<sup>9</sup> Auckland Regional Council, 2009. *Industry Snapshot for the Auckland Region: The Manufacturing Sector*

higher productivity. The United States, for example, has ten times higher labour productivity than China.<sup>10</sup>

China in particular has seen an enormous growth in its basic manufacturing industries over the last 20 years, much of it focussed on export. China is now the world's second largest economy, and a strong low-cost competitor in manufactures export markets all over the world. China's manufacturing output now equals the United States in dollar terms.<sup>11</sup>

According to a 2013 report for the U.S. Council on Competitiveness, "Over the next five years, 20th-century manufacturing stalwarts like the United States, Germany and Japan will be challenged to maintain their competitive edge to emerging nations such as China, India and Brazil."<sup>12</sup>

China's economic growth also creates market opportunities for other countries. China's manufacturers have a growing demand for imports of machinery and equipment as well as raw materials and components. In addition, China's increasingly well-rewarded entrepreneurs, managers, professionals and technicians form a burgeoning middle class that demands more and better consumer goods.

### New Zealand manufacturing's place in the world

New Zealand's manufacturing sector, like many developed countries, has been contracting and restructuring for the last 30 years. In order to survive, firms' products must command a premium price to cover their relatively higher costs for inputs such as labour. This typically involves niche markets, making high-value and low-volume products.<sup>13</sup>

New Zealand's local market is often too small to support viable production volumes of specialist products, so manufacturers rely increasingly on exporting. Specialised manufacturing often uses flexible, short-run production cycles to supply high-value global niches. Increasingly, they also create value in the areas of design, research and development, production and servicing.<sup>14</sup>

Similarly, globalisation creates the need and the opportunity for firms to specialise in particular levels of a global production chain. They import the materials or components they need, and export either finished products or components for further processing or assembly at specialised plants nearby or elsewhere in the world. Over time, they may be able to expand vertically up or down the production chain, or alternatively they may improve productivity by consolidating into a more specialised portion of the chain or contracting-out some of the activities they used to perform in-house. Similarly, changes in global markets create opportunities for firms to expand their share of a particular market, to expand the market itself, and to expand into new markets in which the firm has a competitive advantage.

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<sup>10</sup> KPMG, 2012. *Global manufacturing outlook: Fostering growth through innovation*.

<sup>11</sup> KPMG, 2012. *Global manufacturing outlook: Fostering growth through innovation*.

<sup>12</sup> Deloitte Touche Tohmatsu Limited, 2013. *Global Manufacturing Competitiveness Index 2013*

<sup>13</sup> Infometrics, 2013. *Why NZ should avoid supporting "traditional" manufacturing*. Downloaded from <http://www.infometrics.co.nz/Forecasting/6255/9011/Why-NZ-should-avoid-supporting-%E2%80%9Ctraditional%E2%80%9D-manufacturing>

<sup>14</sup> Auckland Council, 2012. *Auckland Economic Development Strategy 2012*



## Auckland's specialised (niche) manufacturing sector

Auckland has a world-class specialised manufacturing sector that supplies the local market and exports worldwide. It evolved from the need to provide essential equipment for farming, mining and forestry across the Auckland region and New Zealand. The manufacturing sector had to provide equipment such as conveyers for mines, hydraulic weighing systems and specialised log-harvesting machinery. Now Auckland is home for example to exporters specialised in the technology of the movement of goods<sup>15</sup>, including two global leaders in airport conveyor and luggage systems<sup>16</sup>.

More recently, the growth of the processed food and beverage industries in Auckland has led to specialised manufacturing for packaging and weighing machinery and allied support products. The depth of Auckland's expertise in precision-critical industries such as food technology and medicine has influenced the growth of other precision technologies in the region. Among these are automation systems for the construction industry; a number of Auckland companies are leaders in this niche.<sup>17</sup>

### Callaghan Innovation advanced technology institute

The Government has recently launched Callaghan Innovation to better connect New Zealand businesses with the science and technology sector in order to help in the commercialisation of innovative products or services. Formerly referred to as Advanced Technology Institute (ATI), it combines the operations of Industrial Research Ltd (a Crown research institute, formerly known as the DSIR) and relevant teams from central government.

Callaghan Innovation has 400 staff in Auckland, Wellington and Canterbury and will administer research grants to business totalling \$141 million annually<sup>18</sup>, spread over the three cities. It will focus on encouraging innovation and higher value products and services in industries with high-growth potential such as food and beverage manufacturing, agri-technologies, digital technologies, health technologies, therapeutics, and high-value wood products.

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<sup>15</sup> Such as Motion Design and Actronic

<sup>16</sup> Namely Glidepath and BCS Group

<sup>17</sup> Including Stanley, Howick Engineering, FrameCad and Tanderra.

<sup>18</sup> Includes \$24 million increase announced in the 2013 Budget

## High Value Manufacturing and Services Research Fund

The manufacturing component of niche manufacturing is part of the high value manufacturing and services (“HVMS”) sector, and relies heavily on HVMS as both a customer and supplier. The former Ministry of Science and Innovation (MSI) (now part of Ministry of Business, Innovation and Employment (MBIE)) define HVMS as including<sup>19</sup>: “biotechnology, processing, electronics and embedded systems, mechatronics and robotics, sensing and scanning devices, medical technologies, advanced materials and manufacturing technologies (including plastics), marine technology, pharmaceuticals, agritechnologies, digital technologies and information and communication technology (ICT)”

However, MSI also recognised the potential for “the application of technology developments to the more traditional manufacturing sector including for example meat processing, wool processing and related agritech activities”, who are also customers of niche manufacturing. Similarly, another MSI report<sup>20</sup> noted, “The HVMS sector includes non high-tech sectors which we consider to be “high value” in the New Zealand context. For example, textiles, clothing, wood and furniture manufacturing may not be considered high tech industries, but in New Zealand they present significant opportunities for high value productivity gains through the application of new technologies.”

MBIE has a Sector Investment Plan for High Value Manufacturing and Services<sup>21</sup> that aims to support a science-based, innovative and entrepreneurial culture to ensure greater impact from New Zealand research. A key component is the HVMS Research Fund, aiming to generate and support the uptake of science and innovation that will contribute to enhancing the sector’s performance, especially to increase exports of high-technology goods and services.

The fund provides \$157 million per annum<sup>22</sup> invested in various science- and business-led research. The scope of the fund encompasses novel materials, manufacturing and applications, agri-technologies, medical and health technologies, and information, communication and digital technologies.

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<sup>19</sup> Ministry of Business, Innovation and Employment, 2011. *Improving The Access To And Uptake Of R&D In The High Value Manufacturing Sector Including High Tech And Related Services. Terms Of Reference*. Available: <http://www.msi.govt.nz/assets/related-1.pdf>

<sup>20</sup> Martin Jenkins, 2012. *High Value Manufacturing and Services. Final Report. A sector profile prepared for the Ministry of Science and Innovation*. Ministry of Business, Innovation and Employment 2012 Available: <http://www.msi.govt.nz/assets/HVMS-Sector-profile.pdf>

<sup>21</sup> Ministry of Business, Innovation and Employment, 2012. *2013 Sector Investment Plan High-Value Manufacturing and Services Research Fund* [Online]. Available: <http://www.msi.govt.nz/assets/Get-Funded-Documents/2013-science-investment-round/SIP/SIP-HVMS.pdf>

<sup>22</sup> As at November 2012; subject to increases in subsequent budgets

## Definitions of the sector

There are several definitions of the niche manufacturing sector or related sectors, of which the most relevant are from:

- Statistics New Zealand “Niche Manufacturing” (broad, but excludes wholesaling),
- Auckland’s Economic Development Strategy (used for this report)
- Auckland Tourism, Events and Economic Development Limited, Sector Engagement Framework (same as this report, but called “machinery and equipment”).

The “niche manufacturing” sector as defined by Auckland Council broadly corresponds to both manufacturing and also wholesaling, of machinery and equipment (ANZSIC C24 and F34), other than Information and Communication Technology.

The sector is highly diverse, and includes for example manufacture and/or wholesaling of engines, turbines, fans, pumps, food processors, packing machinery, air conditioners, material handling equipment, machine tools, agricultural equipment, mining and construction equipment, whiteware, audio-visual receivers, switchgear and measuring instruments.

### Statistics New Zealand definition

Statistics New Zealand has a grouping they call “Niche Manufacturing” that is very broad, including sub-sectors ranging from textile and footwear manufacturing to construction services (See Table 1(a))<sup>23</sup>.

**Table 1(a): Statistics New Zealand definition of niche manufacturing (ANZSIC 2006)**

<b>ANZSIC 2006 Subdivision Name</b>	<b>ANZSIC 2006 Code (2-digit)</b>
Textile, leather, clothing, and footwear manufacturing	13
Wood product manufacturing	14
Polymer product and rubber product manufacturing	19
Non-metallic mineral product manufacturing	20
Primary metal and metal product manufacturing	21
Fabricated metal product manufacturing	22
Transport equipment manufacturing	23
Machinery and equipment manufacturing	24
Construction services	32

Data source: Statistics New Zealand, 2008. *Business Operations Survey*

<sup>23</sup> Statistics New Zealand, 2008. *Business Operations Survey 2008*.

## Auckland Economic Development Strategy (EDS) and this report definition

This report will instead use the definition from the Auckland Council's 2012 Economic Development Strategy (EDS). It takes a more focussed approach, and identifies the niche manufacturing sector as primarily corresponding to the ANZSIC 2006 categories "C24" and "F34" (Machinery and Equipment Manufacturing, and Machinery and Equipment Wholesaling, respectively), but mostly excluding 4-digit sub-sectors that are already captured in the ICT sector.

Table 1(b) lists the 2- and 3-digit categories<sup>24</sup> (in **bold**) that are partially or fully included in the niche manufacturing sector, the 4-digit categories within them that are included in niche manufacturing, and gives some examples of types of machinery and equipment (or other products) manufactured or wholesaled. Entities engaged mainly in repairs are always excluded from these sub-sectors and are not included in the niche manufacturing sector.

Table A2 in Appendix 2 is a more comprehensive version, which lists all of the 4-digit sub-sectors within C24 and F34 and presents the allocations between niche manufacturing and ICT.

**Table 1(b): Niche manufacturing definition by 2-digit, 3-digit and 4-digit sub-sector**

Code	ANZSIC 2006 Sub-sector	Examples included	Exclusions
<b>C24</b>	<b>MACHINERY AND EQUIPMENT MANUFACTURING</b>	n/a	n/a
<b>C241</b>	<b>Professional and Scientific Equipment Manufacturing</b>	<b>C2419</b>	<b>C2411, C2412</b>
C2419	Other Professional and Scientific Equipment Manufacturing	navigational, measuring, control or meteorological or surveying equipment or instruments	Photographic, optical and ophthalmic; medical and surgical
<b>C242</b>	<b>Computer and Electronic Equipment Manufacturing</b>		<b>C2421, C2422</b>
C2429	Other Electronic Equipment Manufacturing	audio or visual receiving sets, sound reproducing and/or recording equipment, radio receiving sets (except radio transceivers or radio telegraphic or telephone receivers), television receiving sets, headphones, Integrated circuits	Office computer and electronic; communications

<sup>24</sup> Categories refers here to ANZSIC groupings at the 1-, 2-, 3- or 4-digit level, which are also referred to here as sub-sectors.

<b>Code</b>	<b>ANZSIC 2006 Sub-sector</b>	<b>Examples included</b>	<b>Exclusions</b>
<b>C243</b>	<b>Electrical Equipment Manufacturing</b>	<b>C2439</b>	<b>C2431, C2432</b>
C2439	Other Electrical Equipment Manufacturing	batteries, electric motors, generators, electricity transmission or distribution equipment, switchgear, switchboards, transformers;	Electric Cable & Wire; lighting
<b>C244</b>	<b>Domestic Appliance Manufacturing</b>	<b>C2441, C2449</b>	<b>n/a</b>
C2441	Whiteware Appliance Manufacturing	Domestic electric, electronic or gas appliances for cooking, refrigeration, freezing, washing. Also food waste disposal and barbecues	commercial or industrial;
C2449	Other Domestic Appliance Manufacturing	Other domestic appliances	Whiteware; commercial or industrial;
<b>C245</b>	<b>Pump, Compressor, Heating and Ventilation Equipment Manufacturing</b>	<b>C2451, C2452</b>	<b>n/a</b>
C2451	Pumps and Compressors Manufacturing	air or gas compressors; pumps or pumping machinery	refrigeration or air conditioning compressors;
C2452	Fixed Space Heating, Cooling and Ventilation Equipment Manufacturing	commercial or industrial fixed space heating, cooling and air conditioning equipment; refrigerated vending machines or dispensers; water coolers	Domestic; for vehicles; duct work
<b>C246</b>	<b>Specialised Machinery and Equipment Manufacturing</b>	<b>C2461, C2462, C2463, C2469</b>	<b>n/a</b>
C2461	Agricultural Machinery and Equipment Manufacturing	agricultural machinery, equipment or tractors; lawn mowers;	crawler tractors; tools;
C2462	Mining and Construction Machinery Manufacturing	construction, earthmoving or mining machinery or tractors	cranes, winches, hoists;
C2463	Machine Tool and Parts Manufacturing	woodworking or metalworking machinery; pneumatic or power operated hand tools, dies or die sets	Unpowered hand tools; electrical welding equipment
C2469	Other Specialised	Food processing	Domestic; woodworking;

Code	ANZSIC 2006 Sub-sector	Examples included	Exclusions
	Machinery and Equipment Manufacturing	machinery; packing/wrapping machinery; printers; commercial dishwashers; miscellaneous	metal working; various industrial machinery
<b>C249</b>	<b>Other Machinery and Equipment Manufacturing</b>	<b>C2491, C2499</b>	<b>n/a</b>
C2491	Lifting and Material Handling Equipment Manufacturing	forklift trucks, cranes, winches, hoists, conveyors, some materials handling equipment; elevators, escalators or lifts; some tractors	Agricultural tractors; crawler tractors
C2499	Other Machinery and Equipment Manufacturing n.e.c. <sup>25</sup>	Engines; weighing machines; purifiers; fans; turbines;	Heating, air conditioning; computers; appliances; vehicle engines
<b>F34</b>	<b>MACHINERY AND EQUIPMENT WHOLESALING</b>		
<b>F341</b>	<b>Specialised Industrial Machinery and Equipment Wholesaling</b>	<b>F3411, F3419</b>	<b>n/a</b>
F3411	Agricultural and Construction Machinery Wholesaling	Agricultural Machinery; tractors; lawnmowers; Construction Machinery; earthmoving	[None specified]
F3419	Other Specialised Industrial Machinery and Equipment Wholesaling	processing machinery for Dairy, food, textiles, leather, rubber, wood, metals, paper, distilling, printing	electrical or electronic equipment; various items that are in F3499
<b>F349</b>	<b>Other Machinery and Equipment Wholesaling</b>	<b>F3494, F3499</b>	<b>F3491, F3492, F3493</b>
F3494	Other Electrical and Electronic Goods Wholesaling	Appliances, batteries, motors, refrigeration, switchgear, photographic, radios, televisions	Professional & Scientific; Computer; Telecommunication
F3499	Other Machinery and Equipment Wholesaling n.e.c. <sup>25</sup>	Pumps, compressors, heaters (non-electric), jetskis; binoculars; bearings	electrical or electronic; motor vehicle engines

Data source: Auckland Council, from Statistics New Zealand

<sup>25</sup> "n.e.c." is "not elsewhere classified"



## ATEED Sector Engagement Framework definition

The Auckland Tourism, Events and Economic Development Limited (ATEED) Sector Engagement Framework of 2012, written by Martin Jenkins, uses the same definition (and ANZSIC 4-digit categories) as the Auckland Council Economic Development Strategy (EDS) “niche manufacturing” sector, but labels it “machinery and equipment” and groups it with “construction and engineering” and “advanced materials” to form “specialised manufacturing”.

## Data sources

This report uses a range of data sources. Each source has its own merits. Where possible, the most appropriate data source has been used.

**Employment and Geographic Units** – This is taken from Statistics New Zealand's *Business Demography Survey* 2000 to 2012, using the latest (ANZSIC 2006) classification system. The survey is based on the Statistics New Zealand Longitudinal Business Frame (LBF) and gives an annual snapshot (as at February, and released in October) of the structure and characteristics of New Zealand businesses. The series covers economically significant individual, private sector and public sector enterprises that are engaged in the production of goods and services in New Zealand. The term "business" is here used to denote a geographic business unit (GU), as used in Statistics New Zealand's Business Demography data. It is defined as a separate operating unit engaged predominantly in one kind of economic activity from a single physical location or base. Employment is based on employee counts ("ECs"), which includes both full and part time employees but not working proprietors. Data is taken at the 4-digit level, which provides a perfect match to the sector definition used in this report. In some instances, the sector data is aggregated to a 3-digit level for presentation, in which case the 3-digit category includes only those 4-digit components that are part of the sector.

**Gross Domestic Product ("GDP")<sup>26</sup> and labour productivity** - This is taken from Infometrics' national and regional GDP series to 2011, which is expressed in 1995/96 constant prices. Statistics New Zealand does not directly provide calculations or forecasts of regional GDP (i.e. "value added" or "output") for niche manufacturing and its components, so models have been used. These models use lagged estimates of employment, and apply the ANZSIC 1996 classification system, rather than ANZSIC 2006.

The model results are available at the "NA29" level, which splits the economy into 29 categories. "Machinery and equipment manufacturing" and "Wholesale trade" have been modelled to include only the niche manufacturing sub-sectors within those categories, creating proxies for the manufacturing and wholesaling components of the niche manufacturing sector. The results are identical or similar for most sub sectors, but with the proviso that often the ANZSIC 1996 sub-sector includes some firms and employees that are not considered part of the 2006 definition of the sector. Overall the 1996 definition is nearly 20 per cent larger (by employment) than the 2006 definition. The more detailed breakdowns used within the model are not available for GDP.

**Exports Data** – This is not available consistently as a time series to 2012 as a separate item for the sector for Auckland firms, so instead proxies have been used.

- An ATEED report by Martin Jenkins cites Market Economics estimates of Auckland exports of "machinery and equipment", which is an exact match to the sector, but only for the years 2001 and 2008.
- Statistics New Zealand provided a customised report for Auckland Council of ANZSIC 2006 commodities exported through Auckland's ports, but from anywhere in New Zealand, and only for 2011 and 2012. It is based on Statistics New Zealand export data by commodity categories at the six digit level using the New Zealand Harmonised System Classification (NZHSC), 2012 version. The concordance of NZHSC 2012 to ANZSIC 2006

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<sup>26</sup> See Appendix 1 Abbreviations and Glossary for definition of GDP.

is not perfect, so commodities included as “niche manufacturing” at the six digit level may include commodities at the 10 digit level that are not part of the sector.

- At the national level, Statistics New Zealand’s Infoshare has time series export data from 1990 to 2012 and 2000 to 2012 on “machinery and transport equipment”<sup>27</sup> and also at the 4-digit level for four commodities that broadly correlate to the sector<sup>28</sup>.

**Economic Projections to 2031** – This is taken from Market Economics Ltd’s Economic Futures for Auckland model, which is expressed in 2007 constant prices. The Economic Futures Model (“EFM”) provides economic projections for 48 industry sectors in the Auckland region to 2031.

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<sup>27</sup> Statistics New Zealand, 2013. OTV002AA Available: *Infoshare - Exports and Imports - Overseas Trade Indexes - Volumes and Values – OTV - Export volume indexes and values - analytical*

<sup>28</sup> Statistics New Zealand, 2013. EXP084AA Available: *Infoshare - Exports - Summary Data – EXP – EXP - Level of Processing (4 digit)*

## Value added (GDP)

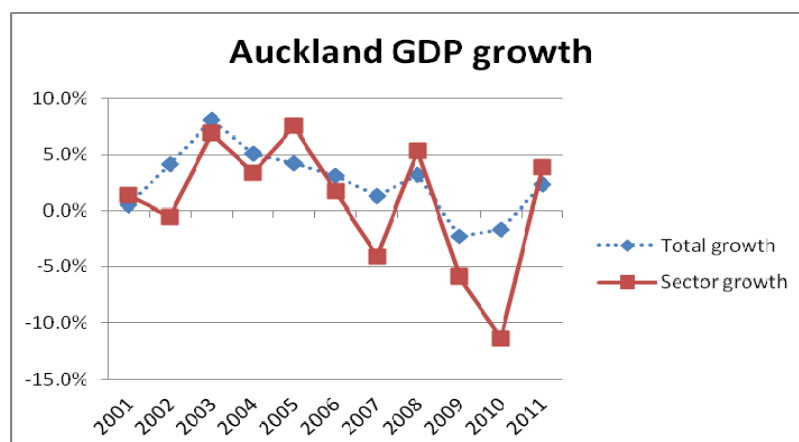
Value added for the Auckland niche manufacturing sector:

- is small (3.2% of Auckland's total economy), but inputs to other sectors
- is highly volatile
- was particularly hard hit by the global financial crisis (GFC)
- is mostly wholesaling (63%) rather than manufacturing (37%).

The Auckland niche manufacturing sector is small, generating only 3.2 per cent of Auckland's economic output (value added, or "GDP"), but is an important input to many other sectors. New Zealand's niche manufacturing sector production is heavily concentrated in Auckland (46%) compared to other sectors (36%), indicating that Auckland has a comparative advantage in that sector compared to other sectors and compared to the rest of New Zealand. This concentration is exceeded only by the wholesale (49%) and finance and insurance (49%) sectors.

Niche manufacturing output in both Auckland and New Zealand grew only moderately less quickly than the rest of the economy during the boom from 2000 to 2006, but were particularly hard hit by the global financial crisis (GFC) and so tended to fall more than other sectors from 2007 to 2010 (see Figure 1(a)). Niche manufacturers mostly produce capital goods and consumer durables, which are often hardest hit during recessions due to customers cutting back on investment and discretionary spending.

**Figure 1(a): Auckland output (GDP) growth in the niche manufacturing sector and total economy 2001 to 2011**



Data source: Infometrics, 2012. *Annual Economic Report for Auckland*

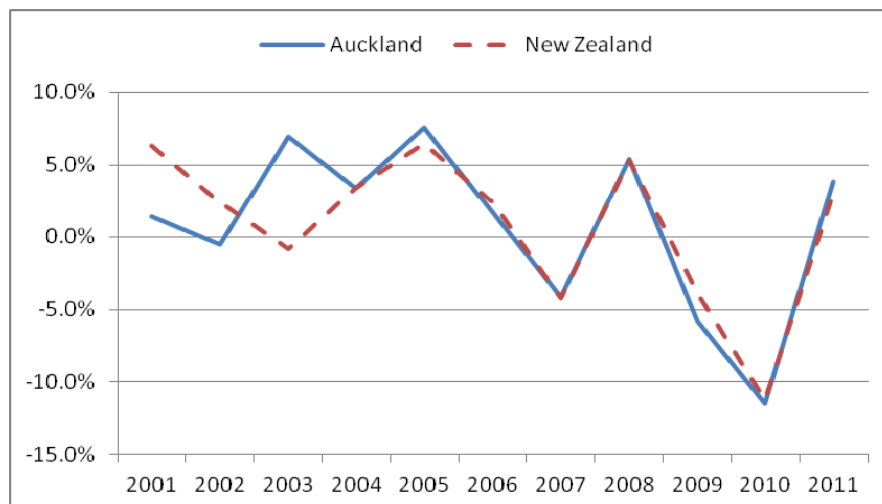
For Auckland, nearly two thirds of the sector's output is from the wholesaling component ("wholesale trade" for sub-sector GDP calculations), which contributed all of the sector's overall net GDP growth from 2000 to 2011. The manufacturing component ("machinery and equipment manufacturing" for sub-sector GDP calculations), in contrast, shrank from 2006 to 2011 by as much as it had grown from 2000 to 2006, for an overall zero net growth from 2000 to 2011.

The Auckland niche manufacturing sector generated \$2,224 million of value added (or “GDP”; \$1,585 million in 1995/96 dollars) in 2011, which was 3.2 per cent of Auckland's economic output - down from 4.0 per cent 10 years earlier. However, Auckland's niche manufacturing sector economic output grew by 3.9 per cent in 2011, substantially more than the sector's growth at the national level (3.0%) that year.

## Auckland and New Zealand GDP growth

Over the last 10 years, niche manufacturing output has been growing at a similar rate in Auckland to the rest of New Zealand, suggesting that Auckland has been maintaining its comparative advantage. Figure 1(b) shows that GDP growth in the sector in Auckland has averaged 0.5 per cent per year, but varying widely from a low of -11.4 per cent in 2010 to a high of 7.5 per cent in 2005. Similarly, the national sector has averaged 0.2 per cent annual growth over the same period but with major fluctuations. At both the Auckland and New Zealand levels, the small overall positive GDP growth trend is swamped by the year-to-year fluctuations, particularly since 2007 and the GFC.

**Figure 1(b): Output (GDP) growth in the niche manufacturing sector 2001 to 2011**

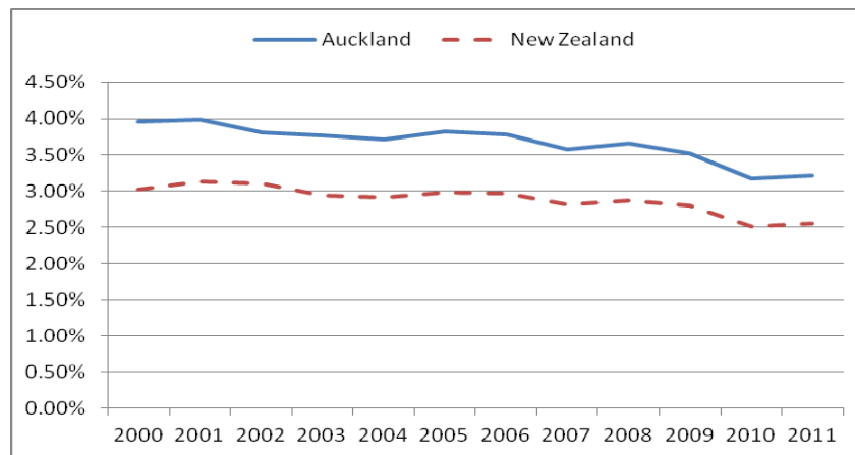


Data source: Infometrics, 2012. *Annual Economic Report for Auckland*

Figure 2 shows the niche manufacturing sector's share of total output for Auckland and New Zealand, and how they have changed over time. It shows that Auckland niche manufacturing share of Auckland total GDP has fallen over time,<sup>29</sup> which is because it grew more slowly than Auckland's other sectors between 2000 and 2011 (see Figure 1(a)). At the national level, New Zealand's niche manufacturing GDP as a share of New Zealand's total GDP has also been generally falling since 2000. The Auckland share fell faster than the New Zealand share from 2000 to 2002, but since then Auckland has remained about 1 ½ per cent above New Zealand.

<sup>29</sup> Infometrics, 2012. *Annual Economic Report for Auckland*

**Figure 2: Niche manufacturing sector share of total output (GDP)**

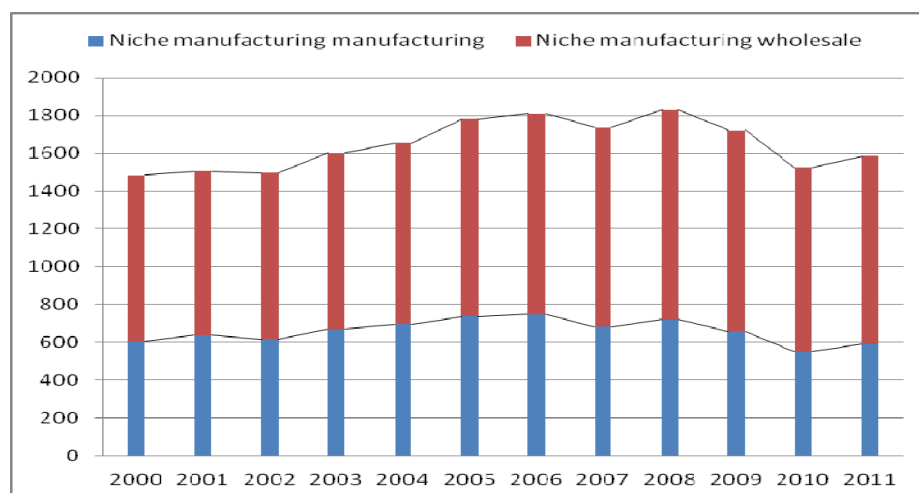


Data source: Infometrics, 2012. *Annual Economic Report for Auckland*

### Auckland's niche manufacturing sector GDP by sub-sector

Figure 3(a) shows value added (GDP) for of the Auckland niche manufacturing sector from 2000 to 2011 in 1995/96 constant dollars, split into the two GDP sub-sectors: the manufacturing component (“Machinery and equipment manufacturing” for GDP) and the wholesaling component (“wholesale trade” for GDP). Measured by GDP, the sector is increasingly dominated by “wholesale trade” (63%), which is the only part of the Auckland sector showing long term growth (12.8% since 2000, or 1.1% pa). “Machinery and equipment manufacturing” comprises the remainder (37%), and has been stagnant overall since 2000, with growth until 2006 and a declining trend since then.<sup>30</sup>

**Figure 3(a): Auckland niche manufacturing GDP by ANZSIC96 sub-sector \$1995/96 million**



Data source: Infometrics, 2012. *Annual Economic Report for Auckland*

<sup>30</sup> Infometrics, 2012. *Annual Economic Report for Auckland*



## Labour productivity

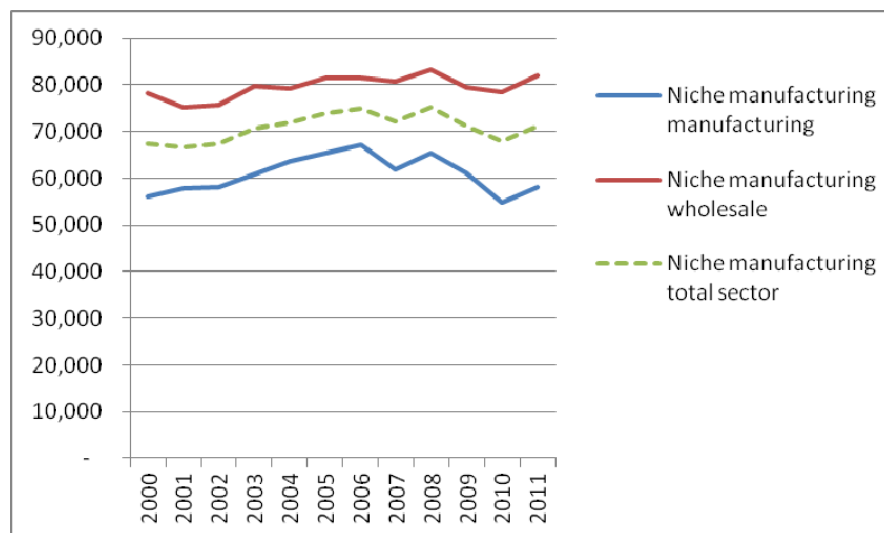
Labour productivity for the Auckland niche manufacturing sector:

- is somewhat lower than for Auckland's total economy
- has enabled modest demand growth to be met with no growth in employment
- is higher for wholesaling than manufacturing
- is volatile, especially the manufacturing component.

One of the key drivers of income growth is labour productivity, which at its simplest is defined as average value added per employee. Table 2 shows that average value added per employee<sup>31</sup> for the niche manufacturing sector (\$71,142) is somewhat lower than for Auckland's total economy (\$79,291). The sector's overall employment growth (ECs) has been virtually nil (0.1% pa from 2000 to 2011), so productivity growth has been the main driver of the sector's GDP growth. Or conversely, modest productivity growth has enabled modest demand growth to be met with virtually no increase in employment.

Figure 3(b) shows that within the niche manufacturing sector, the manufacturing component has significantly lower labour productivity (\$58,120) than the sector average, while the wholesaling component is significantly higher (\$82,069) and is comparable to the rest of the Auckland economy (\$79,291). Both components have shown major fluctuations in annual growth in productivity from 2000 to 2011, but the wholesaling component appears to have a stronger overall uptrend, while the manufacturing component appears to be more volatile and cyclical with a flatter overall trend.

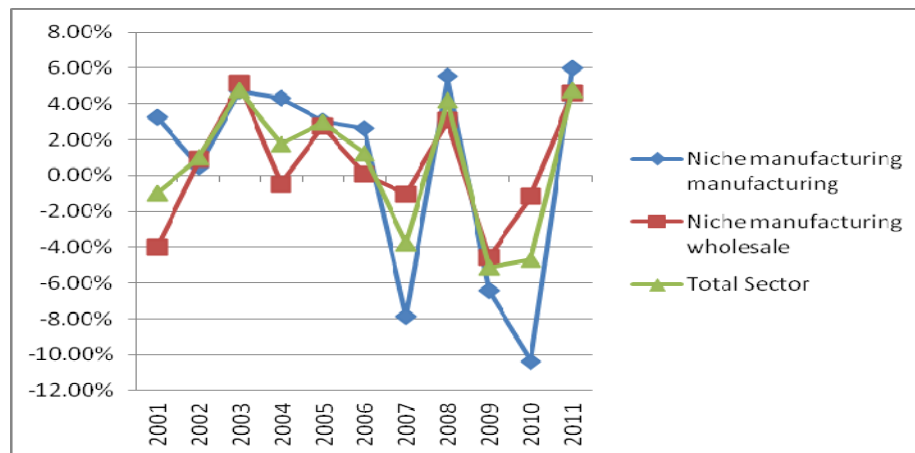
**Figure 3(b): Auckland niche manufacturing productivity by sub-sector \$1995/96 per EC**



Data source: Infometrics, 2012. *Annual Economic Report for Auckland*

<sup>31</sup> In 1995/96 dollars, which is the standard measure in New Zealand for value added and GDP analyses

**Figure 3(c): Productivity growth of components of Auckland niche manufacturing**



Data source: Infometrics, 2012. *Annual Economic Report for Auckland*

Figure 3(c)) shows in more detail that for both the manufacturing and wholesaling components, but particularly the manufacturing component, the annual fluctuations in labour productivity growth are very high relative to the (modest) growth trend. Consequently, long-run average productivity growth calculations are very sensitive to the start and end years chosen, and it is not clear whether the apparent lower growth trend for the manufacturing component is a statistically significant difference.

With both the manufacturing and wholesaling components showing comparable average rates of productivity growth from 2000 to 2011 (0.3% and 0.4% pa respectively), then differences in average GDP growth are largely due to different rates of employment growth between the two components of the sector. Put another way, faster GDP growth in the wholesaling component (due to changing demand) has resulted in higher employment growth for the wholesaling component. (see Table 2). In fact, the wholesaling component had an increase in employment over the period, whereas the manufacturing component had a net decrease in employment. The employment shift within the sector from manufacturing, which is less productive, to wholesaling, which is more productive, has further boosted (slightly) the sector's productivity growth (to 0.5% pa).<sup>32</sup>

**Table 2: Auckland niche manufacturing labour productivity and output average annual growth by component 2000-2011**

	2011 Productivity	Productivity Growth pa	EC Growth pa	GDP Growth pa
Total niche manufacturing sector	71,142	0.5%	0.1%	0.6%
Manufacturing component	58,120	0.3%	-0.5%	-0.2%
Wholesaling component	82,069	0.4%	0.7%	1.1%
Total Auckland economy	79,291	0.6%	1.9%	2.5%

Data source: Infometrics 2012. *Annual Economic Report for Auckland*

<sup>32</sup> Data from Infometrics, 2012. *Annual Economic Report for Auckland*. The employment categories are "NA29" based on ANZSIC 1996, and so differ from definitions used elsewhere in this industry snapshot.

# Employment

Employment in the Auckland niche manufacturing sector:

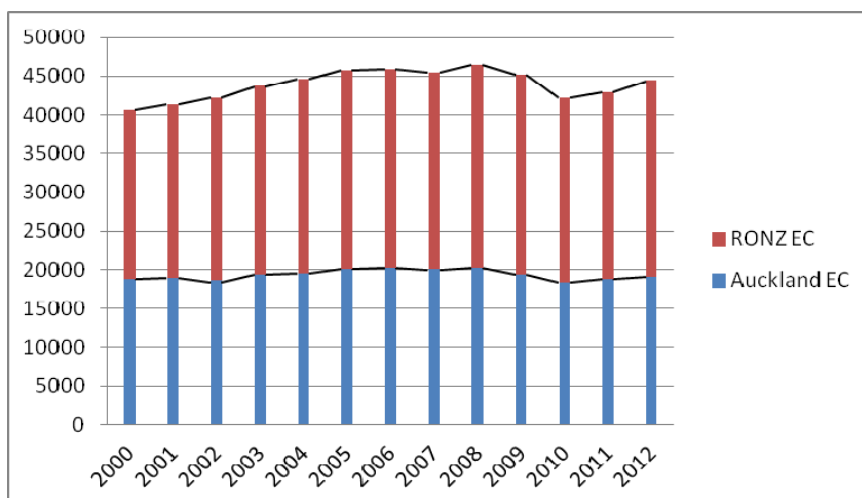
- grew much more slowly than the rest of the Auckland economy 2000 - 2012
- is fairly evenly split between manufacturing (falling) and wholesaling (growing)
- had huge growth in Other Specialised Machinery and Equipment Manufacturing<sup>32</sup>
- had a huge fall in Whiteware Appliance Manufacturing.

Auckland had 19,030 people employed in the niche manufacturing sector in 2012, accounting for 3.0 per cent of total employment in Auckland. Auckland contributes 43 per cent of New Zealand's niche manufacturing employment.

## Employment trends

Figure 4(a) shows that between 2000 and 2012, niche manufacturing employment (ECs) in Auckland had minimal growth - only 200 people (1.1% total increase)<sup>33</sup>. Auckland still accounted for nearly half of New Zealand's total employment in the sector, but with that share falling (from 46% to 43%). Over the 12 year period, Auckland's niche manufacturing sector employment grew more slowly than the sector for New Zealand as a whole (9.4%), and much more slowly than the rest of the Auckland economy (23.3%). The sector also tended to have smaller employment fluctuations in Auckland than in the rest of New Zealand.

**Figure 4(a): Niche manufacturing employee count (EC) within Auckland and rest of New Zealand (RONZ)**



Data source: Statistics New Zealand *Business Demographics 2000-2012*

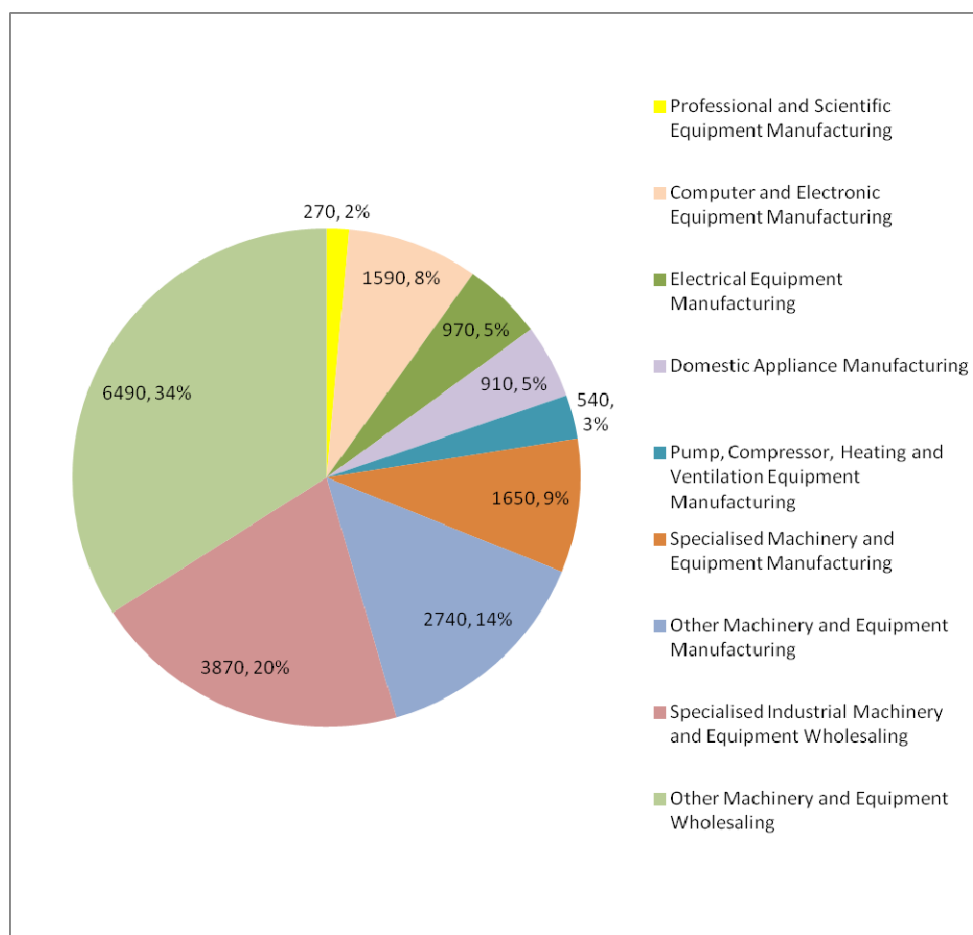
<sup>32</sup>E.g. food processing, packing, dishwashers, miscellaneous

<sup>33</sup>2006 ANZSIC definition

## Employment by sub-sector

Figure 4(b) shows the different sub-sectors' contributions to niche manufacturing employment in Auckland in 2012, at the 3-digit level<sup>34</sup>. The manufacturing sub-sectors provide a total of 46 per cent of the Auckland niche manufacturing sector's employment, and wholesaling the remaining 54 per cent. The manufacturing share is somewhat higher for employment than for GDP due to lower labour productivity, and has fallen from the 2000 share (51%). A third of the sector's employment is in Other Machinery and Equipment Wholesaling (34%), which includes the 4-digit sub-sectors Other Electrical and Electronic Goods Wholesaling (29%) and Other Machinery and Equipment Wholesaling n.e.c. (6%). Of the manufacturing component sub-sectors, the largest is Other Machinery and Equipment Manufacturing (14%).

**Figure 4(b): Auckland niche manufacturing employment by 3-digit sub-sector 2012**



Data source: Statistics New Zealand *Business Demographics 2000-2012*

<sup>34</sup> Excluding employment in 4-digit sub-sectors that are not part of the niche manufacturing sector.

## Employment growth by sub-sector

Manufacturing employment in the sector fell by 990 employees from 2000 to 2012, but this was more than offset by growth in wholesaling employment in the sector (1190 employees). Similarly at the national level, manufacturing's share of the sector has fallen from 55 per cent to 50 per cent, but with the difference that nationally the sector showed even stronger growth in wholesaling (+3940 employee or +21.5%) and almost no fall in manufacturing (-110 employee or -0.5%).

Table 3(a) shows at the 3-digit level that the main drivers of the Auckland sector's employment ("EC") growth from 2000 to 2012 were Other Machinery and Equipment Wholesaling (+13%; +740 employees) (mostly from sheer size) and Computer and Electronic Equipment Manufacturing (+53%; +550 employees) (highest rate of growth). However there were major falls in Domestic Appliance Manufacturing (-54%; -1080 employees) and Other Machinery and Equipment Manufacturing (-15%; -500).

**Table 3(a): Niche manufacturing sector employment growth 2000-2012 by sub-sector**

Code	Ind_3 Description	EC_2000	EC_2012	EC Growth	EC pa	EC Growth #
C241	Professional and Scientific Equipment Manufacturing	310	270	-12.9%	-1.2%	-40
C242	Computer and Electronic Equipment Manufacturing	1040	1590	52.9%	3.9%	550
C243	Electrical Equipment Manufacturing	1150	970	-15.7%	-1.5%	-180
C244	Domestic Appliance Manufacturing	1990	910	-54.3%	-6.9%	-1080
C245	Pump, Compressor, Heating and Ventilation Equipment Manufacturing	470	540	14.9%	1.3%	70
C246	Specialised Machinery and Equipment Manufacturing	1460	1650	13.0%	1.1%	190
C249	Other Machinery and Equipment Manufacturing	3240	2740	-15.4%	-1.5%	-500
<b>C</b>	<b>Sub-total Machinery and Equipment Manufacturing</b>	<b>9660</b>	<b>8670</b>	<b>-10.2%</b>	<b>-1.0%</b>	<b>-990</b>
F341	Specialised Industrial Machinery and Equipment Wholesaling	3420	3870	13.2%	1.1%	450
F349	Other Machinery and Equipment Wholesaling	5750	6490	12.9%	1.1%	740
<b>F</b>	<b>Sub-total Machinery and Equipment Wholesaling</b>	<b>9170</b>	<b>10360</b>	<b>13.0%</b>	<b>1.1%</b>	<b>1190</b>
	<b>TOTAL Niche manufacturing</b>	<b>18830</b>	<b>19030</b>	<b>1.1%</b>	<b>0.1%</b>	<b>200</b>

Data source: Statistics New Zealand *Business Demographics 2000-2012*

Table A3 in Appendix 3 shows at a more detailed level (4-digit) that the main drivers of the Auckland sector's employment ("EC") growth from 2000 to 2012 were: Other Specialised Industrial Machinery and Equipment Manufacturing<sup>35</sup> (+324%; +680 employees); Other

<sup>35</sup> C2469 e.g. for packing, wrapping, washing, food processing

Machinery and Equipment Wholesaling (+130%; +600 employees); and Other Electronic Equipment Manufacturing<sup>36</sup> (+53%; +550 employees).

Major falls occurred in Whiteware Appliance Manufacturing (-980 employees; -61%) and Other Machinery and Equipment Manufacturing n.e.c.<sup>37</sup> (-430 employees; -15%).

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<sup>36</sup> C2429: excluding ICT, professional and scientific

<sup>37</sup> C2499 e.g. weighing machines, purifiers, engines, fans and turbines



## Business units

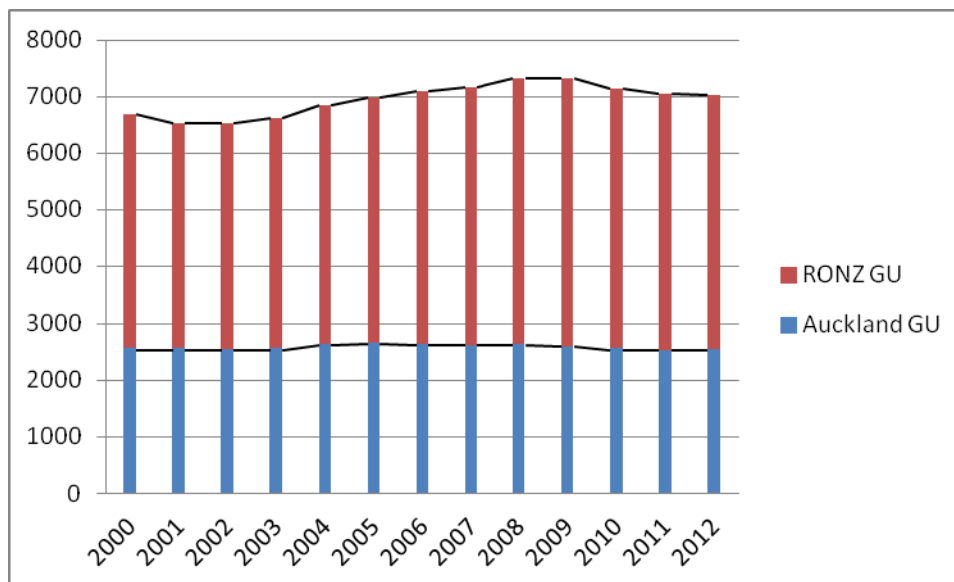
Business units for the Auckland niche manufacturing sector:

- fell as a proportion of the total Auckland economy's businesses 2000-2012
- are more than half (59%) wholesalers, as opposed to manufacturers (41%)
- half of the wholesalers are Other Electrical and Electronic Goods<sup>38</sup>
- are larger than businesses in Auckland's other sectors, but still mostly small.

## Business trends

There were 2547 businesses<sup>39</sup> within Auckland's niche manufacturing sector in 2012. This was a minimal increase of 10 businesses (0.4% increase) from 2011. However, over the period 2000-2012, the total number of businesses in Auckland's niche manufacturing sector decreased by 30 (1.2% decrease). This compares to an increase in the number of businesses in New Zealand's niche manufacturing sector of 354 (5.3% increase) over the same period. Auckland's niche manufacturing sector accounts for 1.6 per cent of all businesses within Auckland, down from 2.1 per cent in 2000<sup>40</sup>. (See Figure 5).

**Figure 5: Niche manufacturing business count (GU) within Auckland and Rest of New Zealand (RONZ)**



Data source: Statistics New Zealand *Business Demographics 2000-2012*

<sup>38</sup> E.g. appliances, batteries, motors, refrigeration, switchgear, photographic, radios, televisions.

<sup>39</sup> The term "business" is here used to denote a geographic business unit (GU), as used in Statistics New Zealand's Business Demography data.

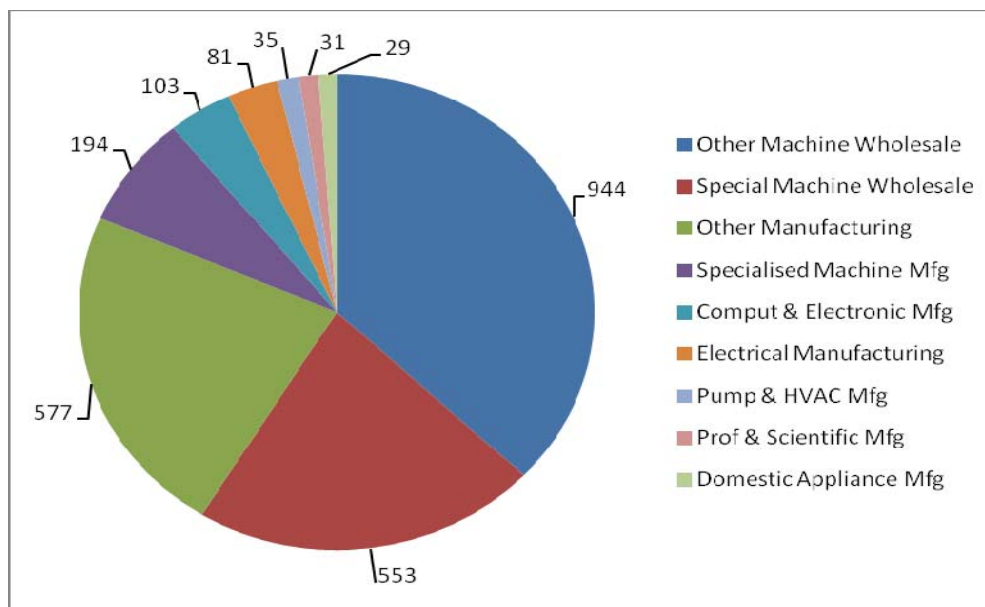
<sup>40</sup> Data Source: Statistics New Zealand, 2012. *Business Demographics 2000-2012*

## Niche manufacturing businesses by sub-sector

Figure 6 shows at the 3-digit level that over half (59%) of Auckland's niche manufacturing businesses are engaged in wholesaling, consisting of Other Machinery [and Equipment] Wholesaling (944 businesses or 37% of the total; mostly Other Electrical and Electronic Goods<sup>41</sup>) and Specialised [Industrial] Machinery [and Equipment] Wholesaling (553 businesses or 22%).

Manufacturers of various kinds make up the remaining 41 per cent of businesses in the niche manufacturing sector, half of them Other [Machinery and Equipment] Manufacturing (577 businesses, or 23% of the total).<sup>42</sup>

**Figure 6: Auckland niche manufacturing business units by sub-sector 2012**



Data source: Statistics New Zealand *Business Demographics 2000-2012*

## Business size

Like most Auckland and New Zealand businesses, Auckland's niche manufacturing businesses are mostly small or even "micro"<sup>43</sup>, despite being nearly twice as large in terms of average number of employees per business: 7.5 for niche manufacturing, versus 4.0 for the rest of the Auckland economy. The main exception is Whiteware Appliance Manufacturing, with an Auckland-wide average of 126 employees per business, which is much higher than the sector average. The other niche manufacturing sub-sectors<sup>44</sup> all have much smaller businesses on average: the next highest is Heating, Cooling and Ventilation Equipment Manufacturing, averaging 21 employees per G.U., but most are below ten. Similarly, the vast majority (85%) of niche manufacturing

<sup>41</sup> F3494, which is 29% of the entire sector – see Table 1(b) for descriptions

<sup>42</sup> Statistics New Zealand, 2012. *Business Demographics*; n.e.c. is "not elsewhere classified"

<sup>43</sup> According to the OECD, "Small firms are generally those with fewer than 50 employees, while micro-enterprises have at most 10, or in some cases 5, workers." Source: OECD, 2005. *OECD SME and Entrepreneurship Outlook: 2005*, OECD Paris, at <http://stats.oecd.org/glossary/detail.asp?ID=3123>

<sup>44</sup> At the ANZSIC 4 or 5-digit level

businesses are in sub-sectors whose businesses are smaller (on average) than the average business size for the overall niche manufacturing sector (7.5 EC/GU).

## Individual businesses

When we move down to the census area unit and mesh block level, we start to find out more about individual businesses. Only 13 niche manufacturing business units have 50 or more employees and so could be considered “medium” or “large” by OECD standards; between them, these larger businesses employ 2590 people, which is 14 per cent of the sector. One is a wholesaler, in the sub-sector Other Electrical and Electronic Goods Wholesaling, but the rest are all manufacturers of various types – mostly Other Electronic Equipment Manufacturing.

The vast majority (77%) of the 13 larger businesses’ employment is accounted for by five “large” businesses (over 250 employees, the OECD definition of “large”)<sup>45</sup>, although even these are not particularly large by international standards: even the largest has less than 600 employees (at its main Auckland location), and the others are all below 500 employees and therefore only “medium” by the United States definition<sup>46</sup>. Nevertheless, these five large businesses together account for over a tenth of the entire niche manufacturing sector’s employment, and a fifth of the manufacturing component’s. They are presumed to be<sup>47</sup>:

- Fisher & Paykel Appliances
- Rakon
- Fuji Xerox
- Temperzone
- Tru-Test.

In addition, 15 firms in the niche manufacturing sector in Auckland are in the TIN 100 list of leading New Zealand technology firms, namely:

- Fisher & Paykel Appliances (also in “large” list)
- Tru-Test (also in “large” list)
- Compac Sorting Equipment
- Autogrow Systems
- JMP Engineering
- Ibex Industries
- Temperzone (also in “large” list)
- Howick Ltd
- RPM International Tool and Die
- Glidepath
- Framacad
- Actronic
- Buckley Systems
- Flotech Group
- AtraxGroup

<sup>45</sup> “The most frequent upper limit designating an SME [small or medium-sized enterprise] is 250 employees” Source: OECD, 2005. *OECD SME and Entrepreneurship Outlook: 2005*, OECD Paris, at <http://stats.oecd.org/glossary/detail.asp?ID=3123>

<sup>46</sup> “the United States considers SMEs to include firms with fewer than 500 employees” Source: OECD 2005. *OECD SME and Entrepreneurship Outlook: 2005*, OECD Paris, at <http://stats.oecd.org/glossary/detail.asp?ID=3123>

<sup>47</sup> cross-referencing Statistics New Zealand, 2012. *Business Demographics with Google Maps*

## Export activity

Niche manufacturing exports through Auckland and/or by Auckland firms:

- are very high relative to the sector's GDP
- have a high proportion by air freight
- were very hard hit by the GFC: fell more than other sectors, back to 2000 levels
- have widely varying growth rates between sub-sectors (changing emphasis).

Current export statistics, and long run time series, of niche manufactures produced by Auckland firms are not available. We can however look at several proxies that provide various combinations of some of these specifications. Key results are:

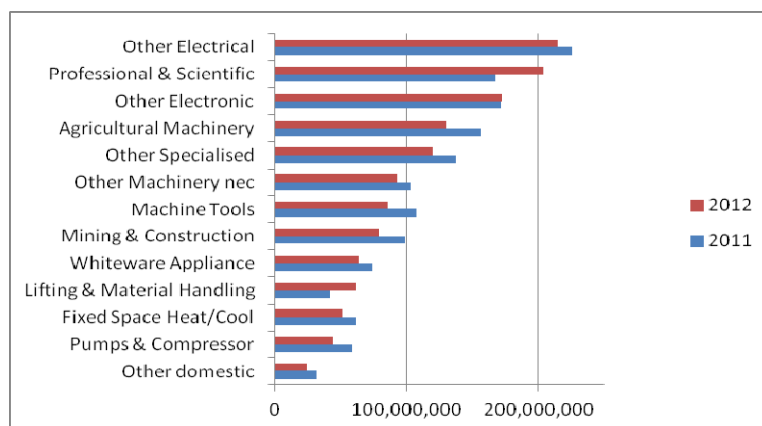
Auckland niche manufacture exports totalled \$1,346 million in 2012. Four categories provided half the sector's exports: Other Electrical Equipment (16%), Other Professional and Scientific Equipment (15%), Other Electronic Equipment (13%) and Agricultural Machinery (10%). Over half of niche manufacture exports through Auckland in 2012 were by air freight, especially Professional and Scientific Equipment and Other Electronic Equipment.

### Exports through Auckland ports 2012

Niche manufactures exported through Auckland's air and sea ports, including both goods produced in Auckland and other parts of New Zealand (but excluding goods produced in Auckland but exported via other ports such as Tauranga), totalled \$1,346 million in 2012, a 6.4 per cent fall from 2011.

The breakdown by ANZSIC sub-sector for 2012 and 2011 is shown in Figure 7(a.) The largest contribution in 2012 was from Other Electrical Equipment (\$215 million), which was 16 per cent of the sector's exports. Next came Other Professional and Scientific Equipment (15%), Other Electronic Equipment (13%) and Agricultural Machinery (10%).<sup>48</sup>

**Figure 7(a): Niche manufacture exports through Auckland (NZ\$fob) 2011 and 2012**

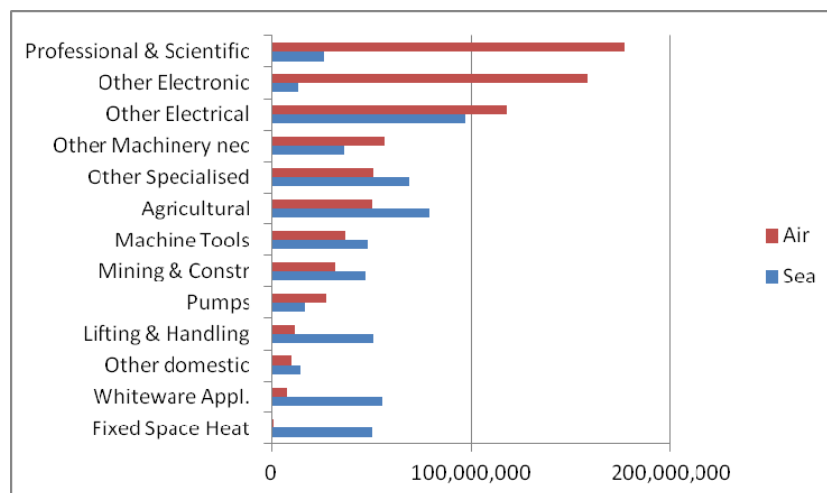


Data source: Statistics New Zealand custom report for Auckland Council

<sup>48</sup> Based on Statistics New Zealand export data by commodity categories at the six digit level using the New Zealand Harmonised System Classification (NZHSC), 2012 version. The concordance of NZHSC to ANZSIC is not perfect, so commodities included as "niche manufacturing" at the six digit level may include commodities at the 10 digit level that are not part of the sector.

Over half of niche manufacture exports through Auckland in 2012 were by air freight (\$740 million), with \$606 million by sea. The breakdown by ANZSIC sub-sector by air and by sea for 2012 is shown in Figure 7(b). The greatest air freight users were Professional and Scientific Equipment (\$178 million) and Other Electronic Equipment (\$172 million), which also had the smallest fraction of their exports by sea (13% and 8% respectively). Other Electrical Equipment (\$118 million) was the third biggest air freighter, but also the biggest sea freighter (\$97 million). The lowest users of air freight also had the highest proportions by sea: Fixed Space Heating, Cooling and Ventilation (98%) and Whiteware Appliance Manufacturing (88%).

**Figure 7(b): Niche manufacture exports through Auckland 2012 (NZ\$fob) by air and sea**



Data source: Statistics New Zealand custom report for Auckland Council, 2013

## Exports by Auckland firms 2001 to 2008

Statistics New Zealand revised their trade classification system in 2012; detailed compatible revised data is not available for Auckland for earlier years (apart from 2011) for inclusion in a time series. However, a recent study for Auckland Tourism, Events and Economic Development Limited (ATEED) by Martin Jenkins using Market Economics data<sup>49</sup> included estimated exports by Auckland firms in 2008, and compound annual growth rates (CAGR) 2001 to 2008, for sub-sectors of the “machinery and equipment” sector as shown in Table 4. These sub-sectors are based on ANZSIC and correspond to the 4-digit sub-sectors included in the definition of niche manufacturing used in this report<sup>50</sup>.

The Auckland sector as a whole had exports in 2008 of \$1237 million, and a modest annual growth rate of 4.0 per cent since 2001. The largest export sub-sectors in 2008 were already Other Electrical (\$179 million) and Other Professional and Scientific (\$113 million), but at that time they were closely followed by Whiteware Appliance (\$105 million) and Pumps and Compressors (\$79 million). These and other “top performing” sub-sectors combined had a modest compound annual growth rate (CAGR) of exports of 3.6 per cent, but varying widely from Other Electronic Equipment (minus 12.9% pa) to Pumps and Compressors (39.7% pa). Other Professional and Scientific Equipment also had strong export growth (29.4% pa),

<sup>49</sup> Martin Jenkins, 2012. *Sector Engagement Framework Draft Report for Auckland Tourism, Events and Economic Development Limited*.

<sup>50</sup> Although there will not be an exact match to the 2012 exports data, due to the Statistics New Zealand reclassification of NZHSC in 2012.

despite employment falling; presumably, there was a shift from local to international markets, but there could also be statistical classification issues.

The four “lower performing” sub-sectors, whose 2008 exports were not individually listed, were also quite large exporters (totalling \$526 million, an average of \$131 million per sub-sector), and had a slightly higher export annual growth rate (4.4% pa) to 2008; by 2012, however, their share of the sector’s exports had fallen substantially as previously indicated in Figure 7(a)<sup>51</sup>.

**Table 4: Auckland firms’ machinery and equipment export growth 2001 - 2008**

	<b>Exports 2008 \$million</b>	<b>CAGR 2001-2008</b>
Other Electrical	179	12.71%
Other Professional and Scientific Equipment	113	29.43%
Whiteware Appliance	105	-4.39%
Pumps and Compressors	79	39.66%
Other Electronic Equipment	71	-12.92%
Other Specialised Machinery and Equipment	58	35.98%
Other Domestic Appliance	54	-4.39%
Lifting and Material Handling Equipment	28	25.44%
Machine Tool and Parts	24	-4.53%
<b>Sub-total high performers</b>	<b>711</b>	<b>3.63%</b>
Fixed Space Heating, Cooling and Ventilation Equipment	n/a	n/a
Agricultural Machinery and Equipment	n/a	n/a
Manufacturing		
Mining and Construction Machinery	n/a	n/a
Manufacturing		
Other Machinery and Equipment Manufacturing n.e.c.	n/a	n/a
<b>Sub-total low performers</b>	<b>526</b>	<b>4.44%</b>
<b>Total niche manufacturing sector</b>	<b>1,237</b>	<b>3.97%</b>

Data source: Martin Jenkins citing Market Economics, 2012

New Zealand exports 2000 to 2012 and 1990 to 2012

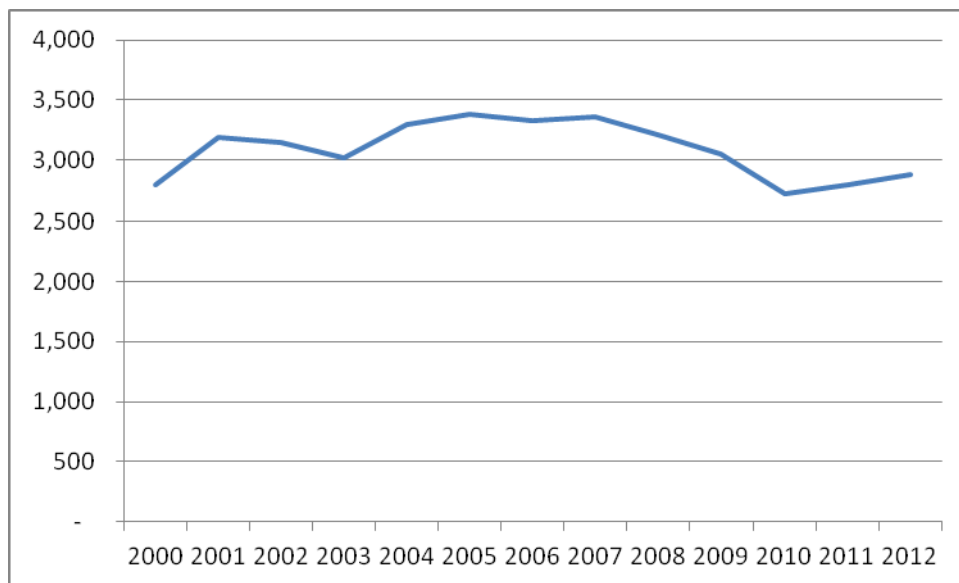
More recent time series export data is not available specifically for the Auckland niche manufacturing sector, but we can instead look at proxies. One available proxy is exports for the whole of New Zealand in the commodity category “machinery and transport equipment”<sup>52</sup>. Figure 8(a) shows that from 2000 to 2005, there was a moderate overall uptrend in the value of exports for the category, but then with the GFC there was a major pullback from 2007 to 2010 which negated those years of growth.

<sup>51</sup> But subject again to the caveat that 2012 export categories are not an exact match to earlier years

<sup>52</sup> Statistics New Zealand, 2013. OTV002AA Available: *Infoshare - Exports and Imports - Overseas Trade Indexes - Volumes and Values – OTV - Export volume indexes and values - analytical*



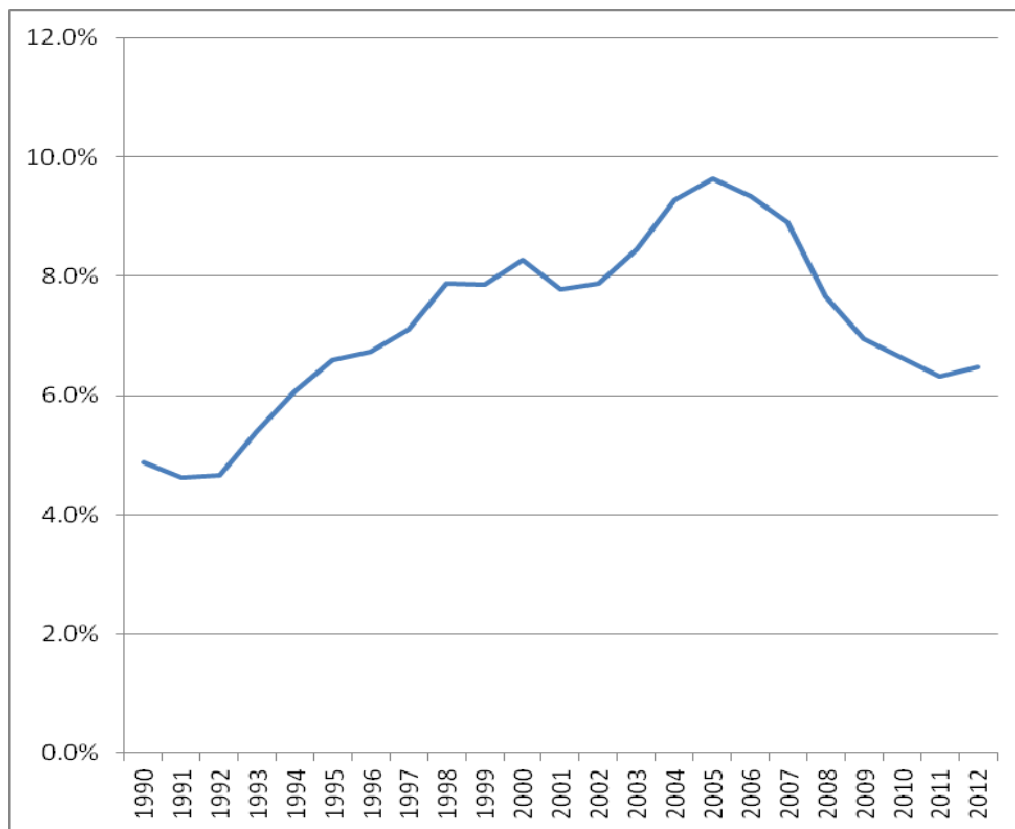
**Figure 8(a): New Zealand exports of machinery and transport equipment (2012NZ\$million, fob) 2000-2012**



Data source: Statistics New Zealand 2013

Exports by the sector are affected by national and global influences that affect all export industries, such as the exchange rate and international recessions. To correct for this, Figure 8(b) shows (again at the New Zealand level) the machinery and transport equipment category's share of total exports. The category's share of total exports showed strong growth from 2002 to 2005, then fell by even more from 2006 to 2011. However, by including a longer term view, the period 1990 – 2012, a slightly different picture emerges. The category's share of exports had been growing strongly for most of the period from 1990 to 2000, then was flat from 1998 to 2002. The category's share doubled in fifteen years from 1990 (4.9%) to the peak in 2005 (9.6%), after which it has fallen by a third to 6.5 per cent in 2012 – still well above its 1990 level.

**Figure 8(b): Machinery and transport equipment share of total exports, New Zealand, 1990-2012**

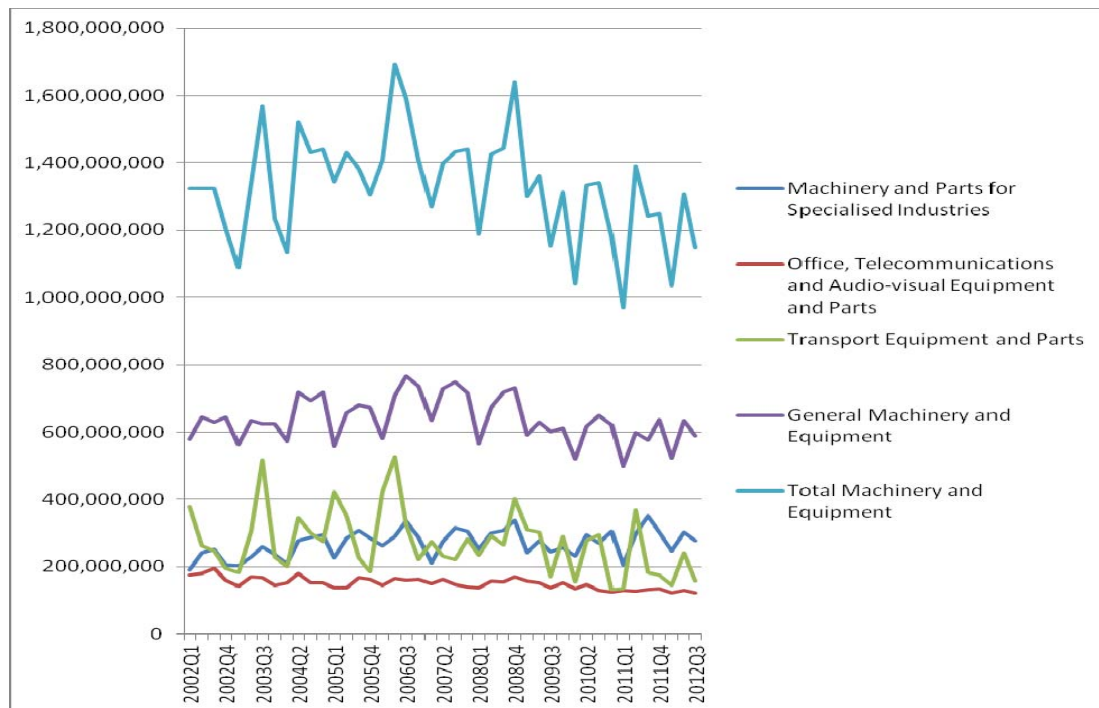


Data source: Statistics New Zealand 2013

An alternative proxy is to combine exports from the following 4-digit categories: Machinery and Parts for Specialised Industries; Office, Telecommunications and Audio-visual Equipment and Parts; Transport Equipment and Parts; and General Machinery and Equipment<sup>53</sup>. Figure 8(c) shows that the total value of New Zealand's machinery and equipment exports in constant 2012 dollars increased from 2002 to 2006, fell (by even more than it had risen) from 2006 to 2009 and has been flat since then. The Transport component has fallen by over 30 per cent from 2002 to 2011/2012. Similarly, Office, Telecommunications and Audio-visual Equipment and Parts exports fell by nearly 30 per cent over the same period, but from a lower starting point so the drop was less in dollar terms. General Machinery and Equipment exports have been comparatively flat over the period (a small increase followed by a small decrease). Machinery and Parts for Specialised Industries had an increase in exports of over 20 per cent over the period, thanks to strong growth to 2006 and a strong recovery from 2010 onwards. All four subsectors are highly volatile from one quarter to the next and with a strong seasonal element, so the sector as a whole also shows strong volatility.

<sup>53</sup> Statistics New Zealand, 2013. EXP084AA Available: *Infoshare - Exports - Summary Data – EXP – EXP - Level of Processing (4 digit)*

**Figure 8(c): Machinery and equipment exports from New Zealand (fob NZ\$2012) quarterly 2002-2012**



Data source: Statistics New Zealand 2013

## Industry location quotients

Simple industry location quotients for Auckland's niche manufacturing sub-sectors:

- are mostly above 1.0, meaning the sector is over-represented (strong) in Auckland
- is very high for Domestic Appliance Manufacturing – nearly all is now in Auckland
- have fallen slightly since 2000: Auckland lagged the rest of the country slightly.

The comparative strength or weakness of a sector in a region, relative to the nation, can be further analysed using location quotients. The Simple Location Quotient (SLQ) is a statistical measurement of the relative concentration of a given industry in a given place. It is calculated by dividing the proportion of the area's economic activity in an industry, by the proportion of the nation's economic activity in that same industry. Put another way, it equals a region's share of national activity in an industry, divided by the total regional economy's share of the total national economy. If the region was a scaled down version of the nation, then all of its SLQs would equal 1. Instead, in most regions in most countries, some sectors are relatively larger than others and have a higher SLQ, and others are relatively smaller and have a lower SLQ (but the weighted average for all sectors in a given region is always 1). If the SLQ index for a sector is greater than 1, then the sector is deemed to be strong there (i.e. the industry is of high importance to the regional economy, compared to that sector's importance to the national economy). The SLQ for the niche manufacturing sector in Auckland is 1.28, meaning the sector as a whole is over-represented in Auckland by 28 per cent relative to its share of the national economy.<sup>54</sup>

### Location quotients by sub-sector

Table 5 shows SLQs for the various niche manufacturing sub-sectors. The wholesaling subsectors are higher on average (1.40) than the manufacturing subsectors (1.17). The Domestic Appliance Manufacturing sub-sector has the highest SLQ (2.67), which reflects the fact that Auckland is home to 90 per cent of the subsector<sup>55</sup>. The only sub-sector with an SLQ below 1 is Other Machinery and Equipment Manufacturing (0.85).

<sup>54</sup> Calculated from employment data in Statistics New Zealand, 2012. *Business Demographics*, which is the standard proxy for "economic activity" for SLQ calculations.

<sup>55</sup> If it were 100% then the SLQ would be 3.00, which is the maximum possible SLQ given Auckland's overall share of all national employment (33.37%).

**Table 5: Simple location quotients for Auckland niche manufacturing 2012**

<b>ANZSIC06</b>	<b>Sub-sector</b>	<b>SLQ</b>
C241	Professional and Scientific Equipment Manufacturing	1.23
C242	Computer and Electronic Equipment Manufacturing	1.72
C243	Electrical Equipment Manufacturing	1.36
C244	Domestic Appliance Manufacturing	2.67
C245	Pump, Compressor, Heating and Ventilation Equipment Manufacturing	1.27
C246	Specialised Machinery and Equipment Manufacturing	1.07
C249	Other Machinery and Equipment Manufacturing	0.85
F341	Specialised Industrial Machinery and Equipment Wholesaling	1.09
F349	Other Machinery and Equipment Wholesaling	1.68
<b>C</b>	<b>Sub-total Machinery and Equipment Manufacturing (average)</b>	<b>1.17</b>
<b>F</b>	<b>Sub-total Machinery and Equipment Wholesaling (average)</b>	<b>1.40</b>
<b>C+F</b>	<b>Total Niche Manufacturing</b>	<b>1.28</b>

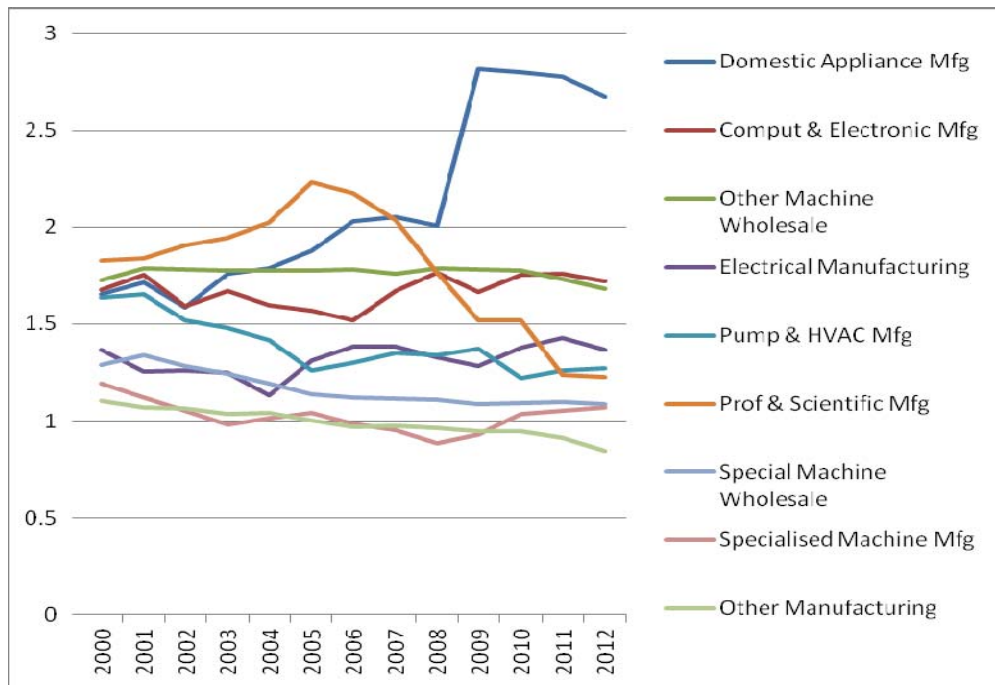
Source: Auckland Council from Statistics New Zealand *Business Demographics 2012*

The SLQ for Auckland's niche manufacturing has fallen slightly (-10%) in the last 12 years, from 1.42 in 2000 to 1.28 in 2012. This indicates that niche manufacturing's share of the economy has fallen slightly more quickly in Auckland than in New Zealand as a whole.

Figure 9 below shows that relative growth has been uneven both over time and across sub-sectors: domestic appliance manufacturing employment fell more slowly in Auckland than the rest of New Zealand (notably closure of the Fisher & Paykell plant in Mosgiel), resulting in a rising SLQ; all other niche manufacturing sub-sector SLQs fell or remained fairly constant.

The largest SLQ fall was Professional and Scientific Equipment Manufacturing (-33%), which was growing strongly until 2005, but has been on a sharp downtrend since 2006. Auckland's boom was slightly better, but the bust much worse, than the rest of New Zealand. Over the 2000-2012 period as a whole, the net result for the sub-sector was only a small net contraction in Auckland, but a moderately high net expansion for the rest of New Zealand.

**Figure 9: Auckland niche manufacturing Simple Location Quotients by sub-sector 2000-2012**



Source: Statistics New Zealand *Business Demographics 2000-2012*

## Niche manufacturing clusters in Auckland

The Auckland niche manufacturing sector has major concentrations as follows:

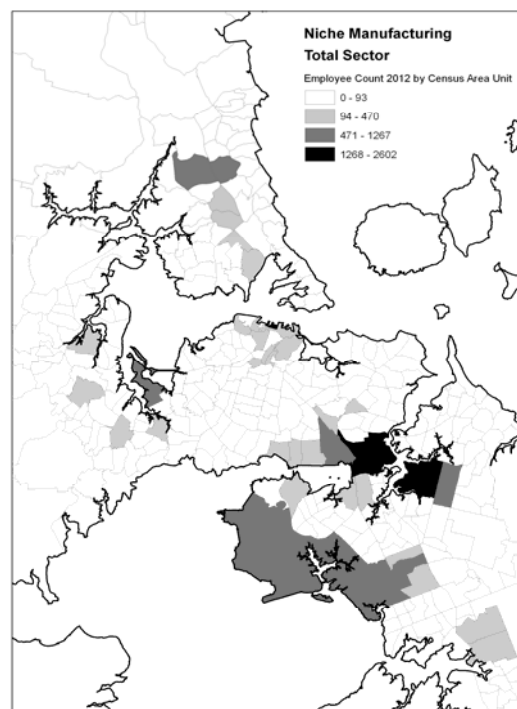
- sector clusters near Mt Wellington/Penrose, East Tamaki, Albany and the airport
- wholesalers also cluster at CBD and fringe
- manufacturers also cluster at Rosebank
- sector much denser than others at Rosebank, East Tamaki and Mt Wellington.

The following section examines the spatial distribution of niche manufacturing in Auckland. Using employment as a proxy, it identifies concentrations of niche manufacturing at the sector and sub-sector levels and for the manufacturing and wholesaling components.

### Niche manufacturing sector employment concentrations

Three quarters of Auckland's niche manufacturing employment is located in and near Mount Wellington (Mount Wellington South/Penrose), East Tamaki (Highbrook/Greenmount), the airport (Mangere South/Manukau Central) and southern Albany (North Harbour East/Windsor Park), and to a lesser extent the CBD and fringes and also Rosebank<sup>56</sup>. (See Figure 10).

**Figure 10: Distribution of niche manufacturing total employment 2012**



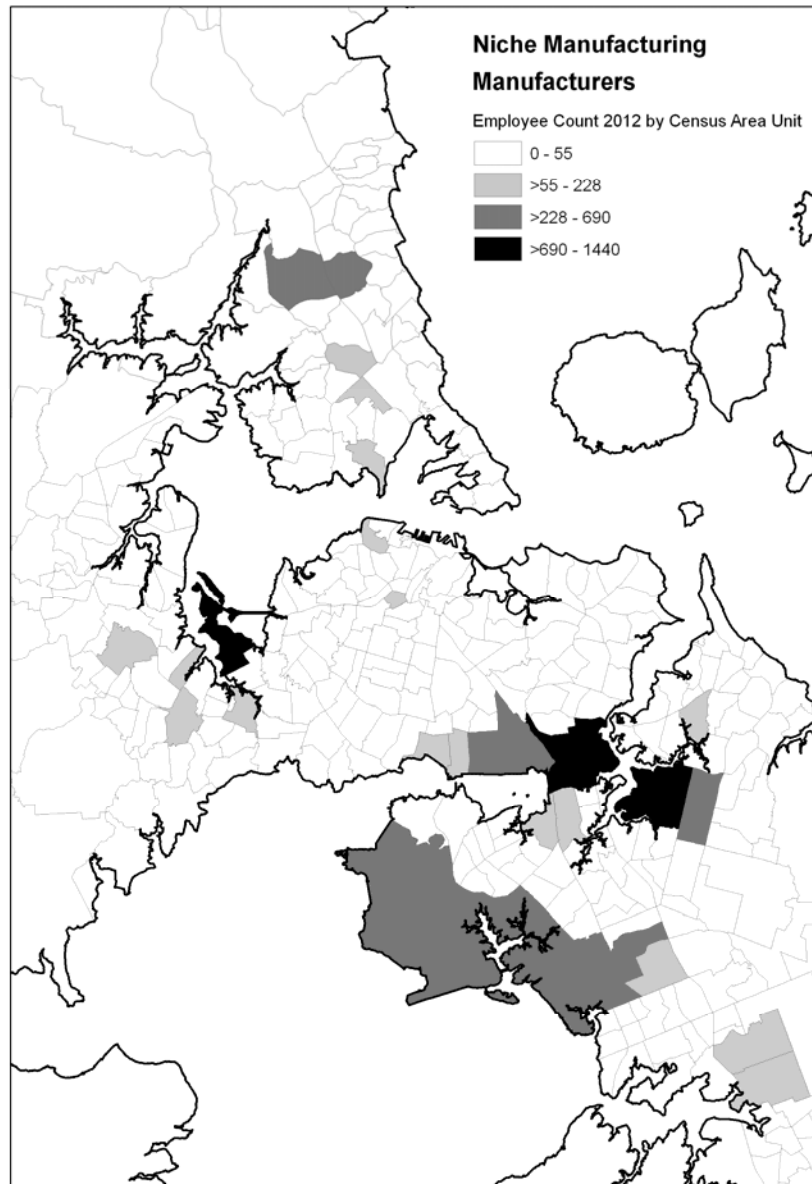
Data source: Statistics New Zealand *Business Demographics 2012*

<sup>56</sup> Statistics New Zealand, 2012. *Business Demographics 2012*

## Niche manufacturing sector manufacturing employment concentrations

The manufacturing component of the niche manufacturing sector has major concentrations in and around Mt Wellington/Penrose and East Tamaki, as well as Rosebank, the airport (Mangere/Manukau Central) and southern Albany. (See Figure 11).

**Figure 11: Distribution of the sector's manufacturers by employment 2012**



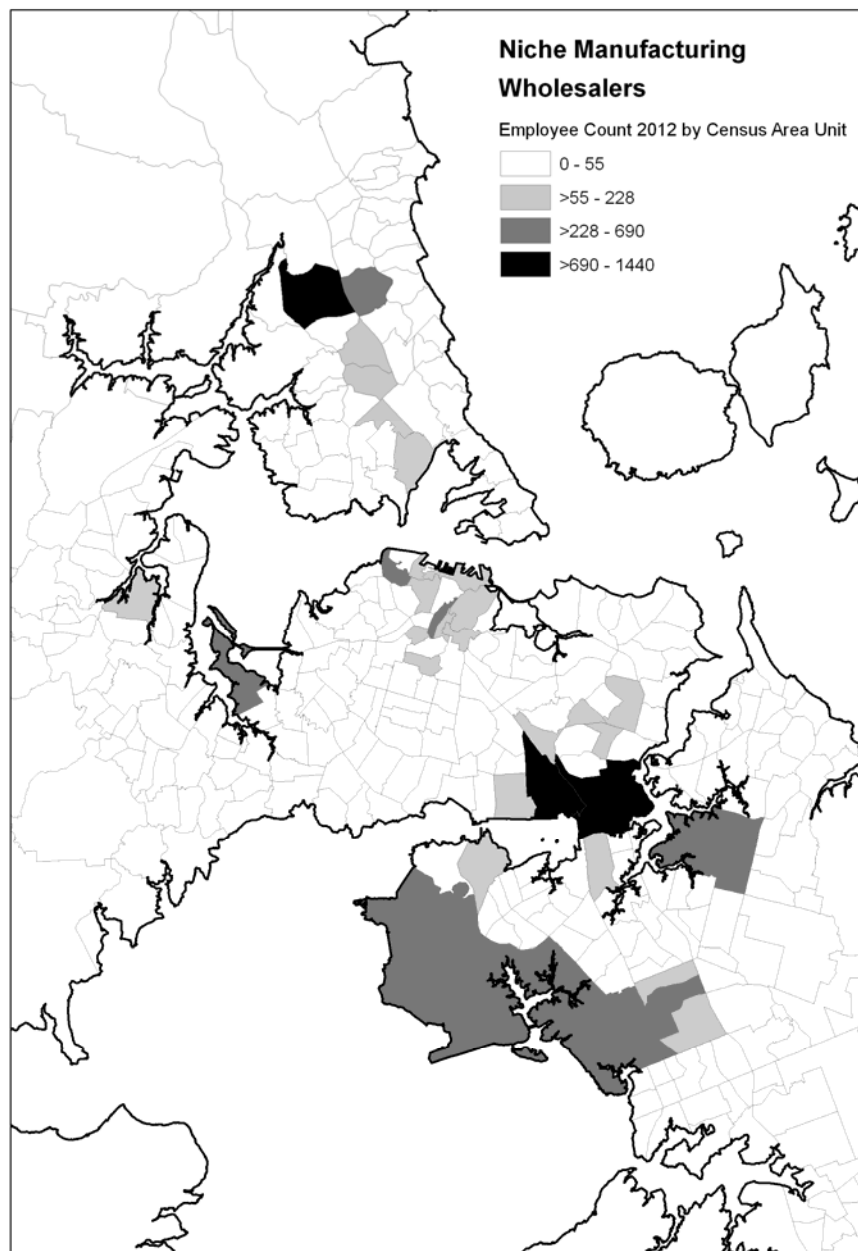
Data source: Statistics New Zealand *Business Demographics 2012*



## Niche manufacturing sector wholesaling employment concentrations

The wholesaling component of the niche manufacturing sector also has major concentrations in Mt Wellington/Penrose and East Tamaki, as well as the airport (Mangere/Manukau Central); but unlike the manufacturing component, the wholesaling component also has major concentrations in southern Albany, and also CBD and fringe, and is less strong in and around Rosebank. (See Figure 12)

**Figure 12: Distribution of the sector's wholesalers by employment 2012**



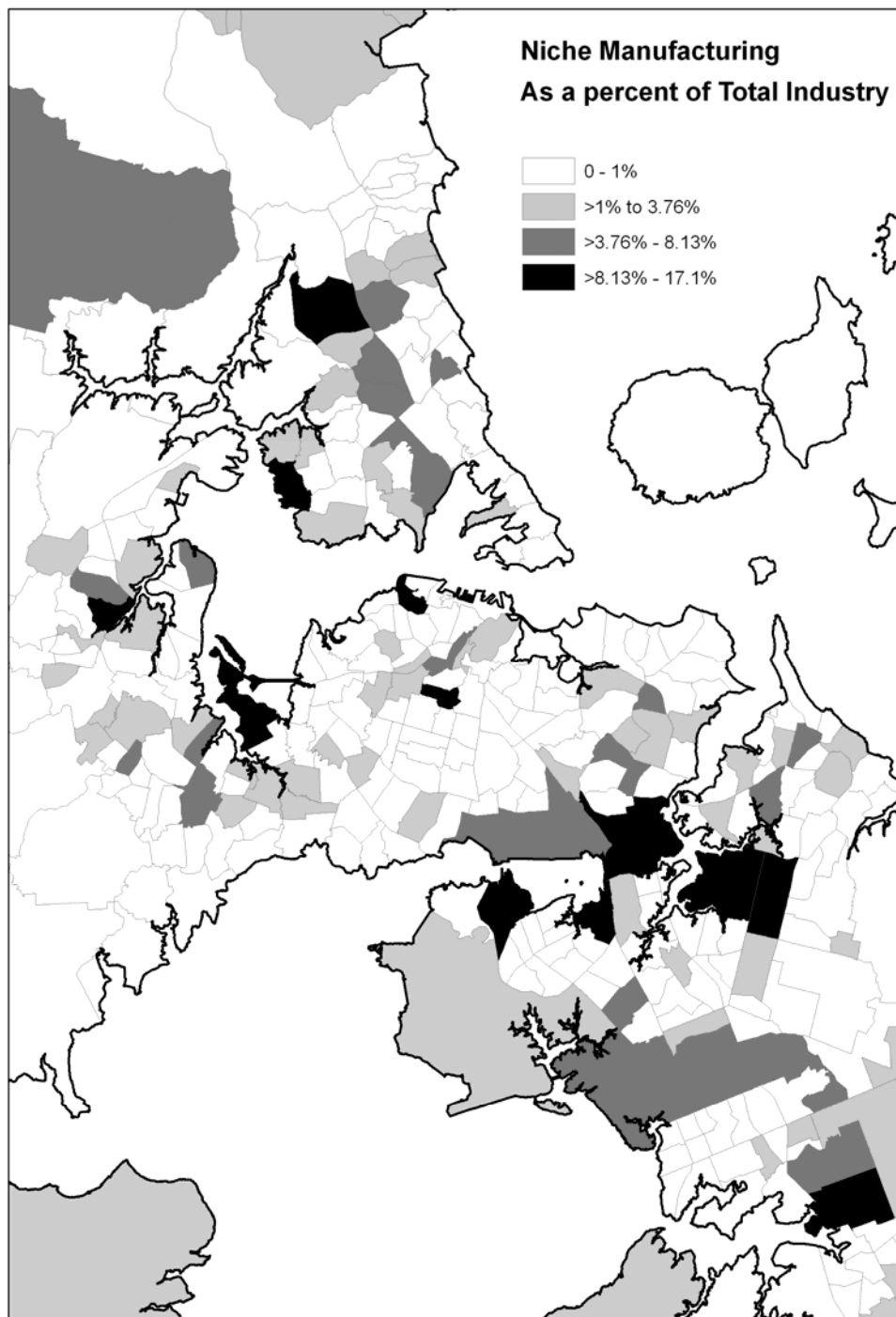
Data source: Statistics New Zealand *Business Demographics 2012*

## Niche manufacturing sector relative employment concentrations

Some of the sector's concentrations of employment are in areas that have high levels of total employment overall for all sectors, while other locations are specifically more attractive to the sector. In an analogous way to sector location quotients (SLQs), we can look at the sector's share of employment in a location and compare it to the sector's share of the city's employment (3.0%). An employment share substantially above 3.0 per cent indicates that the location is particularly favourable to niche manufacturing rather than other industries. Figure 13 shows how the niche manufacturing sector's share of total employment in each Census Area Unit varies across Auckland, with the main concentrations as follows:

- In parts of the CBD and fringes (notably St Marys (17%), followed by Grafton West (7%) and Eden Terrace (7%)), the niche manufacturing sector's share of total employment in those mesh blocks is well above the average for niche manufacturing across Auckland as a whole (3.0%). In most of the other mesh blocks in the CBD and fringes area, however, the sector has only average or below average share of total employment in that mesh block.
- In Rosebank (13%) the sector is large both in absolute terms and relative to the (substantial) total employment in the area.
- In East Tamaki (11%) and in Mount Wellington (11%)/Ellerslie (7%)/Penrose (7%), the high density of niche manufacturing is even higher than the high employment density of other sectors there.
- In southern Albany (North Harbour 9%, Windsor Park 6%), niche manufacturing employment is both dense in absolute terms, and also a moderately high proportion of total employment there.
- Near the airport, niche manufacturing's high density is mostly a reflection of the high overall employment intensity in that area, so the sector is only slightly above average as a proportion of total employment in the area (Manukau Central 5%, Mangere South 4%), apart from small pockets at Mangere Bridge (9%) and Mangere Station (10%) where other employment is less dense.
- In Beachhaven (12%), Takanini (9%), and Waimumu (9%), the sector is small in absolute terms but forms a high proportion of the (low) overall employment in the area.

Figure 13: Niche manufacturing share of total employment 2010



Data

source: Statistics New Zealand *Business Demographics 2012*

## Spatial distribution of sub-sectors

The different niche manufacturing sub-sectors have different spatial distributions of employment, with the main ones distributed as follows<sup>57</sup>:

- Other Machinery and Equipment Wholesaling (mostly electrical and electronic) has major employment concentrations in Mt Wellington, North Harbour and CBD and fringes, plus to a lesser extent East Tamaki and Rosebank.
- Specialised Industrial Machinery and Equipment Wholesaling is heavily focussed in and around Mt Wellington/Penrose, the airport and East Tamaki.
- Other Machinery and Equipment Manufacturing has its largest concentration in Mt Wellington/Penrose/Te Papapa, plus to a lesser extent East Tamaki and around the airport (Mangere/Manukau Central).
- Specialised Machinery and Equipment Manufacturing is smaller in absolute terms, with minor concentrations in East Tamaki, Onehunga, Rosebank and Takanini.
- Other Electronic Equipment Manufacturing is also smaller in absolute terms, but has a major concentration in Mt Wellington South, plus minor groupings in Albany and in CBD and fringe (Eden Terrace and St Mary's).

## Sub-sectors by location

The various cluster locations have different concentration levels of different niche manufacturing sub-sectors (by employment), with the main ones distributed as follows<sup>58</sup>.

- Mount Wellington (Mount Wellington South//Penrose): major concentrations of both the manufacturing component (1481 ECs) and (even more so) wholesaling sub-sectors (2325 ECs); almost the entire sector has a relatively strong presence, with the exception of Domestic Appliance Manufacturing, Specialised Machinery and Equipment Manufacturing and Other Electronic Equipment Manufacturing; the main sub-sectors are Other Electrical and Electronic Goods Wholesaling (1210), Specialised Industrial Machinery and Equipment Wholesaling (910), Other Electronic Equipment Manufacturing (746), and Other Machinery and Equipment Manufacturing (490).
- East Tamaki (Highbrook/Greenmount): major concentrations of both the manufacturing component (1389) and the wholesaling component (1265); the main sub-sectors are Domestic Appliance Manufacturing (640), Specialised Industrial Machinery and Equipment Wholesaling (580), Other Electrical and Electronic Goods Wholesaling (560) and Other Machinery and Equipment Manufacturing (400).
- southern Albany (North Harbour East/Windsor Park): major concentration of the wholesaling component (1205) and moderate concentration of the niche manufacturing component (664); the sector is dominated here by Other Machinery and Equipment Wholesaling (905), most of it electrical and electronic (690)).
- the airport (Mangere South/Manukau Central): moderate concentrations of both the manufacturing component (772) and the wholesaling component (814); the dominant sub-sector is Specialised Industrial Machinery and Equipment Wholesaling (720), but

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<sup>57</sup> Auckland Council, from Statistics New Zealand, 2012. *Business Demographics 2012*

<sup>58</sup> Auckland Council, from Statistics New Zealand, 2012. *Business Demographics 2012*

Pump, Compressor, Heating and Ventilation Equipment Manufacturing is also relatively significant (350).

- the CBD and fringes: moderate concentration of the wholesaling component (957) and some manufacturing component (336). The sector is dominated here by Other Machinery and Equipment Wholesaling (all of it electrical and electronic goods (945)), and the manufacturing is mostly Other Electronic Equipment Manufacturing (246).
- Rosebank: moderate concentration of the manufacturing component (725) and some wholesaling component (278). Largest sub-sector is Other Electrical Equipment Manufacturing (310), and the wholesaling is mostly Other Machinery and Equipment Wholesaling (virtually all of it electrical and electronic goods (220)).

## Auckland sector SWOT analysis<sup>59</sup>

### Strengths

New Zealand manufacturers in the niche manufacturing sector appear to be good at design, engineering and small scale and scope manufacturing. Many are also good at exporting, as indicated by high “revealed comparative advantage” (“RCA”) for many of their products<sup>60</sup>. Exports with high RCA include machinery related to: juicing; mineral sorting; agricultural harvesting, cleaning and grading; metal bending; dish washing and bottle washing and filling; weighing; feedstuffs; milking and dairy processing; textile cleaning.

Many machinery and equipment manufacturers are based around core R&D and design competencies, typically with prototype and some early stage manufacturing done in-house. Often design is integral to their innovation and their ability to manufacture and service their product.

Auckland has several education and research centres that cater to the niche manufacturing sector, notably:

- The University of Auckland: offers courses and research programmes that involve composite materials, polymers, and light metals.
- Massey University, at Albany: offers courses and degrees in engineering and industrial management, product development, industrial design and mechatronics, amongst others.
- Auckland University of Technology: contains the Engineering Research Institute (ERI), which is a multi-disciplinary research institute. The ERI consists of the Centre for Advanced Manufacturing Technology, Centre for Computer and Embedded Engineering and Unit for Advanced Engineering Research. The Centre for Advanced Manufacturing Technology performs research functions as well as development and implementation, and has an emphasis on industrial processes.

### Weaknesses

Firms in Auckland have experienced difficulties accessing appropriate supplies and technology. Firms who have needs for highly specialised components comment on the risk of not being able to source these components if their supplier goes out of business. Firms in this situation noted that they look for other suppliers or are increasingly manufacturing specialised components in-house to mitigate the potential risk to supply continuity.

Firms in Auckland also face shortages of skilled labour. The OECD review of New Zealand’s innovation system, as well as interviews with Auckland-based firms, suggest that while it may be easier to recruit engineers in Auckland compared to other regions (33 per cent of New Zealand’s scientists and engineers are located in the Auckland urban area), it appears that the overall supply of graduates is insufficient to meet demand. A recent

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<sup>59</sup> Source: Martin Jenkins, 2012. *Sector Engagement Framework Draft Report for Auckland Tourism, Events and Economic Development Limited*.

<sup>60</sup> RCA of a product is New Zealand exporters’ share of world exports of that product, compared to New Zealand exporters’ average share of world exports of all products.

Committee for Auckland study found that large firms reported a shortage of engineering project managers, particularly with personal skills beyond technical.

Niche manufacturing firms are generally not strong in export marketing, sales and distribution (as with other sectors). There are relatively small Auckland exports across most segments.

Auckland's niche manufacturing sector may suffer from fragmentation. It is not clear whether Auckland's firms and technologies should be seen as a coherent group that can form a foundation for a much more extensive area of competitive advantage, or whether there are simply lots of firms going their own way with limited overlaps in skills, technologies, markets and other capabilities.

## Opportunities

Demand is increasing for new markets worldwide, such as for sustainability and for agriculture. Sustainability elements are being increasingly incorporated into products and processes, and there is increasing market demand for lighter weight and ever more sustainable materials. Worldwide demand for agricultural technologies, including machinery, is strong and growing, as farmers are turning to technology and machinery to help increase the efficiency of farming and other primary-related activities.

Technologies are converging. Niche manufacturing, as with other areas of specialised manufacturing such as advanced materials, is increasingly integrated with ICT, digital content, health technologies and biotech. Developments in those industries in Auckland are likely to have flow-through impacts on the niche manufacturing sector.

Foreign direct investment (FDI) could help fund the sector's growth. The sector appears to be attractive for offshore investment, with niche manufacturing and advanced materials together receiving \$US 161m in FDI over 2003-2009.

Central government has programmes to support innovation, advanced technology and high value added manufacturing and services, two of which could be of particular benefit to Auckland niche manufacturing firms: High Value Manufacturing and Services Research Fund, and Callaghan Innovation advanced technology institute. Niche manufacturing products are key inputs into high value manufacturing of various kinds, while the advanced technology institute could help niche manufacturers to improve their productivity and the value of their products.

## Threats

Lower cost production offshore may become more attractive. All industrialised countries face increasing competition from lower cost producers who are becoming increasingly sophisticated. There is evidence that firms in some high value sub-sectors (such as electronic equipment) no longer manufacture in Auckland and have tended to move their manufacturing capabilities to lower cost countries (as subsidiaries or joint ventures), or they have outsourced some or all manufacturing to third parties in low cost countries (such as China, Malaysia, or Mexico).

## Economic projections to 2031

Under the base case, the Auckland niche manufacturing sector to 2031 is projected to:

- grow its GDP similarly to the rest of the Auckland economy
- grow its labour productivity faster than the rest of the Auckland economy
- grow its employment more slowly than the rest of the Auckland economy
- improved exports and better productivity could raise growth above the projections.

As the economy grows, the various sectors require more inputs, which in turn means that other sectors supplying them must produce more outputs. Not all of the sectors can grow in the same proportions, due to market and resource constraints such as land, labour, capital, foreign exchange and overseas demand for exports. The overall results can be modelled using economic models based on input-output tables, generating growth projections for employment and value-added for the various sectors of the economy. Like all projections, they are necessarily based on very specific assumptions which are unlikely to be perfectly accurate, and so are indicative only. See also “Effect of different assumptions” sub-section below.

### GDP and employment projections for the niche manufacturing sector

Figures 17 and 18 show the overall growth projections for both value added<sup>61</sup> and employment in the niche manufacturing sector. The figures do not precisely align with the earlier sections as they are modelled scenarios.<sup>62</sup>

Figure 17 shows that average annual value added growth in the sector between 2011-2031 is projected as 1.7 per cent but could range from 1.4 per cent (low) to 2.2 per cent (high), giving a lower bound by 2031 of \$2,294 million, and an upper bound of \$2,702 million.<sup>63</sup>

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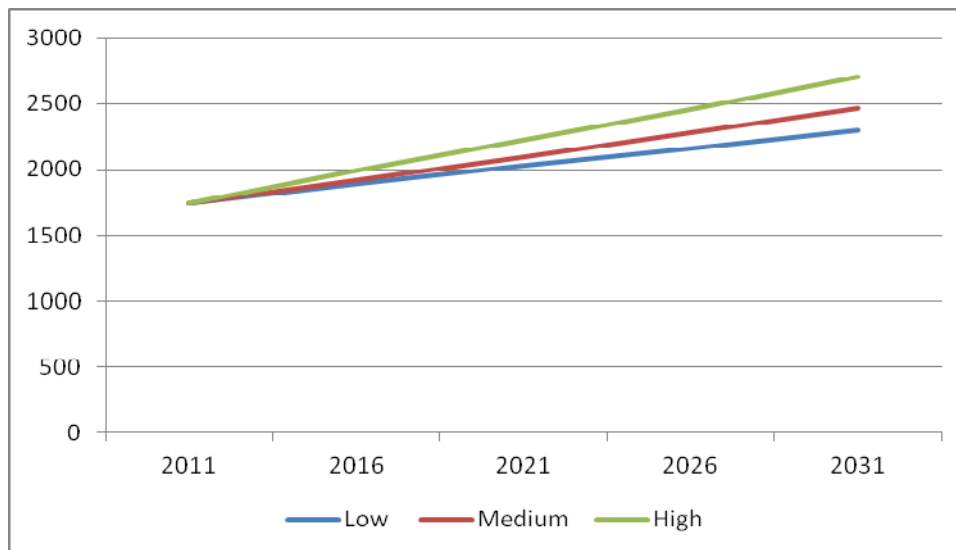
<sup>61</sup> Total Auckland production less imports – this is representative of Gross Regional Product

<sup>62</sup> Derived from the Auckland Economic Futures Model – Market Economics Ltd.

<sup>63</sup> In 2007 dollars



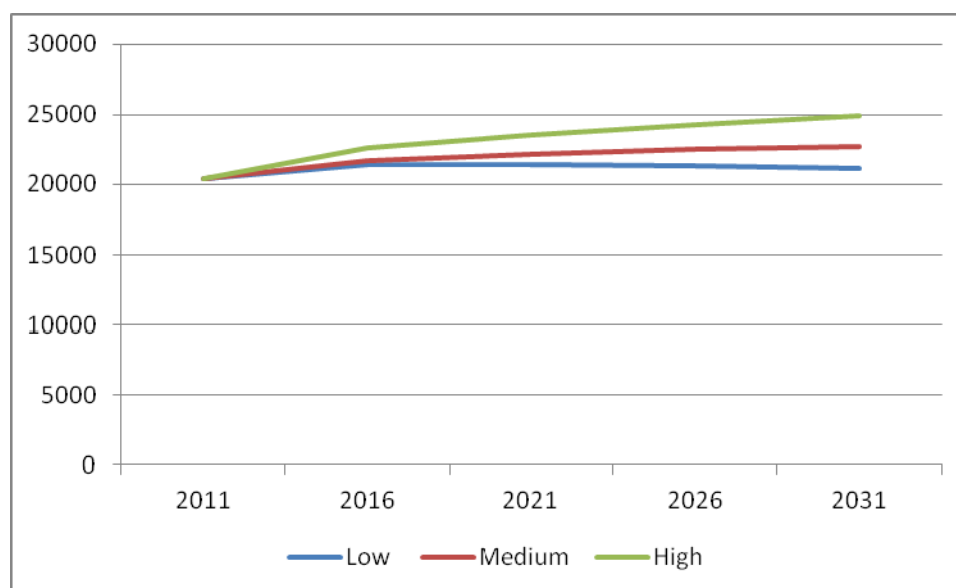
**Figure 17: Current and projected value added in Auckland's niche manufacturing sector**



Data source: Market Economics Ltd, 2012. *Auckland Economic Futures Model*

Employment growth is projected to be lower than value added. Figure 18 shows that average annual employment growth in the sector between 2011-2031 is projected as 0.5 per cent but could range from 0.2 per cent (low) to 1.0 per cent (high), giving a lower bound by 2031 of 21,151 employees and an upper bound of 24,892 employees.

**Figure 18: Current and projected employment counts in Auckland's niche manufacturing sector**



Data source: Market Economics Ltd, 2012. *Auckland Economic Futures Model*

The difference in growth between value added and employment is due to changing productivity. Productivity in the sector is projected to improve by 1.2 per cent per annum, making it the main driver of the sector's output (GDP) growth.

### Niche manufacturing sector projections compared to all industry

Overall, these projections suggest that under the business as usual scenarios, there is likely to be moderate growth in the sector in Auckland through to 2031. Productivity would rise faster than all Auckland industry as a whole (1.2% vs. 0.6% pa) and employment would rise more slowly than all industry (0.5% vs. 1.4% pa), with the net effect being that value added would increase at a slightly slower rate for niche manufacturing than for Auckland's other industries (1.7% vs. 2.0% pa).

### Effect of different assumptions

The EFM projections assume no change in the structure of the Auckland economy. However, the Auckland Economic Development Strategy 2012 has a goal of substantially higher export growth (6% pa), which would involve a substantial increase in the relative size of the niche manufacturing sector. The sector could increase its own exports, and also increase its sales of capital goods and equipment to other sectors that were increasing their exports. There might be a re-allocation of labour towards the growth sectors, but to remain cost-competitive the main driver would probably need to be improved labour productivity. Productivity improvement is likely to require a combination of more efficient production, and higher value products. More efficient production is likely to involve further embedding in global supply and production chains, including contracting out and FDI both inward and outward.

## Conclusion

Niche manufacturing has been identified as a key platform sector for knowledge and technology intensive activities, which are the main focus for Auckland and the country's future improvements in employment, income, productivity and standards of living. Given Auckland's size within New Zealand, plus the presence of three major universities within the city, Auckland can be expected to exhibit a higher concentration of knowledge intensive activities than other New Zealand cities.

According to a recent study of Auckland's Knowledge Economy for the then Ministry of Economic Development<sup>64</sup>, from 1991 to 2006, Auckland's share of employment within knowledge intensive sectors has increased at a faster pace than all four comparator New Zealand cities (Christchurch, Dunedin, Hamilton and Wellington) and all five Australian comparator cities. These trends indicate that intra-country agglomeration forces (attracting activity to Auckland from the rest of New Zealand), have more than offset the inter-country agglomeration forces (attracting activity to Australia from New Zealand).

However, Auckland's "High Tech Manufacturing" intensity had fallen markedly by 2006, to rank the lowest of the four non-capital New Zealand cities. Nevertheless, although Auckland has a lower intensity of High Tech Manufacturing relative to other activities, the sheer size of the city makes it still a major location for this activity in absolute terms, by New Zealand standards.

Overall, then, Auckland's niche manufacturing sector can be expected to continue to grow in importance, both as a sector in its own right, and as a vital input to Auckland's progress towards becoming a knowledge-based centre within both New Zealand and the global economy.

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<sup>64</sup> Grimes, A., Le Vaillant, J. and McCann, P., 2011. *Auckland's Knowledge Economy: Australasian and European Comparisons*, Ministry of Economic Development Occasional Paper 11/02

## Appendix 1: Glossary and abbreviations

**ANZSIC:** Australian and New Zealand Standard Industrial Classification, as re-defined in 2006, except where explicitly stated to be the 1996 version. The usual level of detail is 1-, 2-, 3- and 4- or 5-digit categories; 4-digit is currently the same as 5- and 6-digit. The niche manufacturing sector under ANZSIC 1996 is nearly 20 per cent larger than under ANZSIC 2006,

**ATEED:** Auckland Tourism, Events and Economic Development Limited, an Auckland Council, council-controlled organisation.

**Auckland:** The Auckland region, corresponding to the current Auckland Council territory, which includes the areas covered by the various former councils of the Auckland region (not just Auckland City Council).

**Business:** here used mainly to denote a single geographic business unit (“GU”), but in some contexts means a “firm”.

**CAGR: compound annual growth rate.** The annual growth rate required to generate a given total growth over a period of time, allowing for compounding each year.

**Category:** category refers here to standard ANZSIC groupings at the 1-, 2-, 3- or 4-digit level, which are sometimes also referred to here as sub-sectors, or to NA29 groupings.

**Component:** refers here to splits within a sector or sub-sector, notably the split of the niche manufacturing sector into its “manufacturing component” and “wholesaling component”

**EC: employee count.** The total number of employees in a sector; includes both full and part time employees but not working proprietors. See also “Data Sources” section.

**Firm:** here used mainly to denote one or more businesses owned and managed together as a single entity. For the former Ministry of Science and Innovation (MSI) (now part of MBIE) as all forms of manufacturing (ANZSIC “C” i.e. C11 to C25) plus oil and gas exploration and extraction, electricity generation and transmission, non-road construction, telecommunications and video, music and software production.

**GDP generated:** here refers only to direct value added by the sector itself, so does not include indirect or induced effects on other sectors.

**GDP: gross domestic product.** (often referred to as “Output” or “value added”) the total market value of all final goods and services produced within a country in a given period of time (usually a year). This is also equal to the sum of the value added at every stage of production (the intermediate stages) of all final goods and services produced within a country in a given period of time. The term is also applied to particular sectors of the economy and also at the regional level. See also GDP generated and GRP.

**GFC: global financial crisis** of 2007–2008, which triggered a global recession.

**GRP: gross regional product.** The output or value added in a particular region, i.e. the portion of national GDP attributable to that region. See also GDP.

**GU: geographic business unit.** A separate operating unit engaged predominantly in one kind of economic activity from a single physical location or base (as used in Statistics New Zealand's Business Demography data).

**HVMS: high value manufacturing and services.** Defined by Martin Jenkins in a report

**Labour Productivity:** (average) labour productivity is used here to denote output per employee, calculated as total value added divided by total number of employees (both from ANZSIC 1996). It is affected by various things, including availability and quality of other factors of production (e.g. capital goods).

**LQ: location quotient.** see SLQ.

**Machinery and equipment manufacturing:** A subsector in the NA29 system that includes elements that correspond to the manufacturing component of the niche manufacturing sector.

**Machinery and equipment:** The Auckland Tourism, Events and Economic Development Limited (ATEED) Sector Engagement Framework of 2012, written by Martin Jenkins, uses the same definition (and ANZSIC categories) as the Auckland Council Economic Development Strategy (EDS) category "niche manufacturing" (and this report), but labels it "machinery and equipment" and groups it with "construction and engineering" and "advanced materials" to form "specialised manufacturing".

**Manufacturing component:** The sub-sectors of the niche manufacturing sector that are included within Machinery and Equipment Manufacturing of NA29 or ANZSIC 2006 category C24.

**MBIE:** Ministry of Business, Innovation and Employment.

**MSI:** Ministry of Science and Innovation (now part of MBIE).

**n e c : not elsewhere classified**

**NA29: national accounts 29.** A classification system based on ANZSIC 1996 broken down to 29 sub-sectors, including "Machinery and equipment manufacturing" and "Wholesale trade". See also GDP in the "Data Sources" section.

**Niche manufacturing (SNZ):** SNZ uses this term to denote manufacture (but not wholesaling) of a variety of products including machinery and equipment (ANZSIC C24) but also many others. Defined as ANZSIC 13, 14, 19, 20, 21, 22, 23, 24 and 32.

**Niche manufacturing sector:** Auckland Council uses this term to denote manufacturing and wholesaling of machinery and equipment (ANZSIC C24 and F34), other than Information and Communication Technology (with some exceptions). See "Sector Definition" section.

**Output:** see GDP.

**pa: per annum.** Annual or per year

**Productivity:** see Labour Productivity.

**RCA: revealed comparative advantage.** RCA of a product is New Zealand exporters' share of world exports of that product, compared to New Zealand exporters' average share of world exports of all products. RCA can also be calculated as that product's share of total New Zealand exports, compared to that product's share of total world exports.

**Sector:** The niche manufacturing sector, unless otherwise indicated.

**SLQ: simple location quotient.** A statistical measurement of the relative concentration of a given industry in a given place. It is calculated by dividing the proportion of the area's economic activity in an industry, by the proportion of the nation's economic activity in that same industry. Calculated another way, it is a region's share of national activity in an industry, divided by the total regional economy's share of the total national economy. If the region was a scaled down version of the nation, then all its SLQs would equal 1. Instead, in most regions in most countries, some sectors are relatively larger than others and have a higher SLQ, and others are relatively smaller and have a lower SLQ (but the weighted average for all sectors in a given region is always 1). If the SLQ index for a sector is greater than 1, then the sector is deemed to be strong there (i.e. the industry is of high importance to the regional economy, compared to that sector's importance to the national economy).

**SNZ: Statistics New Zealand** (government department).

**Specialised manufacturing:** See Machinery and equipment

**Subdivision(s):** ANZSIC 2-digit category(s)

**Sub-sector:** Part of the sector; usually an ANZSIC 3- or 5-digit category.

**Value added:** see GDP.

**Wholesale trade:** A subsector in the NA29 system that includes elements that correspond to the wholesaling component of the niche manufacturing sector.

**Wholesaling component:** The sub-sectors of the niche manufacturing sector that are included within "Wholesale trade" of NA29 or ANZSIC 2006 category F34 Machinery and Equipment Wholesaling.

## Appendix 2: ANZSIC concordance to niche manufacturing and ICT

Table A2 presents the allocations of all of the 4-digit sub-sectors within C24 and F34 between niche manufacturing and ICT. It shows that two niche manufacturing sub-sectors are also included in ICT, namely Other Professional and Scientific Equipment Manufacturing, and Other Electrical and Electronic Goods Wholesaling; also, three 4-digit sub-sectors of ANZSIC C24 are absent from both sectors, namely Photographic, Optical and Ophthalmic Equipment Manufacturing, Electric Lighting Equipment Manufacturing and Medical and Surgical Equipment Manufacturing (the latter is included in the Health Technology sector).

All of the sub-sectors within C24 and F34 also include any associated specialised parts manufacture or wholesaling. However, entities engaged mainly in repairs are always excluded from these sub-sectors and are not included in the niche manufacturing sector.

**Table A2: ANZSIC 2006 C24 and F34 Concordance to Niche Manufacturing and ICT**

Code	ANZSIC 2006 Sub-sector	Niche or ICT
	<b>C24 MACHINERY AND EQUIPMENT MANUFACTURING</b>	
<b>C241</b>	<b>Professional and Scientific Equipment Manufacturing</b>	<b>Part niche</b>
C2411	Photographic, Optical and Ophthalmic Equipment Manufacturing	NEITHER
C2412	Medical and Surgical Equipment Manufacturing	NEITHER
C2419	Other Professional and Scientific Equipment Manufacturing	BOTH
<b>C242</b>	<b>Computer and Electronic Equipment Manufacturing</b>	<b>Part niche</b>
C2421	Computer and Electronic Office Equipment Manufacturing	ICT
C2422	Communications Equipment Manufacturing	ICT
C2429	Other Electronic Equipment Manufacturing	BOTH
<b>C243</b>	<b>Electrical Equipment Manufacturing</b>	<b>Part niche</b>
C2431	Electric Cable and Wire Manufacturing	ICT
C2432	Electric Lighting Equipment Manufacturing	NEITHER
C2439	Other Electrical Equipment Manufacturing	Niche
<b>C244</b>	<b>Domestic Appliance Manufacturing</b>	<b>All Niche</b>
C2441	Whiteware Appliance Manufacturing	Niche
C2449	Other Domestic Appliance Manufacturing	Niche
<b>C245</b>	<b>Pump, Compressor, Heating and Ventilation Equipment Manufacturing</b>	<b>All Niche</b>
C2451	Pumps and Compressors Manufacturing	Niche
C2452	Fixed Space Heating, Cooling and Ventilation Equipment Manufacturing	Niche

<b>Code</b>	<b>ANZSIC 2006 Sub-sector</b>	<b>Niche or ICT</b>
<b>C246</b>	<b>Specialised Machinery and Equipment Manufacturing</b>	<b>All Niche</b>
C2461	Agricultural Machinery and Equipment Manufacturing	Niche
C2462	Mining and Construction Machinery Manufacturing	Niche
C2463	Machine Tool and Parts Manufacturing	Niche
C2469	Other Specialised Machinery and Equipment Manufacturing	Niche
<b>C249</b>	<b>Other Machinery and Equipment Manufacturing</b>	<b>All Niche</b>
C2491	Lifting and Material Handling Equipment Manufacturing	Niche
C2499	Other Machinery and Equipment Manufacturing n.e.c.	Niche
	<b>F34 MACHINERY AND EQUIPMENT WHOLESALING</b>	
<b>F341</b>	<b>Specialised Industrial Machinery and Equipment Wholesaling</b>	<b>All Niche</b>
F3411	Agricultural and Construction Machinery Wholesaling	Niche
F3419	Other Specialised Industrial Machinery and Equipment Wholesaling	Niche
<b>F349</b>	<b>Other Machinery and Equipment Wholesaling</b>	<b>Part niche</b>
F3491	Professional and Scientific Goods Wholesaling	ICT
F3492	Computer and Computer Peripherals Wholesaling	ICT
F3493	Telecommunication Goods Wholesaling	ICT
F3494	Other Electrical and Electronic Goods Wholesaling	BOTH
F3499	Other Machinery and Equipment Wholesaling n.e.c.	Niche

Data source: Auckland Council, from Statistics New Zealand *ANZSIC 2006*



## Appendix 3: 4-digit employment growth

Table A3 shows at a more detailed level (4-digit)<sup>65</sup> that the main drivers of the Auckland sector's employment ("EC") growth from 2000 to 2012 were Other Specialised Industrial Machinery and Equipment (+324%; +680 employees), Other Machinery and Equipment Wholesaling (+130%; +600 employees) and Other Electronic Equipment Manufacturing (+53%; +550 employees). Agricultural and Construction Machinery Wholesaling also grew fast, but from a smaller base (+38%; +150 employees). Conversely, Other Specialised Industrial Machinery and Equipment Wholesaling contributed +300 employees, but from a large base so the percentage growth was only 10 per cent.

Although Other Specialised Machinery and Equipment Manufacturing showed the strongest growth (+ 680 employee; +324%), this was largely offset by falls in other components of the "specialised machinery" 3-digit sub-sector (agricultural machinery -360 employees and machine tools -190 employees).

Elsewhere, major falls occurred in Whiteware Appliance Manufacturing (-980 employees; -61%) and Other Machinery and Equipment Manufacturing n.e.c. (-430 employees; -15%).

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<sup>65</sup> Same as 5-digit, so referred to in the table as "Ind-5"

**Table A3: Niche manufacturing sector employment growth 2000-2012 by 4-digit sub-sector**

<b>ANZSIC06 Ind_5</b>	<b>Ind_5 Description</b>	<b>EC_2000</b>	<b>EC_2012</b>	<b>EC Growth</b>	<b>EC pa</b>	<b>EC Growth #</b>
C24690	Other Specialised Machinery and Equipment Manufacturing	210	890	323.8%	14.0%	680
F34990	Other Machinery and Equipment Wholesaling	460	1060	130.4%	7.9%	600
C24290	Other Electronic Equipment Manufacturing	1040	1590	52.9%	3.9%	550
F34190	Other Specialised Industrial Machinery and Equipment Wholesaling	3030	3330	9.9%	0.9%	300
F34110	Agricultural and Construction Machinery Wholesaling	390	540	38.5%	3.0%	150
F34940	Other Electrical and Electronic Goods Wholesaling	5290	5430	2.6%	0.2%	140
C24520	Fixed Space Heating, Cooling and Ventilation Equipment Manufacturing	370	450	21.6%	1.8%	80
C24620	Mining and Construction Machinery Manufacturing	40	100	150.0%	8.7%	60
C24510	Pumps and Compressors Manufacturing	100	90	-10.0%	-1.0%	-10
C24190	Other Professional and Scientific Equipment Manufacturing	310	270	-12.9%	-1.2%	-40
C24910	Lifting and Material Handling Equipment Manufacturing	390	320	-17.9%	-1.8%	-70
C24490	Other Domestic Appliance Manufacturing	380	280	-26.3%	-2.7%	-100
C24390	Other Electrical Equipment Manufacturing	1150	970	-15.7%	-1.5%	-180
C24630	Machine Tool and Parts Manufacturing	610	420	-31.1%	-3.3%	-190
C24610	Agricultural Machinery and Equipment Manufacturing	600	240	-60.0%	-8.0%	-360
C24990	Other Machinery and Equipment Manufacturing n.e.c.	2850	2420	-15.1%	-1.5%	-430
C24410	Whiteware Appliance Manufacturing	1610	630	-60.9%	-8.2%	-980
<b>C24</b>	<b>Sub-total Manufacturing</b>	<b>9660</b>	<b>8670</b>	<b>-10.2%</b>	<b>-1.0%</b>	<b>-990</b>
<b>F34</b>	<b>Sub-total Wholesaling</b>	<b>9170</b>	<b>10360</b>	<b>13.0%</b>	<b>1.1%</b>	<b>1190</b>
	<b>Total sector Auckland</b>	<b>18830</b>	<b>19030</b>	<b>1.1%</b>	<b>0.1%</b>	<b>200</b>
	<b>Total Auckland all sectors</b>	<b>521340</b>	<b>642940</b>	<b>23.3%</b>	<b>1.9%</b>	<b>121600</b>

Data source: Statistics New Zealand *Business Demographics 2000-2012*

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