

# Research note on different methods of estimating retention rates of immigrants using the Longitudinal Immigration Database (IMDB) 2014

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## Introduction

Retention is a key metric for evaluating the success or failure of immigration policies and the integration of immigrants in Canada. However, few researchers or policy makers have systematically examined how different measures of retention change outcomes and in turn policy considerations that affect demographic and socio-economic estimates. In this report, we compare two different approaches for measuring immigrant retention, and examine how these approaches affect the retention estimates, particularly in smaller provinces. Specifically, we compare the “destination-to-residence” to the “residence-to-residence” approach for measuring retention in Nova Scotia, other Atlantic Canadian provinces, and Ontario, to determine 1) the magnitude of the difference between the two measures; 2) if the differences are consistent across time and landing cohort, and 3) how different measures alter conclusions about retention.

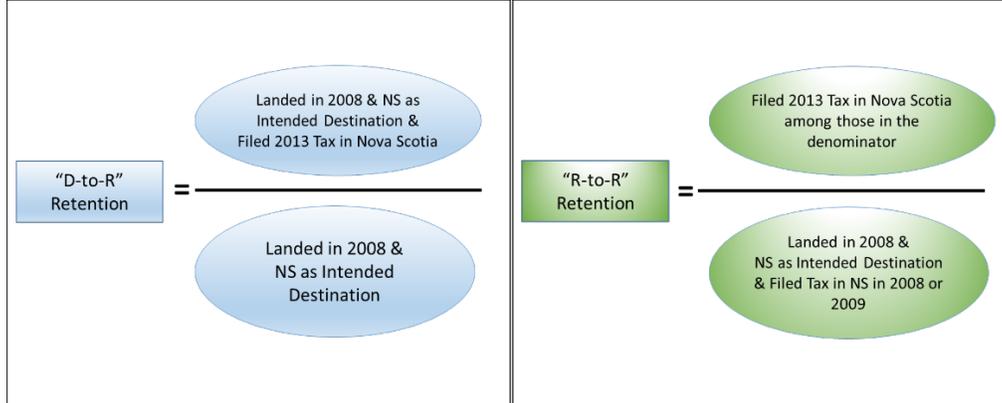
### Two conceptual approaches: “Destination to Residence” and “Residence to Residence”

Retention looks at the rate or number of immigrants that come to a given place and continue to subsequently live there. Increasingly, researchers that examine retention in Canada use the Longitudinal Immigration Database (IMDB), which consists of immigrant landing records linked to T1 family tax files. More recently, these files have been supplemented by temporary resident permits and mortality information.

There are two major approaches to measuring retention with the IMDB. The first is the “**Destination to Residence (D-to-R)**” approach, which is widely used by Immigration, Refugees, and Citizenship Canada, Statistics Canada, and the provinces. The second is the “**Residence to Residence (R-to-R)**” approach that has been introduced more recently. For both methods, retention estimates are limited to immigrants who filed taxes at least once since landing in Canada (often looking at one, three, or five years after landing). Figure 1 summarizes the components used to calculate retention rates for the two methods. It uses an example of retention 5 years after landing for immigrants to Nova Scotia who landed in 2008. This cohort for the example was chosen because it is the most recent cohort, for which we can produce a calculation for five year retention using the 2014 version of the IMDB. We could not calculate the five year retention rate for later periods because imputation used to capture people who did not file taxes in a given year required information of residence from the year before and after the tax year examined. That is, to calculate the 5-year retention for the 2008 landing cohort, data from 2013, 2014 and 2015 were needed.

As Figure 1 illustrates, the “D-to-R” method estimates retention rate by counting how many immigrants are ‘destined’ to a given province (the denominator) and then who filed taxes in the same province (the numerator) at a given point of time after landing. This method assumes that those ‘destined’ to a province actually land there, and that an immigrant found in another province was not retained. The “R-to-R” approach as illustrated in Figure 1, by contrast, looks at immigrants who *filed their taxes* in a province of destination in either the year the immigrant landed or the following year (the denominator). It then compares this count to the number of people filing taxes at a later point in time after landing. Unlike the “D-to-R” approach, the “R-to-R” method does not assume a person lands and instead confirms that an immigrant indeed lands in a given province.

**Figure 1: Two models of retention estimate**



The primary difference between the methods is that the “D-to-R” approach links intended destination to tax-filing location, whereas “R-to-R” uses intended destination, along with some evidence that an individual actually lands in that location (as judged by tax filing in years zero or one after landing), followed by tax filing location one, three, or five years later. The measures differ in that “D-to-R” does not capture whether an individual ever lives in their intended destination, whereas R-to-R requires an individual to state their intended destination, plus actually move and stay there. That is, the “R-to-R” approach examines immigrants who land in Nova Scotia and file taxes in either the year 2008 or 2009 versus filing taxes in the same province in 2013. As a result, the “R-to-R” method excludes those who filed their first tax outside of destination province from its base.

### How Much do Retention Rate Calculations Differ?

Comparing “D-to-R” and “R-to-R” retention rate calculations is important because if there is a difference in retention rates between the two methods it could mean that many immigrants who claim to be ‘destined’ to a province never actually move there. If that is the case, retention rates could be artificially biased downwards. If, conversely, an immigrant indicates a province as their intended destination, but doesn’t actually move there until three years later, they may bias retention rates upward. The measures also have different implications for recruitment, retention, and settlement strategies.

Table 1 shows examines the two approaches looking at retention rates 3- and 5-years after landing in each of the Atlantic Provinces and Ontario for a cohort of immigrants landing in 2008. In all instances but one, the retention rates are lower for the “D-to-R” approach compared to the “R-to-R” method. In the case of Nova Scotia, the 3-year retention rate calculated with “D-to-R” method is 70%, while it is 75.4% when calculated with “R-to-R” method. The differences across other Atlantic provinces ranges from 8.4% to 15.7% difference. If the 5-year retention rate is examined the differences range from 3.1% difference in Nova Scotia compared to 11.9% difference in Prince Edward Island. The magnitude of that problem is illustrated by looking at the same differences between methods for Ontario. The gaps are much smaller in Ontario, a difference of just 0.05% for the 3-year retention rate and 1.6% for the 5-year retention rate.

**Table 1: Retention Rate for Immigrants landed in 2008**

Province	Retention Length	Methods		Difference (a)-(b)
		D-to-R (a)	R-to-R (b)	
NL	3-Year	55.9%	71.6%	-15.7
	5-Year	53.8%	64.2%	-10.3
PEI	3-Year	18.4%	35.4%	-17.0
	5-Year	14.1%	26.0%	-11.9
NS	3-Year	70.0%	75.4%	-5.4
	5-Year	63.9%	67.0%	-3.1
NB	3-Year	60.4%	71.4%	-11.0
	5-Year	51.0%	59.4%	-8.4
ON	3-Year	92.0%	92.5%	-0.5
	5-Year	90.8%	89.1%	1.6

These results show a significant number of immigrants who claim they are ‘destined’ to the Atlantic Provinces never actually land in them (or have not filed the taxes in those provinces). The one instance where “D-to-R” is higher than R-to-R is the 5-year calculation for Ontario. There, the 5-year “D-to-R” calculation is 1.7 points higher than it is for “R-to-R”. This is likely due to a combination of increasing tax filing rates over time, and a share of people that indicated Ontario as their intended destination, but lived elsewhere before finally heading to Ontario to be counted in that province’s 5-year “D-to-R” retention calculation.

**Are the “D-to-R” and “R-to-R” Gaps Consistent Over Time?**

To explore compare “D-to-R” and “R-to-R” methods, in this section we examine if the gaps between the two approaches remain constant over time. The gap between these measures reflects the difference between those who settled in the intended destination and those who did not. It is possible that the gap between methods is more prominent in the early settlement stage because immigrants are more mobile and less rooted in communities during the first 3 to 5 years after landing. Once they are rooted in their community it is more difficult to move and this may lead to a smaller gap in measurements between the two methods.

Table 2 examines the gaps in immigrant retention rates in Nova Scotia between the two methods for immigrants who landed in the year 2000 and follows them for 13 years, using both methods. The table shows that the gaps in retention rate estimates due to differences between the “destination-based” denominator and “residence-based” denominator are greater in the short run. Over time, the difference shrinks.

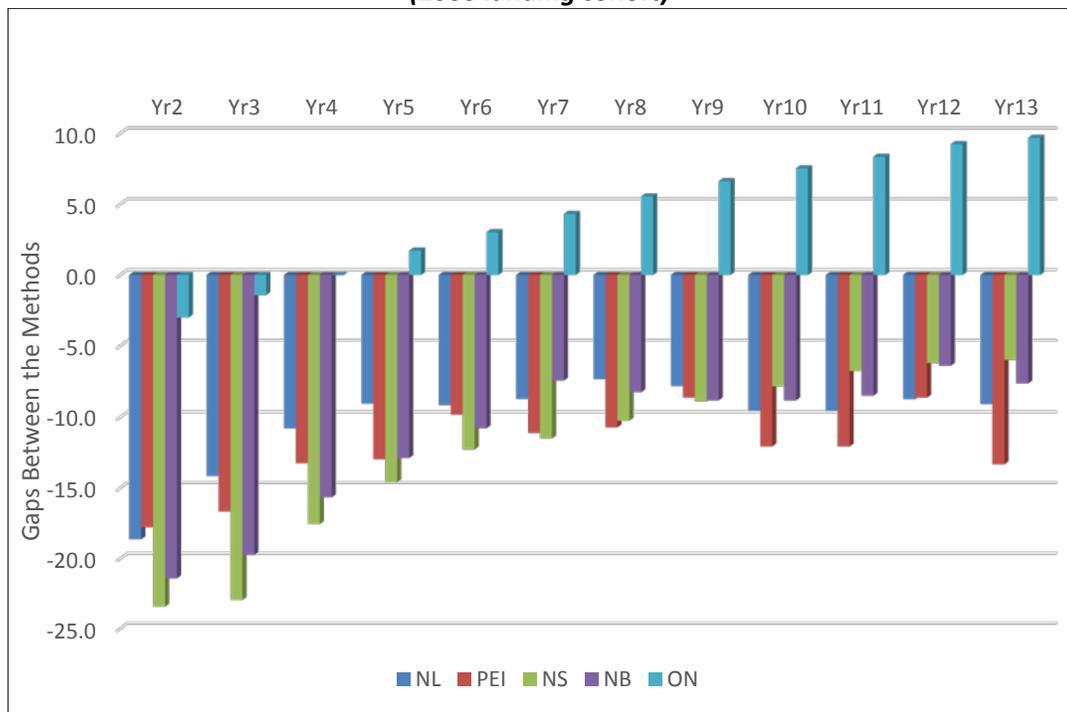
**Table 2: Gaps of Retention Rates Over Time for Immigrants to NS (2000 landing cohort)**

Methods	Year since landing											
	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th	13th
D-to-R (a)	57.9%	55.3%	53.8%	50.5%	48.2%	45.1%	44.8%	44.6%	42.6%	42.1%	41.8%	40.5%
R-to-R (b)	81.4%	78.3%	71.3%	65.1%	60.5%	56.6%	55.0%	53.5%	50.4%	48.8%	48.1%	46.5%
Difference (a-b)	-23.4	-23.0	-17.5	-14.6	-12.3	-11.5	-10.2	-8.9	-7.8	-6.8	-6.2	-6.0

For example, for those who landed in Nova Scotia in 2000, the “D-to-R” retention rates dropped from 58% in 2002 (2 years after landing) to 41% in 2013 (13 years after landing) or 17 percentage points. During the same period, the “R-to-R” retention rate of the same group declined from 81% to 47%, or 35 percentage points. This shows that the gaps are largest in the first few years after landing.

When the three other Atlantic provinces are examined in Figure 2, a similar pattern is observed.

**Figure 2: Gaps of Retention Rates Over Time for Immigrants to Atlantic Provinces and Ontario (2000 landing cohort)**



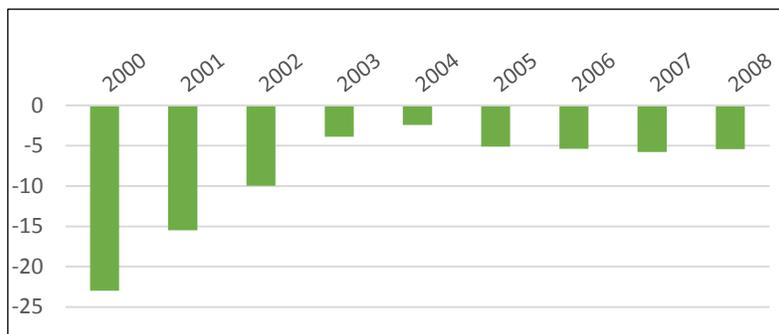
In Figure 2 the gap between the “D-to-R” and “R-to-R” retention rate generally decreases for three of the Atlantic Provinces over time, although for Newfoundland and Labrador and Prince Edward Island the gap slightly increases after 10 years since landing. These trends signal that the impact of “destination” versus “residency” on retention estimates is more prominent in the earlier part of settlement, where immigrants in general are more mobile.

Once again, Ontario’s “D-to-R” calculations differ from other provinces. There, “D-to-R” reveals higher retention rates, suggesting that individuals state Ontario as their intended destination, but don’t actually move there until years later.

### Do the gaps vary across cohorts?

While the gaps of the two estimates of retention rate decline over time, it is unclear whether this is because of differences among older cohorts versus newer cohorts of immigrants. If differences exist this could help determine whether differences are linked to policy changes or demographic attributes of different cohort. Figure 3 examines the 3-year retention rates for immigrants to Nova Scotia by landing cohort from 2000 to 2008.

**Figure 3: Gaps in 3-year Retention Rates for Immigrants to Nova Scotia by Landing Cohort (2000-2008)**



The gaps between “D-to-R” and “R-to-R” methods of estimating retention were highest for the 2000 through 2002 landing cohorts ranging from 23.0 percentage points to 2.4 percentage points difference between the two methods in those years. The gap decreased with newer cohorts. Particularly for those who came to Nova Scotia during 2003 and 2004, the differences between the two approaches were 3.9 2.4 percentage points, respectively. For cohorts after 2005 the differences grew slightly, but continued to hover around 5 percentage points. It appears that more immigrants are actually landing in their ‘destined’ province than was true in the past.

### Conclusion

The “Destination-to-Residence” approach to calculating retention, which does not account for if people land and just looks at their intention to land, produces lower retention rates than the “Residence-to-Residence” method, which captures people that actually land in a given province. The difference signals potential problems in recruitment policies rather than settlement alone. The gaps between the two calculations of retention rates are greater among the Atlantic Provinces compared to Ontario signaling a regional problem with recruitment and retention. The gaps decrease over time, showing that intended destination has a bigger effect in the short run and this means that interventions in recruitment and the first years of settlement will likely have the biggest impact on retention. The gaps between the two calculations are likewise smaller for recent cohorts of immigrant, potentially indicating that the recent immigrants are more likely to settle in the destined province than older cohorts of immigrants.