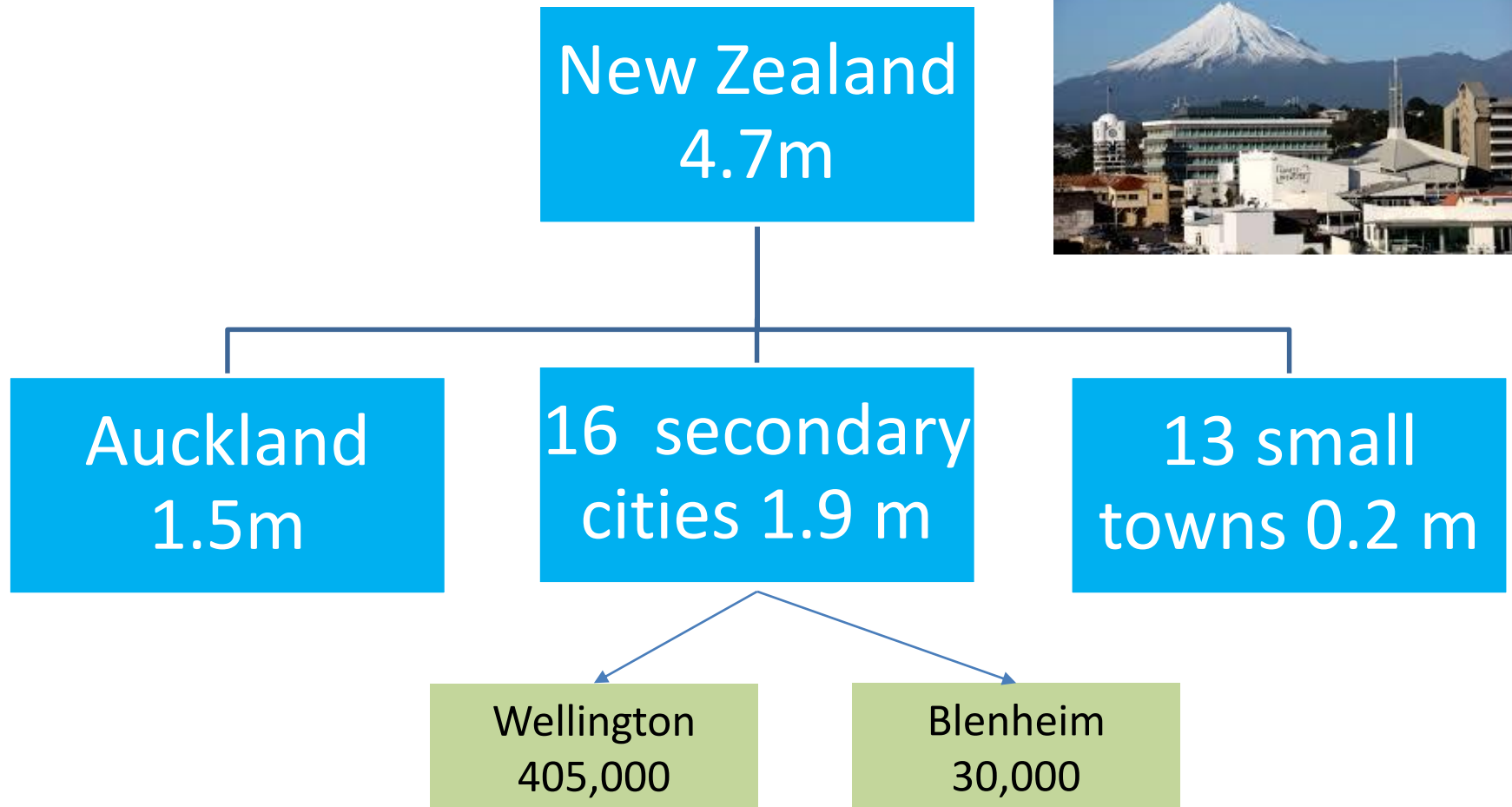


Spatial Productivity Research Regional Employment Trends

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Productivity Commission

Understanding employment growth in second tier cities

2016 population



Understanding employment growth in second tier cities

From 1976 – 2013, employment grew by 48% in NZ cities and towns

9 Medium growth
15 – 48%

12 Slow growth
< 15%

9 Fast growth
> 48%

Tokoroa
-44%

11 slow
-10% to +14%

8 fast
65% -176%

Queenstown
+361%

What correlates with success?

Fast Growing

- Auckland, Hamilton, Tauranga
- South Island locations with sun or scenery
- Satellite towns to major centres

Slow Growing

- Cities and towns in the bottom half of the South Island (except Queenstown)
- Smaller regional centres in the North Island, especially small towns

US evidence suggests that fast growing cities have one of two characteristics

Business cities

- High income, buoyant business environment
- Agglomeration advantages
- Historical location
- B- Resilient (good at reinventing themselves)
- NY, LA, Chicago, Boston, San Francisco, Houston (?)

Consumption “Sun” cities

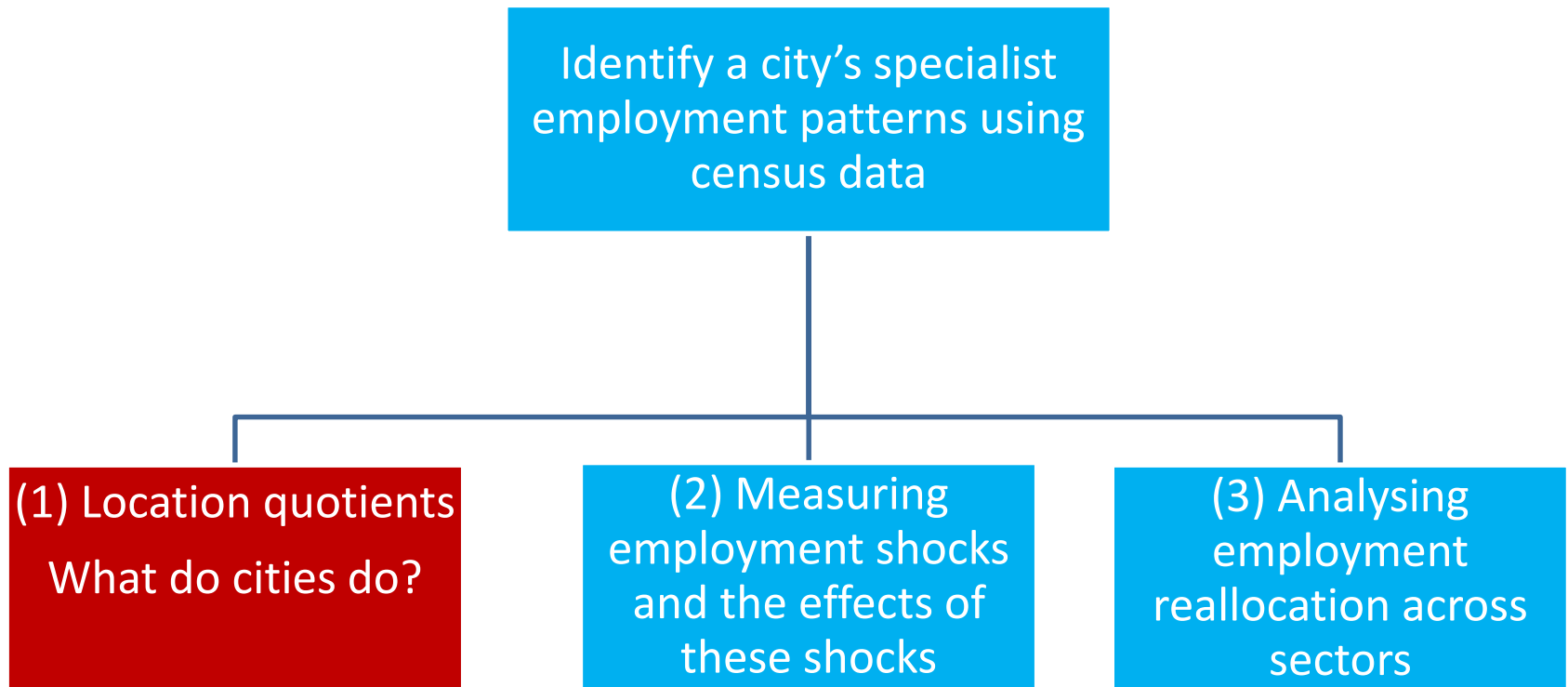
- Good natural amenities
- Luxury good
- Particularly attractive to older people
- Often have low incomes
- Southeast, Southwest, and California

Can we find explanations for New Zealand growth patterns that do not rely sun, surf, or proximity to Auckland?

Our main question

- How much of NZ's cross-city variation in employment growth can be explained by shocks to a city's specialist industries?
 - Do positive or adverse employment shocks explain why some cities have grown so fast or so slowly?

City employment patterns and shocks



Use census data identifying employment in
65 2 – 3 digit ANZIOEC sectors, 1976 - 2013

(1) Location Quotients

Two types of goods



Local goods and services little sold outside the city

- dentists
- retail
- construction

Found in all cities

Main employment

Specialist goods and services primarily sold outside the city

- manufacturing
- some professional services

Characterise a city

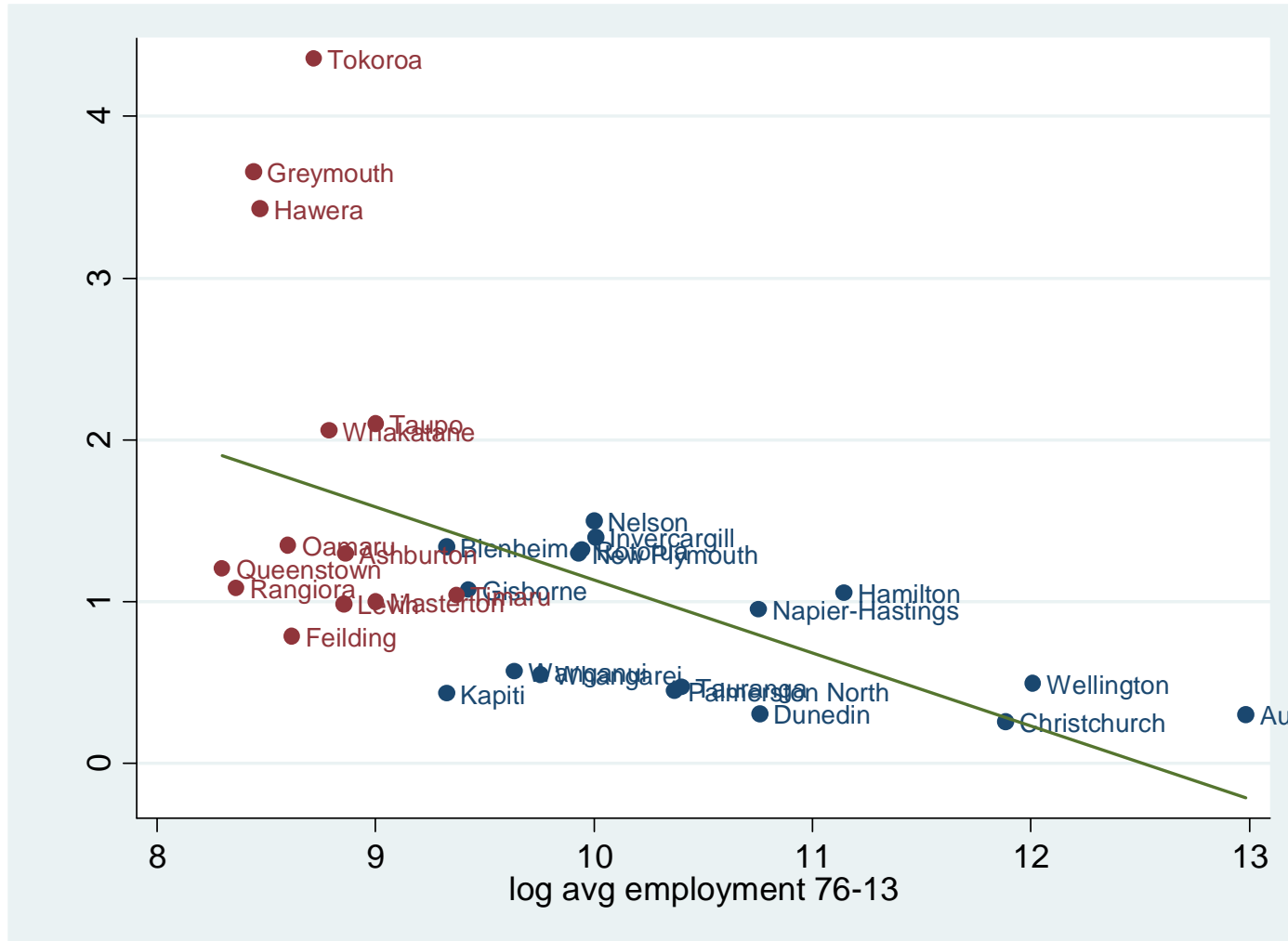
(1) Location Quotients

- We use *location quotients* to identify non-tradeable and tradeable sectors

$$LQ_{l,i} = \frac{\text{fraction of local workforce in sector } i}{\text{fraction of national workforce in sector } i}$$

- We use 65 sectors (2 – 3 digit ANZIOOC codes)
- A high value implies a city speciality (tradeable)
- Low variance across cities implies non-tradeable goods
- High variance across cities implies speciality goods

There is a negative relationship between city specialisation and size



What do small and medium cities and towns do ?

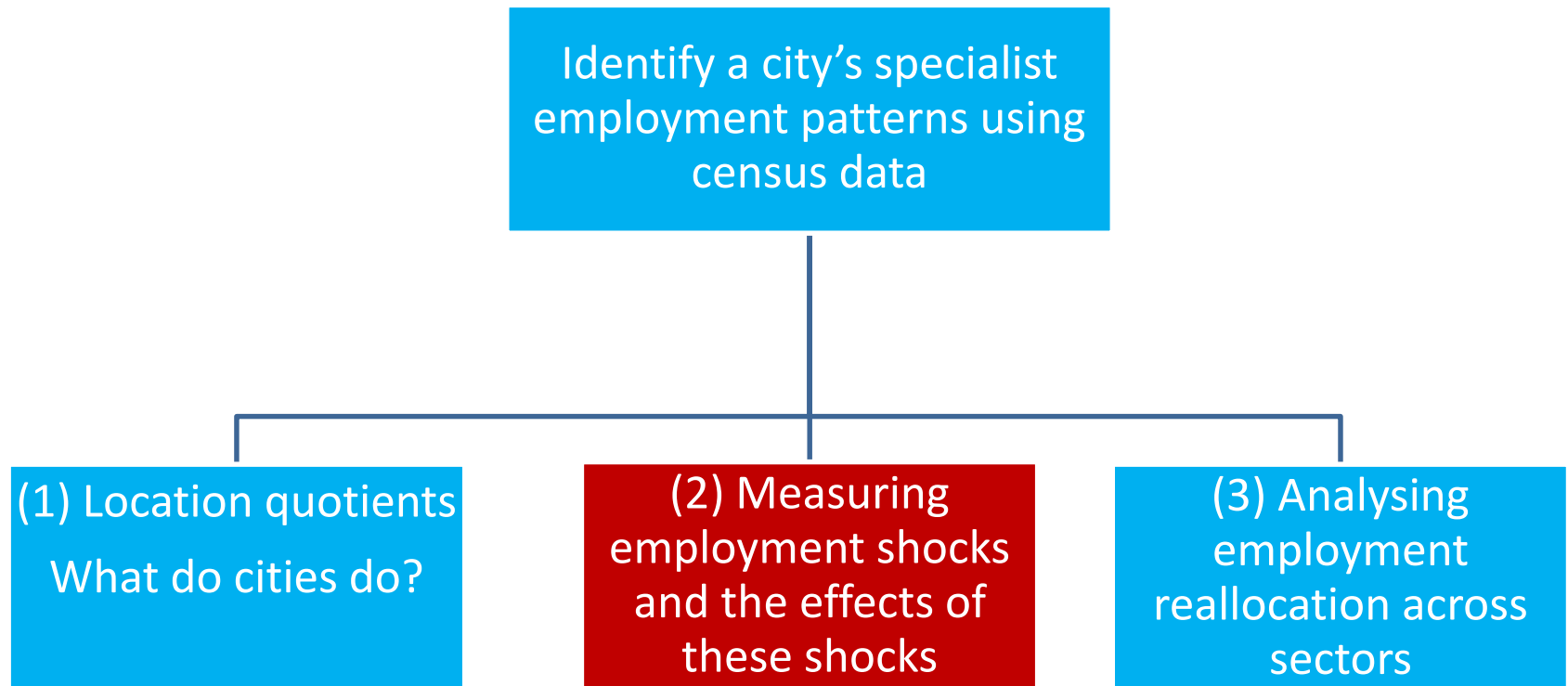
Sectors		Share relative to national average		
		Auckland	Medium cities	Small towns
Retail	11%	-0.7%	1.2%	2.4%
Construction	7%	-0.3%	0.6%	1.1%
Health and Education	17%	-1.9%	2.4%	-0.1%
Professional services	17%	3.2%	-4.9%	-7.2%
Highly specialised manufacturing (High LQ variance)	8%	-2.8%	4.4%	10.4%
Moderately specialised manufacturing (moderate LQ variance)	8%	1.7%	-1.4%	-1.8%

Small towns: very large specialist manufacturing, and large retail; very low professional services

Medium cities: large specialist manufacturing, health and education; low professional services 11

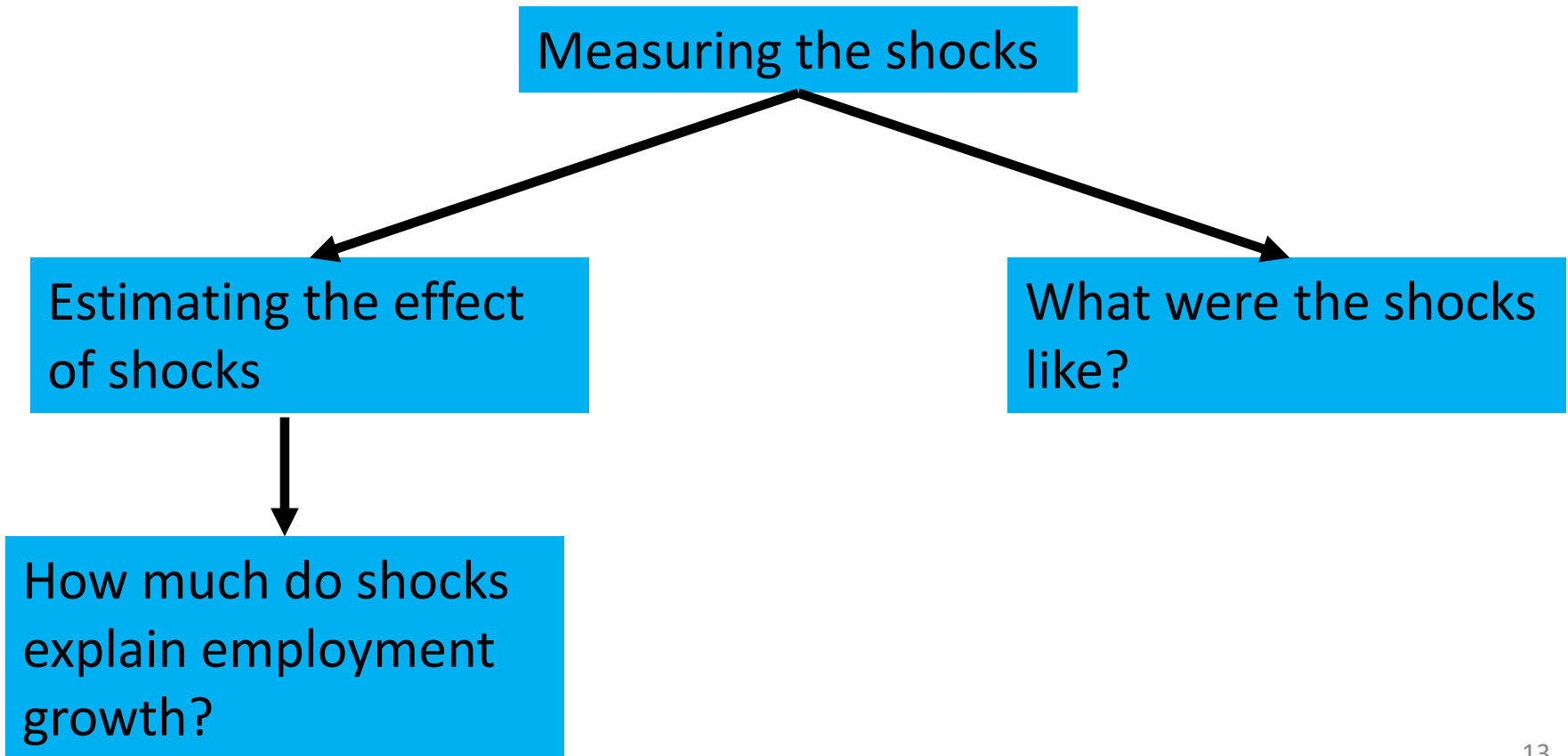
Auckland: large professional services; low health and education

City employment patterns and shocks



Use census data identifying employment in
65 2 – 3 digit ANZIOEC sectors, 1976 - 2013

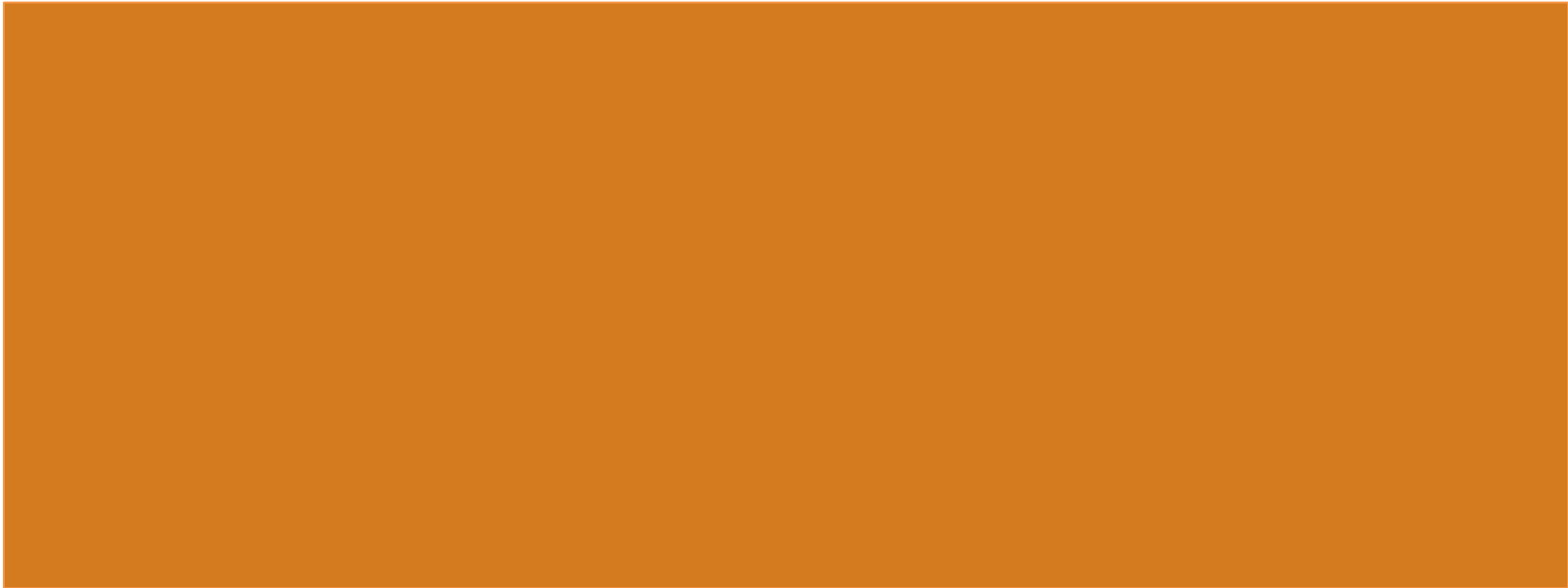
How do sector-specific shocks affect employment growth?



How do sector-specific shocks affect employment growth?

- We focus on *total employment shocks* and *shocks to export and intermediate manufacturing sectors* (XI sectors)
- We define a shock as the employment change a city would expect if its XI firms went up or down at the national average rate for that industry.
- How much would employment expand or contract if each industry expanded at the national average, taking into account a city's initial over-weight or under-weight position in the industries?





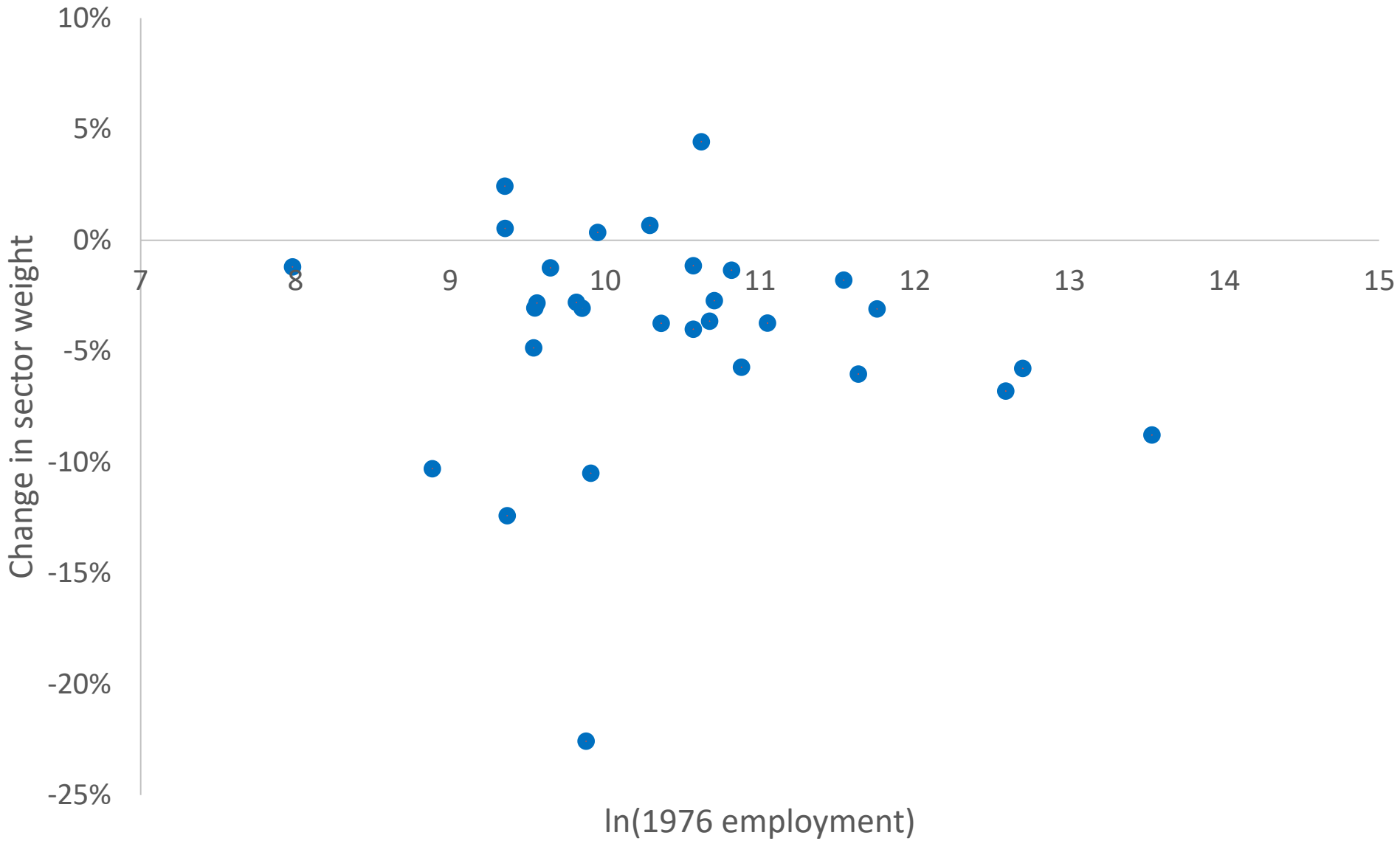
Basic results

1. Since 1996 most of these shocks, particularly shocks to specialist sectors, have been negative.
2. Employment shocks do affect subsequent employment growth
3. The effects are huge for Tokoroa and Queenstown but not for other places – these small towns are unusual
4. These shocks don't explain much of the employment variance for medium and large cities but are qualitatively important for small towns

Result 1 – what are the shocks?

- What shocks have cities experienced?
- Shocks to Export and Intermediate sectors have largely been negative.
- Since 1996 they have disproportionately affected smaller towns and cities
 - large places were worst affected in the 1980s

Change in export sector employment fraction by city size, 1976- 1996



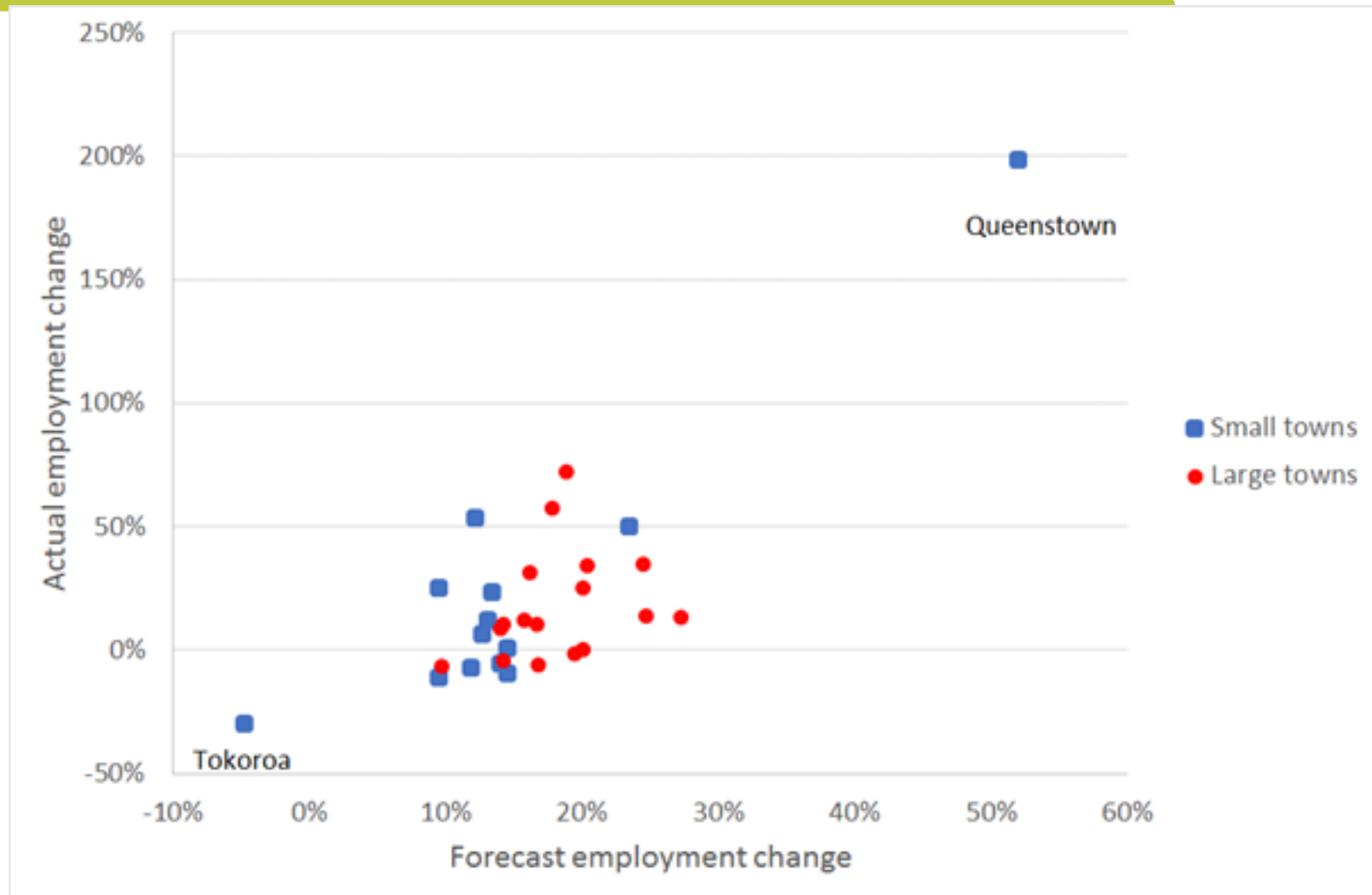
Change in export sector employment fraction by city size, 1976- 1996



Result 2

- National industry shocks *can* have large and long lasting effects on small towns
- Overall they have not explained much of NZ city-level employment changes

Forecast industry-weighted employment change and actual employment change, all cities, 1976 - 1996



Result 2 – long term effects

- From 1976- 1996, 62% of the variance of employment changes can be explained in terms of national shocks to specific sectors
- BUT 70% of the cross city variance in employment growth rates is attributable to Tokoroa and Queenstown due to negative and positive shocks to the pulp and tourism industries
- Excluding these points, less than 10% of employment variance is explained by sector specific employment shocks – and less than 5% 1996 – 2013.

Result 3 – short term effects (5 year changes)

- Over 5 year periods, forecast employment shocks explain actual employment changes.
- In small towns, it appears there is a multiplier effect
- These shocks explain 25% of actual employment variance across cities (including Tokoroa and Queenstown)
- They explain a much smaller fraction of variance in medium sized and larger cities (8%)

Regression: 5-year employment changes vs forecast changes

	All 30 cities and towns		17 cities		13 towns	
	β	R^2	β	R^2	β	R^2
	1.78	0.26	1.13	0.08	2.28	0.41
	(0.37)**		(0.37)**		(0.36)**	

Time dummies included

R^2 is the fraction of variance of employment changes explained, adjusted for common time period effects

Result 4 –effects of manufacturing shocks

- We examine the effect of *shocks to export and intermediate (XI) manufacturing* on city employment
 - Export and intermediate employment
 - Total employment
 - Employment in other sectors
- We subdivide the results into shocks in the highly specialist XI sectors and the moderately specialist XI sectors, noting that the former are disproportionately shocks to small towns.

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- Forecast shocks affect local XI manufacturing employment, but the coefficient is not exactly 1.
 - Shocks to highly specialist sectors affect total employment – when these jobs are lost, total city employment falls.
 - Shocks to moderately specialist manufacturing have little effect in total employment – employment is found in different sectors.
 - The biggest offsetting employment changes in this case are in professional services and personal services – this tends to be a big city phenomena.

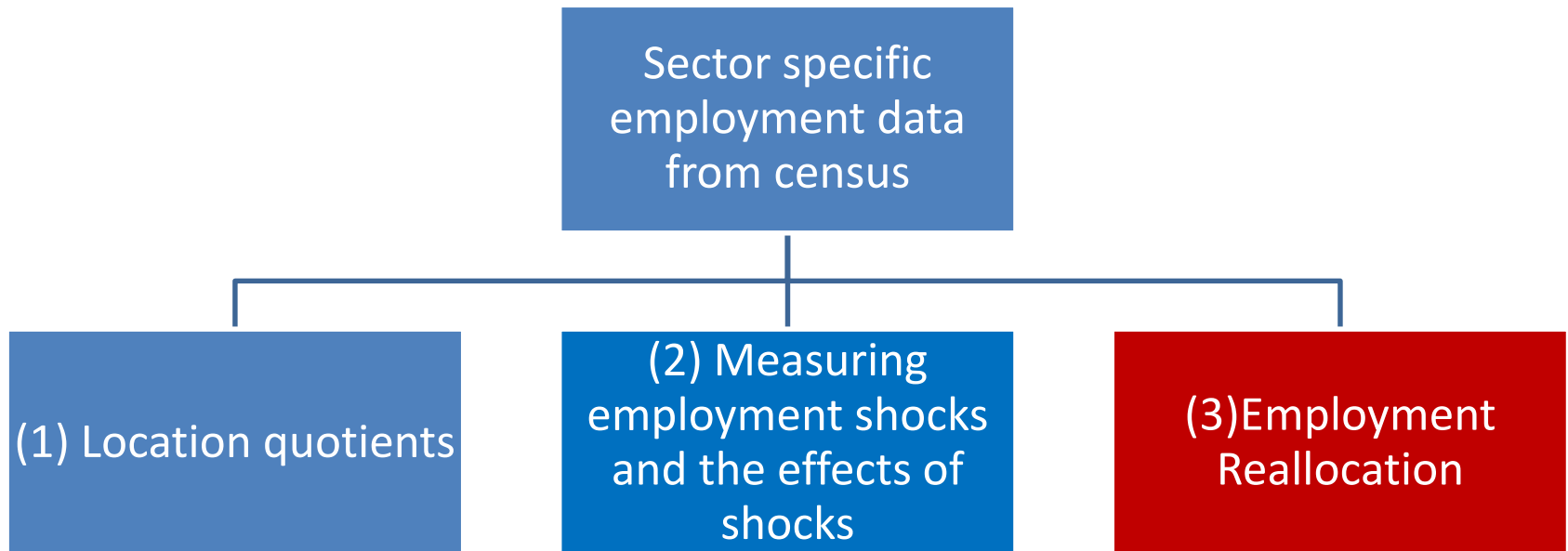
The response to export and intermediate manufacturing shocks.

	Highly Specialised XI	Moderately specialised XI
XI employment	0.66** (3.75)	1.40** (8.0)
Total city employment	1.27** (2.4)	-0.2 (0.2)
Professional services	0.03 (0.3)	-0.68** (3.6)
Personal services	-0.03 (0.3)	-0.26** (2.4)
Retailing	0.13 (1.6)	-0.24 (1.6)
Hospitality	0.11** (2.3)	-0.04 (0.1)

Summary results

1. Employment shocks do affect subsequent employment growth
2. The effects are huge for Tokoroa and Queenstown but not for other places – these small towns are unusual
3. These shocks don't explain much of the employment variance for medium and large cities but are qualitatively important for small towns.
4. The most important shocks are in export or highly specialised sectors – sectors over-represented in small cities

City employment patterns and shocks



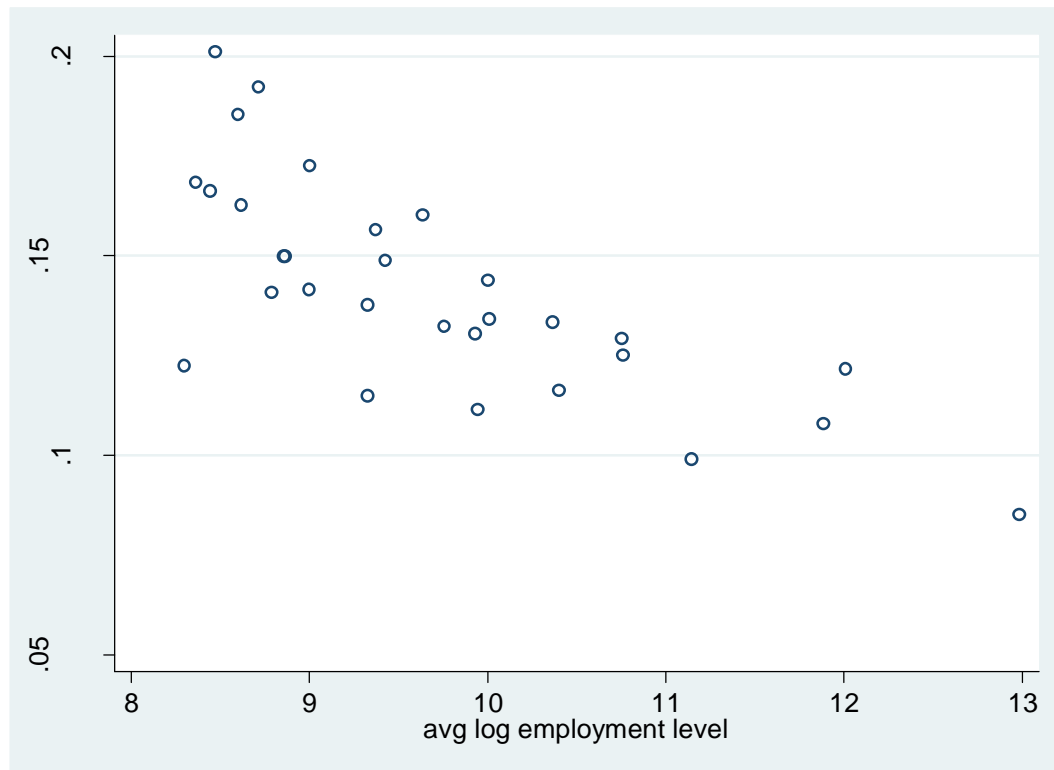
Sectoral Employment Reallocation

- We examine the extent that people move between sectors in response to shocks.
- Our measure is “excess employment churn”
- Excess Churn is the amount of expansion and contraction occurring across sectors that is greater than needed to provide net job growth.

Sectoral Employment Reallocation

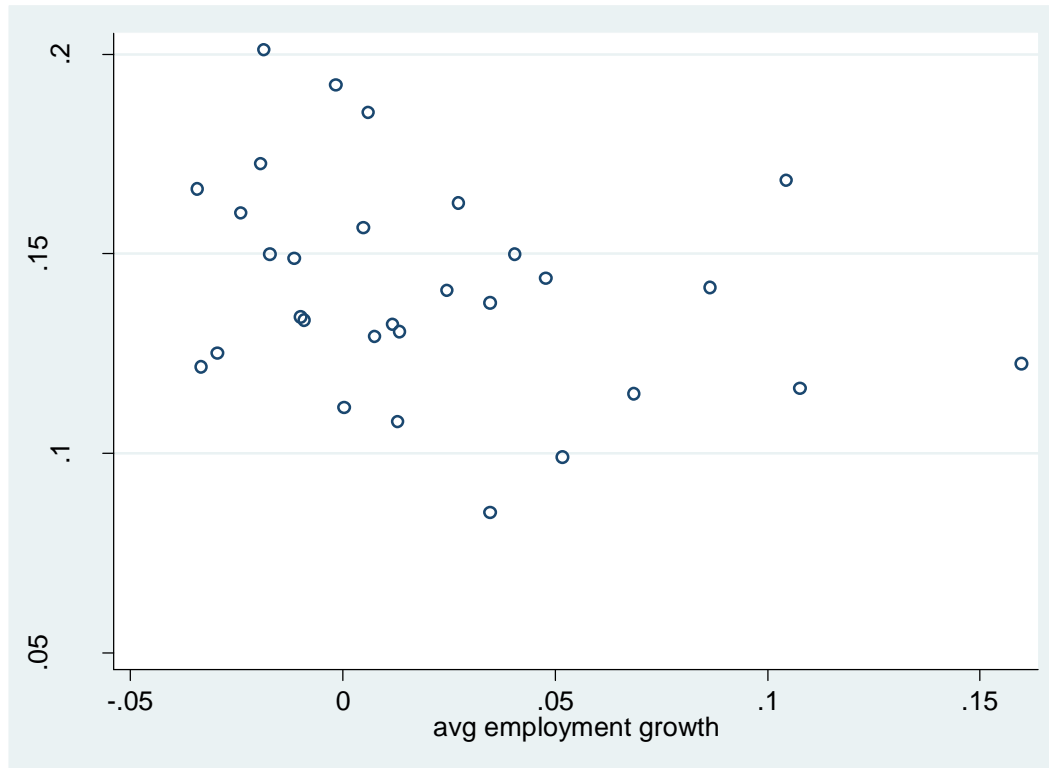
- We explore how the amount of reallocation depends on city size and population growth rates
- Reallocation of employment across sectors is much higher in small and slowly growing cities
- This may represent a loss of job-specific skills and explain lower productivity in small centres

Excess churn by city size, 1976 – 2013 average



Small cities appear to have much higher churn

Excess churn by employment growth, 1976 – 2013 average



Slow growing cities have higher churn

Conclusions

- Smaller towns and cities are more exposed to specialist sectors, often export sectors, than large towns.
- Nationwide shocks to these sectors have largely (but not always) negative over the last 40 years
- Job losses (or increases) from these sectors have affected employment
- These sector-specific shocks only explain a small fraction of overall employment growth variance across cities

Conclusions

- Adverse shocks to small cities have been important
- Overall, explanations for employment growth based on consumption amenities seem more promising – but this doesn't help cities or towns with raw climates or poor scenery.
- Small towns appear to have disproportionately large job churn as people relocate between sectors more frequently than in big cities.