Irrational Expectations Concerning Future Social Security Benefits:

United States, Canada, and Ireland

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Abstract

Expectations play a major role in both macroeconomic and microeconomic theory. While a number of surveys have asked questions concerning workers' expectations as to their future social security benefits, these expectations have not been the subject of extended analysis. This study examines surveys of workers' expectations as to their future social security benefits in the United States, Canada and Ireland. Because social security benefits are an important source of retirement income for most people in these countries, workers' expectations as to their future social security benefits presumably play an important role in their consumption, saving and portfolio investment decisions. In all three countries, while we find heterogeneity in the expectations of workers, in some surveys, a surprisingly high percentage of young workers expect that they will not receive future social security benefits. While the most obvious explanation for such pessimism in the United States is the projected financial shortfall in 2034, we find such pessimism in a U.S. survey in 1996 and in surveys in Canada, where recently benefits were increased. We identify young age and financial illiteracy as two causes of unrealistic expectations as to future social security benefits. The rational and behavioral expectations models can be combined in a theory of marginal rational expectations, where people's expectations as to future social security benefits are affected by behavioral biases and financial illiteracy but improve with age. Underestimating future social security benefits apparently does not lead to greater retirement readiness as a reaction to the perceived reduced generosity of social security, perhaps because young workers are not engaged in much saving for retirement, but that area merits further investigation.

Key words: expectations theory, retirement planning, retirement readiness, Social Security, savings

Expectations play a major role in both macroeconomic and microeconomic theory. Because of the importance of social security benefits for many workers, their expectations as to the level of their future social security benefits presumably play a major role in their retirement planning, thus affecting their savings and consumption decisions. The life cycle and permanent income hypotheses are based on workers being able to formulate reasonable expectations as to their future income, and social security benefits are an important part of retirement income for many workers. In addition, social security wealth forms an important part of the wealth portfolio of many workers, and thus its risk characteristics and amount would presumably affect other decisions relating to portfolio choice.

This study examines workers' expectations as to their future social security benefits in the United States, Canada and Ireland. We chose these three countries because they differ considerably as to the risk to the level of future benefits. While the United States is projected to have insufficient financing to pay future benefits starting in 2034, Canada is projected to have adequate financing to pay future benefits into the future that is relevant for the cohorts of workers studied in this paper. In Ireland, future benefits cuts are possible. Thus, in our study we can assess how and to what extent these differences in the security of future promised benefits affect worker's expectations.

With widespread financial illiteracy, as well as cognitive biases that affect retirement planning (Lusardi and Mitchell 2014), an argument can be made that many workers would not have rational expectations as to their future Social Security benefits. Indeed, an argument for governments providing social security benefits is that many workers have difficulty anticipating their retirement income needs and acting on that information.

The surveys we examine show that in all three countries some workers substantially underestimate their future benefits. We considers different theories as to expectations in an attempt to explain the observed errors in expectations. While focusing on expectations as to future social security benefits, we also consider expectations as to future pension benefits as a benchmark, but without attempting to explain those expectations in this paper.

The paper first provides background on different theories as to the formation of expectations. It then discusses survey data on social security benefits expectations of workers in the United States, Canada and Ireland. The paper compares survey data on expectations across several dimensions—across countries, between social security and private pension benefits, across time, and across demographic and economic groups. The paper proposes a theory of expectations formation concerning future social security benefits**,** which it calls marginal rational expectations. It provides concluding comments.

Expectations Theory

Workers have an incentive to accurately predict their future social security benefits because doing so will help assure that they have an adequate amount saved for retirement. Their consumption and savings decisions presumably depend on their expectations. In addition, expectations as to future levels of social security benefits presumably would affect portfolio investment decisions. The permanent income theory of consumption and the life-cycle theory argue that people's current consumption and saving are based in part on their expectations of future income, which would include their expectations as to future social security benefits (Sargent 2008). However, saving for retirement is a one-time event in people's lives, so they cannot learn from their own mistakes, but only from the mistakes of others. They can make adjustments as retirement approaches, and presumably expectations become more accurate as retirement approaches.

Rational expectations theory suggests that people will not consistently over- or under-estimate their future social security benefits. It assumes that people quickly process all freely available information to form expectations that are consistent with economic theory. People adjust their expectations over time when their expectations prove to be incorrect (Levine 2012).

Rational expectations theory assumes that people use all available information. In the United States, that would include the projections of the Social Security actuaries that indicate that the Social Security trust fund will not have sufficient money to pay benefits by 2034, according to the intermediate projection, which is considered to be the most likely projection (Social Security Administration 2017). Since rational expectations are based on the best estimate of the future, they would presumably take into account that projection.

By contrast, rational inattention theory argues that a person's attention is a scarce resource that must be budgeted (Tuttino 2011). It is rational to not pay attention to things that don't matter much. However, because social security benefit are so important to many people, not having a good estimate of future benefits would seem like an example of irrational inattention. It could be argued that for young people, with retirement many years away, it may be rational inattention to not form rational expectations as to future social security benefits.

Literature Review

Mankiw, Reis, and Wolfers (2003), Souleles (2004), Puri and Robinson (2007) and others find substantial heterogeneity across individuals in macroeconomic forecasts. Similarly, as we show in this paper, heterogeneity exists in workers' forecasts as to future Social Security benefits. Das, Kuhnen and Nagel (2017) find that people with higher income or higher education (high Social Economic Status (SES)) are more optimistic about future macroeconomic developments, including business conditions, the national unemployment rate, and stock market returns. The difference in beliefs between high- and low-SES individuals diminishes significantly during recessions. A comparison with professional forecasters and historical data reveals that the difference in expectations reflects excessive pessimism of low-SES individuals. This finding suggests that low SES may be more pessimistic about future Social Security benefits than people with higher socioeconomic status, and that people with high SES status may make forecasts that are closer to objective forecasts than people with low SES status.

Some studies find evidence of irrational expectations by individuals. Godsell (2017) reports that individual investors in the U.S. and other countries tend to have considerably higher expectations for stock market rates of return (8.5 percent on average) than do financial advisers (5.9 percent). These studies may shed light on individual expectations concerning their future pension benefits, with evidence presented later suggesting that workers tend to overestimate how much they will receive from their individual account pension plans, perhaps because they have an overly optimistic expectation as to future rates of return. This overestimation may lead to an underestimation of the relative role of social security in future retirement income.

Norr (2017) attributes the negative views in the United States as to the future existence of Social Security to negativity bias—the tendency to exaggerate negative information about Social Security's financing.

Reported Expectations, Revealed Expectations, Normative Expectations, Rational Expectations and True Expectations

Parker and Souleles (2017) analyze individuals' revealed preferences versus reported preferences. Revealed preferences are preferences that are revealed by actual behavior.

Traditionally, it has been argued that revealed preferences represent the true underlying preferences. Reported preferences are preferences that are reported as a response to a survey question, and may be biased versions of the true underlying preferences. When there are no penalties or rewards for correct responses, individuals may not always carefully consider theire survey responses. Parker and Souleles (2017) find that reported preferences match revealed preferences in some respects, and are thus informative, but they do not perfectly match all aspects of behavior indicated by revealed preferences.

In related literature on the difference between reported preferences and revealed preferences, willingness to pay for less pollution reported in subjective questions is typically much larger than what appear to be realistic levels of willingness to pay (Diamond and Hausman (1994), List and Shogren (1998), Harrison and Rutström (2008)). This finding suggests that in some circumstances reported preferences reported preferences may reflect a perceived social norm. For example, some people may perceive a social norm among some groups in some countries that government programs, such as social security, can be changed, and it is not wise to rely on them.

Besheaers et al. (2008) make a further distinction between revealed preferences and normative preferences, where normative preferences are the person's preferences if they were acting based on the rational model of economics. Economists traditionally have assumed that revealed preferences are also normative preferences, but behavioral economics has questioned that assumption. Besheaers et al. (2008) list five factors that can create a wedge between revealed preferences and normative preferences—1) passive choice, 2) complexity, 3) limited personal experience, 4) third-party marketing, and 5) intertemporal choice.

These five factors may help explain the irrational expectations of some workers as to future social security benefits. 1) Because participation in social security is mandatory, and thus passive, that may explain why participants are not particularly well informed about the program, despite its importance in retirement savings. 2) The complexity of estimating future social security benefits, particularly when the system faces future funding shortfalls, may lead to errors in doing so. 3) Workers have limited personal experience in estimating future social security benefits and no personal feedback concerning the accuracy of their estimates. 4) Workers' estimates as to future social security benefits may be affected by third-party marketing of financial institutions and financial advisers who have a stake in convincing their clients that they need to save more because they cannot rely on future social security benefits. 5) The intertemporal aspect of social security, with the long time horizon for younger workers, is presumably a factor in the difficulty in making accurate projections.

The focus of our paper is on the discrepancy between reported expectations and normative expectations as to the future level of Social Security benefits. The reported expectations are responses to survey questions. The normative expectations are expectations that would be consistent with rational expectations. The revealed expectations concerning future Social Security benefits are those expectations revealed through their consumption and savings behavior.

We argue that there is another aspect of people's expectations, which is their true expectations. People may not report their true expectations for various social reasons. For example, people may report they do not expect to receive Social Security benefits because they have a negative view of government and reporting that is a way of showing their disapproval, even though they actually realize that they will receive those benefits. If people truly believed that the would not receive Social Security benefits, they could reveal their true expectations by increasing their savings. However, people's true expectations may be inconsistent with their behavior, and thus their revealed preferences. They face a trade-off between current and future consumption that may make it difficult for them to react rationally to their expectations concerning future social security benefits. Their true expectations, which we cannot observe, may differ from their reported expectations, their normative or rational expectations, and their revealed expectations.

Cross Country Studies

The following three sections discuss cross country studies for the United States, Canada and Ireland concerning workers' expectations as to their future social security benefits. The cross country studies provide a source of variation that is not present in a study of a single country. A table for each country summarizes the coverage of public and private pensions, percentage of income that pensioners receive from public pensions and survey data on workers' expectations concerning future social security benefits. Each country's retirement income system is composed of three pillars—social security, pensions, and savings.

While terminology differs across countries, in this paper we use the terms social security or public pensions, depending on the usage in the country being discussed, to refer to government programs providing old-age benefits to most or all workers. We capitalize Social Security when referring to the program in the United States, which goes by that name.

United States

Background on Social Security. For most people in the United States, projecting Social Security benefits is an important issue in retirement planning and savings decisions because Social Security benefits are their most important source of retirement income. Nine out of 10 persons aged 65 or older receive Social Security benefits. Among that age group, 48 percent of married couples and 71 percent of unmarried persons receive 50 percent or more of their income from Social Security. Furthermore, 21 percent of married couples and 43 percent of unmarried persons receive 90 percent or more of their retirement income from Social Security (Social Security Administration 2017b).

Information about Social Security Benefits. Most U.S. workers have a low level of literacy about the program (Young, Rabinovich and Wah 2015). While many individuals have some basic knowledge about program rules, they often lack sufficient knowledge of program details in order to make informed financial decisions (Smith and Couch 2014). Greenwald et al. (2010) find that only 32 percent of survey respondents feel that they are very knowledgeable as to how much they will receive in future Social Security benefits, but the percentage rises with age. Among workers age 25 to 34, only 22 percent feel they are very knowledgeable.

Workers' Expectations. This section discusses the key issue of the paper, which is workers' expectations as to their future Social Security benefits. This issue has been addressed in a number of surveys. Some surveys ask workers about their expectations as to the generosity of future Social Security benefits, while other surveys ask if workers expect to receive those benefits at all, or the likelihood that they will receive any benefits, or the role they expect Social Security benefits to play in their retirement income.

Receipt of Social Security Benefits. The data on Social Security benefits indicate that at least 90 percent of workers should expect to receive Social Security benefits. All federal government workers hired since 1983 are covered by Social Security. Some workers for state and local governments are not covered. Social Security coverage is optional for ministers, priests, nuns, rabbis, and other people in religious occupations. Some people who immigrated to the United States late in life, or people with limited attachment to the labor force, may not work the 10 years required to receive benefits

Some workers, particularly younger workers, rightly may be concerned about the generosity of future benefits, given the projected insufficiency of funding for the payment of future benefits starting in 2034 according to the actuaries' intermediate projections. However, even in the worst case scenario, Social Security will continue paying benefits.

While most of the surveys we discuss were conducted within the past ten years, the first survey we discuss was conducted in 1996. That survey is the first of the annual EBRI Retirement Confidence Surveys (Yakoboski and Schiffenbauer 1997). It has the advantage for our purposes in that the future represented in the expectations reported has for many of the survey participants become a reality because of the passage of time. In that survey, 23 percent did not expect to receive Social Security benefits. Thus, many of the respondents in that survey are overly pessimistic about future Social Security benefits. While the Retirement Confidence Survey does not ask this question in every survey, it was asked again in the 2010 survey, where again 23 percent did not expect to receive Social Security benefits. That survey finds that among workers ages 25 to 34, 33 percent did not expect to receive Social Security benefits, compared to 8 percent for workers ages 55 and older (Helman, Copeland and VanDerheil. 2010). In the 2012 survey, 35 percent of workers ages 25 to 34 did not expect to receive Social Security benefits (Helman, Copeland and VanDerrhei 2012).

Because that survey was taken 38 years before 2034, the current year projected for Social Security insolvency, that survey is important for our analysis because it indicates that the future insolvency of Social Security was not an issue that would affect most of the survey respondents. However, people at the time may have been aware that the full retirement age for Social Security was going to be raised from 65 to 67 (over a 22 year period) in order to help maintain the solvency of Social Security. That information may have contributed to pessimism, even though the action was taken to help maintain solvency.

Using a 2007 internet survey of a module on Social Security expectations from the 2006 Health and Retirement Study (HRS), Delavande and Rohwedder (2011) find that a quarter of respondents assign a 62 percent or less probability of receiving any Social Security benefits.

Young, Rabinovitch and Wah (2015), using the Understanding America Study, an internet-based survey, find that only 4 percent of non-retirees are very confident that Social Security will be there for them when they retire, while 41 percent are not at all confident.

Chard et al. (2017), also using data from the Understanding America Study, find that only 5.4 percent of respondents are very confident that Social Security will be there for them when they retire, and only 22.3 percent are somewhat confident, a total of 27.7 percent showing confidence in the future of Social Security to provide any benefits at all. Considering that the program has been providing benefits since 1940, these results indicate a remarkable degree of pessimistic expectations about the future of Social Security.

Cohen, Luttig and Rogowski (2017) find that most millennials (persons age 18-34 in 2017) are not confident in the future of Social Security. By race and ethnicity, the percentage lacking confidence (and those not expecting to rely on Social Security at all) are whites—77 (37) percent, African Americans—73 (29) percent, Latinos—66 (32) percent, Asians—73 (32) percent.

The EBRI 2017 Retirement Confidence Survey finds that 12 percent of workers indicate that they do not expect to receive Social Security benefits, which is roughly accurate (a slight exaggeration) (Greenwald, Copeland and VanDerhei 2017). The 12 percent figure in 2017 represents a 4-year decline (23 percent in 2012, not available in 2013, 21 percent in 2014, 20 percent in 2015, 16 percent in 2016) (Helman, Copeland and VanDerhei 2016). The cause of this decline is not known, and the decline itself is not consistent with a 2017 survey done by the American Academy of Actuaries (American Academy of Actuaries et al. 2017) which finds that 34 percent of Americans do not expect to receive any Social Security benefits.

In sum, while the exact statistics vary, there is widespread evidence that the percentage of Americans expecting to not receive Social Security benefits substantially exceeds the 9 or 10 percent that would realistically have such expectation. The data by age suggests that a surprisingly high percentage of young workers do not expect to receive Social Security benefits. The next section investigates the responses of workers who expect to receive Social Security benefits as to the generosity of those benefits.

Generosity of Benefits. The first of the annual EBRI Retirement Confidence Surveys (Yakoboski and Schiffenbauer 1997 finds that 50 percent expected Social Security to be only a minor source of retirement income.

Greenwald et al (2010) conduct two surveys, In the survey conducted by Greenwald and Associates, 31 percent of respondents expect to receive less than half of the Social Security benefits promised under current law. In an American Life Panel survey, they find that figure is 45 percent. Thus, a sizable fraction of respondents greatly underestimate their future social security benefits.

Luttmer and Samwick (2016) using data from an internet-based survey, find that, on average, individuals between the age of 25 and 59 expect to receive only 60 percent of the Social Security benefits that they have been scheduled to receive, while 25 percent of respondents expect to receive 37 percent or less of benefits scheduled under current law.

A Gallup poll in 2017 finds that 34 percent of non-retirees expect Social Security to be a major source of retirement income, compared to 50 percent of non-retirees who expect their 401(k) plan or similar employer-provided retirement savings plan to be a major source of retirement income (Saad 2017). Thus, as a group, respondents underestimate the importance of Social Security and overestimate the importance of employer-provided pensions. In 2014, 40.9 percent of hosuseholds aged 65 and older reported receiving any income from a pension (Social Security Administration 2016). In this paper, we don't attempt to explain the expectations for pension benefits, but only use them as a comparison for Social Security. Among non-retirees in the Gallup survey, 45 percent expect Social Security to be a minor source of retirement income and 19 percent thought that it would not be a source of retirement income,

The EBRI 2017 Retirement Confidence Survey finds that only35 percent of workers report that they expect Social Security to be a major source of retirement income (Greenwald, Copeland and VanDerhei 2017).

The survey findings, summarized in Table 1, indicate that many non-retirees overestimate the role of 401(k) plans and underestimate the role of Social Security.

Table 1: Coverage of Pensions, Replacement Rate, Percentage of Income from Social Security and Expectations of Private and social Security Pensions, United States

	Non-Retirees	Retirees
Coverage of Pensions & Replacement Rate		
Coverage of workplace pensions	x%	
Coverage of Social Security	90%	
Replacement for Social Security		35%
Social Security Administration 2017		
Percentage receiving Social Security		90%
Percentage receiving 50%+ of income from Social Security		
- married		48%
- unmarried		71%
Percentage receiving 90% of their income from Social Security		
- married		21%
- unmarried		43%
Percentage receiving private pensions		41%
Delavande and Rohwedder (2011): Internet survey 2007 on module for Health & Retirement Survey 2006		
- respondents assign probability of 62% or less of receiving Social Security	25%	
Luttmer and Samwick (2016): internet based survey		
- average respondent age 25-59 expect only percentage of Social Security benefits	60%	
- percentage resondents age 25-59 expect receive only 37% or less of Social Security benefits	25%	
Greenwald, Copeland, VanDerhei (2017): EBRI Retirement Confidence Survey 2017		
- respondents confident to receive Social Security	37%	
- respondents very confident to receive Social Security	6%	
- percentage of retirees report Social Security a major source of retirement income		61%
- percentage of workers expect Social Security a major source of retirement income	35%	
Saad (2017): Gallup Poll 2017		
- percentage who expect Social Security to be a major source of retirement income	34%	
- percentage who expect Social Security to be a minor source of retirement income	45%	
- percentage who expect Social Security to be no source of retirement income	19%	
- percentage who expect 401k or occupational pensions to be a major source of retirement income	50%	
- percentage say Social Security is major source of retirement income		55%
- percentage say 401k or occupational pensions is major source of retirement income		24%
Young, Rabinovitch and Wah (2015): Understanding America Study		
Percentage respondents very confident Social Security will be there in future	4%	
Percentage respondents not confident Social Security will be there in future	41%	

Chard et.al (2017): Understanding America Study		
Percentage respondents very confident Social Security will be there in future	5%	
Percentage respondents somewhat confident Social Security will be there in future	22%	
Cohen, Luttig & Rogowski (2017)		
Percentage respondents age 18-34 not confident Social Security will be there in future		
- whites	77%	
- African Americans	73%	
- Latinos	66%	
- Asians	73%	
Percentage respondents age 18-34 not expecting to rely on Social Security at all		
- whites	37%	
- African Americans	29%	
- Latinos	32%	
- Asians	32%	
Percentage respondents age 18-34 expecting to rely a little on Social Security		
- whites	46%	
- African Americans	48%	
- Latinos	53%	
- Asians	57%	
American Academy of Actuaries (2017)		
Percentage of Americans expecting to receive any Social Security benefits	66%	
Percentage of Americans expecting to retire	60%	
Percentage of Americans expecting to receive any Social Security benefits		
- 18-34	49%	
- 35-54	70%	
-55-64	91%	
Percentage of Americans earning < $40,000 expecting to receive any Social Security benefits	56%	
Percentage of Americans earning $40,000-$99,000 expecting to receive any Social Security benefits	75%	
Percentage of Americans earning $100,000 expecting to receive any Social Security benefits	71%	
Authors Estimates		
Percentage of workers age 18-34 who have irrational expectations of Social Security	40%	
Percentage of workers age 35-54 who have irrational expectations of Social Security	20%	

Sources: see test.

In sum, widespread evidence indicates that many Americans considerably underestimate the role of Social Security in their own future retirement income.

Factors Affecting Workers' Expectations Concerning Future Social Security Benefits. This section investigates survey data on expectations further.

Luttmer and Samwick (2016) find that the expected benefits as a percentage of scheduled benefits rise with age, which fits the perception that people near retirement will be less likely to face future benefit reductions and have more realistic expectations.

Unpublished data provided to us by the American Academy from their survey (American Academy of Actuaries et al. 2017) indicate that the percentage of Americans expecting to receive benefits from Social Security increases with age, from 48.7 percent for those age 18-34 to 69.7 percent for those age 35-54, and to 90.9 percent for those age 55 to 64. These figures are similar for both males and females, with males having slightly lower percentages than females.

While it makes sense that younger workers would have a greater concern about the sustainability of Social Security than older workers, the percentage of younger workers expecting to receive no benefits from Social Security realistically would be less than 10 percent, compared to the 51 percent implied by the survey results. Currently, roughly 10 percent of retirees do not receive Social Security benefits (Social Security Administration 2016), but in the future that percentage probably will be slightly lower because all new Federal employees hired since 1983 are covered by Social Security. Thus, it appears from this survey that roughly 40 percent of young workers have irrational expectations as to future Social Security benefits.

The figure of 69.7 percent expecting to receive any Social Security benefits for workers age 35-54 is also of interest. These workers are old enough to be saving and planning for their retirement. Roughly 30 percent of workers in that age group are erroneously not expecting to receive any benefits from Social Security. These workers are young enough that if they had immigrated to the United States they would still have time to accumulate the required 10 years of covered work in order to be eligible to receive benefits.

A seemingly contradictory finding from the study, also from unpublished data, is that the percentage of Americans expecting only to have a modest life style in retirement increases with age, from 28.2 percent for those ages 18-34 to 45.5 percent for those ages 55+. Logically, it would seem that the age group having the most people not expecting to receive Social Security benefits would have the highest percent expecting only to have a modest life style in retirement, but in fact the reverse is found.

In addition, the American Academy of Actuaries provided us unpublished tabulations of the expectation of receiving any Social Security benefits by income level. It finds that the percentage of people expecting to receive any Social Security benefits is generally higher for higher income persons than for lower income persons, rising from 55.8 percent for people earning less than $40,000 a year to 74.5 percent for people earning $40,000 to $99,000, and falling slightly to 71.2 percent for people earning $100,000 or more a year. This pattern is roughly consistent with higher-income people having greater financial literacy and thus being more likely to understand that they will be receiving Social Security benefits. It is also consistent with the earlier reported finding that people with higher income tend to report being more optimistic about the economy in the future.

The Gallup poll finding in 2017 (Saad 2017) for non-retirees expecting Social Security to be a major source of retirement is near its peak of 36 percent for surveys over the past 17 years. Before the stock market decline in 2008, between 25 and 29 percent of non-retirees expected that Social Security would be a major source of retirement income. That figure increased to 31 percent during the recession, and has ranged between 29 percent and 36 percent since then. Since 2001 when the question was first asked, the percentage of people thinking Social Security will be a major source of retirement income has followed a generally upward trend. At the same time, the percentage of people expecting a workplace (defined benefit) pension would be a major source has followed a generally downward trend, reflecting the decline over time in the percentage of the workforce covered by that type of plan.

Effects of Expectations on Saving and Investing for Retirement. Delavande and Rohwedder (2011) find that workers' expectations about future Social Security benefits affect their investment decisions. Those with greater uncertainty about future Social Security benefits invest less in stock, which could affect their retirement readiness by reducing the expected rate of return on their investments.

Chard et al. (2017) find in regressions concerning self-assessment of preparedness for retirement that people having no confidence in the future of Social Security have a significantly lower self assessment of their preparedness for retirement. However, having no confidence in the future of Social Security does not have a significant effect on their retirement preparedness index, which is the assessment of the researchers of their preparedness. This result suggests that people do not engage in compensating behaviors in response to their lack of confidence in Social Security providing benefits. However, Chard et al. (2017) find that people who are more likely to perceive the replacement rate provided by Social Security as inadequate are more likely to engage in saving for retirement. Present bias, with people underweighting the future, could cause people not to react to the possibility of future Social Security benefit reductions.

Workers have imperfect knowledge about the magnitude of Social Security's financing problems. If workers generally underestimate their Social Security benefits, and some at least underestimate the probability of receiving those benefits, that would seem to lead them to save more than if they had an accurate expectation as to the level of future Social Security benefits. Saving more would lead to greater retirement readiness. Guiso, et al. (2009) find evidence among Italian workers that greater uncertainty about Italian social security benefits leads to greater likelihood of participation in a private pension plan.

The behavioral economics finding that people tend to underweight gains and overweight losses could play a role. In this respect, their expectations seem to differ from rational expectations. At the same time, their behavior with respect to saving for retirement seems to reflect the view that no benefit reductions will occur, also a deviation from rational expectations, but in the opposite direction.

Workers' responses to a survey concerning future Social Security benefits may be disconnected from their actions relating to savings for retirement. It may be that many workers are not sophisticated enough to consider what future Social Security reforms might mean for their retirement preparedness, or it may be that they lack the discipline to act on their perceived need for greater savings for retirement. Because no penalty or reward is associated with the answer to a question on a survey, people may not take their own answers seriously. Relating to the last point, however, the EBRI Retirement Confidence Survey reports that only 56 percent of people surveyed report being somewhat or very confident about their financial preparation for retirement, which could reflect in part their anxiety about the level of future Social Security benefits. The people who are not confident realize that they may need to work longer than they would like (Greenwald, Copeland and VanDerhei 2017).

Campbell and Weinberg (2015) in their review of retirement readiness studies conclude that most people in the U.S. are fairly well-prepared for retirement, assuming that Social Security pays scheduled benefits. They argue that it appears that U.S. workers are basing their savings for retirement on the assumption that scheduled Social Security benefits will be paid.

Canada

Background on Social Security. The Canadian retirement income system consists of three pillars, though they are conceived slightly differently from in the United States. The first two are public (social security) pensions. The first pillar consists of the Old-Age Security (OAS) pension and the Guaranteed Income Supplement (GIS), which are pay-as-you-go systems financed from general tax revenues that provide means-tested benefits.

The second pillar is the Canada Pension Plan (CPP), or the Quebec Pension Plan for the province of Quebec, which are social security plans administered jointly by the federal and provincial governments that have earnings-related contributions and benefits. The CPP is well-funded, with no shortfall of revenue projected for the future, based on the best-estimate assumptions (Canada 2017a).

The third pillar is voluntary. It includes workplace pension plans, which are sponsored by an employer or a union (Registered Pension Plans, or RPPs); and individual pension accounts and private savings.

Approximately 38 percent of Canadian workers are covered by workplace pension plans. These plans are predominantly defined benefit (DB) plans, particularly in the public sector. In 2015, 67 percent workers with RPPs are covered under DB plans (90 percent for public sector workers with RPPs). DB coverage is gradually dropping with the slow rise of defined contribution and hybrid pension plans (particularly in the private sector) (Statistics Canada CANSIM table 280-0016 2017). In this paper, we focus on the public pension (social security) programs, which are the OAS, the GIS and the CPP.

For the OAS and the GIS, the current age of eligibility is 65, and has stayed at 65 since the late 1960s. In 2012, the Canadian government legislated an increase in the age of eligibility to 67, which it argued was needed to control costs, but the change was reversed in 2016. In 2016, the federal government agreed with the provinces on an increase in CPP benefits, taking effect in 2019. These existing and proposed changes may affect workers' expectations regarding future benefits.

For a median income worker, public pension income (OAS, GIS and the CPP combined) provides a 53 percent net replacement ratio (i.e., relative to earnings after taxes and social security contributions), which is very close to the U.S. at 49 percent, with Ireland at 42 percent (OECD 2017).

Workers' Expectations

The following section reviews key research on public pension expectations of Canadian workers, which is summarized in Table 2.

Table 2: Coverage of Pensions, Replacement Rate, Percentage of Income from and Expectations of Private and Public Pensions, Canada

	Non-Retirees	Retirees
Coverage of Pensions & Replacement Rate		
Coverage of workplace pensions	38%	
Coverage of Canada/Quebec Pension Plan	100%?	
Replacement rate for Canada/Quebec Pension Plan		37%
Canada Pension Plan Administration		
Percentage receiving Canada Pension Plan		x%?
Percentage receiving 50% of income from Canada Pension Plan		
- married		x%?
- unmarried		x%?
Percentage receiving 50% of their income from Canada Pension Plan		
- married		x%?
- unmarried		x%?
Pignal et. al (2010): 2008 Survey of Older Workers: age 50-75		
Don't know source of retirement income	9%	
Know primary source of retirement income	22%	
Expect to receive CPP: at age 60	44%	
Expect to receive CPP : at age 65	45%	

Expect to receive CPP: at age 60 or age 65	89%	
Misunderstand CPP rules for access to benefit; i.e. no requirement to retire	23%	
Don't know CPP rules	10%	
Uppala (2016): **2014 Canadian Financial Capability Survey: age 25-64**		
Know (expect) public pensions primary source of retirement income		
- age 25-34	8%	
- age 55-64	26%	
- Total	13%	
Don't expect to receive public pensions: Total	20%	
Zhang et. al. 2016 survey of pre-retirees & retirees age 50-80		
Average worker retires at age 65 expect CPP primary source of retirement income	x%?	
Workers expect low CPP benefits	32%	
Percentage of retirees experience low CPP benefits	12%	
Workers who have not sought professional advice	59%	

Sources: see text.

Pignal et al. (2010), using data from the 2008 Survey of Older Workers from age 50 to 75, report that 9 percent of older workers do not know what their principle source of income will be, while 22 percent indicated that they expect the CPP would be the primary source of income in retirement. This figure is a considerable understatement since the CPP is the primary source of retirement income for most workers. They also found that such expectations are strongly related to household income, such that workers in higher income groups are more likely to have individual pension assets, and those with lower income indicated stronger expected reliance on public pension benefits in retirement.

Benefits Canada (2012) reports the results of a survey that 48 percent of Canadians were somewhat not confident of not confident in the future of the Canada Pension Plan or the Quebec Pension Plan (if they lived in the province of Quebec). This lack of confidence was up from 41 percent for a similar survey conducted in 2010. In the 2012 survey, 59 percent said they believed benefits would be reduced in the future. In fact, since then benefits have been increased.

Using data from the 2014 Canadian Financial Capability Survey (CFCS), which examined retirement income expectations of labor market participants age 25 to 64, Uppal (2016) similarly finds that on average 13 percent reported that public pensions (social security) would be the major source of income in retirement, and 20 percent expected not to receive public pensions in retirement. Uppal (2016) finds that self-reported reliance on public pensions in retirement increases with age, from 8 percent for workers aged 25 to 34, to 26 percent for workers aged 55 to 64. Perhaps they are more pessimistic than older workers because of the greater uncertainties they face, compounded by a lack of knowledge. An alternative explanation is that younger workers have expectations shaped by their expected (not actual) planning behavior. For example, younger worker may expect not to rely heavily on public pensions because they plan to save and have an adequate level of assets when retired. However, the reality might be that they did not act on this plan to the degree anticipated, which in turn resulted in lower private pension assets than expected.

Results from a 2016 survey indicate that 64 percent of working Canadians either don't know or don't believe that the Canada Pension Plan will be there for them when they retire (Globe and Mail 2017).

Zhang et al. (2017) conduct a 2016 survey on retirement consumption, risk perception and planning objectives of Canadian pre-retirees and retirees aged 50 to 80. One area of interest is the difference between pre-retirees' expectations and retirees' experience of retirement age, income, assets and planning behavior. A large portion (32 percent) of these older workers expect extremely low social security benefits (below CA$12,000 per year for married workers and below CA$6,000 per year for single workers) compared to retirees' experience (12 percent). This difference is largely attributed to financial literacy. They find that workers who expect extremely low benefits are far less educated than the sample average, hence less likely to be financially literate.

Effects of Expectations on Saving for Retirement. Examining workers who expect to retire at age 65 or above, Zhang et al. (2017) find that those who expect higher public pension income tend to have higher retirement savings. The authors postulate that since the CPP is a contributory and earning-related program, and that higher income earners/households tend to save more and to have higher social security benefits, it is reasonable to observe such a relationship. public pension expectations and retirement savings.

Ireland

Background on Social Security. The Irish pension system has three components: first, the State Pension Contributory and the State Pension Non-Contributory provided by government; second, occupational pensions provided by employers; and third, voluntary personal pensions. The two state pensions are paid at age 66, with that age rising to 67 in 2021 and 68 in 2028. The contributory pension is financed on a pay-as-you-go (PAYG) basis. The payment per week is flat-rated which amounts to €238.30 per week or €12,391 per year for a contributor who has a yearly average of 48 weekly contributions. The non-contributory pension is paid at age 66 and is means-tested. The benefit is also flat-rated, which amounts to €227 per week or €11,804 per year for an applicant who satisfies the means test. Both state pensions have lower weekly payments for those who do not fully satisfy the yearly average contributions or who have some means. Also, both state pensions provide weekly benefits for dependents of the beneficiary.

Up to the end of the last century the dominant model of workers' pensions was defined benefit (DB), but since the beginning of the 21st century that has been mainly replaced by a model of defined contribution pension (DC). The government target replacement rate for DC pensions (16 percent) is that in conjunction with the State Pension Contributory (35 percent) the replacement rate should amount to 50 percent of pre-retirement income.

The state (social security) pensions are the most important source of retirement income for pensioners. In 2005, just over 90 percent of pensioners received state pensions and other state transfers while only a third received occupational and personal pensions (see Table 3) In 2010, a Central Statistics Office (2013) survey showed nearly two-thirds (62.5 percent) of retirement income for persons aged 65 years and over came from state pensions and other transfers, whereas only 20.3 percent of their income came from occupational and personal pensions[1].

The state pensions and other state transfers are important for the 80 percent of pensioners in the first four quintiles of the income distribution. Their share of income from state pensions and other transfers ranges from 65 to 94 percent, while income from occupational and personal pensions ranges from 2 to 19 percent. For the highest quintile, occupational and personal pensions and investment income are relatively more important (at 39 percent) than state pensions (at 37 percent of their income). For married pensioners, 63 percent of their retirement income comes from public (social security) pensions while 19.2 percent comes from occupational and private pension. For the never married, 66.3 and 20.5 percent of their income comes from public pensions and occupational and private pensions.

Workers' Expectations. Although the most important source of retirement income in Ireland is provided by state (social security) pensions, 42 percent of workers aged 20 to 69 years said that their main expected source of income in retirement would be provided by occupational or personal pensions

[1] The retirement age for the State Pension Contributory was changed to 66 in 2014. The retirement age for the State Pension Non-Contributory in 2010 was 66 and it has not changed since then.

Table 3: Coverage of Pensions, Replacement Rate, Percentage of Income from and Expectations of Private and Public Pensions, Ireland

	Non-Retirees	Retirees
Coverage of Pensions & Replacement Rate		
Coverage of workplace pensions	47%	
Coverage of social insurance	100%	
Replacement Rate State Pension (Contributory)		35%
CSO 2005 Tables on the Elderly		
Percentage receiving public pensions (social transfers)		92%
Percentage receiving occupational or personal pensions		30%
CSO Thematic Report on the Elderly 2010		
Average percentage of retirement income from social transfers		63%
Average percentage of retirement income from occupational and private pensions		20%
Percentage receiving 50%+ of income from social transfers		80%
Percentage receiving 90% of their income from social transfers		40%
CSO: QNHS Pension Provision: Quarter 4 2015; age 20-69		
Expect primary source of retirement income: public pensions		
- 20-24	29%	
- 55-69	48%	
- part time	53%	
- full time	30%	
- self-employed & assistance relatives	43%	
- employees	35%	
- Total	36%	
Expect primary source of retirement income: occupational and personal pensions		
- 20-24	24%	
- 35-44	48%	
- 55-69	37%	
-men	44%	
- women	40%	
- Total	42%	

Sources: see text.

(see CSO, 2016, Table 4.3). Just over 36 percent of workers expected state pensions would provide their main retirement income. Workers' savings or investments or sale of business or a farm or other property is expected by only 7 percent of those in employment to provide their main income in retirement.

Among workers covered by an occupational or personal pension, 76 percent say they expected private pensions to provide their main retirement income, while 12 percent expected state pensions to provide the bulk of their retirement income. Almost 12 percent of those who have no coverage under private pensions expect occupational and personal pensions to provide their main income in retirement. Presumably, they are workers who expect to be covered by an occupational or personal pension in the future. Surprisingly, only 57 percent of workers who have no private coverage expect that state pensions will be the source of their main income in retirement.

Before the financial crisis in 2008, 55 percent of men and 50 percent of women had coverage by private pensions. After the crisis, the coverage rate fell and converged at the end of 2015, so 47 percent of men and 46 percent of women were covered by private pensions. Nevertheless, men and women differed to some extent on their expectation of the main source of income: 44 percent of men and 40 percent of women expected private pensions to be their main source of income in retirement, while 36 percent of both men and women expected state pensions to provide their main income.

As seen in the U.S. and Canada, workers' expectations of the source of their main income in retirement become more realistic with age. For the age group 20-24, 29 percent expect public pensions to provide their main income in retirement while for the age-group 55-69 the figure reaches 48 percent. Expectations that private pensions will provide the main income doubles from 24 percent of the age group 20-24 to 48 percent for the age group 35-44 but thereafter fall, and for the age group 55-69 it decreases to 37 percent.

The findings for workers' reliance on state pensions as the main source of retirement income increased from 26 percent in 2009 to 36 percent in 2015, predominantly due to a fall from 20 percent of respondents in 2009 who didn't know where their main income in retirement would come from to 8 percent in 2015. No change occurred between 2009 and 2015 from 42 percent of workers who expected their main income in retirement to come from occupational and personal pensions. Workers who didn't know where their income in retirement would come apparently became aware during the recession that they would have to rely on state pensions.

As is in the United States, Ireland's workers in 2015 overestimate the role of occupational and personal pensions and underestimate the role of public pensions. Among current pensioners in 2014, 55 percent of income in retirement is provided by social security pensions (Collins and Hughes 2017), but only 36 percent of workers in 2014 expected that the major source of income in retirement would come from the state. In contrast, current workers overestimate the importance of private pensions. In 2014, 42 percent of workers expected that their main income in retirement would be provided by occupational and personal pensions, whereas only 32 percent of income for pensioners was provided by private pensions.

In the United States, the characteristics of those who have poor knowledge of future pension benefits were investigated by Gustman and Steinmeier (2005) using the Health and Retirement Study. Half of the respondents covered by social security and private pensions did not know their future pension benefits and they were likely to be poor, women and black. In Ireland, a study by Barrett, Mosca and Whelan (2015) of persons aged 50 years and over who are covered by occupational or personal pensions found that around two-thirds of respondents did not know the amount of their future pension benefits, and they were more likely to be younger, poorly educated, women, and living in rural areas.

Effects of Expectations on Saving for Retirement. Although actuarial reviews of social security pensions are carried out every five years, in Ireland workers are less concerned about the financing problems of state pensions than in the United States because the pay related social security contributions are not required to be adequate to balance with expenditure on state pensions. A deficit on the social security (social insurance) fund will be met out of general taxation revenue.

The low expectations concerning the relative importance of social security pensions in Ireland might mean that workers would like to save more for their retirement. But in 2015, 39 percent of workers said that they could not afford to save for a pension, and 9 percent said there was no pension available through work. So nearly half of current workers have no access to a private pension because they are unable to save or their employer does not provide a pension. These figures largely explain why the coverage rate of private pensions in Ireland was only 47 percent at the end of 2015.

Determinants of Expectations

We now investigate the differences in public perceptions concerning the future of social security in the United States, Canada and Ireland. Using Google, we did several searches to assess the issue of public discussion on whether the old-age social security programs in the United States, Canada and Ireland would continue providing benefits. We used quotation marks to limit the results to exact phrases, so as to not pick up results based on part of the phrases, such as the names of the programs.

First, we asked for the United States, “Will Social Security be there”. This search yielded 95,000 results. Then we asked, “Will the Canada Pension Plan be there”. This search yielded 6 results, all of them as part of the following quote, “Canadians will not need to ask, Will the Canada Pension Plan be there for me.” Finally, we asked, “Will the Irish State Pension be there” and alternatively “will the Irish State Pension (Contributory) be there”, neither of them yielding any results. These search results suggest far greater concern in the United States than in Canada and Ireland as to the future of the Social Security program.

In Ireland, when a deficit occurs on the social insurance fund, the government covers it out of general taxation. So there is little discussion in Ireland of when the social insurance fund will run out of money. In addition, there is no specific social insurance contribution for the state pension. The standard social insurance contribution for an employer of 10.75 percent and an employee for 4 percent entitles an employee to unemployment benefit, disability benefit, the state pension and other benefits. The aggregate cost of these benefits is paid out of the social insurance contribution and out of general taxation. Every five years actuaries make assumptions and then makes a long-term projection of the balance between income and expenditure on the state pension contributory. The last actuarial review projected a substantial deficit on the contributory state pension. In Canada, as discussed earlier, the Canada Pension Plan is projected to have sufficient financing for the next 75 years.

Some elements of the financial sector may gain from casting doubt on the future of social security. For example, in the United States the financial online publication *Bankrate* published an article (Steiner 2015) that stated at the beginning of the article, “Many people believe that Social Security will be bankrupt by the time they retire. In fact, a recent survey conducted by

Bankrate found that nearly a quarter of Americans expect to receive no benefits from Social Security. These fears are not entirely unfounded."

Behavioral Expectations Theory

We find evidence that workers have some knowledge about the possibility of future benefit changes, but that knowledge is not precise, and some tend to overestimate possible future effects of reforms. Their expectations tend to become more realistic as they get older and retirement approaches. This pattern can be called marginal rational expectations. Marginal rational expectations combines both behavioral expectations, which cause the expectations of many young people to be incorrect, with rational expectations, in that as people age, their expectations tend more to be consistent with rational expectations.

Comparative Results

By making various comparisons, we can rule out a number of hypotheses for explaining the finding that some people tend to underestimate their future Social Security benefits and underestemate the probability that they would receive any benefits. One hypothesis is that people tend to underestimate future benefits. Because we find evidence that people tend to overestimate the role of private pension benefits relative to social security benefits, it appears that if people underestimate future benefits they do that more so for government provided benefits than for benefits provided by the private sector.

One hypothesis is that people in the United States have an overly pessimistic view of future Social Security benefits because they are aware of the future financing problems for the program. While that may be the case, people in Canada tend to also have an overly pessimistic view of their future social security benefits while in Canada there is little risk of future ubenefit cuts, and in fact recently benefits were increased. The American Academy of Actuaries (2017) survey finds that 34 percent of Americans don't expect to receive Social Security benefits, compared to 20 percent of Canadians (Uppala 2016). Survey results vary, but it does appear that, as expected, relatively more people in the U.S. than in Canada express this concern. It appears that the idea that people might not receive any social security benefits is not considered an issue, and to our knowledge has never been asked on a survey.

Conclusions

Expectations play a major role in both macroeconomic and microeconomic theory. While a number of surveys have asked questions concerning workers' expectations as to their future social security benefits, these expectations have not been the subject of extended analysis. This paper documents pessimistic views among a substantial minority of workers as to future social security benefits in the United States, Canada and Ireland. This mistaken belief presumably affects consumption, savings and portfolio decisions but those effects are not the primary focus of this research and further research needs to be done to investigate that hypothesis. This pattern was found in a survey taken six years before benefit increases were enacted in Canada. This pattern is not due to workers systematically underestimating future payments because it is seen that a substantial minority of workers also overestimate their future employer-provided pension benefits. We identify age and financial illiteracy as two causes of unrealistic expectations as to future social security benefits.

Just as in the broader literature where heterogeneity in worker behavior is recognized and it is seen that some workers fit the rational model of decision making while others fit the model of behavioral economics, we find that some workers appear to fit the rational expectations model, while others fit a model in line with behavioral economics and financial illiteracy. The two strands of thinking can be unified in a theory of marginal rational expectations, where people's expectations as to future social security benefits improve as the get older.

If social security has a negative effect on savings it would be expected that people underestimating their future social security benefits would save more than they otherwise would. We find little evidence of oversaving due to pessimistic expectations as to social security, but that is an area that merits further investigation.

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