VALUING CULTURAL DIVERSITY OF NEW ZEALAND CITIES

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Cultural diversity seen as an urban amenity or disamenity

During the last fifteen years economists have started to quantify the impact of cultural diversity on businesses and people. One method to do this is through linking diversity to observed differences in wages and rents in a cross-section of cities, using an economic theory published by Jennifer Roback in 1982. Roback looked at the effects of features of cities, such as a pleasant climate or accessibility, that might benefit producers and consumers. Such features are usually referred to as amenities. Unpleasant features, i.e. disamenities, can also be considered, for example crime or pollution. Cultural diversity can be considered an additional (dis)amenity of a city. Page (2007) argues convincingly that diversity of the workforce makes firms more innovative and better at solving problems. On the other hand, he also acknowledges that diversity can make decision making more difficult. When producers on balance benefit from diversity, those who are in culturally diverse cities are able to pay higher wages and rents than those in less culturally diverse places and still be equally profitable. Consumers also generally like diversity because of what it offers in terms of the richer range of social interactions, a variety of cuisines, other culture-related goods and services, an exciting urban landscape, etc. However, psychologists have found that people do like to interact most with those who are similar to them, i.e. they like to have a lot in common with their neighbours (a phenomenon called homophily), see e.g. Bakens et al. (2018). When consumers on balance value cultural diversity of a city they would be willing to pay for living in a diverse place in terms of higher rents and lower wages and yet be equally happy as those living in a less diverse place.

As long as businesses and people can move freely between cities, and real estate and labour markets are competitive, differences in wages and rents between cities should reflect the combined impact of all observed and unobserved amenities and disamenities, including cultural diversity. By calculating correlations between these city-specific wages or rents and observable city characteristics, it is possible to see which amenities matter most and to whom. However, this methodology does require the researcher to account for differences between cities in terms of types of firms and workers. Hence the cross-city comparison is usually made in terms of "standardised" wage and rent "premiums" and not in terms of observed wages and rents. This approach to valuing amenities has been previously applied by Chen and Rosenthal (2008) in the US and by Preston et al. (2018) in New Zealand. Ottaviano and Peri (2006) found that diverse cities in the US are more productive. This CaDDANZ research brief summarises the findings of Maré and Poot (2019) regarding the correlation between cultural diversity of cities and wage and rent premiums in New Zealand; and the implications for consumer wellbeing and producer productivity.

Diversity and the spatial equilibrium model

The Roback model can be easily displayed graphically, see Figure 1. The curve $c(w, r; d)$ represents the various combinations of a city's wage w and rent r that for a particular type of firm would yield the same unit cost (c^*), given a certain level of diversity d (below we will elaborate on how to measure diversity). To keep unit cost constant, higher wages would require lower rents and vice versa, with the slope of the curve reflecting the relative importance of wages and rents in firms' costs. We can draw similar curves above the displayed one that have unit cost higher than c^*, or below the displayed one that have unit cost lower than c^*. If diversity is a productive amenity and the city's level of diversity is increasing, the curve $c(w, r; d) = c^*$ shifts up, leading to higher wages and rents where firms benefit from diversity.

The curve $v(w, r; d)$ represents a fixed level (v^*) of utility (i.e., satisfaction) that is associated with varying combinations of wages and rents: consumers would be indifferent between either low wages and low housing costs or high wages and high housing costs. If consumers benefit from diversity and diversity increases, they would be willing to accept a lower wage for a given rent. Hence, the "indifference curve" shifts down, leading to lower wages and higher rents where diversity is appreciated by consumers. The slope of the curve reflects the proportion of workers' earnings that are spent on housing. What is true for diversity is true for any other amenity as well. We therefore expect places where amenities are on average productive to offer high wages and rents, while wages and rents are low in places where disamenities make firms unproductive. At the same time, amenities that make a place pleasant would lead to high rents but relatively low wages, whereas disamenities that make a place unpleasant must coincide with high wages and low rents, otherwise workers would migrate away from there. A key challenge when we try to gauge the effects of local diversity is to separate the contribution of diversity differences from the many other factors that contribute to a place's relative attractiveness.

Figure 1: Equilibrium variation of wages and rents across places
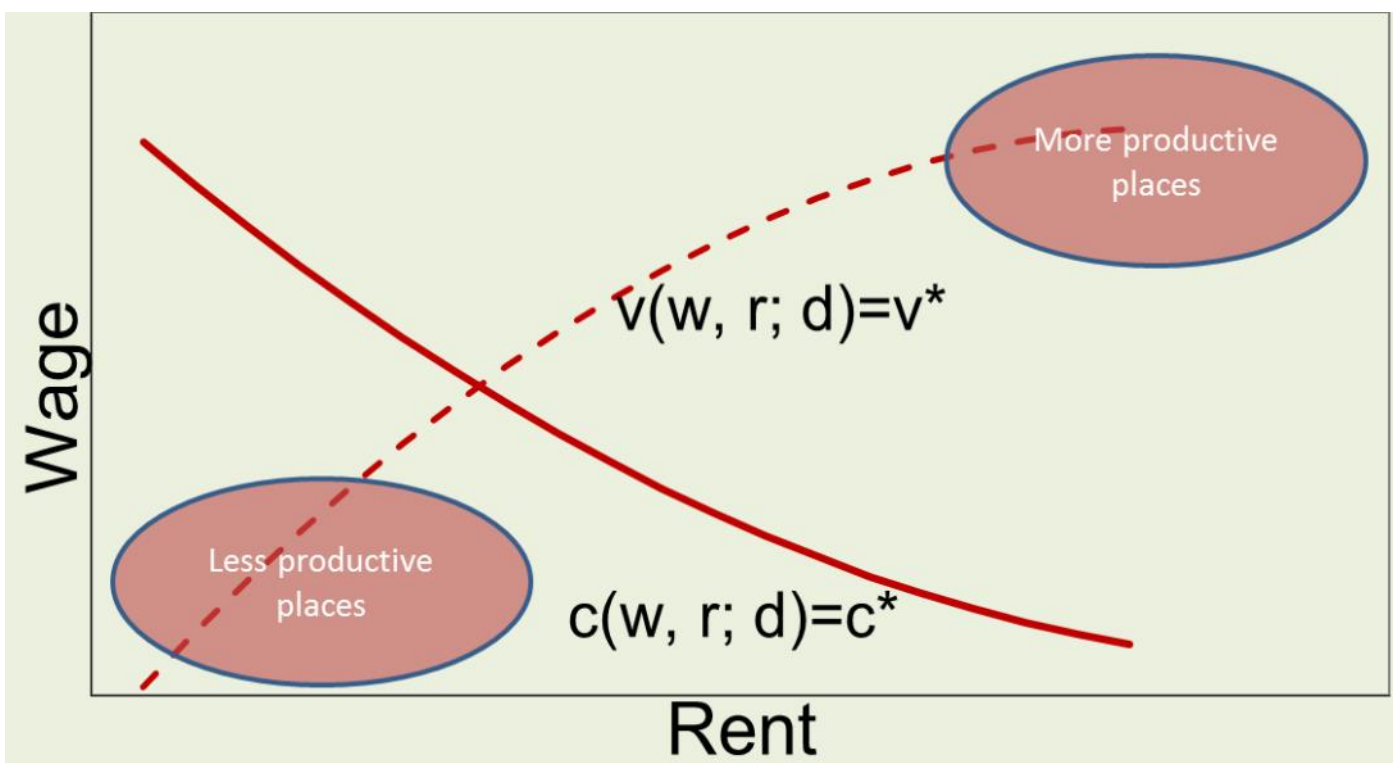
City wage and rents premiums and the impact of birthplace diversity

This theory has been applied to New Zealand unit record census data on individuals and dwellings in 110 urban areas spanning 32 years (7 censuses from 1981 to 2013). Wages were proxied by the reported total income of those employed fulltime. To control for cross-city variation in the workforce, a regression method was used and account was taken of age, gender, qualifications, industry, country of birth, ethnicity and religion. Rents were based on the rent reported in the census by those who live in rental accommodation (35% of the total population in 2013). It was assumed that these rents are highly correlated with the equivalent weekly full cost of owning similar homes, so that the rents can be thought of as applying to everyone. To control for cross-city variation in the type and quality of dwellings, a regression method was used that includes the number of rooms, bedrooms, heating fuel and type of dwelling as variables.

After controlling for differences between cities in workforce composition and housing stock, there continue to be residual inter-city differences in wages and rents that we refer to as wage and rent premiums. These are displayed for 2013 in Figure 2, but figures for the other census years look similar. Each urban area is represented by a circle that is proportional to the population of the city or town. Comparing Figure 1 and Figure 2, we see that cities such as Auckland (including Pukekohe) and Wellington (including Kapiti) are "more productive places" while places such as Whanganui, Gore, Oamaru, Gisborne and Levin are "less productive places" (relatively speaking). On the other hand, Queenstown and Nelson are "more pleasant places" while Tokoroa and Hawera are "less pleasant places" (again relatively speaking). However, given that the urban areas appear clustered in an upward sloping band in Figure 2, we can conclude that consumers are on average roughly equally happy wherever they are. The observed differences in rent and wage pairs across cities then reflect notable productivity differences between New Zealand cities and towns.

The impact of cultural diversity can be calculated by regressing the wage and rent premiums on a measure of diversity. The most popular way of measuring diversity is the so-called fractionalisation index, which can be interpreted as the probability that two individuals who randomly meet are of two different cultural backgrounds. We first measure cultural background in terms of country of birth, but we also consider ethnicity and religion. We account in these regressions for permanent intrinsic differences between cities, national time trends in wages and rents, local population growth and local employment growth. Finally, we need to correct econometrically for the possibility that cultural diversity is itself affected by wages and rents, i.e. reverse causality. The arrow in Figure 2 (starting at the coordinates (0,0)) represents the resulting estimated impact of a one standard deviation increase in birthplace diversity: an increase in rents of 0.134 (i.e. 13.4%) and in wages of 0.040 (4.0%). The ellipsis around the arrow head displays the relatively small statistical uncertainty of these estimates. The direction of the arrow to the northeast shows unambiguously that firms benefit from diversity in terms of greater productivity. It can be calculated that the index of productivity increases by 0.055. For consumers, the slope of the arrow is a little more than that the upward sloping line of worker indifferences. This implies that consumers are slightly less well off (an index of utility declines by 0.013) due to the increase in birthplace diversity. Our conclusion that consumers prefer homogeneity would be reversed if the upward-sloping line were steeper, as would occur if housing costs accounted for a slightly higher proportion of expenditure than we assume for our main estimates.

The key findings turn out to be quite robust to varying the sample of urban areas, the index of diversity and the type of diversity. It turns out that the larger the city, the more favourable the impact of diversity on productivity. With respect to the slightly negative impact on consumers, this effect is somewhat more negative in the main urban areas other than Auckland, Wellington and Christchurch, but is in fact positive in small urban areas. When comparing the period 1981-1996 with 2001-2013, the net benefits from diversity were larger in the earlier period, when the level of diversity was still a lot less than at present. There are mathematically many different ways to measure diversity but the choice of an index does not change the conclusions, at least not in a qualitative sense. However, calculations with one index that has been designed to measure polarisation (the extent to which a city's population is culturally polarised into two large groups, with all other groups combined having a small share of the population) shows that polarisation lowers productivity.

City wage and rents premiums and the impact of birthplace diversity

Finally, Table 1 shows how the results vary depending on whether diversity is measured in terms of birthplace, ethnicity and religion. Column 1 shows the wage effect and the rent effect of birthplace diversity that is also displayed in Figure 2 (0.040 and 0.134 respectively). "Standardized lnFR" refers to the standardized natural logarithm of the fractionalization index. The regression uses 770 observations (110 urban areas in 7 census years). "Change in QL (quality of life)" refers to the effect on consumers that takes account of the relative importance of housing cost in the consumers' budget and the extent to which the wage may reflect a (dis)amenity of diversity in terms of utility. As stated previously, the QL utility effect is slightly negative (-0.013). "Change in QB (quality of business)" refers to the effect on producers that takes into account the relative importance of the use of land in overall business costs. This effect is positive (0.055). Column 2 shows that when we measure cultural diversity by ethnicity, the changes in QL and QB become smaller (and change sign for QL). The reason for this is not obvious. It could be argued that ethnicity is a better measure of cultural identity than birthplace (given that the latter for example groups NZ-born Europeans, Māori and other ethnicities together). On the other hand there has been considerable variation over time in how ethnicity has been measured in the census, whereas country of birth is more consistently defined and measured. Column (3) shows that the effect of religious diversity on wages is essentially zero, while the effect on rents is negative (-2.2%). Taken at face value these results suggest that religious diversity can be interpreted as a disamenity to consumers but has no effect on the productivity of firms.

Table 1: Wage and rents impacts of different types of cultural diversity

	Birthplace Diversity (1)	Ethnic Diversity (2)	Religious Diversity (3)
	(a) Wage Equations		
Standardized lnFR	0.040***	0.013***	0.002
	(0.007)	(0.004)	(0.003)
	(b) Rent Equations		
Standardized lnFR	0.134***	0.088***	-0.022***
	(0.021)	(0.011)	(0.008)
Observations	770	770	770
Change in QL	**-0.013***	**0.005***	**-0.006***
	(0.007)	**(0.003)**	**(0.002)**
Change in QB	**0.055***	**0.023***	**0.000**
	(0.008)	**(0.004)**	**(0.003)**

Note: Standard errors in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Figure 2: The estimated impact of birthplace diversity on wage and rent premiums
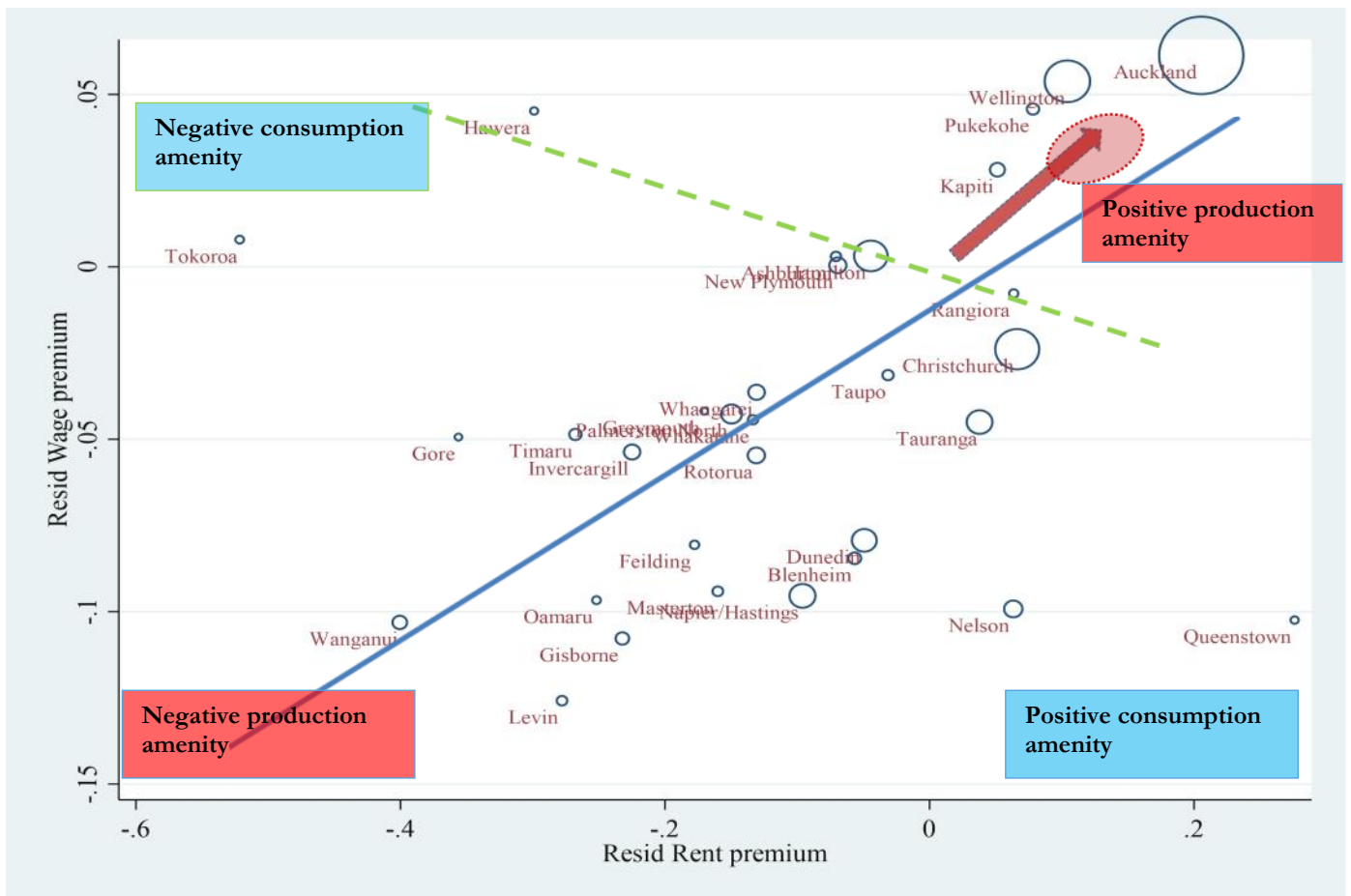
Summary

Our conclusion is that population diversity of cities and towns affects their relative attractiveness to businesses and to people. Using birthplace fractionalisation as our main measure of cultural diversity, our research has shown that cultural diversity serves as a positive productive amenity, as reflected in firms' ability to pay higher wages and rents in more diverse areas. This finding reaffirms for New Zealand what others have found for other countries. For example, Ottaviano & Peri (2006, p.39) state that "a more multicultural urban environment makes US-born citizens more productive". For residents, diversity acts as a weak negative consumption amenity, implying that in diverse places they seek higher wages and lower rents to compensate, but the effect is much smaller than on business. A one standard deviation proportional rise in birthplace fractionalisation raises the attractiveness of an area to business by 0.055. This can be shown to be an impact comparable to increasing city size by 47%. The impact of diversity on attractiveness of a city to residents is a decrease of -0.013, comparable to the impact of a 14% increase in city size.

There are many ways in which these results can be verified further and extended. The results are quite strongly affected by the large wage and rent premiums observed in the largest cities. Besides changing diversity, these premiums may be due to factors that have not been taken into account, such as changes in infrastructure, and changes to education returns in metropolitan areas. The estimations also assume that everyone reacts to diversity in the same way. How consumers react to diversity may be a function of characteristics such as education, income etc. – introducing heterogeneity that has not been taken into account in the estimations. In any case, results from the Netherlands suggests that the spatial scale is very important: people consider cultural diversity of a city to be very attractive in general but voluntary population "sorting" across neighbourhoods (and schools, clubs, etc.) suggests that they consider diversity very differently at a very small scale. Exposure to diversity can vary by time of day as well - workplace diversity during the day and neighbourhood diversity at night. The effects of diversity for firms can also vary. The way in which diversity affects decision making and productivity at the firm level would depend on the nature of the industry and the tasks that workers conduct. Finally, just counting people of different cultural background does not take "cultural distance" or "affinity" between groups in to account. In future research we hope to address some of these remaining issues.

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