

## *Discussion*

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The paper by Crawford and Harrison focusses on an issue at the forefront of the current debate over inflation targeting and price stability: the extent of nominal wage rigidities in Canada's labour market. I have been asked to provide a technical discussion of the paper. Most of my comments thus focus on the data and techniques used by the authors to address this issue.

I commend the authors on their use of multiple data sources. Unfortunately, there is no one "best" source for answering questions about nominal wage rigidities. The authors try to put together an overall picture by bringing together evidence from several data sets. They find that nominal wage rigidities are present in union wage settlements data. However, alternative data sources indicate that more flexibility exists in wage-setting and compensation practices in the Canadian labour market than the large union contract data would lead one to think. Unfortunately, these data are not ideal either, since they cover shorter time periods and selective, smaller samples. More work needs to be done, therefore, before any broad conclusions can be reached.

The authors' data are derived mostly from union wage settlements data covering contracts at unionized firms with more than 500 workers, and providing information only on changes in base pay. The evidence from this main source can be divided into two categories: supportive and not supportive of the presence of nominal wage rigidities in Canada. The evidence consistent with a strong presence of wage rigidities is threefold: (1) the fraction of wage freezes increases during the low-inflation period of 1992-96, (2) the percentage of rollbacks in the sample is small, and (3) the

proportion of freezes increases by 10 to 15 percentage points when moving from a 6 per cent to a 2 per cent inflation rate. However, the skewness of the wage-change densities becomes more negative with the fall in inflation—opposite to the direction predicted in the presence of rigidities. Rollbacks increase during the 1992-96 period. And the median inflation rate over all contract wage freezes is 4 per cent, indicating that wage freezes also occur at higher inflation rates. These last three observations are not consistent with a strong presence of nominal wage rigidities. Most of the evidence from the alternative data sources does also point towards wage flexibility, however: (1) non-union firms are more likely to exhibit wage flexibility than union firms, (2) small firms are more flexible than large firms, and (3) measures of total compensation (including bonuses) reveal that a significant fraction of compensation changes involve rollbacks. In contrast, the authors present survey evidence in which employers report problems with wage floors.

The two main data lessons learned from this work are, first, that care should be taken with respect to measures of wage rigidity, and second, that the union wage settlements data are not representative. With regard to the first lesson, the different results with respect to first-year wage changes, year-to-year wage changes, and wage changes over the lifetime of the contract are striking. I agree with the authors that lifetime changes are more appropriate for the data and issues addressed here. However, as with the use of multiple sources, it is important to report results using multiple measures for comparative purposes. For example, the year-to-year definition would be the most appropriate when comparing the contract data with worker survey data from the Labour Market Activity Survey (LMAS) or the Survey of Labour and Income Dynamics (SLID). On the second point, I also agree with the authors that the evidence presented shows that the large union wage settlements data are not representative of the Canadian labour market as a whole, in terms of either coverage or compensation. This result underlines the importance of finding a more representative data source before coming to firm conclusions on the issue of nominal wage rigidity.

In the analysis of the union wage settlements data, the authors adopt the proportional hazard approach of Donald, Green, and Paarsch (1995). This is a flexible and innovative way of getting at this issue. In the hazard approach, however, the random variable must be non-negative to allow for the estimation of a density. Thus the treatment of negative values becomes an issue.<sup>1</sup> Here this is not so important because of the small number of rollbacks in the data. However, the use of this technique precludes any discussion of the degree to which rollbacks will increase in times of low inflation and any comparability with estimates from alternative data sets in

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1. For some specifications of the baseline hazard, zero values are also problematic.

which rollbacks are present in unavoidable numbers. I wonder how much of the authors' estimated excess density at zero belongs in the negative range.

Within their chosen framework I would encourage the authors to report a table of parameter estimates for the inflation rate with standard errors, to adopt a simpler specification such as the Cox proportional hazard model, and to add more covariates such as time dummy variables to capture regime shifts. A final point is that so far this is only a statistical analysis. Interpretation of the results is difficult without a structural model of wage determination.

A key to using multiple data sources is reconciling opposing findings. The authors try to do some reconciliation of their varying results from the different data sets. They discuss differences in sample coverage, compensation, and time periods. Unfortunately many of the alternative data sets cover only the 1990s, and therefore there is no comparable evidence from periods of high inflation.

One data source the authors do not investigate is the Canadian LMAS. The LMAS is the closest Canadian source to the type of data that have been used in the United States to address the issue of nominal wage rigidity (for example, Card and Hyslop 1996). It contains a representative sample of the civilian population and consists of two panels, from 1986-87 and 1988-90. Unfortunately, both of those periods have average inflation rates around 4 per cent. Once the second wave of SLID is complete, however, comparisons of a low-inflation period (1993-94) with the LMAS data will be possible.

Since the LMAS is available, I find it instructive to see what these data have to say about wage changes. Using the 1986-87 LMAS, I collected nominal wage changes for two different groups in the Canadian labour market—job stayers and job changers.<sup>2</sup> Figure 1 shows the density of wage changes for job stayers.<sup>3</sup> It reveals much more flexibility than anything shown here, especially for a period when inflation was 4 per cent. Figure 2 shows the density for job changers.

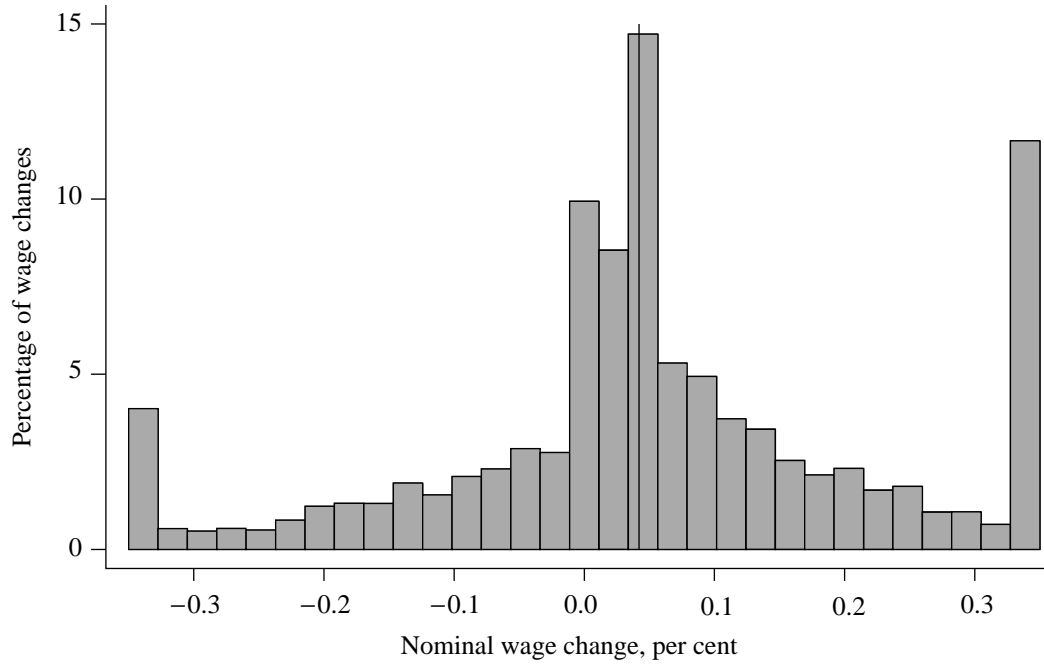
Several points should be made: (1) in both graphs there is a spike at zero; (2) for the job stayers, the spike at the inflation rate (the vertical line) is

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2. My sample includes paid workers in the labour market in 1986 and 1987. I collected information only on job one and job two in the two years. A job stayer is defined as someone who holds only one job over the two-year sample period and reports a wage rate for the job in both survey years. A job changer is someone who switches jobs during the sample period. Measurement error is not dealt with directly. However, all wage rates less than \$3 an hour and greater than \$100 an hour were excluded from the analysis.

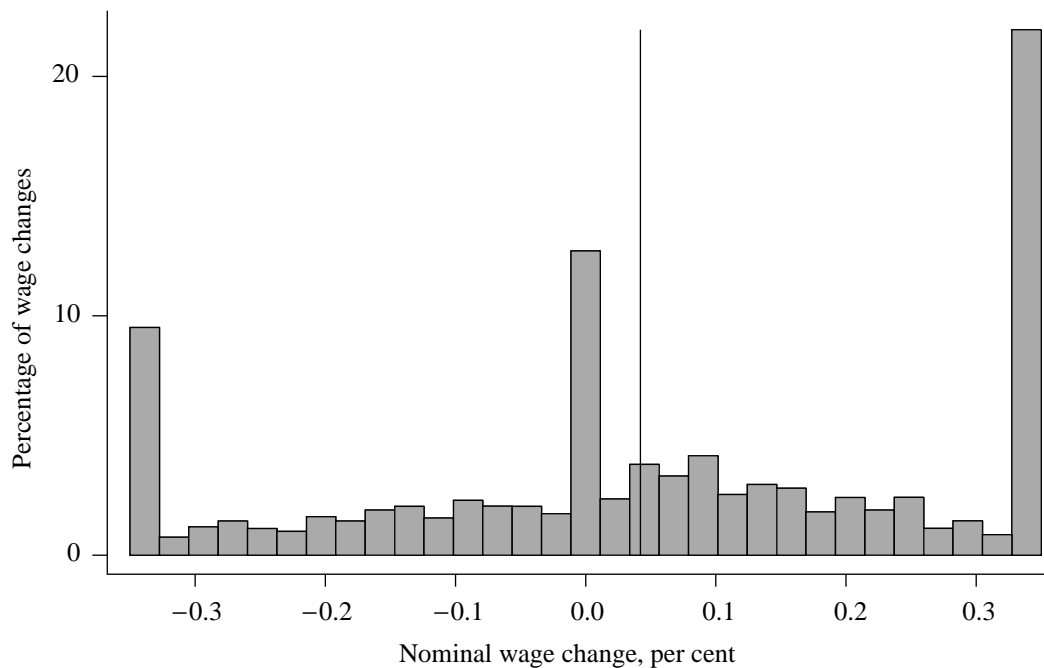
3. The end bars represent the remaining density above 0.35 and below  $-0.35$ . A vertical line is shown at 0.042 indicating no change in the real wage.

**Figure 1**  
**Density of Wage Changes for Job Stayers**



Source: Data are from the 1986-87 Labour Market Activity Survey.

**Figure 2**  
**Density of Wage Changes for Job Changers**



Source: Data are from the 1986-87 Labour Market Activity Survey.

larger than that at zero; (3) a large proportion of individuals are reporting wage cuts—25 per cent of job stayers and 32 per cent of job changers; and (4) the density for job changers differs greatly from that of job stayers. An important issue is how one reconciles the LMAS evidence with that presented by the authors. Measurement error in the LMAS wages is a likely reason for some of the difference, but I do not think it can be the only explanation. As mentioned earlier, a key to this issue will be the comparison of these densities with those from the 1993-94 period of SLID. The authors do point out that 10 per cent of SLID respondents reported wage cuts of more than 10 per cent in 1993. This is lower than the figures from the LMAS. More work must be done, however, to make the two data sets as comparable as possible before we can draw any conclusions.

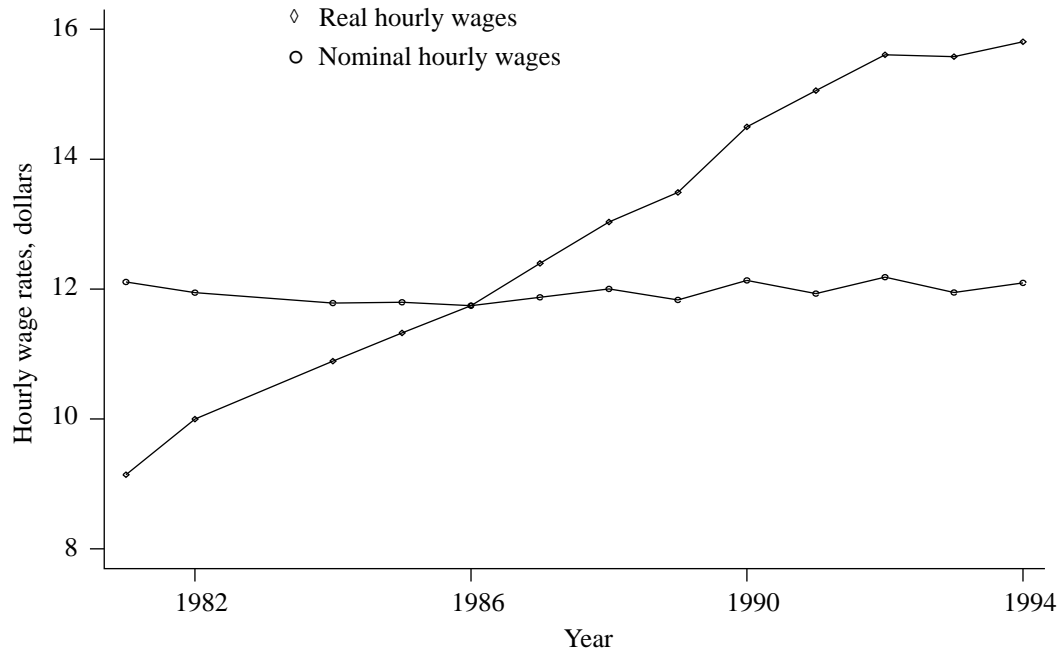
I suggest two points: The first is to ask whether or not we are studying the correct or relevant price. Should we be looking at real wage rigidity rather than nominal wage rigidity and the effect of inflation on real wages? In all the data presented here, including the LMAS, there is more real wage flexibility than nominal. Alternatively, one might consider an aggregate measure more appropriate. Figure 3 shows the trend in average nominal and real hourly wage rates since 1982.<sup>4</sup> While the average nominal wage has been growing, the average real wage has been essentially flat—showing no signs of varying with inflation. Many argue that looking at aggregate measures of wages does not reveal the “true” price of labour because of aggregation biases. A method proposed by a doctoral candidate at the University of Western Ontario is to use the hedonic pricing approach to identify the price of an efficiency unit of labour (Liu 1997). Using the Canadian Survey of Consumer Finance (SCF) data, his method shows that, while the average value of labour quality in Canada (that is, the average number of efficiency units of labour per employed worker) has been steadily increasing since 1982 (Figure 4), the price of these efficiency units has been falling (Figure 5) even during the current period of low inflation. If this is the price that firms are concerned with when making hiring decisions, then we are focussing our attention on the wrong object, and getting the story wrong as well.

My concluding point is that, so far, no one has made a connection between wage rigidities—real or nominal—and employment (unemployment) or output. That is, there is no link in this paper or in any others I have seen that shows that wage floors have a statistically and economically significant effect on employment or output in Canada. This to me is key to whether or not wage rigidity should be at the forefront of the inflation debate. It would therefore be helpful to have an analysis of employment

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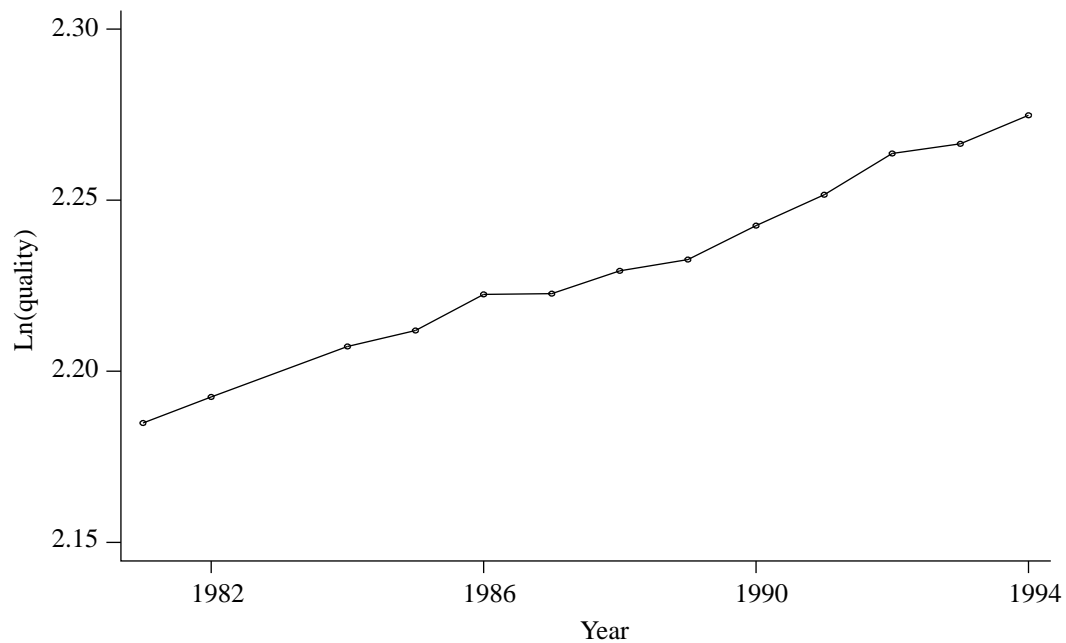
4. All wages have been deflated by the consumer price index with the base year, 1986.

**Figure 3**  
**Aggregate Wage Measures for Paid Workers**



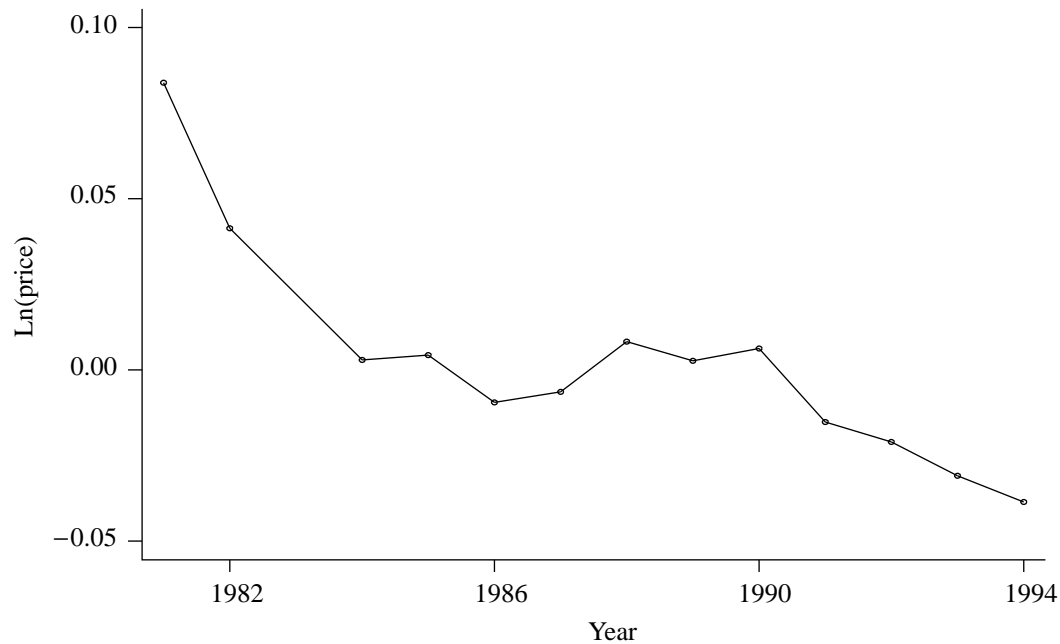
Source: Data are from the Canadian Survey of Consumer Finance, income years 1981-82, and 1984-94.

**Figure 4**  
**Measure of Labour Quality**



Source: Calculations are by the author based on data from the Canadian Survey of Consumer Finance.

**Figure 5**  
**Price of Efficiency Units of Labour**



Source: Calculations are by the author based on data from the Canadian Survey of Consumer Finance.

changes in conjunction with wage changes. To obtain this, one would, of course, require establishment-based data. My hope is that such information is available in one of the data sources used by the authors.

## References

- Card, D., and D. Hyslop. 1996. "Does Inflation 'Grease the Wheels of the Labor Market'?" NBER Working Paper No. 5538. National Bureau of Economic Research, Cambridge, Mass.
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