**MIMINUM WAGES IN CANADA: THEORY,
EVIDENCE AND POLICY**

**(Prepared for the Federal Labour
Standards Review Commission)**

by

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INTRODUCTION

As a policy instrument, minimum wage legislation is called upon to serve a variety of interrelated purposes, albeit often with contradictory objectives as well as ulterior motives different form those explicitly stated. The main purposes as espoused in the literature, and expanded upon subsequently, are:
1) Alleviate poverty
2) Reduce wage inequality
3) Put a floor below which transactions are not allowed to occur
4) Eliminate low-wage jobs and encourage movement up the value-added chain
5) Provide an incentive to leave income maintenance programs
6) Increase aggregate demand with associated multiplier effects
7) Help pay for rising tuition fees
8) Protect the unprotected who have little individual or collective bargaining power
9) Protect the protected by reducing low-wage competition
10) Reduce the need for unions, and
11) Provide a model for emulation by others.

Not surprisingly, when "burdened with so many tasks" and "serving so many masters" minimum wages tend to generate heated controversy. The controversy, however, tends to generate more "heat" than "light" and often clouds the policy discussion. The purpose of this paper is to try to generate some light on the issue, with particular attention paid to the role of minimum wages in the federal jurisdiction of Canada. The paper begins with a discussion of the rationales for minimum wage legislation. It then analyses the theoretically expected impact on a range of outcomes of policy interest. Potentially offsetting factors that could mitigate the adverse effects are then discussed. Methodologies for estimating the impact of minimum wages are outlined. With this background in place, the empirical evidence on the impacts is then documented. Canadian studies are given separate treatment both because they are obviously of most relevance to the policy debate in Canada, and because (for reasons discussed) Canada provides an excellent "laboratory" for estimating minimum wage impacts. Minimum wages in Canada are then described – how they vary and the characteristics of those covered. Aspects of the federal minimum wage are then discussed, with particular attention to the key policy issue of whether there should be a return to the pre 1996 situation where the federal minimum was set independently or a continuation of the current policy of having it set equal to the minimum wage in the provincial jurisdiction where the federally protected workers are employed.

RATIONALES FOR MINIMUM WAGE LEGISLATION

The various rationales for minimum wage legislation will be outlined and critically assessed. The intent is not to indicate the appropriateness or inappropriateness of a rationale, but rather to highlight the various trade-offs that are involved and the requirements for minimum wages to achieve these stated purposes. At this stage, the various rationales will simply be

summarized. Later, theoretical considerations and empirical evidence will be brought to bear on the extent to which minimum wages achieve some of these goals.

Alleviating Poverty

        Alleviating poverty tends to be the most important objective advanced for minimum wage legislation. At first glance, the connection seems obvious. If the person remains employed then raising wages increases annual earnings which can contribute to a reduction in poverty. The advantages of minimum wages as an anti-poverty device include:

➢ They enable recipients to "earn" their income which is generally regarded as preferable (by both recipients and "payers") to receiving income in the form of a transfer payment.
➢ They bolster the labour market as a first line of defence against poverty.
➢ Minimum wages may provide an attractive and more dignified alternative to social assistance or other income support programs.

        The disadvantage of minimum wages as an anti-poverty device are generally associated with the fact that they are at best an exceedingly blunt instrument for dealing with poverty, and may actually have a perverse effect, exacerbating poverty.

➢ If the person loses their job or is offered fewer hours of work because of the minimum wage, then the minimum wage can contribute to, rather than alleviate, poverty.
➢ Poverty is related to *family* income relative to family *need*, while minimum wages are paid to individuals irrespective of their family situation or need. In that vein, minimum wages are not well targeted towards the poverty population, many of whom are not able to work in the first place.
➢ As an anti-poverty device, minimum wages would also be poorly targeted even to the working poor since they also affect the earnings of youths and multiple earners in wealthier families.
➢ Minimum wages affect only small portions of the population, most of whom are youths who are still within their family and temporarily in minimum wage jobs.
➢ Minimum wages are an exceedingly blunt instrument for curbing poverty because even if the person were in poverty and remained employed, the earnings increase would not likely do much to close the poverty gap.
➢ Some jobs are low-wage because they provide training or experience that can be valuable for subsequent wage growth that can facilitate a move out of poverty. If this training or experience is no longer possible (i.e., it is "priced out of the market") then this could exacerbate poverty in the long-run.
➢ Pricing such jobs out of the market because they cannot be done at a low wage, can lead to their being done at a zero wage as in the case of volunteer work or unpaid internships that are often done for the value of the experience. There is some irony to the fact that low-wage jobs are illegal, but jobs at zero wages can be encouraged for social reasons.
➢ Using minimum wages to curb poverty places the onus on employers to deal with a social issue the costs of which should be shared by society in general. If a person is paid $6.00 per hour and society deems that they should be paid $8.00 per hour for social reasons, then it would seem appropriate for that difference to be paid out of general tax revenues perhaps in the form of a wage subsidy, rather than imposed on a particular employer.

<u>Reduce Wage Inequality</u>

Somewhat related to the objective of reducing poverty, minimum wages are also sometimes regarded as a policy instrument for reducing wage inequality (theory and evidence discussed subsequently). Such wage inequality has increased in recent years, largely reflecting the impact of technological change that has reduced the employment prospects of the less skilled, while increasing those of the more skilled. Other contributing factors include industrial restructuring from manufacturing to services (both low-end personal services and high-end business and financial services) as well as trade liberalisation where import competition has been strongest at the low end of the wage spectrum.

<u>Place a Floor on Market Transactions</u>

Minimum wages are sometimes justified on the ground of placing a floor below which labour market transactions are not allowed to occur. The rationale for this is usually couched in vague terms such as "people ought not to have to work at wages below the floor" irrespective of their productivity or the fact that the floor may mean that they cannot work at all. In that vein, minimum wages are simply a form of price fixing. Such price fixing occurs in other areas such as the requirement to pay "fair wages" in government contracts or "living wages" often in public sector jobs.

<u>Eliminate Low Wage Jobs and Encourage Employers to Move up the Value-Added Chain</u>

While the potential adverse employment effect of minimum wages is generally regarded as a negative consequence, there is a perspective that regards the elimination of such jobs as a positive consequence. Presumably, the rationale is that it puts pressure on employers to move up the value-added chain and create only higher-wage jobs. Minimum wages may also create pressures for employers to train their now higher priced labour so that their productivity now matches their higher pay, again enhancing productivity. Without such pressures, employers would gear their production processes to the availability of low-wage labour, with a low-wage labour market being a self-perpetuating equilibrium. Even if people are displaced into unemployment by minimum wages, this puts pressure on governments to develop training and other programs to move them into the higher-wage jobs.

Sometimes the argument is tied up in terms of foreign competition. That is, it is impossible to compete with the extreme low wages that exist in many developing countries; hence, it is better to eliminate such jobs domestically and focus on creating high-productivity, high-wage jobs. Forcing employers to invest in labour-saving technology may be essential in the long run to maintain competitiveness and hence create (or at least save) other jobs – any elimination of low-wage jobs being a regrettable by-product of this process.

Obviously, if the elimination of low-wage jobs were a costless process this would seem socially desirable. But the elimination of such jobs is costly to those who lose them, and it obviously imposes costs on employers who otherwise rely on low-wage, low-productivity labour. It is easy to say "better no-job than a low-wage job" if you are not the recipient of no job. As well, if training low-wage workers for higher wage jobs is socially desirable, this can be

done without eliminating low-wage jobs – it is a matter of devoting resources to move minimum wage workers up the value added chain. Over, this argument of minimum wages ultimately enhancing productivity and competitiveness is difficult to assess theoretically or empirically.

Provide an Incentive to Leave Income Maintenance Programs

Minimum wage legislation is sometimes justified on the ground of providing an incentive to leave income maintenance programs like welfare. If the monetary returns to work are higher, then there obviously is an incentive to engage in labour market work as opposed to remaining on an income maintenance program. This obviously can be a saving to taxpayers. It is also likely to be preferred by transfer recipients, most of whom are likely to prefer work to welfare if the work pays sufficiently.

While this may occur in many circumstances, it is also likely to be the case that the elimination of many low-wage jobs can also reduce the opportunities to leave income maintenance programs for work. Such work requires that the jobs are available and it is not clear that fewer jobs (because some are eliminated because of the minimum wage, although the remaining ones are higher-paid) provide more alternatives to welfare than does more lower-wage jobs. Furthermore, if it is socially desirable to provide higher-wage jobs to induce people to voluntarily move out of income maintenance programs, then it would seem that the appropriate policy response is for governments to supplement the pay in otherwise low-wage jobs. This assumes, of course, that employers are paying low wages because the jobs are of low productivity, and that employers are thereby assuming the full labour cost associated with such work. In such circumstances, a government supported wage subsidy would mean that there would not be an adverse employment effect. It would also ensure that the burden is shared across society and not imposed on a small number of employers who are otherwise paying low wages because the workers simply have low productivity. The concern, however, is that employers may be paying low wages not because of low productivity, in which case a government wage subsidy effectively subsidizes their behaviour.

Increase Aggregate Demand and Generate Multiplier Effects

There is some intuitive appeal to the notion that minimum wages may raise aggregate demand in the economy by putting purchasing power in the hands of low income persons who are likely to spend rather than save. This is especially the case since minimum wage earners are likely to spend their income in their community to the benefit of the local economy, as opposed to spending on travel and foreign luxury goods. Such initial spending could have multiplier effects as it ripples through the system affecting the purchasing power and spending of others. As indicated by Whittingham (1970, p. 4-8) in documenting the early arguments advanced in favour of minimum wage legislation in Ontario when it was first applied in the 1920s: "Side effects from setting [minimum wage] floors such as … placing a floor under purchasing power ... were used by the Board as selling points to gain support for its program."

The operative phrase here is "selling points" since there is little contemporary credence placed by economists on such arguments. It is not clear how aggregate demand would be affected by minimum wages given that some would be unemployed with little or no purchasing

power. Furthermore, if firms did not have to pay the higher wages presumably they would spend on other items like investment and this would increase aggregate demand and have multiplier effects. Much of the investment spending would also be in the local community. In dealing with aggregate effects it is always important to consider the counterfactual of what would occur in the absence of the event (e.g., the minimum wage increase). The counterfactual is seldom that nothing would occur.

Help Pay for Rising Tuition Fees
　　　　Raising minimum wages may be regarded as a policy that would help students pay for rising tuition fees. This could be especially important for those who are otherwise credit constrained and hence who would find it difficult to finance post-secondary education, perhaps because of their disadvantaged status. Since students are increasingly working while in school, higher minimum wages could possibly help in this regard.

　　　　This, of course, must be traded off against the possibility that some may not be able to get jobs because of the higher minimum wage. As well, higher minimum wages may entice some to leave school to look for the higher paying jobs. Furthermore, there is no reason tuition fees should be singled out as a merited expenditure item any more than, say, the basic necessities of food, shelter and clothing. Policies to assist in meeting tuition fees are likely best dealt with more directly through such means as scholarships, loans and financial aid.

Protect the Unprotected
　　　　Historically, minimum wages were instituted to "protect the unprotected" – namely women and youths. As indicated by Whittingham (1970, p. 4-8) minimum wages were introduced in the 1920s:
> "To protect the physical, moral and intellectual well-being of female workers … by ensuring that single female workers would be paid a living wage, thereby protecting those unorganised workers who had little bargaining power ...
> …
> In 1937 … the authority to set legal minimum wages was extended to male employees, a reflection of concern over cut-throat competition and the related socially undesirable impact on wages that occurred during the depression of the 1930s. However … while the principle of a minimum wage for male employees was accepted in 1937, with one minor exception floor rates for male workers was not ordered until 1963, twenty-six years after the enabling legislation was passed.
> …

A more modern day rationale would include protecting others who have little individual bargaining power or collective bargaining power against employers (and the modern day rationale would not likely deem women in need of categorical "protection").

　　　　It is possible that benevolent employers may willingly accept the legislative constraints of minimum wages (as well as other employment standards) providing that it is uniformly and fairly applied to all. In effect, it provides a level playing field and inhibits what some may regard as "unfair" competition based on low-wages. It gets employers around the "prisoner's dilemma"

problem of having to pay low wages to compete with their competitors who pay low wages. All may agree not to compete on that bases by agreeing to all be bound by legislative constraints that inhibit them from paying low wages.

Of course, if the low wages reflected low productivity, then this would not be "unfair" competition. As well, rallying cries against "unfair" competition usually result from their being *any* competition. Also, the prisoner's dilemma rationale of all agreeing not to compete on the bases of very low wages is not relevant to a global market place where it is not possible to enforce such co-operative behaviour.

Protect the Already Protected from Low-Wage Competition

A more cynical version of the protection rationale is that minimum wages are not designed to help those who receive the minimum wage, but rather to protect the already protected higher-wage groups who otherwise would be subject to competition from low-wage labour. This is an interpretation often given to the historical rationale to protect women and youths – that is, the real rationale was to protect males from competition from lower-wage women and youths. Unions can also benefit from reduced competition from low-wage labour. The same can apply to higher-wage employers for whom minimum wage legislation would not be a binding constraint, although it could be a binding constraint on their low-wage competitors.

It is often emphasized in economics that those who are regulated tend to "capture" the regulatory process to further their own ends, often under the guise of lofty social goals. This is especially the case when incumbent employers want to deter new firms from entering the market and competing on the basis of lower costs and hence prices. One way to do this is by extending, to potential new entrants, the costly regulations that the incumbent employers already meet – such incumbent employers have revealed that they can already meet those costs since they are surviving in the market under such costs. By extending them through laws and regulations they ensure that new entrants also have to meet those higher costs.

Reduce Need for Unions

A related cynical interpretation of the "real" rationale for labour standards legislation, including minimum wages, is to potentially reduce the demand for unions. If the "state" can provide the protection, there may be less need for individuals to look to unions to provide such protection. For some employers, employment standards laws may be the "lesser of two evils." They generally impose costs, but involve less of a loss of control than can be the case under unionisation. In a game - theoretic context, labour standards laws can be a form of collective pre-commitment whereby employers as a group agree to be mutually bound by such laws. The laws are costly, but less costly than the alternative of, say, unionisation. Having laws that are uniformly mandated on all employers can get around the prisoner's dilemma problem that each employer would have an incentive to defect if adherence to such employment standards to deter unionisation relied on voluntary co-operation.

For this reason unions often opposed labour standards laws when first introduced. The fact that unions almost invariably support them now, however, suggests that this rationale as

being a possible substitute for unions is offset by the fact that they tend to help unions by reducing competition from low-wage labour that could otherwise be a substitute for unions.

Provide a Model to be Emulated by Others

A rationale for minimum wage legislation that may be particularly relevant to the federal jurisdiction is to provide a model to be emulated by other jurisdictions. This is particularly the case since, as discussed subsequently, workers in the federal jurisdiction tend not to work in jobs that are affected by minimum wages at least at conventional levels. As well, the federal jurisdiction may be closely watched as a possible leader in "progressive" initiatives, setting the cue for others to follow. The federal minimum wage may thereby be a pattern setting norm to be emulated by other jurisdictions.

There is empirical evidence that minimum wage setting in Canada follows a "race to the middle" based on government's responding to voters' notions of fairness (Green and Harrison, 2005). That is, minimum wages are set by comparisons to the minimum wage in other jurisdictions as well as the median wage of other low-skilled workers so as not to appear to be unfair in their minimum wage setting process. Ideological pressures cause deviations from that pattern, with left-leaning governments tending to set relatively higher minimum wages and right-leaning ones setting lower ones (largely by not altering the minimum wage so that its real value gets eroded by inflation), although those deviations dissipate over time as governments change.

Whether the federal government does, or should, follow this process is an open question (dealt with in the conclusion of this paper). As indicated, it is more likely to be a beacon for norm setting and hence can deviate from the pattern of following others to the middle. That it *should* fulfil its role as a pattern setter assumes that the advantages of a higher minimum wage outweigh its disadvantages – an assumption that is extremely contested as documented subsequently. Furthermore, an argument can be made that it should *not* play the role of a leader putting political pressure on others to follow since the federal government does not likely bear the cost (in terms of possible lost jobs) from a higher minimum wage given that few workers in the federal jurisdiction are at the minimum wage. As such, it may be socially irresponsible to lead others into battle when it is at no risk. It is simply enhancing its image at the expense of others who may feel pressured to follow, but whose constituencies may bear the cost. In effect, it may simply be encouraging the "exporting" of jobs by pricing them out of the market, given global pressures.

Relevance of Rationales in Current Environment

Clearly, there are a variety of rationales for minimum wage legislation and they are not always mutually consistent (e.g., reduce low-wage non-union competition which should foster unionisation versus reduce the demand for unions by providing higher wages through legislative fiat). Whatever the rationales, there are reasons to believe that many of them are more relevant and others are less relevant in the new world of work of today compared to the former old world of work.

Minimum wages may be more relevant to curb the rising wage inequality, although this could also mean that the increasing number at the bottom of the wage distribution could have their employment opportunities adversely affected by minimum wages. Minimum wages also may be more relevant for encouraging people off of the rolls of welfare or other forms of income maintenance (assuming, again, that they obtain jobs) since increased emphasis is being placed on "workfare" or encouraging able-bodied person off the roles of welfare. As well, minimum wages may be regarded as increasingly relevant to assist the "working poor" whose wages otherwise are so low that they cannot earn a living wage. Minimum wages may be more relevant to eliminate low-wage jobs and encourage movement up the value-added chain, given the increased emphasis on competing on the bases of high value-added and high productivity for high-wage economies. They may be more relevant to protect the unprotected who have little individual or collective bargaining power, given the decline in unionization (slight in Canada, nevertheless a decline) as well as the likely decline in union bargaining power given the forces of global competition.

In contrast, minimum wages may be less relevant in the new compared to the old world of work for a number of reasons. Given the proliferation of multiple earners in the family (emanating from the increased labour force participation of women and youths working part-time while in school) the connection between an individual's wage and family poverty is weakened even further. The growth of small business and non-standard employment means that minimum wage legislation may be more difficult to monitor given the nature of such jobs (although this is likely to be more true of other aspects of labour standards since minimum wages are relatively straightforward).   There is concern, however, that regulations can have a disproportionately adverse effect on the small business sector given the small profit margins, and that this can jeopardise the new job creation that characterises that sector. In general, there is growing concern that increased regulation will deter new investment and the jobs associated with that investment given the increased mobility of financial and physical capital in the global economy. This could be of particular concern if federal minimum wage increases, which are not likely to be resisted in that sector given the fact that it is a non-binding constraint for most federal employers, played a leading-edge role putting political pressure on other jurisdictions to raise their minimum wages and this regulatory constraint affected employers in those jurisdictions.

Many of the dilemmas associated with minimum wage legislation arise because wages are an unusual "price" in that they are called upon to serve a variety of competing functions, not all of which are mutually compatible. From an economist's perspective, wages are used to allocate labour to its most efficient use and to create the appropriate incentives with respect to labour supply (participation, hours of work) as well as human capital formation (education, training, mobility, job search). From a policy perspective, however, wages are also called upon to help alleviate poverty and to influence the distribution of income. They can also have an impact on aggregate unemployment as well as competitiveness. Not surprisingly, when a single instrument is called upon to serve so many functions, conflicts may arise.

THEORETICALLY EXPECTED IMPACT OF MINIMUM WAGES

        Minimum wage legislation can have an impact on various dimensions of labour market behaviour[1]. The dimensions examined here include employment, hours of work, earnings, wage inequality, income distribution, labour force participation, unemployment, fringe benefits and working conditions, training, spillover effects on other wages, and aggregate wages. In this section, the expected effect is outlined based on basic principles of economics.

<u>Employment</u>
        By far the most studied aspect of minimum wage legislation is its impact on employment. The static, partial equilibrium impact of minimum wages is straightforward. Minimum wage increases should unambiguously reduce employment since the substitution and scale effects work in the same direction. That is, the minimum wage increase should induce firms to substitute away from the higher priced labour that receives the minimum wage increase, and into using more of other inputs including capital and even higher priced labour that does not receive the minimum wage increase. In the short-run such substitution may be difficult, but in the long-run it can occur in subtle fashions especially as firms alter their technology and processes of production. For example: self-service gasoline stations with credit card payment systems can substitute for low-wage attendants who pump gas; buildings can be designed to require low maintenance as a substitute for custodial and maintenance services; discount retailers (e.g., Costco and Home Depot) that utilise automated inventory and self-service systems can substitute for more personalised retailing; pre-packaged foods can substitute for food preparation; disposable food containers can substitute for dishwashing; and almost "disposable" consumer goods can substitute for repairs (it is generally cheaper to buy a new toaster, likely made with low-wage foreign labour, than to try to repair a broken one).

        In addition to this substitution effect, wage increases induce a scale or output effect as firms pass part of the cost increase to consumers who reduce their purchases of the more expensive goods or services. This in turn reduces the firm's derived demand for the higher priced labour as well as all other complementary inputs. In the extreme, the cost increase could force some firms out of business, perhaps shifting some of their lost production offshore, thereby eliminating those jobs as well as the use of complementary inputs including other workers.

        In a dynamic growing economy, these adverse employment effects would be manifest in the slower growth of employment of minimum wage jobs rather than layoffs or terminations of persons at the minimum wage. This is likely one of the reasons that minimum wage effects are so difficult to observe.

        The magnitude of this adverse employment effect depends upon the elasticity of demand for labour with respect to the minimum wage increase. That elasticity is likely to be large, and hence the adverse employment effect substantial, if:

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[1] Many of the theoretical issues and the empirical evidence on the impact of minimum wages is contained in recent comprehensive reviews such as Brown, Gilroy and Kohen (1982), Brown (1999), Card and Krueger (1995) and Kennan (1995).

1) There are many good substitute inputs for those affected by the minimum wage increase
2) There are many good substitute goods and services for those produced by the minimum wage labour so that consumers will substitute away such goods when their price increases
3) Minimum wage labour costs are a substantial portion of the costs of producing the product or service
4) The substitute inputs are in elastic supply such that their use will not be choked off by their price increasing as the demand for such substitutes increase as they are used in place of minimum wage labour.

In general, most of these factors are such that the demand for minimum wage labour is likely to be fairly elastic, and hence the adverse employment effect large, especially in the longer run. For example, minimum wage labour is unlikely to possess scarce talents that make it such that other inputs cannot be substituted for minimum wage labour, especially in the longer run when employers have had the opportunity to alter their production process. Similarly, the products and services produced by minimum wage labour (e.g., textiles, personal services) are likely to be sensitive to price increases, especially given the availability of low-cost imports (in essence making low-wage labour in other countries a substitute for minimum wage labour in Canada). Even in the case of non-tradable personal services (e.g., restaurants, custodial and maintenance) there is generally considerable sensitivity to the prices that are charged in part because of intense competition as well as alternatives through subcontracting. Many minimum wage jobs are also in labour intensive industries where labour costs are a substantial component of total costs. Also, the substitute inputs (e.g., basic capital equipment and other labour) are likely to be fairly readily available in elastic supply since they are not "unique" inputs. This is especially the case given world markets under globalisation.

While minimum wage legislation should have an unambiguously negative effect on the demand for workers affected by the minimum wage, it can have an ambiguous effect on the demand for other workers who are not at the minimum wage. The substitution effect away from workers at the minimum wage should increase the demand for workers who are substituted for minimum wage labour. If minimum wages disproportionately affect teenagers, for example, this could mean an increase in the demand for youths (age 20-24) to the extent that they tend to be paid slightly above the minimum wage and are a good substitute for teenage labour. In contrast, if the employment of persons at the minimum wage fall then this means a reduction in the demand for other inputs (including workers) who are complements to workers at the minimum wage. Similarly, the output reduction emanating from the minimum wage increase (in the extreme, the firm going out of business) means a reduction in all inputs including other workers at the firm. For these reasons, the demand for non-minimum wage labour is affected in an ambiguous fashion by minimum wage increases; their employment could increase or decrease as a result of minimum wage changes.

Hours
        While the employment response of minimum wage receives by far the most attention, employers can also adjust the hours of work of those affected by the minimum wage increase. The decision as to whether to adjust hours or employment generally depends on the quasi-fixed costs associated with hiring, training and terminating employees. If such costs are high, then firms are more likely to adjust the hours of existing employees so as not to incur the fixed costs if they terminate existing employees and may have to subsequently rehire them or hire and train new employees.

        In general, such fixed costs are not regarded as substantial for less skilled employees at the minimum wage. Training is often minimal, as is recruiting and hiring costs, at least compared to more skilled employees who embody considerable human capital. For this reason, firms are just as likely to reduce the employment of minimum wage workers as they are to reduce their hours, in contrast to skilled employees where they may reduce their hours so as not to lose them (and the quasi-fixed hiring and training costs they embody).

        This does suggest, however, that the employment response of minimum wage increases may understate the total reduction in labour demand to include hours reductions. In essence, if any hours reductions were converted to full-time equivalents, the employment response would be larger.

Labour Force Participation
        Minimum wages could reduce labour force participation (i.e., the decision to enter the labour force and work or look for work) because the adverse employment effect would discourage people from entering the labour market given that fewer jobs are available – a form of the "discouraged worker" effect. Alternatively stated, those who cannot get a job because the minimum wage has "priced them out of the market" may leave the labour force altogether and engage in non-labour force activities. For younger people this could mean school, for older persons it could be retirement, and for others it may be household activities.

        Working in the other direction, if a family member loses their job because of the minimum wage, other family members may enter the labour market and work or look for work – a form of the "added worker" effect. As well, given the higher wage in the minimum wage jobs more persons may engage in "wait unemployment" – remaining in the labour force in the hope of getting the more coveted job.

Unemployment
        Minimum wages can increase unemployment to the extent that there is an adverse employment effect and the person remains in the labour force looking for work. This may exacerbated by the "added worker" effect if other family members also enter and look for work to offset the decline in family income associated with the job loss. It may be further exacerbated by the possibility that those who are looking for work may engage in longer "wait unemployment" given the higher-wage jobs. Working in the other direction, the fewer number of jobs that exist because they are priced out of the market by the minimum wage may lead some

to leave the labour force altogether and engage in other activities such as school, retirement or household work. To the extent that there is substantial labour force withdrawal, then the rise in unemployment would be much smaller than the decrease in employment.

Education Enrolment

Since remaining in school is one form of not participating in the labour market, the theoretically expected effect of minimum wages on the decision to remain in school is similar to those related to the labour force participation decision. More specifically, minimum wages can have opposing effects on the enrolment decision[2] and hence the impact is ultimately an empirical matter.

Minimum wages can encourage youths to remain enrolled in school because any adverse employment effect of minimum wages means there are fewer jobs – to the extent that they are "priced out of the market" they may remain in school. This is reinforced by the fact that the additional education may be necessary for them to raise their productivity to be able to get the higher-wage minimum wage jobs.

Working in the other direction, minimum wages may discourage youths from staying in school to the extent that the higher minimum wages both increase the opportunity cost of remaining in school since that cost is now the forgone income from a higher wage job, and they increase the benefits from dropping out to the extent that they would get a higher-wage minimum wage job. Minimum wages may also induce employers to shift from part-time to full-time employees, and this would induce some students who otherwise worked part-time while attending school to drop-out and work full-time.

Spillover or Ripple Effects

Minimum wages can affect wages not only of those directly affected by the minimum wage but also of others especially just above the minimum wage who are likely to be good substitutes for minimum wage workers. The mechanism whereby this occurred on the demand side was discussed previously. That is, the demand for workers just above the minimum could increase if they are used as substitutes for the higher priced minimum wage workers. Alternatively, the demand for such workers could decrease if they were complements to minimum wage labour or if the reduced output because of the higher costs and hence prices reduced the demand for all inputs including slightly higher priced labour. As such, the demand and hence wages of persons just above the minimum could increase or decrease although it is likely it would increase, as they were used to substitute for minimum wage labour.

There could be spillover effects on the supply side if persons displaced by the minimum wage increase sought work in those slightly higher paying jobs. This is unlikely to be prominent, however, since they would likely have sought those more coveted jobs in the first place. If they cannot keep a minimum wage job they are unlikely to be able to get a higher paying job. This could occur if they engage in more "wait unemployment" for the higher paying job and this

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[2] Landon (1997) provides a clear statement of these opposing forces as well as a review of much of the empirical evidence.

greater queue of persons seeking these jobs could constrain their wages. But again, this is unlikely to be prominent since they would likely have done this in the first place as opposed to accepting their minimum wage job.

The spillover or ripple effect throughout the wage distribution, but especially for jobs just above the minimum, could also occur for institutional reasons as firms try to restore at least some of their former wage structure. If the next lowest paying job paid 20 percent more than the job at the minimum wage, and this was the benchmark that employees used in accepting that job, then the firm may try to restore at least part of that former differential for purposes of recruiting, retention and morale (hence it could be consistent with profit maximising behaviour on the part of the firm – a consideration formally modelled in Grossman (1983).   This could lead to a ripple or whipsawing effect throughout the wage distribution, with the crest being greatest in jobs closest to the minimum and dissipating for higher wage jobs.

There could also be spillover effects onto wages below the minimum wage – for example, for uncovered workers or for persons working below the legal minimum. These would largely work in the same direction as for persons above the minimum. That is, wages would increase to the extent that the lower wage workers were substitutes and to restore old relativities. The could decrease, however, to the extent that they were complements to the minimum wage workers or to the extent there were adverse output effects that reduced the demand for all workers. For those below the minimum, there is greater likelihood of a supply spillover from persons who lost their job because of the minimum wage and who are displaced to the lower wage sector with that supply influx lowering wages in that sector.

Aggregate Wages
The previously discussed spillover effects imply that minimum wage increases should lead to higher aggregate wage changes both directly because of the minimum wage increase and indirectly because of these spillover effects. In effect, this shifts any Phillip's curve outwards because it implies higher aggregate wage changes at each level of unemployment.

Prices
The prices of goods and services produced by labour receiving a minimum wage increase should increase as part of the cost increase is passed forward to consumers. If minimum wage increases reduce employment and this in turn leads to reduced output, then this reduced supply should also increase prices. If monopsony prevails, however, (discussed subsequently) then the minimum wage increases could lead to increased employment this should increase output with this supply increase lowering prices.

Fringe Benefits and Working Conditions
Wages are only one aspect of total compensation. As such, employers may respond to minimum wage legislation by lowering the non-wage component of total compensation. While this component is substantial for many workers (approximately one-third of total compensation) it is not likely to be so common for minimum wage jobs. As well, many are required by law and

in minimum wage jobs the non-wage aspects of the job are also likely to be at the legal minimum.

Nevertheless, there are components that could be changed such as break times, uniforms, store discounts and payments in kind such as meals in restaurants. As well, employers may increase the general pace of work, effectively deteriorating the working conditions.

Training and Human Capital Formation

Employers often provide training on the job, sometimes formally and sometimes informally through mentors or matching new employees with experienced employees who will "show them the ropes." If this training is company specific and usable only in the sponsoring company, then the company will generally pay for the training. They are not at risk of losing the trained employee because the training is specifically usable only in the sponsoring company. If the training is generally usable in other companies, however, then the company will be less likely to pay for the training since they would effectively have to double pay – pay for the training and pay a higher wage to keep the employee from going to other organisations that do not train but instead "poach" or hire employees from companies that do train. In such circumstances, employees have an incentive to pay for the generally usable training since they reap the benefits in terms of higher wages and better employment opportunities. One way for employees to "pay" for such training is to accept a lower wage during the training period or to work in companies that are know for providing good training.

Minimum wage legislation can preclude such "transactions" if the pay would otherwise have fallen below the minimum wage and if there was no exemption for training or a separate training minimum. Even if there were an exemption or separate training minimum this would not apply to companies that were known as companies that provide a good training environment in return for paying low wages. The exception would be for volunteer labour or non-paying internships and where they were "done for the experience" which could be valuable in obtaining other jobs. As indicated previously, it is ironic that such training and experience cannot be provided in jobs that pay below the minimum unless they do not pay at all.

To the extent that minimum wage jobs are "dead-end" jobs then it is unlikely that they provide much training in the first place. Certainly, most are not low-wage jobs *because* they are providing an abundance of coveted skill training. Nevertheless, many jobs in low-wage retail trade and services can provide valuable on-the-job training through experience, and newcomers to the labour force may accept the low wages in return for that experience. Such "trading" of wages for experience are disallowed by minimum wage legislation.

Training can also be reduced by any adverse employment effect or reduced hours emanating from minimum wage legislation because if people are not working they are not accumulating the on-the-job training and experience that comes with such working. This can be particularly important for young workers making the school-to-work transition.

While training is likely to be reduced both because of the direct effect through making it more difficult for employees to obtain on-the-job training by accepting a lower wage, and the indirect effect that comes from any adverse employment effect and its associated training, the minimum wage could encourage employees to acquire additional training and education so as to improve their productivity to *qualify* for the scarcer high wage jobs. This could also apply to employers who may not want to lay off workers in response to the minimum wage increase (perhaps because of quasi-fixed costs) and hence who will upgrade them so that their productivity is commensurate with their new higher wage.

Earnings

Earnings are the product of wages times hours worked. As such, the earnings of persons at the minimum wage would be affected in an ambiguous fashion by the minimum wage increase. Their wages would obviously rise, but their hours of work would fall (being zero for those who were no longer employed). This is why minimum wages can have quite different effects, creating "winners" and "losers" for workers at the minimum. Those who retain their jobs at the higher wage are clearly winners; those who lose their job are clearly losers.

Wage Inequality

Minimum wage increases can have a complicated impact on wage inequality. Wage inequality should be reduced because:

➢ Some of the bottom of the wage distribution is eliminated or effectively truncated if such jobs disappear because of the minimum wage.
➢ Those who retain their job should move up the distribution to the "spike" at the new higher minimum wage.
➢ Positive spillover effects likely will occur raising wages just above the minimum wage for reasons discussed previously; however, there will also be more of such jobs (to the extent that they substitute for minimum wage jobs) and they are still low-paying jobs even though they pay above the minimum wage
➢ Positive spillover effects will also likely occur raising wage for those below the minimum wage for the same reasons, although supply spillovers could lower wages in that sector. As well, there will be more of such low-wage jobs (if they substitute for the minimum wage jobs) even though they now likely pay slightly higher wages.

Minimum wages could exacerbate wage inequality in the long run, however, to the extent that they discourage training and other human capital formation that could otherwise raise wages.

Income Distribution and Poverty

The effect of minimum wages on the distribution of income is likely to follow the pattern of the effect on wage inequality as outlined previously, and for the same reasons. Income distribution, however, also is affected by employment and to the extent that there is an adverse employment effect this could worsen the distribution of income. As well, the income distribution is affected by the impacts on different family members.

The connection between minimum wages and poverty is further complicated by the fact that wages affect an individual, while poverty depends upon family need as well as the number of wage earners in a family and the effect on their employment and hours of work. Minimum wages are more likely to reduce family poverty if persons affected by the minimum wage come from poor families, they retain their jobs and hours of work after the increase, they have multiple earners at the minimum wages, and many of the poor are working poor. They could exacerbate poverty to the extent that there is an adverse effect on employment or on training or human capital formation that could otherwise facilitate a move out of poverty. In any case, minimum wages are likely to be an exceedingly blunt instrument for alleviating poverty, and could even have perverse effects.

POTENTIAL OFFSETTING FACTORS MITIGATING ADVERSE EFFECTS

As discussed previously, economic theory unambiguously predicts that minimum wage increases should lead to reductions in employment since the substitution and scale effect work in the same direction to reduce the firms demand for labour in response to an exogenous wage increase – demand curves slope downwards. There are, however, potential offsetting factors that could mitigate these adverse employment effects. There is even the possibility of a paradoxical result of an increase in employment.

Monopsony

Monopsony exists when the employer is so large relative to the size of the local labour market that the employer is a wage setter and not a wage taker. It is not absolute size that matters, but rather size relative to the local labour market. A large firm in a city could be a competitive buyer of particular types of labour. A small firm in a local labour market could still be the dominant employer – the stereotype being the one-industry town. A firm that is a competitive buyer of most types of labour could still be the dominant firm for other more specialised types of labour that likely could only find work with that particular employer, at least in that local labour market.

Firms that are competitive buyers of labour face infinitely elastic labour supply schedules at the going rate. They can hire all of the labour they want at the going wage; conversely if they lower their wage they will loose all of their workforce. In contrast, monopsonists face upward sloping supply schedules. If the want to hire additional labour (e.g., to attract it in from other firms or industries or regions or from the household or from retirement) they have to raise wages. Conversely, if they lower their wage they will lose some but not all of their workforce. Some workers will stay out of loyalty or ties to the local employer or because of lack of alternatives elsewhere.

When the monopsonist has to raise wages to attract in additional workers, it also has to pay its existing similar workers the same higher wage rate for reasons of internal equity – otherwise morale problems and turnover of the existing workers may arise. In such circumstances, the cost of hiring additional workers is not only the higher wage that must be

paid, but also the additional cost of raising the wages of the existing workforce. That is, the marginal cost of hiring additional workers (which is the relevant factor in the firm's decision making calculus) is the higher wage for new recruits *plus* the increment in wages for the existing workforce. In such circumstances, the monopsonist is understandably reluctant to hire additional workers. In fact, the monopsonist will constantly report vacancies and shortages of labour *at the existing wage rate* but will do nothing to reduce those vacancies because of the high marginal cost of doing so since it would also have to adjust its existing internal wage structure. The vacancies will be equilibrium vacancies and persist.

Ironically, if the monopsonist is faced with an exogenously imposed minimum wage rate that is above the wage it pays, it may actually *increase* its employment, at least over a range of wage increases (Manning, 2003). This paradoxical result occurs because the monopsonist is no longer constrained in its hiring decision by the fact that it must pay higher wages to attract in new workers (and adjust its internal wage structure accordingly). It can hire new workers at the fixed minimum wage and it pays that same wage to its existing workforce. It does not *like* to have to pay the higher minimum wage, but it would no longer be reluctant to expand its workforce because of the higher wage it would have to pay to new recruits and to its existing workers.

A variant of the monopsony model is given in Wessels (1997). If restaurants (or service establishments whose employees rely on tips) want to expand their workforces they have to pay higher wages to existing personnel to offset the reduction in tips that waiters will experience as more waiters are "spread over" a given clientele. This inhibits them from expanding their workforce. If faced with a higher minimum wage, however, they do not have to raise wages to expand, and hence they may increase employment as in the conventional monopsony case.

How likely is it that monopsony could prevail, especially in sectors impacted by the minimum wage (e.g., retailing and services)? In general, we think of such sectors as having an infinitely elastic supply of low-wage, high-turnover labour to draw on without having to raise wages. Furthermore, in a world of advanced communications, transportation and rapid information dissemination the stereotypical one-industry town where the firm sets wages is not so relevant. Nevertheless, many small otherwise competitive firms may have a degree of local monopsony power in that they draw on a local labour market that has geographic ties to that employer. Local residents may want to work at that location because it is close to their home or school. Furthermore, employers do seem to worry that if they raise wages to attract more recruits or reduce quits they may also have to adjust the internal wage structure for their existing workforce to avoid costly turnover and morale problems. Employers may have a degree of dynamic monopsony power in that they have to raise wages to increase the flow of applicants or reduce the flow of quits. Conversely, lower wages will reduce but not eliminate the flow of applicants, and it will increase the flow of quits, but many workers will still remain even if wages are lowered somewhat.

Whether monopsony is more of a theoretical curiosity or a real-world possibility remains an open question, especially in low-wage labour markets that do not involve unique skills that

are specific to the particular employer. It does raise the possibility, however, that minimum wage increases may not have an adverse employment effect, and indeed may even increase employment at least over a limited range of wage increases. As seen subsequently, it is an issue that has some relevance to interpreting some of the new evidence on minimum wage effects – or lack of such effects.

Wages Tied to Jobs

Wages are very often tied to jobs, especially in larger organisations or franchises operating in different locations. In such circumstances when faced with a minimum wage increase in particular localities, the short-run response may simply be to keep employing people at that higher wage. In fact, even more may be employed if they were earlier having recruiting problems because of the lower wages since more may now apply to fill those slots (a variant of the dynamic monopsony situation outlined earlier).

While this can lead to a lack of a short-run response, and even the possibility of a short-run increase in employment, in the longer run such practices will likely be re-evaluated, with substitutions being made away from the more expensive labour. The substitutions could be subtle, for example, by using more higher-wage personnel who are more productive.

Shock Effects

The adverse employment effect of minimum wage increases may be offset by shock effects on both employers and employees. The minimum wage increase may shock employers into reassessing their internal practices and to engage in efficiency enhancing changes that they should have done in the first place – but they needed the catalyst of an exogenous wage increase. There is the conventional adage "if it ain't broke don't fix it" but there is also the counter-adage "if it ain't broke, break it" so as to provide a catalyst to induce productive change – the minimum wage increase could be the catalyst that "breaks it." Employers, for example, may now find it worthwhile to utilise their new higher priced labour in a more efficient fashion.

The shock effect could apply to workers more directly. In return for the higher wage they may be more motivated and work harder and smarter – a form of the efficiency wage response where higher wages induce higher productivity rather than the conventional causality which works from higher productivity to higher wages. As in the efficiency wage scenario, higher wages may "pay for themselves."

Economists are generally uncomfortable with such arguments[3] –indeed often hostile to them since they imply that the firms were not behaving optimally in the first place. If it "pays" to utilise your workforce more efficiently or to pay efficiency wages after a minimum wage increase, then it would have paid them to do it without the minimum wage increase. While this is likely the case, it is also the case that at least some shock effect may be present to alleviate at least some of the adverse employment effect.

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[3] Prasch (1996) gives many of the non-economic arguments on why minimum wages may not reduce employment.

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Offsetting Fringe Benefits, Working Conditions and Training

As discussed previously, minimum wages by definition affect only the wage portion of total compensation. Employers may well try to offset some of the costs by reducing fringe benefits or altering work conditions (e.g., speeding up the pace of work, or shortening break times). To the extent that they offered training in return for a lower wage during the training period they may also reduce the training component in their jobs.

It is difficult to determine how important these offsets could be in minimum wage jobs. Such jobs tend not to offer generous fringe benefits or large amounts of skill training. Nevertheless, they can offer informal on-the-job training through experience and there may be some scope to alter the pace of work and break times. This is especially the case if there is now a larger queue of applicants who are now wanting the higher paying jobs.

Train or Upgrade Existing Personnel

Working in the other direction, there is an institutional argument that is sometimes advanced. That is, forced with having to pay a higher wage under the minimum wage increase, employers will now try to upgrade those persons so that their productivity is commensurate with their new higher pay. The "implicit model" behind this behavioural response is certainly not obvious since it would appear that firms would be augmenting not offsetting their cost – paying for a minimum wage increase and then paying to upgrade their personnel. The only way that the training or upgrading cost would be offsetting would be if the firm expected the employee to absorb more training and upgrading that would normally be regarded as an addition to the workload, but that now is tolerated by employees because of the higher pay.

Aggregate Demand and Multiplier Effects

To the extent that they were substantial and affected large groups of workers, minimum wages could increase the purchasing power of such employees and this could increase consumption and hence aggregate demand, possibly with multiplier effects through the system. This would be the case especially if such groups had a higher propensity to consume out of their low income. This in turn could offset at least some of the adverse employment effect of the minimum wage increase.

As indicated, such aggregate demand effects are not given much credence by economists since they would require large numbers to be affected in a substantial fashion. Furthermore, their purchasing power would not be enhanced if they were unemployed because of the minimum wage increase. As well, minimum wages essentially involve a transfer from employers and ultimately customers to workers who receive the higher wage and still have a job. The fact that it is a transfer presumably means that employers are spending less, say on investment, and this should affect aggregate demand. The same applies to customers if their real purchasing power is reduced by higher prices.

Endogenous Response

The adverse employment effect of a minimum wage increase could be mitigated – more accurately "hidden" – if the minimum wage were endogenously determined and increased only

when substantial employment growth was otherwise expected in the low-wage sector. In such circumstances, employment may continue to grow, albeit less rapidly than if there was no minimum wage increase. Since minimum wage changes are "political acts" then this may be a rational aspect of political decision making since slower employment growth is likely to be more politically acceptable than job losses. It could be that much of the decline in real minimum wages (documented subsequently) that occurred in recent years reflects a reluctance to raise minimum wages when low-wage employment is already under jeopardy because of skill-biased technological change and import competition from low-wage countries.

If minimum wages are more likely to be increased when there is more rapid growth in the low-wage sector, there still would be an adverse employment effect. It simply would be more "hidden" in the form of *slower* employment growth that otherwise would have occurred.

Summary of Potentially Offsetting Factors
Clearly there are a wide range of factors that could offset, in part at least, the adverse employment effect that economic theory predicts to result from minimum wage increases. In most circumstances, these arguments are not part of conventional economic reasoning, albeit monopsony and adjustments to fringe benefits and working conditions could be potentially offsetting factors. In general, however, the expectation remains for minimum wage increases to lead to an adverse employment effect, especially in the longer run.

METHODOLOGY FOR ESTIMATING IMPACT

A wide range of methodologies have been used to estimate the impact of minimum wage legislation, with the focus being on measuring the employment impact. This section can be skipped by those who are interested only in the bottom-line evidence presented later, rather than the methodologies used to generate that evidence.

Time Series Analysis
The most common earlier methodology, prior to the advent of large cross section and panel data sets, was time series regression. The analysis usually involved regressing the ratio of employment to the population on a set of control variable as well as a measure of the minimum wage. Control variables included such factors as a measure of the business cycle, school enrolment and the share of youth in the population (to capture cohort size effects). The minimum wage variable is usually constructed as an employment weighted average of the minimum wage relative to the average wage in each industry. It is also usually weighted by the percent of the industry that is covered by the minimum wage. This minimum wage measure is sometimes referred to as the Kaitz index after its originator. The analysis is sometimes done for different age, gender and race groups. Twenty six of such studies in the United States are reviewed in Brown, Gilroy and Kohen (1982), 28 in Brown (1999) and 29 in Card and Krueger (1995, p. 180-82). Such time series analysis, however, suffers from the difficulty of controlling for the myriad of other factors that change over time and that can affect employment opportunities.

Aggregate Cross Section Analysis

Aggregate cross section studies usually used the state or metropolitan area in the United States as the unit of analysis. Variation in the minimum wages tended to come from three main sources: (1) state "top ups" to the federal minimum wage that was otherwise the same across the country, (2) state variation in the coverage, (3) differences in the average hourly earnings across states, which gave rise to variation in the denominator of the ratio of the minimum wage to the average wage in the area.

Similar to the time series analysis, the ratio of employment to the population was used as the dependent variable. Control variables included: the ratio of the youth to the adult population to control for cohort size effects that could otherwise affect wages; unemployment rates; family income; and urban size. As with the time series analysis, however, it is often difficult to fully control for the effect of these other factors that could influence employment opportunities.

Combined Aggregate Cross Section, Time Series Panels of States over Time

Obviously combining time series and cross section data provides richer data sets and this has been a more common procedure in the 1990s. Brown (1999, p. 2125) cites seven of such studies[4], with some containing more than one set of estimates based on different data sets. Control variables are similar to the ones used in the time series and cross section studies, but also include state and time fixed effects. The minimum wage variable is sometimes constructed similar to the Kaitz index – the maximum of the federal or state minimum, adjusted for coverage (e.g., Neumark and Wascher 1992) and sometimes as the fraction of the relevant population that is affected by a minimum wage increase (Card 1992a, b; Card and Krueger 1995). Obviously, having both time series and cross section variation in minimum wages helps identifying their impacts, albeit controlling for the full range of factors that can also influence employment opportunities poses a challenge.

Individual Employment Transition Probabilities with Panel Data for those "At Risk"

A more novel and recent approach involves estimating the transition probabilities of individuals from employment to non-employment based on panel data that follows the same individual over time[5]. Essentially, the "treatment" group of individuals "at risk" of being affected by a minimum wage increase are identified as individuals whose wage is "bounded" by or lies between the old minimum wage and the new minimum wage at a point in time. Their transition probability or probability of being employed in the next period is then compared to various control groups who are not "at risk" of being affected by the minimum wage increase. Essentially a regression equation is estimated where the dependent variable is coded 1 if the person is employed in period t, zero otherwise, based on data of persons who were employed in period t-1. A series of control variables in period t-1 were used that could affect the transition

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[4] Card (1992a), Neumark and Wascher (1992, 1994), Card, Katz and Krueger (1994), Card and Krueger (1995), Deere, Murphy and Welch (1995).

[5] Variants of this procedure have been used in Linneman (1982), Currie and Fallick (1996) for the U.S., Abowd, Kramarz, Lemieux and Margolis (2000) for France and the US, and Campolieti, Fang and Gunderson (2005a, b) and Yeun (2003) for Canada.

probability of being employed in period t, given that they were employed in period t-1. The minimum wage variable is essentially a dummy variable coded 1 if the person was in the "treatment" group of individual at risk of being affected by the minimum wage in that their wage fell in between the old and new minimum, and coded 0 for persons in the control group who were not at risk of being affected by the minimum wage increase. The coefficient on the minimum wage variable[6] gives the effect of being at risk of being subject to a minimum wage change (compared to the control group that is not at risk of being affected) on the probability of being employed in period t, conditional upon having been employed in period t-1, and after controlling for the effect of other variables that could affect that transition probability.

A minimum wage gap measure can also be used, constructed as the difference between the individual's actual wage and the minimum wage for those "at risk" of being affected by the minimum wage increase in that their wage fell in between the old and new minimum. The gap would capture the extent to which an individual's wage would have to increase to be in compliance with the new minimum wage. The larger the potential increase (and hence the greater the cost to the employer) the less likely the person would be expected to be employed in the next period. The minimum wage gap or potential wage increase would be set to 0 for persons in the control group whose wage would not be affected by the minimum wage increase.

Control groups are utilised to control for the other factors that could affect the employment transition probabilities of persons who are *not* at risk of being affected by the minimum wage increase. These "baseline" effects should be "subtracted" from the effect for those "at risk" to get a pure "treatment effect" of the impact of the minimum wage. The control group could include all other persons not "at risk" of being affected by the minimum wage – that is, all persons whose wages are not bounded by the minimum wage increase. Or it could include only persons who are likely to be similar to those experiencing the minimum wage increase but who do not experience a minimum wage increase – for example, those whose wages lie in the same bound as those potentially affected by a minimum wage increase, but who are in jurisdictions that did not have a minimum wage increase. Such, "treatment" - "control" group procedures likely control for the impact of factors that could confound the impact of minimum wages better than simple time series, cross-section studies.

Natural Experiments and Difference-in-Difference Estimators
Another novel approach[7] that has been used in a number of recent studies – and the ones that have generated the most controversy – involves comparisons of before-and-after employment changes in firms in jurisdiction that have experienced a minimum wage increase (the "treatment" group), compared to firms in contiguous jurisdictions that are otherwise similar, except that they did not experience a minimum wage increase (the "control" group). The

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[6] In a conventional OLS regression of a linear probability function the coefficient would give a direct approximation to that probability change. In a logistic or probit regression, the change in probability or marginal effect would have to be calculated.
[7] Katz and Krueger (1992), Card (1992b), Card and Krueger (1994, 1995, 2000), Kim and Taylor (1995) and Neumark and Wascher (2000). Earlier studies that involved before-and-after comparisons in low-wage industries or areas are discussed in Brown, Gilroy and Kohen (1982), Brown (1999) and Kennan (1995).

minimum wage impact is simply the change in employment in the jurisdiction experiencing the minimum wage increase less the change in employment in the contiguous jurisdiction that did not experience the increase. The latter control group is utilised to control for other factors that could have affected employment changes over that period, with the implicit assumption that these factors affected the minimum wage treatment group and the control group similarly.

These are termed "natural experiments" because they are natural events that approximate random assignment into treatment and control groups – with such random assignment being the ideal experiment but one that seldom occurs in the social (as opposed to medical) sciences. In general the data is obtained from surveys of employers or from administrative payroll data. The existing studies tend to be of fast-food restaurant chains.

While such procedures have an "elegant simplicity" to them since they essentially involve comparisons of means, and they approximate random assignment, they can have potential problems. For example, other factors (e.g., business cycles) may be affecting the treatment and control groups differently. The minimum wage increase could be endogenous in that the jurisdiction that instituted the increase could have done so at a time when they felt there would be unusual prosperity and employment growth (perhaps induced by other policies they were instituting). Furthermore, these procedures generally only estimate short-run effects since they are usually evaluated just before and just after the minimum wage increase.

Pre-Specified Research Design
Another recent novel approach (Neumark 2001) employs a pre-specified research design involving a pre-commitment to the empirical specification in advance of having the data so as to avoid subsequent data mining and "author bias" in selectively reporting on specifications that yield preferred estimates. This comes at the expense, however, of having less data (and hence less precise estimates) because the researcher cannot use past data that is affected by minimum wage changes.

Comparisons of Hypothetical and Actual Wage and Employment Distributions
A more complicated methodology for estimating the wage and employment effects of minimum wage legislation involves comparing the actual distribution of employment at different wages with the hypothetical distribution that would prevail if there were no minimum wage increase (Meyer and Wise, 1983a,b). The minimum wage does four things to the wage distribution: shifts a portion of those below the minimum up to a spike in the wage distribution around the minimum wage; leaves a portion of those below the minimum because of exemptions and non-compliance; shifts a portion completely out of the distribution if they lose their jobs; and shifts the wage distribution above the minimum upwards because of spillover or ripple effects.

Meyer and Wise estimate the hypothetical wage distribution that would prevail in the absence of the minimum wage increase by making assumptions about how the actual distribution above the minimum would extend back to reflect the distribution that would prevail if there were no minimum wage change. The difference between the actual distribution and this hypothetical distribution that would have prevailed in the absence of the minimum wage increase is used as an

estimate of the adverse employment effect of the minimum wage change[8].   The viability of such a procedure, however, depends upon the assumptions about how the actual distribution above the minimum would extend back to reflect the distribution that would prevail if there were no minimum wage change.

<u>Summary of Alternative Approaches</u>
       Clearly there is a wide range of methodologies used to evaluate the impact of minimum wage legislation. Each has its pros and cons. A consensus has not emerged on any single methodology as being best, nor has a consensus emerged as to the inherent bias and direction of the bias that may emerge from each of the methodologies.

       In part because of the different methodologies and the lack of agreement as what is the preferred methodology, the empirical literature (discussed subsequently) does not yield a consensus – in fact, an earlier consensus has been shattered by new results done by reputable researchers. Those new results have been hotly contested by other reputable researchers in part due to the fact that the new results – minimum wage increases, at least over the limited ranges that have occurred, do not have an adverse employment effect and may even increase employment -– go against a fundamental theoretical tenet of economics, being that wage increases will unambiguously reduce the demand for labour since substitution and output effects work in the same direction. While there has been some narrowing of the differences in the empirical literature, a new consensus has not emerged.

EVIDENCE FROM U.S. STUDIES

       The empirical evidence based on the previously discussed methodologies are discussed based on evidence mainly from the United States since that is where the vast majority of the studies have been done. The review summarizes the impact of minimum wages on various aspects of labour market behaviour as outlined previously in the section on the theoretically expected impact of minimum wages. The next section discusses the British studies, followed by an analysis of the Canadian studies on a study-by-study basis since the number of studies makes this manageable, and a more detailed treatment is merited given their obvious relevance to policy making in Canada.

<u>Impact on Employment</u>
      ➤ Over the 1950s, 60s and 70s, the consensus, based mainly on time series studies was that a 10% increase in the minimum wage led to a 1% - 3% reduction in employment of teens[9], the group that was most often studied. That is, the elasticity of teenage

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[8] Estimates from this procedure are difficult to compare with ones from other procedures since the Meyer-Wise procedure essentially estimates the employment effect of a minimum wage while the conventional literature estimates the employment effect of a minimum wage change. For this reason, their results are not included in the subsequent material on the employment impact. They do find substantial adverse employment effects, with the employment of teenage males in the US being reduced by 7% during 1973-78 because of the minimum wage.
[9] Based on approximately 26 studies reviewed in Brown, Gilroy and Kohen (1982), 28 in Brown (1999) and 29 in Card and Krueger (1995, p. 180-82).

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employment with respect to the minimum wage was about –0.1 to –0.3. Almost all of the early studies found a negative relationship between minimum wages and employment, and most found the relationship to be statistically significant.

➤ This negative relationship was generally found for all age, sex, race subgroups, although it was largest for those whose wages were most likely to fall below the minimum (e.g., the youngest and Blacks)

➤ Importantly, the impacts tended to be smaller (slightly less than 1%) and less often statistically significant in the later studies[10] based on time series data from the 1980s as well as in the cross-section studies (across states or metropolitan areas), suggesting that the preferred estimates are likely to be at the lower end of the 1% to 3% range.

➤ The limited evidence[11] suggests that minimum wage increases also led to a slight reduction in hours of work, suggesting that the focus on employment tends to underestimate the total employment effect if the reduction in hours were also added to the employment effect.

➤ The limited evidence suggests that the reduction in employment gets translated into increased unemployment, but the effect is very small, implying that the minimum wage also leads to some labour force withdrawal (i.e., a slight negative effect on labour force participation).

➤ The impact on the employment of young adults (age 20-24) is also negative, but slightly smaller than that of teens suggesting that at least some of the adverse employment effect on young adults is offset by the positive employment effect emanating from the fact that some may be substitutes for teens when minimum wages are increased[12].

➤ Few studies have examined the impact on adult employment and their results are inconclusive.

➤ The more recent studies that combine aggregate time series and cross section data across states, usually for the more recent period of the 1980s and into the 1990s, tend to find very conflicting results: sometimes within the former consensus range whereby a minimum wage increase of 10% would lead to an employment reduction of 1-3% (Neumark and Wascher 1992, 1994, Williams 1993, Williams and Mills 1998); even larger negative effects than the earlier consensus range (Burkhauser, Couch and Wittenburg 2000, Deere, Murphy and Welch 1995, Kim and Taylor 1995); smaller effects than the earlier consensus range, ranging from negative and insignificant (Card 1992a; Zavodny 2000), to positive but generally insignificant (Card and Krueger 1995) to positive and often significant (Card, Katz and Krueger 1994), to insignificant positive and negative depending upon gender and time period (Mills, Roy and Williams 1999).

➤ The studies that use panel data with individuals as the unit of observations to estimate the employment transitions of persons affected by minimum wage increases tend to find adverse employment effects that range from modest (Currie and Fallick 1996, Zavodny 2000) to substantial (Abowd, Kramarz, Lemieux and Margolis 2000, Linneman 1982) with Zavodny (2000) finding no effect on hours worked.

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[10] Klerman (1992), Solon (1990), Wellington (1991) and Card and Krueger (1995).
[11] Gramlich (1976) and Brown, Gilroy and Kohen (1983), but not Zavodny (2000).
[12] Wellington (1991), Brown, Gilroy and Kohen (1982).

- Neumark (2001) is an important study because it uses recent pooled cross-section data for 1995-98, and, more importantly, it is based on a pre-specified research design discussed previously. Based on the results from 20 alternative specifications for five different groups, the following generalisations emerge:
  - There are never positive employment effects that are statistically significant.
  - Based on the groups that are used most often in the empirical literature (teens 16-19 and all youths 16-24) both positive and negative employment effects are found about equal numbers of times, but they are *never* statistically significant (hence being consistent with no employment effect)
  - When restricted to young persons who are not in school, and who have no more than high-school education, the employment effects are usually negative and significant about half of the time, albeit somewhat less so for young adults 20-24 when some specifications yield positive, albeit insignificant effects.
  - When adding the further restriction of not having completed high-school, the employment effect is always negative and significant in half of the specifications.
  - Overall, the results highlight the variability that occurs from alternative specifications and focusing on different groups, but seem most consistent with an interpretation of no substantial employment effects for teens and all youths, except for youths who are less educated and not in school
- The more recent studies that use the "difference-in-difference" methodology based on natural experiments with before-and-after comparisons in "treatment" jurisdictions that increased their minimum wage compared to "control group" jurisdictions that did not increase their minimum wage, tend to find no adverse employment effect or even a positive employment effect that is sometimes statistically insignificant (Card 1992b, Katz and Krueger 1992, Card and Krueger 1994, 1995, 2000). Not surprisingly, given these findings, these studies have been hotly contested, and some "difference-in-difference" estimates do provide negative employment effects (Bellante and Picone 1999).
- The exchange between Neumark and Wascher (2000) and Card and Krueger (2000) provide some resolution of the differences because they essentially re-examined the earlier natural experiment of the fast-food industry in New Jersey and Pennsylvania originally done in Card and Krueger (1994). Neumark and Wascher (2000) were critical of the fact that the original study was based on survey data of firms. They provided new evidence based on administrative payroll data of the firms and found that the survey data exhibited much more employment variability than did the payroll data (causing them to question the accuracy of the survey data). More importantly, they find that the payroll data imply that a 10% increase in the minimum wage would reduce employment by 1 - 2.5% which is almost exactly equal to the earlier consensus estimates of 1 - 3%, although their results are often statistically insignificant. They conclude (p. 1391) that "minimum wage increases reduced fast-food employment … [and] we can be more decisive in concluding that New Jersey's minimum-wage increase did not *raise* fast-food employment in that state." Card and Krueger (2000) respond to that critique by reanalysing the Neumark and Wascher payroll data (arguing that it is not based on a representative sample of employers) and by using two alternative sources of administrative payroll data provided by the Bureau of Labor Statistics. They conclude:

"Consistent with our original sample, the BLS fast-food data set indicates slightly faster employment growth in New Jersey than in the Pennsylvania border counties over the time period that we initially examined, although in most specifications the differential is small and statistically insignificant (p. 1397) … the increase in the New Jersey minimum wage in April 1992 had little or no systematic effect on total fast food employment in the state (p. 1398) … The increase in New Jersey's minimum wage probably had no effect on total employment in New Jersey's fast-food industry, and possibly had a small positive effect" (p. 1419). One interpretation of this exchange is that both sides converged closer to zero effect. That is, although Neumark and Wascher (2000) found estimates that were in the earlier consensus range, they were often not statistically different from zero. As well, the new Card and Krueger (2000) estimates moved away from their earlier ones of often finding statistically significant positive employment effects, closer to ones that find no employment effect, and this seems their "preferred interpretation".

➢ Overall, it is extremely difficult to summarise the empirical evidence on the employment effect of minimum wages. Subject to that caveat, the following conclusions are offered:

- The results vary by methodology, specification and group being examined
- There is no consensus on the impact
- The earlier consensus range of a 10% increase in the minimum wage leading to a 1 – 3% reduction in employment has likely widened to a "more fragile consensus" range of 0 – 3%. It is probably closer to the 0 end of the spectrum for most groups of teens and young adults, and possibly at the middle or higher end of the spectrum for less educated youths not in school, and in the longer run when firms have more opportunity to make the adjustments.
- A positive employment impact is unlikely in the aggregate, albeit possible for some establishments.

Evidence on Labour Force Participation and Unemployment

Mincer (1976) and Ragan (1977) estimate separate equations (based on pooled cross section time series data) on the effect of minimum wages on teenage employment, labour force participation and unemployment, and they indirectly calculate the impact on unemployment from the employment and labour force participation equations. They find, in concordance with the general literature, that minimum wages reduce employment. They also find that minimum wages reduce labour force participation as people leave the labour force because of the fewer employment opportunities. The labour force withdrawal is not as large as the adverse employment effect; hence, unemployment increases. Alternatively stated, not all of the adverse employment effect gets translated into unemployment since many withdraw from the labour force, with the increase in unemployment being mitigated by the labour force withdrawal.

Evidence on Spillover or Ripple Effects

Although the number of studies is limited, the evidence on spillover is generally in agreement: small positive spillover effects exist, raising the wages of those slightly above the minimum wage, with the impact largely being confined to those just above the minimum[13].

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[13] Card and Krueger (1995, p. 160-66), Cox and Oaxaca (1981), Gramlich (1976), Grossman (1983) and Katz and Krueger (1992).

Interestingly, this has both a "good news" and a "bad news" connotation. The good news is that this suggests that the minimum wage raises the wages of persons not only at the minimum wage, but also those just above the minimum wage. The bad news is that this could contaminate control group comparisons that rely on groups not directly affected by the minimum wage. If persons just above the minimum wage also have their wages increase for reasons of maintaining old relativities then they may also experience an adverse employment effect and hence the adverse employment effect of those affected directly by the minimum wage may be muted since they are being compared to a group whose employment is also declining because of their indirect wage increase. If their wages are increasing because of an increase in demand for their services reflecting a substitution away from minimum-wage workers, then this suggests that a small negative aggregate employment effect for a group, say teenagers, could be the net result of a large decline in the employment of persons affected directly by the minimum wage being partially offset by an expansion in the employment of persons just above the minimum wage. This "churning" would likely be regarded as undesirable even though it does not result in a large net employment reduction since otherwise fairly similar groups (e.g., low-wage teens just below and just above the minimum wage) receive very different outcomes. This violates the principle of horizontal equity whereby similar people should otherwise receive similar treatment.

Evidence on Permanency of Minimum Wage "Careers"

A limited number of empirical studies have documented that most minimum wage jobs for persons are temporary and that most people soon move out of such jobs into higher paying ones (Carrington and Fallick 2001, Long 1999, Schiller 1994, Smith and Vavrichek 1992). This is consistent with the notion that minimum wages disproportionately affect younger workers since such younger workers are most likely to move up the wage hierarchy as they gather experience.

While most minimum wage jobs are temporary and there is considerable upward mobility out of such jobs, Carrington and Fallick (2001, p. 17) "identify a nontrivial fraction of workers that spend substantial portions of their post-career on minimum wage or near minimum wage jobs. For example, we estimate that more than 8 percent of workers spend at least 50% of their first 10 post-school years working in jobs paying less than the minimum wage plus $1.00. We find that workers with such minimum wage careers are largely drawn from demographic groups with generally low wages: women, minorities and the less-educated. Thus, while relatively few in number, there is an identifiable subpopulation of workers whose lifetime income and employment is likely to be associated with minimum wages. For individuals in this group, minimum wages do not have merely transitory effects." Of course, this does not imply that minimum wage laws would lift them out of such permanent minimum wage "careers" – they could move them out of employment altogether.

Evidence on Fringe Benefits and Working Conditions

Although employers could offset part of the minimum wage increase by reducing fringe benefits and desirable working conditions, the limited empirical evidence[14] suggests that this

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[14] Card and Krueger (1994), Katz and Krueger (1992) and Wessels (1980).

does not occur, in part because there are few of such benefits in the low-wage sector. The few studies that examine this, however, do not have information on the "pace" of work, which is one margin that could be adjusted. There is some evidence that employers increased the amount of responsibility in jobs affected by minimum wage increases (Converse, Coe, Corcoran, Kallick and Morgan 1981).

Evidence on Training and Human Capital Formation

As indicated previously, the theoretical predictions were that minimum wages would reduce training and human capital formation by making it more difficult to accept low-wages in return for training and by reducing the on-the-job training associated with employment if employment and hours are reduced. There could be an increase in training, however, if employees engage in training to increase their productivity to qualify for the minimum wage jobs or if employers who retain their higher wage employees upgrade them so that their productivity is more commensurate with their higher wage.

The limited empirical evidence[15] that exists tends to suggest that minimum wages reduce training as evidenced by direct measures of training (albeit the effects are sometimes small and statistically insignificant) and by indirect measures such as slower wage growth in minimum wage jobs (training would otherwise foster wage growth). There is no evidence that minimum wages induce individuals to acquire more training to qualify for the higher wage jobs.

The evidence, however, is not always in agreement. Acemoglu and Pischke (2001) find no effect of minimum wages on training. Based on earlier survey evidence, Converse, Coe, Corcoran, Kallick and Morgan (1981) find that employers increased the amount of responsibility in the jobs affected by minimum wages, and they provided some training to enable workers to deal with those added responsibilities – to "earn" their higher wage. If that is the case, this would generally be considered a desirable by-product of a minimum wage increase since it would be improving the productivity of low-wage workers, moving them up the value-added chain. It is true that the additional responsibility may have some disutility, but this generally would not be considered as negative, say, as an increase in the pace of work or cutting of work breaks. Interestingly, that study also indicated that many low-wage jobs did have reasonable training component, contrary to the stereotype of them being dead-end jobs with no training.

Evidence on School Enrolment

As indicated previously, minimum wages have a theoretically indeterminate impact on the decision to stay in school. Unfortunately, the empirical evidence is mixed, although most studies tend to suggest a negative impact whereby higher minimum wages encourage students to drop out of school and try to obtain the higher-wage minimum wage jobs.

Such negative effects are found in the more recent studies by Neumark and Wascher (1995a, 1995b, 1996) and for some race-sex groups in Cunningham (1981). Ehrenberg and Marcus (1980, 1982) find that minimum wages lower enrolment of teenagers from low-income

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[15] Grossberg and Sicilican (1999), Hashimoto (1982), Leighton and Mincer (1981), Neumark and Wascher (2001) and Neumark and Sicilian (2001).

families but raise it for white teenagers from high-income families. However Card (1992a) find no effect on enrolment and Mattila (1981) finds positive effects.

Evidence on Wage Inequality

As indicated previously, minimum wages can have a complicated effect on wage inequality, reducing it by eliminating some low-wage jobs, moving others up the wage distribution to the spike at the minimum wage, and having possible positive spillover effects on the wages of persons just above the minimum wage and possibly those below the minimum wage (although for this latter group those displaced by the minimum wage may lower wages by competing for the even lower wage jobs). Wage inequality could be increased, however, in the longer run if minimum wages reduced training and human capital formation.

The empirical evidence confirms that minimum wages tend to reduce wage inequality (Fortin and Lemieux 1997). Meyer and Wise (1983a, b) indicate how minimum wages truncate some of the low wage distribution and push many up to the spike around the minimum wage. DiNardo, Fortin and Lemieux (1996) provide evidence indicating that 30% of the increased wage inequality for women that occurred between 1979 – 1988 can be attributed to the falling real minimum wage over that period, with the corresponding figure for men being 14%. This is a conservative estimate since it assumes no wage spillovers to other low-wage workers. Card and DiNardo (2002), Card and Krueger (1995), Lee (1999), Lemieux (2005) and Tuelings (2000) also find minimum wages to reduce wage inequality.

Evidence on the Effect on the Income Distribution and Poverty

As indicated previously, minimum wages could lead to a reduction in *income* inequality and *poverty* for the same reasons as they reduce *wage* inequality as discussed above. However, the connection between wages and income distribution and poverty is complicated by the possible adverse effect on employment and hours, and by the fact that poverty relates to *family* income as well as *need*. In essence, even though minimum wages can reduce *wage* inequality, this could have little effect on family income distribution and poverty – a conclusion that in fact emerges from the literature.

Empirical evidence[16] from the US tends to suggest that about 20% of low-wage workers are poor or are in poor families, and this percent is falling over time. As an alternative perspective, about 30-40% of *workers* who are poor or in poor families earn low-wages. This suggests that minimum wages have some potential to reduce poverty, but that potential is small since most low-wage workers are not poor, and most workers in poor families are not low-wage workers.

The empirical evidence[17] tends to confirm that this is the case. That is, minimum wages have only a small effect on reducing poverty. They are at best a blunt instrument for reducing

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[16] Burkauser, Couch and Glenn (1996), Burkhauser, Couch and Wittenburg (1996), Burkauser and Finegan (1989), Card and Krueger (1995), Gramlich (1976), Johnson and Browning (1983), Kohen and Gilroy (1981) and Smith and Vavrichek (1987).

[17] Card and Krueger (1995), Johnson and Browning (1983) and Mincy (1990).

poverty, although it is also the case that they do not exacerbate poverty as could be the case if the adverse employment effect were large.

Evidence on Effect on Prices

As discussed previously, minimum wage increases should lead to price increases to the extent that some of the cost increases are passed on to consumers and to the extent that employment reductions lead to output reductions and hence reduced supply. If employment is increased because of monopsony, however, then output will increase and prices should fall.

The empirical evidence on prices is mixed. Earlier evidence summarised by Wessels (1980) is mixed although it suggests prices increased in services disproportionately affected by minimum wages. Katz and Krueger (1992) find that relative prices actually fell in establishments affected by minimum wage increases (which would be consistent with monopsony since they also found positive employment effects) although the price effects were statistically insignificant. Card and Krueger (1995) find positive effects on prices (although often not statistically significant). This is weak confirmation of the competitive model of wage cost increases leading to product price increases, but it is not confirmation of a monopsony story since they often found positive employment effects. Clearly the evidence on prices is mixed.

BRITISH STUDIES

British studies of the effect of minimum wages are effectively divided into two periods. Prior to 1993, minimum wages were set at the industry level by Wage Councils. A limited number of studies evaluated their effects and found no negative effect on employment and occasionally a positive effect, albeit not statistically significant (Machin and Manning 1994, Dickens, Machin and Manning 1999). Even though this evidence is consistent with that found by Card and Kruger in the U.S., Card and Kruger (1995, p. 271) raise the concern that this lack of effect may reflect the possibility that "Wage Councils might have set rates strategically, raising them in industries that were expected to grow, and lowering them in industries that were expected to shrink."

In 1999, Britain adopted its first-ever national minimum wage. The Low Pay Commission (2000) reported that its background studies did not find negative effects. However, these were essentially case studies or surveys indicating *perceptions* of the effect at the time the law was passed. More rigorous econometric evaluations, however, generally (but not always) come to a similar conclusion. More specifically:

- ➢ Overall, there does not appear to be an adverse employment effect *economy-wide* (Stewart 2004).
- ➢ There was a conventional adverse employment effect, however, in the *low-wage sector* where minimum wages would be expected to have an impact. The elasticity of employment with respect to the minimum wage increase ranged from about -0.01 to -0.03 in the low-wage nursing home care sector, indicating that a 10% increase in the

minimum wage would reduce employment by about 1% to 3%. This is exactly the "consensus" range of estimates based on earlier US studies.

➢ There is no evidence of spillover effects on wages near the minimum nor of any impact on wage inequality (Dickens and Manning 2004)
➢ There is no evidence of a negative impact on training; if anything, the effects are positive (Arulampalam, Booth and Bryan 2004).

Overall, the British evidence suggests that their recent national minimum wage did not have negative effects except in the low-wage sector. There are three qualifications, however, that should be kept in mind from the recent British experience:

➢ The case studies and surveys are based on perceptions at the time of the policy.
➢ The econometric studies, while solid, were done shortly after the minimum wage came into effect so that longer-run effects are not observed.
➢ The policy was anticipated and some adjustments may have occurred prior, making the before-and-after comparisons appear small.
➢ The minimum wage increases were very small and were based on "what we believed the economy and business could manage" (Low Pay Commission, 2000, p. vii). In other words the wage increases were instituted at a time when they could more easily be absorbed.

SOME INTERNATIONAL EVIDENCE

While the vast majority of studies of the impact of minimum wages have been for the U.S., some international evidence is available. The OECD (1998) conducted pooled time-series, cross-country regressions for nine OECD countries over the period 1975 to 1996 and concluded P. 46):

> The results suggest that minimum-wage rises have a negative impact on teenage employment although the magnitude of the reported elasticities varies significantly, from -0.3 to -0.6 when Spain and Portugal are excluded, and from 0 to -0.2 when they are included in the regression. In some of the specifications, negative employment effects are also found for groups of workers other than teenagers.

They did the analysis with and without including Spain and Portugal because of data limitations for those countries. The estimates of the adverse employment effect of -0.3 to -0.6 are higher than the earlier "consensus" range of -0.1 to -0.3 based on U.S. data, although they fall within that range when Spain and Portugal are included. Overall, they conclude (p.47):

> Firstly, the results suggest that a rise in the minimum wage has a negative effect on teenage employment. Secondly, negative employment effects for young adults are generally close to zero or insignificantly different from zero. Thirdly, for prime- age adults, the most plausible specifications suggest that minimum wages have no impact on their employment outcomes.

CANADIAN STUDIES

The Canadian studies are reviewed here on a study-by-study basis given the greater relevance of these studies to minimum wage issues in Canada.[18] As well, the Canadian data are generally regarded as better than US data for estimating the impacts of minimum wages (Neumark 2001, p. 128; Hamermesh 2002, p. 716, 717). This is so because minimum wages in Canada are largely under provincial jurisdiction and there is considerable cross-sectional and time series variation in minimum wages so as to facilitate identifying their effects. Having *both* cross-section and time-series variation is particularly useful since the cross-section *alone* suffers from the possible biases from unobserved geographic effects that are correlated with the minimum wage and the outcome of interest, and the time series variation *alone* suffers from the possible bias from similar unobserved time effects (Baker 2005, p. 11). This richer Canadian data is in contrast to the U.S. data where minimum wages are under the federal jurisdiction, with changes seldom occurring. In the US, variation in minimum wages tends to come from differences in state 'top-ups', the extent of coverage or the slow erosion of the real value of the minimum wage as its infrequent changes do not keep up with changes in the average wage of the state – the latter forming the denominator of the minimum wage index.

Fortin (1979)

Fortin (1979) reports on a larger study he had done for the Quebec government on the impact of minimum wages in that province. A 10% increase in the minimum wage was estimated to have the following effects:

➢ An increase in the wage bill averaging 0.65% based on a direct effect of 0.4% and indirect effect of another 0.2 to 0.3 % through wage emulation[19]
➢ This in turn was expected to increase inflation by 0.4% ranging from 0.3 to 0.5%
➢ An increase in the overall unemployment rate of 0.8 percentage points (ranging from 0.6 to 1.0) based on increases of 3.0 percentage points for young men aged 15-24 (ranging from 2.5 to 3.5 percentage points) and an increase of 2.3 percentage points for young women age 15-24 (ranging from 1.5 to 3.0 percentage points) and 0.5 percentage points for adult women (ranging from 0.4 to 0.7 percentage points) and zero effect for adult men
➢ Because of these large adverse employment effects, a decrease in the earnings of young men of 13%, and an increase of 2% for young women (ranging from a decrease of 2% to an increase of 4%) and an increase of 5% for adult women (ranging from 4 to 6%) and zero effect for adult men
➢ Any adverse effect on earnings however is invariably offset by unemployment insurance leading him to conclude (p.637) that "the reason why a high relative minimum wage helps many workers is because the Unemployment Insurance Commission takes charge of a larger fraction of their total incomes."

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[18] Earlier Canadian studies that surveyed employers as to how they responded to minimum wage increases are discussed in Fantl and Whittingham (1970) and Whittingham (1970).
[19] These estimates, along with other evidence on the impact of minimum wages on average wages in Ontario, were used by Dungan and Gunderson (1989, p. 4) to arrive at a range whereby a 10% increase in the minimum wage was estimated to increase average wages by a range of 0.187%, 0.306% and 0.650%.

➢ Over 80% of minimum-wage workers are young persons (mostly living with their parents), unattached individuals or the second wage earner in childless families, leading him to conclude (p. 673) that the minimum wage is an "indiscriminate measure which often does not help the average worker to earn a higher income and whose incidence falls mainly on workers with family incomes well beyond the poverty levels."

Cousineau 1979

Cousineau (1979) employs time series regression of the female and teen unemployment rates in Quebec on a measure of the minimum wage relative to the average industrial wage and various control variables. The analysis is based on bi-annual and monthly data for the period 1968-77. He finds that "minimum wage changes have contributed to the growth of unemployment rates of females and teenagers in the 1970s … The impact is substantial." (p. 417). Specifically he finds that the 0.10 increase in the minimum wage (from 0.46 to 0.56) relative to the average hourly wage in manufacturing that went on over that period of 1968-77 led to a 2.9 percentage point increase in the teenage unemployment rate and a 1.7 point increase in the female unemployment rate.

Maki 1979

Maki (1979) employs pooled time series (1970-77) cross-section (10 provinces) analysis to regress the unemployment rate on a measure of the minimum wage relative to the average wage and other control variables. He finds and elasticity of the unemployment rate with respect to the relative minimum wage is 0.56. He illustrates the magnitude of this effect measured at the average relative minimum wage of 46.5 percent (p. 425): "If some province with a minimum wage of $3.00 per hour and average weekly wage of $250 and an unemployment rate of 8 percent were to increase its minimum wage to $3.50, ceteris paribus, its unemployment rate would increase to 8.7 per cent." He interprets these effects as "not very large … [although] non-negligible." However, it should be emphasised that these are effects on the *overall* unemployment rate across all age groups and not just on those groups like teenagers and youths who would be most affected by minimum wage increases. The impact on the unemployment rate of these groups would be much larger. Furthermore, an increase in the unemployment rate from 8 to 8.7% is a 9 percent increase in the overall unemployment rate and that is not inconsequential.

Swidinsky 1980

Based largely on the methodology developed in Mincer (1976) and Ragan (1977), Swidinsky (1980)[20] uses pooled cross-section (5 regions) time series (1956-75) data to regress measures of employment, labour force participation and unemployment for teenagers on various independent variables including the adult unemployment rate, a non-linear time trend and a measure of the minimum wage. He finds that minimum wages significantly reduce both

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[20] Swidinsky cites a number of the earlier Canadian studies on minimum wages based on survey evidence on how employers said they responded to minimum wages. Most of these studies, as was the case with most of the US studies that also asked employers how they responded, found very little adverse employment effects. One of the problems with such survey evidence, however, is that it is unlikely to pick up dynamic responses as employers may have reduced their *growth* of such jobs, even though they did not directly engage in layoffs.

employment and labour force participation for males and females. He also finds minimum wages to increase unemployment, although the effect is significant only for females. The adverse effect on unemployment is smaller than the adverse effect on employment since many who are not employed drop out of the labour force because they cannot obtain jobs at the higher minimum wage.

The minimum wage employment elasticity is –0.17 (-0.10 for males and –0.27 for females) which is in the middle of the earlier "consensus" range of –0.10 to -0.30 based on US evidence as discussed previously. The unemployment rate elasticities were considerably smaller because of the labour force withdrawal.

Gruebel and Maki (1981)

Maki and Greubel (1981) estimate separate employment, labour force participation and unemployment equations based on cross-section (10 provinces) time-series (1950-75) data. They find that minimum wages have a negative and statistically significant effect on reducing employment for males and females combined. Minimum wages have a similar negative effect on labour force participation, however, so that the unemployment rate is essentially not affected by minimum wages. That is, according to this analysis, the reduction in jobs is accompanied by an approximately equal reduction in labour force participation so that overall unemployment does not change substantially.

The effects differ, however, for males and females. For females, the impacts on employment and labour force participation (and hence unemployment) are quantitatively small and statistically insignificant – essentially zero. For males, the adverse employment effect is large and statistically significant as is the equally large effect on reducing labour force participation so that the overall effect on unemployment is essentially zero.

Swidinsky and Wilton 1982

Swidinsky and Wilton (1982) estimate the impact of minimum wage changes on aggregate wage changes. Essentially they estimate a Phillip's curve or aggregate wage equation augmented to include measures of legislated minimum wage increases. Their data is based on 2,338 major private-sector collective agreements (200 or more employees) over the period 1966 to 1975, a period that had over 100 legislated minimum wage increases across the 10 provinces. Even though minimum wages would not likely affect wages in collective agreements directly, since union wages are generally well beyond any minimum wages, they may have indirect spillover effects if unions raise wages in order to restore old relativities and if there is an increased demand for high priced union labour to substitute for minimum wage labour.

Their empirical results indicate that minimum wage increases have a positive and usually statistically significant spillover effect on wages in collective agreements. Calculations based on their results indicate that about 10 percent of the minimum wage increase is reflected in subsequent wage increases in collective agreements, with that spillover being 14 percent in the low-wage union sector.

<u>Schaafsma and Walsh (1983)</u>

Schaafsma and Walsh similarly use pooled cross-section (9 provinces) and time series (1975-79) data with a somewhat different specification as in Swidinsky. They also include youths 20-24 and adults 25 and over as well as teenagers (only the later was used in Swidinsky (1980) and in Mincer (1976) and Ragan (1977).

Schaafsma and Walsh also find minimum wages to have a negative effect on employment for all age-sex groups, being significant for five of them. A generally similar pattern was found for labour force participation as people withdrew from the labour force because of the fewer jobs. The withdrawal from the labour force, however, did not offset the employment reduction so unemployment increased. The impacts were generally larger than those found in Swidinsky (1980) and in Mincer (1976) and Ragan (1977).

Specifically, the minimum wage elasticities of employment for males (with the different age groups listed in parenthesis) were:

Age	Males	Females
15-19	-0.61	-0.60
20-24	-0.29	-0.18
25+	-0.15	-0.06

Of particular note, these elasticities for teenagers are about twice as high as the high end of the earlier consensus range of -0.10 to -0.30 based on US data and also for that found in Swidinsky based on earlier Canadian data. As well, the adverse effects decline with each successive higher age group, highlighting how the adverse effects are concentrated amongst teenagers and to a lesser extent amongst young adults. The adverse employment effects, however, are fairly substantial for young adults and even for adults 25 and over, suggesting that they do not benefit by a minimum wage increase (as they could if they were substituted for teens who are priced out of the market).

The unemployment rate elasticities (calculated from the employment and labour force participation elasticities) are around 1 for the different age and sex groups. This implies that a 10% increase in the minimum wage would increase the unemployment rate by about 10% (this is 10% not 10 percentage points). Based on an unemployment rate of around 0.10 at that time, this would increase the unemployment rate by around 1 percentage point.

<u>McKee and West 1984</u>

McKee and West (1984) estimate the impact of minimum wages on the ratio of part-time to full-time employment. They highlight that the effect is theoretically ambiguous. It could reduce the ratio if part-time workers are more likely to have low-wages and hence more likely to be affected by minimum wages and experience an adverse employment effect. In contrast, if part-time workers are less likely to be covered by minimum wages then firms may substitute into using more uncovered part-time workers. As well, any workers displaced by minimum wages in the covered sector may shift to the uncovered sector and work part-time.

Based on monthly data for eight provinces over the period 1975-81 they find that minimum wages generally reduced the ratio of part-time to full-time employment for both males and females. The effect was negative and statistically significant in 12 of the 16 cases (8 provinces separate for males and females) and negative but insignificant in 2 others. In the 2 cases where it was positive the effect was significant in one – for females in Alberta. In essence, their results suggest that minimum wages have a disproportionately adverse effect on the employment of part-time workers, and that this more than offset any tendency to shift to part-time workers who were not covered. This reflects the fact that in Canada part-time workers were invariably covered, although in Alberta students who worked part-time during the school year were subject to a lower minimum wage which may explain the anomalous result for that province.

Mercier 1985
       Mercier (1985) uses time series regression to estimate the employment effect of minimum wages for the province of Quebec for the period 1966-81, separately for teens 14-19 and young adults 20-24 and separately for males and females. Negative employment effects are generally found, larger for teens than for young adults, and larger for females than males. A wide range of specifications were used, with the elasticities generally, but not always, in the earlier "consensus range" of -0.1 to –0.3.

Grenier and Seguin 1991
       Grenier and Seguin (1991) replicate the earlier time analysis of Swidinsky (1980) based on pooled cross-section (5 regions) time series (1956-75) for teenagers, and they repeat it for the time period 1976-88. They replicate the fairly strong negative effects on employment and labour force participation and the weaker positive effect on unemployment as found in Swidinsky in the earlier 1956-75 time period. However, in the 1976-88 time period the effects are usually statistically insignificant, leading them to conclude (p. 124): "the minimum wage index is no longer significant in the estimated regressions. This suggests that the influence of the minimum wage on the labour market of teenagers is weaker than it used to be, or, at least, that it is more uncertain."

Cousineau, Tessier and Vaillancourt 1992
       Cousineau, Tessier and Vaillancourt (1992) use time series analysis of quarterly data for the Ontario economy for the period 1968 to 1990 for women and 1975 to 1990 for youths (15-24). They regress the unemployment rate of these groups on a measure of the minimum wage relative to the average manufacturing wage and other control variables.

       Their results indicate that a 10% increase in the minimum wage raised the unemployment rate of women by 1.4 percentage points and of youths by 1.5 percentage points. This would imply that the minimum wage proposal at that time (which would increase the minimum wage from 0.47 of the average industrial wage to 0.60 of the average industrial wage) would have increased the unemployment rate of women and youths combined by about 1 percentage point – or about 10% based on their unemployment rate of around 0.10 at that time. They indicated that their results were very similar to ones estimated for Quebec.

Johnson and Kneebone (1991)

Johnson and Kneebone (1991) estimate the impact of minimum wages and unemployment insurance on the natural rate of unemployment for each of the provinces over the period 1961 -86. Their natural rates varied from a low of 5.4% in each of the years 1965-67 to a high of 8% in 1978. They hypothesised that minimum wages should increase the natural rate "because an increase in the minimum wage both decreases the quantity of labour demanded and increases the quantity of labour supplied." (p. 1307).

They find that minimum wages increased the natural rate of unemployment in 6 of the 10 provinces although the impact was statistically significant in only 3 of those cases. Minimum wages reduced the natural rate in 4 of the 10 provinces, albeit the effect was significant in only 1 case. Overall, their results provide weak evidence of minimum wages increasing the natural rate of unemployment. In those provinces where the minimum wage had a statistically significant effect on increasing the natural rate of unemployment, the magnitudes were such that an 0.10 increase in the ratio of the minimum to the average wage in the province (e.g., from 0.50 to 0.60) would increase the natural rate of unemployment by 1.7 percentage points in Newfoundland, 1.3 percentage points in New Brunswick and 0.6 percentage points in Saskatchewan.

Kan and Sharir 1996

Kan and Sharir (1996) estimate pooled cross-section (9 provinces) time-series (1975-91) regressions on the impact of minimum wages. Although they do not report the magnitudes of the effects, they indicate (p. S 56) that minimum wage increases had "no effect, or to have a negative effect, on employment … [and] a negative effect on labour force participation, especially for males." Contrary to most other empirical studies they also found "no effect on the employment of the two youngest groups." It is difficult, however, to assess why their results appear different from most others, because they only report the conclusions and not the actual results.

Shannon and Beach 1995

Shannon and Beach (1995) provide simulation evidence of the potential impact of Ontario's proposed 35% increase in the minimum wage (from $5.00 to $6.75) that was to be phased-in between 1991 and 1995. They base their analysis on the 1989 Labour Market Activity Survey (LMAS) where the individual is the unit of observation.

They first determine who would potentially be affected by the minimum wage increase in that their wage falls between the old and the new minimum. Such individuals tend to be young, part-time workers, less educated, in the retail, accommodation and food industries and from families with low earnings. For these workers they then calculate their wage gap as the amount that their wages would have to increase to be in compliance with the new minimum wage. This averages 23.3% -- that is, on average the wages of those affected by the minimum wage would rise by 23.3%. This is 2.3% of the wage bill across all workers, not just those affected by the minimum wage. This wage increase of 23.3% is then multiplied by conventional labour demand elasticities obtained from the literature (-0.33 for employment and –0.51 for hours) to get the expected impact on employment and on hours worked. These calculations yield a reduction in

employment of 7.7% for those affected by the minimum wage increase or 1.5% across all workers, and a reduction in hours of work of 11.9% for those affected by the minimum wage increase or 1.3% across all workers. Adjusting these figures for an 80% compliance and coverage rate yields a reduction in employment of 6.2% for those affect by the minimum wage increase or 1.2% across all workers, and a reduction in hours of work of 9.5% for those affected by the minimum wage increase or 1.1% across all workers. These are effects that would result from a proposed 35% increase in the minimum wage – converting them to elasticity equivalents from a 10% increase in the minimum wage would entail dividing them by 3.5.

Shannon and Beach also indicate that about 20% of the Ontario workforce would have been affected by a minimum wage increase of that magnitude, albeit only about 11 % of hours worked would be affected since most minimum-wage workers work part-time. Of those affected, 60% would be youths (under 25) and about 50% would be full-time students who work part-time. Of the additional earnings emanating from the higher minimum wage, only 28% would go to low-income families, 41% to middle-income families and 31% to high-income families. They indicate that the minimum wage increase would reduce the proportion of workers who are in families that had family earnings below the Statistic's Canada low-income cut-off rate by a meagre amount, from 16.9 percent of workers to 16.6 percent. This leads them to conclude (p. 300) that "the policy suffers from a targeting problem … a better targeted policy focusing more exclusively on the working poor (e.g., skills upgrading) may be advisable."

Shannon 1996
Shannon (1996) utilises the Labour Market Activity Survy (LMAS) for 1986 to estimate the impact of minimum wage legislation on the male-female earnings gap. This entails estimating the hypothetical male-female wage gap that would prevail in the absence of the minimum wage, utilising the procedure outlined in Meyer and Wise (1983a, 1983b) for estimating the impact of minimum wages on the wage distribution.

Shannon finds that for youths age 16-24 the male-female wage gap would have been almost twice as large as it was were it not for minimum wages. About half of this can be attributed to the fact that minimum wages had a disproportionate impact on raising the wages of low-wage females compared to males, and the other half due to the fact that it correspondingly had a disproportionately larger adverse employment effect on females so that they were no longer in the wage distribution. For adults age 25 and over, minimum wages had only a small effect (almost zero) on reducing the male-female wage gap and all of it was due to the larger adverse employment effect for females. Overall, it appears that minimum wages can reduce the male-female earnings gap for youths (16-25) but not for adults, and that slightly over half of the effect for youths comes about because of the greater adverse employment effect for females – they no longer contribute to the gap because they are no longer employed.

Baker, Benjamin and Stanger 1999
Baker, Benjamin and Stanger (1999) use pooled cross-section (9 provinces) time series (1975-93) data to estimate the impact of minimum wage changes that occurred both over time and across the different jurisdictions. They estimate a wide range of specifications and filter the

time series data in a way that approximates short-run (1-2 years) and long-run (4-6 years) adjustments to the minimum wage changes.

Their results indicate that the short-run employment effects are generally small, statistically insignificant and sometimes even positive. However, the longer run employment effects are negative and statistically significant, with a 10% increase in minimum wages generally leading to approximately a 2.5% reduction in employment. This minimum wage elasticity is towards the higher end of the earlier consensus estimates of 1-3% and the newer estimates that were closer to 0 – 3%.

They suggest that this may partially reconcile some of the differences in the US results that have emerged, as discussed previously. That is, the natural experiment results which generally yielded no adverse employment effects and possibly even positive effects were essentially measuring short-run adjustments. The other studies, and especially those with lagged minimum wage effects, were estimating longer-run responses, and these were generally negative and more substantial. In essence, an adverse employment effect occurs after employers have had sufficient time to adjust through attrition and turnover (of both firms and employees) as well as through altering their production processes and the substitutions of other inputs.

Goldberg and Green 1999

Goldberg and Green also use pooled time-series (1976-97) cross-section data (Quebec, Ontario, Alberta and British Columbia). They find that a 10 percent increase in the minimum wage leads to a decrease in the employment of 1.6% for female teenagers, and 1.4% for male teenagers, but both are statistically insignificant. For young adults (20-24) the impacts are smaller (1%) but statistically significant for males although essentially zero for females. For adults 25-54 they are essentially zero for males and 1% (and significant) for females. They also find that minimum wages did increase the total wages paid to low-wage workers.

Fortin and Lemieux 2000

Fortin and Lemieux (2000) use the 1988 Labour Market Activity Survey (LMAS) and the 1995 Survey of Work Arrangements (SWA) to simulate the effect of minimum wage changes on the distribution of wages and of family income. They find that minimum wages do reduce wage inequality and that (p. 240): "individuals in the lower half of the family income distribution benefit the most from the minimum wage. Individuals in this part of the wage distribution account for 70 percent of the earnings of all minimum-wage workers."

Benjamin 2001

Benjamin (2001) finds that there are little or no spillover effects, based on estimates of the effect of minimum wage changes on average wages in various industries over the period 1975-1993. Using the 1990 Labour Market Activity Survey he indicates that the bottom decile of the family income distribution has no low-wage workers since these families have no workers. However, 17% of families in the second lowest decile have a low-wage worker, and this proportion generally declines with each higher family income decile. Overall, he concludes (p. 217) that "Minimum wages have only a limited scope for improving the welfare of the lowest

income households, since most of these families have no full-time earners. Similarly, many of the benefits of higher minimum wages are transferred to teens who are distributed relatively evenly across the income distribution. Nevertheless, the benefits would flow disproportionately to poor working adults."

<u>Yuen 2003</u>

Yuen (2003) uses the Labour Market Activity Survey (LMAS) panel data from 1988-90 to estimate the impact of minimum wage changes over that period. The methodology involves estimating the employment transition probabilities for those "at risk" of being affected by a minimum wage increase (treatment group) compared to those not at risk (control group).

When the control group is all individuals whose wage is not in the range of the minimum wage increase (thereby consisting mainly of high-wage individuals) persons affected by a minimum wage increase (which averaged 8.4% in the different jurisdictions over that time period) were 7% less likely to be employed in the subsequent time period in the case of teens and 15% less likely in the case of young adults. These results were fairly similar to US results using the same methodology and based on the "high-wage" control groups. The US studies had to rely on high-wage control groups since most minimum wage changes in the US are the result of federal changes and hence are uniform across the country so there are no comparable low-wage groups that did not have a minimum wage change. The reliance on high-wage control groups has been a criticism of these studies since the results may simply reflect how other factors may have a different effect on high- and low-wage groups (Card and Krueger 1995, p. 228).

To ascertain if this is a concern, Yuen exploits the fact that Canada does have low-wage control groups in other provinces who are not affected by minimum wage changes since minimum wage legislation in Canada is under provincial jurisdiction. When he restricts the control group to low-wage individuals the effects become statistically insignificant and quantitatively small, suggesting that the criticisms were correct; that is, the large adverse employment effects were the result of common forces having a different impact on the low-wage treatment group affected by minimum wage increases and the high-wage control groups.

However, Yuen further divides his low-wage control groups into those who are "transitory" low-wage workers in that they have less than 3 quarters of low-wage employment in the three-year sample period, and "permanent" low-wage workers who have 3 or more quarters of low-wage employment in the sample period. The "temporary" low-wage workers tend to be full-time students working in low-paid summer jobs or normally high-wage workers who are in a temporarily low-paid job. In such cases, wages are not likely to reflect their normal longer-run productivity. When he restricts his analysis to the permanent low-wage control group, he gets larger and significant adverse employment effects that are similar to the conventional estimates that include the high-wage control groups. Specifically, he finds that workers whose wages are affected by a minimum wage increase (which averaged 8.4%) are 7% less likely to be employed in the subsequent period in the case of teens and 10% less likely in the case of young adults, with the effects being statistically significant. These are substantial adverse employment effects for

those who are affected by the minimum wage increase, although they will be less prominent for all teens and young adults since most are not affected by the minimum wage increases.

Campolieti, Fang and Gunderson 2005a
Campolieti, Fang and Gunderson (2005a) also estimate employment transition probabilities based on the "at risk" methodology. They utilize the longitudinal nature of the Master File of the Survey of Labour and Income Dynamics (SLID) for the period 1993–1999 to compare transitions from employment to non-employment for individuals affected by minimum wage changes with appropriate comparison groups not affected by minimum wages. This is based on the large number (24) of minimum wage changes that have occurred across the different provincial jurisdictions in Canada over the 1990s. The results indicate that the minimum wage increases have increased the transition from employment to non-employment of employed low-wage youths, who are at-risk of being affected by a minimum wage increase, by around 6 percentage points (ranging from 4 to 8 percentage points). These dis-employment effects in turn imply fairly high 'minimum wage' negative elasticities of about - 0.4 (ranging from -0.3 to - 0.5).

Campolieti, Fang and Gunderson 2005b
Campolieti, Fang and Gunderson (2005b) also use the longitudinal data from the Master File of the Survey of Labour and Income Dynamics (SLID) for Canada for 1993-99 to estimate multinomial logit equations of the effect of minimum wages on the probability of being in one of four schooling-employment states as well as transitions across the states. They find that minimum wage increases led to large and statistically significant reductions in the employment of teenagers but had no net effect on their school enrolment (in contrast to the more recent US studies which found that it reduced school enrolment). They also find no substantial substitution of students for non-students or students leaving school to queue for the higher minimum wage jobs.

Baker 2005
Although the focus of his analysis is on the impact of minimum wages on human capital formation (education and training), Baker (2005) also updates earlier estimates of the employment effect from Baker, Benjamin and Stanger (1999). His replication for the same time period of 1983 – 1993 yields a statistically significant elasticity of employment with respect to minimum wages for teens of -0.32, very close to the earlier estimates -0.37 (Statistics Canada revisions to the data accounting for the difference). Updating the data for the full time period 1983 to 2000, however, yields a much larger negative elasticity of -0.57. Alternative specifications yield an elasticity of -0.49. Since this is for the full period 1983-2000, and the elasticity for the earlier period of 1983-1993 was -0.37, this implies that the negative elasticity was considerably higher than -0.57 over the more recent period of the 1990s; that is, the adverse employment effect increased substantially over the 1990s. Taking an elasticity of -0.5 as a reasonable estimate over the full period implies that a 10 percent increase in the minimum wage led to a 5 percent decrease in the employment of teens over that full period 1983 to 2000. For youths age 20-24, the elasticities are smaller but also much larger in the full 1983 to 2000 period

to include the more current data from the 1990s (-0.09 in the earlier 1983-1993 period, and -0.17 to -0.20 in the full 1983 to 2000 period).

Baker (2005) attributes the greater adverse employment effect to the increasing proportion of youths affected by the minimum wage increase. Baker, Benjamin and Stanger (1999) reported that in the 1983-1993 period, 13 percent of employed teens held jobs paying within 5 cents of the minimum wage; by 1997 (half-way through the updated period), Baker (2005) calculates that 25% of employed teens were earning within 5 cents of the minimum wage in their jurisdiction.

Baker (2005) argues that this adverse employment effect has the largest indirect but "first-order" effect on reducing the training opportunities for youths since they miss out on work related training and experience. He then estimates the more direct effect of minimum wage on training using the 1992, 1994 and 1998 Adult Education and Training (AETS) Surveys. He generally finds negative effects on training, sometimes small and statistically insignificant, and sometimes large and statistically insignificant. He concludes, however, that the data are not adequate to make precise statements of this more direct impact of minimum wages on training, although he argues that the more indirect effect through employment is substantial and negative.

Baker (2005) also estimates the effect on education enrolment. The results are mixed. He concludes that minimum wage laws have no effect on schooling for teens age 15-16 in part because compulsory school laws inhibit them from leaving school to queue for the minimum wage jobs. They do, however, reduce the proportion of such teens who work while in school although the effects are small. For the older age groups of youths who can leave school, the effects of minimum wages are modestly positive on staying in school. For 17-19 year olds, this is also associated with a reduced likelihood of working while in school, while for 20-24 year olds it is associated with an increased likelihood of working while in school. The magnitudes of the effects, however, are generally small.

Campolieti, Gunderson and Riddell (forthcoming)
Based on the methodology of a pre-specified research design, Campolieti, Gunderson and Riddell (forthcoming) use pooled cross-section time series from the Labour Force Survey (LFS) and the Survey of Consumer Finances (SCF) for years 1981 through 1997. This yields considerable time series and cross-section variation in provincial minimum wages (71 changes) over the time period. They find substantial adverse employment effects for youths (16-24) with negative minimum wage elasticities typically in the range of -0.14 to -0.44, with -0.30 being a reasonable point estimate, and with the effects being larger after lagged adjustments.

Conclusions from Canadian Studies
While there are substantial differences across the different Canadian studies, the following generalisations emerge:
➢ The earlier Canadian studies (based on data prior to the 1980s) tended to find adverse employment effects that were in the range of US consensus estimates, and sometimes

higher, where a 10% increase in the minimum wage would give rise to a 1-3% reduction in employment.

➢ Studies based on data to include the 1980s tended to find smaller effects that were at the lower end of the consensus range, and possibly zero, as was often also the case in the US.[21]

➢ However, some more recent studies using different and more sophisticated methodologies as well as more recent data (e.g., Baker, Benjamin and Stanger 1999, Yeun 2003, Baker 2005, Campolieti, Fang and Gunderson 2005a, b, Campolieti, Gunderson and Riddell, forthcoming) find larger adverse employment effects at the higher end and beyond the consensus range, especially in the longer run. The elasticities typically range from -0.3 to -0.6 for teens (slightly lower for young adults), implying that at 10 percent increase in the minimum wage would lead to a 3 to 6 percent reduction in the employment of teens. The fact that they use different data sets and methodologies suggest that these results are robust.

➢ Overall it appears that the Canadian studies tend to find adverse employment effects that are at least as large and likely larger than US studies; certainly none find positive employment effects as occasionally occurs in the US.

➢ Minimum wage increases also tend to reduce the labour force participation rate inducing some to leave the labour force and this means that not all of the employment reductions get translated into unemployment rate increases.

➢ There is some evidence of wage spillover effects but not in all studies.

➢ There is no substantial impact on schooling, although there may be some weak positive effect for older youths.

➢ Although data problems preclude estimating robust results, the effects on training are generally negative, although sometimes small and statistically insignificant. The most likely negative effect, however, is indirect resulting from the more substantial adverse employment effect that precludes accumulating on-the-job training and experience.

➢ Minimum wages tend to reduce wage inequality and disproportionately benefit low-income families. As an anti-poverty device, however, they are an exceedingly blunt instrument and not well targeted towards the poor for various reasons:

• many of the poor do not work;

• those that do often work few hours;

• there is the risk of an adverse employment effect;

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[21] It is unknown whether this weaker effect of minimum wages throughout the latter part of the 1970s and early 1980s reflects a structural change in the way minimum wages affected labour markets, or simply the fact that the real minimum had declined by so much (eroded by the fact that the nominal minimum wage was seldom adjusted and hence was eroded by inflation) that it no longer had any impact on employment (Benjamin, 1996, p. 39). It is also possible that there could be an asymmetry in how labour markets respond to an increase in minimum wages (as occurred in the earlier periods) compared to a decline (as occurred in the latter periods). The increases are overt in that they entail an announced increase in the nominal minimum wage. The declines are passive in that they occur through the slow erosion of the minimum through it not being adjusted to keep up with inflation. This passive decline may not elicit a response to expand low-wage employment, especially because employers may not feel that the minimum wage decline is permanent, and that it will soon be offset by upward adjustments, and perhaps substantial ones to offset the cumulative decline.

- minimum wages disproportionately affect teens who are distributed throughout the family income distribution; and
- minimum wages affect individual wages while poverty is defined in terms of family income and need.

➢ There is, perhaps surprisingly, no direct published evidence on the differential impact of raising minimum wages in times of high unemployment or low unemployment. Basic theoretical reasoning (and the experience of Britain discussed previously) would suggest that any adverse employment effect would be mitigated if minimum wages were raised in periods of low unemployment in part because it would more likely not to be a binding constraint. As stated by Sussman and Tabi (2004, p. 6) in commenting that only 1.1% of workers in Alberta were working at the minimum wage compared to 4.1% across all of Canada and 8.5% in Newfoundland and Labrador: "more opportunities in Alberta may have translated into greater bargaining power for workers." Certainly, any adverse employment effect would be masked by a tight labour market where its manifestation would be only slower employment growth.

MINIMUM WAGES AND MINIMUM WAGE WORKERS IN CANADA

The appropriate policy response in the area of minimum wages depends in part on the characteristics of persons affected by minimum wages. A comprehensive picture of those characteristics as well as a picture of minimum wages in Canada is provided in Battle (2003) and Sussman and Tabi (2004).

Trends and Patterns of Minimum Wages in Canada
According to Battle (2003):
➢ In constant 2001 dollars, minimum wages in Canada (a weighted average across the different jurisdictions) rose from slightly under $6.00 per hour in the early 1960s, to a peak of about $8.50 per hour in 1976, falling steadily to about $6.00 in the mid 1980s to the early 1990s, and then rising again to about $7.00 in the late 1990s to the present (p.6).
➢ A similar pattern prevails for minimum wages relative to average wages, where they rose from 45% in 1965 to a peak of 50% by 1976, falling to around 38% in the mid 1980s to the early 1990s, and then rising slightly to about 41% in 2001 (p. 8).
➢ In 2001, minimum wages as a percent of average wages, ranged from lows of 30% to 35% in the North West Territories, Nunavut and Alberta (reflecting the high wages in those areas) to highs of 45% in Quebec and 45% in B.C. (p. 7).
➢ As a percent of the before-tax low income cut-off (poverty line) for one person, the national average minimum wage ranged from 75% in metropolitan centres, rising steadily for smaller towns to a high of 109% in rural areas, reflecting the lower cost of living in rural areas (p. 10). The percents were all lower for two-earner families, ranging from 60% in metropolitan areas to 87% in rural areas (p. 11).
➢ Minimum wages in Canada are roughly comparable to those in the U.S. on a purchasing power parity bases (implying that persons on minimum wages in both countries could purchase about the same bundle of goods and services). However, because average wages are somewhat higher in the U.S. than in Canada, minimum wages expressed as a

percent of average wages of full-time, full-year workers are lower in Canada (34%) compared to the U.S. (37%). (p. 250).

➢ On a broader international basis, both countries are at the low end of that spectrum, with Canada being fourth lowest at 34% of 17 countries, higher only than the UK (30%), Spain (28%) and Japan (24%), compared to the high-end countries of Denmark (57%), Belgium (52%), Italy (51%) and France (51%).

Characteristics of Minimum Wage Workers in Canada
According to Battle (2003):
In terms of the probability of being a minimum wage worker (figures are for 2001 or 2002):
➢ About 4.6% (580,000 of the 12.5 million employees) worked for minimum wages (p. 32), ranging from a low of 2% in Alberta to a high of 8.7% in Newfoundland (p. 33). In 2004, the same 4.6% of all employees worked for the minimum wage, although it was down to 0.9% in Alberta (Fact Sheet on Minimum Wages, 2005).
➢ The probability of being a minimum wage workers is higher for women (6%) compared to men (3.7%) (p. 35).
➢ The probability falls dramatically with age: 44% for teens age 15-16; 30% for teens age 17-19; 7% for youths age 20-24, and under 3% for those 25-64; but rising to 8.2% for the small number of workers 65 and older (p. 37).
➢ The probability generally falls with higher levels of education (p. 41).

In terms of the distribution or composition of the minimum wage workforce (which reflects not only their probability of being a minimum wage worker but also the size of their workforce):
➢ Almost 80% (78.4%) of minimum wage earners were in Ontario (38.5%), Quebec (27.4%) and B.C. (12.5%) reflecting their large shares (75.8%) of the workforce (p. 35).
➢ 62% of minimum wage workers are women compared to 38% who are men (p.35).
➢ Almost half (47%) of minimum wage workers are teenagers and a further 16% are youths age 20-24 (p. 37).
➢ 58% of minimum wage workers work part-time while 42% work full-time (p. 42).
➢ 60% of minimum wage workers are teens or youths who live with their parents, 25% are couples (of which 75% have a spouse employed at a job above the minimum wage), 11% are unattached individuals and 4% are single heads of families (p.45).
➢ Most minimum wage workers are in the service industry: 30% in trade, 29% in accommodation and food services, 6% in other services and 6% in information, culture and recreation (p.45).

A similar picture prevails in 2004 (Fact Sheet on Minimum Wages, 2005). Sussman and Tabi (2004, p. 10, 11) also indicate:
More than half of all minimum wage workers had been in their current job for no more than one year, compared to only 22% of all employees. Many of these jobs are occupied by students and other young people at the start of their careers. With more education and experience, these workers move into better paying jobs. Indeed working for minimum wage was most prevalent for those who had been at their job for three months or less (1 in 9), and least common for those who had been there for more than five years (1 in

80)… Almost two-thirds of all minimum wage workers in 2003 lived with their parents or other family members, again reflecting the large number of minimum wage workers under 25 and in school. This is often a temporary situation until the completion of education and the accumulation of experience.

This portrayal is not meant to imply that minimum wage earners are "little rich kids who live with their parents." As indicated by Fortin and Lemieux (2002, p.230):

Minimum-wage earners tend to be concentrated in the lower half of the income distribution of adjusted family income. This is true even for youth living with their parents, who disproportionately come from the lower-middle class (deciles 3 to 5). Our results clearly do not support the view that the typical minimum-wage workers are teenagers living in upper-class (deciles 9 to10) or upper-middle-class (deciles 6 to 8) families. This being said, the minimum wage remains a relatively small transfer program, which limits its ability to change the distribution of family income in Canada in a quantitatively important way.

MINIMUM WAGES IN THE FEDERAL JURISDICTION

Since 1996, when the federal government abandoned its policy of setting its own minimum wage, minimum wages in the federal jurisdiction in Canada are set to be equal to the minimum wage of the province/ territory in which the federal jurisdiction worker is employed. This applies to about 10 percent of the workforce, in private sector industries that are international or inter-jurisdictional in scope such areas as in transportation, banks, telecommunications and some federal Crown corporations. In practice, the federal government also voluntarily applies the federal minimum wage to its own workforce (Battle 2003, p. 3).

The federal minimum wage, however, is generally a non-binding constraint since the industries in which federal jurisdiction workers are employed are generally well-paying industries. While precise numbers of those affected are not available, some earlier evidence from 1986 highlights that they are likely to be small, and even smaller now given the general increase in wages. That evidence[22] indicates that only 1/10 of one percent of all workers in Canada were directly affected by the federal minimum wage. Only about 1.4% of workers in the federal jurisdiction worked in minimum wage jobs (compared to the 4.6% of workers in all jobs as indicated previously). The characteristics of persons in those jobs tended to be similar to the characteristics of minimum wage workers in general: in the service sector; occupied by young workers often students; in short-term jobs; and non-union.

Since minimum wages in the federal jurisdiction are no longer independently set, but rather they follow the minimum wages in the jurisdictions where the federally protected workers are employed, they do not have an indirect role in setting leading-edge minimum wages for other jurisdictions to follow. In essence, federal minimum wages are largely a "non-issue" because, *directly*, the minimum wage is largely irrelevant for workers in the federal jurisdiction, and

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[22] The evidence was provided by the Research unit of the Federal Labour Standards Review Commission.

indirectly, it does not have a leading-edge role since it is a "follower" and not a "leader" in minimum wage setting.

This raises the issue of whether that should change and the federal jurisdiction should revert back to setting its own independent wage that could then serve as a leading-edge model, pressuring other jurisdictions to follow, especially given the visibility of the federal government. The analysis of this paper suggests that the main advantage of doing so is that it may inhibit a "race-to-the bottom" as the various jurisdictions try to compete for business investment and the jobs associated with that investment by reducing their labour regulations, including minimum wages. If all jurisdictions feel political pressure to gravitate towards the federal norm, then this may sustain higher minimum wages.

The analysis of this paper, however, also suggests three problems with this line of reasoning. First, it assumes that inter-jurisdictional competition on the basis of reducing regulatory costs is always negative. This is certainly questionable, since many regulations serve an efficiency rationale (providing infrastructure, improving the functioning of markets) and these should not only survive but thrive under greater competitive pressures. If minimum wages serve such functions then they should not be part of a "race-to-the-bottom." As well, some jurisdictions may simply choose not to compete on the basis of low legislative minimum wages even if they impede market efficiency and have adverse employment effects.

The second problem with this line of reasoning is that it would create horizontal inequities (the unequal treatment of equals) in that individuals in exactly the same jobs could be subject to different minimum wages simply because one is under federal jurisdiction and the other under a provincial/territorial jurisdiction. This must confront the possibility that two employees under federal jurisdiction could be paid a different wage simply because they are working in two different provinces. Inter-provincial wage differences, however, are a common phenomenon, although when the workers are in contiguous locations (e.g., Ottawa vs. Gatineau) the minimum wage differences for workers in the federal jurisdiction are more anomalous, especially since Ottawa currently has the lower minimum wage but higher cost of living.

The third and most serious problem with the line of reasoning that the federal jurisdiction should revert back to setting its own independent minimum wage and provide a leading-edge role model for other jurisdictions, is that it assumes that higher minimum wages are desirable. The analysis of this paper suggest that this may be true in some areas like reducing wage inequality, but this comes at a cost in terms of a very likely adverse employment effect that seems to be well documented for Canada. As well, it is an exceedingly blunt instrument for fighting poverty, and may even be harmful.

This can be an issue of particular concern if the federal government takes on the mantle of being a role model in this area since it effectively bears little of the cost of its actions (since few workers in the federal jurisdiction are at the minimum wage where their employment could be adversely affected) and yet it can reap political benefits by appearing to be a role model. Other jurisdictions where the adverse effects are more likely to occur may feel political pressure

to follow, even if there are adverse effects. The notion that "people should face the natural consequences of their actions" should also apply to governments. There is a temptation to revert back to setting its own minimum wages since that could be politically expedient for the federal government and give it visibility as a role model in this area. The analysis of this paper, however, suggests that such a temptation should be resisted.

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