NATIONAL PENSION HUB

# Forced Retirement Risk and Portfolio Choice

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August 24th, 2020

**Interim Report 3**

## Overview

- Our paper, based on the findings from the U.S. data, has been published in the *Journal of Empirical Finance* (September 2020, vol. 58), which is a top-notch journal in Finance (impact factor: 1.244).
- The current report focuses on the new results from the Canadian data.
- First, we have updated our empirical analysis with Canadian data by including observations during the coronavirus crisis. The pattern we find during the coronavirus crisis is noticeably different than that in the past. The correlation between stock returns and the chance of involuntary job separation is much stronger during the coronavirus crisis.
- Second, we report the optimal portfolio adjustment strategy from our life-cycle model, under the late-in-life employment risk estimated from Canadian data. Due to the weaker correlation between stock returns and the chance of involuntary job separations, the implications of late-in-life employment risk on portfolio adjustment is much weaker than what we found from the U.S. analysis. Still, the common advice—to decrease the stock share as one gets older and

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enters retirement—is not supported as the optimal strategy. The human capital of working households is still stock-like, implying that the optimal stock share before retirement is lower than that in retirement.

# Forced Retirement Risk in Canada

To put our new results in the context of our previous findings, we reproduce three sections from the last report (Section 1-3). After that, we report the new results.

## 1. Dataset used

- We use the Public Use Microdata File (PUMF) of the Labour Force Survey (LFS).
- LFS is a monthly cross-sectional survey. Though the survey does not have questions on whether a reported retirement was voluntary or not, it has information on the reasons for separation from the previous job. This information allows us to identify involuntary job losses in old ages. Given that an involuntary job loss in late life is very likely to end up transitioning into retirement or at least a large reduction in the permanent income (Chan and Stevens, 2001, 2004), the risk of involuntary job loss we measure from the LFS should be very close, in its nature, to the risk of forced retirement we measured from the Health and Retirement Study (HRS) data in the U.S.
- We use waves from 2001 to 2020 (June).
- For the stock returns, we compute annual returns from the S&P/TSX index.

## 2. Definition of the risk

- For the U.S. analysis using the HRS data, we used the following formula to define the forced retirement risk:

$$ForcedRetirementRisk_{i,j} = \frac{N(ForcedRetirees_{i,j})}{N\left(ForcedRetirees_{i,j}\right) + N(Working_{i,j})},$$

where the numerator is the number of respondents forced into retirement in each wave while the denominator is the sum of the number of forced retirees and the number of those who are still working. The estimated number can be interpreted as the share of the forced retirees out of all the respondents who wanted to keep working in the considered survey wave.

- In the LFS data, we cannot identify whether a reported retirement is voluntary or involuntary. Instead, we focus on whether older Canadians experience an involuntary job loss in late life. We estimate the following ratio in each wave:

$$ForcedJobSeparationRisk_{i,j} = \frac{N(ForcedJobSeparation_{i,j})}{N\left(ForcedJobSeparation_{i,j}\right) + N(Working_{i,j})},$$

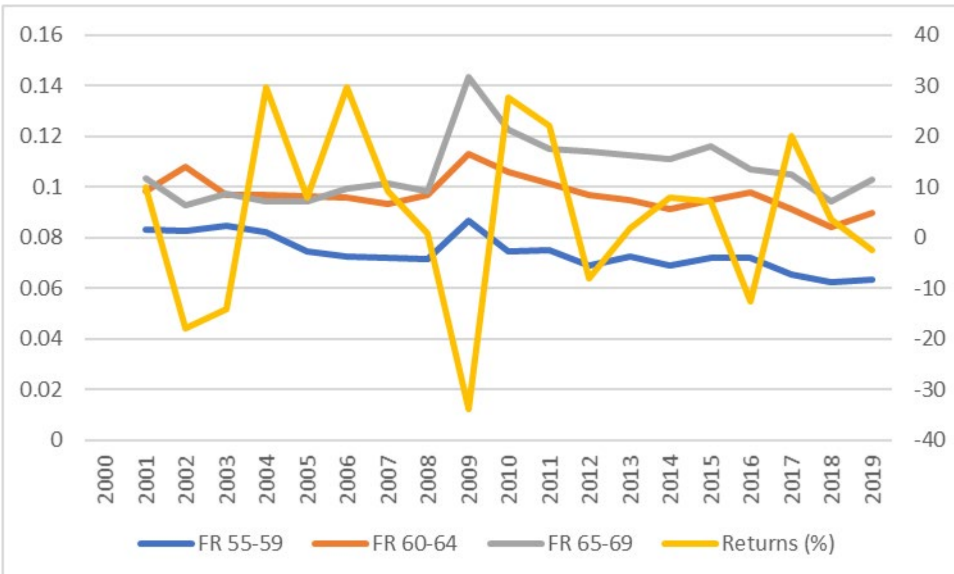
  where the only difference compared to the formula used in the U.S. analysis is that the number of forced retirement is replaced by the number of forced job separations. The estimated number can be interpreted as the share of those who lost jobs involuntarily out of all the respondents who wanted to keep working in the considered survey wave.
- We can think of reasons that this new measure may over- or under-estimate the late-in-life risks in earnings compared to the forced retirement risk. The forced job-separation risk will include job separations that do not lead to forced retirement. On the other hand, the forced job-separation risk may not be able to capture late-in-life earnings risks that take subtler forms (e.g., own decision to retire under some pressures from the employer). But we believe that these two measures are comparable in their nature and we expect them to be highly correlated.

## 3. Estimated risk and its correlation with stock returns (2001-2019)

- Figure 1 shows the time series of the probability of a forced job separation from 2001 to 2019, separately for the age groups 55-59, 60-64, and 65-69.
- For all the age groups, the risk is significant. Older Canadians, on average, face about ten percent chance of losing their jobs involuntarily each year. The risk is larger for older groups.
- We do find some negative correlations between the forced job-separation risk and the lagged S&P/TSX returns. The correlation between the risk measure and the lagged stock returns is -0.27, -0.33, and -0.26, for the age groups 55-59, 60-64, and 65-69, respectively.
- The negative correlation mostly reflects turmoils during the Great Recession. For the age group 60-64, we also see an increase in the risk during the burst of the dot-com bubble (2002) as well as after the negative return in 2015-2016. When we regress the risk measure

on the lagged stock returns, the negative slope of the age group 60-64 comes with a p-value close to 0.10, while for the other two groups, the estimates are statistically not significant.

Figure 1: Forced job-separation risk and lagged S&P\TSX returns (2001-2019, annual)



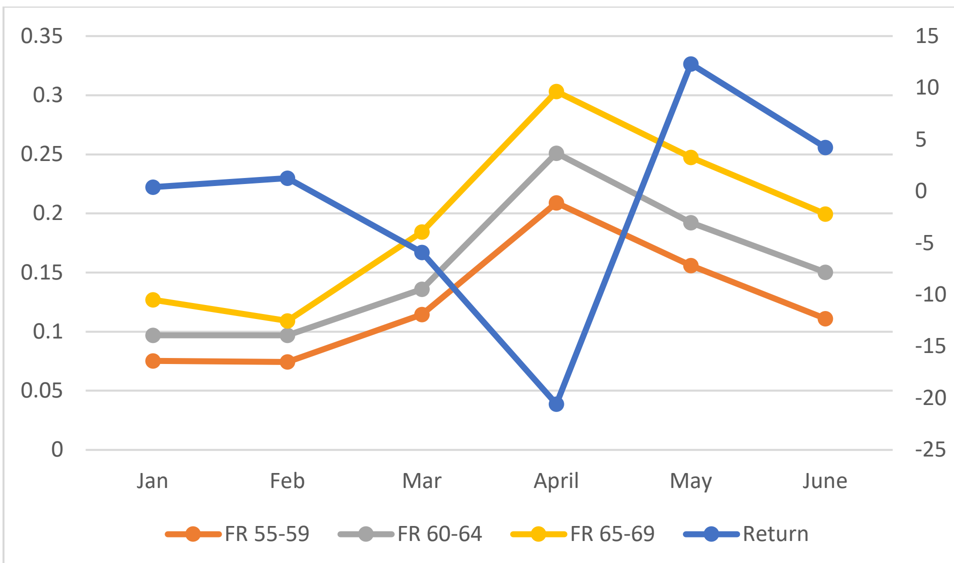

Note: This figure presents the probability of a forced job separation by age group and year (the units are shown in the left vertical axis). We sort our sample into three age groups: 55-59, 60-64, and 65-69. The probability of a forced job separation is defined as the share of respondents who got separated from their job involuntarily among those who wanted to continue working. The figure also plots the returns on the S&P/TSX index (January to January, the units are shown in the right vertical axis).

## 4. Estimated risk and its correlation with stock returns (during the coronavirus crisis)

- As of now, the LFS data is available up to June 2020. Using data from 2020, we can examine the forced job-separation risk and stock returns during the coronavirus crisis that started in March 2020.
- Figure 2 plots both the forced job-separation risk and lagged S&P\TSX returns at the monthly frequency in the first half of 2020.
- As expected, both series have very large fluctuations during the crisis. For the age group 60-64, the forced job-separation risk was around 10%, which is the pre-crisis average, until

February. Then it soars up to 15% in March and to 25% in April. Even though it decreases after that, it is still at 15%, or 50 percent higher than the pre-crisis average, as of June. On the other hand, the stock market experienced a small (-3%) loss by the beginning of March and then a very large loss (-21%) by the beginning of April. After that, the market has quickly recovered in by the beginning of May (+13%) though the TSX index hasn't recovered its pre-crisis level.

Figure 2: Forced job-separation risk and lagged S&P\TSX returns during the coronavirus crisis (2020, monthly)




Note: This figure presents the probability of a forced job separation by age group and month (the units are shown in the left vertical axis). We sort our sample into three age groups: 55-59, 60-64, and 65-69. The probability of a forced job separation is defined as the share of respondents who got separated from their job involuntarily among those who wanted to continue working. The figure also plots the returns on the S&P/TSX index (January to January, the units are shown in the right vertical axis).

- The figure also demonstrates a very strong negative correlation between the two series. The peak of the forced job-separation risk coincides with the trough of the stock return series. The forced job-separation risk decreases as the market recovers.
- Figure 2, therefore, clearly illustrates that, during the coronavirus crisis, many older Canadians have experienced both involuntary job separation and loss of their investments.
- This stark negative correlation, in particular at the monthly frequency, is not what is observed in the pre-crisis history. If we calculate the monthly correlation between the two series using

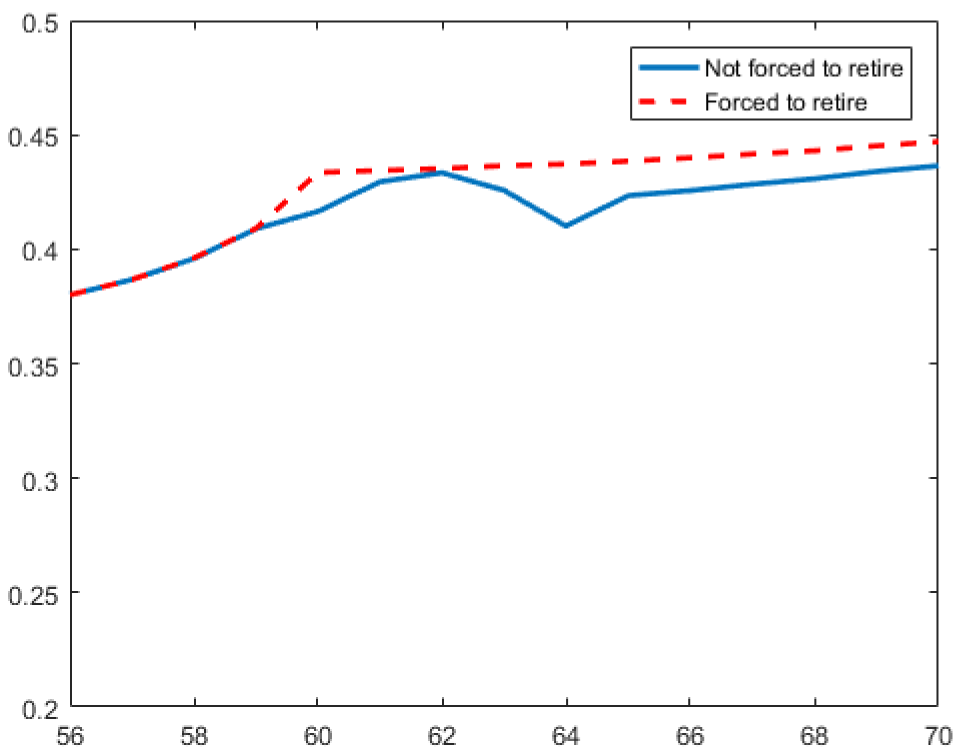
pre-crisis data, it is not statistically different from zero. In all the recessions observed in Figure 1, it took some time for the labor market to respond to the general economic conditions (reflected in the stock returns), as laying off someone typically requires advance notices. (This is why we plot Figure 1 in annual data.) During the coronavirus crisis, however, the labor market reacts to the economic conditions in realtime as most of these separations come from restrictions on the business activities and business closures.

## 5. Implications on the optimal portfolio choice around retirement

- We examine the implication of the forced job-separation risk from the Canadian data on the optimal portfolio choice using a life-cycle model. The life-cycle model we use is identical to the one used in the analysis in the U.S. analysis, except that the forced retirement risk is calibrated based on the Canadian data.
- Two notes on the calibration of the forced retirement risk in this analysis:
    - We use the patterns obtained from the annual data from 2001-2019. Though the correlation between the stock returns and the involuntary job separation risk is much stronger, at a higher frequency, during the coronavirus crisis, and it may have a strong implication on the optimal portfolio choice, we do not want to generalize that peculiar experience.
    - What we measure in the LFS is involuntary job separations, not involuntary retirements. As mentioned above, involuntary job separations at these ages likely lead one to withdraw from the labor force permanently, but still, a significant fraction of them may find a new job and return to work. Hence, we assume that about half of those involuntary separated from their job retire while the other half find a new job and return to work. This assumption makes the level of the forced retirement risk similar between Canada and the U.S. Therefore, any difference in the result comes from the difference in the correlation between the forced retirement risk and stock returns in Canada versus in the U.S.
- Figure 3 plots the age-profile of the optimal stock share under the late-in-life labor market risk from the Canadian data. Compared to the one from the U.S. (Figure 4(b)), the impact of the forced retirement risk is much smaller. At each age, the retirees still have higher stock share than the workers, but the gap is much smaller than what we find from the U.S. analysis.

Also, although the optimal stock share is still an increasing function of age, the slope is much flatter than that from the U.S. analysis. The difference is due to the weaker correlation between the stock returns and the forced retirement risk in Canada compared to the U.S. The human capital in late life is still stock-like in Canada, but much less so compared to in the U.S.

Figure 3: Life-cycle stock-share profile with forced retirement risk from the Canadian data



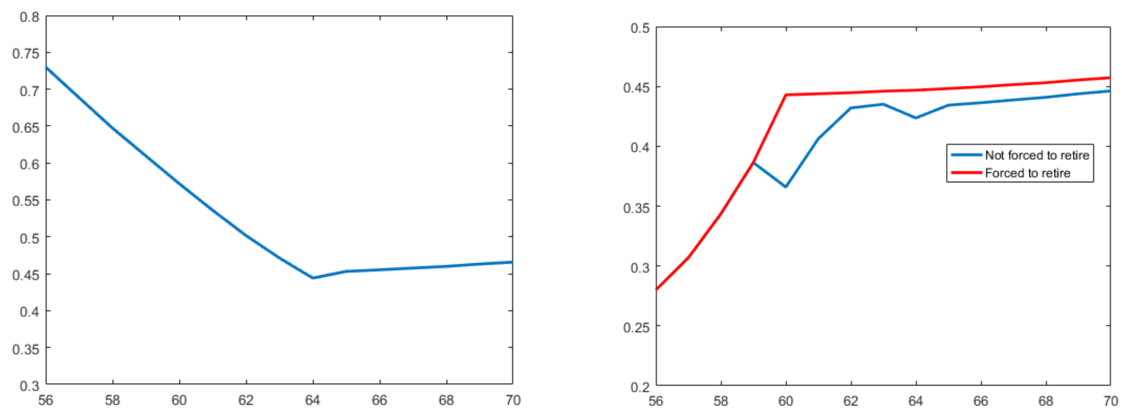

Note: The profile is constructed as the average of 10,000 simulations from the life-cycle model that incorporates the forced retirement risk from the Canadian data.

- However, the gap between the optimal stock adjustment strategy for the older Canadians (Figure 3) and the common suggestion in the market that ignores the late-in-life labor market risk (Figure 4(a)) is still starking. The stock share that is sharply decreasing with age from the latter is not supported as the optimal strategy from the model that incorporates the forced retirement risk.

- Overall, we conclude that these analyses reveal the importance of revisiting the common advice that financial planners give to older households. Though much less so than in the U.S., the common advice of "keeping higher stock share while working" could be misleading guidance to Canadian older workers, exposing them to too much market risks. The welfare cost of such misleading guidance could be even higher if the involuntary job separation pattern we saw during the coronavirus crisis persists.

Figure 4: Life-Cycle Stock-Share Profile without Forced Retirement Risk: Comparisons

(a) Under no forced retirement risk (b) Under forced retirement risk from the U.S. data




Note: The profile is constructed as the average of 10,000 simulations from the life-cycle models. Panel (a) is from the model that does not account for the forced retirement risk. Panel (b) is from the model with the forced retirement risk from the U.S. data.

## References

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