Unexpected Inflation and Redistribution of Wealth in Canada

Césaire A. Meh, Canadian Economic Analysis, and Yaz Terajima, Financial Stability

- *One of the most important arguments in favour of price stability is that unexpected inflation generates changes in the distribution of income and wealth among different economic agents. These redistributions occur because many loans in the economy are specified in fixed-dollar terms. Unexpected inflation redistributes wealth from creditors to debtors by reducing the real value of nominal assets and liabilities.*
- *This article quantifies the redistributional effects of unexpected inflation in Canada. To this end, we first provide comprehensive evidence of the nominal assets and liabilities of various economic sectors and household groups.*
- *We find that the redistributional effects of unexpected inflation are large even for episodes of low inflation. The main winners are young, middle-income households, who are major holders of fixed-rate mortgage debt, and the government, since inflation reduces the real burden of their debt for both groups. The losers are high-income households and middle-aged, middle-income households that hold long-term bonds and non-indexed pension wealth.*

There is ongoing research on potential refinements to monetary policy regimes in countries with low and stable inflation. In Canada, for example, a systematic review of the current inflation-targeting framework is underway (see the other articles in this issue). An issue that has received relatively less attention is the redistributional effects of unexpected inflation.[1] Redistributional effects occur because many savings, investments, and loans in the economy are specified in money terms (i.e., not adjusted for inflation); unexpected inflation therefore redistributes wealth from lenders to borrowers by lowering the real value of nominal assets and liabilities.[2] The analysis of these effects may be important since the welfare costs of inflation depend not only on aggregate effects but also on potential redistributional consequences. Our calculations show that, even with an episode of low inflation, the redistribution can be sizable. While this is a wealth transfer from one agent in the economy to another, a sense of who wins and who loses is essential in order to assess transitional costs and potential public support for reform.

The goal of this article is to provide insight into the redistributional effects of inflation in Canada. The article is a summary of the recent research of Meh and Terajima (2008).[3] The article proceeds as follows. The first section documents nominal assets and liabilities (i.e., financial assets and liabilities that are denominated in Canadian dollars and not fully indexed to inflation) held by different economic sectors and

1 In this article, we focus on inflation that is either unexpected or partially unexpected. If inflation were completely expected, the change in the real value of the nominal claim would be incorporated in the contract. Hence, there would not be any redistribution.

2 On the other hand, lower-than-expected inflation redistributes wealth from borrowers to lenders.

3 Meh and Terajima (2008) build on Doepke and Schneider (2006) who document nominal assets and liabilities in the United States and develop a methodology to compute the redistribution of wealth caused by inflation.

household groups, while the second part describes the methodology used to compute the redistribution of wealth induced by unexpected inflation. Using this methodology and the documented nominal positions, the third section quantitatively assesses the redistribution of wealth under episodes of low and moderate inflation. The final part of the article concludes.

Nominal Assets and Liabilities

Unexpected inflation generates redistributions because most financial assets and liabilities are specified in money terms. For example, payments on fixed-rate mortgage contracts, bank deposits, non-indexed defined-benefit pension plans,[4] government and corporate bonds, and other types of loans are generally not adjusted for unexpected inflation. Hence, when inflation is high, the value of these assets and liabilities falls in terms of purchasing power, since the prices of other goods and services go up with inflation, but payments on these financial claims are fixed. The extent of the changes in the purchasing power of financial assets and liabilities also depends on the term to maturity, as we will show later on. In this section, we document Canadian holdings by type and maturity in various categories of assets and liabilities. Specifically, we look at asset and liability positions for three sectors: household, government, and non-residents.[5] We also consider different groups of households. The objective is to show that, among these different groups of agents, holdings of nominal assets and liabilities differ in both qualitatively and quantitatively important ways. Given that these differences exist, there is potential for redistribution among them following inflation shocks.

Unexpected inflation generates redistributions because most financial assets and liabilities are specified in money terms.

Data

We use two main data sets, both provided by Statistics Canada: the National Balance Sheet Accounts (NBSA) and the Survey of Financial Security (SFS). The NBSA documents the ownership of financial and non-financial assets and liabilities by sector. We use the NBSA to compute the net asset and liability positions of the household, government, and foreign sectors. The SFS is a household survey data set on income and wealth. We use the 2005 wave (the latest available), involving about 5,000 households, with weights to produce Canadian aggregates. It provides a comprehensive picture of assets and liabilities. For the sake of consistency, we use the 2005 NBSA and focus our analyses on the year 2005.

Categories of nominal assets and liabilities

Following Doepke and Schneider (2006), nominal assets and liabilities are defined as all financial claims that are denominated in Canadian dollars and not fully indexed to inflation. We report net nominal positions (i.e., assets minus liabilities) in four categories, defined as follows:[6]

- *Short-term* – financial assets and liabilities with a term to maturity less than or equal to one year (e.g., domestic currency, bank deposits, consumer credit, and short-term paper)
- *Mortgages* – all mortgage claims
- *Bonds* – non-mortgage and non-pension nominal claims with maturity greater than one year, including government and corporate bonds and bank loans
- *Pensions* – employer pension plans without provisions for indexing benefits to the cost of living, including both defined-contribution plans and non-indexed defined-benefit plans[7]

We distinguish among these categories because they differ in maturity structure. Differences in maturity will emerge as a key factor in assessing the extent of potential redistribution.

Sectoral positions

Table 1 shows net positions in each category, as well as the overall net nominal position (NNP) for each sector. Positions are expressed relative to gross domestic product (GDP) in 2005. Positive numbers indicate net lending; negative numbers, net borrowing.

4 Non-indexed defined-benefit pension plans are those where retirees receive fixed payments not adjusted for inflation.

5 Since all businesses are owned by their shareholders, we allocate business sector portfolios across the three sectors, based on each sector's equity holdings.

6 For more details, see Meh and Terajima (2008).

7 Another type of plan is the indexed defined-benefit plan. These plans are treated as real assets, since inflation will not affect them.

We observe that households are the main net nominal lenders overall, with NNP at 40.14 per cent of GDP. The government sector, at about 43 per cent of GDP, is the main counterparty borrowing from households. The foreign sector has a positive but small NNP of 2.85 per cent of GDP. Households tend to lend through short-term claims, bonds, and pensions, and borrow through mortgages. The government sector borrows mainly through bonds; it also borrows through short-term claims and pensions.[8] The non-resident sector lends in mortgages and bonds and owes in pensions.[9] These observations suggest that households are the likely losers of unexpected inflation, since it lowers the purchasing power of their lending (i.e., savings).

Table 1: Net Nominal Positions as a Percentage of GDP

Sectors	Households	Government	Non-residents
Short-term claims	12.25	-7.60	-4.65
Mortgages	-11.94	3.19	8.75
Bonds	22.14	-29.67	7.53
Pensions	17.69	-8.91	-8.79
NNP	40.14	-42.99	2.85

Household groups

We now look at the household sector in more detail, using the SFS data set. We examine three classes (low-income, middle-income, and high-income) and six age groups (under 36, 36–45, 46–55, 56–65, 66–75, and over 75) to observe differences within the sector.[10] Table 2 presents the overall positions for each age group as a percentage of the group's net worth. We observe that the NNP increases with age, implying that households shift from being net borrowers to net lenders as they get older. Most of the borrowing of the young is from mortgages. With age, more lending (i.e., saving) is observed in pensions and in liquid short-term claims. This implies that young households will gain from unexpected inflation while older households will lose.

Table 2: Nominal Positions as a Percentage of Net Worth by Age

	Age Cohort					
	Under 36	36–45	46–55	56–65	66–75	Over 75
Short-term claims	4.83	-1.01	1.48	2.40	9.00	12.27
Mortgages	-37.95	-13.57	0.07	4.48	3.55	3.29
Bonds	-2.63	4.70	6.50	7.90	6.70	7.68
Pensions	-0.05	-1.31	5.01	7.36	8.68	8.65
NNP	-35.80	-11.19	13.06	22.14	27.93	31.89

Qualitatively, these patterns generally hold across different income classes, although with different magnitudes. Table 3 shows the positions of the three income classes, with the long-term category combining mortgages, bonds, and pensions.[11] The general pattern of "borrowing more when young and lending more with age" holds across different income classes. We observe, however, that levels of borrowing relative to their net worth among young middle-income and low-income households are relatively larger than they are for high-income households, mainly because the portfolios of low-income and middle-income households are concentrated in residential real estate (mortgages). This implies that while the young generally benefit from inflation, benefits are likely concentrated among low-income and middle-income households.

Table 3: Nominal Positions as a Percentage of Net Worth by Age and Income Class

	Age Cohort					
	Under 36	36–45	46–55	56–65	66–75	Over 75
High-income						
Short-term claims	3.86	-3.73	-1.97	-2.36	8.48	8.56
Long-term claims	-6.52	5.89	18.40	19.89	19.03	21.26
Medium-income						
Short-term claims	5.83	2.24	4.39	5.49	9.07	14.91
Long-term claims	-95.27	-28.71	7.01	20.55	20.29	18.97
Low-income						
Short-term claims	18.90	-0.06	5.04	13.84	12.58	10.96
Long-term claims	-71.01	-27.07	-8.30	6.89	1.57	12.79

8 The government sector is a borrower in pensions as it holds liabilities from employer pension plans to its employees.

9 The borrowing in pensions by the non-resident sector indirectly reflects the pension liabilities of the business sector. As previously mentioned, we allocate business sector portfolios across the three sectors, based on each sector's equity holdings.

10 The classes are defined based on a mix of income and wealth. For simplicity, we use the terms low-income, middle-income, and high-income to refer to each class. See Meh and Terajima (2008) for the details.

11 The distribution of households as well as that of net worth by age group and income class is shown in Meh and Terajima (2008).

How Inflation Causes Redistribution

Given the observed differences in nominal positions among households, government, and non-residents, unexpected inflation should induce redistributions of real wealth. But how do we begin to identify the pattern and quantify the extent of the redistributions? The size of wealth redistribution depends on how economic agents adjust their expectations to inflation surprises. We follow Doepke and Schneider (2006) by considering two scenarios that provide upper and lower bounds on the redistribution of wealth. The upper bound is captured by a "full-surprise" scenario (hereafter FS). In this scenario, during several years of experiencing inflation shocks, agents do not anticipate that shocks will continue in subsequent periods; nominal interest rates remain unchanged and the inflation shock lowers the real value of nominal positions each period, regardless of the duration of these positions.

The size of wealth redistribution depends on how economic agents adjust their expectations to inflation surprises.

The lower bound is given by an "indexing ASAP" scenario (hereafter IA), where agents adjust their expectations after the initial shock to take into account the full duration of the shock. This scenario is also known as a gradual inflation episode, since inflation is partially anticipated. Under the IA scenario, the nominal yield curve is adjusted upwards to incorporate the inflation shock. As a result, under the IA scenario, inflation-induced gains or losses depend on the maturity of the nominal position. The position is "locked-in" at the pre-shock nominal interest rate until its maturity date but must be discounted using the new nominal rate, resulting in a lower present value. Intuitively, present-value gains or losses for a claim are larger under the FS scenario because all the positions are affected equally by the inflation episode. Under the IA scenario, however, long-term positions are affected more drastically than shorter positions. Agents are able to mitigate their losses on instruments that mature before the inflation episode ends. Our calculations are based on a present-value analysis, described in Box 1. Box 2 discusses how we assign terms to maturity for each category of claims.

Wealth redistribution from inflation

The goal of this section is to use the nominal positions documented above, combined with the methodology just described, to estimate the redistribution of wealth for an inflation episode. Historically, inflation episodes with different magnitudes lasting for extended periods have occurred. For example, between 2000 and 2004, the average inflation rate in Canada was generally higher than the inflation target rate of two per cent. To illustrate the inflation-induced redistribution of wealth, we will consider a hypothetical inflation episode that lasts five years with an inflation shock of one per cent, starting in the benchmark year 2005.[12]

Redistribution across sectors

Table 4 summarizes the sectoral present-value gains and losses induced by an inflation episode with one per cent shocks that continue for five years, beginning in 2005, under the FS and IA inflation scenarios.

Table 4: Redistribution of Wealth across Sectors as a Percentage of GDP, with a One Per Cent Inflation Shock Lasting Five Years

Sectors	Households			Government	Non-residents
	Net	Gains	Losses		
Full-surprise scenario	-1.95	12.53	-14.48	2.09	-0.14
Indexing ASAP scenario	-1.26	7.61	-8.86	1.49	-0.23

It is apparent from the table that, under the two scenarios, the household sector loses, while the government sector wins. The household sector loss and the government gain are both large. Under FS, the household losses amount to 1.95 per cent of GDP (or $26.8 billion), while the government gain is 2.09 per cent (roughly 5 per cent of NNP). The non-resident sector loses, but the loss is small, just 0.14 per cent of GDP. To understand these findings, recall that, under FS, gains and losses are directly proportional to the initial nominal positions. Since the household sector is the economy's main lender and the government sector is the main borrower, it is not surprising that these sectors are the most dramatically affected by the shock under the FS scenario.

12 Under the current inflation-targeting framework, inflation has not exceeded expectations by one per cent for five consecutive years. However, as a hypothetical scenario, we suppose price-level shocks that push inflation to the upper bound of the range specified in the current framework. The current annual inflation target is two per cent with the target range extending from one to three per cent.

Box 1

Present-Value Analysis of Redistributions[1]

Full-surprise (FS) Scenario

We start with an explanation of how unexpected inflation changes the purchasing power of a nominal claim. Consider an n-year, zero-coupon bond with a total nominal yield at time t of $i_{t,n}$. In the absence of unexpected inflation, the present value of one dollar earned in n periods through investment in this financial claim is given by

$$V_t(n) = exp(-i_{t,n}),$$

where exp indicates the exponential function to base e. Suppose that at time t, there is a one-time *surprise* increase in inflation of θ per cent per year that lasts for T periods. Under the FS scenario, since the inflation shock in each subsequent period is unanticipated, market expectations do not adjust and the nominal term structure is unchanged. As a result, only a proportion, $exp(-\theta T)$, of a position's present value remains, and this proportion falls as the size and duration of the shock increase. The present value of this nominal claim under FS, $V^{FS}{}_t(n)$, is thus given by

$$V^{FS}{}_t(n) = exp(-i_{t,n}) \cdot exp(-\theta T).$$

This equation shows that the present value of a one-dollar claim at time t is independent of the term to maturity of that claim. The present-value gain or loss, $G^{FS}{}_t(n)$, is given by

$$G^{FS}{}_t(n) = V^{FS}{}_t(n) - V_t(n) = V_t(n) \cdot [exp(-\theta T)-1].$$

The net present value of gain or loss depends only on the size and duration of the shock and the initial nominal position. The gain is, indeed, proportional to the pre-shock position, with a coefficient of $[exp(-\theta T)-1]$. If $G^{FS}{}_t(n)>0$, then there is a gain from the inflation episode; otherwise, there is a loss. In order to derive the total gain or loss of an economic agent (e.g., a sector or a household), $G^{FS}{}_t(n)$ is calculated for each claim with a term to maturity n. The gains or losses are then summed over all claims to derive the net redistribution.

Indexing ASAP Scenario

The indexing ASAP scenario corresponds to a one-time announcement at period t that, starting from the current period t, inflation will be θ percent higher than expected during each period for the next T periods. Assuming that the announcement is credible, bond markets will immediately revise their inflation expectations and incorporate these updates into the nominal yield curve. Assuming that the real curve does not change after the shock and that the Fisher equation holds, the new nominal interest rate used to discount a claim is $\hat{i}_{t,n} = i_{t,n} + \theta\ min\{n,T\}$. Therefore, the present value, $V^{IA}{}_t(n)$, of a claim under IA is

$$V^{IA}{}_t(n) = exp(-\hat{i}_{t,n}) = exp(-i_{t,n}) \cdot exp(-\theta\ min\{n,T\}) = V_t(n) \cdot exp(-\theta\ min\{n,T\}).$$

As can be seen from this equation, in contrast to the FS scenario, under IA, a financial position of maturity $n<T$ will be affected only for the n periods of its duration, before which the agent is assumed to reinvest at the pre-shock real yield. This is analogous to the agent's reinvesting in a claim that offers a nominal rate of return that has been indexed to take the inflation announcement into account. The present-value gain or loss of a claim of maturity n under IA is given by:

$$G^{IA}{}_t(n) = V^{IA}{}_t(n) - V_t(n) = V_t(n) \cdot [exp(-\theta\ min\{n,T\})-1].$$

Hence, under IA, the present-value gain or loss depends on (i) the size of the shock (θ), (ii) the duration of the shock (T), (iii) the initial nominal position ($V_t(n)$), and (iv) the maturity of the claim (n). On the other hand, as mentioned above, the gain or loss under the FS scenario for any position is independent of its maturity. The IA scenario provides a lower bound for gain or loss on a claim, since it assumes full adjustment of expectations to the path of inflation following the initial announcement. The total gain or loss of an economic agent is derived in the same way as in the FS scenario, based on the sum of the gains and losses from each claim.

1 This methodology to calculate redistribution can be applied to compare the size of redistribution under different monetary policy regimes such as inflation targeting and price-level targeting. This point is summarized in Crawford, Meh, and Terajima (this issue) and analyzed in detail in Meh, Ríos-Rull, and Terajima (2008).

Box 2

Term-to-Maturity Structure

In this box, we describe how terms to maturity are determined for each claim. For financial short-term claims, we assume that they all have one-year terms to maturity, such that we set $n = 1$. For mortgages, we apply the distribution of fixed-rate mortgages by term in 2005.[1] The distribution is obtained using the *Canadian Financial Monitor* data set from Ipsos Reid Canada, which is compiled from a household survey containing detailed mortgage information. Chart A presents the distribution of mortgages across terms of mortgages, weighted by outstanding balances. It shows that the most common term of Canadian fixed-rate mortgages is five years.

Based on the fractions we obtain from Chart A, we assign a weight for each n. For example, we assign a 60 per cent weight to $n=5$.

We take a similar approach for bonds. We derive a maturity distribution from quarterly data on the maturity and face value of federal government debt.[2] Chart B shows the distribution from the fourth quarter of 2005. We assume that the distribution of terms to maturity for federal government bonds approximates that for all instruments in this category.

For pensions, we focus on two types of pension plans: defined-contribution and non-indexed defined-benefit plans. For defined-contribution plans, we assume that the average investment portfolio is approximated by the holdings of Trusteed Pension Plans.[3] The assets of Trusteed Pension Plans are given in the NBSA. We compute the distributions of these assets over terms to maturity and use them to assign weights to each n value. For non-indexed defined-benefit plans, we assume a fixed stream of annual post-retirement payments. When calculating the present-value gains and losses of pension assets, we apply the formulas in Box 1 to each payment, then sum all the gains or losses. In assigning the term to maturity of each payment, we set n based on the difference between the current age of the household and the age at the time of the payment.

Chart A: Distribution of Fixed-Rate Mortgages by Term

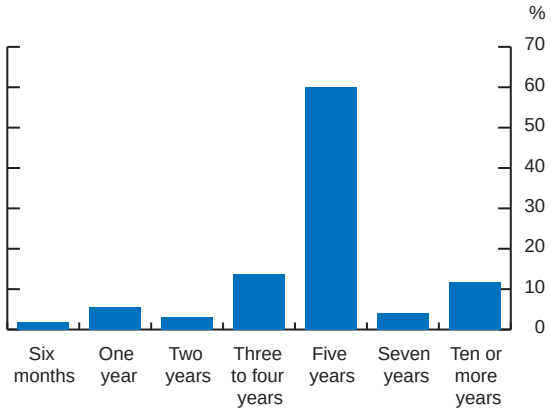
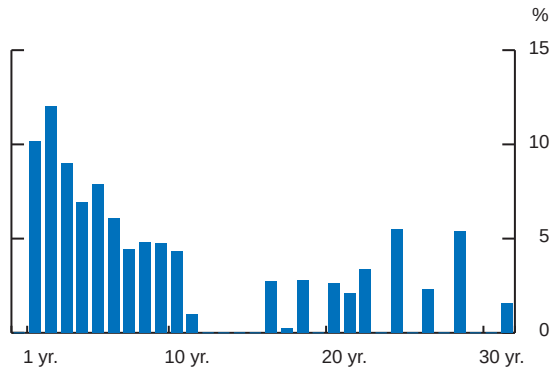


Chart B: Distribution of Government Bonds by Term to Maturity



1 The term of mortgage is the length of the current mortgage agreement. A mortgage can have a long amortization period, such as 30 years, with a shorter term, such as 5 years. When the term expires, a new term agreement can begin at the prevailing interest rate. The term of mortgage, rather than the amortization period, is relevant for our analysis.

2 These data were obtained from the Bank of Canada's Communication, Auction and Reporting System database. See Meh and Terajima (2008) for more details.

3 Trusteed Pension Plans hold approximately 70–75 per cent of employer pension plan assets. See Meh and Terajima (2008) for more details.

It is also clear that gains and losses are generally smaller under IA. The household sector loss under IA is 1.26 per cent of GDP (or $17.3 billion), compared with 1.95 per cent under FS. This change is driven by a reduction in the losses associated with the sector's net savings in long-term bonds and pensions relative to the FS case. The change is offset somewhat, since instruments with a shorter maturity are less sensitive to gradual inflation, and the gains associated with the sector's net debt in mortgage markets shrink relative to the FS case. The government gain drops from about 2.1 per cent of GDP under the FS scenario to about 1.5 per cent under the IA scenario—i.e., it shrinks by almost one-third. This occurs because the government borrows through some bonds that have maturities of less than five years. The non-resident sector's losses, although small, increase from 0.14 per cent of GDP under FS to 0.23 per cent of GDP under IA.

Finally, Table 4 shows gross redistributions for the household sector—i.e., it distinguishes between losses associated with lending and gains associated with borrowing. It should be clear from these results that net calculations substantially understate how much wealth is shifted around. Under FS, the household sector gains 12.53 per cent of GDP and loses 14.48 per cent, implying a total gross redistribution of 27.01 per cent of GDP. In other words, household wealth worth 27 per cent of GDP is reshuffled. Under IA, the total gross redistribution is 16.47 per cent of GDP.

Redistribution between household types

Even though the household sector as a whole loses from surprise inflation, the loss (or gain) is not uniform across different types of households. For different groups of households, we calculate the redistribution of wealth induced by the inflation episode described above. Table 5 reports the present-value gains and losses as a percentage of the average net worth of each group for FS and IA.

Overall, with respect to age categories, young households benefit from inflation and older households lose. On the income dimension, the right column of the table indicates that high-income households lose the most and the loss declines as income becomes lower. Specifically, the main winners are young, middle-income households with large, fixed-rate mortgage debts. Their gain as a proportion of mean net worth is large: 4.34 per cent under FS and 3.91 per cent under IA. The second group of winners is the young, low-income group, who enjoy, on average, gains between 2.53 per cent and 2.66 per cent of their average net worth. The gains of the young low-income group come largely from their holdings of student loans and mortgage debt. Note that this group actually experiences greater gains under IA. As in the case for the non-resident sector, this occurs when there is a maturity mismatch. More specifically, while the gains associated with their net borrowing positions in bonds and mortgages do not vary much between inflation scenarios, the losses associated with their savings in short-term instruments are mitigated under IA, since these claims mature before the shock has ended.

Table 5: Redistribution of Wealth across Households as a Percentage of Net Worth by Age and Income Class, with a One Per Cent Inflation Shock Lasting Five Years

	Age group						
	Under 36	36–45	46–55	56–65	66–75	Over 75	All
Full-surprise scenario							
All	1.74	0.54	-0.63	-1.07	-1.36	-1.55	-0.53
High-income	0.13	-0.10	-0.80	-0.85	-1.34	-1.45	-0.68
Middle-income	4.34	1.28	-0.55	-1.26	-1.42	-1.64	-0.42
Low-income	2.53	1.32	0.16	-1.01	-0.69	-1.15	-0.16
Indexing ASAP scenario							
All	1.66	0.44	-0.54	-0.84	-0.83	-0.82	-0.34
High-income	0.26	-0.18	-0.74	-0.76	-0.82	-0.86	-0.55
Middle-income	3.91	1.15	-0.43	-0.94	-0.89	-0.81	-0.19
Low-income	2.66	1.15	0.28	-0.42	-0.17	-0.56	0.14

The main winners are young, middle-income households with large, fixed-rate mortgage debts.

More age groups among low-income housholds benefit from the inflation episode than those among the middle class or the high-income under FS. This is because low-income households remain net borrowers through to age 56, and therefore the youngest three groups among the low-income are winners. In general, older middle- and high-income households bear most of the losses under the two inflation scenarios. More specifically, under the FS scenario, high- and middle-income households over age 75 are the sector's greatest losers, with losses accounting for 1.45 per cent and 1.64 per cent, respectively, of their respective average net worth. These losses are

mainly owing to their large positions in bonds and non-indexed defined-benefit pensions. Table 5 also shows that most high-income households lose from the inflation episode.

Older middle- and high-income households bear most of the losses . . . owing to their large positions in bonds and non-indexed defined-benefit pensions.

Conclusion

In this article, we quantify the redistributional effects of unexpected inflation in Canada. To this end, we first provide comprehensive evidence of the nominal assets and liabilities of various economic sectors and household groups. We then conduct experiments examining the redistributional consequences of various inflation episodes. The key finding is that the redistributional effects of unexpected inflation are large even for episodes of low inflation. For example, during an episode of low inflation, where inflation is one per cent above expectations for five consecutive years, the loss of wealth among the household sector as a whole could amount to the equivalent of two per cent of GDP, or $27 billion. Among the main winners are young, middle-income households, who are major holders of fixed-rate mortgage debt, and the government, since inflation reduces the real burden of their debts. The losers are a combination of high-income households; middle-aged, middle-income households; and old households, who hold long-term bonds and non-indexed pension wealth. Non-indexed pension assets play an important role in the losses of old households.

A natural question arising from these results is whether these redistributions have implications for the aggregate economy and welfare. These issues are analyzed in recent research by Meh, Ríos-Rull, and Terajima (2008), whose findings are also summarized in Crawford, Meh, and Terajima (this issue).

Literature Cited

Crawford, A., C. A. Meh, and Y. Terajima. 2009. "Price-Level Uncertainty, Price-Level Targeting, and Nominal Debt Contracts." *Bank of Canada Review*, (Spring): 31-41.

Doepke, M. and M. Schneider. 2006. "Inflation and the Redistribution of Nominal Wealth." *Journal of Political Economy* 114 (6): 1069–97.

Meh, C. A., J.-V. Ríos-Rull, and Y. Terajima. 2008. "Aggregate and Welfare Effects of Redistribution of Wealth under Inflation and Price-Level Targeting." Bank of Canada Working Paper No. 2008-31.

Meh, C. A. and Y. Terajima. 2008. "Inflation, Nominal Portfolios, and Wealth Redistribution in Canada." Bank of Canada Working Paper No. 2008-19.