Full Employment in Canada in the early 21st Century[1]

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[1] This chapter is a much-revised version of "Playing with Fire: Austerity and the Consequences of Neglecting Unemployment" presented at the "Employment in the Age of Austerity" Conference hosted by the Department of Economics, Laurentian University, Sudbury, October 7-8, 2016. The helpful comments of Andrew Jackson, Brian MacLean and Brian Nolan are very much appreciated. Remaining errors are mine alone.

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Abstract

Canada's national unemployment rate of 6.3 % in 2017 was only "low" compared to what Canadians have gotten used to in recent decades. Between 1946 and 1975, Canada's unemployment rate averaged 4.7% and since then the labour force has become much better educated and considerably older, which should have reduced the unemployment rate significantly. This paper asks what "full employment" would look like in Canada in the early 21st century, how we might we get there and why we might want to. It begins by discussing why "full employment" became a policy priority of government in Canada after 1946, but then disappeared after 1980 – collateral damage in Canada's successful war on inflation. It then addresses the political economy context created by the thirty-year stagnation of earnings produced by that policy decision. Recent econometric evidence on the possibility that lower unemployment might cause inflation is discussed. The long term costs of inadequate labour demand and the available macroeconomic policy tools that could produce full employment are then surveyed. The paper concludes that full employment can and should be reinstated as a major policy objective of Canadian governments.

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This chapter is organized around three linked questions:

1. What would "full employment" look like in Canada in the early 21st century?
2. How might we get there? What are the barriers and what are the possibilities?
3. Why might Canadians want to have full employment?

It begins, however, with the observation that whether a national unemployment rate of, for example, 6.3 % in 2017[2] is "low" or just "lower than Canadians have gotten used to in recent years" depends very much on one's historical frame of reference. Although by 2018 Canadians had experienced even higher unemployment rates almost continuously since the early 1980s, it is worth remembering that the 1980s constituted a regime shift for Canadian unemployment. As Figure 1 shows, between 1946 and 1975, Canada's unemployment rate averaged 4.7% and was never above 7%. In fact, the only time the national unemployment rate exceeded 6% during the 1946 to 1975 period was during the 1959-1961 recession, an episode induced by a high interest rate policy initiated by the Bank of Canada which has entered Canadian economic history as "The Coyne Affair"[3]. By contrast, in only one full year (2007) since 1980 has Canada's national unemployment rate gotten down to 6%. "Normal" unemployment in Canada shifted up dramatically after 1980 – the national unemployment rate was consistently greater than 8% throughout the 1980s and 1990s, averaging 9.5% over these two decades[4]. From 2000 to 2017[5], the annual national unemployment rate has averaged 7.1%, but this was still high compared to a longer term historical perspective.

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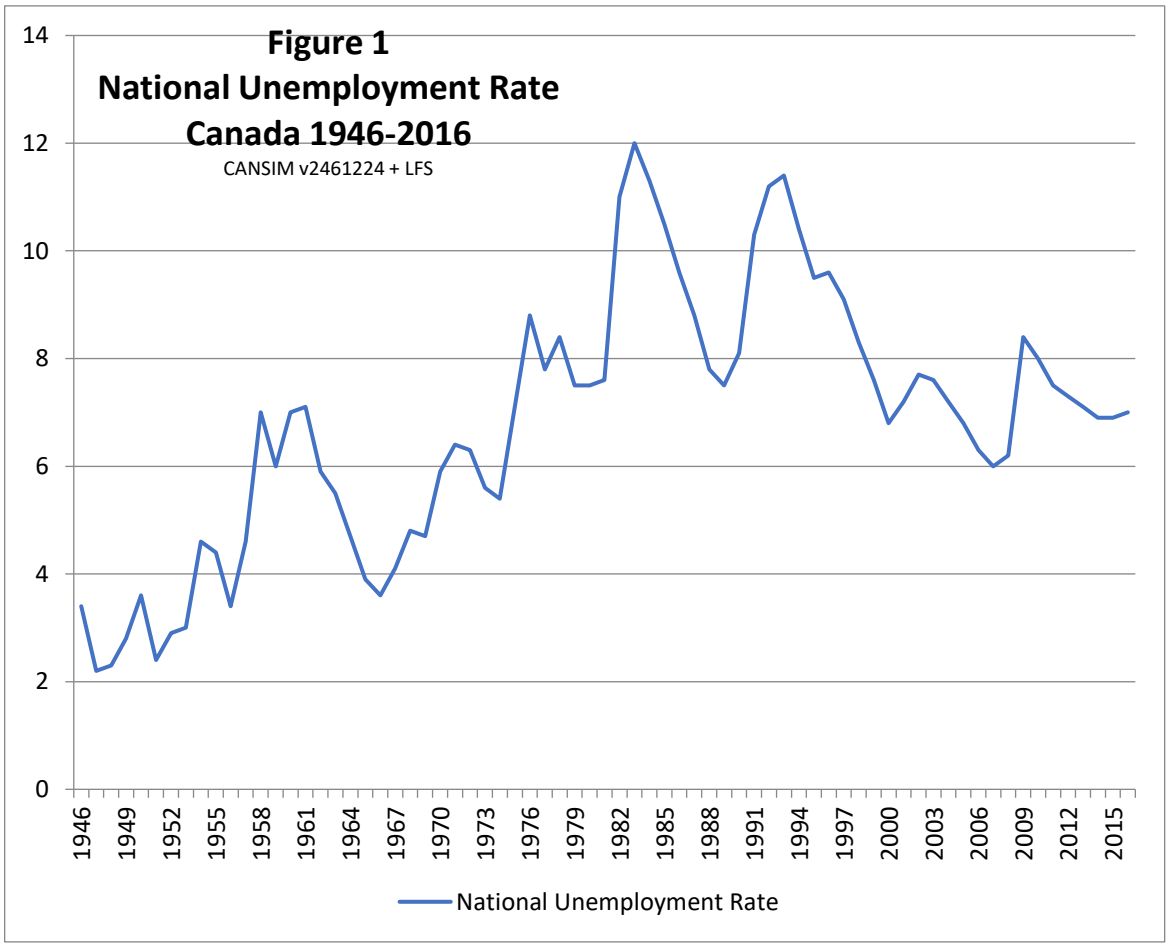
[2] CANSIM Table 282-0086; Official unemployment rate: 2017

[3] See Siklos (2010) – absent the Coyne Affair years, the average national unemployment rate 1946-1975 was 4.4%.

[4] Supply side rationalizations for higher unemployment cannot explain the upward surge of Canadian unemployment after 1980 and its continuing high level thereafter. There is no credible evidence of any sudden shift in Canadians' preferences for unemployment time and any "incentives" to unemployment embedded in Canada's unemployment insurance and social assistance systems were reduced, not increased, during the 1980s and 1990s. Improvements in the technology of labour market matching (e.g. internet job search) and in labour mobility (e.g. cheap air fares which have enabled interprovincial commuting) would also have been expected to reduce national unemployment rates.

[5] During Canada's oil boom period from 2000 to 2014, the Bank of Canada arguably somewhat accommodated the surge in labour demand associated with resource mega-projects.

Furthermore, although 7.1% unemployment was also the annual national unemployment rate in 1976, the age and education composition of the Canadian population was then very different, and long term demographic trends would have been expected to decrease the national unemployment rate substantially. In 1976, Canada's baby boomers were in their high unemployment rate youth but 40 years later they were firmly in their low unemployment late middle age[6], so the unemployment rate should have gone down – but age-specific unemployment rates have shifted up considerably (for example, comparing 1976 and 2016, by 1.5 percentage points for 50 to 54 year olds and 1.9 percentage points for 55 to 59 year olds[7]). If Canada in 1976 had had the same age distribution as Canada in 2016, but age-specific unemployment rates and labour force participation rates had remained at actual 1976 levels, the unemployment rate in 1976 would have been a full percentage point lower than its actual 1976 rate.



[6]In 1976, 15 to 24 year olds were 26.7% of the 15+ population, falling to 14.8% in 2016, while 45 to 64 year olds increased from 25.7% to 33.4%. CANSIM 282-0002

[7] On average over five year age cohorts, there was a 1.38 percentage point increase in age specific unemployment rates from 1976 to 2016. See CANSIM 282-0002

As well, Canada's labour force is now also much better educated. Duclos and Pellerin (2016) report that the fraction of full time workers with some college or more increased by 26.6 percentage points between the 1980 and 2010 censuses[8]. Labour Force Survey data[9] reporting educational attainment is only available since 1990, but between 1990 and 2016 the percentage of Canadian adults with some post-secondary education or more increased by 23.6 percentage points[10]. Over this period, the unemployment rate differential between "some high school" and "bachelor's degree" also widened from 7.9 percentage points in 1990 to 9.2 points in 2016[11] – i.e. the increased population weight of the more educated was combined with an increasing importance of education to unemployment probability. Even ignoring the increased importance of education to unemployment probability, if the labour force participation and unemployment rates associated with education had remained the same as in 1990 and if Canada's 1990 population had had 2016 educational attainment, the national unemployment rate in 1990 would have been 6.7% instead of its actual 8.1% - a difference of 1.4 percentage points.

Clearly, shifts in the age distribution and the educational attainment of the Canadian population should have reduced unemployment. If the unemployment rate was being determined by the supply side characteristics of workers, the shift in the composition of the Canadian labour force towards low unemployment types should have produced a very substantial tendency to a lower "natural" rate of unemployment in Canada[12] than in the 1970s.

In the U.S., Aaronson et al (2015) adjusted the U.S. unemployment rate for similar, but smaller, trends there and concluded: "When we account in some simple ways for these demographic and educational changes, we find support for a natural rate at or just slightly below 5% at the end of 2014. Moreover, we estimate that absent major new developments, these forces will further lower the natural rate to around 4.4% to 4.8% by 2020." When Barnichon et al (2017a and 2017b) took into account the fact that flows into labour force participation and unemployment are jointly determined, they concluded the impact of demographic change was even larger: "Taking a longer-run perspective, we consider the effects of demographics on unemployment since the mid-1970s …. … demographic factors lowered the unemployment rate by about 2 percentage points over this period." (2017b:3).

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[8] see Table 4, Duclos and Pellerin (2016)
[9] CANSIM Table 282-0004
[10] From 36.7% in 1990 to 52.3% in 2016.
[11] CANSIM Table 282-0004
[12] As well, a succession of changes to Unemployment Insurance (now called Employment Insurance) have drastically decreased its availability and benefits over this forty-year period. To the extent that UI/EI generosity influences unemployment, these cuts should also have decreased the unemployment rate.

Adjustment for demographic and educational change therefore reinforces the perception that a Canadian unemployment rate of 6.3 % in 2017 is relatively high in long term perspective[13], which raises the question – what unemployment rate could and should Canada now aim for?

Section 1 of this paper begins with a discussion of the intellectual context for discussions of full employment in Canada in the early 21st century. Section 2 then addresses the political economy context. Section 3 asks what "full employment" might now look like and section 4 discusses whether available macroeconomic policy tools could produce it, and what costs might be entailed. Section 5 concludes.

1. The Intellectual Context for "Full Employment" in Canada in the early 21st Century

The term "Full Employment" is not now commonly heard in official discussions of macro-economic policy in Canada[14]. However, for many years "full employment" was a central, often stated objective of public policy, in Canada and elsewhere. This emphasis grew out of historical experience. For example, the U.K. debate during the early 1940s on post-war economic policy took place in the social context of "an almost universal conviction that there could be no return to the mass unemployment, poverty and intolerable inequality of the 1930s ….. Once the danger of a German invasion had passed there was an intense and sustained debate on how to create a better future" (King 2007:14). In the U.K., Keynes, Kalecki and Kaldor all argued that full employment and real macro-economic balance – not budget balance – is what matters for long run political and economic stability.

Throughout the Great Depression of the 1930s, influential voices had warned about the dangers of financial deficits and excess government spending. However, the hardships of the Depression and the immense suffering, loss of life and destruction of World War II produced after the war a widespread conviction that the alternative to macro-economic stimulus could be much worse. Mass unemployment was seen by many as the root cause of political instability and the growth of fascism and Nazism, and the totalitarian loss of freedoms and the wars which that had produced. As well, the rapid ramping up of wartime production, and the fact that aggregate consumption rose despite the vast resource costs of war,

[13] A similar issue arises in the UK context, where Bell and Blanchflower (2018) question whether UK unemployment is now "low" and ask the question "if unemployment is really "low" why do we not see appreciable real wage gains?" Their hypothesis is that increases in hidden unemployment have meant an overstatement of the decline in labour market slack.

[14] The top 25 Google Scholar hits for ["full employment" Canada] all date from 1979 or before.

had shown concretely how illusory the barriers to greater employment and output really were. Throughout the 1950s and 1960s, many western governments also had to contend with domestic communist movements who argued that mass unemployment was an inherent defect of market capitalism. This historical context produced a widespread "Keynesian Consensus" that maintaining sufficient aggregate demand to produce full employment[15] was an essential function of government – a consensus which informed macro-economic policy for roughly thirty years, until undermined by the combination of inflation and higher unemployment which followed the oil price shocks of 1973 and 1979.

In the 1980s, among senior economic policy makers in Canada, the Keynesian consensus that both unemployment and inflation mattered was replaced by the conviction that inflation and budget balance matter and the unemployment rate should be considered a residual variable. Monetary policy shifted from balancing macro-economic objectives to a single-minded focus on inflation control[16]. Fiscal policy emphasized deficit control, budget balance and lower taxes. Full employment disappeared as a policy objective – indeed, the very word "unemployment" largely vanished from Canadian government budget documents and central bank reports[17]. (Since the U.S. Federal Reserve's dual mandate to balance

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[15] In the U.S., the Employment Act of 1946 was originally introduced as the Full Employment Bill of 1945. The 1946 Act "declares that it is the continuing policy and responsibility of the federal government to use all practicable means …to create and maintain conditions under which there will be afforded useful employment for those able, willing, and seeking work, and to promote maximum employment, production, and purchasing power." This wording was less radical than the 1945 Bill which had declared: "All Americans able to work and seeking work have the right to useful, remunerative, regular, and full-time employment, and it is the policy of the United States to assure the existence at all times of sufficient employment opportunities to enable all Americans who have finished their schooling and who do not have full-time housekeeping responsibilities to freely exercise this right." https://www.federalreservehistory.org/essays/employment_act_of_1946 . As Thorbecke (2002) notes, the 1978 Full Employment and Balanced Growth Act reaffirmed the U.S. Federal government's commitment to "promote full employment … and reasonable price stability".

[16] The Bank of Canada Act (1934) mandated a balancing of objectives: "to regulate credit and currency in the best interest of the economic life of the nation, to control and protect the external value of the national monetary unit and to mitigate by its influence fluctuations in the general level of production, trade, prices and employment." These objectives have never been amended by legislation. However, with the agreement of successive governments, the Bank of Canada has since 1991 explicitly limited its objectives to "keeping inflation low, stable, and predictable", interpreted as a target core CPI inflation rate of 2%, plus or minus 1%. [See http://www.bankofcanada.ca/wp-content/uploads/2010/11/why_canada_inflation_target.pdf]

[17] See Osberg (2011) for word counts. In its quarterly reports on the Canadian economy, the Bank of Canada now uses instead a "Labour Market Indicator" derived from a principal components analysis of eight labour market variables – the labour underutilization rate, two long-term unemployment rates, job-finding rate, separation rate, labour force participation rate, average hours worked, nominal wage growth, and the unemployment rate at provincial level – see Fritsche and Ragan (2016). By equally weighting each variable, their equal social and statistical importance is implicitly presumed, while the opaqueness of the statistical procedure guarantees the mystification of both other economists and the wider public.

the objectives of full employment and inflation control has never been modified, the vocabulary of U.S. debates has differed.)

Intellectually, the 1980-2008 period was marked by remarkable hubris among the newly dominant New Classical school of macro-economists. Lucas (2003), for example, famously declared: "macroeconomics ..has succeeded: Its central problem of depression prevention has been solved, for all practical purposes, and has in fact been solved for many decades". Although in Canada, success in consistently achieving the Bank of Canada's inflation target was accompanied by the stagnation of middle class earnings for two decades (1980 to 2000) and a substantial increase in income inequality[18], many macro-economists preferred to ignore such issues and to instead congratulate themselves on a "Great Moderation" of economic fluctuations and the presumed end of the business cycle.

For some economists, that complacency was shattered by the depth and unforeseen suddenness of the Great Recession of 2008-2009, the slow speed of recovery and the consistent failure of macro-economic models to predict both the 2008 crisis and the slowness of recovery[19]. The prevailing methodology of calibrating DSGE (Dynamic Stochastic General Equilibrium) models has attracted particularly trenchant criticism – Romer (2016), for example, has argued recently that "For more than three decades, macroeconomics has gone backwards[20]." For some economists, in addition to failures of economic forecasting, political events – Brexit in the U.K., the rise of "Trumpism" in the U.S. and right wing "populism"[21] across Europe – have also prompted a reconsideration of whether it is wise to concentrate macro-economic policy priority on inflation and ignore the economic misfortunes, such as unemployment, afflicting the working class[22]. But based on the public record, only "some" economists have re-evaluated their prior certainties. The Governor of the Bank of Canada has, for example, recently emphasized the unchanging nature of his perceptions, declaring: "I've been at this for a long time, having been part of the team that developed the Bank of Canada's policy framework back in the 1980s. Inflation

[18] see Osberg (2018).

[19] See Turner (2016); Guénette, Labelle St-Pierre, Leduc and Rennison (2016), Lewis and Pain (2015)
[20] Stiglitz (2017) also critiques DSGE modelling. Christiano, Eichenbaum and Trabandt (2017) mount a defence.
[21] A more accurate term is "xenophobic authoritarian nationalism" – see Inglehart and Pippa (2016)
[22] Maintaining political stability had been an important motivation for the Keynesian consensus. However, by the 1980s, the concerns of economists about the instabilities of the 1930s and the disasters of the 1940s had been largely replaced instead by the convenient "ceteris paribus" assumption that political implications of macro-economic choices could be ignored. However, Algan et al (2017) have recently documented the "strong relationship between increases in unemployment and voting for non-mainstream, especially populist parties….and a decline in trust in national and European political institutions".

targeting, supported by a flexible exchange rate, is the product of an enormous cumulation of thought and research spanning an entire generation". (Poloz, 2017)

However, like surgeons who have to be able to reassure their patients, central bankers cannot in public admit to being uncertain about what they do. It is basically a job requirement of central bankers that when they address the public they should project a sense of calm confidence that "everything is under control here" so that citizens can believe that very wise public servants are making the undoubtedly best possible decisions. In speeches to a lay audience, the inflation determination process may therefore be summarized as being fairly simple: "The underlying trend in inflation is driven by the laws of supply and demand, which are as applicable today as they ever were. Excess demand pushes inflation up; excess supply pushes inflation down." (Poloz, 2017).

One advantage of using such everyday language is that it cuts through the changing underbrush of academic terminology. Although Friedman (1968) initially popularized the idea of a "Natural" rate of unemployment, it was replaced for many years by the more precise sounding concept of NAIRU (Non-Accelerating Inflation Rate of Unemployment). Recently Yellen (2017:6) has referred to the "sustainable" rate of unemployment, by which she means "The unemployment rate consistent with long-run price stability at any time" – which amounts to the same meaning as the "Natural" or NAIRU rate. Since the level of output determines the level of employment and unemployment, "potential output" estimates or estimates of the "output gap" depend on estimates of the Natural/NAIRU/Sustainable unemployment level. Whatever the label assigned, the core idea is the same. But although it may be reassuring to the public to be told that policy decisions are "the product of an enormous cumulation of thought and research spanning an entire generation", there is in practice a great deal of uncertainty.

As Champagne, Poulin-Bellisle and Sekkel (2016:1) have noted, although "the output gap—the difference between an economy's output relative to its trend or potential level—plays a central role in the conduct of monetary policy", theory provides no guide to its size at any given point in time. Their paper examined the usefulness of alternative output gap estimates for forecasting Canadian inflation, including simple random-walk models of inflation which predict future inflation rates purely as a function of recent past inflation rates, omitting completely any consideration of estimated output gaps. The conclusion they choose to emphasize (2016:18) is that "real-time estimates of the gap perform as well or better than final estimates of the gap in Phillips Curve models". They choose not to emphasize the fact that both these

types of output gap models are actually outperformed by simple random walk models *which omit <u>any</u> estimate of the output gap*[23].

The fact that currently used methodologies for estimating potential output or the output gap do not actually add much, if anything, to the accuracy of inflation forecasts is not just a Canadian problem. Janet Yellen, while still Chair of the Federal Reserve, noted the quantitative unimportance of labour market slack variables as influences on employment costs and inflation in the U.S.[24]. Examining the accuracy of OECD forecasts of macro-economic performance, the head of OECD macro-economic forecasting has also noted that: "While potential output is an important concept for policy analysis, it is less clear whether potential output calculations have in practice contributed positively to forecast performance. In particular, the reliability of output gap estimates – in general and not just those made by the OECD – has for a long time been called into question" (Turner, 2016:11)[25].

Uncertainty is therefore the intellectual context for discussions of "full employment" in Canada in the early 21st century. The optimal methodology to use for macro-economic modelling is uncertain, subject to vigorous and fundamental debates between highly regarded economists, with severe criticisms made about the major method now in standard use (DSGE modelling). Standard methodologies in use did not help predict the Great Recession of 2008 (the most severe global downturn of the last eighty years) and consistently under-estimated the slowness of recovery[26], so it now takes a major leap of faith to believe that future predictions using the same methods will be reliable. Although the empirical forecasts of the IMF, OECD and Central Banks often agree with each other, "one-year-ahead forecasts are often little better than naïve forecasts and display no obvious signs of trend improvement. Perhaps of greater concern -- given that the forecasts are the basis for policy assessment and advice -- is that one-year-ahead forecasts are biased and particularly poor at anticipating downturns" (Turner, 2016:17). The long fixation of economists on a unique equilibrium rate of unemployment and a correspondingly unique output gap has not produced empirical estimates that can reliably add to predictions of inflation or output.

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[23] Their Table 3 (2016: 13) shows that the random walk models (especially the Atkeson and Ohanian (2001) or Stock and Watson (2007) UCSV models) have lower mean squared forecast error over all forecast horizons from the current quarter to six quarters in the future.

[24] see Yellen 2016 and 2017:22

[25] This finding is at least 25 years old. Setterfield, Gordon and Osberg (1992:119) showed, using consensus econometric methods, that "the range of prime age male NAIRU estimates generated by statistically satisfactory and econometrically reasonable estimating equations covers almost the entire range of post war prime age male unemployment experience." Although their results have been much cited academically, their conclusion that "the NAIRU cannot be known with sufficient accuracy to make it a useful structural parameter for macroeconomic policy" (1992:120) has had little impact on central bank practice.

[26] See Lewis and Pain (2015)

Meanwhile, large real shocks to output and prices (such as the financial crisis of 2008 and the oil price collapse of 2014) have arrived from totally unexpected directions. Indeed, Mervyn King (2016) has argued, based on his experience as Governor of the Bank of England during the Financial Crisis, that "radical uncertainty" is inherently prevalent in macro-economic policy decisions, in the sense that the big changes in political and technological and market context that fundamentally drive major macro-economic events are inherently unpredictable. Hence, although the political imperatives of their jobs require central bankers to project a reassuring image that all their policy decisions are the product of mountains of scientific evidence, the reality is that uncertainty of theory, forecasting methodology and events means there is very substantial room for judgement calls.

This chapter is based on the perspective that, particularly when inflation expectations are firmly anchored (as is now the case in Canada), a range of unemployment rates can be consistent with roughly constant inflation. In between booms with labour markets so tight and unemployment rates so low that inflation accelerates and recessions with so much labour market slack and such high unemployment that price deflation occurs, there is an intervening band of unemployment rates consistent with roughly stable inflation.

Indeed, all sensible discussions of macro-economic events implicitly presume there is a band of possible unemployment rates consistent with stable inflation – the practical question is how wide the band is presumed to be. The convention that the unemployment rate is normally reported to one decimal place, so that a sustainable unemployment rate may be said, for example, to be 4.5%, implicitly establishes a very narrow unemployment rate band, ranging from 4.45 % to 4.54%. Nonetheless, although this is the smallest unemployment rate band one might think of, being at the top or the bottom of that 0.09 percentage point unemployment rate range has non-trivial consequences. In Canada in 2017, when the labour force was 19.66 Million and GDP was $2.14 Trillion, this range (0.09 percentage points) corresponds to roughly 17.7 thousand jobs, $4.34 Billion in GDP and additional tax revenue of $1.3 Billion[27]. Clearly, for policy purposes the width of the unemployment rate band is the crucial issue – one U.S. study has put it at roughly 3.2 percentage points[28]. But the unemployment rate band perspective implies that "Full Employment" should be interpreted as the lowest possible unemployment rate consistent with relatively stable price inflation. This policy objective can be contrasted with the objective of "Avoiding Any Possible Risk of Excess Inflation At Whatever Cost Necessary", which focusses solely

[27] Assuming the Okun's law coefficient is 2.25 and the incremental tax yield on GDP increases is 0.3.
Data from CANSIM Tables 380-0063 and 282-0002
[28] Peach, Rich and Cororaton (2011).

on an inflation target and in practice is satisfied by aiming for the upper end of any unemployment rate band.

Decision making under uncertainty is always much easier if the decision makers perceive only one variable which defines "success". Central bankers who are instructed to be averse only to the risk of inflation are implicitly being told that there are no costs to achieving the benefits of hitting an inflation target. They can achieve their inflation objective, and have no reason to be dissatisfied, when unemployment is at the top end of the stable inflation unemployment range (and by being at the top end of the unemployment band they thereby minimize any chances of excess inflation). When monetary policy is motivated solely by inflation avoidance, policy makers do not assign themselves the harder task of navigating the risks of unnecessarily high unemployment and possible inflation surges. However, the rest of society may bear large social and economic costs if that is their incentive structure.

Recently, Debortoli, Kim, Lindé, and Nunes (2017) have given a resounding "Yes" to the question: "Designing a Simple Loss Function for Central Banks: Does a Dual Mandate Make Sense?". Incorporating realistic estimates of monopolistic competition and price and wage stickiness in a standard New Keynesian model of the U.S. economy, they show both analytically and quantitatively that simple loss functions for central bank decision makers should feature a high weight on measures of economic activity – and that this result is robust to the presence of measurement errors in estimates of the output gap[29]. Indeed, some change is arriving to the world of Central Banking – in early 2018, the agreed objectives of the Reserve Bank of New Zealand (which had been the world's first central bank to adopt inflation targeting) were amended to add that it will "contribute to supporting maximum sustainable employment within the economy".[30] However, this new perspective has not as yet affected central bank decision making in Canada.

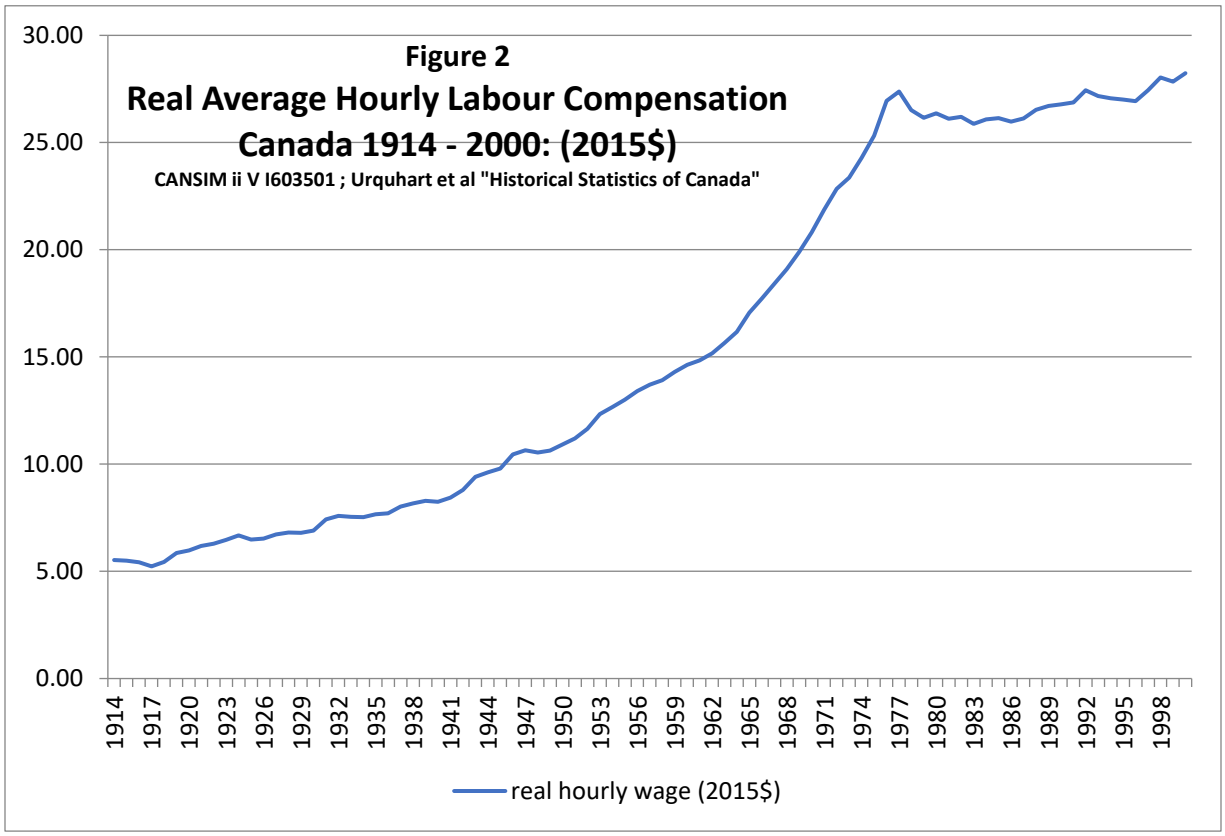
2. The Political Economy Context for Discussions of Full Employment in Canada

Why, at this point in Canadian history, might an emphasis on full employment be appropriate? The short answer is that although the Bank of Canada's inflation target has been consistently achieved[31], ignoring the unemployment rate has not, for most of the last 35 years, produced rising real incomes for

[29] They conclude (2017:13): "the hours gap - defined as the difference between actual and potential hours worked per capita - should be assigned a large weight in such a loss function" and that (2017:32) "a mandate with only wage inflation and hours worked performs the best, reducing the welfare cost associated with the simple mandate (of targeting only price inflation) by nearly 34 percent relative to the benchmark objective."
[30] See https://www.rbnz.govt.nz/monetary-policy/policy-targets-agreements/pta2018
[31] See Beaudry and Ruge-Murcia (2017)

the majority of the Canadian population – and the contrast between middle class earnings stagnation and elite income growth is producing increasing discontent[32].

Figure 2 documents the long run increase in hourly real labour compensation in Canada[33], the abrupt end of wage growth in approximately 1980 and the stagnancy of average real hourly compensation from approximately 1981 to 2000. Throughout the 1950s, 1960s and 1970s, Canadians had come to believe that growth in income for ordinary workers was, is and should be the "normal" state of affairs in a capitalist economy, but somewhere around 1980, reliable growth of average real hourly labour compensation in Canada came to a sudden stop.



This sudden stop in the growth of average real hourly wages and the continued stagnation of the 1980s and 1990s occurred despite many structural changes that might have been expected to increase wages. Canada's Baby Boom generation aged into their most highly paid years and there was a substantial increase in the education levels of the Canadian workforce. Canada's capital/labour ratio

[32] For polling data on public attitudes in Canada, see Osberg (2018).

[33] Figure 2 splices together two data series (1914 to 1961 and 1961 to 2000), which terminate in 2000. It shows "Real average hourly labour compensation" defined as total labour compensation (taken from the National Income accounts, and therefore including the employer cost of CEO stock options and social insurance contributions and fringe benefits such as any employer paid pension), adjusted for changes in the consumer price index and divided by total hours worked in the same year. Hourly labour compensation is therefore greater than respondents' reports of their money wages received, which is the wage concept recorded in household survey and census data.

increased and technological change transformed production. Canadian governments also made many institutional reforms with the stated objective of increasing market efficiency – such as de-regulation, privatization of crown corporations and signing the FTA, NAFTA and WTO accords and a host of bilateral trade accords. Canada's federal government repeatedly assured Canadians that the new policy framework of trade agreements and commitment to a low inflation monetary policy would produce increased prosperity. Canada's real GDP per capita did grow by 55.9% between 1981 and 2016, (i.e. by almost $20,000 CDN[34]), but the real hourly wages of Canada's middle class stagnated.

As Duclos and Pellerin (2016:261) conclude: "Wages within educational and potential experience groups have stagnated between 1980 and 2010. Hourly compensation growth among full-time workers is driven largely by rising educational attainments. Once we remove the wage effects of changes in the composition of the labour force, average hourly compensation stagnates or even declines over the period." They use Census micro-data (2016-Table 3) to unpack the trends going on within the distribution of hourly wages. Their findings repeat the common conclusion: "Most of the action has been at the very top[35]." For the full thirty year period from 1980 to 2010, the compound annual growth rate of median real hourly wages of full time workers was an anaemic 0.36% annually – almost entirely concentrated in the oil boom period after 2000. Because the top 99.9th percentile considerably more than doubled their hourly real wage between 1980 and 2010, the dollar gap between the mid-point and the top end (i.e. between the median hourly real wage and the 99.9th percentile) grew by $186 per hour (from $128 to $314 per hour). Simultaneously, there was also an increase of $8 in the gap in hourly wages between the upper middle class 90th percentile and the median – but the increase in the gap between the median and the 99.9th percentile was more than twenty-three times larger[36].

Between 2001 and 2014, Canada's labour market was heavily influenced by the fact that the steady surge in real oil prices from $22 per barrel[37] in late 2001 to $142 per barrel in June 2008 spawned a confident expectation that real energy prices could only continue to go up. Between 1999 and 2013

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[34] From $35,723 to $55,681 (in 2015 $ CDN) – a compound growth rate of 1.3% annually. Household final consumption per capita grew slightly faster – by a total 63.3% or 1.4% annually. CANSIM Table 380-0084 Gross domestic product at 2007 constant prices, expenditure-based. (Note that consumption can only grow faster than incomes if net indebtedness is rising, which if continued long enough raises issues of financial stability.)
[35] Alvaredo et al (2013:13)
[36] See Osberg (2018) for detailed calculations.
[37] All oil prices are reported in U.S. dollars. The real price of oil is the average nominal price per barrel of imported crude oil deflated by U.S. Consumer Price Index, first quarter, 2017. Source: https://www.eia.gov/outlooks/steo/realprices/

approximately $201 billion (CDN) was invested in the Alberta oil sands industry.[38] During the oil boom, as charter flights flew crew changes into Fort McMurray construction sites from Atlantic Canada and rural B.C. and places in between, labour market impacts were apparent to Canadians from coast to coast. David Green (2016)[39] has argued convincingly that although Canada's oil and gas sector directly employs only a small percentage of Canadian workers, the rapid expansion of oil sands investment established new reference points for wage setting nation wide. Low unemployment and high wages in Alberta also attracted substantial interprovincial migration, which combined with the explosive growth of interprovincial commuting to bid up real wages throughout the country. Canada's resource boom also offset much of the impact of the Great Recession of 2008-2009. As Figure 1 indicates, the increase in Canadian unemployment in 2009 was relatively small and quickly peaked. The continued collapse of oil prices since 2014 has thus come as a distinct shock. Although the unpredictability of oil prices does mean that there is a chance that oil prices will bounce back up, oil prices continue to stagnate and competing energy technologies, such as solar, continue to drop in cost. Hence, the "low for long" scenario for oil prices seems much more plausible.

Going forward, Canadian macroeconomic policy makers can anticipate heightened uncertainty around a lower long run trend for feasible growth. Economic growth between 2000 and 2014 depended heavily on the oil boom, which has now ended. Growth since then has been partly sustained by a debt-fueled housing construction boom[40] fueled by housing price increases in major cities that seem highly likely to end fairly soon. Recent Canadian forecasts[41] agree in predicting, largely because of the entry of Canada's baby boom generation into their retirement years, that growth of national income (GDP) will slow to approximately 1.6% per year which, given population growth is forecast to be 0.85% annually[42], implies real national income per capita growing at 0.95% annually until 2021 and 0.75% thereafter (assuming no recessions occur). This will be a sharp deceleration from the 1.3% growth rate in real per capita GDP which Canada enjoyed over the 1981-2016 period.

Issues ignored by these forecasts of future GDP growth include:

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[38] http://www.energy.alberta.ca/OilSands/791.asp On a per year basis oil sands investment was of the order of 1% of GDP**.** Although the upward march of oil prices was interrupted by a collapse to $42 per barrel in December 2008 as the Great Recession hit, price recovery was swift, rebounding to $119 per barrel in March of 2012.

[39] See also Morissette, Green and Sand (2017)

[40] The impact on employment has been significant - jobs in construction increased by 562,400 between 2001 and 2016, from 5.51 per cent to 7.66 per cent of total employment. CANSIM Table 282-0012.

[41] Finance Canada (2016:11) Drummond, Capeluck and Calvert (2015: vii)

[42] M1 scenario from Statistics Canada's official population projections - http://www.statcan.gc.ca/pub/91-520-x/91-520-x2014001-eng.pdf

1. the probability of a recession or a global slowdown in trade. In the short term, Canada and Mexico, having integrated their economies so thoroughly into a continental market, are also uniquely exposed to the hazards to international trade posed by the Trump administration in the U.S. – the uncertainties of which are already affecting investment planning.
2. the "secular stagnation" argument[43] that global growth rates are slowing because excess global savings confront a dearth of profitable investment opportunities;
3. the argument that technological change inevitably hits diminishing returns at some point, which may be about now – as evidenced by recent declines in multi-factor productivity growth[44]. (Although some of the "headwinds to growth[45]." discussed in the literature are specific to the U.S, (e.g. inadequate quality of education), this is of only limited consolation to Canada, since the U.S. is by far Canada's most important market and Canadian GDP growth prospects thus depend heavily on U.S. trends.)

Growth optimists may object that the "Third Industrial Revolution" of artificial intelligence, telecommunications and the Internet will produce a larger productivity impact than is assumed in current forecasts of Canadian economic growth, because machine learning, new sensors and "Big Data" computer algorithms are only now just beginning to have their full impact on labour productivity[46]. However, the problem for Canada's middle class is that if these technologies really do mean that "it is largely already technologically possible to automate almost any task, provided that sufficient amounts of data are gathered for pattern recognition"[47], then middle class occupations from truck driver to legal assistant that were once thought to be "safe" from replacement by computers may soon become obsolete. Estimates of the possible disruptive impacts of robots and machine learning on employment vary widely – from 9% to 47% of all jobs[48] - but even the low-end estimate of 9% of jobs would be a large impact. And although the highly skilled and the well-educated have been and will be less affected, jobs for low-skill workers are at severe risk (e.g. truck drivers). Hence, more rapid productivity growth is likely to imply even faster

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[43] See Summers (2016)
[44] Gordon (2012, 2016)
[45] Gordon (2012) suggests that future growth in consumption per capita for the bottom 99 percent of the U.S. income distribution could fall below 0.5 percent per year for an extended period of decades.
[46] Beaudry, Green and Sand (2016) also raise the possibility that the widening differential between college and high school earnings up to 2000, and its narrowing since, may reflect a one-time transition to the new job structure required by the new information technologies – i.e. Canada's growing supply of university graduates will not be matched by growing future demand.
[47] Frey and Osborne (2013:23)
[48] Frey and Osborne (2013) argue that 47% of all persons employed in the US are now working in jobs that could be performed by computers and algorithms within the next 10 to 20 years. Arntz, Gregory and Zierahnon (2016:4) suggest that "on average across the 21 OECD countries, 9 % of jobs are automatable". Chui, Manyika and Miremadi (2016) examine the time spent on different activities within occupations and conclude: "currently demonstrated technologies could automate 45 percent of the activities people are paid to perform".

shrinkage of employment opportunities for the less educated (particularly for less educated men) than has already occurred.

The increase in anxiety about future job availability arises partly because having a job is important for much more than just money income. The continuing importance of employment to psychological well-being in modern industrial societies has been timelessly expressed by Jahoda (1979:423):

> "There are latent consequences of employment as a social institution which match human needs of an enduring kind. First among them is the fact that employment imposes a time structure on the waking day. Secondly, employment implies regularly shared experiences and contacts with people outside the family. Thirdly, employment links an individual to goals and purposes which transcend his own. Fourthly, employment defines aspects of status and identity. Finally, employment enforces activity. It is these objective consequences of work in complex industrialized societies which help us to understand the motivation to work beyond earning a living; to understand why work is psychologically supportive, even when conditions are bad, and, by the same token, to understand why unemployment is psychologically destructive."

How large might the costs of high unemployment be? Clearly the unemployed bear the direct costs of higher unemployment, both financially and psychically. One of the clearest, most long-established regularities in the literature on the economics of happiness is the fact that at any point in time the unemployed are very much less happy than the employed – to a degree that cannot be nearly explained by net income loss[49]. The employed are also affected, because when there is higher unemployment the employed have to worry more about the chances that they too will lose their jobs – and even at 7% unemployment there are far more people employed than unemployed (93/7 = 13.3). Helliwell and Huang (2014) therefore examined the impact of higher unemployment rates on the life satisfaction of the employed, using Gallup poll micro-data on roughly 3 million Americans.[50] Since this data includes local level variation in the unemployment rate and the respondent's household income, they can ask how big an increase in income it would take to compensate the employed for the negative impact on their well-being of an increase in their local unemployment rate. Their conclusion (2014:1485) is: "For the unemployed, the nonpecuniary costs of unemployment are several times[51] as large as those resulting from lower incomes, while the indirect effect at the population level is 15 times as large. For those who are still

[49] An early survey was by Frey and Stutzer (2001).
[50] They also note (2014:1486) that the comparative international literature concludes "both unemployment and inflation reduce satisfaction but the coefficient on the unemployment rate is almost twice as large as the coefficient on the rate of inflation."
[51] Approximately 5.6 times larger (2014:1500)

employed, a one percentage point increase in local unemployment has an impact on well-being roughly equivalent to a 4% decline in household income."

To the extent that unemployment is uncorrelated across spouses, the long run increase in the female labour force participation rate implies a somewhat greater cushioning of the economic shock of unemployment to household income. However, by controlling for household income, Helliwell and Huang's estimates of the impacts of unemployment on well-being have already implicitly controlled for the income pooling of the financial risk of unemployment within households. And the rising labour force participation of women also implies that the psychological importance of having a job has become more important to a larger fraction of adult Canadians[52]. The long term rise in the total labour force participation rate also implies that the adverse health impacts of job insecurity – specifically, mental health and obesity[53] – are affecting increasingly larger fractions of the adult population, with increasing consequences for health care costs.

The bottom line is that the continuing importance for people of having paid jobs coincides, in Canada in the early 21st century, with expectations of lower feasible growth and great uncertainty about future economic shocks. The context is a recent economic history in which total victory on inflation control has been accompanied by disappointingly slight improvements in middle class living standards, increased income inequality and heightened anxieties about future jobs. Hence, a key set of risks facing Canada, and other OECD nations, are the political implications of heightened economic insecurity and increased working class resentments spawned by past long term stagnancy of real wages and rising income inequality. For many reasons, a full employment labour market is now more important than ever.

3. What would "Full Employment" Look Like?

If "Full employment" means an unemployment rate that is at the low end of the range of estimates of the "sustainable/natural/NAIRU unemployment rate", what might that mean in practice? Currently, the Bank of Canada and the Department of Finance avoid discussion of the unemployment rate

[52] Over the 1976 to 2017 period, the labour force participation of Canadians over the age of 15 has risen from 61.5% to 65.8% and the female labour force participation rate has increased from 45.7% to 61.5%, as the gender composition of Canada's labour force has changed from 37.6% to 47.4% female. In 1976, Canadian women had a significantly higher unemployment rate than men (8.2% compared to 6.4%) but by 2017 the unemployment rate differential was reversed (6.8% for men versus 5.8% for women). The 7.5 percentage point decline in adult male participation (from 77.7% in 1976 to 70.2% in 2017) may, particularly for older male cohorts, be partly a discouraged worker effect. See CANSIM Table 282-0002

[53] See Watson, Osberg and Phipps (2016); Rohde, Tang, Osberg and Rao (2016); Rohde, Tang and Osberg (2016)

but U.S. policy makers are not so reticent – and U.S. evidence is highly relevant. In September 2017, Janet Yellen, then Chair of the Board of Governors of the U.S. Federal Reserve concluded (2017:6):

> "The unemployment rate consistent with long-run price stability at any time is not known with certainty; we can only estimate it. The median of the longer-run unemployment rate projections submitted by FOMC participants last week is around 4-1/2 percent."

"Full employment" in Canada is unlikely to be higher than "full employment" in the U.S. – and 4.5% is the mid-point of the range of U.S. estimates. In thinking about what the costs and benefits might be of aiming for even less unemployment, at the low end of the unemployment rate range rather than at the mid-point, Yellen goes on to note (2017: 14): "The influence of labor utilization on inflation has become quite modest over the past 20 years, implying that the inflationary consequences of misjudging the sustainable rate of unemployment are low. But we cannot be sure that this modest sensitivity will persist in the face of strong labor market conditions, given that we do not fully understand how it came to be so modest in the first place."

Uncertainty does of course run both ways – there is also the likelihood that this "modest sensitivity" will persist, and that even much lower unemployment would continue to have few inflationary implications. Given this two sided uncertainty, the important issue is where the balance of risks and potential social costs actually lies. Many older economists will remember seeing this show before. In the macro-economics literature of the early and mid 1990s, estimates of the "sustainable/natural/NAIRU unemployment rate" in the 6% to 7% range in the U.S. were common but then disappeared discretely from the policy discourse as the Greenspan Fed "felt its way down" and allowed U.S. unemployment to get to 4%, without an acceleration of inflation[54]. An emphasis on "full employment" in Canada today would mean that monetary and fiscal policy makers in Canada would similarly test the waters of lower unemployment.

In 2018 in Canada, with inflationary expectations well anchored at 2% after thirty years, the issue is whether the risk of inflation is now actually more of a hazard for Canada's long-term well-being than the danger of choking off the kind of inclusive growth in real wages and employment that could benefit the middle class – and help preserve the stability of Canada's political economy framework. However, the danger is that a generation of policy makers raised on avoiding, at all costs, any possibility of inflation

[54] See Staiger, Stock and Watson (1997)

will continue to disregard the economic, social and political economy costs that slow growth and high unemployment imply.

4. How Might Canada get to "Full Employment"?

In one sense, the path to full employment is clear. It has long been known that the demand for labour is derived from the demand for goods and services. Hence, if the Canadian economy is not in total generating enough jobs for those seeking work, that inadequacy of aggregate labour demand stems from an inadequacy of aggregate demand for goods and services. At any point in time, the two biggest[55] policy levers available to stimulate the level of aggregate demand for goods and services are fiscal and monetary policy – specifically, the level of real interest rates and the change in the size of the government deficit.

As of the time of writing in early 2018, the announced monetary policy of the Bank of Canada was to raise interest rates gradually over the next several years and the announced fiscal policy of the federal government was to reduce the federal deficit over time – both of which slow the growth of aggregate expenditure and of total employment. An emphasis on full employment would start by reversing these contractionary policy settings. To increase aggregate demand and job creation, the federal government should provide greater fiscal stimulus, and the Bank of Canada should be willing to maintain a low interest rate policy.

In Canada's context in 2018, fiscal policy is especially important. The old saying about interest rate policy always was "one cannot push on a string" – the impacts of monetary policy can be asymmetric. Although raising the cost of borrowing by raising interest rates can always be counted on (if rates are raised high enough for long enough) to discourage borrowing and reduce investment and consumer expenditure, lowering the cost of borrowing may not necessarily be successful in increasing such spending, if firms and households are anxious about the future. Although bank rate was below 1% from 2009 through 2017 in Canada, this historically unprecedented period of ultra-low nominal interest rates did not produce a boom in investment and consumer spending[56]. The long, and successful, emphasis of Canadian macro-economic policy on attaining low and stable inflation came with the unanticipated

[55] The exchange rate also influences domestic employment in exporting and import-competing industries, but is not considered separately here, since it is just one of the channels through which the interest rate set by monetary policy influences aggregate demand. Governments also influence households' decisions to look for paid work and firms' decisions to offer employment through their decisions on the design of tax and transfer policies and product market and labour market regulation, and therefore influence the level of potential output. However, at any point in time aggregate demand determines how much of that potential output is actually utilized.

[56] See Dorich, Reza and Sarker (2017)

implication that the Bank of Canada ran out of room to stimulate aggregate demand through lower real interest rates, due to the Zero Lower Bound on nominal interest rates.

When monetary policy cannot adequately stimulate aggregate demand, the remaining alternative is fiscal policy, but worries about the cumulative impact of larger deficits on the stock of public debt now prevent expansion of the public deficit in Canada. Canada's debt crisis in the mid 1990s[57] left a profound awareness of the long run potential problem of debt stability – how a succession of annual deficits can add up to a stock of public debt that is unsustainably large, and potentially highly vulnerable to shifts in interest rates and growth. When the public debt is privately held, the 'debt stability' equation starts from the accounting identity that the face value of the stock of debt at a point in time is equal to the previous period's debt plus interest accruing minus any "Primary Balance" surplus of tax revenue over current spending which is used to pay back the debt, as in Equation 4.1.

(4.1) $$D_t = (1 + r_t)^* D_{t-1} - PB_t$$

D_t = Debt in period t; r_t = average rate of interest of debt in period t;
PB_t = Primary Balance in period t = Revenue – Program Expenditure in period t

The dynamics of the Debt/GDP ratio are then determined by Equation (4.2), which derives directly from (4.1).

(4.2) $$\Delta (D/Y)_t = (r_t - g_t)^*(D_{t-1}/Y_t) - (PB_t / Y_t)$$

Y_t = Income; g_t = growth rate of income; $\Delta (D/Y)_t$ = change in Debt/Income ratio

In equation (4.2) the first term makes clear how much debt stability depends on the interaction between the overhang of debt from the past (D_{t-1}/Y_t) and the interest rate / growth rate differential (r_t - g_t)[58]. Whenever the interest rate exceeds the income growth rate (i.e. when $r_t - g_t > 0$), past debt is compounding faster than income is growing. Since 2009, interest rates have been extremely low, enabling governments to avoid this outcome. However, the prospect of increased interest rates in the future raises the likelihood that the stock of past debt may start to feed on itself, implying that expenditure on servicing

[57] For discussion of the origins and implications of the "debt crisis" see Osberg and Fortin (1996)
[58] It does not matter in this discussion whether r_t and g_t refer to real or nominal interest and growth rates, since inflation just cancels out.

the debt (which can be approximated by r_t*D_t) rises over time, potentially squeezing out other public expenditures.

However, a key assumption in this depressing scenario is that all debt is privately held, by agents outside government. Over the 2008 to 2018 period, central banks in the U.S., U.K., Europe and elsewhere demonstrated that this is not a necessary assumption. Under their "quantitative easing" policies, central banks in all these places purchased government debt, in large magnitudes, in order to enable government spending to stimulate an otherwise inadequate aggregate demand for goods and services. Although by 2018 several had announced plans to reduce their portfolio of public debt over time, their policy decision to do so was not forced by some crisis of financial or real markets, rather it reflected their intention to gradually implement a more contractionary stance to economic activity. But it is evident that one lesson of the decade 2008 to 2018 is that the sky does not fall when central banks purchase public debt.

If α is the percentage of the public debt which is held by the central bank, the annual cost to government of servicing the public debt is $(1-\alpha)* r_t*D_t$ since the interest rate cost of central bank held public debt [$\alpha* r_t*D_t$] returns to government as revenue. The ratio (D/Y) of total nominal debt to GDP then loses any significance as a predictor of the long-run sustainability of deficit and debt policies. Non-government holdings of public debt [$(1-\alpha)*D_t$] remain an important constraint[59], but one that is self-imposed (directly by the central bank but ultimately by government, since governments could instruct central banks to purchase public debt). Fundamentally, the percentage of the public debt to be held by the central bank is always a policy choice variable. The assumption that $\alpha = 0$ has to always be the case is a specific policy choice that should be justified by evidence that this policy setting produces over time superior economic outcomes[60]. In the absence of such evidence, it is a "judgement call". In the presence of evidence that excess unemployment and the lack of inclusive growth has large costs, it is reasonable to think that fiscal policy – running a public sector deficit – has an important and feasible role to play in generating full employment in Canada in 2018.

[59] Japan has, for example, long had very high gross public debt to GDP ratios (240.3% of GDP in 2017) compared to other OECD nations, but because roughly half of that debt has been internally held, net debt is manageable (120.9% of GDP in 2017). Japan's net interest payments on its debt were a very manageable 1.0 percent of GDP in 2015. Hence, the ability of fiscal policy to respond to demand shortfalls with deficit spending has not been adversely affected. See International Monetary Fund, World Economic Outlook Database, October 2017

[60] In the Canadian context, this might be hard to prove. The $\alpha = 0$ policy setting has been in place in Canada but the long period of wage stagnancy for most workers suggests that for many Canadians, economic outcomes were sub-optimal.

5. Conclusion

By 2018, Canadians had lived with high unemployment for a very long time. Many know no other reality. One consequence is a massive cumulative loss of foregone output and another is habituation to the multiple labour market implications of not enough jobs. In Canada in 2018, it is, for example, seen as normal that new graduates have to try to get unpaid internships and then work second jobs to pay their bills, that firms can advertise "experience required" jobs and choose from a queue of qualified applicants and that the "gig economy" generates economic insecurity and low wages for the many workers trapped in it.

A full employment labour market works differently in many ways. Short-term jobs cause much less stress when new gigs can easily be found, and when long term jobs are also available, the short term ones tend to be filled by people who actually prefer that lifestyle. When there are enough jobs of all types, employers also have to give new workers a chance – youth are big winners and so also are the disadvantaged minorities, the new immigrants and the poorly credentialed who firms now do not have to take a chance on when there are so many applicants for every available position.

When unemployment is low, firms face a different kind of risk – the risk that sales and profits might be lost because a vacancy remains unfilled. Firms then have incentives to compete for workers. It becomes in their interest to make their jobs attractive and to provide the training that workers need. Job quality improves – if, for example, more convenient and more predictable shift schedules can attract workers, better scheduling becomes an employer initiative, not an employee grievance. Social policy is also affected – adequate day care, for example, suddenly becomes an employer priority, because it enables more women to work full time. When labour is scarce firms also have much stronger incentives to economize on it – faster growth of labour productivity is an important implication, which enables faster growth of real wages.

There are therefore many reasons why full employment matters – in addition to the political economy and well-being implications already emphasized in Section 2. Clearly, "full employment" should never be seen as the only important economic outcome – one of the themes of this chapter has been the multiple social problems that a myopic policy focus on a single target variable can produce. Inflation, economic growth, environmental impact and economic inequalities are among the other big desiderata of public policy. The core argument of this paper is, however, that in Canada monetary policy success in hitting the 2% inflation target and fiscal policy success in budget balancing has not in fact produced satisfactory economic outcomes for most Canadians. Although it may be bureaucratically easier to avoid consideration of the trade-offs between policy objectives, recognizing that policy trade-offs may

exist and reinstating “full employment” as a major policy objective for macro-economic decision-makers is long overdue in Canada.

References

Aaronson, Daniel, Luojia Hu, Arian Seifoddini, and Daniel G. Sullivan (2015). "Changing Labor Force Composition and the Natural Rate of Unemployment," Chicago Fed Letter 338. Chicago: Federal Reserve Bank of Chicago, May, www.chicagofed.org/publications/chicago-fed-letter/2015/338.

Algan, Y., S. Guriev, E. Papaioannou, E. Passari (2017) The European Trust Crisis and the Rise of Populism, BPEA Conference Drafts, September 7–8, 2017

Atkeson, A. and L. E. Ohanian (2001): "Are Phillips curves useful for forecasting inflation?" Federal Reserve Bank of Minneapolis Quarterly Review, Winter, 2-11.

Barnichon, Regis, and Christian Matthes (2017a). "The Natural Rate of Unemployment over the Past 100 Years," FRBSF Economic Letter 2017-23. San Francisco: Federal Reserve Bank of San Francisco, August 14, www.frbsf.org/economic-research/publications/economic-letter/2017/august/natural-rate-of-unemployment-over-past-100-years

Barnichon, Regis, and Geert Mesters (2017b). "How Tight Is the U.S. Labor Market?" FRBSF Economic Letter 2017-07. San Francisco: Federal Reserve Bank of San Francisco, March 20, www.frbsf.org/economic-research/publications/economic-letter/2017/march/how-tight-is-labor-market

Beaudry, Paul and Francisco Ruge-Murcia (2017) "Canadian inflation targeting" Canadian Journal of Economics, 50(5), December 2017, pages 1556-1572

Bell, David N.F. and Blanchflower, David G., (2018) The Lack of Wage Growth and the Falling NAIRU (April 2018). NBER Working Paper No. w24502. Available at SSRN: https://ssrn.com/abstract=3163251

Champagne, Julien, Guillaume Poulin-Bellisle and Rodrigo Sekkel (2016) "The Real-Time Properties of the Bank of Canada's Staff Output Gap Estimates" Staff Working Paper/Document de travail du personnel 2016-28, June 2016 http://www.bankofcanada.ca/2016/06/staff-working-paper-2016-28/

Christiano, Lawrence J., Martin S. Eichenbaum, Mathias Trabandt (2017) "On DSGE Models" November 9, 2017

Chui, Michael, James Manyika, and Mehdi Miremadi (2016) "Where machines could replace humans—and where they can't (yet)" McKinsey Quarterly July 2016 https://www.mckinsey.com/business-functions/digital-mckinsey/our-insights/where-machines-could-replace-humans-and-where-they-cant-yet

Debortoli, Davide, Jinill Kim, Jesper Lindé, and Ricardo Nunes (2017) "Designing a Simple Loss Function for Central Banks: Does a Dual Mandate Make Sense?" IMF Research Department, Working Paper WP/17/163, July 2017

Dorich, J. , A. Reza and S. Sarker (2017) "An Update on the Neutral Rate of Interest" Bank of Canada Review • Autumn 2017 http://www.bankofcanada.ca/wp-content/uploads/2017/11/boc-review-autumn2017-dorich.pdf

Duclos, Jean-Yves and Mathieu Pellerin (2016), 'The Evolution of Hourly Compensation in Canada between 1980 and 2010', *Canadian Public Policy*, 42(3), 250.

Frey, B.S. and A. Stutzer (2001) *Happiness and Economics: How the Economy and Institutions Affect Human Well-Being* Princeton University Press

Fritsche, Alexander and Katherine Ragan (2016) *Extending the Labour Market Indicator to the Canadian Provinces* Bank of Canada Staff Discussion Paper 2016-2 January 2016 Canadian Economic Analysis Department, Bank of Canada

Guénette, Justin-Damien, Nicholas Labelle St-Pierre, Martin Leduc and Lori Rennison (2016)The Case of Serial Disappointment Staff Analytical Note/Note analytique du personnel 2016-10 Bank of Canada

HELLIWELL, J. F. and HUANG, H. (2014), NEW MEASURES OF THE COSTS OF UNEMPLOYMENT: EVIDENCE FROM THE SUBJECTIVE WELL-BEING OF 3.3 MILLION AMERICANS. Economic Inquiry, 52: 1485–1502. doi:10.1111/ecin.12093

Inglehart, Ronald and Norris, Pippa, (July 29, 2016) Trump, Brexit, and the Rise of Populism: Economic Have-Nots and Cultural Backlash. HKS Working Paper No. RWP16-026. Available at SSRN: http://ssrn.com/abstract=2818659

Jahoda, M. (1979). The psychological meanings of unemployment. *New Society*, *49* (883) 492-495

King, Mervyn **(2016) The End of Alchemy: Money, Banking and the Future of the Global Economy**, *Little, Brown, 448 pages*

King, J.E. (2007) "*KALDOR'S WAR"* DISCUSSION PAPER 25/07, DEPARTMENT OF ECONOMICS Monash University, ISSN 1441-5429

LUCAS, ROBERT E. JR (2003) "Macroeconomic Priorities" Presidential Address delivered at the one-hundred fifteenth meeting of the American Economic Association, January 4, 2003, Washington, DC. *THE AMERICAN ECONOMIC REVIEW MARCH 2003 pages 1-14*

Lewis, Christine and Nigel Pain (2015) "Lessons from OECD forecasts during and after the financial crisis" *OECD Journal: Economic Studies* Volume 2014 © OECD 2015

Osberg, Lars (2011) *Why Did Unemployment Disappear from Official Macro-Economic Policy Discourse in Canada*? (2011) Pp 127-165 in New Directions for Intelligent Government in Canada: Papers in Honour of Ian Stewart edited by Fred Gorbet and Andrew Sharpe, Centre for the Study of Living Standards, Ottawa 2011

---------- (2018) *"Canada's Middle Class – Forever Further Behind?"* in "Inequality and Inclusive Growth" (forthcoming) Brian Nolan (editor) Oxford University Press

Osberg, L. and Fortin, P. (eds) (1996). *Unnecessary Debts* (Toronto: James Lorimer Publishers).

Peach, Richard, Robert Rich, and Anna Cororaton (2011) "How does slack influence inflation?," *Current Issues in Economics and Finance*, Vol. 17, No. 3, pp. 1-7.

Poloz, Stephen (2017) *Understanding Inflation: Getting Back to Basics* Remarks by Stephen S. Poloz Governor of the Bank of Canada, CFA Montréal and Montreal Council on Foreign Relations Montréal, Québec November 7, 2017 https://www.bankofcanada.ca/2017/11/understanding-inflation-getting-back-to-basics/

Reserve Bank of New Zealand (2018) *Policy Targets Agreement https://www.rbnz.govt.nz/-/media/ReserveBank/Files/Publications/Policy%20targets%20agreements/2018pta.pdf*

Rohde, N., Tang, K. K., Osberg, L., & Rao, P. (2016). The effect of economic insecurity on mental health: Recent evidence from Australian panel data. Social Science & Medicine, 151, 250-258.

Rohde, N., Tang, K. K., Osberg, L. (2016): The self-reinforcing dynamics of economic insecurity and obesity, Applied Economics, DOI: 10.1080/00036846.2016.1223826

Romer, Paul (2016). "The trouble with macroeconomics." The American Economist, forthcoming.

Setterfield, M.A. , D.V. Gordon, L. Osberg (1992) "Searching for a Will O' the Wisp: an empirical study of the NAIRU in Canada," *European Economic Review*, Volume 36, Issue 1, Pages 119-136

Siklos, P. L. (2010). Revisiting the Coyne Affair: A singular event that changed the course of Canadian monetary history. *Canadian Journal of Economics*, *43* (3) 994-1015. Retrieved from SSRN: https://ssrn.com/abstract=1640828 or http://dx.doi.org/10.1111/j.1540-5982.2010.01603.x

Staiger, Douglas, James H. Stock and Mark W. Watson (1997) The NAIRU, Unemployment and Monetary Policy *JOURNAL OF ECONOMIC PERSPECTIVES* VOL. 11, NO. 1, WINTER 1997 (pp. 33-49)

Stiglitz, Joseph E (2017) "Where Modern Macroeconomics Went Wrong," National Bureau of Economic Research Working Paper Series, 2017.

Stock, J. H. and M. W. Watson (2007): "Why has U.S. inflation become harder to forecast?" Journal of Money, Credit and banking, 39(s1), 3 -33.

Thorbecke, Willem (2002) "A Dual Mandate for the Federal Reserve: The Pursuit of Price Stability and Full Employment" *Eastern Economic Journal* Vol. 28, No. 2 (Spring, 2002), pp. 255-268

Turner, D. (2016), "The Use of Models in Producing OECD Macroeconomic Forecasts", *OECD Economics Department Working Papers*, No. 1336, OECD Publishing, Paris.

Watson, B., Osberg, L., & Phipps, S. (2016). Economic Insecurity and the Weight Gain of Canadian Adults: A Natural Experiment Approach. Canadian Public Policy, 42(2), 115- 131.

Janet L. Yellen (2017) "Inflation, Uncertainty, and Monetary Policy" Remarks by Chair, Board of Governors of the Federal Reserve System, at "Prospects for Growth: Reassessing the Fundamentals" 59th Annual Meeting of the National Association for Business Economics, Cleveland, Ohio September 26, 2017 https://www.federalreserve.gov/newsevents/speech/yellen20170926a.htm

---------- (2016). “Macroeconomic Research after the Crisis,” speech delivered at “The Elusive ‘Great’ Recovery: Causes and Implications for Future Business Cycle Dynamics,” 60th annual economic conference sponsored by the Federal Reserve Bank of Boston, Boston, Mass., October 14, www.federalreserve.gov/newsevents/speech/yellen20161014a.htm