Worker mobility across regions in New Zealand: the role of house prices

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Introduction

Geographic worker mobility—the movement of individuals across regions for employment—plays a critical role in shaping labour market dynamics and regional economic development. By enabling workers to relocate in pursuit of better job matches and higher wages, mobility contributes to allocative efficiency and economic resilience, especially in the face of shifting labour demand or regional shocks (Glaeser & Maré, 2001; Haltiwanger et al., 2018). Yet, across many advanced economies, including New Zealand, the rate of job-to-job transitions has been declining over the past two decades (Ball et al., 2020; Causa et al., 2021; Deutscher, 2019). This trend raises concerns about labour market fluidity and the capacity of workers to respond to economic opportunities across geographic space.

A key constraint on geographic mobility is housing affordability. Regions with high or rising house prices may deter potential in-migrants due to financial barriers, while also pushing current residents to relocate in search of more affordable housing (Cavalleri et al., 2021; Poghosyan, 2018). These dynamics imply that housing markets can exert both 'pull' and 'push' effects on inter-regional labour flows, with implications for regional inequality and the distribution of human capital. In New Zealand, where housing affordability has deteriorated markedly—with median house prices reaching 8.7 times average household income by 2022—the interaction between house prices and worker mobility warrants closer scrutiny.

This paper investigates how regional house prices influence inter-regional worker mobility in New Zealand. Specifically, we explore whether high house prices in a worker's origin region encourage out-migration and whether elevated prices in potential destination regions act as a deterrent. Using granular administrative data from Statistics New Zealand's Integrated Data Infrastructure (IDI) covering the 2000–2020 period, we estimate region-to-region worker flows via gravity models augmented with house price variables. The empirical strategy allows us to quantify the housing-market sensitivity of different demographic groups and assess how mobility responds to affordability pressures.

By providing new evidence on how housing markets shape worker mobility, this study contributes to a growing body of research on the spatial dimension of labour market adjustment. The findings have important implications for the design of housing, transport, and regional development policies that aim to enhance labour market efficiency and economic inclusion.

Literature Review

Geographic worker mobility refers to the relocation of employed individuals from one region to another within a country for the purpose of employment. It is distinct from internal migration, which includes all population movements, regardless of labour force status. As defined by Greenwood (1997), geographic mobility captures the economic motivations behind relocation, such as improved earnings, job match quality, or living conditions. Worker mobility is thus central to models of labour market efficiency and human capital allocation (Sjaastad, 1962).

From an analytical perspective, two broad approaches dominate the literature: micro-level and macro-level models. Micro-level models, grounded in human capital theory, examine individual migration decisions based on a cost-benefit calculus, often formalised via net present value frameworks (Borjas, 2013). In contrast, macro-level models focus on aggregate flows between locations and incorporate region-specific characteristics such as population size, distance, and economic conditions.

The gravity model has emerged as a dominant macroeconomic framework for studying inter-regional migration. Analogous to Newtonian gravity, the model posits that migration flows between two locations are positively related to their population size and negatively related to the distance between them (Ravenstein,1885, 1889). Over time, the model has been extended to include economic and social variables, including house prices.

The inclusion of house prices captures the affordability constraints that influence migration decisions. Rising house prices in destination regions are hypothesised to deter in-migration (negative pull effect), while higher prices in origin regions may encourage out-migration (positive push effect). These dynamics have been empirically validated in various national contexts. For example, Liu (2018) found that housing costs discouraged migration into Spanish cities, while Stawarz et al. (2021) reported similar patterns for Germany using county-level rent data. In the UK, Biswas et al. (2009) observed that higher destination house prices were associated with reduced inflows.

Despite broad empirical support, the magnitude and symmetry of house price effects differ across countries. Cavalleri et al. (2021), using panel data from multiple OECD countries, noted stronger negative effects on inflows than positive effects on outflows, suggesting that high prices act more as a deterrent than a motivator. This asymmetry is important for understanding net migration outcomes and potential spatial mismatches in labour allocation.

In New Zealand, evidence on the relationship between house prices and internal worker mobility is limited. Coleman and Zheng (2020) found inconclusive results for the full working-age population but observed negative house price effects on mobility for specific industries such as health and construction. Grimes et al. (2019), while not directly estimating house price effects, highlighted the role of amenities—often capitalised into house prices—in shaping migration flows. These findings point to the importance of disaggregating by demographic and sectoral characteristics when analysing the mobility-housing nexus.

This paper builds on these insights by applying gravity models to a comprehensive dataset of region-to-region worker flows in New Zealand, explicitly incorporating house price variables and estimating heterogeneous effects by age, gender, and ethnicity. In doing so, it addresses a critical evidence gap and contributes to the international literature on how housing markets shape internal migration patterns.

Data

This study draws on de-identified microdata from Statistics New Zealand's Integrated Data Infrastructure (IDI), which provides linked administrative records across employment, tax, education, and residential information. The primary data source for employment histories is the Employer Monthly Schedule (EMS), a mandatory monthly return filed by all employers that details wages and PAYE deductions for each employee. The EMS dataset enables longitudinal tracking of individuals' job attachments at the firm level from 1999 onwards.

To start, a snapshot is taken of workers' jobs during March months from 1999 to 2021 in the EMS. March years are chosen because most New Zealand businesses use 31st March as the end of the accounting year. A series of exclusions are applied to refine the analytical sample:

- Each job must have positive earnings of at least $1.
- Working proprietors (i.e., self-employed individuals or business owners) are excluded.
- Workers are limited to those aged 15–64 with complete demographic data.
- For individuals holding multiple jobs, only the two highest-paying jobs are retained.

Then, worker job locations are mapped to one of 16 regional council areas using a residential-to-workplace matching algorithm developed by Statistics New Zealand. The methodology allocates each worker to the most probable workplace location based on commuting distances (see Fabling & Maré, 2015). Although some misclassification is inevitable, particularly for workers in multi-branch firms, the scale and structure of the dataset mitigate major concerns about measurement error in geographic mobility.

Following standard conventions in the literature (e.g., Burgess et al., 2000; Davis & Haltiwanger, 1998), a job-to-job transition is defined as a change in employer between two time periods. Workers who move from one employer to another in March across years are classified as job changers. Job changers are further classified based on whether their new job is located in the same or a different region. This paper focuses exclusively on inter-regional job-to-job transitions cases where workers move between firms located in different regional council areas.

Method

The empirical framework uses a gravity model to explain the volume of inter-regional worker flows. The baseline gravity model (Equation 1) analyses bilateral migration flows as a function of region-specific factors and inter-regional distance:

Equation 1 Baseline gravity model

$$Y_{ijt} = \beta_1 lnP_{it-1} + \beta_2 lnP_{jt-} + \beta_3 SI_{i,j} + \beta_4 lnDist_{ij} + \alpha_1 lnHP_{it-} + \alpha_2 lnHP_{jt-1} + \sum_{s=1}^{n}(\gamma_s Z_{ist-1} + \delta_s Z_{jst} \quad) + \theta_{ij} + \rho_1 GDP_{t-1} + GDP_{t-1}^{e} + \varepsilon_{ijt}$$

where subscript i, j and t are origin region, destination region, and year, respectively.

The dependent variable, Y_{ijt}, is the number of worker flows from origin region i to destination region j in year t. P_{it-1} and P_{jt-1} are the total populations in regions i and j in year t-1 (the log of these population sizes is used in the model). These population numbers are the estimated resident population figures from Statistics New Zealand.

$SI_{i,j}$ is a dummy variable for whether regions i and j are located on the same island. When the two regions are on the same island, it returns a value of 1 (otherwise, 0). $lnDist_{ij}$ is the log amount of travel time in minutes from the city centre of region i to the city centre of region j. This variable was created by Poot et al. (2016) who estimated travel time from Google Maps in 2013. Travel time is held fixed at these 2013 values over the entire study period. While this assumption is unlikely to hold in reality - new roads, better transportation technology, and government legislation have gradually altered travel time between regions - no alternative public data on travel times was available at the time of writing.

HP_{it-1} and HP_{jt-1} are the key variables of interest in this study. They are median house price (sourced from the Real Estate Institute of New Zealand) in region i and region j at year t-1 (the log of these values is used in the model). Their corresponding coefficients, α_1 and α_2, quantify the impact of house prices on worker migration between regions. The signs of these coefficients are expected to be positive for HP_{it-1} and negative for HP_{jt-1}. A positive estimated coefficient for the region of origin (α_1) indicates an accelerated number of worker outflows to other destinations if the local house price increases. More expensive house prices add extra pressure to living costs for some workers who may struggle to stay and seek better opportunities elsewhere. If the estimated coefficient at the destination (α_2) is negative, higher house prices may lower economic benefits associated with migration and slow down worker inflows from other regions.

Z_{ist-1} and Z_{jst-1} are region-level macroeconomic indicators covering log real GDP per capita, the unemployment rate, and shares of the workforce between ages 40 and 64 years, at origin i and destination j, respectively.

θ_{ij} are regional fixed effects that capture unobservable and time-invariant factors. Fixed effects are designed to mitigate omitted variable bias caused by correlations between unobservable factors and the independent variables. For example, regions with better job opportunities or education institutes tend to attract more workers from other areas. Previous New Zealand studies, including Poot et al. (2016) and Grimes et al. (2019), recommend a fixed-effects model that mitigates omitted variable bias.

GDP_{t-1} is economy-wide annual GDP growth in March quarters taken from National Accounts, and GDP^{e}_{t-1} is the expected annual GDP growth rate over the next 12 months from a survey of expectations by the Reserve Bank of New Zealand (RBNZ). It is expected that worker mobility could be influenced by both the current and future state of the economy. Lastly, ε_{ijt} is the residual term.

All explanatory variables, except $SI_{i,j}$ and $lnDist_{ij}$, in the base model are lagged by one year, t-1. Poot et al. (2016) recommends using lagged variables to avoid endogenous bias.

In the baseline gravity model, the relationship between log median house price (origin and destination) and log inter-regional worker flows are linear. Under this assumption, the model predicts that all regions will experience the same change in inter-regional worker movements for a given percentage change in median house prices. While this linear assumption may hold true under certain conditions, it may not universally apply due to significant variations in house prices across regions.

The extended gravity model introduces four interaction terms and estimates the region-specific impact of house prices on worker migrations between regions. The extended gravity model is shown in Equation 2:

Equation 2 Extended gravity model

$$
\begin{aligned}
Y_{ijt} = \; & \beta_1 lnP_{it-1} + \beta_2 lnP_{jt-1} + \beta_3 SI_{i,j} + \beta_{\mathbf{4}} lnDist_{ij} + \pi_1 I_{i\in large} \times HP_{it-1} \\
& + \pi_2 I_{i\in small} \times HP_{it-} + \pi_3 I_{j\in large} \times HP_{jt-1} + \pi_4 I_{j\in small} \times HP_{jt-1} \\
& + \sum_{s=1}^{n} \left(\gamma_s Z_{ist-1} + \delta_s Z_{jst-1}\right) + \theta_{ij} + \rho_1 GDP_t + GDP^{e}_{t-1} + \varepsilon_{ijt}
\end{aligned}
$$

$I_{i\in large}$ and $I_{j\in large}$ are binary indicators for large urbanised regions at origin and destination locations, respectively. Large urbanised regions cover Auckland, Wellington, and Canterbury. They are the three largest regions (in terms of population) and capture over 50% of the country's jobs and households. Changes in house prices in these regions may be expected to have some impact on the overall inter-regional flows. The remaining 13 regions are classified as small regions, $I_{i\in small}$ and $I_{j\in small}$.

In Equation 2, $I_{i\in large} \times HP_{it-1}$ and $I_{i\in small} \times HP_{it-}$ are interaction terms between house prices and large and small origin regions, respectively. Their corresponding coefficients (π_1 and π_2) provide estimates of the push effects of house prices in large and small regions. Additionally, the coefficients π_3 and π_4 provide estimates of the pull effects on house prices in large ($I_{j\in large} \times HP_{jt-}$) and small ($I_{j\in small} \times HP_{jt-1}$) destination regions.

These additional interaction terms test whether the impact of housing costs on inter-regional worker flows varies between large and small regions. For instance, if $\pi_1 > \pi_2 > 0$, it means that house prices in larger regions have a stronger effect on pushing out local workers than those in smaller regions. In this case, an increase in house prices across all regions in New Zealand will result in a greater number of workers leaving large urban areas. On the other hand, if $\pi_3 < \pi_4 < 0$, it suggests that housing costs act as a significant barrier to worker migration, especially in large regions. Given that housing costs are generally higher in larger regions, an increase in the housing market will likely slow down worker migration to the region.

Given the count nature and overdispersion of inter-regional worker flows, the model is estimated using a fixed-effects Negative Binomial regression. This approach is more appropriate than Poisson models in this context, as it accounts for unobserved heterogeneity in mobility across region pairs and over time.

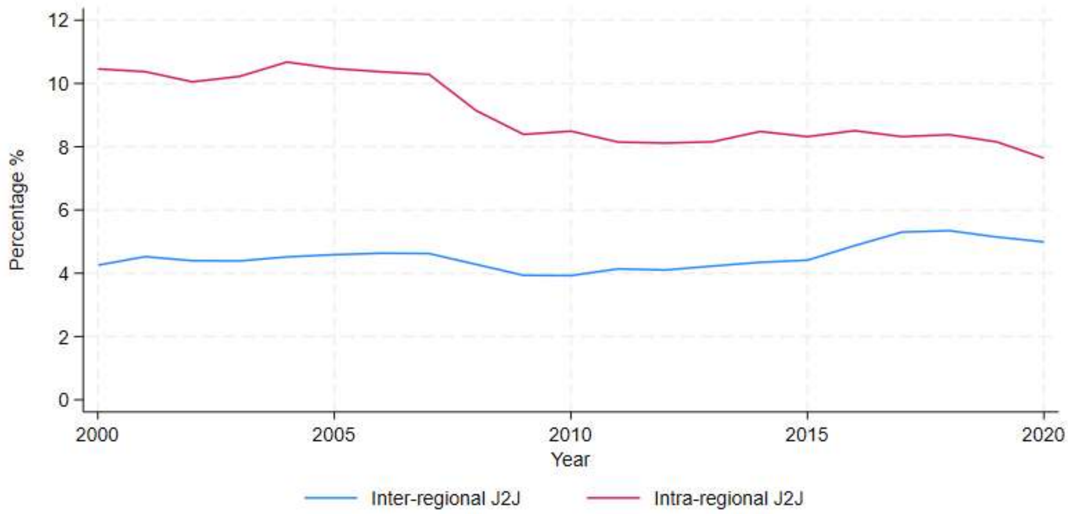
To explore demographic variation in the effects of house prices on mobility, separate regressions are estimated for subgroups defined by:

- Age group (15–24, 25–39, 40–54, 55–64)
- Gender (male, female)
- Ethnicity (European, Māori, Pacific Peoples, Asian, Other)

Descriptive Evidence on Worker Mobility Patterns

As shown in Figure 1, the national job-to-job transition rate steadily declined from 14.7% in 2000 to 12.6% in 2020. The decline was largely driven by a reduction in within-region transitions. By contrast, inter-regional transitions remain relatively stable, fluctuating between 4.3% and 5.3% per year.

Figure 1 Job-to-job transition rates within and across regions of New Zealand over 2000-2020



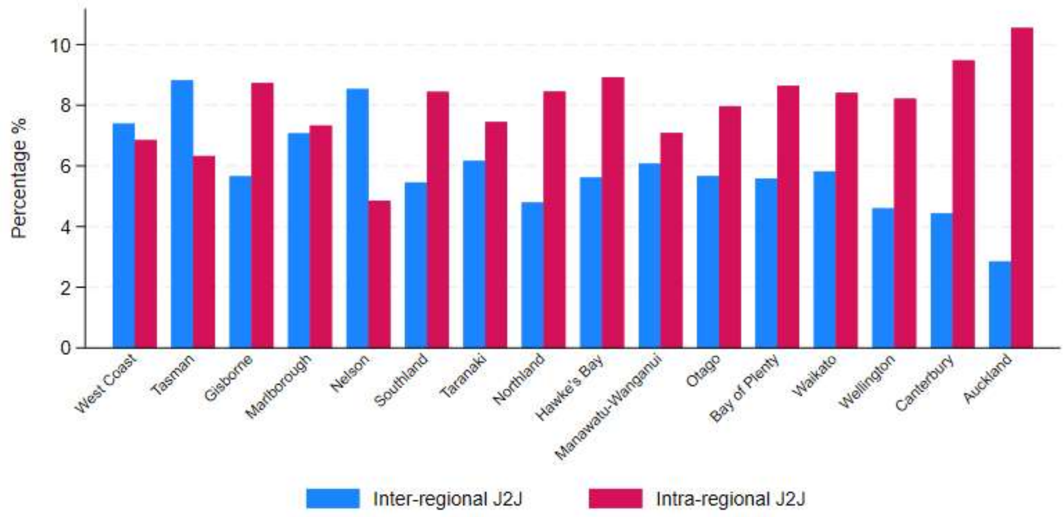
Inter-regional transition rates vary markedly across regions. Figure 2 reports the average within-region and inter-region job-to-job transition rates for each of New Zealand's 16 regional council areas from 2000 to 2020. While overall transition rates are similar across regions, the composition differs. Inter-regional transitions are more common in smaller regions (e.g., West Coast and Tasman), whereas workers in larger urban centres (e.g., Auckland, Wellington) are more likely to change jobs without changing region.

This pattern reflects differences in local labour market thickness: smaller regions offer fewer employment alternatives within the same area, incentivising mobility across boundaries. On the other hand, workers in larger regions face an abundance of job opportunities. They are less likely to consider taking a job in another region as an attractive option.

Mobility patterns also differ across demographic groups. As shown in Figure 3, inter-regional transitions are most common among younger workers aged 15–24, with rates declining steadily across older age groups. While young workers are typically more flexible and mobile, the increasing transition rates observed among older cohorts over time (especially 40–54 and 55–64) may reflect growing pressures from regional housing costs or career restructuring in midlife.

Gender and ethnicity are also related to mobility (Figure 3). Male workers tend to exhibit slightly higher inter-regional transition rates than females. By ethnicity, workers identified as Māori and Pacific Peoples demonstrate higher mobility than Europeans.

Figure 2 Relationship between population size and job-to-job transition rates (Intra- and inter- regions of New Zealand averaged over 2000-2020)



Source: Author's calculations using IDI data.
Note: Regions on the horizontal axis are ordered from the smallest population count (left) to the largest population count (right).

Inter-regional job-to-job transitions provide crucial insights about differences in worker mobility patterns, but they do not provide information about specific movements from one region to another.

Figure 4 provides information about specific movements from one region to another. It is a heatmap-style chart that shows the fraction of inter-regional job-to-job transitions from the origin location (vertical axis) to the destination location (horizontal axis) averaged over 2000 to 2020.[1] All fractions are classified into five mutually exclusive categories: 0-9%, 10-19%, 20-29%, 30-39% and 40% and higher. The chart is colour-coded: the darker the shade, the higher the fraction of inter-regional movement.

The figure illustrates two interesting patterns. Firstly, more than 50% of workers who changed job locations moved to highly populated regions such as Auckland, Wellington and Canterbury. These three regions accounted for over 50% of the total number of jobs[2] and had higher productivity compared to other regions (Maré, 2016). This suggests that workers prefer areas with abundant job opportunities and higher-paying jobs.

Secondly, many workers relocated to neighbouring regions. For instance, the largest share of inter-regional transitions out of Waikato and Northland migrated to Auckland, while Southland attracted the largest share of its geographically mobile workers from the neighbouring Otago region. This short-distance movement could be attributed to the high costs associated with longer-distance migration. Additionally, moving to a new place could be socially and culturally challenging, especially if it is far away from one's family and community.

[1] Movements within the same regions (the leading diagonal) are excluded.
[2] It is based on the EMS data in IDI.

Figure 3 Inter-regional job-to-job transitions by region across broad age group (top), gender (middle) and ethnicity (bottom), average 2000-2020

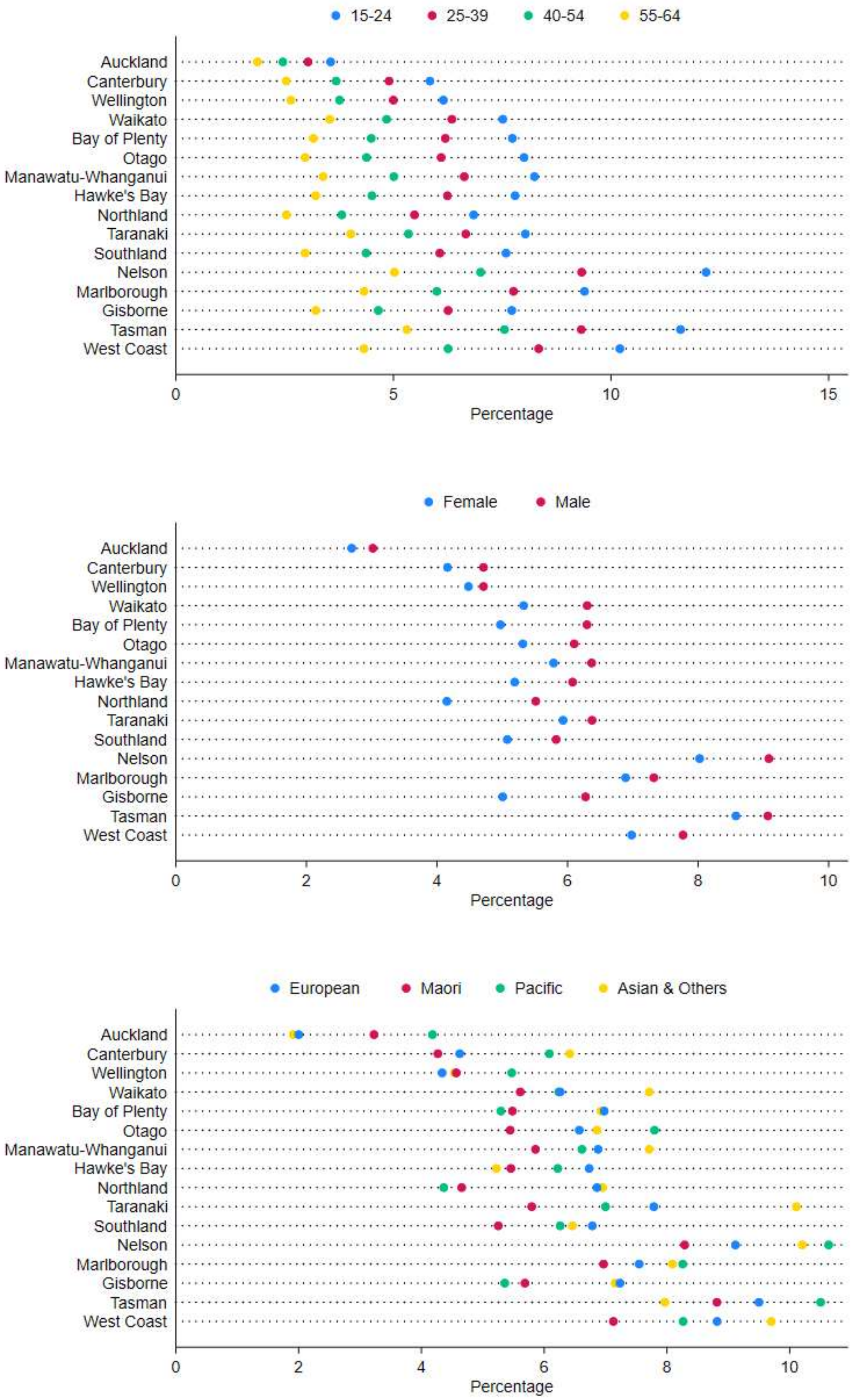
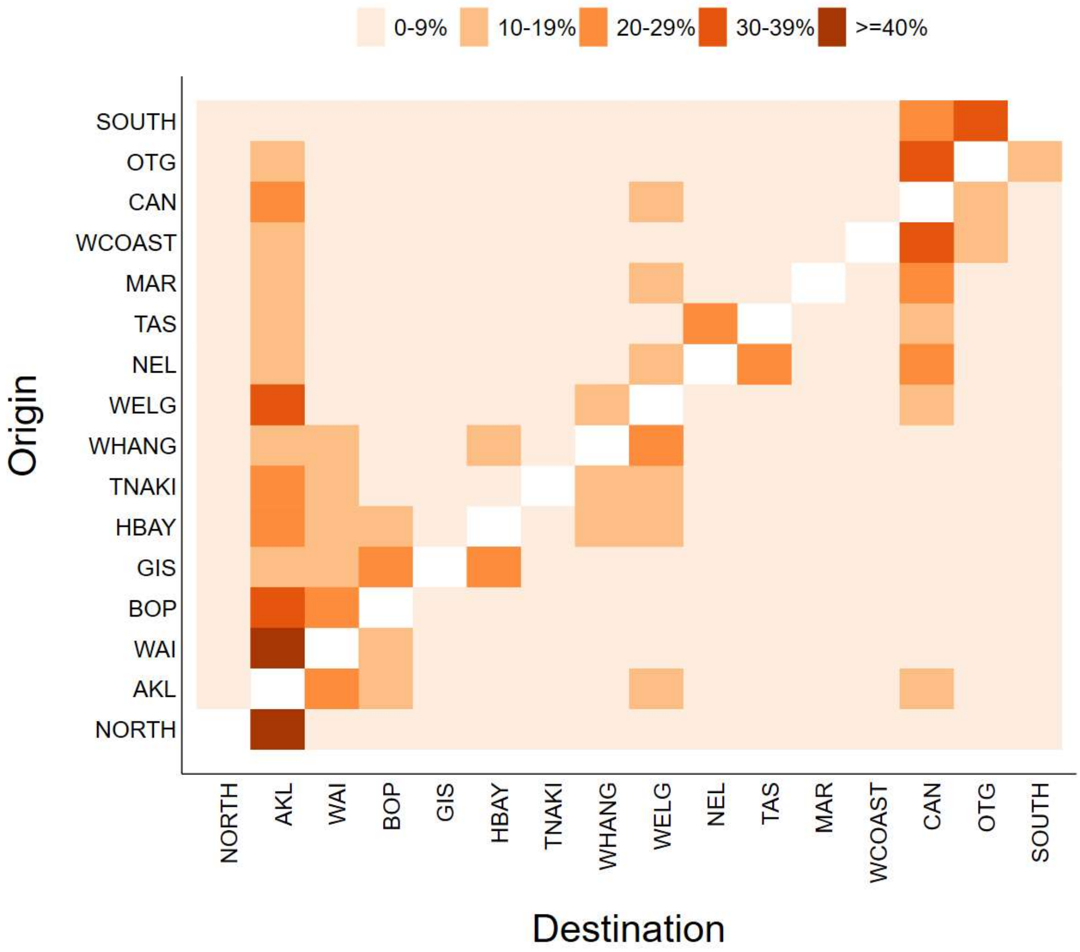


Figure 4 Region-to-region movements arising from inter-regional job-to-job transitions, average 2000-2020.



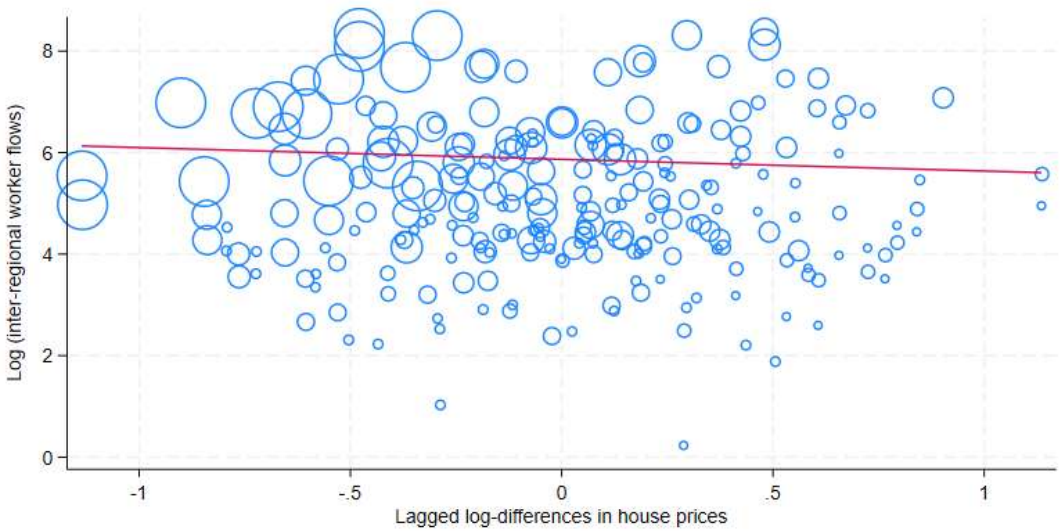
Note: NORTH=Northland, AKL=Auckland, WAI=Waikato, BOP=Bay of Plenty, GIS=Gisborne, HBAY=Hawke's Bay, TNAKI=Taranaki, WHANG=Manawatu-Whanganui, WELG=Wellington, NEL=Nelson, TAS=Tasman, MAR=Marlborough, WCOAST=West Coast, CAN=Canterbury, OTG=Otago and SOUTH=Southland.

Relationship between inter-regional job-to-job transition and house prices

To explore the relationship between inter-regional job-to-job transitions and house prices, the volume of inter-regional job-to-job transitions are first aggregated up to the 240 distinct region-to-region movements that workers can make (averaged over the period 2000-2020). Figure 5 displays a scatter plot that demonstrates the relationship between inter-regional job-to-job transitions and relative house prices averaged over the period 2000-2020. Relative house prices refer to the difference in house prices between two regions.[3] To aid with graphical representation, both inter-regional worker flows and relative house prices are expressed in natural logarithms.

The chart illustrates a slight negative correlation between the number of inter-regional job-to-job transitions and relative house prices. When house prices in the destination region are higher than those in the origin region (indicated by positive log relative house prices), the volume of job movements between regions tends to be lower. Conversely, when a region has relatively lower house prices compared to others (indicated by negative log relative house prices), inter-regional job transitions are generally higher. This suggests that house prices may act as a deterrent or facilitator for inter-regional worker mobility, influencing the flow of workers between regions.

Figure 5 Scatterplot of inter-regional job-to-job transitions versus relative house prices, average 2000-2020



Source: Author's calculations using IDI data.

Notes:

1. Each circle represents a distinct region-to-region movement. The larger the circle, the larger the population of the region of origin. For presentational purposes, the natural logarithm of the number of region-to-region movements is used on the y-axis with movements of zero imputed as 1.
2. Red solid line is a best-fit line from a weighted regression.

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[3] These are calculated as follows. First, median house prices in each region are averaged over the 21-year period. Second, the average median house price in the destination region is divided by the average median house price in the origin region. Third, the natural logarithm of this ratio is taken. A positive relative house price (right side of the graph) indicates that house prices in the destination region are more expensive than those in the origin region. A negative relative house price (left side of the graph) indicates that house prices in the destination region are cheaper than those in the origin region. All observations (depicted as circles) in the scatterplot are weighted by the local population at the origin region to control for the size of the region. The larger the circle, the larger the population in the region of origin

Econometric Results

Baseline Gravity Model Estimates

Table 1 shows two sets of regression estimates from the baseline gravity model specification. Column (1) and (2) are estimates from Negative Binomial (NegBin) methods. The only difference between these estimates is the choice of region fixed-effects. The regression model in column (1) includes 32 regional fixed effects (corresponding to 16 origins and 16 destinations). The second and preferred model uses 240 origin-destination fixed effects. This large set of regional fixed effects reflect distinct region-to-region movements that a worker could make (16 regions of origin multiplied by 16 regions of destination, minus within-region permutations).

Although both models show sound goodness-of-fit (R-squared values exceeding 0.85), regression estimates in model (1) show poor predictions for large regions. Figure 6 shows a scatterplot of actual (horizontal axis) and predicted (vertical axis) inter-regional job-to-job flows from both models. Both models provide similar prediction up to approximately 2,000. However, beyond this threshold, predictions from model (1) become either excessively high or low, indicating difficulties in accurately predicting inter-regional job-to-job flows for large regions (i.e., job movements into and out of Auckland, Wellington and Canterbury). In contrast, model (2) does not exhibit this issue. This suggests that incorporating the set of origin-destination fixed effects not only enhances the predictive accuracy of the gravity models but also captures complex region-to-region migration patterns.

Model (2) reveals statistically significant coefficients for house prices in both origin and destination regions.[4] For the origin region, the coefficient (0.180) is slightly larger than in the Poisson method. Additionally, the NegBin method identifies a 'pull' effect in the destination, with a negative coefficient of -0.133.

To visualise these findings, Figure 7 shows predicted values of inter-regional worker flows across the full range of house prices at both origin and destination It is clear that there is an upward trend between inter-regional worker flows and house prices at the origin, indicating that more workers tend to leave when local house prices rise or more workers tend to stay if local house prices come down. A downward trend is observed for house prices at the destination, suggesting that higher (lower) house prices at the destination slow down (speed up) worker flows into the region.

For the other variables in the gravity models, high unemployment is significantly associated with fewer inter-regional job-to-job flows. Higher unemployment rates indicate unfavourable economic conditions, discouraging both inflows and outflows of workers. Higher GDP per capita in destination and origin regions is significantly associated with more worker mobility. Higher regional labour productivity is often translated into higher average earnings for individuals and households. Higher incomes in destination regions contribute to mobility by attracting workers from other regions. Higher actual and expected GDP growth are associated with higher regional

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[4] House prices in the destination region is weakly significant, between the 5% and 10% statistical significance levels.

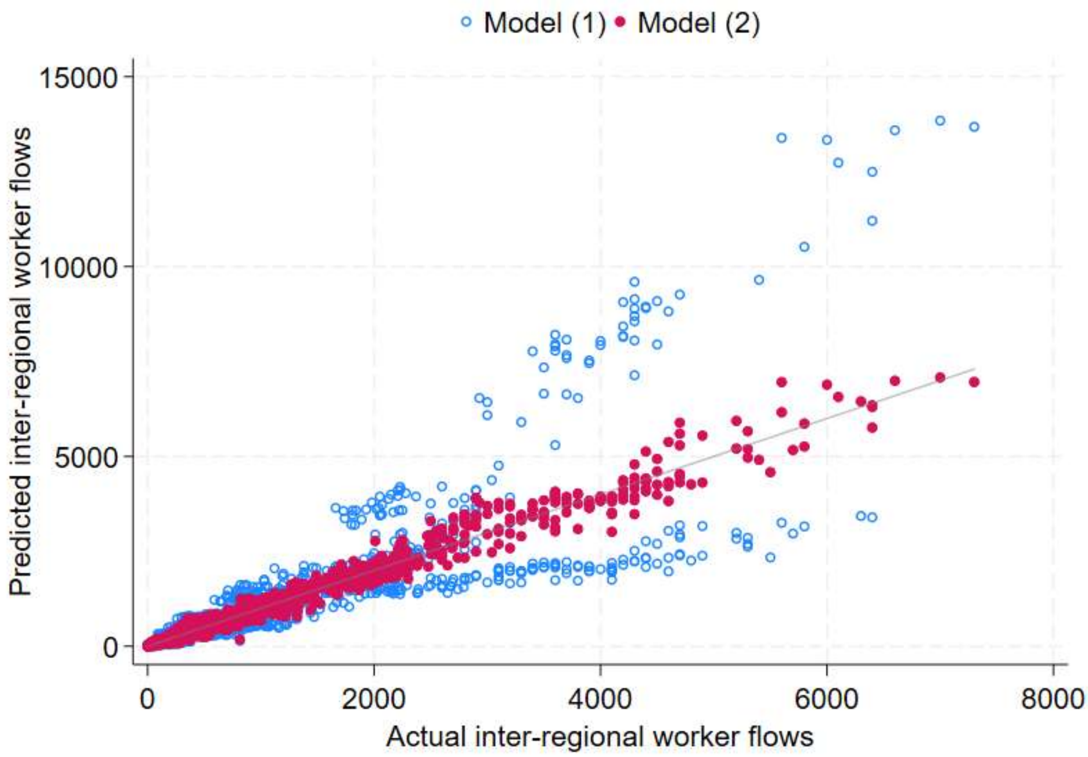
worker flows. This relationship reflects that the pro-cyclical nature of labour market dynamics, where inter-regional job-to-job flows follow business cycles.

Table 1 Regression results from baseline gravity models

Variables	*(1)*	*(2)*
Log population at destination	0.837***	0.979***
	(0.310)	(0.314)
Log population at origin	1.186***	1.310***
	(0.332)	(0.319)
Log travel time	-0.946***	-0.293***
	(0.0608)	(0.0950)
Dummy for same island	0.333***	2.340***
	(0.444)	(0.769)
Log median house prices at destination	-0.162**	-0.133*
	(0.0810)	(0.0787)
Log median house prices at origin	0.190***	0.180**
	(0.0828)	(0.0768)
Log GDP per capita at destination	0.370**	0.327**
	(0.168)	(0.163)
Log GDP per capita at origin	0.382**	0.339*
	(0.185)	(0.176)
Unemployment rate at destination	-0.0252***	-0.0223***
	(0.00562)	(0.00664)
Unemployment rate at origin	-0.0150**	-0.0143**
	(0.00686)	(0.00669)
Share of 40-64 labour force at destination	-0.0181*	-0.0178*
	(0.0100)	(0.0102)
Share of 40-64 labour force at origin	-0.0186*	-0.0210**
	(0.0100)	(0.0101)
Annual GDP growth rate	0.0211***	0.0199***
	(0.00384)	(0.00371)
Expected GDP growth rate over the next 12 months	0.0531***	0.0584***
	(0.00551)	(0.00923)
Constant	-17.436***	-24.85***
	(3.857)	(3.541)
Observations	4,800	4,800
Over-dispersion parameter	0.186***	0.0668***
Number of fixed effects	32	240
R^2	0.855	0.982

When compared to evidence from other advanced economies, these findings for New Zealand are not unique. Cavalleri et al. (2021) investigated the role of housing factors in shaping inter-regional migration flows across 14 OECD countries and found that high housing costs consistently act as a significant barrier to internal migration. Many economies demonstrated clear 'push' and 'pull' effects related to housing prices – higher house prices in origin regions increased outward migration, while higher prices in destination regions reduced inflows. New Zealand's results align with countries such as Canada, Italy, the UK, and the US, both in terms of the signs and statistical significance of house price variables (Cavalleri et al., 2021). This international consistency underscores the broader relevance of housing affordability as a key determinant of regional mobility, highlighting that New Zealand's experience is part of a broader global pattern.

Figure 6 Scatterplot of predicted vs actual numbers of inter-regional worker flows from baseline gravity models



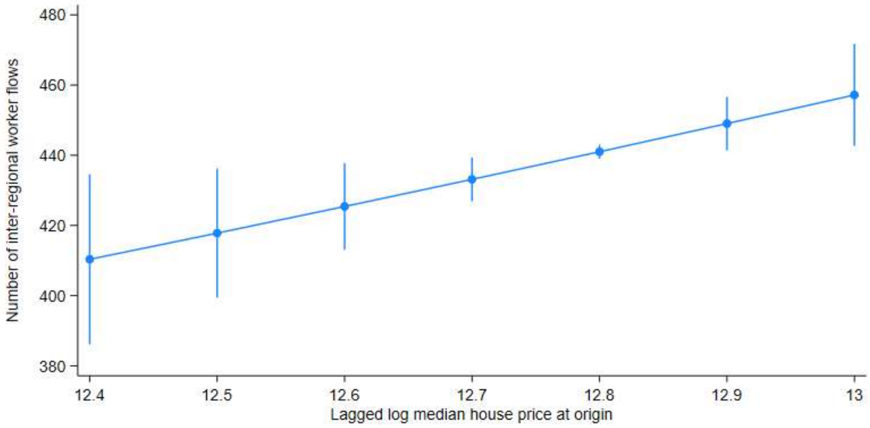
Source: Author's calculations using IDI data.

Notes:

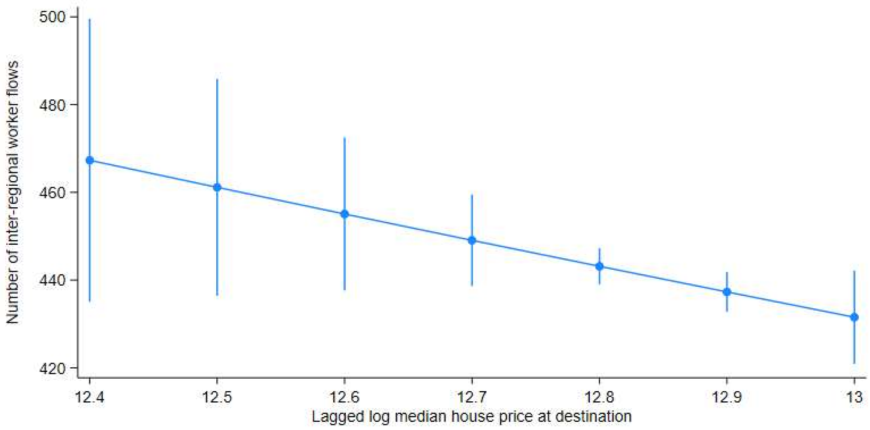
1. The grey line is the 45-degree reference line.

Figure 7 Predictions of inter-regional worker flows from the Negative Binomial model (baseline)

House prices at origin



House price at destination



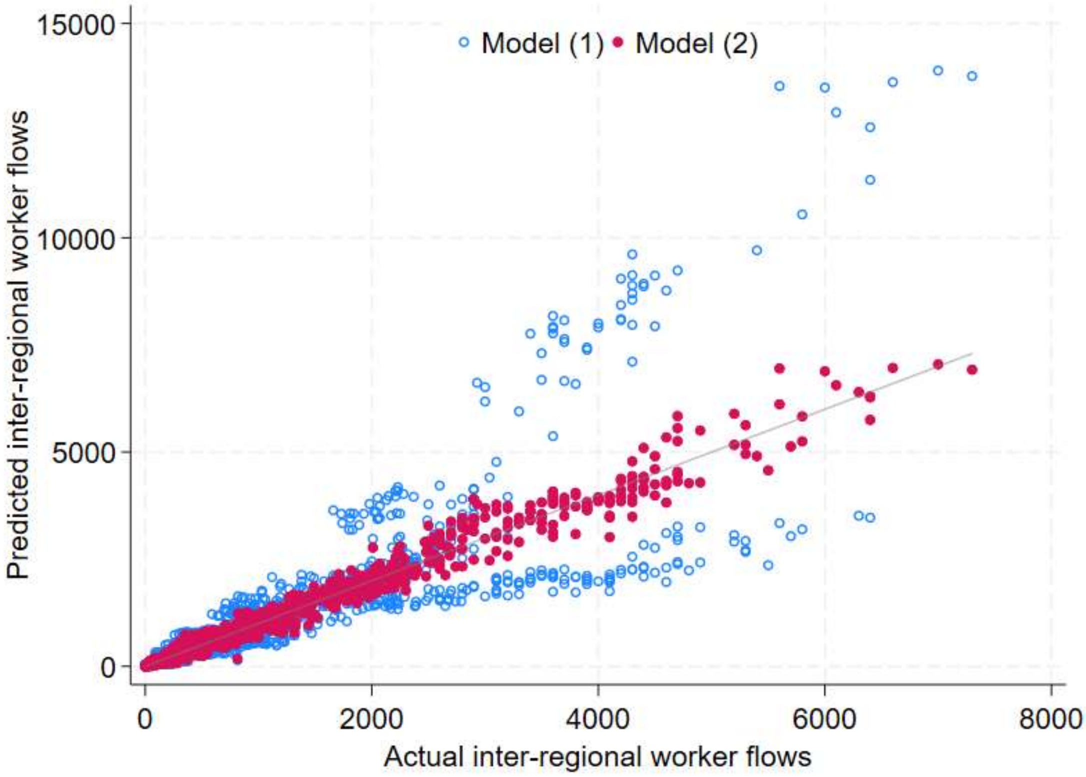
Source: Author's calculations using IDI data.

Notes:

1. Predictions are derived from corresponding house price variables in the Negative Binomial model by holding other variables constant.
2. Vertical lines represent 95% confidence intervals of regression predictions.

Extended Models: Regional and Demographic Interactions

Figure 8 Scatterplot of predicted vs actual numbers of inter-regional worker flows from extended gravity models



Source: Author’s calculations using IDI data.

Notes:

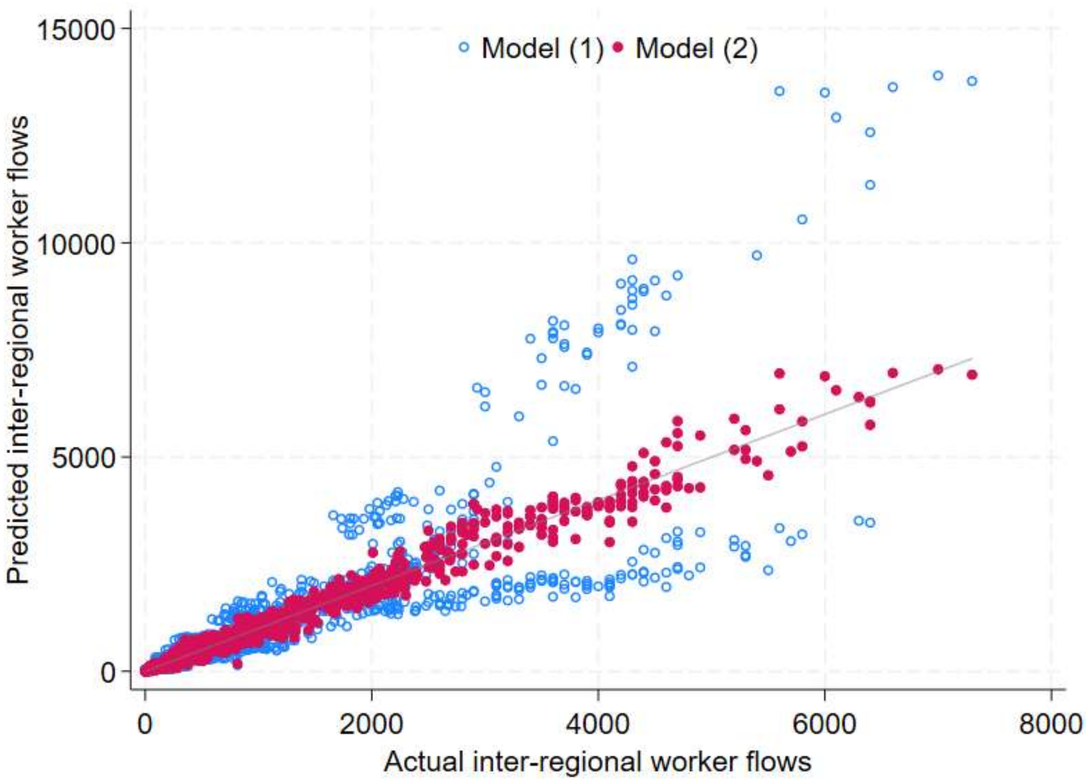
1. The grey line is the 45-degree reference line.

Table 2 shows regression estimates on the NegBin method. Column (1) and (2) are extended gravity models with 32 and 240 regional fixed effects. Similar to the above finding in Figure 6, estimates based on the extended gravity model with 240 regional fixed effects are preferred due to better predictive accuracy.

In the NegBin method, the interaction between log house price at origin and region size shows a strong positive effect. For large regions, a 1% increase in origin house prices is associated with a 0.165% increase in inter-regional job-to-job transitions (significant at the 10% level), while for small regions, the effect is smaller but still significant (0.182%, significant at the 5% level). This suggests that higher house prices in the region of origin encourage the out-migration of workers

For house prices at destination regions, the effects are negative: -0.14 for large regions and -0.132 for small regions. However, these effects are not statistically significant; This may indicate that higher house prices in the destination region have only a weak effect on slowing inflows of workers, as high costs could deter workers from moving from other regions.

Figure 8 Scatterplot of predicted vs actual numbers of inter-regional worker flows from extended gravity models



Source: Author's calculations using IDI data.

Notes:

1. The grey line is the 45-degree reference line.

Table 2 Regression results from extended gravity models

Variables	*(1)*	*(2)*
Log population at destination	0.786***	0.983***
	(0.211)	(0.356)
Log population at origin	1.157***	1.327***
	(0.192)	(0.363)
Log travel time	-0.946***	-0.451
	(0.0608)	(1.295)
Dummy for same island	0.333***	2.165*
	(0.0667)	(1.284)
Log HP at destination x large region	-0.115**	-0.140
	(0.0929)	(0.0944)
Log HP at destination x small region	-0.169	-0.132
	(0.0829)	(0.0807)
Log HP at origin x large region	0.222**	0.165*
	(0.100)	(0.0979)
Log HP at origin x small region	0.186**	0.182**
	(0.0830)	(0.0782)
Log GDP per capita at destination	0.385**	0.325*
	(0.172)	(0.167)
Log GDP per capita at origin	0.393**	0.335*
	(0.186)	(0.177)
Unemployment rate at destination	-0.0251***	-0.0224***
	(0.00711)	(0.00676)
Unemployment rate at origin	-0.0148***	-0.0144**
	(0.00683)	(0.00673)
Share of 40-64 labour force at destination	-0.0179*	-0.0177*
	(0.0101)	(0.0102)
Share of 40-64 labour force at origin	-0.0261***	-0.0210**
	(0.00769)	(0.0101)
Annual GDP growth rate	0.0206**	0.0200***
	(0.00380)	(0.00368)
Expected GDP growth rate over the next 12 months	0.0543***	0.0581***
	(0.00960)	(0.00943)
Constant	-14.575***	-23.34*
	(3.435)	(12.18)
Observations	4,800	4,800
Over-dispersion parameter	0.186***	0.0668***
Number of fixed effects	32	240
R^2	0.856	0.982

Demographic Variability in House Price Effects

Separate gravity models estimated for different demographic groups reveal marked differences in housing-related mobility responsiveness.

By Age:

Older workers (40–54 and 55–64) exhibit the strongest responses to house prices, particularly at the origin. A plausible interpretation is that older individuals are more likely to own property and thus can use accumulated housing equity to fund relocation. Younger workers (15–24) are less responsive, likely due to lower homeownership rates and liquidity constraints.

By Gender:

Males show greater responsiveness to house prices at both origin and destination, although the difference relative to females is modest. This may reflect gendered differences in job mobility preferences or household bargaining dynamics.

By Ethnicity:

Workers identifying as Māori or Pacific Peoples are more responsive to house prices at the destination, potentially due to greater exposure to affordability constraints. In contrast, European workers show stronger push effects from origin prices, possibly reflecting higher rates of homeownership.

Discussion and Policy Implications

The regression results presented in the previous section offer strong empirical support for the proposition that regional house prices significantly shape inter-regional worker mobility in New Zealand. In line with economic theory and international evidence, this study finds that high house prices in destination regions reduce inflows (a negative pull effect), while elevated prices in origin regions stimulate outflows (a positive push effect). Notably, the deterrent effect of high destination house prices is stronger, indicating that housing unaffordability is a more potent barrier than a motivator in workers' location decisions.

These findings have several important implications. First, they suggest that housing market conditions constrain geographic labour mobility and thereby affect the ability of workers to relocate in response to job opportunities. In a well-functioning labour market, individuals would be able to move efficiently to locations offering better matches for their skills. However, when house prices rise faster than incomes, particularly in large urban areas, this matching process is hindered, leading to under-utilisation of human capital and reduced allocative efficiency.

Second, the demographic heterogeneity in mobility responses provides evidence of unequal constraints and opportunities. Older workers are more responsive to price changes at the origin, likely reflecting greater equity holdings and housing wealth. This suggests that the mobility of younger workers, who are more dependent on rental markets or first-home affordability, is disproportionately limited by housing costs. Ethnic disparities also emerge, with Māori and Pacific workers exhibiting higher sensitivity to destination prices. These patterns point to equity concerns and the potential for regional disparities in access to employment to widen over time.

The results underscore the need to integrate housing and labour market policy frameworks more closely. Traditionally, housing policy and labour mobility have been treated in separate policy silos. However, as this study demonstrates, barriers in the housing market—such as lack of affordable housing near employment centres—can suppress labour mobility and contribute to persistent regional inequalities.

Several policy levers could help address this misalignment:

- **Targeted housing supply**: Expanding affordable housing supply in regions with strong labour demand (e.g., Auckland, Wellington) could help lower the cost barrier for in-migrants. This may require zoning reform, streamlined consenting, and support for medium-density developments near employment hubs.
- **Support for mobile workers**: Mobility subsidies, relocation grants, or tenancy support could be targeted at demographic groups facing higher barriers to mobility—particularly younger workers and underrepresented ethnic groups.

Conclusion

This paper examined the extent to which regional house prices influence inter-regional worker mobility in New Zealand. Using comprehensive administrative data from Statistics New Zealand's Integrated Data Infrastructure and applying a gravity model framework, the analysis reveals that housing market conditions significantly affect geographic labour mobility. Specifically, higher house prices in destination regions discourage inflows, while higher prices in origin regions encourage outflows.

The results show that these effects are not uniform across population groups. Older workers respond more strongly to rising origin-region prices, likely due to greater accumulated housing equity, while younger and Māori and Pacific workers are more constrained by destination-region affordability. These patterns highlight not only the economic but also the equity dimensions of geographic mobility.

The findings have important implications for housing, transport, and labour market policy. In particular, the evidence underscores the need to integrate housing affordability considerations into workforce and regional development planning. Facilitating mobility by addressing housing market barriers can support a more efficient allocation of labour, improve access to economic opportunities, and reduce regional inequalities.

Future research could explore long-term outcomes of mobility—such as career progression and life satisfaction—and investigate the effects of mobility constraints on firm-level productivity. Additionally, integrating more detailed data on housing tenure, household structure, and individual preferences would provide a richer understanding of the constraints shaping mobility decisions.

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