Why Isn't Productivity More Popular? A Bargaining Power Approach to the Pay/ Productivity Linkage in Canada

Mathieu Dufour
John Jay College of Criminal Justice, CUNY
Ellen Russell
Wilfried Laurier University[1]

Abstract

Canadian real labour income has increasingly lagged behind productivity growth. This article employs a bargaining power approach to wage determination to explore the hypothesis that some public polices intended to promote productivity growth may have contributed to the erosion of worker bargaining power, thereby reducing workers' capacity to benefit from productivity growth. We present an econometric analysis of several policies that supports this hypothesis.

Prominent Canadians (Carney 2010; Mulroney 2011; Dodge 2005), research organizations, and the media repeatedly endorse the virtues of productivity. The benefits of productivity growth seem self-evident: rising productivity generates more output (GDP), and a higher standard of living (typically defined as GDP per capita). There is even a "surprisingly broad consensus" (Drummond and Bentley, 2010) among economists on a policy agenda to enhance productivity growth. The "productivity agenda" typically includes calls for lower taxation of capital and marginal tax rates on individuals, deregulation, Employment Insurance (EI) reform, trade and investment agreements, and many other policy initiatives intended to maintain low and stable inflation, reduce government deficits and debt, and increase labour market flexibility (Drummond, 2006).

Yet despite the consensus in public policy circles concerning the desirability of enhancing Canadian productivity growth, the productivity agenda does not appear to be widely popular. Pollster David Herle indicates that "most people do not see how…the productivity agenda in general will have a positive impact on their lives"(Herle, 2007). Productivity may even be becoming less popular over time: Environic's quarterly Focus Canada poll

1 Mathieu Dufour is Assistant Professor at the John Jay College of Criminal Justice at the City University of New York. Ellen Russell is Assistant Professor in Digital Media and Journalism, Society, Culture and Environment at Wilfrid Laurier University, Brantford. This article is a revised version of a paper presented at a session organized by the Centre for the Study of Living Standards (CSLS) and the Progessive Economics Forum (PEF) entitled "What Has Happened to Living Standards in Canada?" held at the 2013 annual meeting of the Canadian Economics Association, HEC, Montreal, Quebec, May 31-June 2. We are grateful to Andrew Sharpe and two anonymous referees for comments. We also thank Leisha Senko for research assistance. Emails: russell@wlu.ca and mdufour@jjay.cuny.edu.

of 2,000 Canadians found that the number of Canadians who agreed that increasing productivity is "very important" decreased by 18.4 percentage points between 1985 and 2005.[2] Don Drummond (2011:5) claims that public aversion to the concept of productivity is so intense that government officials dare not refer to it by name:

> ... Canadian governments react to the public's misunderstanding, even fear of productivity by borrowing a concept from Harry Potter. Just as Lord Voldemort must be referred to as "He-Who-Must-Not-Be-Named" or the "Dark Lord" so must productivity be globally replaced by 'innovation' or "competitiveness."

What accounts for the lack of popularity of the productivity agenda? Often advocates of the productivity agenda blame widespread misunderstandings of the concept of productivity, suggesting that the public interprets calls to increase productivity growth as a "code" for longer working hours and intensified work (Drummond and Bentley, 2010) or the prelude to job loss in particular industries. Whatever the merits of these explanations, this article takes a different approach: it employs a distributional perspective to understand the unpopularity of the productivity agenda.

Certainly productivity growth means that the economy generates more output from its natural resources, labour, and capital. But this begs the question of who will benefit from this increased productivity. Proponents of the productivity agenda typically argue that productivity growth will be broadly beneficial thanks to the wide distribution of the gains from productivity via the wage mechanism. The presumption that real wages will grow as productivity increases is not only ubiquitous in introductory economics textbooks, it has an immense influence on public policy. For example, education and training programs are premised on the expectation that investments in human capital will enhance labour income (Rennison and Turcotte, 2004). The productivity-real wage linkage is not always explicitly stated when governments promote policies consistent with the productivity agenda (indeed, to the extent that the term productivity is unpopular, it would likely be avoided in public pronouncements). But arguably the pay/productivity linkage is invoked via the frequent rhetoric emphasis on "good" jobs and "prosperity" that are said to accompany policies consistent with the productivity agenda.[3]

Yet a strong pay/productivity linkage is not borne out by empirical examination. While in the decades prior to the 1980s, the pay/productivity linkage was relatively robust, wages have not grown in tandem with productivity growth in Canada (and elsewhere) recently. The International Labour Organization estimates that labour productivity has increased more than twice as much as average wages in developed countries as a whole between 1999 and 2011 (International Labour Organization, 2013). This trend has been echoed in Canada.[4] A recent report of the Parliamentary Budget Office (Bartlett and Tapp, 2012:14) concluded that this divergance of remuneration and productivity growth has become a persistent attribute of Canadian labour markets:

2 As calculated by comparing Environics Focus Canada polls from 1985 and 2005.

3 A recent example of this rhetoric was included in the materials promoting the Canada-European Union Comprehensive Economic and Trade Agreement "Across Canada, businesses, workers and their families will enjoy many new opportunities resulting from free trade with the European Union, translating into good jobs, economic growth, and greater long-term prosperity" (Government of Canada, 2013).

4 See Sharpe, Arsenault and Harrison (2008b).

> Labour productivity growth has outpaced the growth in the real total compensation rate, on average, over the past three decades. This is particularly true since the mid-1990s, suggesting that productivity gains over this time have not led to equivalent increases in compensation.

It seems reasonable that public enthusiasm for measures intended to enhance productivity growth would wane to the extent that the benefits of productivity are not translated into paycheques. Moreover, we make the case that the delinkage of real wages and productivity growth may be attributed – in part – to the very policies that were introduced to encourage productivity growth. We present a bargaining power approach to wage determination to consider conditions which may impact workers' capacity to secure the benefits of rising productivity growth in their paycheques. We argue that several of the public polices implemented in the name of enhancing productivity growth have reduced workers' bargaining power, thereby undermining workers' capacity to benefit from productivity growth. If the policies intended to boost productivity also contribute to the diminished ability of workers to secure the benefits from growing productivity, this situation would be an important consideration in understanding the lack of popularity of the productivity agenda.

We present an econometric analysis to explore how the pro-productivity policy environment may contribute to the delinking of real wages and productivity growth. This econometric analysis focuses on certain attributes of EI reform and the North American Free Trade Agreement, which are policies explicitly linked to the productivity agenda. In addition, we examine union membership, minimum wage regulations, and unemployment rates. While these variables are not the direct outcome of particular policy initiatives explicitly introduced as part of the productivity agenda, they are impacted by a range of policy initiatives prompted in part by the anti-inflation, deregulatory, and labour market flexibility themes that are prominent in it.

This article is divided into three sections. Section one argues that there is no necessary link between real wages and productivity growth, and that the relative bargaining power of employers and employees will determine how the fruits of productivity growth are shared. Section two conducts an empirical examination of the linkage between pay and productivity in the Canadian context and discusses some conceptual, measurement, and data issues that have muddied the assessment of this linkage. It concludes that between 1961 and the late 1970s, the real wage/productivity linkage was relatively tight, but thereafter productivity growth generally outpaced compensation. Section three argues that some of the public policies associated with the productivity agenda have played a role in undermining the bargaining power of workers in this later time period. We present an econometric analysis to demonstrate that these policies have been associated with a widening pay/productivity gap.

Productivity and Real Wage Growth: A Bargaining Power Approach

"Ask any economist and he or she will tell you that faster productivity growth leads to higher real wages..." (Walsh, 2004). While the real wage/productivity linkage is often asserted as an economic truism, there is no necessity that real wages must rise in tandem with productivity. As we discuss below, for several decades prior to the late 1970s, a close empirical relationship existed between the

growth of productivity and real wages in Canada and elsewhere, but it no longer holds. Nor does economic theory dictate that real wages must follow productivity growth. Economists trained in neoclassical economic theory are well acquainted with some widely-used special cases, such as the Cobb-Douglas production function, which is constructed according to several highly restrictive assumptions so that it is a mathematical necessity that wages and productivity grow in tandem.[5] The frequent reference to the real wage/productivity connection may be the result of the fact that many of the most influential conclusions of neoclassical economic theory proceed from situations in which the real wage/productivity link does hold.[6] But except in special circumstances (such as the Cobb-Douglas case), rising productivity does not necessarily produce a proportional increase in real wages.

In practice, while rising productivity creates resources which may be distributed as rising real wages, they don't have to be. We view the distribution of the gains from productivity growth as a question of the relative bargaining power of employees and employers. Worker bargaining power refers to the capacity of workers to compel their employers to accept contractual terms that are favourable to them. In an environment of relatively strong worker bargaining power, employees are in a better position to secure increases in their compensation. Consequently, while labour productivity improvements do increase the resources to be shared between employers and employees, it is the relative bargaining power of each group that ultimately determine how much (if any) of the fruits of productivity growth are allocated to increased wages.

What determines the relative bargaining power of workers and their employers? As Max Weber (1947:152) helpfully states, "[p]ower is the probability that one actor within a social relationship will be in a position to carry out his own will, despite resistance, regardless of the basis on which this probability rests". Certainly bargaining power is shaped by the typical demand and supply considerations familiar to any labour economist. But in principle, anything within the firm, industry, labour market, larger society or international sphere could affect the relative bargaining power of employers and employees. To be sure, any number of considerations, such as technological change and various attributes of globalization, are relevant to a bargaining power analysis. However, this article focuses on factors that are directly or indirectly linked to the productivity agenda in order to examine the possibility of a link between policies undertaken to enhance productivity and worker bargaining power.

Worker or employer bargaining power is enhanced to the extent that either party can deliver a credible threat of injury to the opposing party. For example, employers may threaten to move production overseas to secure wage concessions. Relative bargaining power will be affected by public policies that either a) enhance the ability of either employers or employees to make threats, and/or b) affect the credibility of such threats. Thus if any public policies advocated as part of the productivity agenda can be

5 Cobb-Douglas assumptions are constructed so that marginal and average productivity are proportional and vary together if we assume a stable labour share. Moreover, capital and labour must be freely substitutable for one another instead of there being, say, a relatively fixed amount of capital per worker (e.g. one car per cab driver). Also, workers and units of capital are aggregated in a way that makes them undifferentiated (all workers are alike).

6 For example, the neoclassical argument on behalf of the Pareto-optimal allocation of resources is predicated on the situation in which real wages are tightly linked with labour productivity. This pay/productivity linkage is also central to the standard of distributive justice employed in neoclassical theory, namely that remuneration is meritocratically determined by workers' contribution to production.

shown to either increase the capacity of employers to make credible threats, or reduce the capacity of workers to make credible threats, then these policies contribute to undermining worker capacity to secure the benefits of increased productivity growth in the form of rising real wages.

Bargaining power analysis also concerns the so-called "fallback" position. Each party to a negotiation must consider the situation they will likely face if negotiations are resolved in a manner that is unfavourable to them. For example, employees must consider the situation they face if negotiations were to lead to the termination of their employment (or some other undesirable outcome). Workers assess many considerations in determining their fallback position in the event of job loss, including their savings or other sources of income, the likelihood of securing another job and so on. Worker fallback positions are influenced by public policies, including those policies that provide income during periods of unemployment or other forms of support to both the unemployed and people with low incomes. To the extent that policies associated with the productivity agenda undermine the fallback positions of workers, these policies would contribute to a situation in which workers are less likely to translate productivity growth into rising paycheques.

An Overview of the Canadian Data on Pay and Productivity

Since there is no theoretical necessity of a strong wage/productivity linkage, we must examine the empirical record to ascertain the degree to which real wages in Canada have risen in tandem with productivity growth. This section presents evidence suggesting that there have been two distinct historical epochs since the 1960s regarding the wage/productivity link. Between 1961 and the late 1970s, the real wage/productivity linkage was relatively tight, but thereafter productivity growth generally outpaced increases in compensation.

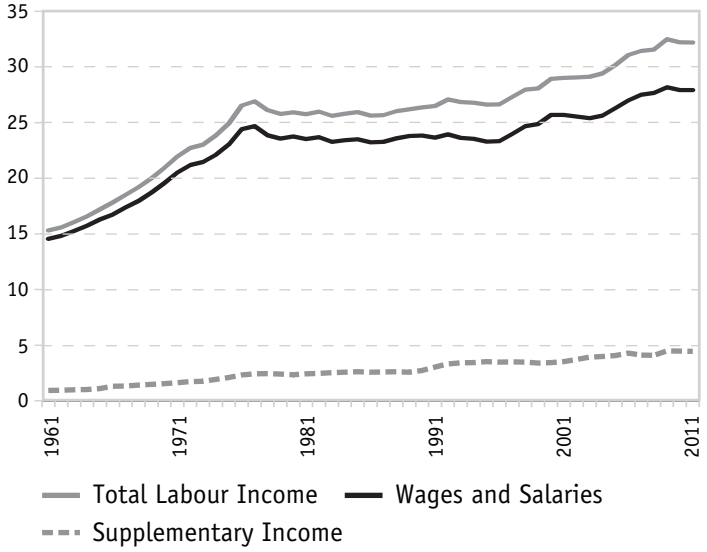
To address this issue in the Canadian context, we work with Statistics Canada's labour income statistics. Labour income statistics have three helpful attributes. First, because this data set extends between 1961 and 2011, it permits the examination of trends over time. Second, this definition of labour income captures over 89-90 per cent of all workers' income throughout the period and about 95 per cent of that income from the mid-1970s onward. Third, Statistics Canada's category "labour income" excludes the self-employed. There is not a clear distinction between wages, profits, and other forms of income for the self-employed. Consequently, estimating the wage-implicit component of self-employed income poses problems ranging from reporting issues to measurement difficulties inherent in the attempt to distinguish income derived from labour versus income derived from profits or other avenues.[7] The exclusion of the self-employed does not dramatically alter the overall conclusions derived below, since the trajectory of the increase in the imputed real wages of the self-employed closely corresponds to that of other workers.

The empirical investigation of the productivity/real wage relationship must grapple with the definition of what constitutes wages.[8] In recent decades, workers increasingly receive non-wage compensation in the form of pensions, health insurance, and a variety of other employer-paid benefits in addition to their paid wages. Feld-

7 Efforts to impute labour income for the self-employed are often based on the questionable assumption that the self-employed earn the same, on average, as comparable paid employees. Freeman (2011) discusses the difficulties of estimating labour income from self-employment.

8 We use the term "wages" and "salaries" interchangeably.

Chart 1
Components of Real Hourly Labour Income based on the CPI, 1961-2011
(expressed in 2011 dollars)



Sources: Statistics Canada, CANSIM database, Tables 326-0021, 382-0001, 382-0006, 383-0003.

stein (2008) followed others (Bosworth *et al.*, 1994, Anderson 2007) in arguing that a narrow focus on wages understates the full extent of employee remuneration, and thus contributes to understating the extent to which workers benefit from productivity growth. Feldstein and others insist that the relevant comparison is between productivity growth and all forms of employee compensation, which includes both paid wages and other fringe benefits and noncash compensation made by employers.

Chart 1 presents real total hourly labour income between 1961 and 2011, including both wages and salaries[9] and "supplementary income."[10] Supplementary income consists of a wide variety of employer payroll contributions including pension and health care benefits.[11] Chart 1 has accounted for inflation using the Consumer Price Index (CPI), as the CPI is the best indicator of the changes in the prices of goods and services purchased by workers.

Chart 1 illustrates that supplementary income is a rising proportion of total labour income over time. It also suggests that real labour income grew rapidly prior to the mid-1970s, but stagnated until the late 1990s when it resumed an upward trend (although at a much slower pace than was the case prior to the 1970s). While this comprehensive approach to employee remuneration undoubtedly captures some payments made by employers that are close substitutes for wages, it is debatable whether all of the items included in supplementary income should be viewed as non-wage compensation, as Leckie and Caron (1991) have acknowledged in a Statistics Canada publication.[12] There are two rea-

9 Statistic Canada defines "wages and salaries" as regular earnings, special payments, stock options and bonus payments.

10 In all charts, the most recent source of data is used for any given year. For example, labour income is obtained from Cansim Table 382-0001 for 1961-1996 and Table 382-0006 for 1997-2011, even though the data in table 382-0001 goes to 2001. This methodological choice does not have a notable impact on the results.

11 Supplementary income as defined by Statistics Canada includes pensions, employment insurance, Canada/Quebec pension plan, worker's compensation, welfare –such as employers contributions to health insurance—and retiring allowances, or "severance pay, including payments for unused sick leave credits and other amounts received upon termination of employment.

12 "Supplementary labour income (SLI) is neither a true benefit nor a true income in the sense of money directly received by employees. SLI represents the contributions to public and private health and welfare plans made by employers on behalf, and for the future benefit, of their employees. While employer contributions may well be the most practicable measure of these benefits, the use of this indicator of SLI is at times misleading. Changes in employer contributions and in employee benefits do not necessarily move in tandem. For instance, changes in financing arrangements or financial conditions may alter employer premiums without producing a corresponding effect on benefit levels. Indeed, where public benefit plans receive a continuing subsidy out of general taxation revenues, the use of employer premiums alone will chronically underestimate the value of the benefits provided" (Leckie and Caron, 1991).

sons that the inclusion of all items in supplementary income may lead to an overstatement of worker remuneration: one concern is that some of these payments function in a manner analogous to taxation,[13] and the second concern focuses on the declining accessibility of the programs funded by some of these payments.

Some forms of supplementary income might arguably be viewed as taxation such as employer contributions to employment insurance (EI) and workers' compensation. These contributions amounted to 21 per cent of supplementary labour income in 2005 (Sharpe, Arsenault and Harrison, 2008, Appendix Table 5). Unlike private retirement or health insurance benefits, employment insurance and workers' compensation are not matters that are internal to the employment contract. These government-mandated payments cover benefits extended via publically-administered programs which could have been designed to be funded through general taxation. Since surplus employment insurance premium revenues have been allocated to government purposes other than funding employment insurance (witness the use of EI funds to reduce the federal deficit in the 1990s), employment insurance premiums might well be regarded as more analogous to taxation than, say, private employer pension contributions.

In reference to the motivations for this article regarding public perception about the benefits of productivity growth, we think it unlikely that the inclusion of payments to fund government social programs is viewed as interchangeable with other types of non-cash compensation as workers assess their total labour income over time. For example, EI benefits paid have become less generous[14] and more difficult to obtain in recent decades. As the probability of receiving these benefits has declined, it seems likely that workers will be less willing to assess these payments as a meaningful portion of their compensation package. It should also be noted that an important component of the labour force is engaged in jobs that offer little or none of the pension, health care or other benefits contained within supplementary income.

Despite these concerns, we have elected to include all forms of supplementary income as part of total worker remuneration, thus adopting the most generous possible assessment of employee pay. This operates to the advantage of those arguing on behalf of a tight linkage between pay and productivity growth.

Another empirical concern raised by Feldstein (2008) and others focuses on the methodology used to adjust nominal dollar amounts for inflation. Chart 1 uses the CPI, which assesses the inflation of all consumer goods purchased by households (including imported consumer goods). Feldstein insists on the use of the GDP deflator, which assesses the inflation of all new domestically produced final goods and services. His insistence on the use of the GDP deflator derives from the neoclassical argument that the nominal wage is equal to the marginal revenue product of labour, which is the marginal product of labour multiplied by the price of the firm's output. Since firms consider the likely price of their output as they bargain over wages, the deflator representing changes in the product price (the GDP deflator) should be used to compare real wages and productivity growth (Feldstein, 2008). There are objections to this approach. For example, Mishel (2012) argues

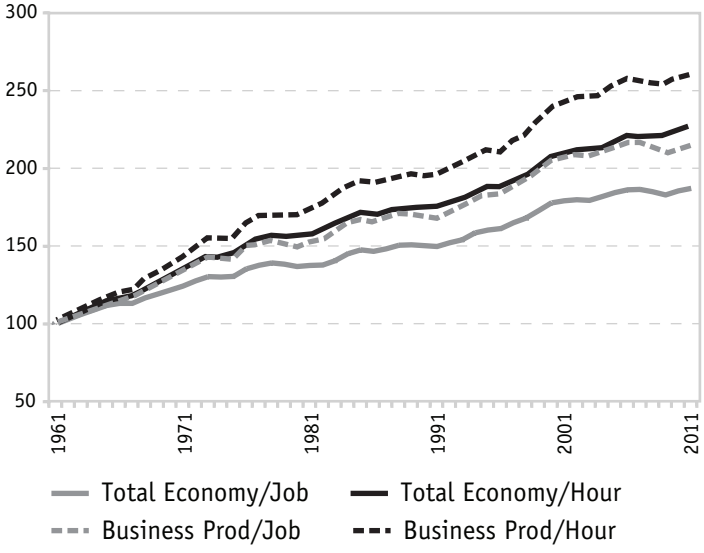
13 The International Labour Organization acknowledges that total compensation may be overstated by including taxation-like payments, and therefore the ILO excludes employer social security contributions in its concept of "total cash remuneration" (International Labour Organization, 1998).

14 In the last three decades, the average percentage of earnings replaced by EI benefits peaked in the early 1990s at slightly over 44 per cent, and have since dropped to around 40 per cent (Osberg and Sharpe, 2011).

Chart 2
Components of Real Hourly Labour Income based on the GDP Deflator, 1961-2011
(expressed in 2011 dollars)

Sources: Statistics Canada, CANSIM database, Tables 380-0056, 382-0001, 382-0006, 383-0003.

Chart 3
Labour Productivity in the Total Economy and the Business Sector, 1961-2011
(1961=100)



Sources: Author's calculations and data from the Centre for the Study of Living Standards.

that workers are focused on changes in what they can buy over time when they assess how much they have benefited from productivity growth.[15] Nevertheless, Chart 2 recalculates the information from Chart 1 using the GDP deflator. The resulting chart depicts a more steady rising of real labour income over time.

Our analysis requires an assessment of productivity with which to compare the progress of total labour income. Chart 3 presents several measures which confirm the growth in labour productivity over the relevant time period.

We use the productivity measure expressed as total economy per hour for the subsequent analysis as opposed to the business sector. The justification for this choice of productivity measure is threefold. First, in terms of the denominator, we require a productivity measure expressed in hourly terms because total labour income is expressed at an hourly rate. Second, in terms of the numerator, we select a measure related to the total economy since total labour income encompasses the earnings of all workers rather than business sector workers alone. Note that the selection of the GDP numerator operates to the advantage of those arguing on behalf of the pay/productivity linkage, given that the productivity measures related to the business sector rise faster than those related to GDP. Third, the choice of a measure of productivity growth expressed in terms of hours has the added virtue that it accounts for the change in the annual number of hours per worker, thus better reflecting the true relationship between labour productivity and actual labour input.

Chart 4 presents the comparison between total real hourly labour income and real hourly labour income grown at the rate of productivity growth between 1961 and 2011.

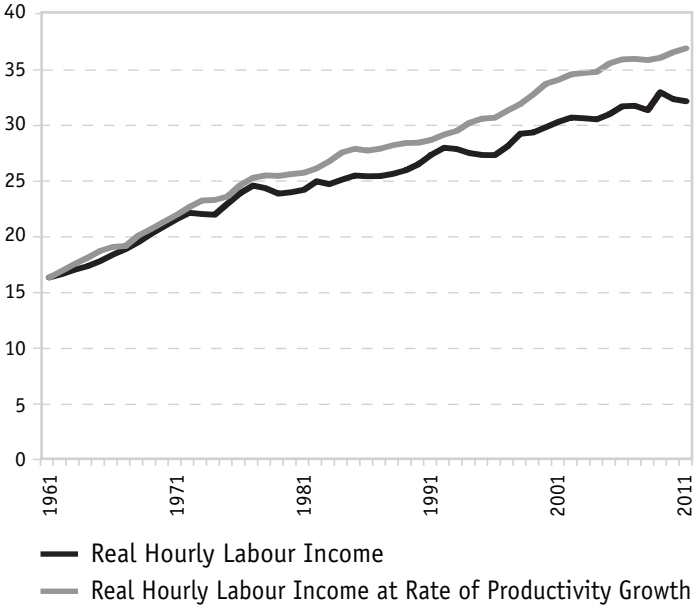
15 Mishel's analysis accounts for the distinction between these methods of accounting for inflation by including a terms of trade measure (Mishel, 2012).

The "real hourly labour income" line represents the rate at which total hourly real labour income grew, while the "labour income at the rate of productivity growth" line represents the rate at which total hourly real labour income would have grown had it identically matched productivity growth (defined as total economy output per hour). Productivity and pay measures are equated at the beginning of the time period under examination as this facilitates the examination of the relative progress of the growth of productivity and pay over time.[16] Some analysts construct the pay and productivity lines to converge in some midpoint in the era under investigation (Rao, 2011). However, this approach tends to understate the visual appearance of any divergence between the two lines.

Chart 4 depicts two distinct historical periods. Between 1961 and the late 1970s, total labour income was rather tightly linked with productivity growth, but by the early 1980s, they began to diverge. Productivity growth did outpace compensation growth during this last period, except for some years in the early 1990s and late 2000s. But even these "catch-up" periods, when compensation growth exceeded productivity growth, were not enough to reverse the overall trend. By 2011, average labour income per hour—expressed in 2011 dollars—was $32.20, while it would have been $36.97 had it followed average productivity growth. If pay had followed productivity, workers would have earned an additional 14.8 per cent per hour; instead the $4.77 differential went to employers.

While Chart 4 illustrates the increasing disconnect of real labour income and productivity growth across employees in general, there are indications that some workers fared better than others. To investigate this possibility, we used Statistics Canada's data on annual earnings, which differ from labour income, in order to compare average and median earnings. Statistics Canada defines earnings as income from paid employment, wages, salaries, commissions and self-employment, so it excludes supplementary income, but includes all other income categories from labour income and self-employment. As Chart 5 illustrates, average earnings are consistently higher than median earnings because higher income workers' earnings are far enough above the median to pull up the average. This difference has been increasing in recent decades. Since the early 1990s, average earnings have

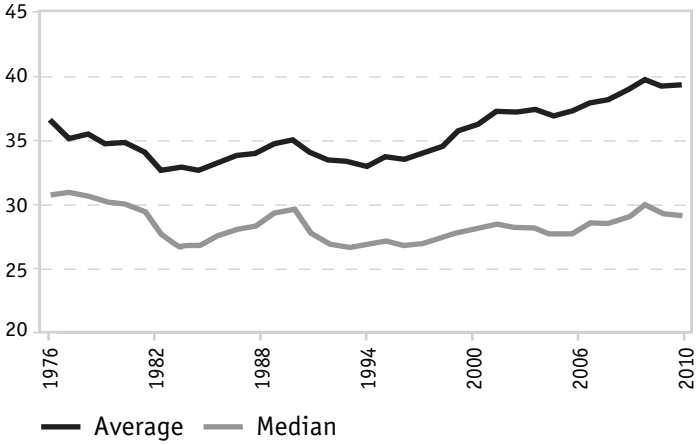
Chart 4
Comparison of Actual Hourly Labour Income and Hourly Labour Income at Rate of Productivity Growth, 1961-2011
($2011, GDP deflator)



Sources: Statistics Canada, CANSIM database, Tables 380-0056, 382-0001, 382-0006, 383-0003, 383-0009 and the Centre for the Study of Living Standards.

16 By equating productivity and labour income at the onset of the time period, this equation focuses attention on any divergence between the growth of labour income and productivity growth. It should not be interpreted as evidence that neoclassical conditions concerning the equation of labour income and the marginal revenue product of labour held at the beginning of the time period.

Chart 5
Real Average and Median Annual Earnings, 1976-2010
(Thousands of 2010 dollars, CPI adjusted)



Sources: Statistics Canada, CANSIM database, Table 202-0101.

increased steadily such that the real average earnings of workers in 2010 exceeded their level in 1976 by $2,800. However, real median earnings have lost ground. The median worker earned $700 less in 2010 than she did in 1976, in 2010 dollars. In 1976, average earnings were 119 per cent of median earnings, while by 2010 average earnings were 134 per cent of median earnings.

This increasing divergence between average and median earnings since the early 1990s suggests a situation in which higher income workers have been much more successful than lower income workers in translating productivity gains into increased real earnings.[17]

The concern that lower income workers are much less capable of receiving the benefits of productivity growth in their own paycheques is reinforced by Table 1, which shows real wage growth (exclusive of supplementary income) by occupation from 1997 to 2010, with occupations ranked by the average hourly wage rate at the beginning of the period.[18] Employees in all occupations saw average annual real wage growth of 0.89 per cent, which falls far short of average productivity growth of 1.20 per cent. However, the experience of the well-paid occupational categories differs starkly from the lower paid occupational categories. The only occupational categories for which workers experienced a wage growth faster than average productivity growth, such as "senior management occupations," are in the upper portion of the table, with an above-average wage rate at the beginning of the period. Of the occupational categories with a below-average wage rate in 1997, only the remuneration linked to "occupations unique to primary industries" grew at a pace close to that of productivity. Incomes in only one other sub-category – chefs, cooks and other occupations in the food industry – increased faster than average.

Bargaining Power and Productivity Policies

In an effort to explain the increasingly weak pay/productivity link in Canada, this section examines the possibility that policies associated with the productivity agenda erode workers' bargaining power and thereby undermine their capacity to secure the benefits of productivity growth in their paycheques. This analysis proceeds by highlighting the two dimensions of bargaining power – threat effects and fallback positions – that were introduced above. We discuss several policies associated with the productivity agenda that may have either influenced the relative capacity of workers and employers to issue credible threats, or their fallback positions. The section concludes with an econometric

17 There is evidence suggesting that much of the income growth has occurred at the very top of the distribution, particularly the top 1 per cent of earners, who are concentrated in finance, management, and the professions (Fortin *et al.*, 2012)

18 All subcategories of occupations are included in this table. In instances where no subcategories were available, broad categories were used.

Table 1
Real Hourly Wage Growth by Selected Occupations, 1997-2010

National Occupational Classification for Statistics (NOC-S)	Annual Hourly Real Wage 1997 ($2011)	Annual Real Wage Compound Growth (hourly) 1997-2010
Senior management occupations	*35.72*	*1.61*
Teachers and professors	30.17	0.44
Professional occupations in health, nurse supervisors and registered nurses	*27.60*	*1.40*
Senior management occupations	*27.27*	*1.77*
Natural and applied sciences and related occupations	27.05	1.09
Professional occupations in business and finance	*25.98*	*1.28*
Contractors and supervisors in trades and transportation	25.39	0.87
Occupations in social science, government service and religion	22.78	1.02
Other trades occupations	22.19	0.71
Occupation in protective services	22.08	0.63
Wholesale, technical, insurance, real estate sales specialists, and retail, wholesale and grain buyers	21.43	0.72
Construction trades	21.2	0.48
Occupations in art, culture, recreation and sport	20.48	0.76
Total employees, all occupations	20.09	0.89
Technical, assisting and related occupations in health	20.05	0.56
Financial, secretarial and administrative occupations	19.90	0.64
Transport and equipment operators	18.92	0.63
Machine operators and assemblers in manufacturing, including supervisors	18.79	0.47
Clerical occupations, including supervisors	17.32	0.55
Trades helpers, construction, and transportation labourers and related occupations	17.08	0.35
Occupations unique to primary industry	16.65	1.19
Labourers in processing, manufacturing and utilities	16.03	-0.29
Childcare and home support workers	15.3	0.3
Sales and service occupations not elsewhere classified, including occupations in travel and accomodation	12.91	0.42
Retail salespersons, sales clerks, cashiers, including retail trade supervisors	12.06	0.64
Chefs and cooks, and occupations in food and beverage service, including supervisors	11.64	0.96

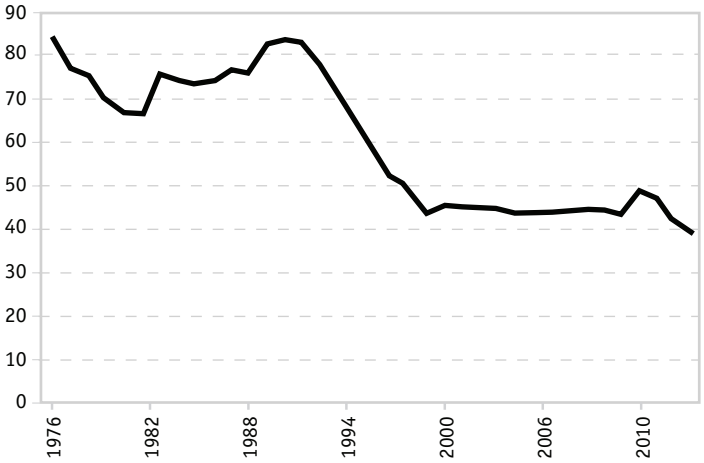
Note: Italicized catagories exceed compound average annual productivity growth of 1.20.
Sources: Labour Force Survey, Statistics Canada, CANSIM database, Tables 282-0070 and 326-0021.

analysis of several prominent pro-productivity policies to explore the relationship between these public policies and the gap between pay and productivity.

Policies related to the productivity agenda have several elements that shape threat effects. For example, we would expect international agreements such as the North American Free Trade Agreement (NAFTA) to diminish worker bargaining power to the extent that they facilitate the relocation of production abroad. Trade agreements, such as NAFTA and the 1988 Canada-US Free Trade Agreement, have been introduced as a means to "raise Canada's productivity and ...thereby provide permanently higher real incomes for Canadians" (Department of Finance, 1988:27). Another theme in the productivity agenda has been the promotion of "labour market flexibility".[19] The pursuit of labour

19 Karabegovic, Gabler and Veldhuis (2012) provide a good overview of prominent policies associated with labour market flexibility.

Chart 6
EI Coverage Ratio, 1976-2012
(per cent of unemployed receiving regular EI benefits)



Sources: Statistics Canada, CANSIM database, Tables 276-0001, 282-0048.

market flexibility has influenced many diverse public policies, which in turn have affected the capacity of workers and employers to issue credible threats. These include legislative, judicial and procedural developments that constrain the capacity of unions to organize, undermine job security, and inhibit unions and workers from engaging in various forms of militancy.

The employment insurance system has been extensively restructured in recent decades, often with the explicit objective of enhancing labour productivity and creating "good jobs" (Human Resources Development Canada, 1994). Various reforms have resulted in an EI system that covers fewer unemployed workers (Chart 6), and that is less generous in the income it replaces for those that do qualify. Both of these changes to the EI system would be expected to make workers' fallback positions more precarious, thus contributing to declining worker bargaining power.

In considering their fallback positions, workers must assess their alternative employment prospects. Thus, the overall unemployment rate will factor into worker assessments of the likelihood of obtaining alternative employment and the wages associated with that employment. Anti-inflationary monetary policies which are prominent in the productivity agenda have tended to increase the unemployment rate (Fortin, 2001). Another consideration in workers' assessment of their fallback position is the level of remuneration they are likely to secure if they do find alternative employment. Since workers' worst case scenario is that they will be paid minimum wage, statutory minimum wages influence workers' fallback positions. Moreover, wages slightly above the statutory minimum wage rate may be influenced by the minimum wage level. Real minimum wages in Canada dropped through the first half of the 1980s, and have only barely surpassed their 1980 value in the late 2000s in most provinces. While the failure of the statutory minimum wage to rise in real terms often reflects policy inaction, demands for minimum wage increases are often condemned by advocates of labour market flexibility (Elgrably, 2006).

In short, a variety of public policies associated directly or indirectly with the productivity agenda may affect relative bargaining power to the detriment of employees by constraining their capacity to issue credible threats, making their fallback positions less attractive, or by enhancing their employers' recourse to threats and/or fallback position. As an illustration of the way public policies could have influenced the bargaining power of workers and their ability to capture the fruits of productivity growth over the last decades, we identified some quantifiable variables that may be expected to have an influence on bargaining power and estimated their impact on the productivity-income gap. Four of the variables we examined are directly related to pub-

lic policies: the rate of coverage of EI, the relative generosity of EI benefits, the rate of growth of real minimum wage, and the North-American Free Trade Agreement. Two additional variables which could be expected to have an important impact on workers' bargaining power are the unemployment rate and the rate of union membership. These are included in the analysis because the anti-inflation and labour market flexibility aspects of the productivity agenda have encouraged various government actions that affect these variables.

The equation estimated is the following:

$$Gap_{i,t} = \beta_0 + \beta_2 Gap_{i,t-1} + \beta_3 Gap_{i,t-2} + \beta_4 U_{i,t} \beta_5 EICov_{i,t} + \beta_6 IncRep_{i,t} + \beta_7 MinW_{i,t} + \beta_8 UMem_{i,t} \beta_9 Nafta_{i,t} + \sum_{j=1985}^{j=2010} \alpha_j T_j$$

Where the subscript *i* identifies the province, *t* is the time period, *Gap* is the difference between the growth rate of productivity and the growth rate of labour income, *U* is the rate of unemployment, *EIcov* is the rate of coverage of employment insurance, *IncRep* is the average proportion of earnings replaced by EI benefits, *MinW* is the rate of growth of minimum wage, *UMem* is the rate of union membership, *Nafta* is a dummy variable taking the value of 1 after the start of the North American Free Trade Agreement (from 1994 onward), and *T* is a series of time dummies, using 1984 as the base year.[20]

We estimated this equation for the period spanning from 1981 to 2010, using annual data for every province, via an Arellano-Bover/Blundell-Bond linear dynamic panel estimation.[21] We estimated two regressions, the second one without the rate of coverage of employment insurance because of the very low statistical significance of the variable's estimated coefficient in the first regression. Estimation results are laid out in Table 2.

The coefficients on the lags of Gap are both negative and statistically significant in both regressions, which suggests that an increase in the income-productivity gap in one year does not lead to an explosive process of increases in subsequent years. While these increases do add up, as we have shown above, there seems to be a tendency for some catching up immediately after the gap increases.

As can be expected, the rate of unemployment has a positive and strongly statistically significant effect on the gap. This is consistent with the proposition that higher unemployment rates reduce worker bargaining power. Employment insurance is an important component of workers' fallback and expectedly, the higher the proportion of income covered by EI benefits, the lower the productivity-pay gap for that year. The coefficient of the rate of coverage of EI is not significant in the first regression, which is surprising at first blush. However, given the way the program was reformed by the Liberal government in the 1990s, there is a major drop in coverage that is concentrated over those years while the rate is otherwise relatively stable, which could make its yearly effect difficult to measure.

The coefficient of the rate of union membership is marginally statistically insignificant

20 Data sources for the econometric analysis include Cansim Tables 382-0001, 382-0006, 282-0028, 384-0038 for the gap; Human Resources and Skills Development Canada for the minimum wage; Cansim Tables 282-0048, 276-0001 for the EI coverage rate; Osberg, Lars and Andrew Sharpe (2011, Table 19) for the EI replacement ratio; Cansim Table 282-0086 for the unemployment rate; and Cansim Tables 279-0025, 282-0220 for union membership.

21 We employ Arellano-Bover/Blundell-Bond linear dynamic panel estimation in order to adjust for the endogeneity between the lagged dependent variable and the province-specific effects. To do so, the model is transformed into first differences and instrumental variables are computed from lagged dependent variables and lagged differences, in a generalized method of moments approach.

Table 2
Econometric Results

Dependent variable: Gap_t	(1)	(2)
Gap_{t-1}	-0.309***	-0.307***
	(0.036)	(0.041)
Gap_{t-2}	-0.441***	-0.438***
	(0.063)	(0.071)
U_t	0.0051***	0.0053***
	(0.0011)	(0.0012)
$EICov_t$	0.000075	
	(0.00045)	
$IncRep_t$	-0.0022*	-0.0022*
	(0.0013)	(0.0013)
$MinW_t$	-0.089*	-0.087*
	(0.046)	(0.046)
$UMem_t$	-0.0018	-0.0017*
	(0.0011)	(0.0009)
$Nafta_{t-1}$	0.053*	0.053*
	(0.029)	(0.03)
Number of observations	270	270
Years covered	1981-2010	1981-2010

Estimates are obtained using an Arellano-Bover/Blundell-Bond linear dynamic panel estimation, including year dummies. The coefficients for year dummies and for the constant term are not reported. Standard errors are in parentheses.

* statistical significance at 10%

** statistical significance at 5%

*** statistical significance at 1%.

at the 10 per cent level in the first regression, but negative and statistically significant once we take out the rate of EI coverage, suggesting that there might have been a statistical interaction between the two variables. The negative coefficient of union membership suggests that a higher rate of union membership tends to narrow the productivity-income gap. The coefficient on the rate of growth of the minimum wage is negative and statistically significant in both regressions. This result is expected, since an increase in the minimum wage has both a direct positive effect on the labour income of the workers earning that wage, and a positive influence on the overall fallback of other workers. Finally, the coefficient on the NAFTA dummy is positive and statistically significant in both regressions, suggesting that the agreement indeed had a negative effect on the bargaining power of workers.[22]

Conclusion

Public policies are often predicated on the assumption that real wages rise with productivity growth. If this link between productivity growth and pay were incontrovertible, we would expect pro-productivity policies to be highly popular. Yet, advocates of the productivity agenda are often puzzled that the public views productivity growth with mistrust.

We argue that the link between pay and productivity growth is not automatic in theory. Thus, empirical analysis must assess whether the pay/productivity linkage holds in the Canadian context. We find that Canadian real labour income has increasingly lagged behind productivity growth over recent decades. In addition, evidence suggests that this divergence between productivity growth and real labour income is greater for low-income workers.

Since productivity growth offers the possibility – but not necessity – of real wage growth, we conclude our article with an examination of the conditions in which productivity growth is likely to translate into wage growth. We use a bargaining power approach to argue that the relative bargaining power of employers and employees is important in determining whether employees are capable of translating productivity into real wage growth.

22 Technically speaking, the significance of the estimated coefficient on the dummy variable only tells us that there is a break in the series starting in the mid-1990s. We interpret the estimated coefficient as capturing the effect of the implementation of NAFTA in 1994 given the importance of that accord, but it could also reflect other structural changes that happened in the period, such as the focus on inflation targeting by the Bank of Canada early in the decade.

Bargaining power is influenced by many factors, including the public policy environment in which wage determination takes place. To the extent that bargaining power is shifted toward employers by public policies associated with the productivity agenda, this presents a plausible reason that the concept of productivity, and the efforts by government to boost productivity, are greeted with suspicion. Indeed our econometric analysis suggests that EI reforms, the NAFTA agreement, the behavior of the minimum wage, the unemployment rate, and unionization rates have affected the capacity of workers to reap the benefits of productivity growth. This result is consistent with our hypothesis that public policies associated with the productivity agenda have eroded worker bargaining power, thereby diminishing workers' ability to secure wage gains in tandem with productivity growth.

The bargaining power perspective is a promising approach for future research. For example, it would be worthwhile to investigate the possibility that low-income workers have suffered greater erosion of their bargaining power than higher income workers, thus leading to the differences in average and median earnings depicted in Chart 6. This avenue of exploration may offer important insights into the relation between the dynamics of bargaining power and the larger question of income inequality.

The relationship between public policies intended to boost productivity growth and the real wage/productivity gap suggests a reinterpretation of the productivity agenda for policy-makers. The unpopularity of the productivity agenda is understandable if workers have reason to regard these policies as harming their relative bargaining power. To the extent that the productivity agenda undermines workers' capacity to benefit from any ensuing productivity growth, it is possible that the productivity agenda is generating some of its own headwinds. Policies intended to encourage productivity growth might thus be both more successful and just if they are designed to enable the fruits of productivity growth to be more broadly shared.

References

Arellano, M. and O. Bover (1995) "Another Look at the Instrumental Variable Estimation of Error-Components Models," *Journal of Econometrics*, Vol. 68, pp. 29-51.

Anderson, Richard (2007) "How Well Do Wages Follow Productivity Growth?" *National Economic Trends*, Federal Reserve Board of St. Louis.

Bartlett, Randal and Stephen Tapp (2012) *An Assessment of Canada's Labour Market Performance*, Office of the Parliamentary Budget Officer. Ottawa.

Blundell, R. and S. Bond (1998) "Initial Conditions and Moment Restrictions in Dynamic Panel Data Models," *Journal of Econometrics*, Vol. 87, pp. 115-143.

Bosworth, Barry, George Perry, and Matthew Shapiro (1994) "Productivity and Real Wages: Is There a Puzzle?" *Brookings Papers on Economic Activity*, Vol. 25, No. 1, pp. 317-344.

Carney, Mark (2010) "*The Virtue of Productivity in a Wicked World*," Ottawa Economics Association, March, http://www.bankofcanada.ca/2010/03/virtue-productivity-wicked-world/.

Department of Finance, Canada (1988) *Canada-U.S. Free Trade Agreement: An Economic Assessment*.

Dodge, David (2005) "*Investing in Productivity*," Canadian Council for Public-Private Partnerships Toronto, http://www.bankofcanada.ca/2005/11/investing-in-productivity/.

Drummond, Donald (2006) "The Economists' Manifesto for Curing Ailing Canadian Productivity," *International Productivity Monitor*, No. 13, Fall, pp. 21-26.

Drummond, Donald (2011) "Confessions of a Serial Productivity Researcher," *International Productivity Monitor*, No. 22, Fall, pp. 3-10.

Drummond, Donald and Alistair Bentley (2010) "The Productivity Puzzle: Why is the Canadian Record So Poor And What Can We Do About It?" Special Report, TD Economics.

Environics Research Group (1985) *Focus Canada 1985-5* (Toronto: Canadian Opinion Research Archive).

Environics Research Group (2005) *Focus Canada 2005* (Toronto: Canadian Opinion Research Archive).

Elgrably, Nathalie (2006) "The Minimum Wage and Labour Flexibility," *Economic Note*, Montreal Economic Institute.

Feldstein, Martin (2008) "Did Wages Reflect Growth in Productivity," NBER Working Paper No. 13953, National Bureau of Economic Research.

Feldstein, Martin (2011) "Want to Boost the Economy? Lower Corporate Tax Rates," *The Wall Street Journal* [New York], February 15.

Fortin, Nicole, David A. Green, Thomas Lemieux and Kevin Milligan (2012) "Canadian Inequality: Recent Developments and Policy Options," *Canadian Public Policy*, Vol. 38, No. 2, June, pp. 121-145.

Fortin, Pierre (2001) "Interest Rates, Unemployment and Inflation: The Canadian Experience in the 1990s" in Keith Banting, Andrew Sharpe, and France St-Hilaire (eds.) *The Longest Decade: Canada in the 1990s* (Ottawa: Centre for the Study of Living Standards and Montreal: Institute for Research on Public Policy).

Freeman, Rebecca (2011) "Accounting for the Self-Employed in Labour Share Estimates: The Case of the United States," OECD Science, Technology, and Industry Working Papers No. 2011/04.

Government of Canada (2013) "*Why EU Trade Deal is Good News for Canadian Workers*," Canada's Economic Action Plan.

Herle, David (2007) "Poll-Driven Politics: The Role of Public Opinion in Canada," *Policy Options*, May, pp. 19-25.

Human Resources Development Canada (1994) *Improving Social Security in Canada: A Discussion Paper*.

International Labour Organization (1998) "Resolution Concerning the Measurement of Employment-Related Income," Sixteenth International Conference of Labour Statisticians.

International Labour Organization (2013) *Global Wage Report, 2012-13*.

Karabegovic, Amela, Nachum Gabler, and Niels Veldhuis (2012) "Measuring Labour Markets in Canada and the United States," Fraser Institute.

Leckie, Norm and Christina Caron (1991) "On Non-Wage Labour Income," *Perspectives on Labour and Income*, Statistics Canada, Vol. 3, No. 4, Winter.

Mishel, Lawrence (2012) "The Wedges Between Productivity And Median Compensation Growth," *Issue Brief #330*, Economic Policy Institute.

Mishel, Lawrence and Kar-Fai Gee (2012) "Why Aren't Workers Benefiting from Labour Productivity Growth in the United States," *International Productivity Monitor*, No. 23, Spring, pp. 31-43.

Mulroney, Brian (2011) "Productivity: Canada's Weakest Link," *Policy Options*, December, pp. 6-10.

Osberg, Lars and Andrew Sharpe (2011) "Beyond GDP: Measuring Economic Well-being in Canada and the Provinces, 1981-2010," CSLS Research Report No. 2011-11, Centre for the Study of Living Standards.

Rao, Someshwar (2011) "Cracking Canada's Productivity Conundrum," Institute for Research on Public Policy Study No. 25.

Rennison, Lori and JulieTurcotte (2004) "The Link between Technology Use, Human Capital, Productivity and Wages: Firm-level Evidence," *International Productivity Monitor*, No. 9, Fall.

Sharpe, Andrew, Jean-Francois Arsenault and Peter Harrison (2008a) "The Relationship Between Labour Productivity and Real Wage Growth in Canada and OECD Countries," CSLS Research Report No. 2008-8, Centre for the Study of Living Standards.

Sharpe, Andrew, Jean-Francois Arsenault and Peter Harrison (2008b) "Why Have Real Wages Lagged Labour Productivity Growth in Canada?," *International Productivity Monitor*, No. 17, Fall, pp. 16-27.

Walsh, Carl (2004) "The Productivity and Jobs Connection: The Long and Short Run of It," *FRBSF Economic Letter*, Federal Reserve Bank of San Francisco.

Weber, Max (1947) *The Theory of Social and Economic Organization* translated by Talcott Parsons (New York: Free Press).