

POLICY IMPLICATIONS OF GLOBAL VALUE CHAIN RESEARCH

Part of the NZPECC dairy value chain project

January 2014 v1.02a

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ABOUT CORIOLIS' SERVICES

Coriolis is a boutique management consulting firm that focuses on food, consumer packaged goods, retailing and foodservice.

Coriolis advises clients on strategy, operations, organization, and mergers and acquisitions. We develop practical, fact-based insights grounded in the real world that guide our clients decisions and actions. Founded in 1999, Coriolis is based in Auckland, New Zealand and works on projects across the Asia Pacific region..

WHAT WE DO

We help our clients assemble the facts needed to guide their big decisions. We make practical recommendation. Where appropriate, we work with them to make change happen.

HOW WE DO IT

Our style is practical and down-to-earth. We try to put ourselves in our clients' shoes and focus on actions. We listen hard, but we are suspicious of the consensus. We provide an external, objective perspective. We are happy to link our fees to results.

WHO WE WORK WITH

We only work with a select group of clients we trust. We build long term relationships with our clients and more than 80% of our work comes from existing clients. Our clients trust our experience, advice and integrity.

Typical assignments for clients include...

FIRM STRATEGY & OPERATIONS: We help clients develop their own strategy for growing sales and profits. We have a strong bias towards growth driven by new products, new channels and new markets.

MARKET ENTRY: We help clients identify which countries are the most attractive - from a consumer, a competition and a channel point-of-view. Following this we assist in developing a plan for market entry and growth.

VALUE CREATION: We help clients create value through revenue growth and cost reduction.

TARGET IDENTIFICATION: We help clients identify high potential acquisition targets by profiling industries, screening companies and devising a plan to approach targets.

DUE DILIGENCE: We help organisations make better decisions by performing consumer and market-focused due diligence and assessing performance improvement opportunities.

EXPERT WITNESS: We provide expert witness support to clients in legal cases and insurance claims. We assist with applications under competition/fair trade laws and regulations.



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NZPECC seeks to better understand implications of global value chains to policy makers

What?



Two representative value chains
Dairy based
New Zealand to Asia
Both Asian & NZ production

So What?



Lessons for New Zealand
Barriers to growth
Drivers of participation
Can NZ capture more value?

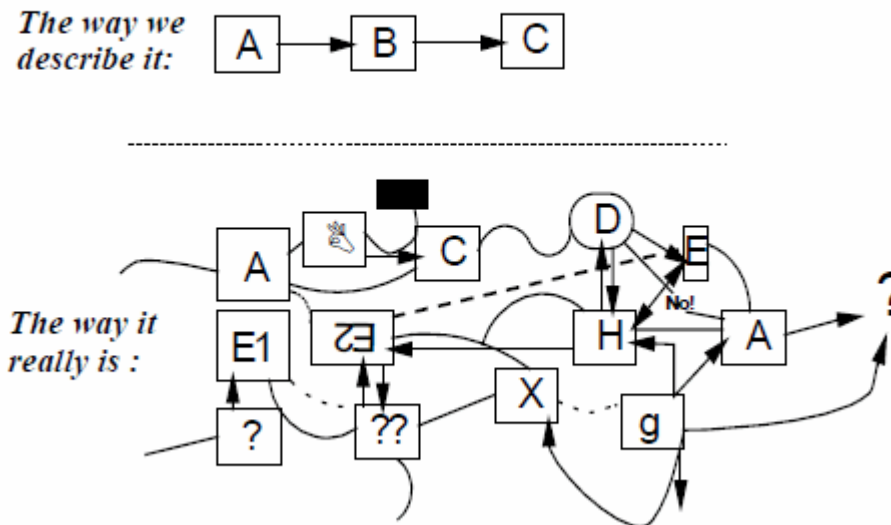
Why?



Informed & aware
Policy implications
Service & regulatory reform
Trade negotiation

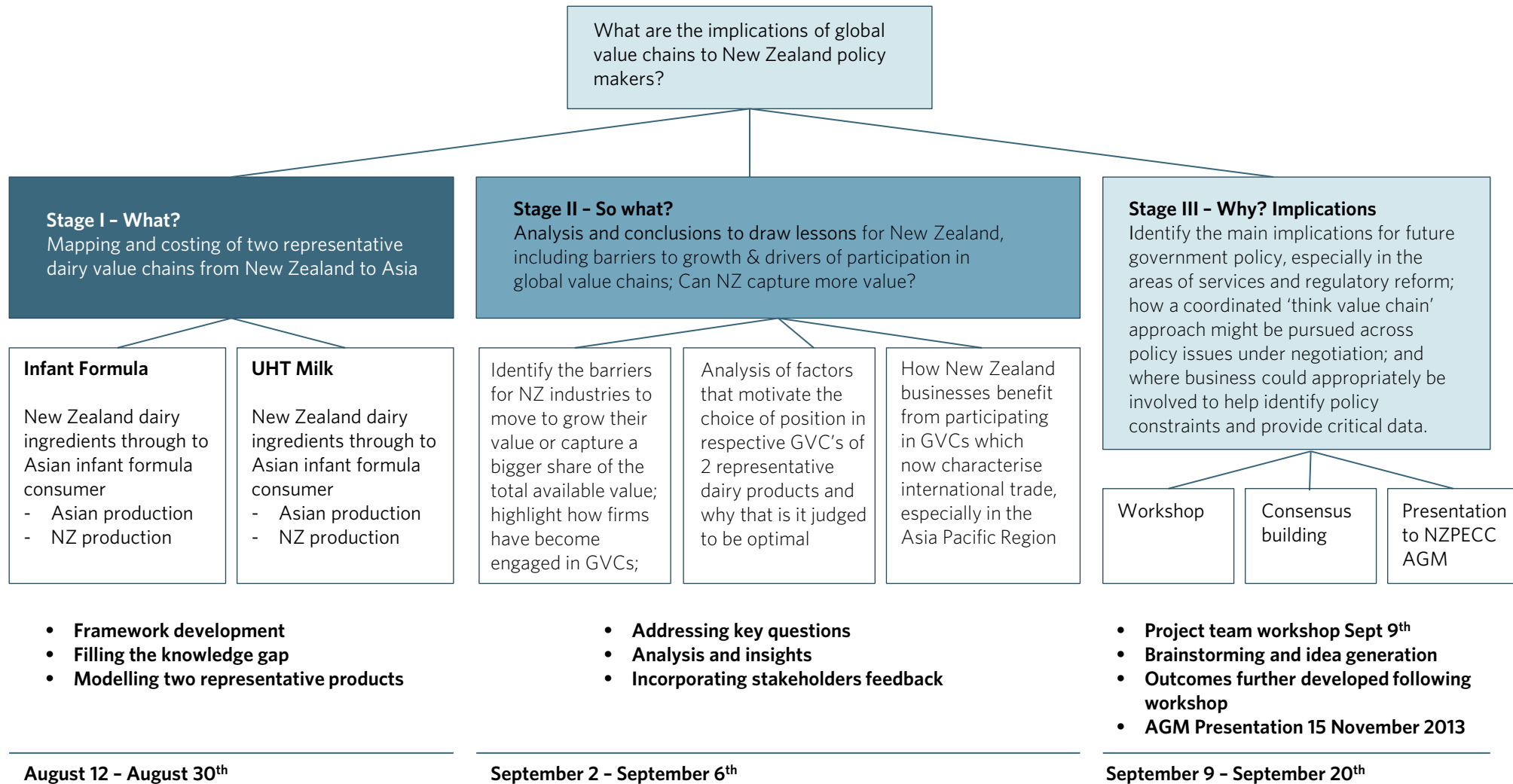
This value chain analysis has a number of important limitations

- This project was conducted for a **limited budget** and it was agreed that the focus would be on the implications of analysis (Stage II & III) rather than getting to a hugely detailed level of analysis of the example value chains (Stage I)
- The project used only **publicly available** data and Coriolis estimates. We have no access to any confidential or commercial data.
- Constructing a model value chain involves **massive simplification** of a very complex and messy reality into a much simpler, more comprehensible 'story.' This process naturally involves trade-offs. We have tried to be fair and balanced in making these simplifying assumptions. Brown, Bessant and Lamming (2000) describe this inherent limitation in all value chain mapping with the following diagram, titled "Value chain mapping: theory and reality"

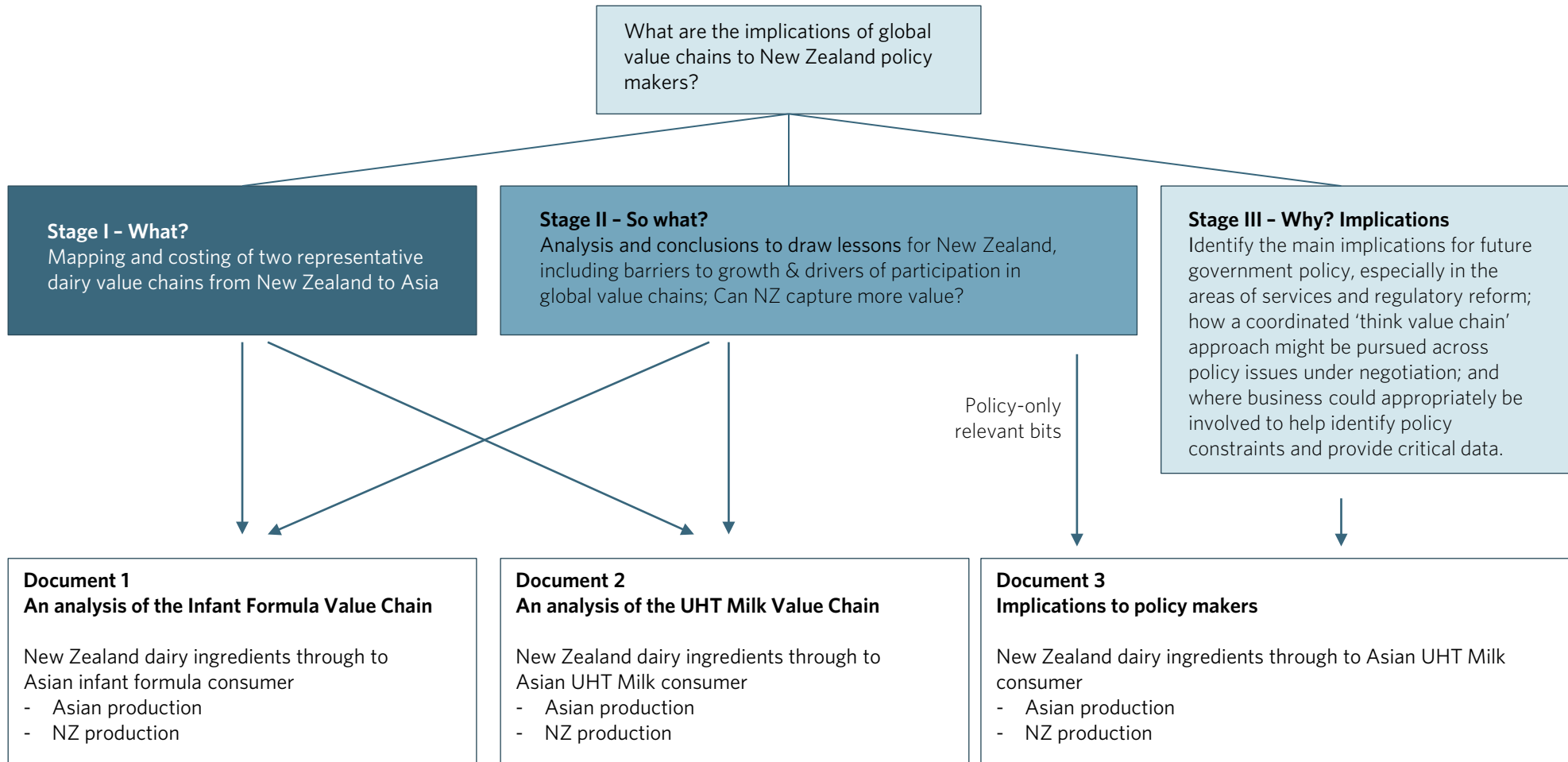


- The numbers in this document come from multiple sources. While we believe the **data** are **directionally correct**, we recognise the **limitations** in what information is available. Many data sources incorporate estimates of industry experts.
- If you have any questions about the source or meaning of a number in this report, please contact the project leader, Tim Morris at Coriolis Research on (09) 623 1848

The project is structured as follows



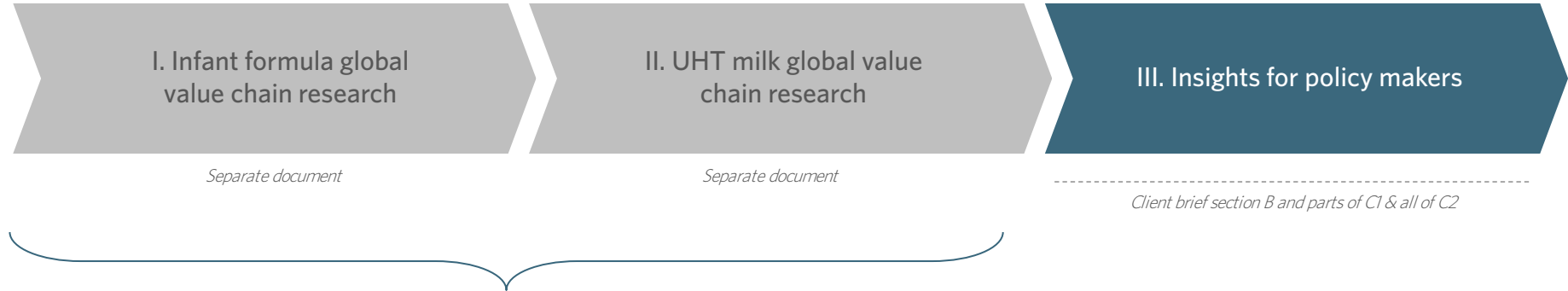
The project has delivered three documents - two focused value chain reports delivering Stage I and parts of Stage II; one policy focused report delivering parts of Stage II and all of Stage III



Targeting a business & policy maker audience

Business and policy maker audience

This document collects together the policy focused parts of the research; it should not be read before the two value chains as it builds on and complements them



This document assumes the reader has already absorbed these documents

The first policy question coming out of this value chain research is, what are the barriers to taking more value?

- 1** Identify the barriers for NZ firms/industries to move to grow their value or capture a bigger share of the total available value; highlight how firms have become engaged in GVCs;
- 2** Highlight how firms have become engaged in GVCs;
- 3** Drawing on all the foregoing, and to the extent possible, identify the main implications for future government policy, especially in the areas of services and regulatory reform; how a coordinated 'think value chain' approach might be pursued across policy issues under negotiation; and where business could appropriately be involved to help identify policy constraints and provide critical data.

New Zealand is well positioned to continue growing its food & beverage exports

General

- New Zealand is a developed, temperate-climate country in the Asia-Pacific region. It is a stable democracy with strong economic freedoms (Index of Economic Freedom #4), excellent investor protection (World Bank #1) and low corruption (Transparency International #1). It is by almost all measures the most attractive investment destination in the temperate zone of the Southern Hemisphere.

Food & beverages

- Food and beverage exports are important to New Zealand and the country is a major F&B exporter. New Zealand's F&B exports are growing strongly and the country's export performance is strong and improving relative to peers.
- The country has demonstrated capability in the production of temperate-climate food and beverages. It is the largest exporter in the world of dairy products and lamb and a major exporter of beef, kiwifruit, apples and seafood.

Drivers

- The success of New Zealand in temperate foods is built around a natural environment conducive to agriculture. New Zealand – surrounded by the Pacific Ocean – has the light of Spain with the climate of Bordeaux. NZ's maritime climate will also moderate the effects of global warming going forward (relative to large continents).
- The country's farmers are highly productive and efficient. The country has no agricultural subsidies and regulation is generally rational and light handed.
- New Zealand has a supportive infrastructure for food and

beverages along the total value chain.

- NZ has built up a reputation with customers and consumers around the world as a trusted producer of food and beverages. Customers and consumers around the world trust food and beverages produced in New Zealand.
- In science, New Zealand spends more than half a billion dollars a year on Agri-Food research across a wide range of areas, from fruit genetics to nutraceuticals. The country is also home to four major universities respected globally for their Agri-food research.

Opportunities

- While New Zealand is a major global F&B exporter, the country has significant untapped capacity to export more. New Zealand is a country the size of Italy with the population of Singapore. However Italy feeds a domestic population of 60m people and exports twice as much F&B as New Zealand.
- The New Zealand Government has set a target of doubling the country's food and beverage exports (in real terms) over the next 15 years. This will be achieved through both growth of existing major sectors and the newer emerging growth stars.
- New Zealand is a young country still discovering its comparative advantages and new industries continue to emerge. In the past twenty years New Zealand wine, honey, aquaculture and avocados have all emerged from almost nothing into world leading sectors.
- New Zealand has attracted investment in F&B manufacturing from around the world. Global leaders have already endorsed New Zealand by investing in manufacturing in the country and 25% of the F&B manufacturing sector is foreign owned.

New Zealand is well positioned in dairy for further growth, with a wide range of strengths to leverage and opportunities to exploit

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> - Clear revealed comparative advantage in dairy - Low cost pasture-based dairy production system - National champion Fonterra with resources to address global market opportunities - Growing market leadership position in Australasia/Oceania - Functioning food safety system comparable with those in Europe, Japan & USA - Rule of law; scores highly in some global benchmarking surveys - Global surveys reveal top 5 position in country brand/reputation (comp. Sweden) 	<ul style="list-style-type: none"> - Small milk producer in an absolute sense - Limited defensibility of commodity and ingredient position - Significant trade barriers limiting New Zealand access to North America and Europe - Farmgate price mixes returns on milk with returns on Fonterra ownership leading to dairy land price increases leading to decreased international competitiveness
OPPORTUNITIES	ISSUES/THREATS/RISK
<ul style="list-style-type: none"> - Intensification through additional supplementary feed smoothing seasonal peak increasing total milk production and improving return on assets - Growing dairy product consumption in developing world; dry and tropical countries not able to produce all the milk they consume - Chinese dairy consumption per capita growing rapidly drawing in significant imported dairy product (in the short to medium term) - Asians more likely to be dairy intolerant, therefore different consumption patterns (e.g. yoghurt drinks; infant formula) - Ongoing dairy industry consolidation, particularly in South America - Changing global weather patterns (also a threat) - Further investment in in-market production - Reduction in dairy (export) subsidies, esp. from Europe and US, following conclusion of Uruguay Round 	<ul style="list-style-type: none"> - Intensive feedlot dairy model (e.g. California) improving productivity faster than pasture system (e.g. NZ/AU) - Southern South America rapidly adopting the AU/NZ pasture system (e.g. Argentina, Uruguay, Brazil) - The boom/bust economic cycle expresses itself in China - Experience of Japan & South Korea suggest Chinese growth has another 5-7 years to run; after this point, China will be either self sufficient or a major exporter; Chinese milk/cow almost at NZ levels - Developing countries consumers, currently perceive dairy as healthy; science/attitudes/opinions could turn negative - Adoption of genetically modified animals or feed by poor countries changing international competitive dynamics - Non-dairy substitutes (e.g. soy) more suited to Asian tastes and physiology

However, despite this strong position in dairy in general, our research has revealed New Zealand has limited leverage to take a stronger position in the global value chains of either infant formula or UHT milk

	Europe	United States	New Zealand	China	Philippines Other developing
Do you have a well functioning food safety system & clear rule-of-law?	●	●	●	○	○
Are you good at making some of the key raw materials?	◐	◐	●	◐	○
Are you a global leader in the category?	●	●	○	◐	○
Do you own global brands?	●	●	○	○	○
Do you spend a lot of money marketing your brand to consumers?	●	●	○	◐	◐
Are there a lot of consumers near your factories?	●	●	○	●	●
Did you come up with the idea?	●	●	○	○	○
Have you been developing the product for 100 years?	●	●	○	○	○
Do you have a large sales force regularly visiting all major channels?	●	●	○	◐	◐
Do you have a lot of money? Can you get more?	●	●	◐	●	◐
Can you navigate your way through murky local politics and going on's?	◐	◐	◐	●	●

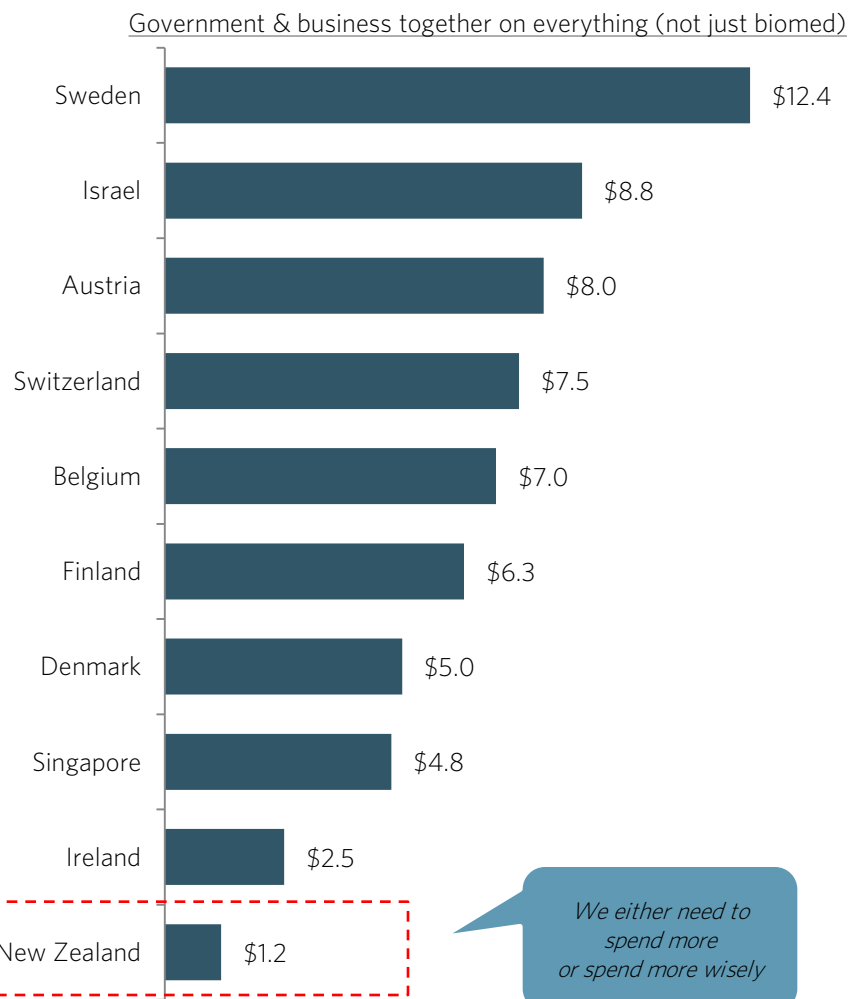
- High
- ◐ Medium
- Low



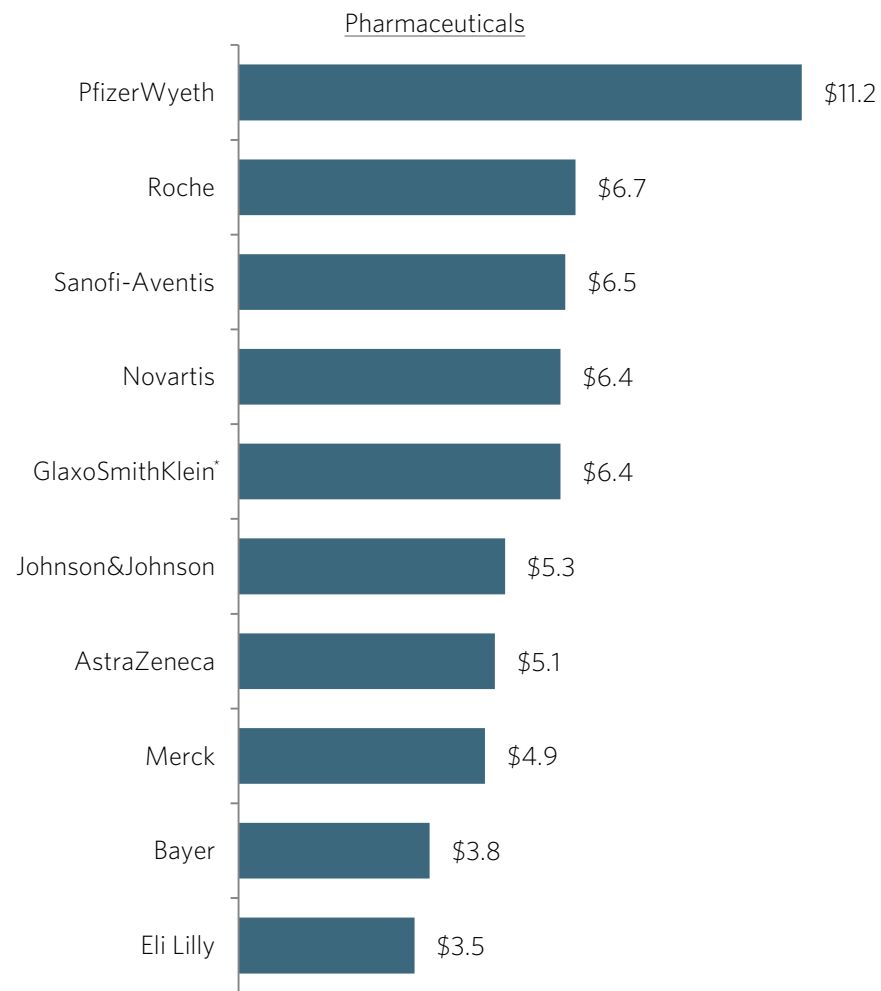
BARRIER 1 - LOW R&D SPEND

New Zealand - in aggregate as a country - does not spend a lot of R&D; many pharmaceutical firms outspend New Zealand

Total national expenditure on R&D across all industries and fields
(US\$b; exchange rates at PPP; 2007 or latest available)



Total expenditure on R&D by top 10 pharmaceutical companies
(US\$b; actual as reported; 2007 or latest available)



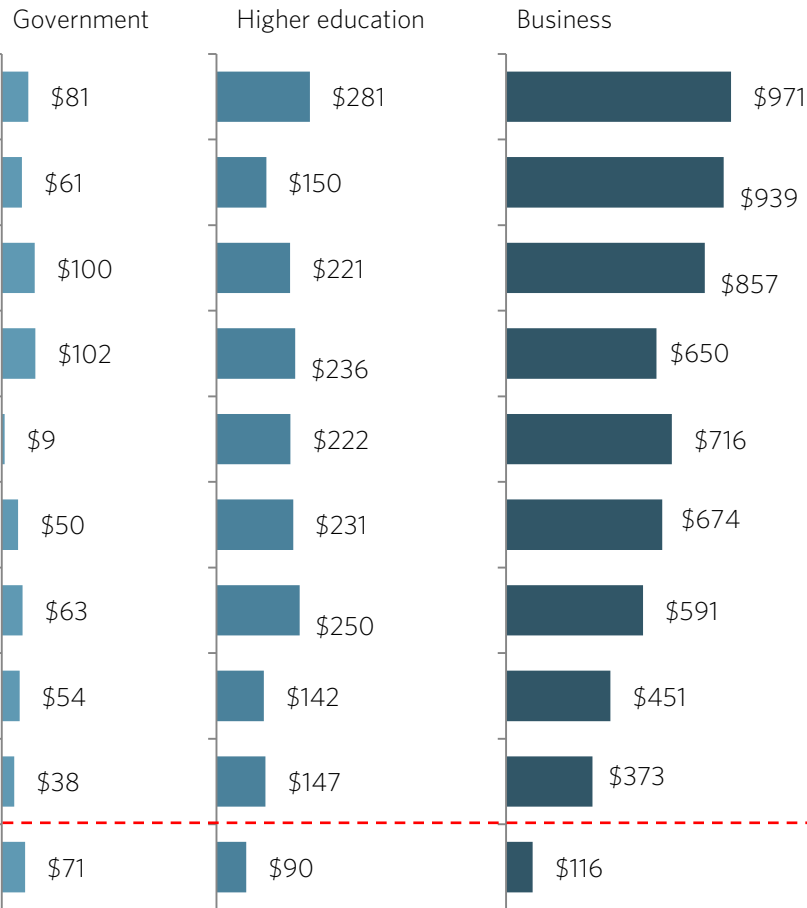
* Founded in Bunnythorpe, New Zealand; Note: this will include double counting (ie. GSK business R&D spending in Singapore); PfizerWyeth is pro-forma (merger Jan 2009); Source: OECD main science and technology indicators 2008-2 database (custom job); Pharmaceutical Technology Europe, Sep 2008; Coriolis analysis

BARRIER 1 - LOW R&D SPEND

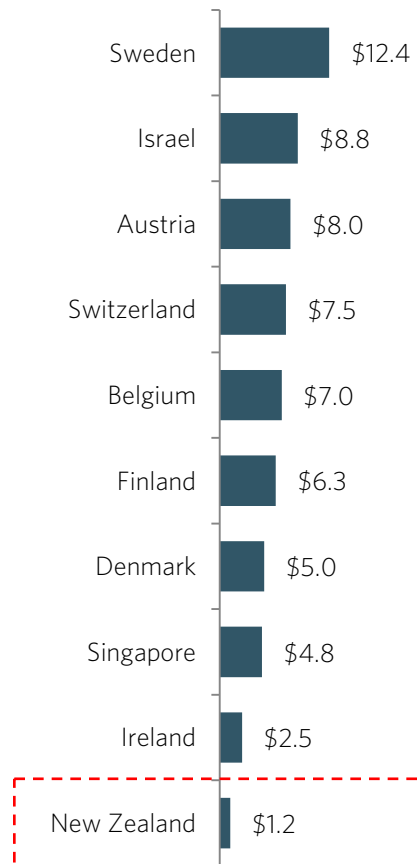
New Zealand does not spend a lot per person on R&D relative to peers; business spending stands out as especially low (though this may be a function of product mix)

Total national expenditure on research and development across all industries and fields: peer group
(US\$; 2007 or latest available)

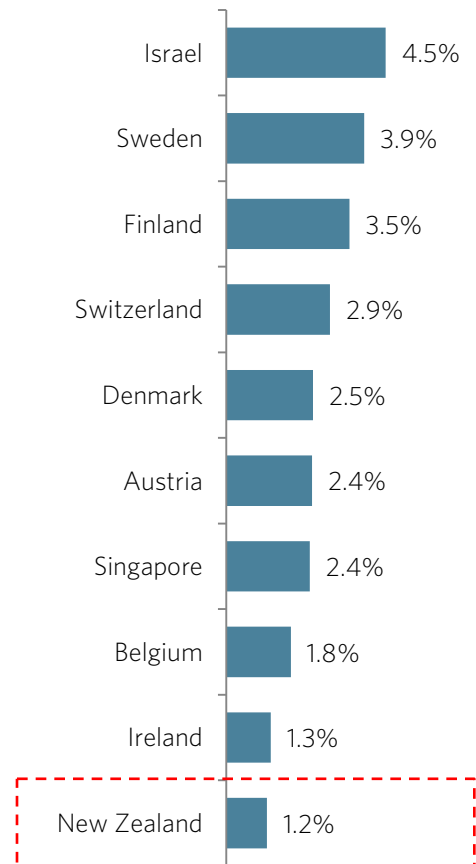
Expenditure per capita in US\$; actual; exchange rates at PPP



Total expenditure; US\$ billions; PPP



% of GDP

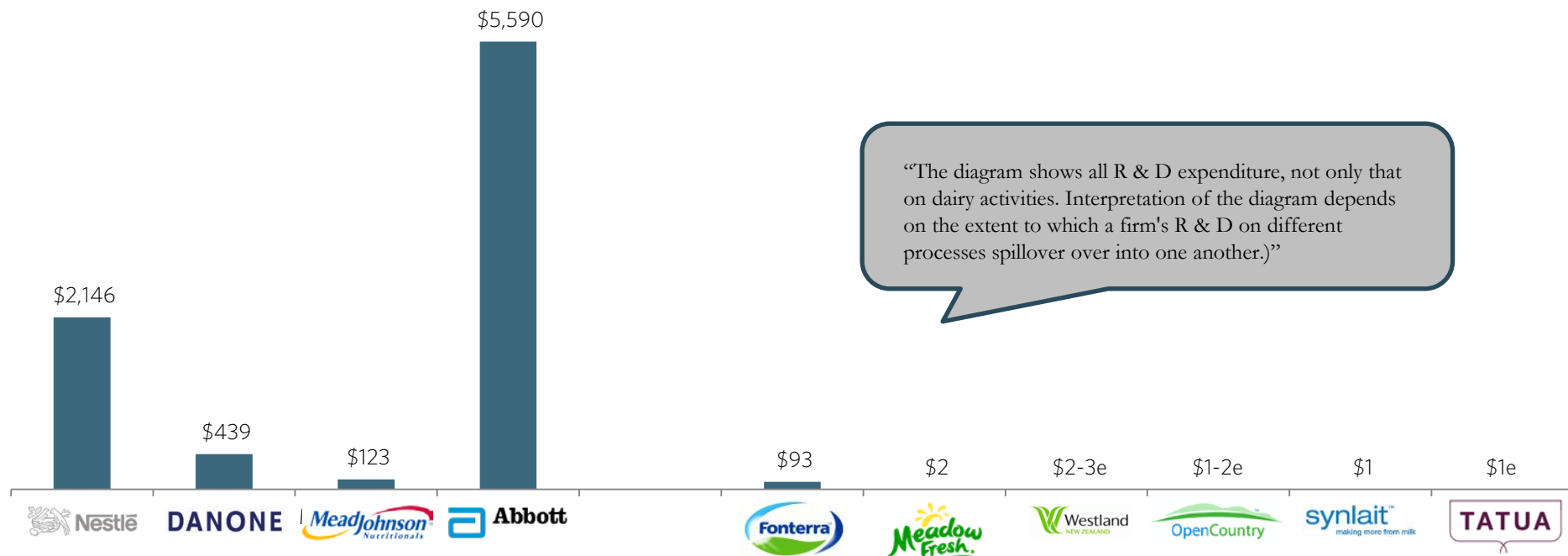


BARRIER 1 - LOW R&D SPEND

New Zealand dairy companies do not spend a lot on R&D, either as a percent of sales or in total

Research and Development (R&D) expenditure: top 4 global infant formula firms vs. top 6 New Zealand dairy firms

NZ\$m; 2012



“The diagram shows all R & D expenditure, not only that on dairy activities. Interpretation of the diagram depends on the extent to which a firm's R & D on different processes spillover over into one another.”

Company	R&D as a % of turnover
Nestlé	1.7%
DANONE	1.5%
Mead Johnson	2.4%
Abbott	10.8%
Fonterra	0.5%
Meadow Fresh	0.5%
Westland	0.5%
OpenCountry	0.3%
synlait™	0.3%
TATUA	0.5%

Global #1 and #2 infant formula firms; also global #1 and #2 largest dairy companies in the world by sales; includes other non-dairy R&D activities

Global #3 and #4 largest infant formula firms; includes significant other non-IF/non-dairy R&D activities

Global #4 largest dairy company in the world by sales

Source: Nestle annual report; Danone annual report; Mead Johnson annual report; Abbott annual report; Goodman Fielder annual report (AU/NZ group total A\$10.9 pro rata to dairy share of sales (\$411/2514); Synlait annual report; Westland and Tatua are Coriolis estimates using Fonterra as a proxy; Open Country is a Coriolis estimate using Synlait as a proxy; Rabobank; Coriolis research and analysis

BARRIER 2 - LACK PRODUCT DEVELOPMENT TRACK RECORD

New Zealand dairy companies lack a track record of innovation and product development in difficult value-added dairy categories, as this example from infant formula shows

EXAMPLE: Major infant feeding products launched by Mead Johnson in the last 100 years
1900-2013

1910s	Launches Dextrilactic-Powder a combination of digestive aids and dehydrated milk targeted at infants	1960s	Launches Enfamil as a ready-to-use liquid	2010s	Launches 17 medically targeted products for infants with inborn errors of metabolism
	Launches Dextri-Maltose, a carbohydrate-based formula to be mixed with milk	1970s	Launches ProSorbee, first US formula using soy protein (instead of milk)		Launches Nutramigen AA LIPL, a hypoallergenic amino-acid based formula for children with cow's milk allergies
1920s	Launches Casec, milk derived protein supplement to address infant digestive issues		Launches Pregestimil, a medical formula for infants unable to absorb fats (e.g. due to cystic fibrosis)		Launches Nutramigen with Enflora LGG with Lactobacillus Rhamnosus GG probiotic to support strength of intestinal barrier
	Launches Reolac, a "reconstructed milk" including new ingredients for better nutrition		Launches Sustagen as a tube feeding products for infants; product later evolves into "toddler milk" product		Reformulates Enfamil with "Triple Health Guard" and "Natural Defense Dual Prebiotics"
	Launches Sobee made of soybean flour for infants with cow milk allergies	1980s	Reformulates Enfamil to have 60:40 whey-to-casein protein component		Launches Enfamil Premium Newborn targeting needs in 1 st 3 months; includes Wellmune Beta Glucan for immune support
1930s	Launches Pablum pre-cooked vitamin enriched infant cereal		Launches Enfamil human milk fortifier additive to be added to breast milk		Introduces Ensure reusable tub and refill system
	Launches Olac "reconstructed milk" replacing animal fats with vegetable derived ones		Launches Enfapro follow on formula targeting older children (in Hong Kong)		Introduces Enfamil Human Milk Fortifier Acidified Liquid for premature babies
1940s	Launches Nutramigen, first protein hydrosate formula for infants with cow milk allergies	1990s	Launches Enfamil A.R.		
1950s	Launches Lofenalac, first formula for children with Phenylketonuria (PKU)	2000s	Launches Enfamil A+ including nutrients DHA and ARA (found naturally in human milk & important in brain & eye development)		
	Launches Enfamil powder patterned after the nutritional composition of human milk; 1 st US formula to contain choline & inositol		Launches Enfamil LIPL, Enfamil Premature LIPL, Enfamil LactFree LIPL & Enfamil ProSobee LIPL, all containing SHA and ARA		

BARRIER 3 - LACK HISTORY

New Zealand dairy companies lack the history and experience that the leading global firms have in the more difficult value added dairy products, as this example from infant formula demonstrates

EXAMPLE: Year of company formation: top four global infant formula producers vs. top four New Zealand dairy companies
Year incorporated

Top four global infant formula manufacturers



1866

- Henri Nestlé launches milk-based baby food in Switzerland
- In 1905 merges with Anglo-Swiss Milk Co. formed in 1867
- Makes numerous acquisitions



1896

- Martinus van der Hagen launches milk-based baby food using "Backhaus method" in the Netherlands
- Makes numerous acquisitions of other IF firms



1903/1925

- Harry C. Moores and Stanley M. Ross found M&R Milk Co. in Ohio; in 1925 they launch a new infant formula developed by Scientist Alfred Bosworth



1905

- Edward Mead Johnson leaves family firm Johnson & Johnson in New Jersey to launch infant feeding product targeted at doctors



2007

- Today the largest food company in the world



1964

- Merged with Abbott



1967

- Acquired by BMS in 1967
- Spun off to shareholders in 2009

Top four New Zealand dairy firms



1937

- Formed by farmers in 1937
- Legally barred from selling its own products in international markets for first 64 years of operations



2001

- Formed from New Zealand Dairy Board (legislated into existence in 1923/1961)
- Merged with two major NZ dairy production cooperatives



2001

- Start-up launched following removal of legal restrictions on dairy exporting from New Zealand



2001

- NZ Commerce Commission forces newly formed Fonterra to divest some domestic assets
- These are acquired by NZ's richest man who later merges them with another acquisition¹

1. There is not enough space here to review the strange 2005 brand switch; Source: Coriolis

BARRIER 4 - LACK PORTFOLIO OF PRODUCTS & BRANDS

New Zealand dairy companies lack a strong portfolio of products and brands in high value categories, as this example from infant formula demonstrates

EXAMPLE: Comparison of portfolio of infant/child targeted products and brands: Westland vs. Mead Johnson

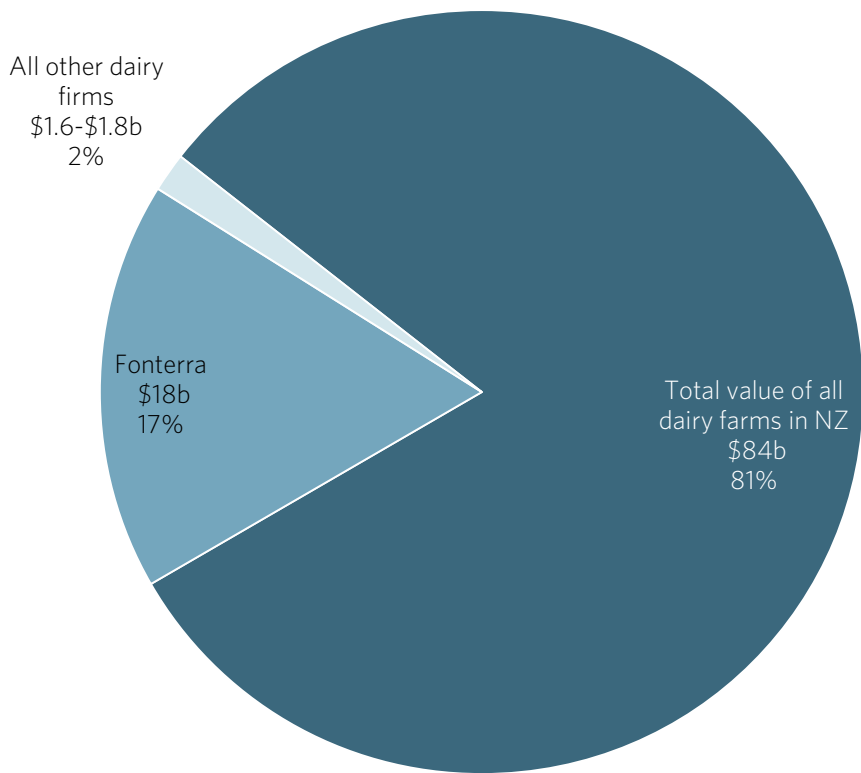
Presence: 2013

	Routine infant formula & growing up milk	Solutions infant formulas for common feeding problems	Specialty infant formulas and supplements	Industrial ingredients sold to others
Mead Johnson	<p>Infant formula</p> <ul style="list-style-type: none"> - Enfamil Premium - Enfamil Premium Newborn - Enfamil A+ - Enfalac A+ - Enfapro A+ - Enfapro Premium - SanCor Beb� - SanCor Beb� Premium <p>Children's Nutrition</p> <ul style="list-style-type: none"> - Enfagrow - Enfagrow A+ - Enfagrow Premium - Enfakid A+ - EnfaSchool A+ - Sustagen KID - Lactum - Alacta - ChocoMilk - Cal-C-Tose <p>Expecting & nursing mothers</p> <ul style="list-style-type: none"> - Expecta - EnfaMama A+ 	<ul style="list-style-type: none"> - Enfamil Gentlease: for gas/fussiness - Enfamil ProSobee: soy formula - Enfamil LactoFree: for lactose intolerance - Enfamil AR: for anti-regurgitation - Enfamil HA: for infants at risk of cow's milk protein allergy - Enfamil Comfort: for gas/fussiness 	<ul style="list-style-type: none"> - Nutramigen: for mild to moderate cow's milk or soy allergies - Nutramigen with LGG (probiotic) - Nutramigen AA: for severe cow's milk protein or multiple food allergies - Pregestimil: for fat malabsorption - Enfamil Premature: for premature infants - Enfacare: for premature infants - Enfamil Human Milk Fortifier: liquid supplement added to human milk for premature infants - 17 formulas targeted at specific disorders for use under the direct and continuous supervision of a physician; for example: <ul style="list-style-type: none"> - Mead Johnson BCAD for infants with "maple syrup urine disease" - Mead Johnson Phenyl-Free for infants with phenylketonuria - 15 other medical formulas 	<ul style="list-style-type: none"> - <i>None</i>
Westland	<ul style="list-style-type: none"> - <i>None</i> 	<ul style="list-style-type: none"> - <i>None</i> 	<ul style="list-style-type: none"> - <i>None</i> 	<ul style="list-style-type: none"> - Westpro Nutrition IF base powder - Westpro Nutrition follow on formula base powder - Westpro Nutrition Growing Up milk Powder Base

BARRIER 5 - LOW RETURNS

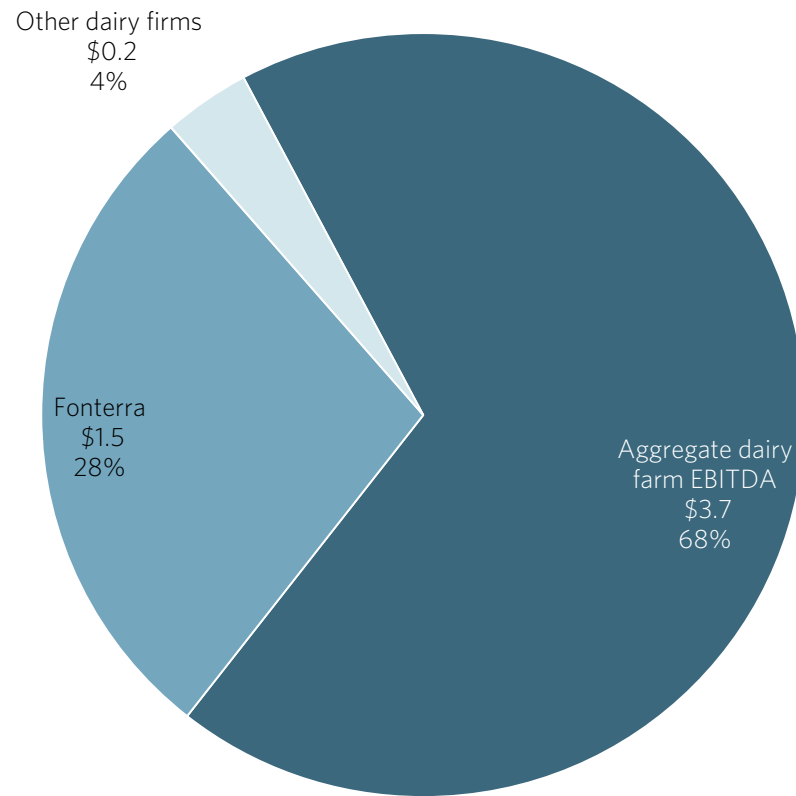
The New Zealand dairy industry generates low returns on its capital

Estimated/implied value of total New Zealand dairy industry
NZ\$b; 2012/13



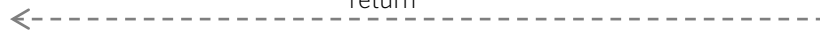
Total = \$105b
 (estimate)

Estimated total New Zealand dairy industry EBITDA
NZ\$b; 2012/13



Total = -\$5.4b
 (estimate)

5.2%
 return



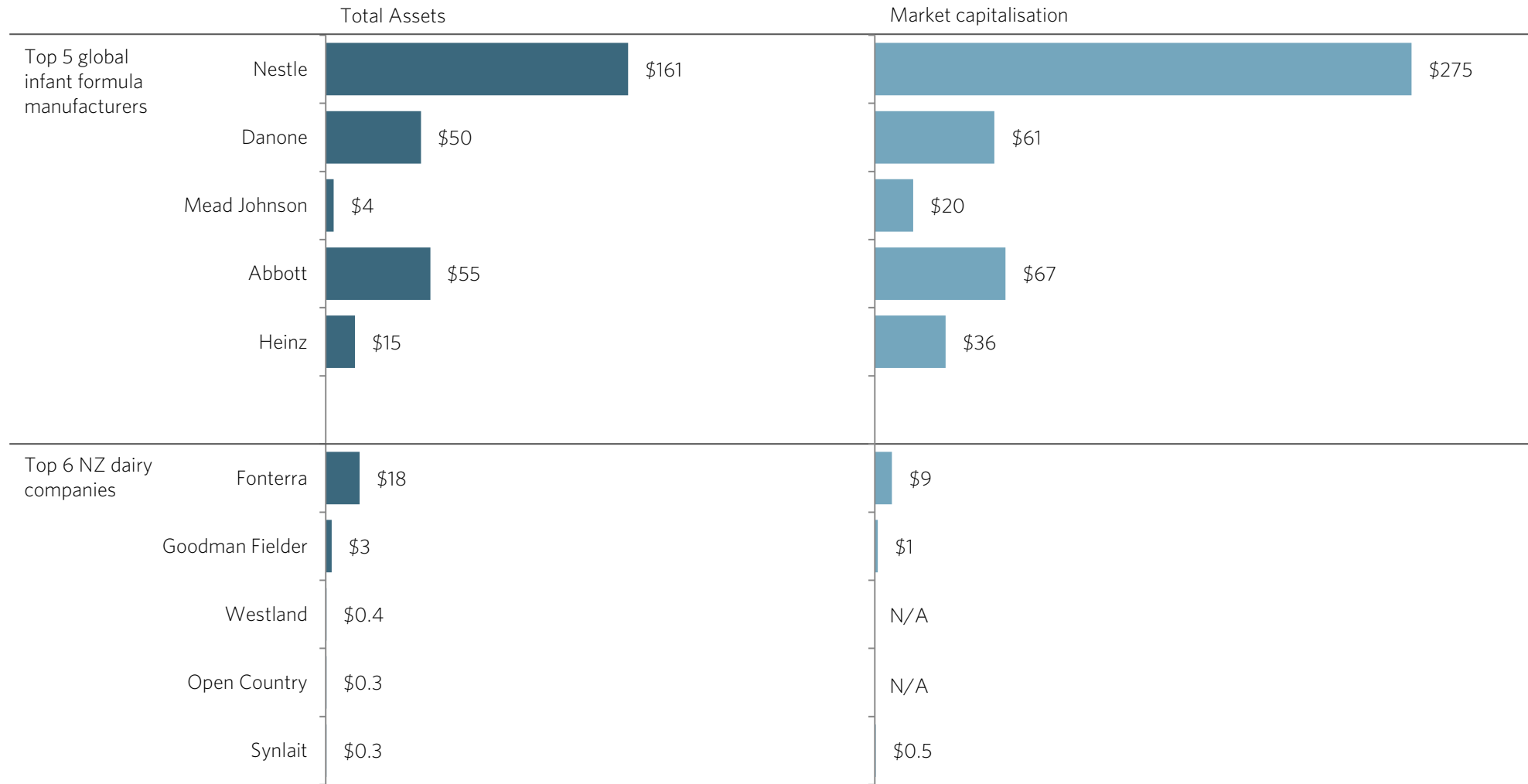
Source: various published annual reports; farm value (Average selling price per hectare of a New Zealand dairy farm from REINZ July 2013 \$34,882 X number of hectare in dairy farms in New Zealand from SNZ 2012Agricultural Census 2,414,769); Estimated aggregate farm EBITDA (excluding dairy co dividends) based on mean dairy farm from MPI Farm Monitoring Report 2012; Coriolis estimates and analysis

BARRIER 6 - LACK OF CAPITAL

New Zealand dairy companies are low in capital – measured either by total assets on the balance sheet or market capitalisation - relative to global category leaders

Comparison to total assets & EBITDA: top 5 global infant formula manufacturers vs. top 6 New Zealand dairy companies

NZ\$b; FY 2012



Note: Many of the firms on this last have wide ranging operations; value given is total company; Source: various company annual reports; Fonterra and Synlait Milk market capitalisation from NZX (<https://www.nzx.com/markets/NZZX>) as of August 2013; Heinz uses Berkshire/3G purchase price for market capitalisation; Coriolis analysis

BARRIER 6 - LACK OF CAPITAL

As a result of having a low return on capital and being low in capital, New Zealand dairy firms do not have the “financial horsepower” to buy into a leadership position in the global value chain

Select major acquisitions in the global infant nutrition industry

1980-2013

Acquirer	Year	Reported price	Target	Target detail
Numico	1981	N/A	Cow & Gate	- Leading infant nutrition brand in UK & Ireland
Numico	1995	US\$560m	Milupa	- Leading infant nutrition brand in Germany and Eastern Europe
Numico	2004	N/A	Tutteli & Muksu	- Leading infant nutrition brand in Finland & Baltics (from Valio)
Numico	2005	€400m	Mellin	- Leading infant nutrition company in Italy
Numico	2005	\$645m	Dumex	- Leading infant nutrition business in Thailand and throughout Asia
Danone	2007	€12.3b	Numico	- Largest infant formula producer in Europe; #2 global infant formula producer
Nestle	2012	US\$11.9b	Pfizer's infant nutrition unit	- Number six global infant formula producer; strong in emerging markets
Abbott	2012	US\$150m	Nutricion para el Conosur S.A.	- Leading mnfr. of infant formula in Argentina (SanCor Bebé and Bebé Plus)

Select major spin-offs of infant nutrition operations by global pharmaceutical firms

2010-2013

Firm	Year	Market cap	What was spun-off?	Target detail
Abbott Pharmaceuticals	2013	US\$51.8b	Firm split into nutrition (Abbott) and pharmaceuticals (AbbVie)	- #4 global infant nutrition firm; other non-pharma activities and products
Bristol-Myers Squibb	2009	US\$15.2b	Mead Johnson	- #3 global infant nutrition firm (acquired in 1967)

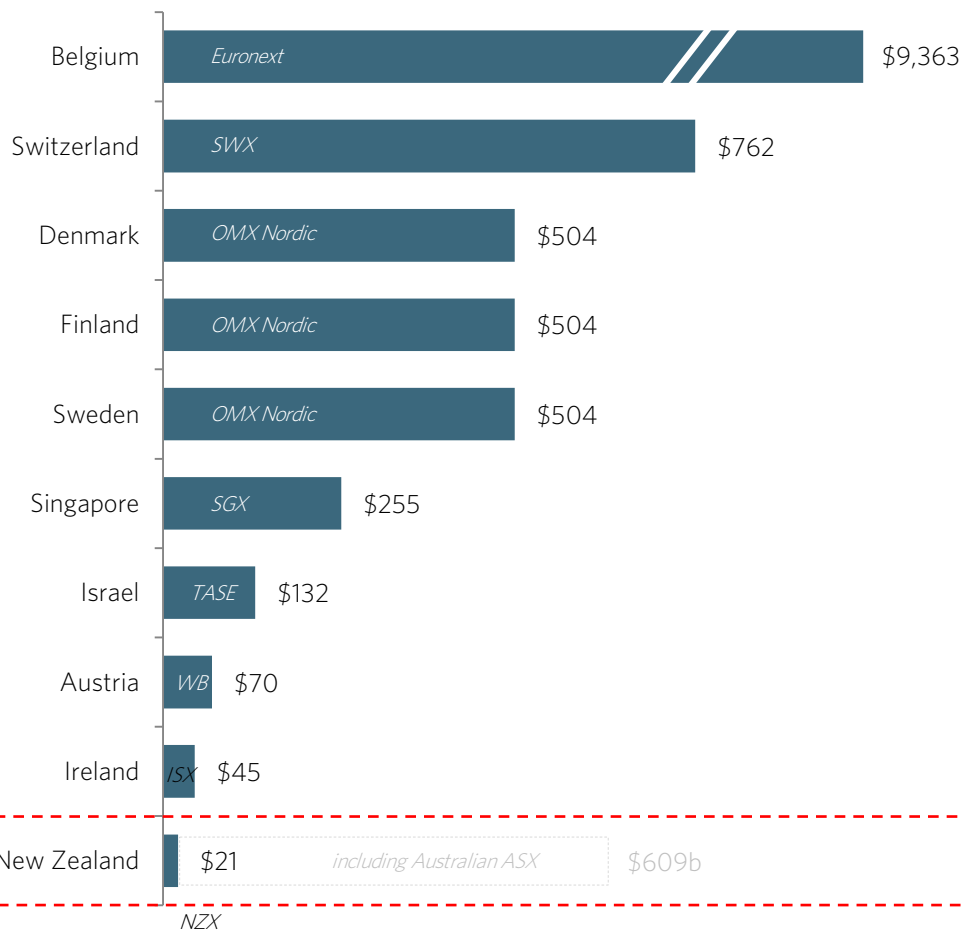
Versus Fonterra market capitalisation US\$8.7b

BARRIER 6 - LACK OF CAPITAL

New Zealand has a small stock market relative to peers and a relatively low market cap per person

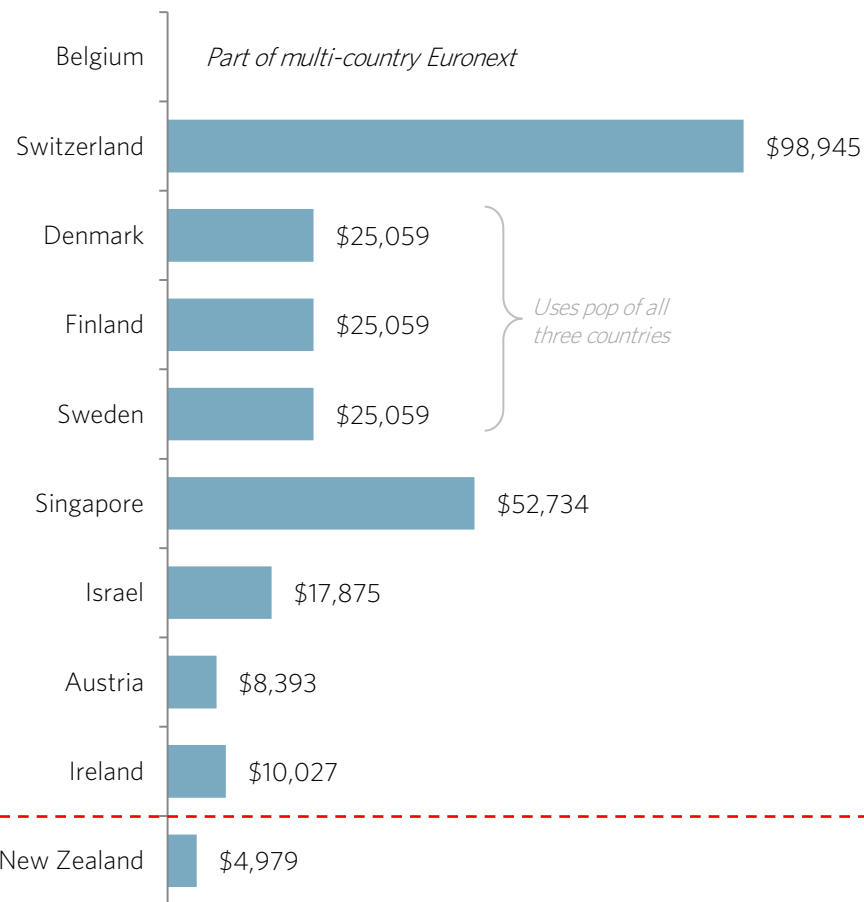
Market capitalisation of national stock exchange

US\$b; Jan 2009



Market cap per person of national stock exchange

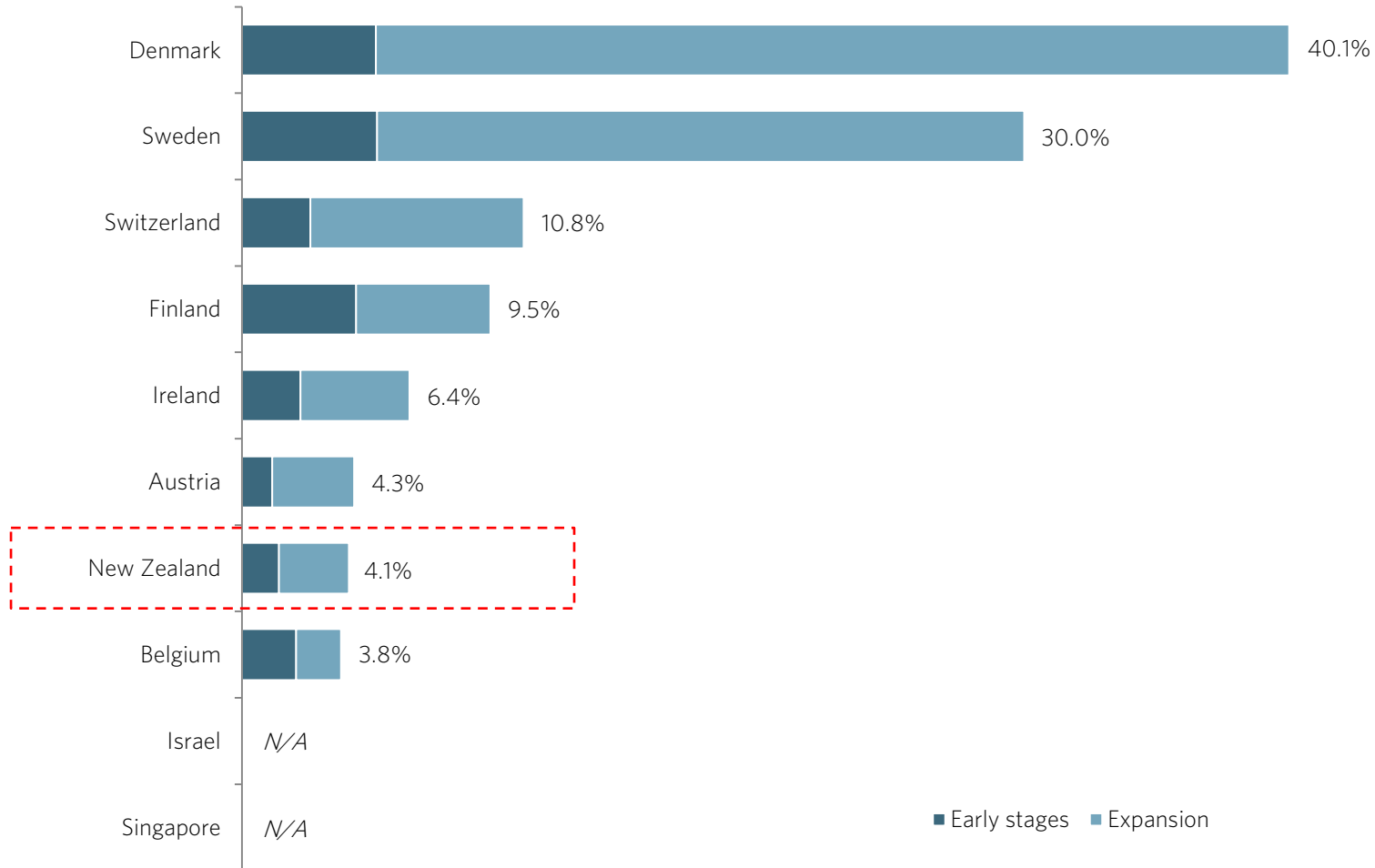
US\$; Jan 2009



BARRIER 6 - LACK OF CAPITAL

New Zealand does not have a lot of venture capital (VC) funding available

Venture Capital (VC) as a % of GDP
(% of GDP; 2005)



BARRIER 7 – STRUCTURAL CHALLENGES

Sometimes there are just insurmountable structural barriers blocking New Zealand from participation in the global value chains of some products

Examples of barriers to integration into global value chains

Various dates

	New Zealand example	Non-New Zealand example
Perishable nature of product	<ul style="list-style-type: none"> - Fresh milk (ca. 1920) - Fresh meat (ca.1900) 	<ul style="list-style-type: none"> - Chilled ready meals - Fresh cut flowers
Key inputs not produced cost competitively in country	<ul style="list-style-type: none"> - Wheat, corn & rice to feed chicken & pork - Tomatoes to produce pasta sauce 	<ul style="list-style-type: none"> - Milk in Japan for value added dairy products
Local production inefficient due to legal protection	<ul style="list-style-type: none"> - Pork and chicken (currently) 	<ul style="list-style-type: none"> - Egg and dairy in Canada - Milk and rice in Japan - Sugar and kiwifruit in the United States
Lack of scale in local production	<ul style="list-style-type: none"> - Hot sauce, tacos, frozen Indian meals & other ethnic dishes - Microwave popcorn 	<ul style="list-style-type: none"> - Kiwifruit industry in Kyrgyzstan, Switzerland and Bulgaria
Lack of supporting ecosystem	<ul style="list-style-type: none"> - Cranberries - Buffalo & sheep milk 	<ul style="list-style-type: none"> - Sheep in Denmark (143,890 head) - Farmed deer in the United States
Trade barriers	<ul style="list-style-type: none"> - Dairy products into the United States, Canada & Japan (currently) - Apples into Japan (currently) - Kiwifruit into South Korea (currently) 	<ul style="list-style-type: none"> - Australian lamb into Europe - Biotech crops into India
Legal ban on importation of animals or genetics	<ul style="list-style-type: none"> - Bird, animal and fish species not currently present 	<ul style="list-style-type: none"> - Australia - Many island nations
Presence of diseases that can be spread through food	<ul style="list-style-type: none"> - Fireblight on Apples 	<ul style="list-style-type: none"> - Avian Influenza - Bovine Spongiform Encephalopathy (BSE)
Local lack of required skills or expertise	<ul style="list-style-type: none"> - Wide pool of executives with FMCG/CPG sales & marketing experience (ca. 1970) 	<ul style="list-style-type: none"> - Cocoa beans to chocolate in the Ivory Coast
Lack of a differentiated enough local product to achieve premium needed for export success	<ul style="list-style-type: none"> - NZ biscuits into the United States - New Zealand wine into France 	<ul style="list-style-type: none"> - Finnish dairy in Asia

The second policy question coming out of this value chain research is to highlight how firms have become engaged in global value chains

- 1 Identify the barriers for NZ firms/industries to move to grow their value or capture a bigger share of the total available value; highlight how firms have become engaged in GVCs;
- 2 Highlight how firms have become engaged in GVCs;
- 3 Drawing on all the foregoing, and to the extent possible, identify the main implications for future government policy, especially in the areas of services and regulatory reform; how a coordinated 'think value chain' approach might be pursued across policy issues under negotiation; and where business could appropriately be involved to help identify policy constraints and provide critical data.

HOW & WHY DID NZ FIRMS BECOME ENGAGED IN THESE VALUE CHAINS?

New Zealand firms appear to have first become engaged in all three value chains – milk powder, infant formula and UHT milk – by copying ideas developed elsewhere to make money

EXAMPLE: When, how and why did New Zealand become engaged in the two (three) value chains evaluated?

1832-2013

	When did New Zealand become engaged in this value chain?	How and why?
Milk powder	<ul style="list-style-type: none"> - The first commercial production of dried milk was organized by the Russian chemist M. Dirchoff in 1832. In 1855, T.S. Grimwade took a patent on a dried milk procedure; Milk powder appears to have begun being produced in New Zealand in the 1900's (?) and exports begin around this time - Initially New Zealand exported milk powder primarily to the United Kingdom and other parts of the British Empire and Anglo-Sphere - Export markets grew over the 20th Century and trade barriers were reduced 	<ul style="list-style-type: none"> - Entrepreneurial flair and vigour - Copying and implementing an idea developed elsewhere in the world - To grow markets and increase sales
Infant formula	<ul style="list-style-type: none"> - The idea for "infant formula" emerged in the late 19th and early 20th Century clearly following on from the development of dried milk - The top four global firms in the market today all trace their origin back to this period - Infant formula would originally have been imported into New Zealand, introducing the idea - Glaxo ("The food that builds bonnie babies") was founded in Bunnythorpe, New Zealand in 1904 to make infant milk products, the firm exited domestic production in the mid 20th century - New Zealand would have been a supplier of no fat or skim milk powder to the major global producers of infant formula, particularly when they moved beyond their own home markets into the developing world (e.g. Wyeth & Mead Johnson plant construction in the Philippines in the 1960's) 	<ul style="list-style-type: none"> - Entrepreneurial flair and vigour - Copying and implementing an idea developed elsewhere in the world - To grow markets and increase sales
UHT Milk	<ul style="list-style-type: none"> - Dr. Ruben Rausing of Sweden launched the Tetra-Pak, the world's first laminated aseptic product in 1961 - Five year old dairy start-up Parmalat - founded by Calisto Tanzi of Parma, Italy - recognised the potential of the Tetra-Pak package and launched the world's first UHT milk in 1966 - Travelling New Zealand dairy executives would have seen and read about the product; some amount would have been imported into New Zealand - Initially New Zealand would have been a supplier of whole milk powder to in-market producers of reconstituted milk packed into UHT - In 1981 (?) - fifteen years after Parmalat invented the product - the Canterbury Dairy Farmers Co-operative in Christchurch, New Zealand installed the first UHT milk packing line in New Zealand. Ambury Milk in Auckland followed with a line of its own. 	<ul style="list-style-type: none"> - Entrepreneurial flair and vigour - Copying and implementing an idea developed elsewhere in the world - To grow markets and increase sales

ATTRACTING GLOBAL INVESTMENT

About 66 of the top 100 food and beverage firms in New Zealand are owned - in whole or part - by foreign firms; this suggests acquisition may be the main way firms are tied into global F&B value chains

EXAMPLES: Significant investors in F&B manufacturing in New Zealand
(Current as of 2011)

Asia



Australia



South America



Europe



North America



WHEN & WHY DID F&B MULTINATIONALS COME TO NEW ZEALAND?

An analysis of when and how global multinationals arrived in New Zealand suggests global category leaders acquire New Zealand category leaders to integrate New Zealand into their global value chain

Select global F&B multinationals in New Zealand: when and how they arrived

Select firms; 1930-2012

Firm	Year	How?	Leverage at time of acquisition or entry?
Cadbury	1930	Acquired #1 domestic chocolate manufacturer R. Hudson (founded 1868)	- Largest chocolate manufacturer in UK; #2 in world
Coca-Cola	1939	Licensed local firm to produce	- Largest soft drink manufacturer in the world
Ralston-Purina	1940s?	Acquired #1 domestic dry dog food producer Tux from Tiny Moore	- Global number one pet food manufacturer
Nabisco	1962	Acquired #1 domestic New Zealand biscuit maker Griffin & Sons (founded 1864)	- Largest biscuit manufacturer in the world
Kraft	1981	Acquired 49% of Butland/Chesdale Cheese (later 100%)	- Largest cheese producer in the world
Heinz	1992	Acquired #1 domestic sauce & canned maker J. Wattie Foods (founded 1934)	- Largest sauce manufacturer in the world
Numico	1990s?	Acquired only domestic infant formula business Karicare	- Global number two infant formula manufacturer
Danone	1990	Acquired #1 domestic biscuit manufacturer	- Second largest global biscuit manufacturer
LVMH	1990	Acquired Cloudy Bay winery	- Largest global champagne producer
McCain	1990	Acquired NZ Alpine Foods (Timaru)	- Global number two frozen french fry manufacturer
Allied Domecq	1991	Acquired listed #1 New Zealand wine producer	- Largest global spirits producer
Heineken	1993	Acquired majority share in listed #2 domestic beer brewer DB Breweries	- Largest European brewer; #3 globally
Pepsico/Frito-Lay	2006	Acquired #1 domestic potato chip maker Bluebird (from Goodman Fielder)	- Largest global potato/snack chip manufacturer
Suntory	2008	Acquired #2 domestic soft drink maker Frucor from Danone	- Second largest brewer in Japan
Kirin	2009	Acquired listed #1 NZ and #2 AU brewer Lion	- Largest brewer in Japan
Asahi	2011	Acquired #1 domestic juice maker (Charlie's) and #1 RTD alcohol (Independent)	- Third largest brewer in Japan

HOW DO FIRMS BECOME MORE ENGAGED IN GVCS?

Research suggests the following causes for firms becoming more engaged in global value chains

Firm Behaviour

- Invest in developing new skills or capabilities
- Technological innovation; R&D; IP creation
- Increase scale; new plant and equipment; gain market share
- Increase profitability
- Increase available capital

Industry Structure

- Acquire backwards or forwards
- Be acquired by a larger firm
- Joint-venture with a global leader

External conditions

- Changing market conditions
 - Key customers grow
- Customers become more sophisticated
- Improved trade access
- Changing regulatory environment
- Technological change (railway through to internet)

SOME PRODUCTS ARE MORE ENGAGING...

Some products just have more engaging value chains than others

Drivers of level of observed value chain engagement

Model; 2013

Indicators of a low engagement/integration value chain

Low value-added ingredient
(e.g. cocoa beans)

Low embedded intellectual property
(e.g. coal)

Product is pure **commodity** raw material
(e.g. salt)

Process/production technology **is well understood** and production capabilities are widely dispersed (e.g. rice farming)

Low comparative advantage; comparative advantage eroding
(e.g. New Zealand pork industry)

Legal and regulatory **barriers to ownership or trade**
(e.g. pharmacies in New Zealand)

Industry is **visible** and ownership is **political** or **newsworthy**
(e.g. dairy farms in New Zealand)

No historical "Top 5 global" firm **investment** in local activities
(e.g. chilled ready meals in New Zealand)

Industry is **capital intensive** with relatively low returns
(e.g. milk powder)

Industry is **domestically focused**; export are minimal

Most exports go to a **large** number of **small** markets
(e.g. sugar exports from New Zealand)



Indicators of a high engagement/integration value chain

High value-added differentiated good (e.g. Abbott Jevity High-Protein Nutrition With Fiber and NutraFlora® scFOS®)

High intellectual property component
(e.g. a turn-key coal fired power plant)

Product is **customised** key component used in next stage
(e.g. Coca-Cola Merchandise 7X)

Process/production is **difficult**; production capabilities rare and not readily accessed (e.g. premium confectionery)

High comparative advantage; increasing comparative advantage
(e.g. New Zealand dairy industry)

Low/no controls on ownership or investment in firms
(e.g. phone apps)

Industry is **invisible** to lay public; news coverage is non-existent
(e.g. industrial bushings in New Zealand)

Strong "Top 5 global" firm **investment** in local manufacturing
(e.g. beverages industry in New Zealand)

Industry has low capital intensity with high returns
(e.g. computer operating system software)
or Industry has high capital intensity with high returns
(e.g. commercial aircraft)

Industry is primarily **export focused**

Most exports go to a **small** number of **large** markets
(e.g. pet food from New Zealand)

WHY? SOME PRODUCTS ARE MORE COMPLEX

Some products have complex value chains, that involve a wide number of components, sub-components and activities that are at the technology frontier and themselves complex in their own right

EXAMPLE: Key components of an Apple iPhone 5
2013

Glass	Gyroscope
	
RF Chip	LCD Panel
	
Audio Chip	Chipset
	
Controller Chip	Controller Chip
	
Battery	DRAM/Flash
	

... and others



Assembly



Design
Operating System
iTunes
Other key software
Phone support
Sales & marketing
Wholesaling

Advertising



Huge range of other retailers



... and a huge number of others in every country on earth

WHY? SOME PRODUCTS ARE LESS COMPLEX

Other products have less complex value chains, that involve a smaller number of components and activities; components are well understood technologies that have been around for a long time

EXAMPLE: Key components of a 1l Meadow Fresh UHT Milk

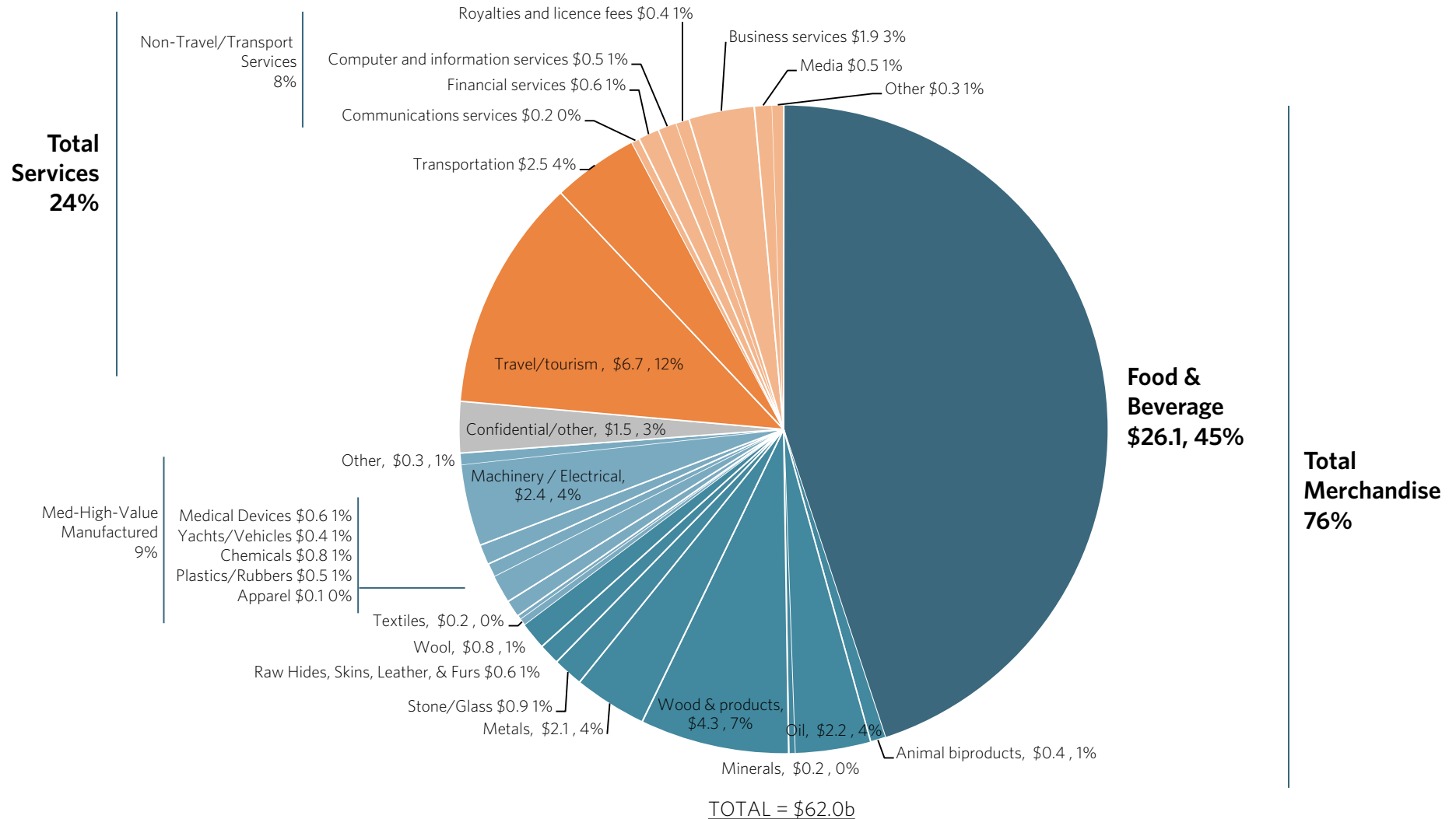
2013



WHY? WE EXPORT LOTS OF F&B

While New Zealand exports a wide range of products and services, exports are still dominated by food & beverage, oil, wood & products, oil, metal, stone and glass, hides, furs, wool and such like

Total New Zealand exports of goods and services by category
NZ\$b; 2012

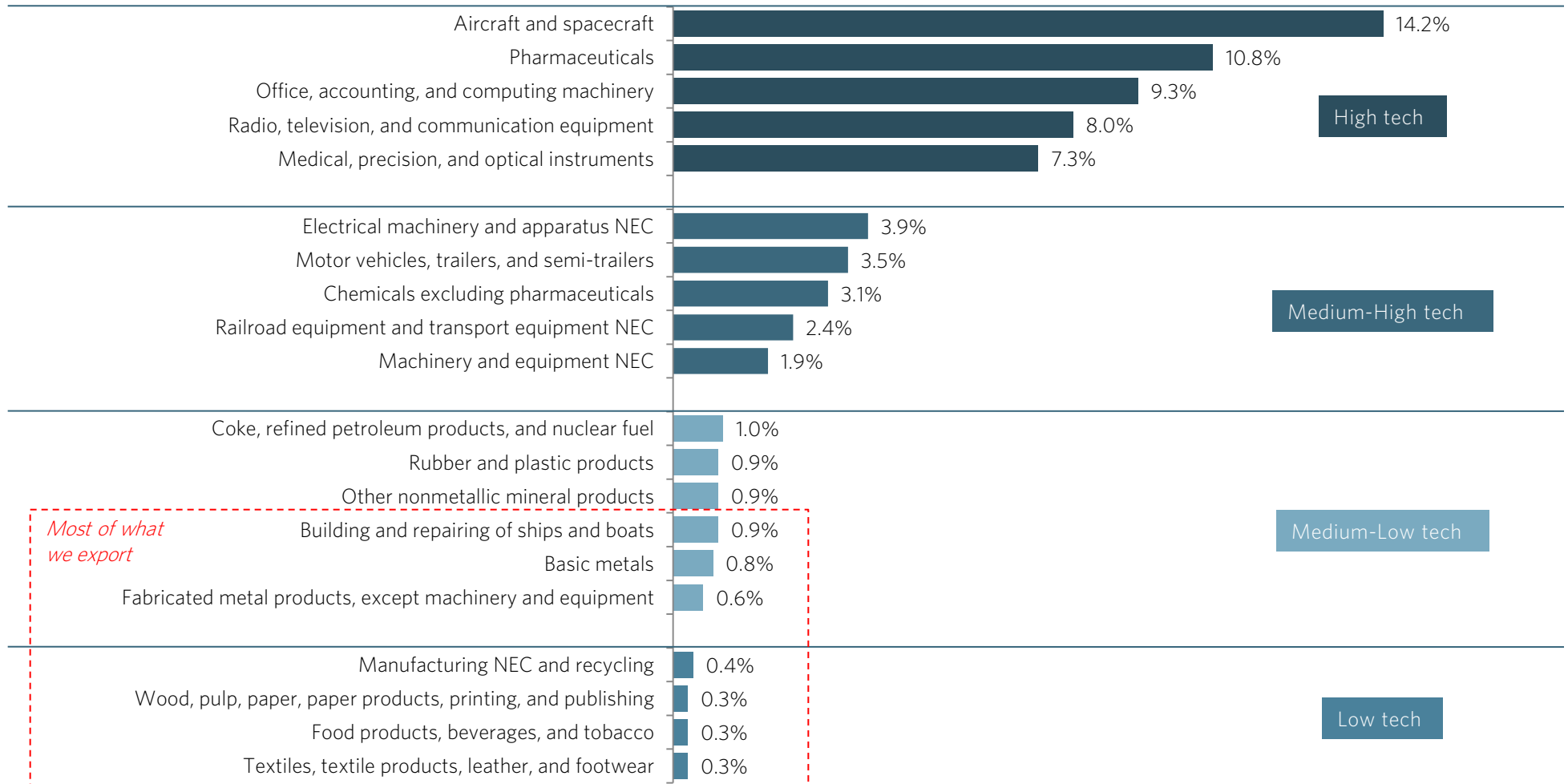


Source: Statistics New Zealand (Infoshare database; Census of International Trade in Services and Royalties); Coriolis analysis

WHY? MOST KEY EXPORT ARE LOW TECH

Most key New Zealand exports are low tech; if high tech items have highly integrated value chains and low tech items have low integration value chains, then this suggests the reason for the OECD/WTO results for NZ

Classification of manufacturing industries based on average R&D intensity (direct R&D expenditure as a % of turnover)
 (% of industry turnover; total OECD; multi-year average; 1991-1997)



Most of what we export

The third policy question is what are the implications to policy makers coming out of this value chain research

1

Identify the barriers for NZ firms/industries to move to grow their value or capture a bigger share of the total available value; highlight how firms have become engaged in GVCs;

2

Highlight how firms have become engaged in GVCs;

3

Drawing on all the foregoing, and to the extent possible, identify the main implications for future government policy, especially in the areas of services and regulatory reform; how a coordinated 'think value chain' approach might be pursued across policy issues under negotiation; and where business could appropriately be involved to help identify policy constraints and provide critical data.

Scope

The GVC analysis provides some new information and implications for policy but its strongest contribution is to draw together (as the phrase “think value chains” suggests) and sharpen the focus around a number of already known policy issues.

This project explores the implications for policy of attempts to improve the value that New Zealand businesses are able to extract from global value chains of which they are a part. Any attempt to achieve that needs to be grounded in a specification of what might realistically be considered to be “on the table”.

The fundamental underpinnings of organisational structures and economic policy settings are not considered to be open topics. For example, the whole matter of capital gains taxation (which could have implications for land values at the start of the value chain) is much wider than its impact on the value chain, and is accordingly assumed to be out of scope for this exercise.

Fonterra’s Co-operative structure has a rationale that goes beyond extracting value from particular markets it supplies ingredients to, and it is similarly out of scope.

New Zealand’s international interests are much more complex than extracting commercial value from bi-lateral and multi-lateral treaties,

agreements and relationships. The value chain “tail” is not presumed to be allowed to wag the overall national interest policy “dog”.

The project uses two specific value chains to generate the empirical data that provide some of the factors that can be used to inform policy development. An attempt has been made to extract lessons from the analyses that may have more generic policy implications, but there are likely to be particular features of other value chains that require other instruments to be applied, or that do not need to be addressed by the policies implied by the experiences of the two case studies developed in this project.

Stage III – Why? Implications

1. Identify the main implications for future government policy, especially in the areas of services and regulatory reform;
2. How a coordinated ‘think value chain’ approach might be pursued across policy issues under negotiation; and
3. Where business could appropriately be involved to help identify policy constraints and provide critical data.

Six key “big picture” value chain barriers were identified as part of the evaluation of the two dairy global dairy value chains

Identified barriers in evaluated global value chains

Model; 2013

Value chain barrier	Summary	Real world example from value chains evaluated
Low R&D Spend	<ul style="list-style-type: none"> - Low R&D spend limits access to higher value parts of value chain 	<ul style="list-style-type: none"> - Mead Johnson spends 2.4% of turnover on R&D while Synlait spends 0.3% (or eight times as much)
Lack of product development record in IF and UHT	<ul style="list-style-type: none"> - High “innovation” rhetoric and innovation playing a strong role in national mythology - Low actual in market portfolio of currently successful innovative products - Low historical track record of success (small portfolio of past successes) 	<ul style="list-style-type: none"> - Goat milk based formula is the only clearly identifiable innovation in infant formula to have come out of New Zealand and be in the market - New Zealand waited ~15 years following the invention of UHT milk to launch a product
Lack of history	<ul style="list-style-type: none"> - Lack of deep history, heritage and experience in difficult value added dairy products 	<ul style="list-style-type: none"> - New Zealand has a stronger deep history and experience in soft drinks than either UHT milk or infant formula (though not in dairy in general)
Lack of portfolio of products & brands	<ul style="list-style-type: none"> - Lack of portfolio of products and brands in high value categories 	<ul style="list-style-type: none"> - No New Zealand owned infant formula or UHT milk brands currently on the shelf in either leading supermarket in Singapore
Low returns	<ul style="list-style-type: none"> - Dairy farming has a low return on capital (though this is offset by gains in land values) 	<ul style="list-style-type: none"> - Dairy farming returns 4% on assets
Lack of capital	<ul style="list-style-type: none"> - Top 6 New Zealand dairy companies have low assets and low market cap 	<ul style="list-style-type: none"> - Market cap increase of Nestle in last year alone more than all NZ dairy processors are worth

Identify the main potential implications for future government policy, especially in the areas of services and regulatory reform

	What we found	Implications for policy
1.1	Historically, New Zealand has had periods where it developed and dominated global value chains (whole milk powder is an example), but has not sustained those dominant positions as well financed global businesses have moved in to capture take over control of the GVC	Market structure (size of firms, firm capitalisation, geographic distance) has made it difficult to sustain value chain dominance, which implies either that policy should support consolidation within a segment of the market “beachhead”, or seek to support continued exploration of new market opportunities and pockets of value around the world
1.2	At times, New Zealand businesses have anticipated emerging market opportunities and established an early presence in them (dairy into Asia) but do not seem to have followed that up to consolidate market dominance and as a result has lost opportunities to extract full value from the emerging GVC.	Improved market intelligence may enable “fleet of foot” New Zealand businesses to continue to renew sources of value, even if they cannot sustain dominance in the face of better capitalised global competitors.
1.3	New Zealand tends to be an ingredients supplier to global value chains.	This is not necessarily a poor public policy outcome, but it does limit potential for sustained growth in value, instead locking New Zealand businesses into growth paths that are volume dependent and where profits may be relatively low.
1.4	Even where ingredients can be sourced from competing and lower cost countries, New Zealand is among a handful of countries that are seen as suppliers of choice.	This source of competitive advantage tends to arise from consistency and reliability of ingredient supply, which is vulnerable to a loss of either, and to quality improvements by competitor country suppliers.
1.5	Global businesses that dominate markets at the branded retail end tend to have vastly greater in-market sales forces than potential New Zealand competitors.	In the immediate future, this implies that extracting further value from global value chains needs to concentrate on developing processing at their intermediate stages.

Identify the main implications for future government policy, especially in the areas of services and regulatory reform

	What we found	Implications for policy
1.6	Developing high value products in part of the global value chain requires substantial capital investment that is beyond the capacity of the scale of most New Zealand enterprises.	NZ firms need more support in identification and development of niches and regions or other pockets of value around the world where NZ has the resources to compete with a real prospect of success. Enhanced direct inwards investment by foreign firms, where possible in partnership with New Zealand businesses.
1.7	The small scale of the New Zealand market confronts businesses with the dilemma of whether to commit the substantial resources needed to make the “leap” into value added, offshore processing and market servicing.	Business and industry development assistance and advice can help businesses confront the dilemma but it is ultimately one that only business can determine.
1.8	Owners of businesses might have commercially rational reasons to focus on shorter term, risk averse investment horizons and resist committing substantial levels of assets that have the (uncertain) potential to generate returns over extended periods of time (decades)	In New Zealand, a significant proportion of traded output is delivered through user-owned, rather than investor-owned businesses (i.e. cooperatives). Policy should avoid trying to impose standardised investment solutions on business.
1.9	Shares of global value added tend to be lower to New Zealand businesses relative to shares of total assets committed to supply those chains.	Some of this arises from the process of capitalising increased returns into land values, which implies a much broader policy focus. In the meantime, the implication is once again to promote intermediate level further processing of ingredients.
1.10	New Zealand businesses have been slow in sourcing complementary ingredients from other countries to complement local ingredients in producing sophisticated, high value consumer products.	Causes are complex, and in large measure historical. Foreign competitors have established defensible market positions

Identify the main implications for future government policy, especially in the areas of services and regulatory reform

	What we found	Implications for policy
1.11	Scale is a factor that drives unit cost when New Zealand businesses seek to import complementary ingredients to capture more of the value from product processing within their New Zealand operations.	Policy needs to recognise that at times, scale and distance are relevant considerations in shaping the structure of New Zealand industry (i.e. ingredients exporting focus).
1.12	Global businesses have been consolidating through mergers and takeovers and have developed robust and defensible market positions in the more mature developed countries.	The implication is that there will be low and slow returns from further investment in mature, developed economy markets. Other regions may still provide valuable opportunities.
1.13	China is a growing and evolving market with participation hotly contested, and with local businesses favoured by government policies	China provides an opportunity, but should not be taken for granted and may prove to be only a short/medium term opportunity. Partnerships with Chinese businesses could be encouraged where appropriate and in New Zealand's interests.
1.14	Products and countries go through lifecycles, with opportunities to gain value from participating in them greatest at the early life stage when product innovation is strong and supply is fragmented, but that tends to be followed by rapid consolidation and domination by a few large businesses	Ideally, systems should be in place to support New Zealand businesses to identify the next generation of relevant market opportunities.
1.15	Higher value products such as Infant Formula may demand more stringent quality assurance systems and regulatory oversight than lower value commodity ingredients, Foreign governments can themselves encourage and support market consolidation in the face of public safety concerns with supplies from poorly supervised small scale firms, as a way of ensuring effective oversight of product standards.	Reinforces the importance of robust and transparent food safety, quality assurance and traceability systems. This will protect returns to New Zealand businesses even in an "ingredients supplier" end structure

How a coordinated 'think value chain' approach might be pursued across policy issues under negotiation?

	What we found	Implications for policy
2.1	Government funded R&D is similar (as a % of GDP) to that of other countries, but private R&D is substantially lower	It is not obvious that private R&D is inappropriately incentivised, but with the existing funding balance, it is important to get the best possible returns from an expense that is so heavily public sector dependent. Taking into account the results of GVC research could help target government R+D spend more effectively on innovation in response to higher value segments of value chains and market demands.
2.2	Support for innovation need not be limited to, or best delivered through, "science" in the conventional view of it	
2.3	In market assistance to New Zealand businesses is patchy, and does not compensate for the scale of in market presence that the main competitor businesses can mount	
2.4	There is no apparent "joined up" approach between various government agencies to ensure consistent support to value added business development strategies being pursued by specific businesses	R&D, industry, regional or economic development programmes, trade policy, inward investment regulation and market assistance could better co-ordinate so that returns are optimised
2.5	Attraction of inward direct investment is not focussed on investors that seek to augment New Zealand participation in higher value sections of global value chains	A policy that rests on the prospective inward investor seeking regulatory approval is essentially passive, and while the destination of inward investment is changing, change is somewhat slow.
2.6	It is important to recognise that governments (including foreign governments) have a direct stakeholder interest in value chains through returns they extract from them in the form of sales and company taxes, tax on earnings of employees and the like	Recognition of the returns from rather than cost to governments of support to enhanced participation in global value chains will inform policy on appropriate levels of additional supports to business development

Where business could appropriately be involved to help identify policy constraints and provide critical data?

	What we found	Implications for policy
3.1	New Zealand firms historically have tended not to have significant presences in the most valuable parts of the two value chains studied, but instead to be heavily represented in lesser value commodity ingredients. Nonetheless, investment in manufacture of high-value products such as Infant Formula over the last 10 years demonstrates there is an opportunity for manufacture in New Zealand. Public statements from major NZ cooperatives also signal a shift towards more high value products higher up the value chain.	Implications of GVC research should be taken into account more actively in forming trade policy. Market access in realistic future potential product opportunities that have higher value should be taken into account in setting trade policy priorities.
3.2	Environmental, public health and other social policy standards that need to be met in foreign markets are not always clearly understood by New Zealand businesses seeking to get established in emerging markets	The implications are a combination of provision of information to prospective exporters or businesses seeking to expand abroad, and approaches to trade negotiations to seek to establish basic standards across trading partners
3.3	New Zealand firms face substantially higher barriers to entry to other markets than other countries face in entering New Zealand	Where these exist, the appropriate response is trade policy negotiation as opposed to subsidisation.
3.4	There is no central, comprehensive database that identifies the regulatory barriers that New Zealand firms face in either exporting to, or directly investing in, overseas markets	The lack of such a database is a disadvantage to both investors seeking to capture a greater share of the global value chain, and to officials seeking to refine regulatory policy to facilitate it.
3.5	Information on tariffs and on other administered restrictions on market access and market activity are relatively difficult to obtain, especially for smaller businesses	Further improvement in availability of information will assist business planning
3.6	Government policy advisors do not necessarily have a clear micro level understanding of either the needs of end consumers, or of the commercial profiles of various industry sectors when designing policies to assist with extracting values from global supply chains	Improved market intelligence will feed in to improved policy design
3.7	Medium sized businesses are not always aware of the existence, extent and content of trade agreements that are negotiated from time to time	Difficulty in sourcing relevant up to date information tends to leave New Zealand businesses as respondents to market requests as opposed to being active initiators of commercial opportunities. Intensification of existing business outreach by government in New Zealand is likely to yield further growth dividends.

Appendix

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