



# Tracking the Paths of Ageing and Depopulation in Regional New Zealand

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Pathways Conference  
11 November 2016



# Acknowledgements



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- This research is supported by funding through two projects:
  - Tai Timu Tangata (TTT) – Marsden Fund
  - Capturing the Diversity Dividend for Aotearoa New Zealand (CADDANZ) – MBIE
- And follows the earlier MBIE-funded Nga Tangata Oho Mairangai (NTOM) and Climate Change Impacts and Implications (CCII)
- Much of the historical data was derived from Statistics NZ data by Natalie Jackson (Massey). The changing nature of population decline is also her thesis
- The population projection model is joint work with Jacques Poot (NIDEA)
- The ideas in this presentation also benefited greatly from discussions with Dave Maré, Bill Cochrane, and Lars Brabyn

- National population projections produced by Statistics New Zealand (SNZ) paint a picture of gradually slowing population growth
  - At the median, annualised population growth of 1.2% from 2014-18, falling to a fairly stable 0.3% from 2053-68
- However, this masks substantial variation in the likely experiences of subnational areas
  - One-third of the nation's TAs declined in size between 1996 and 2013
  - The number of TAs projected (by SNZ) to decline in size increases from 12 (18 per cent) between 2013 and 2023 to 39 (58 per cent) between 2033 and 2043

# Some terminology



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- **Population growth** = increasing population
- **Population decline** = decreasing population
- **Net in-migration** = in-migration exceeding out-migration
- **Net out-migration** = out-migration exceeding in-migration
- **Natural increase** = births exceeding deaths
- **Natural decrease** = deaths exceeding births

# Types of population change



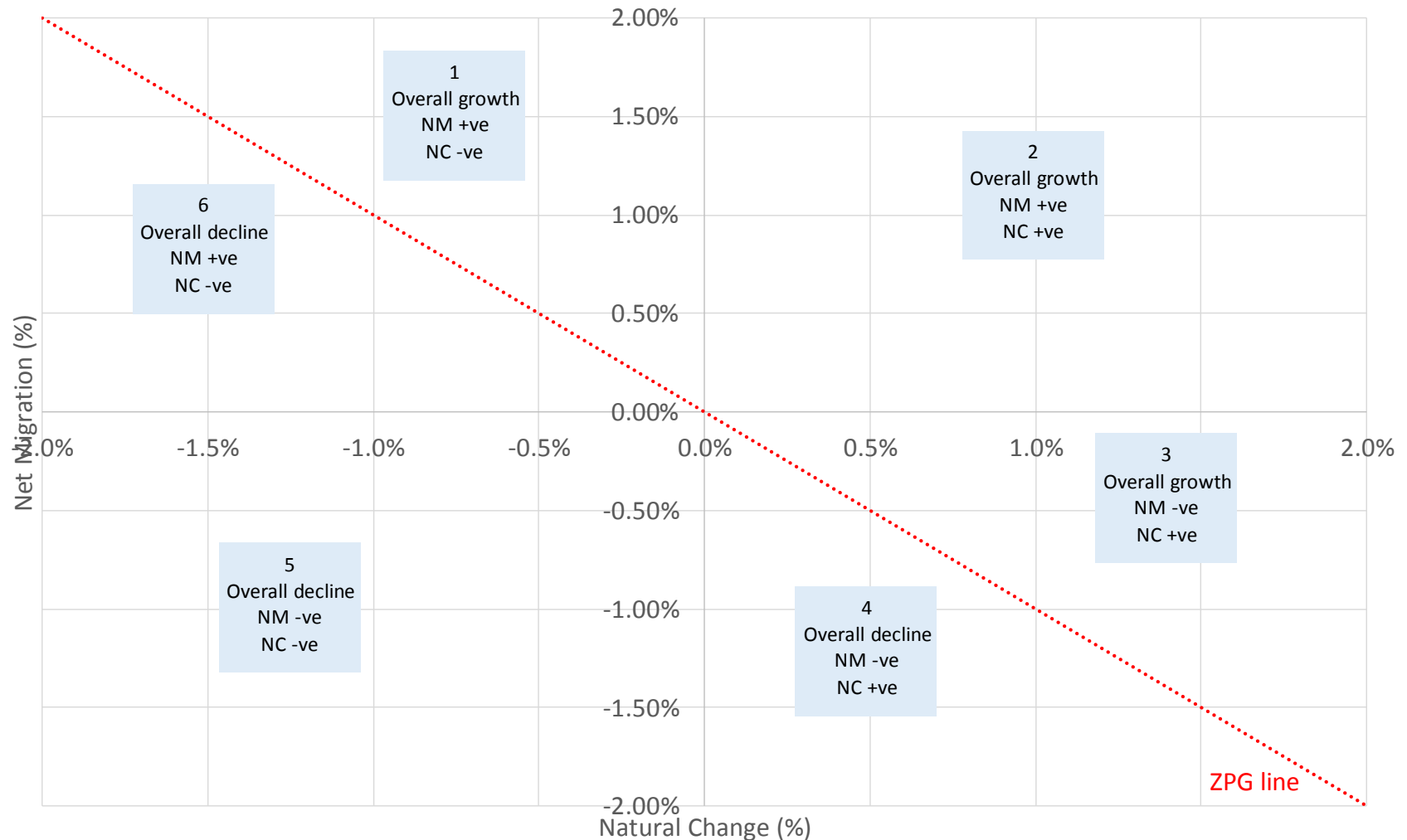
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- We can categorise population change into six types:
  1. Population growth through net in-migration that exceeds natural decrease
  2. Population growth through combined net in-migration and natural increase
  3. Population growth through natural increase in spite of net out-migration
  4. Population decline through net out-migration that exceeds natural increase
  5. Population decline through combined net out-migration and natural decrease
  6. Population decline through natural decrease in spite of net in-migration
- Sub-national areas may move between these types
  - In fact, we expect areas to move towards types 1 and 5, and 6 (the latter is what Natalie Jackson has termed the 'new form' of population decline)

# Population change



### Population Change Typologies

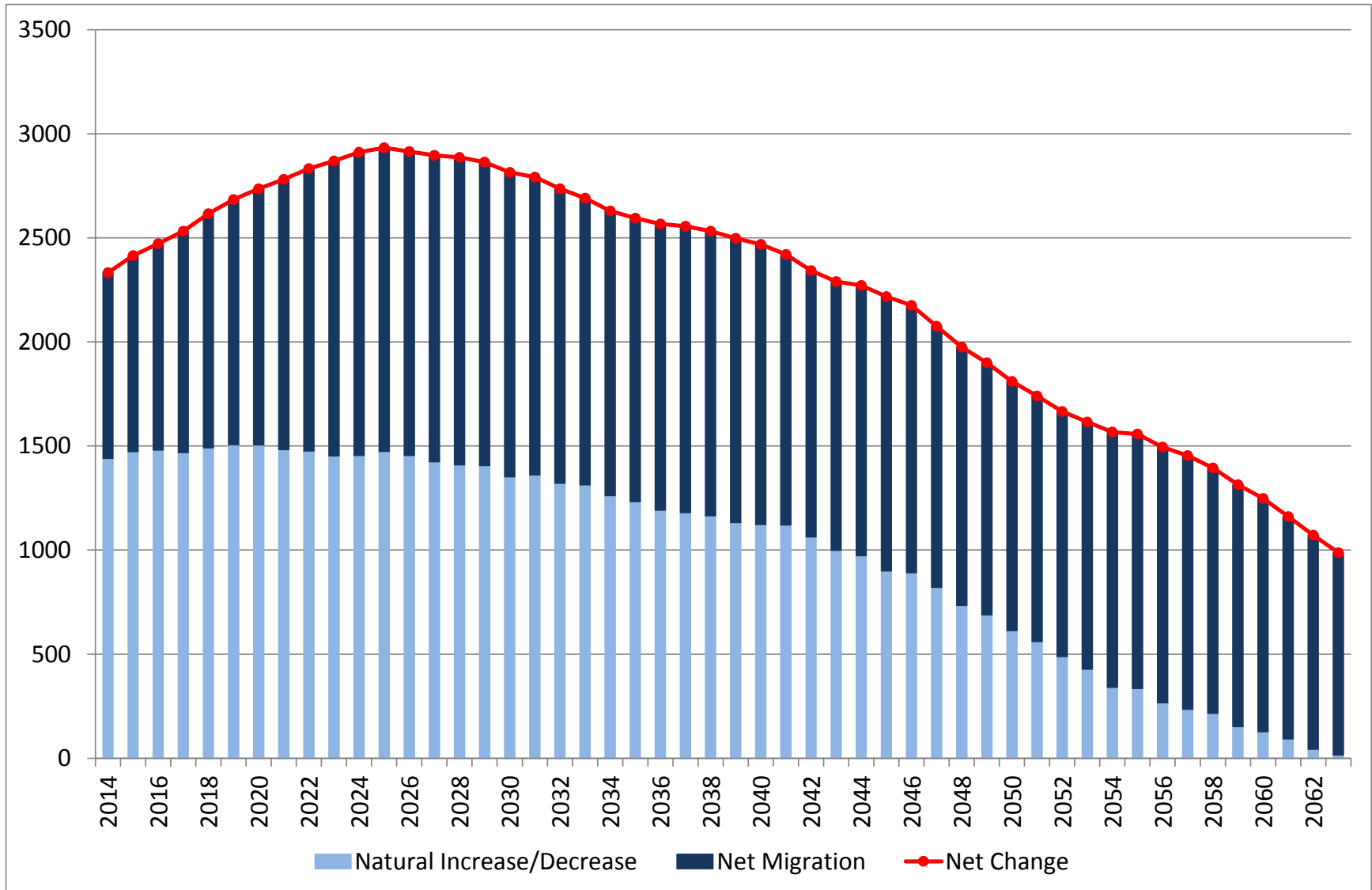


- The historical data I will use comes from inter-Censal population changes
  - Calculations by Natalie Jackson
- The projected data comes from two sources:
  - The WOW population model (single-district cohort-component model)
  - A prototype multi-district cohort-component model (which I discussed briefly in my presentation yesterday)

# Hamilton City – Annual projected population change



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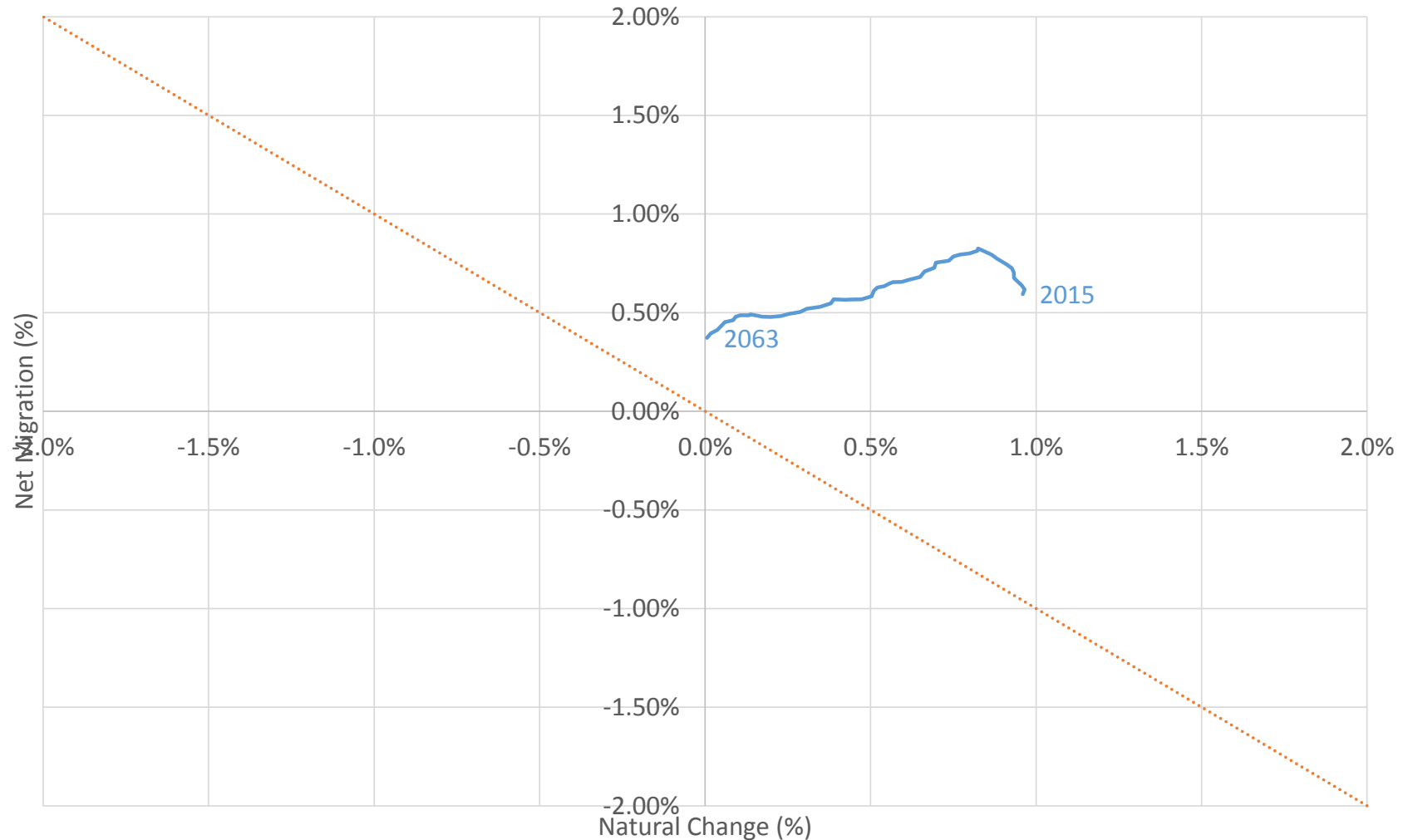


# Hamilton City – Annual projected population change



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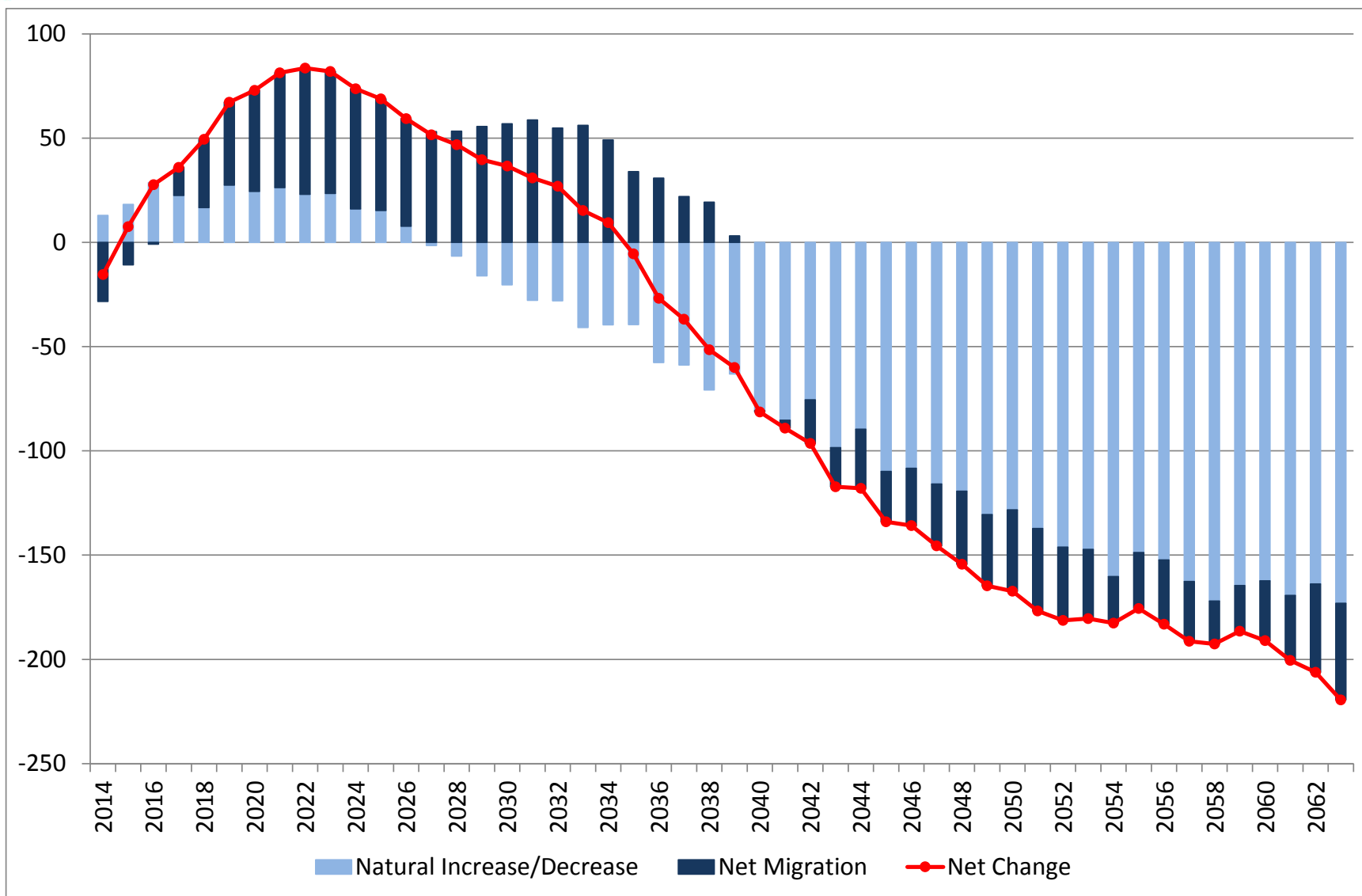
Time Path for Components of Population Change - Hamilton



# Hauraki District – Annual projected population change



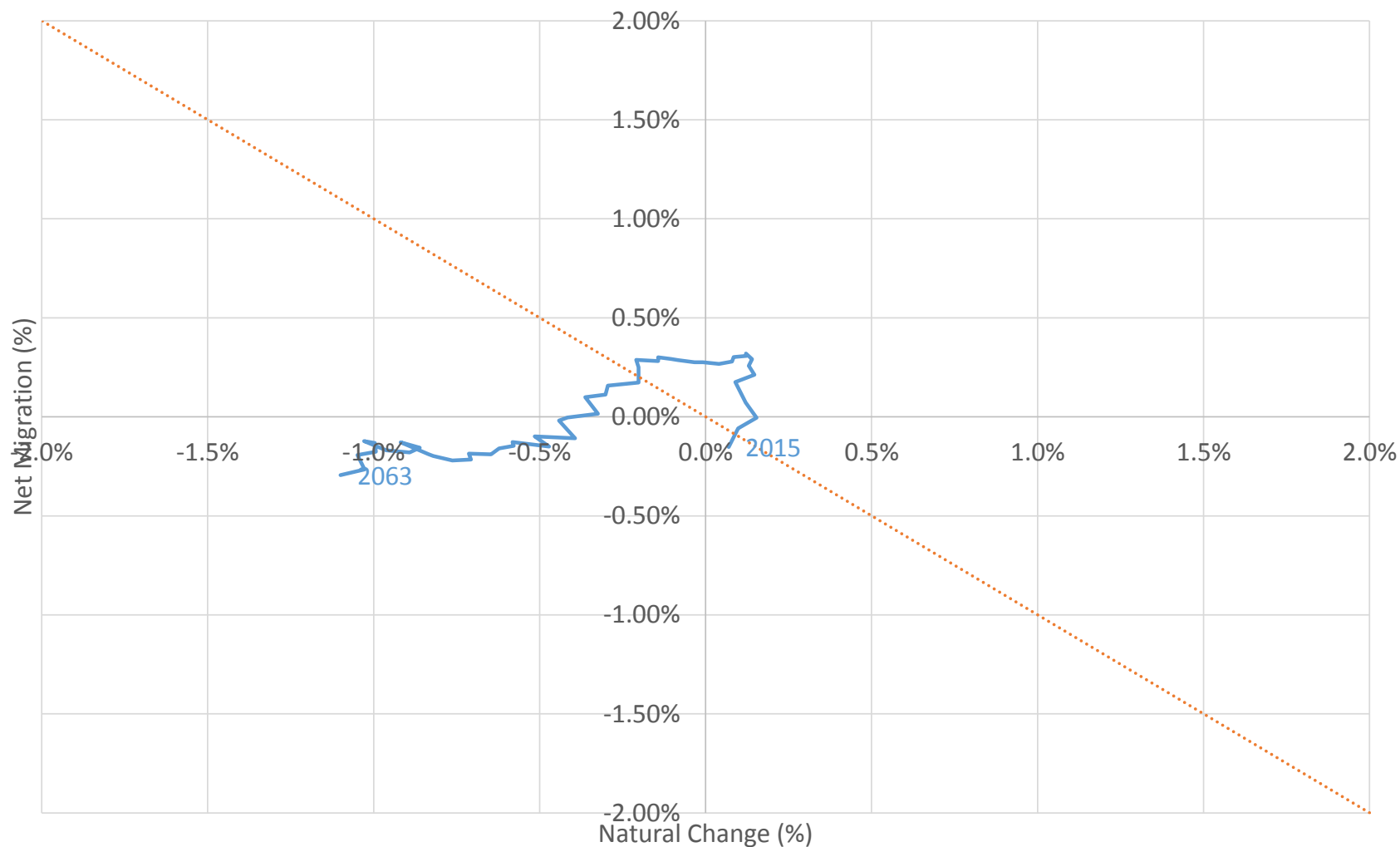
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# Hauraki District – Annual projected population change



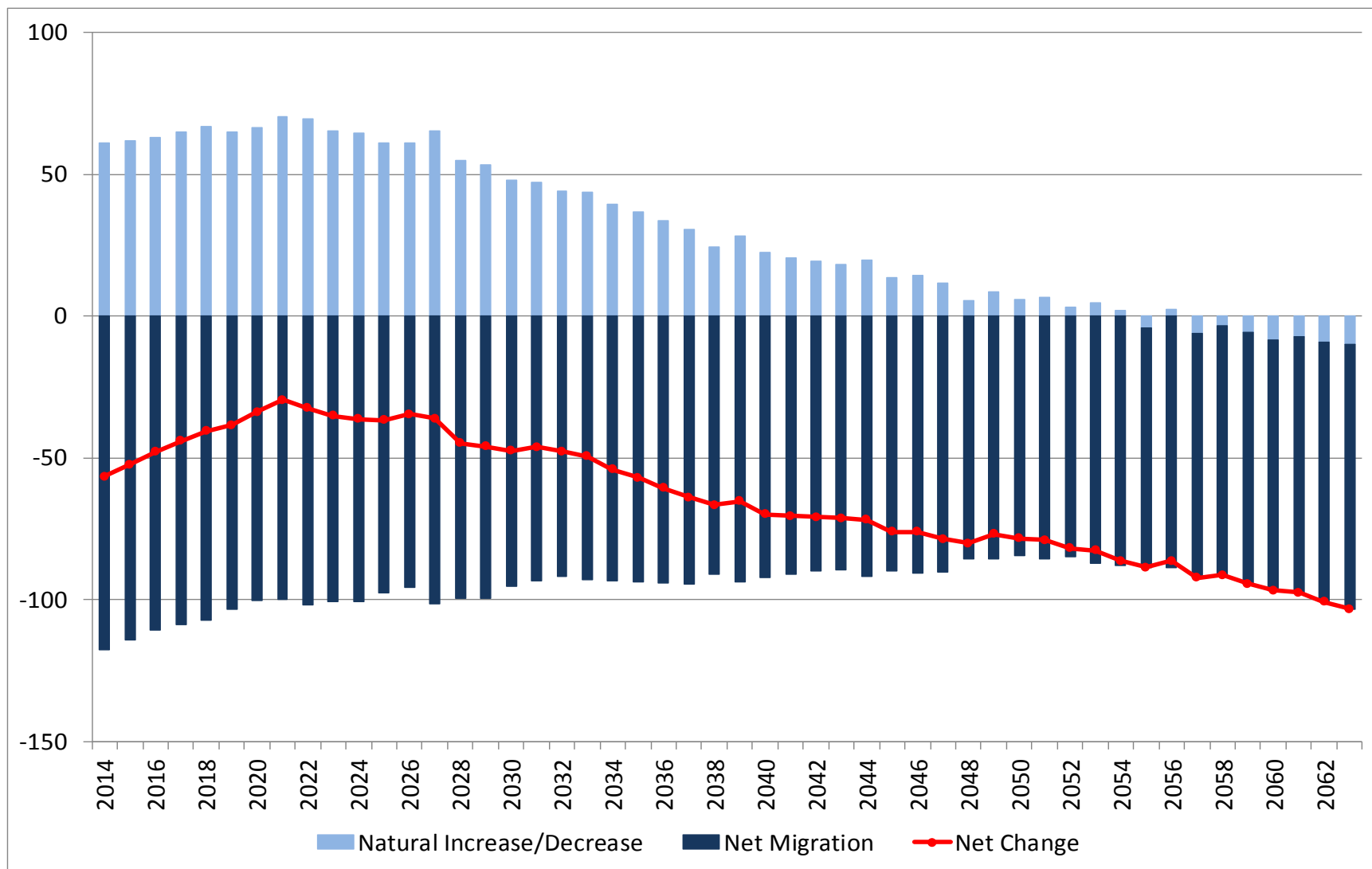
Time Path for Components of Population Change - Hauraki



# Waitomo District – Annual projected population change



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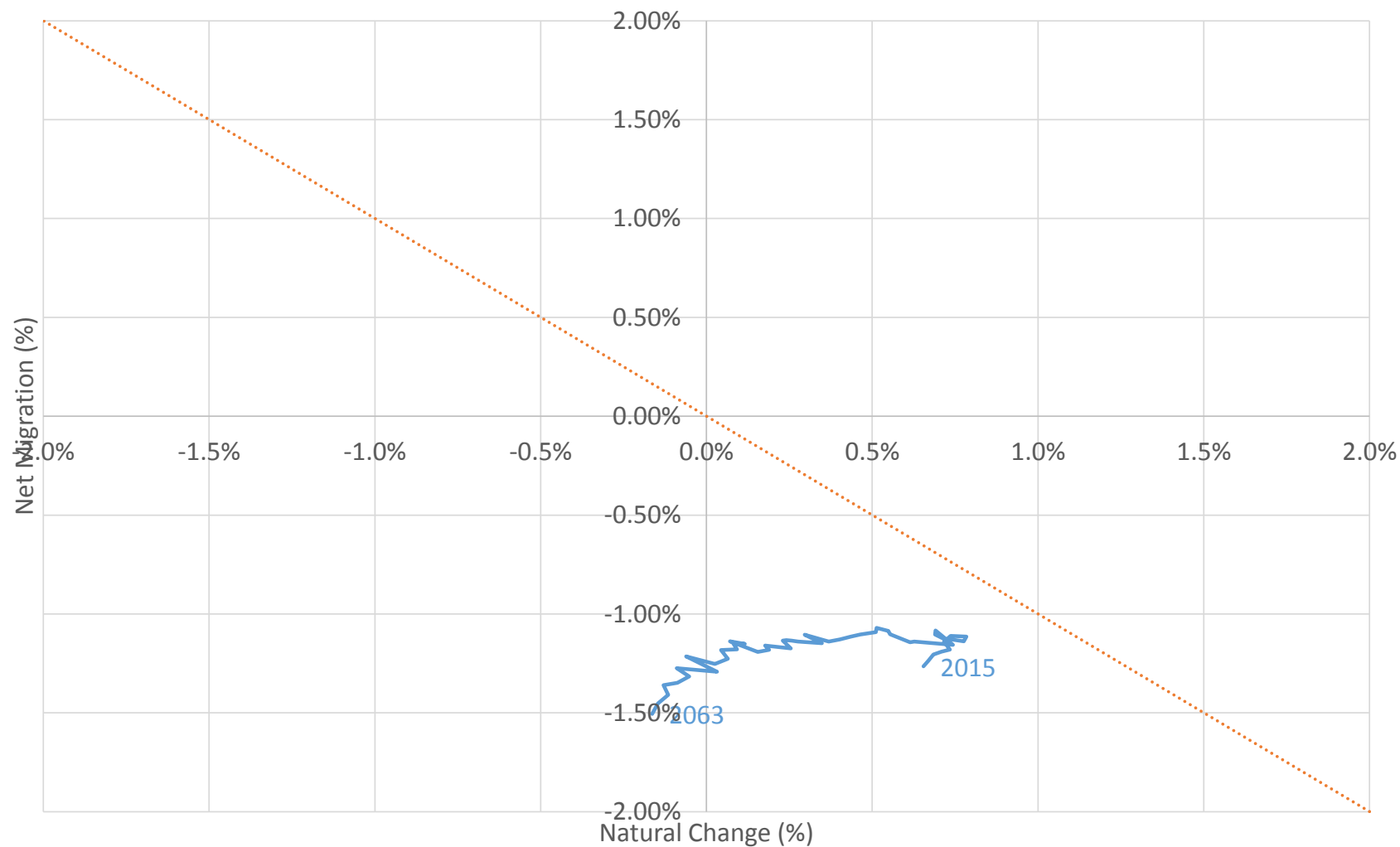


# Waitomo District – Annual projected population change



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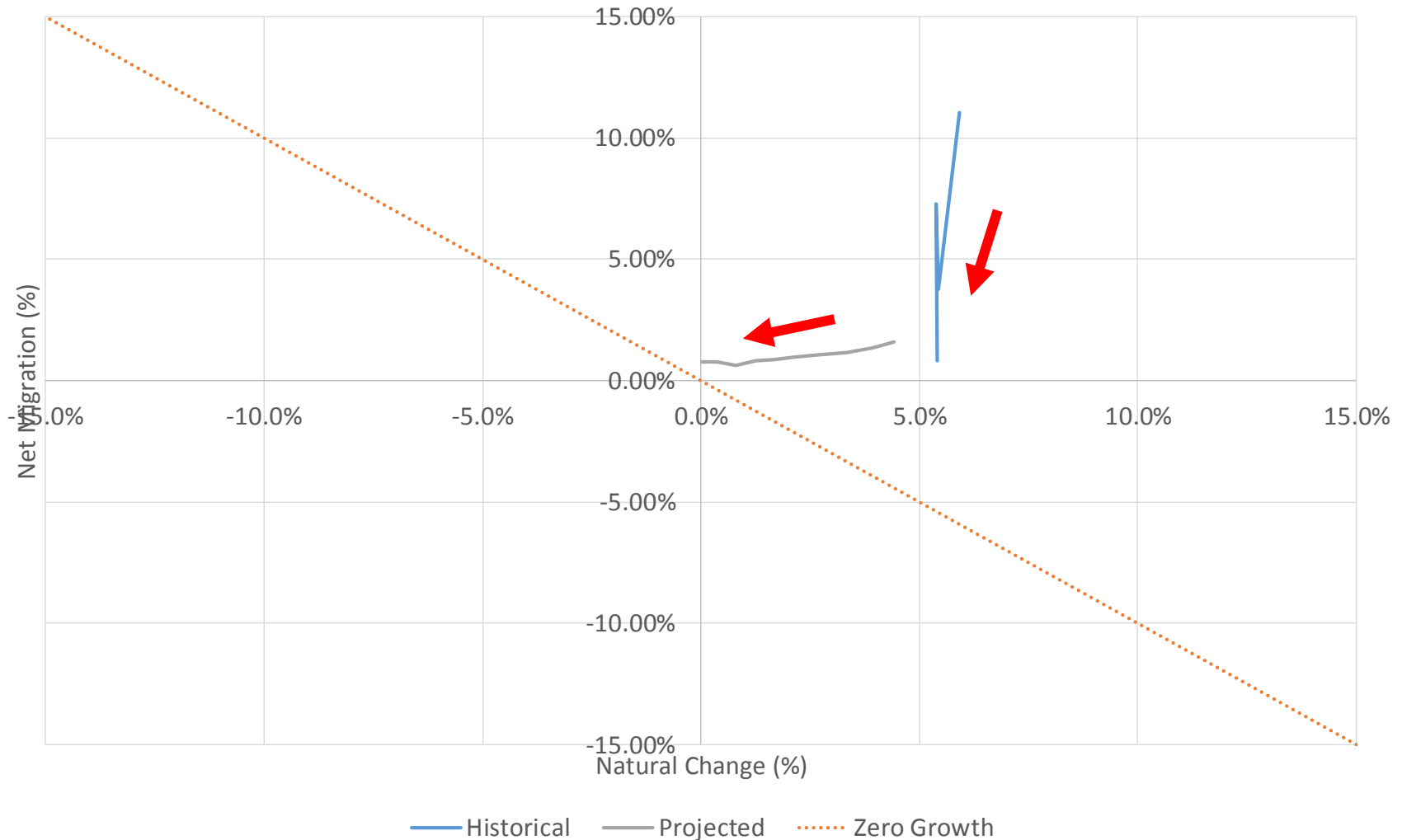
Time Path for Components of Population Change - Waitomo



# Auckland City – Five-year population changes



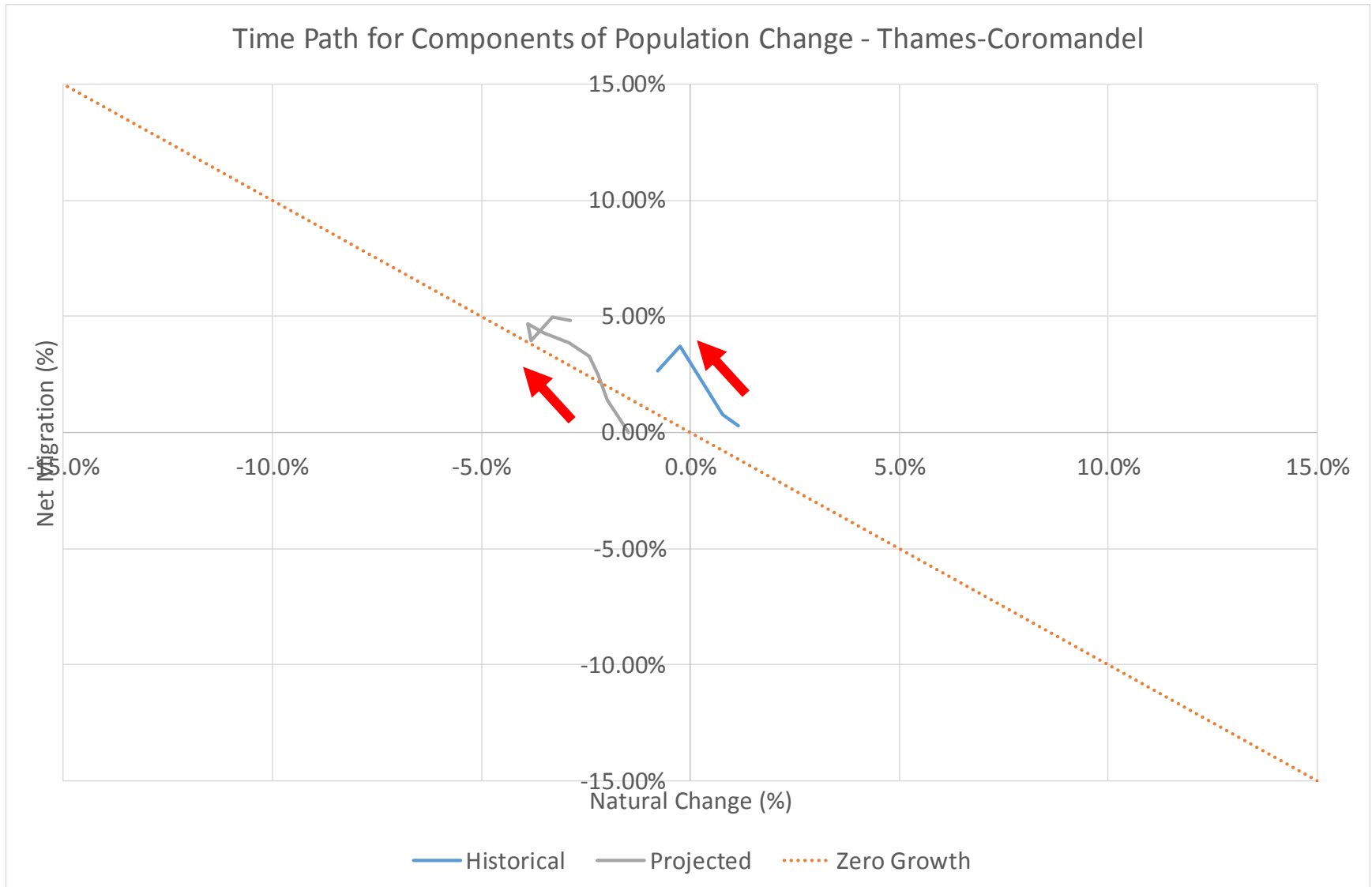
Time Path for Components of Population Change - Auckland



# Thames-Coromandel – Five-year population changes



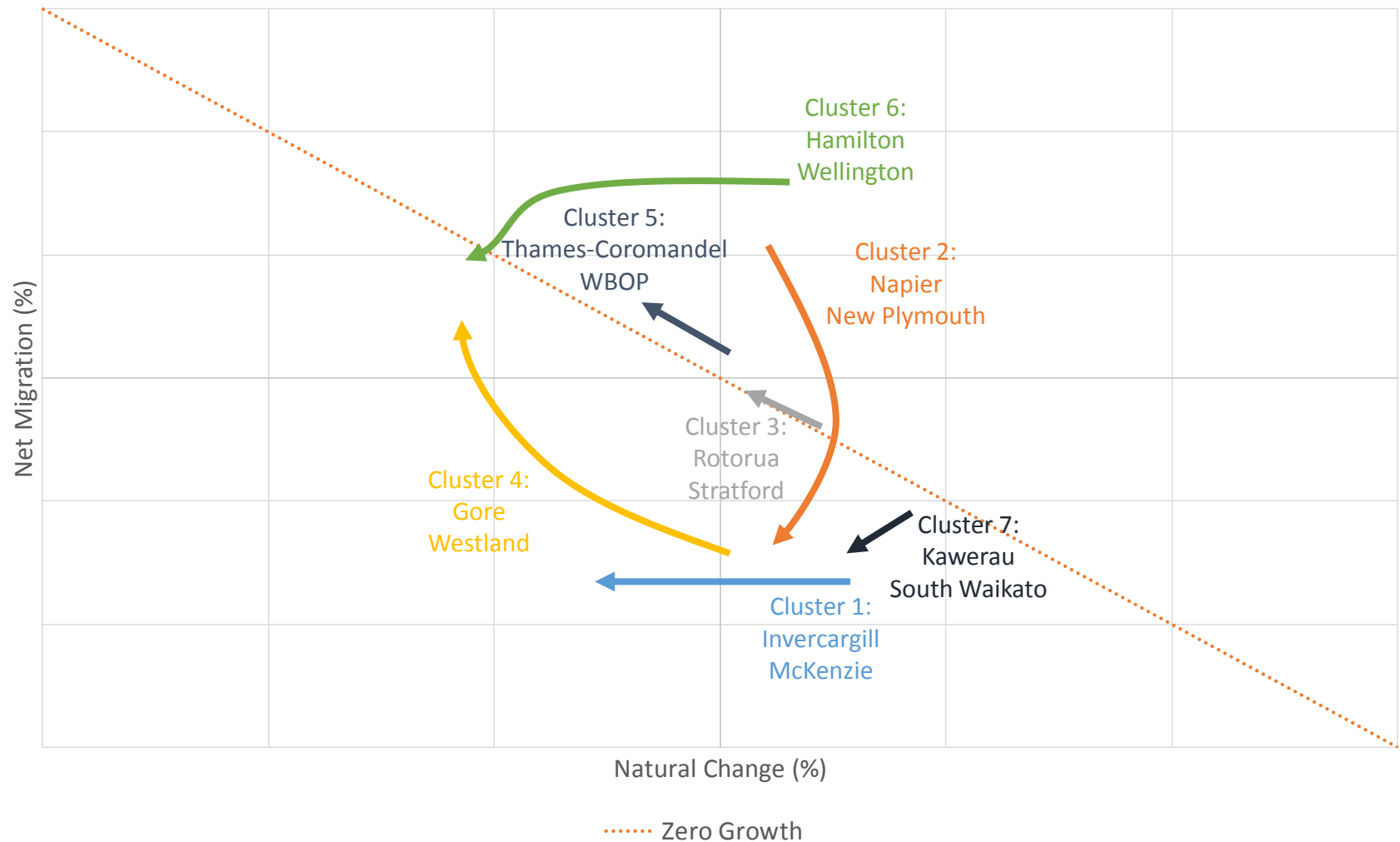
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# Time paths of population change



Time Path for Components of Population Change - By Cluster





# The role of population ageing



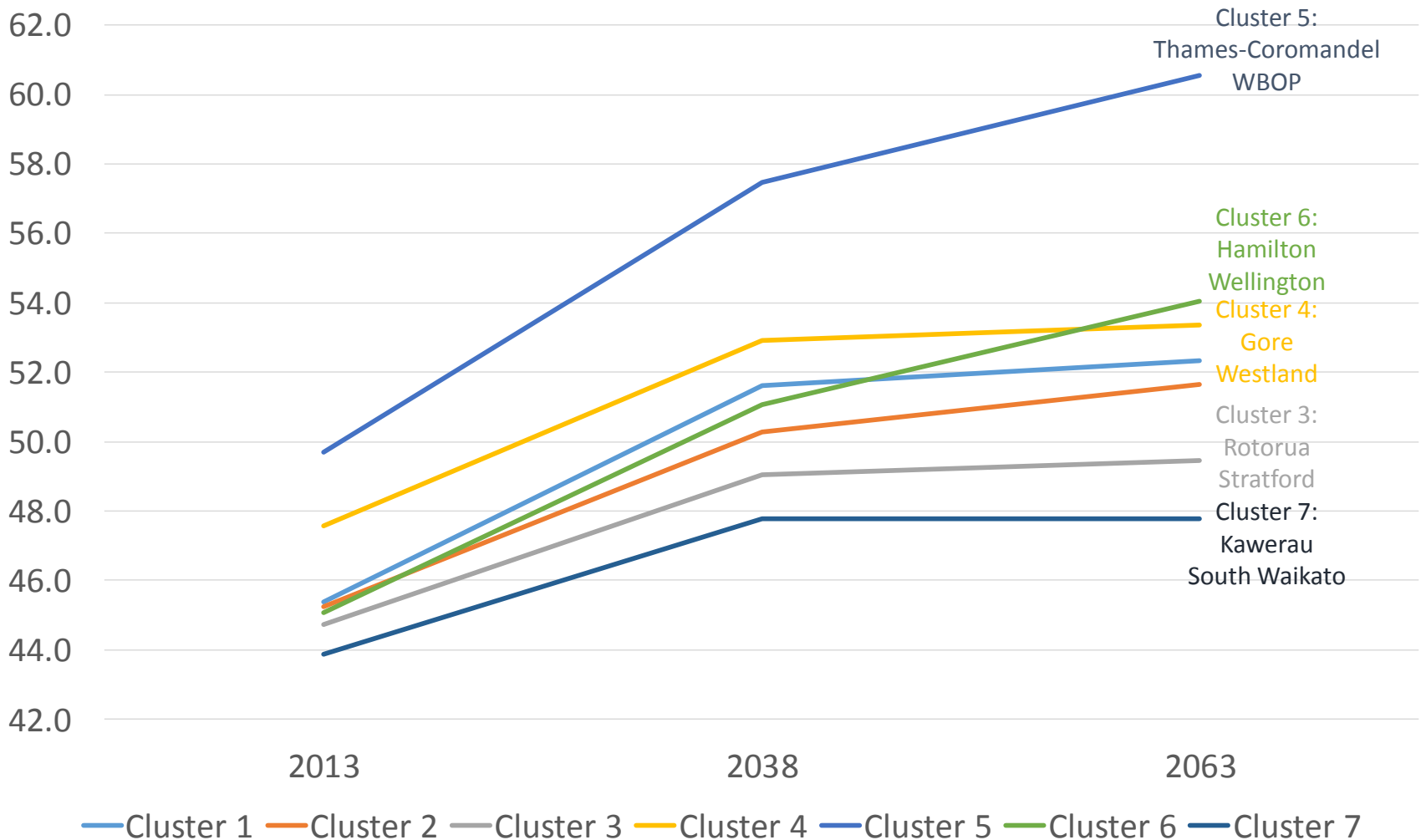
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- The age of the population has a clear theoretical role in determining the population trajectory
  - Older populations have fewer children, higher mortality, probably less migration (inward *and* outward)
  - This explains the general shift to the left in the path diagrams for most TAs
- However, to understand the role of population ageing we need an appropriate summary measure of structural ageing
  - I use the root-mean-squared age (RMSA) as a 'new' axiomatically-consistent measure of structural ageing

# Ageing and population change



RMSA, by cluster



- This work in progress gives us some food for thought in terms of the ‘new form’ of population decline
  - We **do** project decreasing natural change for TAs experiencing net in-migration, but we see much less of a shift to the expected ‘new form’ of population decline for areas experiencing net out-migration
  - That is, there are movements from Type 2 to Type 1 (and to a lesser extent Type 6), but the movements from Type 3 towards Types 4 and 5 are much slower
  - We need to consider more what is happening in areas with net out-migration

# Where to from here?



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- More work is required on the prototype population projections model
  - The source of many of the issues appears to be the projection of international migration (esp. emigration)
  - This should fix the mis-categorisation of some TAs in the cluster analysis, but probably won't change the lesser degree of leftwards movement for TAs experiencing net out-migration
- This developing work sits alongside work at the regional level, and work on subnational ethnic population projections (from the CADDANZ project)

# Thanks!



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