

Prospects for Reverse Mortgage Loan Insurance in Canada

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March 31, 2020

1 The global market for reverse mortgage loans

A reverse mortgage typically involves a lump sum, credit line, or guaranteed income stream given from a lender to an older homeowner in exchange for repayment at loan termination. Termination occurs at the earliest of a voluntary prepayment, a move while alive, or death of the borrower. Typically the lender has no recourse to assets other than the home, and no principal or interest payments are required until the date of loan termination. The borrower is responsible for property tax and insurance payments. Borrowers may be single or married couples; the former are easier to consider for termination purposes.

The expected present value of collateral at termination, and hence loan to value (LTV) ratios at origination, will rise with a borrower's age and fall with interest rates, as the discounted value of collateral at termination can be expected to rise with current age and fall with discount rates.

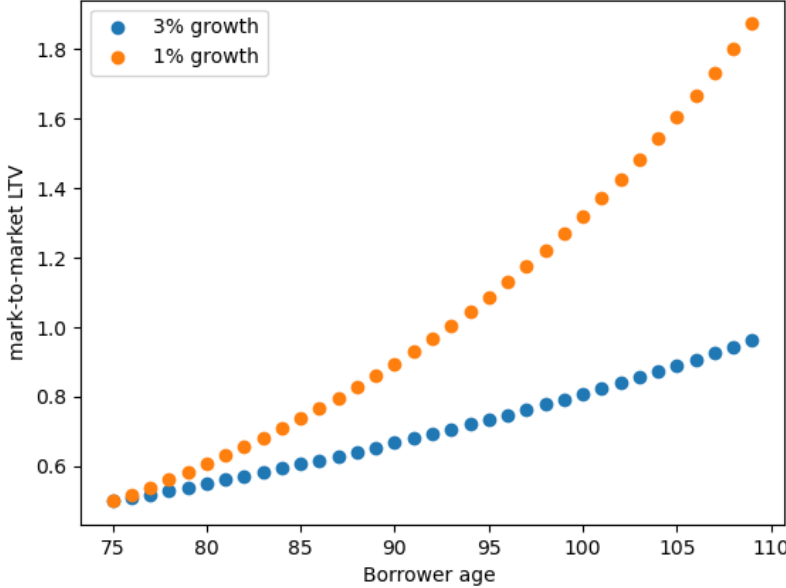
Figure 1 plots mark-to-market LTV over time for a loan with an initial 50% LTV for a 70 year old borrower, with the borrower's age on the horizontal axis on the top panel. Due to the non-recourse feature, the fundamental risks are that the borrower will remain in the home for too long, with too large of a gap between the investors' discount rate and home price appreciation. With continual compounding and a constant discount rate r and growth rate g , and an initial ltv of L , the loan balance at date t is:

$$LTV(t) = Le^{[r-g]T}. \quad (1)$$

The value of the limited liability "put option" induced by the non-recourse provision per dollar of initial property value, discounting at rate δ is equal to:

$$p(t) = \max(0, LTV(t) - 1) e^{-\delta t} \quad (2)$$

Figure 1: Loan to value ratio for a 50% loan at 5% interest over time for different home price growth rates



Because the put option may have considerable value, and may induce contractual problems (see below), reverse mortgage debt may be an expensive source of funds, even risk-adjusted. We thus expect that borrowers will be drawn from the high end of the distribution of home value to other asset ratios. This has certainly been true in the U.S. (Davidoff (2014)) and anecdotally appears to be the case in Canada.

A fundamental tension in reverse mortgage design is between initial LTV and put option value. Conditional on LTV, there are multiple ways to price and allocate put option risk among investors.

Among the best-developed markets for reverse mortgages globally are the US, the UK, South Korea, and Australia.¹

In both the U.K. and Australia, both reverse mortgages (“lifetime mortgages”) and “home reversion schemes” are available. The latter are forward sales of a fixed fraction of the proceeds from the seniors’ home, but in both countries reversion schemes are niche products with much lower market share than reverse mortgages. Home reversion schemes do not explicitly feature a put option, but the lender loses money as the borrower’s tenure grows.

Per Australian Securities & Investments Commission (2018), through December 2017,

¹The Chinese market, despite a population with many very low income, high housing wealth seniors, is tiny, per Hanewald et al. (2020). Japan’s government offers reverse mortgage-type specialized loans, but with restricted use of the proceeds.

Australian reverse mortgage balances were AUD 2.5 billion on a total population of 24.6 million, with 72% lines of credit and 11.3% lump sum.² However, Kobayashi, Konishi, and Takeishi (2017), citing Deloitte and SEQUAL, find larger numbers of 41,500 outstanding loans with a balance of 3.6 billion AUD through 2013. LTV ratios appear to be quite low, commonly 30% or lower for 70 year olds based on a government calculator, with interest rates above 6%.³ Australia has a “Pension Loan Scheme” run by its government that allows only a regular payment option. This market is quite small, at 1,100 users as of October, 2019.⁴

The UK lifetime income market appears significantly larger than Australia, with annual originations of roughly 3.9 billion, 44,870 originations in 2019 and a similar number in 2018.⁵ Combined with older figures from Kobayashi, Konishi, and Takeishi (2017), this suggests roughly 500,000 outstanding reverse mortgage loans and up to a 10% share of the potential market of senior homeowners.⁶ Neither the UK nor Australia appears to have a securitization or insurance market for reverse mortgage loans. Rates appear to be somewhat lower in the thicker UK market and available LTV ratios somewhat higher: a 70-year old based on one calculator can obtain a 43% LTV at 5.5% interest.

A relatively recent product offering in the U.K. market is “Retirement Interest-Only” (RIO) mortgage loans. These require income sufficient to pay interest, but not principal, and are not due and payable until pre-defined life events occur. Rates appear somewhat lower and LTVs somewhat higher than lifetime mortgages.

Until recent growth in the U.K. market, South Korea and the U.S. appeared to be the largest markets for reverse mortgage loans, and notably both featured government guarantees to investors. In South Korea, the JTYK (JooTaekYeonKeum “Housing pension”) program offers relatively low interest rates (under 2% spread above 6-month COFIX rate, currently near 2%, inclusive of the guarantee fee). The Korean Housing Finance Agency guarantees these loans.⁸ Notably, in Korea, while a lump sum is available, a life annuity appears to be the favored drawdown style, and reverse mortgage borrowers appear to have *higher* pre-retirement incomes than non-borrowers. The Korean program was originating roughly 5,000 loans per year in the mid-2000s, up to 10,000 to 11,000 in each of 2016 through 2019,

²Australian Securities & Investments Commission (2018), there might be a stock versus flow issue in my reading.

³Per <https://moneysmart.gov.au/retirement-income/reverse-mortgage-calculator#section-details>. and <https://www.canstar.com.au/home-loans/reverse-mortgages/what-might-a-reverse-mortgage-cost-over-time>

⁴“Pensioners Win Reverse Mortgage Reprieve”, Financial Review, Joanna Mather, October 23, 2019

⁵Per <https://www.equityreleasecouncil.com/news/2019-was-a-year-of-consolidation-as-equity-lease-lending>

⁶There are roughly 6.5 million UK households over age 65, with 78% homeowners and only 6% still paying a mortgage.⁷

⁸Kobayashietal

suggesting a stock of roughly 50,000 loans on a 65+ 65+ homeowner household population of roughly 5 million, for a 1% penetration rate.

The U.S. Home Equity Conversion Mortgage (HECM) has been sponsored and guaranteed by the U.S. Federal Housing Administration and run through the Department of Housing and Urban Development since the early 1990s. Congressional Budget Office (2019) estimates that as of the end of fiscal year 2018, \$111 billion of HECM credit was outstanding, for a penetration rate of 1.5% by value. Combining recent estimates from Congressional Budget Office (2019), Housing Studies (2018), and Community Living (2018), there are approximately 40 million homeowners over age 65, and roughly 400,000 outstanding HECM loans, for a penetration rate of 1%. Growth has slowed dramatically since the Great Financial Crisis. In 2007, there were 107,000 originations, in 2019, just 31,274 (per the National Reverse Mortgage Lenders' Association). Loan to value ratios have fallen, and for seniors with low incomes or poor credit histories (a sizeable fraction of HECM borrowers), a holdback of proceeds was introduced.

The U.S. experience has been notable for very poor *ex-post* performance of the FHA insurance fund. Because a large fraction of reverse mortgages were originated at the peak of the mid-2000s housing boom, in the states with the largest housing cycles, and in the neighbourhoods with the worst housing cycles within markets, a large number of loans have terminated with outstanding balances greater than collateral value.⁹ As Moulton, Haurin, and Shi (2015) and Begley et al. (2020), a surprisingly large percentage of HECM loans have fallen into property tax and insurance default, which puts servicers and FHA in a difficult position. Allowing non-performing loans to fester with no payments will generate large losses, but displacing delinquent seniors who have run out of cash is also unattractive both for policy and reputational reasons. Responding to this problem, FHA introduced the "Life Expectancy Set Aside." ("LESA") That set aside is placed into an account that grows with time, and can only be used to fund property tax and insurance payments, although there is limited protection against longevity.¹⁰ From the 2019 actuarial analysis: "The Economic Net Worth is defined as cash available to the Fund plus the Net Present Value (NPV) of all future cash outflows and inflows that are expected to result from the mortgages currently insured by the MMIF. As of the end of Fiscal Year 2019, Pinnacle's Actuarial Central Estimate (ACE) of the MMIF HECM Cash Flow NPV is negative \$11.228 billion. The total capital resource as reported in FHA's audited financial statement is \$1.694 billion at the end of Fiscal Year 2019. Thus, the estimated economic net worth of the MMIF is negative \$9.534 billion.

⁹Davidoff (2014)

¹⁰This is described in FHA HECM Mortgage Letters 2014-21 and 2015-09. Upon the loan's termination, LESA reverts to borrowers, undoing true annuitization.

A notable feature of the U.S. market is a healthy market for HECM mortgage backed securities (HMBS). These are pass-through claims on pools of HECM loans, with Ginnie Mae guarantees at the pool level, on top of FHA guarantees. Investors are protected in terms of timing risk further by FHA's right and obligation to purchase loans out of pools when loan-to-value (based on original appraisals) hit just below 100%.¹¹

Recently, private, uninsured securitized "jumbo" reverse mortgage loans that allow constant loan to value ratios at collateral values greater than those supported by FHA insurance have grown to roughly 25% of reverse mortgage <https://www.newviewadvisors.com/commentary/hmbs-december-2019-stocking-half-full-in-2018-then-hang-two-stockings-this-year/originations> by dollar volume.¹² Interest rates appear to be similar to HECM at 4.5% to 5%. To my knowledge, these are not securitized loans.

2 The Canadian Context

A significant number of Canadian seniors may be characterized as house rich, with a moderate number both house-rich and cash-poor. The high value of homes, particularly in Greater Toronto and Vancouver is well-known. Median income among single Canadian Canadians over 65, per the 2016 Censs was \$28,325. Poverty rates were relatively low, at 4%.

The reverse mortgage market in Canada has grown rapidly with home prices in recent years, but on a very small base. The oldest and largest product, the Canadian Home Income Plan, owned by Home Equity Bank, holds a portfolio of approximately \$4 billion. CHIP originations began in 1986 in Vancouver, and 2019 originations at \$820 million represented roughly 20% of the stock of balances. CHIP offers loan to values up to 55%. Interest rates on CHIP loans vary from 5% for a one-year term to 6% for a five year term. CHIP offers both lump sum and line of credit advances. CHIP originations appear to be growing at roughly 20% per year. With roughly 3 million households in Canada headed by a senior over 65, and assuming a \$200,000 average loan balance, CHIP has a market share of roughly one-half of one percent of eligible Canadian owners.

A new entrant to the market is Equitable Bank. They originated only \$20 million in loans in 2019, but have been doubling or tripling volume in recent years. Equitable Bank offers somewhat lower rates than CHIP, at 4.24% to 4.84% from 1 to 5 year terms, and lower origination fees, but lower loan-to-value ratios, at only 25% at age 70, and only 40% at 85.

A significant challenge to reverse mortgage lending model in Canada appears to be the

¹¹This repurchase saves guarantee fees to the government, as investors earn rates in excess of the riskless rate.

¹²<https://www.newviewadvisors.com/commentary/hmbs-december-2019-stocking-half-full-in-2018-then-hang-t>

funding model. U.K. lenders appear willing to offer fixed rate loans at moderate interest rates. In Korea, banks, which are not liquidity constrained (anecdotal), are willing to retain loans on their balance sheets, as they have guarantees from the federal government that they will be repaid in full.

The Canadian banks fund loans through GICs.¹³ As a result, they typically do not commit to interest rates past the first five years of a loans life. An attentive prospective borrower might therefore be worried about a hold up problem. Should the home appreciate significantly after origination, an unscrupulous lender could raise interest rates dramatically. Borrowers would have the right to sell at term, but have presumably used a reverse mortgage because they wish to remain in their homes for a long time.

3 Insurance and securitization

Were Canadian lenders able to sell cashflows to patient investors at origination, they could presumably commit to interest rates or at least margins over an index at origination.

3.1 Standard reverse mortgage put option pricing in Canada

A first question is: what are fair insurance premiums for put option risk in Canada? Answering this requires considerable modeling.

3.1.1 Terminations

Reverse mortgage terminations typically occur with a move while alive or death of the borrower. Death probabilities may be considered exogenous functions of age, but with a more generous put options, selection may be adverse.¹⁴ As observed in **DavidoffWelke**, there is an important moral hazard dimension to moves while alive.

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¹³In late 2019, CHIP completed its first sale of whole loans to another Canadian lender, while retaining servicing rights and obligations.

¹⁴Jeanne Calment, the famously long-lived French woman, was a “viager” borrower in France.

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