Multi-Pillar Pension Systems: Lessons from Canada and Internationally
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1. Introduction

Pension systems play a crucial role in providing financial security in old age. This role will continue to increase as populations grow older and the population’s share of workers diminishes. In addition, longevity increases over the last decades suggest that current and future generations will spend greater period of their life in retirement than previous generations. So how can retirement income systems best serve the needs of current and future cohorts of retirees? There is of course no unique answer and different countries find different solutions that meet their needs.

Any retirement income system has multiple objectives. Not only are pension benefits expected to ensure a minimum income during retirement, they are also usually aimed at replacing a certain share of pre-retirement income. A retirement income system is expected to be structured in such way as to not disrupt labour markets and provide incentives to work and save during the working years of an individual. The system and individuals face a variety of risks (mortality, disability, economic, demographic…) and governments may wish to mitigate some of these risks through the design of their retirement income system.

It is highly unlikely that one program can properly address all these elements, and many others. This is why many countries have adopted systems composed of different programs with various roles. The objectives of a multi-pillar pension system are to address different aspects of what constitutes adequate and sustainable pension benefits.

Considering the multitude of objectives, each pillar is generally assigned different and sometime overlapping roles. The first pillar is usually a public benefit system which may be accompanied by a range of social assistance benefits. It often has a poverty reduction function. Mandatory or quasi-mandatory private or public pension schemes linked to labour force participation constitute the second pillar and focus on income replacement. Finally, the third pillar complements the first two pillars by providing voluntary retirement saving vehicles.

The first part on this paper discusses design aspects of multi-pillar pension systems from a point of view of the interaction between pillars. The role and relative importance of pillars are analyzed across countries, and scenarios are presented to illustrate how pension benefits outcome can vary under different circumstances.

The second part of this paper discusses how these design considerations were taken into account during the latest reform of the Canadian retirement income system –the enhancement of the Canada Pension Plan.
2. Multi-Pillar Pension System Design Considerations

An efficient pension system is expected to provide adequate benefits in a sustainable manner while supporting labour market policies and economic growth of a country. It is questionable whether all these objectives can be achieved through a single program. One of the advantages of a multi-pillar system is that it allows for the diversification in respect of benefit accrual principles (e.g. defined benefits versus defined contributions), the roles of public and private approaches, mandatory and voluntary programs, types of financing, etc. Thus, it is more likely that such system is better positioned to meet the multiple objectives of the retirement income system of a particular country.

This section presents a brief non-exhaustive discussion of some of the important elements to consider in the design of a multi-pillar pension system. The discussion mainly looks at this issue from the point of view of benefits. Therefore, the extremely complex and important aspects of financing and financial sustainability regarding pension systems is not addressed.

It should be noted that all references in this section to the Canadian retirement income system do not reflect the recent enhancements of the Canada and Quebec Pension Plans, unless mentioned explicitly.

Combining Private and Public, and Mandatory and Voluntary Pillars

Many countries have adopted a multi-pillar system with a mix of private and public pillars. As shown in Chart 1, a three-tiered retirement system often consists of two mandatory (or quasi-mandatory) pillars and one voluntary pillar.

The majority of countries around the world have some type of first pillar public safety-net pensions. OECD (2015) states: “These benefits play a more important role in times of high unemployment, or if general pension benefits are being reduced. Aligned with an increasingly ageing society their role could become more pronounced in the years to come as public finances come under increasing pressure.”

The second pillar offers a wide choice of retirement plans’ designs, such as defined benefit (DB), defined contribution (DC), notional defined contribution (NDC), as well as a choice between public and private routes.

The third pillar is usually a voluntary one and may include either or both individual and employer-assisted types of retirement savings.

An important design consideration is the relative importance of each pillar. Do the first and second mandatory pillars provide most of the benefits, or are voluntary savings essential for the provision of adequate retirement income?
Chart 1: Multi-Pillar Pension System

In Canada, the Old Age Security (OAS) basic benefit corresponds to the basic first pillar income and the Guaranteed Income Supplement (GIS) corresponds to the resource-tested benefit. There is no minimum pension linked to the second pillar. The eligibility criteria for the first pillar benefits are related to years of residence, and the benefits are financed out of general revenue on a Pay-As-You-Go (PAYG) basis.

The second pillar in the Canadian retirement income system consists of public national contributory pension schemes – Canada and Quebec Pension Plans (C/QPP) - that provide earnings-related DB pensions on a partially funded basis. These plans currently replace 25% of career-average income up to the Year Maximum Pensionable Earnings (YMPE). The YMPE today is equal to approximately 108 per cent of the Canadian average wage.

Finally, voluntary fully-funded occupational pension schemes (registered pension plans) and individual tax-assisted savings constitute the third pillar of the Canadian multi-pillar pension system. Registered pension plans have an income replacement objective and are offered by employers. These plans are mostly designed in line with DC or DB principles. Individuals who do not have access to an employer-sponsored pension plan can voluntarily invest in a Registered Retirement Savings Plan (RRSP) or Tax-Free Savings Account (TFSA), which are tax-favored vehicle.

Addressing Adequacy through Retirement Income System Design

An important objective of any retirement income system is to provide adequate benefits. However, what are adequate benefits?

The definition of adequate benefits heavily depends on the perspective of the ultimate user. A November 2015 Briefing for European Parliament (EP, 2015) states that “The adequacy of pensions is measured by their ability to prevent poverty, the degree to which they match the level of pre-retirement income and how they compare to the average incomes of people below pensionable age.” This definition attempts to incorporate views of both individuals and public policy makers, two major stakeholders of
Pension systems. It also addresses three fundamental concepts: societal policies (poverty reduction), balance between generations (relationship between income of younger and older generations), and individual preferences (how much pre-retirement income is replaced).

The concept of a multi-pillar system is crucial for the provision of overall adequate benefits. To measure the input of the different pillars to adequacy of benefits a multitude of concepts are used, such as replacement rate (gross, net, etc.), the share of people 65+ at risk of poverty, comparison with average work income, net income after non-pension subsidies and taxes, etc.

Chart 2 presents the gross replacement rate of public pensions (the first two pillars) in the absence of other retirement income as a function of pre-retirement income in Canada. It can be seen that the gross replacement rate of the first two pillars varies by income. The GIS targets low-income pensioners and is progressively reduced as other income increases. This means that workers with low pre-retirement earnings have higher income replacement ratio thanks to the combination of the benefits from the OAS, GIS and CPP. However, as income increases, the share of pre-retirement earnings replaced by the public pillars gradually diminishes. That is because in Canada the public pillars on their own are not meant to replace a high percentage of pre-retirement income at mid- to high-income levels. However, from a point of view of poverty reduction, the first two pillars offer valuable protection to nearly all Canadian workers.

Chart 2 Gross Replacement Rates from the OAS and CPP by Level of Pre-Retirement Adjusted Career Average Earnings (2018)

Source: Office of the Chief Actuary (OCA)

In Canada, the third pillar is an essential part of retirement income for mid- to high-income earners. This is illustrated by Chart 3 which compares net replacement rates for Canada and three other advanced economies (Denmark, Netherlands and Sweden).
Chart 3 Net replacement rates for full career workers with and without private supplementary coverage

Source: Sørensen et al. (2016); Detailed assumptions available in appendix.

Without the income of private pensions (third pillar in Canada, second and third pillars in three other countries), the net replacement rates drop significantly in all four countries, most notably for higher-income workers. This is because in all four countries, the 2nd and 3rd pillars have primarily an income replacement role, which is a key aspect of pension adequacy. Therefore, all pillars are needed to provide adequate pension benefits to various types of individuals.

Poverty Reduction

One of the goals of a retirement income system is to reduce old-age poverty. This responsibility is often assigned to the first pillar, but higher pillars also play an important role. For example, following the introduction of the Canada and Quebec Pension Plans and the GIS in 1966, the poverty rate of people 65+ declined from 37% to 22% over 15 years (Ménard et al., 2013). At the time, this was the equivalent of introducing the second pillar to Canada’s retirement system and strengthening the first one. As a result, these two pillars shared the poverty reduction role.

Today, in several countries, all pillars contribute to some degree to the reduction of poverty among seniors. Tables 1 and 2 present the cumulative impact of sources of income on poverty reduction for Canada and Sweden.
Table 1 Decomposing Poverty Protection for Canadian Seniors aged 65+

<table>
<thead>
<tr>
<th>Share of seniors with equivalised household income before taxes below 35% of the average wage (2011), %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above age 65 (no income)</td>
</tr>
<tr>
<td>Basic OAS Income (universal Pillar 1)</td>
</tr>
<tr>
<td>+ C/QPP Income (Pillar 2)</td>
</tr>
<tr>
<td>+ Private Pension Income (Pillar 3)</td>
</tr>
<tr>
<td>+ Investment Income</td>
</tr>
<tr>
<td>+ Work Income</td>
</tr>
<tr>
<td>+ Other Income</td>
</tr>
<tr>
<td>+ GIS (Income-tested Pillar 1)</td>
</tr>
</tbody>
</table>

Source: OCA (2017)

From Table 1, it can be seen that if the basic income from the universal first pillar (OAS) was the only income of seniors, they would all have income below 35% of the average Canadian wage. If the CPP and QPP retirement benefits are added, this proportion decreases to 60%. It further reduces to 35% once private pension income is taken into account. Should OAS, CPP benefits, private pension income and other income fall below a certain threshold, income-tested GIS benefits are specially designed to increase household’s income to a certain level. Overall, Table 1 provides an illustration of how all three pillars contribute in the reduction of low income senior households. It should be noted that although Table 1 shows that 13% of seniors have income below 35% of the average Canadian wage, other programs are in place to support these seniors. Further, the numbers presented are based on pre-tax income and Canada has a range of tax credit for low income households. Table 2 presents a similar decomposition for Sweden. It shows, again, how the multiple pillars contribute to providing sufficient income.
Table 2 Decomposing Poverty Protection for Swedish Seniors aged 65+
(Share with income less than 60% of median income, %)

<table>
<thead>
<tr>
<th></th>
<th>Single</th>
<th>Couple</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Above age 65</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Income from work</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+ Public earnings related pension (1st pillar)</td>
<td>96</td>
<td>66</td>
<td>58</td>
</tr>
<tr>
<td>+ Occupational pension (2nd pillar)</td>
<td>92</td>
<td>52</td>
<td>58</td>
</tr>
<tr>
<td>+ Private pension (3rd pillar)</td>
<td>94</td>
<td>48</td>
<td>41</td>
</tr>
<tr>
<td>+ Other private income (capital gains, etc.)</td>
<td>48</td>
<td>33</td>
<td>39</td>
</tr>
<tr>
<td>+ Guaranteed pension (0 pillar)</td>
<td>38</td>
<td>36</td>
<td>41</td>
</tr>
<tr>
<td>+ Housing and other allowances (0 pillar)</td>
<td>33</td>
<td>29</td>
<td>32</td>
</tr>
<tr>
<td>+ Adjusted for household income</td>
<td>33</td>
<td>29</td>
<td>25</td>
</tr>
</tbody>
</table>

Source: Settergren (2014)

Finally, some countries partially address poverty outside of the pension setting through taxes and non-pension subsidies (e.g. housing and energy). As an example, according to Sørensen et al. (2015), about 27 percent of all Danish pensioner households received a housing allowance in 2015. More than 90 percent of all payments and more than 95 percent of the total payment amounts went to low or very low-income households. The payment of housing and heating allowances in Denmark may more than double the disposable income of a low-income pensioner after taking into account housing costs.

Mitigating Impacts on Benefits of Reductions in Labour Input

The vast majority of people do not have a full career at the same level of earnings. Individuals may have years of schooling, unemployment and/or reduce their labour market involvement as result of caring for family members or illness. In addition, for countries with significant level of immigration, like Canada, people start contributing to the pension system at a later age. For example, the average age of immigrants to Canada is about 30 years. The issue of variant careers may become even more prominent in the future due to an ongoing technological transition which may impact future labour markets (see for example Billig et al. (2018)).

When individuals work less, they earn less and contribute less to the pension system and to their private savings. Thus, it is important to assess how the retirement system treats people with variant careers. Examples of such analysis are Sørensen et al. (2016) and OECD (2015).

In a multi-pillar pension setting, the public pillars usually have mechanisms that mitigate the impacts of reduction in labour input. The first pillar is often given the role of providing a minimum retirement income independent of work input as well as income-tested benefits. As a result, a portion of retirees’ income is protected against adverse events or individual decisions that lead to reduced labour input. In the public second pillar, reduced labour input can be mitigated by excluding from the pension benefit’s calculation low-earning years due to certain life situations or imputing a certain level of earnings for these periods.
To illustrate the impact of reduced labour input on pension income, a maternity scenario is presented in the context of three countries with a developed three-pillar pension system structure: Canada, Denmark and Netherlands. Compared to a full-time worker, the scenario assumes two maternities and 15 years of part-time work before returning to full-time work up to the pension age. As shown in Chart 4, the overall labour input is equal to about 80% of the labour input of a full-time worker.

**Chart 4 Reduction in Net Pension Income versus Full-Time Worker - Maternity Scenario (mid-income worker)**

<table>
<thead>
<tr>
<th></th>
<th>Labour input</th>
<th>Private pension wealth</th>
<th>Net pension income</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada</td>
<td>-15%</td>
<td>-16%</td>
<td>-20%</td>
</tr>
<tr>
<td>Denmark</td>
<td>-20%</td>
<td>-25%</td>
<td>-30%</td>
</tr>
<tr>
<td>Netherlands</td>
<td>-25%</td>
<td>-30%</td>
<td>-35%</td>
</tr>
</tbody>
</table>

Source: Based on Sørensen et al. (2016); Does not reflect the CPP enhancement for Canada.

From Chart 4, it is apparent that a reduced work input has a significant impact on private pension wealth, which in the present case relates to the third pillar of Canada’s pension system (assumed to be a DC plan) and the second pillar of the Denmark and Netherlands systems. For each of these three countries, the reduction in labour input translates to a comparable reduction in private pension wealth. However, when the public pillars are taken into account, the decrease in net pension income is much less significant than the decrease in labour input. This is because the public pillars are either not earnings-related or have specific mechanisms in their design to mitigate the impact of reduced work input.

Another thing to consider is that the impact of reduced labour input on pension benefits might vary as a function of income level. As shown in Chart 5, under the two maternities scenarios, the relative reduction in pension income increases as income increase. In all three countries, low-income workers can benefit from flat-rate benefits and, in the case of Canada and Denmark, from income-tested benefits provided through the first pillar. Further, all countries provide some type of mitigation mechanisms for periods of child care. In Canada, it takes the form of a child-rearing provision which allows dropping years of low earning while caring for young children from the calculation of the second indicator.

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1 Canada actually shows a smaller reduction for higher-income workers versus middle-income workers because pensionable earnings under the second pillar are capped.
pillar retirement benefit. However, as pre-retirement and retirement benefits increase, the relative importance of the flat-rate benefits decreases and income-tested benefits are reduced. Therefore, higher-income workers need to rely more on other sources of income in retirement.

**Chart 5 Reduction in Net Pension Income versus Full-Time Worker – Maternity by Income Level**

Source: Based on Sørensen et al. (2016)

**Balancing of Retirement Income Protection and Incentives to Work and Save**

The mitigation of adverse impacts of reduced labour input may come at the cost of weakened incentives to work and save\(^2\), especially when the mitigation mechanisms are based on income testing. Retirement income protection mechanisms may influence individual decisions on labour market participation (part-time work, financing early retirement from private savings, etc.) and on savings (evasion of contributions, reduced voluntary savings, etc.). As a result, an individual who is not low income during their whole working life may end up as a low-income pensioner eligible for targeted benefits. Therefore, it is important to understand the objectives of such mitigation mechanisms and how they affect incentives to work and save.

Multi-pillar pension systems address the issue by using different types of benefit accruals in the different pillars, providing for different degree of links between labour input/contributions and retirement income, and by varying the generosity of the first pillar pensions and the eligibility for income-tested benefits. In general, the last two elements vary quite significantly from one country to another (OECD, 2017a). Countries with low value universal pensions or low coverage by income-targeted benefits are implicitly providing more incentives to individuals to work and contribute to their retirement. The downside of such an approach may be higher poverty levels among seniors.

\(^2\) See, for example, Barr and Diamond (2008) for an elaborate discussion on the implications of this dilemma for pension design.
Based on Sørensen et al. (2016), when the Swedish pension system was reformed in the mid-1990s, it was done with the explicit objective to put less emphasis on redistributive features and create an incentive-driven pension system. The result is a system with a strong link between the labour input and the retirement income and a modest guaranteed pension available only at quite low level of post-retirement income. At the same time, as can be seen from Table 2, non-pension allowances are important to protect seniors from poverty in the Swedish context. Their neighbour, Denmark, has an income-tested supplement which is available to almost 90% of pensioners. This income-tested supplement, therefore, provides individuals a wide protection against a decrease in their overall retirement income, regardless of the cause of such a reduced income.

In Canada, the balance between the protection of retirement income and the incentives to save is achieved through the combination of mandatory earnings-related savings (CPP and QPP) and modest income-tested benefits (GIS). As a result, in general, it is more advantageous to work and save rather than to rely mostly on an income-tested benefit. As illustrated by Chart 6, since the second pillar (CPP and QPP) is based on work income and is mandatory, it is a major contributor to income testing at a lower level of retirement income (dark blue area). As shown by both Charts 2 and 6, today a person at the maximum CPP benefit (i.e. full-time career worker at about average wage) will be entitled to a very low GIS amount. As such, disincentives to save for workers at earnings level above average wage are quite modest. These disincentives will reduce further in the future as the expansion of the CPP and QPP matures over the coming decades. Finally, in line with a protection-oriented approach, the latest reforms of the GIS were aimed at the poorest retirees who, most likely, would have very weak labour force attachment.

![Chart 6 Gross CPP and Private Income and Total Retirement Income](source)

Source: OCA. Numbers are based on 2014 benefit amounts.

**Preservation of the value of benefits**

The relative importance of pension income coming from different pillars depends on the indexation of these benefits and rights while in pay and indexation of starting amounts. The relative weight of benefits evolves over time depending on the indexation rules in place. Benefits indexation can be tied to prices, wages or some combination of both (see OECD, 2015 for summary of practices in the OECD countries).
As wages usually increase at a faster pace than prices, adjusting pension benefits to prices over time reduces the relative income position of retirees compared to workers. Given that low-income worker’s retirement income often relies significantly on the first pillar pensions, price-indexing these pensions has the potential of increasing income inequalities.

It is important to note that indexation of benefits in pay represents a significant cost and many private pension arrangements do not provide inflation protection. In a multi-pillar pension system setting, having at least some of the pillars provide some degree of indexation is one way to mitigate the absence of indexation in other pillars.

Canada increases its first pillar benefits using a price index (the CPI). Its second pillar benefits are indexed to wages during working years and CPI in retirement years. Because of this difference in indexation methodology, it means that over time, the OAS/GIS benefits upon retirement will tend to represent a decreasing share of public benefits.

**Risk Mitigation through Multi-Pillar Systems**

Retirement income systems and individuals are exposed to a variety of risks, including economic and demographic risks.

Depending on the overall system design, the impacts of various economic and demographic environments on benefits and financial sustainability may differ for systems and pillars. For example, a traditional DB pension plan provides known-in-advance benefits to its participants regardless of how financial markets perform. For a traditional DC pension plan, the investment risk is fully transferred to its participants. Thus, the amounts of benefits under these two types of pension offering react differently to the same external factor – investment risk.

A robust and diversified retirement system is usually better positioned to mitigate risks both from the angle of benefit amounts and overall stability of the system.

Sørensen et al. (2016) analyzed the impact of various economic growth scenarios on net replacement rates for workers in Canada, Denmark, Netherlands and Sweden. Under the high-growth scenario, rates of return on investment and wage increases are high. In the low-growth scenario, low inflation, low rates of return on investment and low wage increases are assumed. As shown in Chart 7, because each of these countries has different combinations of DC, DB, and universal benefits programs, as well as different type of benefit indexation, the impact on pension income for average wage full-time workers is quite different under each scenario.
In the Netherlands, the pension design is primarily DB which results in stable net replacement rates regardless of economic growth. In Canada and Denmark, the net replacement rates will be affected slightly, however the public pension portion will vary significantly (Chart 8). Thus, under the low-growth scenario, pensioners will be partially protected by higher public pension benefits, while the upside of higher investment returns under the high-growth scenario will be partially neutralized by lower public pension benefits. In Sweden, since the accrual principles are more or less similar in all pillars (NDC and DC) there is a potentially very high net replacement rate under the high-growth scenario. However, low growth translates into a noticeable decrease in the net replacement rate. In general, as shown in Chart 8, public pensions act as a retirement income stabilizer with their share increasing under adverse circumstances.
Chart 8 Public Pension Fraction for Average Wage Full-Time Workers under three different Financial Scenarios

Source: Sørensen et al. (2016)

The failure of higher pillars to deliver an adequate retirement income could result in higher benefits paid from the first pillar. In this case, even if the first pillar is financed from general revenues, and, therefore, do not have a direct exposure to investment risk, it is affected by this risk through its interaction with the other pillar(s) of the retirement income system. Still, even though this represents a potential cost for society, public pensions offer a valuable protection to pensioners.

Individuals face the risk of longevity, i.e. the risk of outliving their savings. Again, a multi-pillar system ensures that at least part of their income is guaranteed, regardless of how long they live. In the context of the public first and sometimes second pillars, individual longevity risk is pooled across a generation. Of course, there is a cost to this strategy since if an entire generation lives longer than expected, then society as a whole will bear the cost. Some mechanisms might be put in place to mitigate this risk such as adjusting benefits for expected longevity or postponing the normal retirement age. It is effectively a way to transfer back part of the longevity risk to individuals\(^3\), but in doing this several issues should be considered including the difference in longevity by socio-economic groups\(^4\). While the protection offered by the first pillar may be sufficient for low-income individuals, higher-income individuals need additional protection against longevity risks since public pensions often are not expected to replace a sufficient share of their pre-retirement income.

External factors can affect not only individuals, but also any pillar and the whole retirement income system. An example is the shift from DB systems to DC (or NDC) systems around the world. In Canada, such shift affected mostly the third pillar (OCA, 2018). In Europe, there has been a movement to replace

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\(^3\) For more consideration regarding the change in the retirement age reader is referred to the IAA (2016)

\(^4\) Please see Billig (2018) for more information.
DB universal systems by those based on NDC or DC accrual principles\(^5\). This shift was triggered by increasing longevity, overall ageing of many countries’ populations, as well as an unfavourable economic environment. While it may be argued that such reforms serve to control the cost of pension programs, the way risks are shared between stakeholders should be examined and monitored.

Coverage by Pillars
The share of the population covered by a pension system (both legal and effective coverage) is an important concept, especially in developing countries that have a large share of their labor force employed in the informal market. In such situations, the country’s retirement income system may provide adequate income at retirement to a certain (often quite small) subpopulation which is formally employed, but leaves those working in the informal market unprotected. Coverage could also become a challenge in developed countries if automation and the gig economy result in the transformation of the labour markets\(^6\).

The question of coverage becomes even more important when a system is designed to rely on voluntary savings (either individual or through occupational pension plans provided by employers) to provide a sufficient retirement income. While employer-related pension coverage might be maintained by strong union tradition in countries such as Denmark or the Netherlands\(^7\), the situation might not be the same in other countries where occupational pension plans are not (quasi) mandatory. This creates a situation where the adequacy of the system as a whole may depend on the employers’ capacity or willingness to offer retirement income or on the availability and efficiency of individual retirement saving vehicles.

In Canada, the percentage of employees covered by an employer-sponsored pension plans, especially in the private sector, has been slowly declining over the last forty years (Finance Canada, 2016). The percentage of private sector employees covered by an employer-sponsored pension plan decreased from 35% in 1977 to less than 25% in 2013. In addition, there is a well pronounced trend of converting DB plans to DC plans (Finance Canada (2016) and OCA (2018)). This shift is attributable to the increasing and volatile costs associated with DB plans due to a low interest rates environment and market volatility.

Looking at individual voluntary savings, in 2016, about one in four tax filers contributed to a RRSP and the average age of contributors was 46 years old (OCA, 2018). The proportion of tax filers who contribute to a RRSP also varies by total income class. As shown in Table 3, this proportion increases with the tax filer’s total income. In 2016, 60% of tax filers with total income of $80,000 or more contributed to a RRSP compared to 23% on average.

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\(^5\) Some of these reforms have been subsequently reversed. This discussion is outside the scope of this paper.

\(^6\) See OECD (2018) for case studies from Europe.

\(^7\) See OECD (2017b) for Denmark and OECD (2017c) for Netherlands
### Table 3 Proportion of Canadian Tax Filers Who Contributed to a RRSP by Income Class and Year

<table>
<thead>
<tr>
<th>Income Class</th>
<th>Less than $20,000</th>
<th>$20,000-$40,000</th>
<th>$40,000-$60,000</th>
<th>$60,000-$80,000</th>
<th>$80,000 or more</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2006</strong></td>
<td>5%</td>
<td>37%*</td>
<td>37%*</td>
<td>37%*</td>
<td>70%</td>
<td>27%</td>
</tr>
<tr>
<td><strong>2016</strong></td>
<td>2%</td>
<td>13%*</td>
<td>31%*</td>
<td>45%*</td>
<td>60%</td>
<td>23%</td>
</tr>
</tbody>
</table>

*Before 2007, income classes $20,000-$40,000, $40,000-$60,000 and $60,000-$80,000 were grouped together.

*Source: OCA (2018)*

The ability of individual saving vehicles to provide reasonable retirement income depends on many factors such as financial literacy, availability of investment choices and size of investment fees. In particular, high investment fees may result in low individual saving balances even for well-disciplined savers. According to the Morningstar Global Fund Investor Experience Study (2017), Canada is ranking quite poorly in this respect.

In general, in order to mitigate the cost of the first pillar which is usually financed from general revenues, the design of the multi-pillar retirement income system should aim at increasing the coverage of earnings-related schemes, both public and private, use greater diversification of designs, and take advantage of risk pooling.
3. Interaction of Pillars in Multi-Pillar Pension Systems – Example of the Additional CPP

This section discusses how the considerations highlighted in the previous section were applied in the recent pension reforms of the second pillar of the retirement income system in Canada.

CPP Expansion and its Interaction with other Pillars

Today, the Canadian retirement income system is performing generally quite well. However, over the last few years, concerns regarding potential insufficient retirement saving were raised. These concerns were triggered by several factors. The first one is the decline in employer-sponsored pension plans coverage, especially in the private sector, resulting in 62% of the Canadian labour force not being covered by employer-sponsored pension plans (Chart 9).

Chart 9 Employer-Sponsored Pension Plans Coverage

Source: OCA (2018)

Secondly, financial market volatility and the low interest rates environment following the 2008-2009 financial crisis complicate individual saving strategies. The Department of Finance, Canada, found that one in four families approaching retirement—1.1 million families—are at risk of not saving enough (Finance Canada, 2016). The middle-class families were affected more than other income quintiles.
These concerns triggered a society-wide discussion on how the issue of retirement preparedness can be addressed, and, in particular, through which pillar. Discussions on the potential saving vehicles covered solutions that could be implemented through either the third or the second pillar. Aspects present in many proposals were the expansion of coverage, pooling of risk and portability of benefits (from one employment to another). For review of several proposals, please see Baldwin (2010).

At the same time, several Canadian provinces put forward proposals to create their own province-wide pension plans to address this issue. The proposal advanced by Ontario – the Ontario Retirement Pension Plan (ORPP)\(^8\) was based on DB principles and mandatory participation of both employers and employees. The ORPP aimed at providing a replacement rate of 15% of an individual’s earnings, up to a maximum earnings threshold (closed to 170% of average wage) financed by contributions of 3.8% of earnings equally split between employers and employees. In particular, the ORPP was to be mandatory for all employers except those who offer comparable workplace pension plans\(^9\).

On the other end of the spectrum was the joint Alberta and British Columbia proposal which was pure DC and based on auto-enrolment approach with opt-out possibility.

At the end, a decision to address the issue through the expansion of the Canada Pension Plan, and eventually of the QPP, was taken. Before beginning the work on the expansion design, the stewards of the CPP (Federal and Provincial Ministers of Finance) have agreed on the expansion principles. Modest –

\(^8\) See Backgrounder from Ministry of Finance Ontario (2014).

\(^9\) A private pension plan was deemed comparable if it provided a minimum accrual rate of 0.5% of pensionable earnings per year for DB plans or if it was a DC plan with a mandatory contribution rate of at least 8%.
to leave enough space for private savings, gradual – to minimize impacts on businesses and individuals, and fully funded - to minimize intergenerational transfers.

In June 2016, federal and provincial Ministers of Finance reached an agreement on the CPP expansion. The CPP expansion consists of two parts. First, the income replacement rate is increased from 25% of adjusted career earnings to 33%. Second, the pension earnings cap is increased from 100% of the YMPE to 114% of the YMPE. Full benefits will be available to workers with 40 years of contributions and benefits will be pro-rated for those with fewer contribution years. The intention of this reform is to provide a higher income replacement rate to all workers, particularly those who do not have access to an employer-sponsored pension plans. These benefits are to be financed by additional contributions of 2% up to 100% of the YMPE and 8% on the additional earnings between 100% and 114% of the YMPE. Chart 11 graphically presents the main parameters of the expansion.

Chart 11 Main Design Parameters of Enhanced CPP

Source: Finance Canada (2016)

Although the term “CPP expansion” suggests that the enhancement is simply a continuation of the base plan, the base and additional CPP are in fact quite different. Pension benefits are not calculated the same way. Under the enhanced part, full benefits are based on the 40 highest years of earnings. Considering that 40 years represent a large portion of a typical career, it means that each year with low earnings has a significant impact on the amount of benefits. The additional CPP features drop-in provisions for child-rearing and disability years, meaning that earnings are imputed for these years based on a certain percentage of average earnings before the event that triggers the drop-in. In comparison, the base CPP benefits are based on an individual’s whole career but contain drop-out provisions that disregard low-earnings years, disability years and child-rearing period. As a result, calculation of adjusted career-average salary may be based on a number of years that is quite lower than 40. Because individuals’ earnings tend to be greater towards the end of their working-life, drop-out provisions have the effect of giving more weight to higher-earnings years compared to the drop-in provisions. Thus, the accrual principle of the base CPP allows for a greater redistribution effect than in the CPP expansion, which is based on a stronger link between benefits and contributions.

When the (base) CPP was introduced in 1966, it was to address, among other goals, an issue of poverty among seniors. Its design therefore included redistributive elements which helped to rapidly provide income to pensioners at the cost of creating an obligation for future generations. Although the reform of 1997 restored the long-term sustainability of the base CPP, there remains a form of past obligation in the plan today. In the case of the additional CPP, the enhancement is introduced on a prospective
approach. The objective is to address potential gap in future retirement income. No past service liability is created at inception; today's workers will contribute towards their own retirement and full benefits will start to be available only 40 years after the implementation.

Another important distinction between both parts is the difference in financing approaches. It results in different exposure of the two parts to demographic and economic risks (OSFI, 2016 and 2018). The main source of income for the base CPP is contributions. In the case of the additional CPP, investment income constitutes the most important source. As a result, the financial state of the base CPP is more sensible to demographic factors while the financial state of the additional CPP is more sensible to market performance.

**Who Benefits from the Expansion in Retirement?**
Finance Canada estimated that the percentage of families at risk of undersaving will reduce from 24% to 18% by the time the enhancement will mature.

**Chart 12 Estimated Reduction in the Percentage of Families at Risk of Not Having Sufficient Retirement Income, by Income Quintile**

<table>
<thead>
<tr>
<th>Income quintile</th>
<th>1st quintile</th>
<th>2nd quintile</th>
<th>3rd quintile</th>
<th>4th quintile</th>
<th>5th quintile</th>
<th>All families</th>
</tr>
</thead>
<tbody>
<tr>
<td>per cent</td>
<td>10  25</td>
<td>18  25</td>
<td>22  31</td>
<td>22  28</td>
<td>20  25</td>
<td>18  24</td>
</tr>
</tbody>
</table>

Notes: Chart shows the estimated impact of the CPP enhancement if it was fully mature today (i.e., workers had contributed to the enhanced plan over their full careers). Figures represent the share of families nearing retirement age at risk of not replacing 60 per cent of their pre-retirement after-tax income when considering income from the three pillars of the retirement income system and savings from other financial and non-financial assets. Income quintiles correspond to pre-retirement after-tax income of families with a major income earner age 45-59. The 1st quintile corresponds to the bottom 20% of families in the income distribution while the 5th quintile corresponds to the top 20% of families.

Sources: Survey of Financial Security, 2012; Department of Finance Canada calculations.

Source: Finance Canada (2018)

As shown in Chart 12, middle-income workers are those who are expected to benefit the most from the CPP enhancement. This is not surprising since a higher share of their earnings will become pensionable and the replacement rate of their pensionable earnings will increase. It could also be said that middle-income workers usually have a level of retirement income that precludes them from benefiting from income-tested programs such as GIS in their retirement. Therefore, this subgroup is expected to benefit fully from the CPP enhancement.
The important question is: will low-income earners benefit from this enhancement since they rely significantly on the first-pillar benefits and, in particular, on the income-tested GIS benefit? On the one hand, the enhanced CPP benefits are expected to reduce their GIS benefit (however, the total benefit will still be higher). On the other hand, these individuals are expected to reduce part of their consumption to pay for additional CPP contributions.

Before answering this question, it is important to understand who low-income earners are. To answer this question, the Office of the Chief Actuary (OCA) performed an analysis of GIS recipients and their labour force attachment and level of earnings. Chart 13 shows the distribution of the CPP contributors’ cohort aged 65-69 in 2014 (1.4 million persons) by level of earnings and labour force attachment.

Chart 13 CPP contributors’ cohort aged 65-69 in 2014

Source: OCA (2016)

Individuals are divided in three categories. Low labour force attachment individuals are those with more than 20 years without contributions to the CPP. This group includes mid-career immigrants and the generation of women who joined the labour force later in their lives. People in this group, even if they may be entitled to the GIS, cannot systematically be characterized as low-income earners.

The group that would hypothetically see a reduction in GIS benefits are the persistent low-income workers who represent 19% of the cohort of individuals aged 65-69 with past CPP contributions. Individuals of this group are defined as having more than 10 years of earnings between 10% and 50% of the YMPE and less than 20 years of absence from the labour force. In the presence of the CPP enhancement, individuals of this group would have contributed all their careers towards a benefit that might offset part of the GIS they would have received without contributing to the enhancement. However, it turns out that more than 75% of persistent low-income workers do not receive GIS benefits.
Since the GIS is a family benefit, over 80% of female persistent low-income workers do not receive the GIS due to the income of their partner. This means that the majority of low-income workers will actually fully benefit from the enhancement. Others who are entitled to the GIS still will see an increase but at a lower level due to the income-tested nature of the GIS.

**Impact of Additional Contributions on Low-Income Individuals**

Another issue that was widely discussed is the impact of additional contributions on low-income earners. One of the proposed solutions was formulated in the consultation document on the expansion of the QPP (Retraite Québec, 2016). Under this option a tranche of earnings (up to 50% of the YMPE) was excluded both from calculations of contributions and benefits. However, as shown in Chart 14, increasing the lower bound of contributory and pensionable earnings would reduce replacement rates at all spectrum of earnings.

![Chart 14 Replacement rate for Annual Retirement Benefit at Age 65 (after full implementation)](chart.png)

Source: OCA (2016)

Further, due to the way the contributions are collected, such approach would further reduce additional benefits to many employees with multiple jobs during the year (estimated 1 million people in 2014) (OCA, 2016).

Instead, the Federal Government has used tax tools outside the retirement income system to lower the burden of the additional contributions on low-income workers. An existing Working Income Tax Benefit designed to keep people in the workforce and encourage others to join it was expanded. This expanded income tax benefit ensures that low income workers have the resources necessary to contribute to the enhanced CPP and that its introduction will improve their capacity to face retirement.

**Impact on the First and Third Pillar**

It is not possible to change one pillar without affecting the other pillars; each part interacts with each other. The expansion of the CPP is expected to result in a reduction in GIS expenditures because workers...
will receive increased benefits and GIS is income-tested. By 2060, it is expected that the overall GIS recipient rate will be 25% instead of 27% in the absence of additional CPP benefits. The 2060 GIS expenditures are expected to decrease by 6% from $49 billion to $46 billion due to the introduction of the additional CPP (OSFI, 2017).

With respect to the third pillar, many private pension plans are integrated with the C/QPP. It is possible, that in order to mitigate the cost from the increase in pension contributions, this integration will be expanded to cover enhanced CPP benefits, and contributions will be adjusted accordingly. Increasing the replacement rate and the earnings covered under the second pillar may potentially reduce the exposure of employers that offer pension plans to a variety of risks such as longevity and investment risks. In a way, the additional CPP enables employers to pool together their pension risks and benefit from economies of scale. That being said, a recent survey of Canadian employers revealed that few of them (about 17%) have actually started to make plans to adjust their pension plans to the CPP expansion (Aon, 2018). It is likely that the progressive phase-in of contribution rates has not prompted employers to react immediately and that as the enhancement matures, so will the integration of workplace pension plans vis-à-vis the CPP.

Finally, it is expected that the increase in contributions will result in some reduction in voluntary savings in individual retirement savings plans (RRSPs). While there is no publicly available analysis for the CPP expansion, the Conference Board of Canada has performed such analysis for the ORPP (Conference Board of Canada, 2015). Based on tax data, the authors found that lower-income groups would reduce their private savings by the amount of additional contributions. Higher-income groups on the other hand, would exhibit no reduction in their saving habits. A similar pattern may apply in the case of the CPP expansion.
4. Conclusion

Designing a pension system or introducing pension reforms is not a trivial exercise. It requires assessing what are the primary goals and how changing one part of the system might affect the other parts. The above discussion shows that the objectives and considerations can be quite numerous. It is not realistic to expect that one single pension program can achieve all the desired objectives. In fact, even if such a program existed, it would present significant concentration risk, as the entire retirement system would rely on a single program, akin to putting all your eggs in the same retirement basket. If it is not realistic for a single program to deliver on all the objectives set by policymakers, then it must do so with multiple programs, or multiple parts. In monetary policy, it is said that the number of goals a policymaker can pursue can be no greater than the number of instruments the policymaker can control. This idea can certainly be applied in the context of a pension system. Furthermore, this need for different parts in the retirement system creates a natural opportunity for diversification, thereby ensuring that should a part of the system come under pressure, then retirees can rely on the rest of the system.

The above discussion also shows that careful examination of pillar interactions ensures that pension reforms are done in a proper way. The strength of multi-pillar pension systems resides in the interaction of their pillars, in how the multiple objectives of the pension system can be attributed to different pillars, how the risk of one particular pillar can be mitigated by the others, and how in the end retirees can benefit from diversified sources of income.

5. Bibliography


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6. **Appendix: Modelling of net replacement rates (Sørensen et al. (2016))**

Calculations of pension rates and net replacement rates are based on 2014 wage levels for modelled individuals.

The modelling covers three model-type individuals. The model-type individuals are defined using an average income worker as a starting point and considering two additional workers with wage levels of 50 per cent and 150 per cent of the average wage respectively. Further, careers of these individuals are varied to reflect maternity leave, part-time work, unemployment and early retirement.

The individuals enter the labour market at age 25, in 2014. They retire at the forecasted pension age of the four countries: Canada, age 65; Denmark, age 73; the Netherlands, age 71; Sweden, age 69.

It is assumed that the modelled individuals have the same wage level – the same full-time reference pay – throughout their entire labour career. The individuals pay pension contributions according to the standards set in each country. In Canada, for the third pillar, it is assumed that an individual participates in a DC plan with both employer and employee paying contributions at a rate of 3 per cent of earnings, for a total contribution of 6 per cent of earnings.
Each year, the individuals pay taxes according to each country’s tax regulations.

The gross pension entitlement of each individual is based on his/her level of earnings, career path and rules for each country. The net pension income is then determined by subtracting income tax.

The net replacement rate is defined as a ratio of net income during first year of retirement to the net income during the last year of work.

Existing and adopted future tax regulations are applied along with existing and adopted future regulation regarding social security benefits and public old-age pensions.

The financial scenarios apply the following assumptions:

<table>
<thead>
<tr>
<th>Table A-1 Assumptions</th>
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<tbody>
<tr>
<td></td>
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<tr>
<td>Inflation</td>
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<tr>
<td>Base scenario</td>
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<tr>
<td>Low growth scenario</td>
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<td>High growth scenario</td>
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