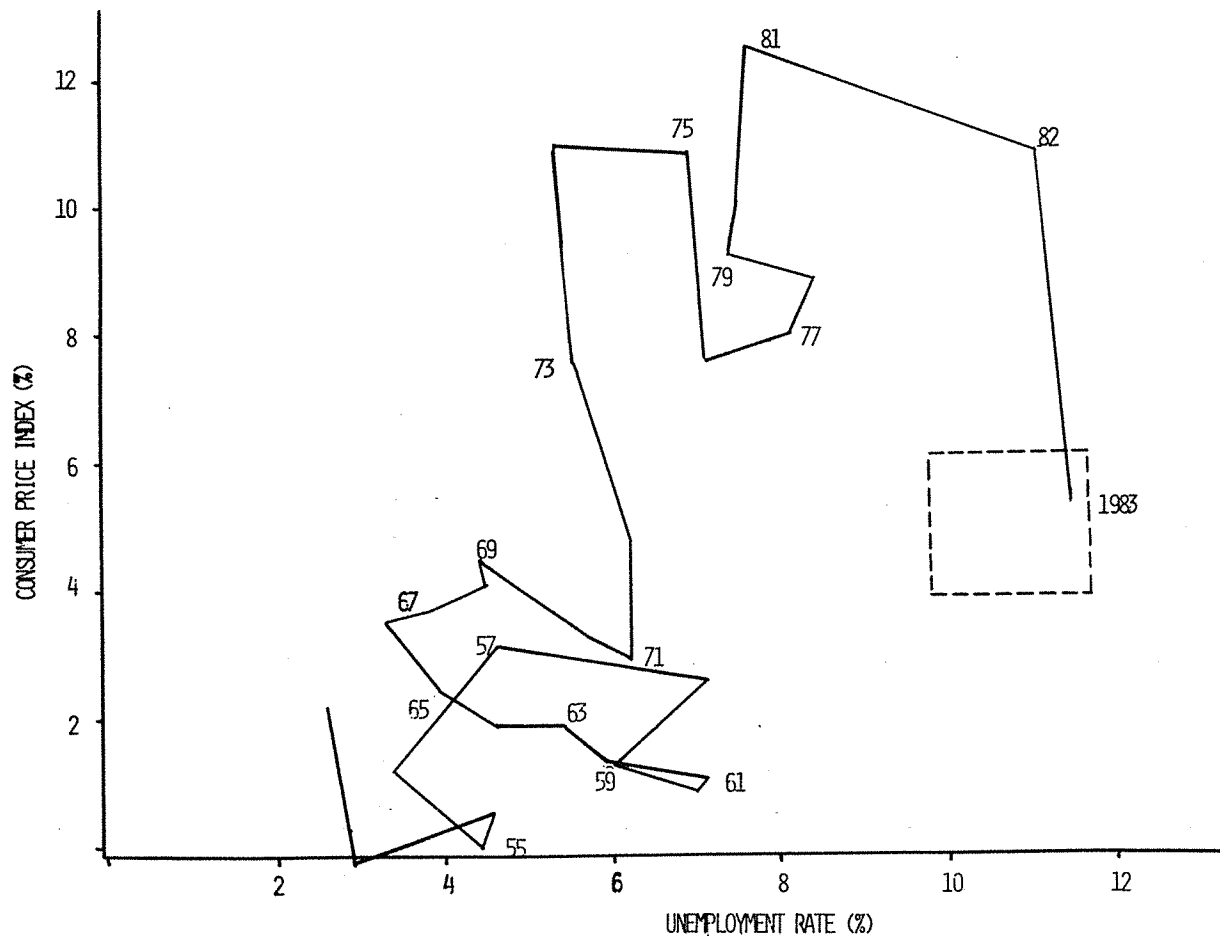


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1

Empirical Measures of Natural Resource Rents*

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The appropriate treatment of natural resource rents has been a central policy issue since the 1970s and one embedded deep in Canadian political culture. As discussed by Nelles (1974, pp. 1-48), our traditions of resource tenure, reverting to both the French and British regimes, are such that the Crown retains mineral rights unless they are expressly alienated to the private sector. There is thus a very strong sense that natural resources are part of a national patrimony, rather than "belonging" to their private developers. On the other hand, the landlord's prerogatives are not in practice divorced from the Crown's other responsibilities, so that only a share of the rents reverts to the landlord, contrary to Ricardo's (1817) expectations.

Thus, a quick method of estimating rents by observing market transactions - as was used by Kahn (1960, p. 290) in a study of the American oil industry, or by Chambers and Gordon (1966) in their assessment of the staple theory of growth - is not available. Many authors have perceived them to be large. Indeed, the size of the putative rents is a vital input to policy making. Yet, at a recent conference sponsored by Canadian Public Policy/Analyse de

Politiques (1980, p. 142) on the Alberta Heritage Fund, the editor observed that only Helliwell (1980, p. 180) had attempted to estimate, given plausible assumptions, the size of the rents which were the subject of discussion.

By now, a number of empirical estimates of Canadian resource rents have received widespread circulation[1]. Kierans (1973) used his estimations to argue that huge sums were being transferred from the public to the private sector, thus reducing the public sector's ability to direct economic development. Cairns (1981, 1982a,b) tries to clarify some of the issues by his estimations for the nickel industry. Mackenzie and Bilodeau (1979, 1982b) model the effects on investment incentive and revenue sharing of federal and provincial taxes and of smelter pollution controls on the base metal mining industry. Copithorne (1976, 1979; Copithorne and Rowse, 1980) discusses base metal and forestry rents in the context of regional disparities in per capita income, while Bernard, Bridges and Scott (1982) aim to treat the effects of hydroelectricity rents on the equalization system. In many recent papers, Helliwell (1980a,b,d, 1981; Helliwell, Pearce, Sanderson

and Scott, 1974; Helliwell and May, 1977; Helliwell and McRae, 1981, 1982) analyses the macroeconomic effects of oil and natural gas production, as well as the implications of possible government policies for the division of rents among various actors. Daniel and Goldberg (1982) perform a similar analysis.

Some authors have noted the potential for distortions of the political economy occasioned by the very existence of resource rents. Copithorne (1979, pp. 49-50; 55-74; 194) finds that, in concert with imperfections in the labour market, the rents in question can result in allocative inefficiencies in the B.C. forest industry, in terms of what is produced and where. Helliwell (1980d, p. 18) notes the possibility for "rent-seeking migration" to Alberta to create social unrest in both Alberta, which would receive immigrants attempting to gain a share of oil and gas rents (as opposed to jobs), and in the sending provinces. Inefficient pricing of certain natural resources may give inappropriate signals for the adoption or development of technology (Helliwell, 1980c, pp. 21-4). A part of this problem is the haemorrhage of rents (beyond "fair" return to capital and risk) to foreigners because of foreign ownership of much of the resource industries, and resulting incentives to inefficient pricing to assure that more benefits remain in Canada (see, for example, Helliwell 1980a, p. 6; Scarfe, 1981, p. 3).

Although some estimates of rents (Kierans, 1973; Hughes and Singh, 1978) apply general accounting methods to highly aggregated data, other authors have recognized that in theory rents should be expressed as a present value over some time horizon, using, as far as possible, actual cash data. It is now accepted that accounting procedures and

ratios provide biased measures for applications of economic theory (see Solomon, 1970 and Stauffer, 1971); cash, not book, measures are the appropriate figures, and also have the advantage of being less subject to error. Still, as theory holds that rent accrues on individual projects, the time profile of cash flows on a project basis will be very important to the rent they contribute. While a present value of expected rents arises as soon as a resource is discovered (or even before; see our discussion of exploration below), and is the fundamental theoretical concept, a determination of rent flows may be important to elaborating policies to deal with the distortions mentioned above[2].

The real discount rate is the key variable in these calculations. It is generally assumed that capital is elastically supplied at the rate chosen, usually an average opportunity rate of return on capital for the entire Canadian economy. According to Bradley (1977), that assumption is not necessarily correct; capital is likely to be in less than perfectly elastic supply. Mackenzie and Bilodeau do note that the cost of capital may be different for different firms. Cairns (1982a) accounts for this variation in company rates by estimating the cost of capital using the capital asset pricing model, at the same time explicitly determining the "risk" faced by each firm. This rate is assumed to remain the same through the period of the study for each firm. Thus, the different situations of individual firms are considered, even though the possibility that capital may not be elastically supplied to an individual firm at the cost of capital, is not.

The dynamics of the industry are an important consideration. Cairns (1981) directly integrates the theory of natural resource depletion,

finding that the depletion rent should be quite small compared to the price of nickel. Mackenzie and Bilodeau also remark upon a trend to declining rents, and observe that the reason is a trend to more remote, deeper and lower grade deposits. This is also one of the purposes for which I would judge the econometric cost function approach of Slade (1982) to be very useful[3].

Exploration receives a quite varied treatment. Helliwell and McRae assume that the supply of hydrocarbon reserves has a non-zero price elasticity, which is built into their model. The writers who treat the mining industry all agree that the cost of discovery includes not only successful, but also unsuccessful, exploration ventures. Cairns utilizes figures for expenditures and gross value of discoveries tabulated by Cranstone and Martin (1973), in effect assuming that exploration expenditures vary directly with the gross value of contained metal in a deposit. He also assumes that expenditures are concentrated at the point of commencement of production. Mackenzie and Bilodeau also use total exploration expenditures recorded for all of Canada, but derive a profile of exploration expenditures through time. Total exploration expenditures are divided equally among the "economic" deposits (those which return the assumed cost of capital, 8 percent, and also have a gross value of production exceeding \$20 million). This figure, together with the assumed optimal annual exploration budget of \$2 million, yields the number of years that an exploration program is carried out before development of a given deposit can commence. Thus, an explicit model of the exploration process yields an expenditure profile for the average deposit.

Given the uncertainties of

exploration (akin to those of R & D) and the lack of theoretic models of exploration, it seems appropriate for authors to utilize broad averages. It is especially appropriate for Mackenzie and Bilodeau's purpose, namely, to evaluate the generalized effects of taxation. One might question, with respect to their first criterion, what the model will do with the marginal deposit which is worthwhile to develop once found, but will not cover all costs including assigned exploration. However, this problem lurks in Cairns' method as well. Cairns' method would seem to allow for recognition of smaller deposits which might be rejected by the second Mackenzie-Bilodeau criterion. If indeed exploration effort is responsive to the (subjective) probability distribution of expected returns (Mackenzie and Bilodeau, 1977, p. 22), then possibly greater exploration expenditures should be adduced to the larger, richer deposits than the Mackenzie-Bilodeau constant. On the other hand, the Mackenzie-Bilodeau method, by omitting consideration of smaller deposits, may partially recognize the segmented market in exploration (see Going, 1973), in which the larger firms, searching for fairly large deposits, use a different technology and have different goals from smaller firms seeking small rich deposits.

No consideration, however, is given by any of the authors to the possibility for the dissipation of rents arising from the common property nature of exploration lands (cf. Kierans, 1973, p. 10; Bradley, 1977, p. 224). This is despite the fact that, presumably, the exploration is originally motivated by potential rents. The literature on common property resources, such as the fishery, might lead one to expect rents to be completely dissipated. Yet, the authors whose works

are being considered here all seem to find positive rents net of exploration expenditure[4].

Some have questioned the nature of these rents. An obvious possibility is that they are Ricardian differential rents. But, it is also a common observation that many minerals industries are oligopolistic. Which type of rent arises is an important policy issue. For example, Copithorne (1979, pp. 44-5) reasons that Ricardian rents may be obtained by governments by various instruments, but that any attempt to appropriate monopoly rents may prove a will-o'-the-wisp. Normative considerations enter as well. Scott (1977, p. 9) observes that society creates land value, i.e., the Ricardian rents. On the other hand, O.W. Main (1955, p. 133) reports that one of the most important oligopolists, Inco, did much through research, etc., to determine its own demand curve, i.e., its monopoly rents.

The distinction being made here, in static single period terms, is illustrated in Figure 1. Monopoly rent relates to the ability of a firm to raise price above marginal cost. Ricardian rent reflects the differential quality of intramarginal sources of supply. Together with depletion rent (a constant

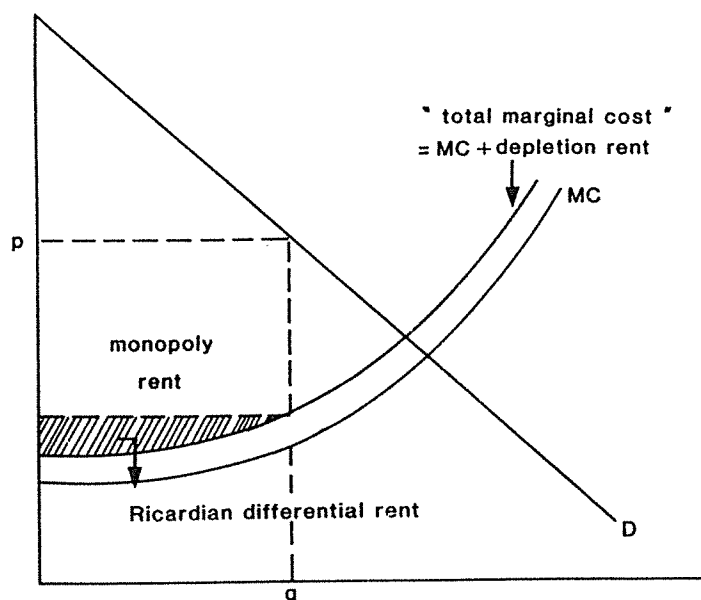
amount per unit) they sum to the total rent of the firm. It is to be noted that all three will depend on the demand in any given period, although the static diagram cannot depict the effect of demand fluctuations on depletion rent. The estimates of various authors reflect differences in their treatment of market institutions.

While Hughes and Singh (1978, p. 136) outline the theory for distinguishing these types of rent, they do not try to apply it. Others have made estimates, although they show some differences in their treatment of market institutions.

Cairns has argued that, in the estimations, the institutions of the industry and of its environment create the opportunity costs in the economy and should be taken as they are. In this argument, Hughes and Singh (1978, p. 137) apparently agree. Helliwell, McRae, Daniel and Goldberg implicitly agree, by measuring efficiency with respect to the (cartelized) world price of oil. Bernard et al. (1982, pp. 25-6, 40) explicitly take as given certain non-optional institutions affecting the competitiveness of hydroelectricity, while recognizing their effects (p. 49).

Figure 1

The Distinction Between Ricardian and Monopoly Rents



Note: "Total marginal cost" is a term used by Levhari and Liviatan (1977).

Copithorne, on the other hand, sets out to answer the question of how the existing pattern compares to the ideal. His linear programming model is sufficiently powerful to indicate an optimum, from which he draws useful policy conclusions. The method, however, seems also to point up a potential pitfall of having to choose which non-optimal institutions to reject and which to accept in what is a fundamentally partial equilibrium analysis. In order to side-step issues of transfer pricing in vertically integrated firms, Copithorne takes as the opportunity cost of metal in concentrate, the arms-length price received by Canadian exporters to Japan. It is important to note, however, that especially for copper and nickel, two of the key metals

studied in his model, Japan protects its smelting and refining industry with very high tariff barriers, and is also inclined to pay high prices for concentrates[5]. This assumption may affect somewhat Copithorne's ultimate conclusions, as argued below. In addition, Copithorne assumes that Inco is a short-run profit maximizing firm, without considering the full implications of Inco practice of consistently milling grades of material which are lower than published ore reserves: depending on mining conditions, this practice may be neither profit maximizing nor socially optimal.

Helliwell and McRae (1980, 1981) and Helliwell and May (1977) have, in keeping with their objectives, designed a method to evaluate many institutional settings of a

political nature. Mackenzie and Bilodeau also accomplish this in evaluating resource taxation. In their discussion of smelter control costs, they are also able to consider the possibility of shared regional milling facilities for the output of several mines.

Monopoly rent also receives varied treatment. Copithorne, as mentioned above, assumes that firms are short-run profit maximizers. Despite the fact that provincial hydro utilities in B.C., Manitoba, Ontario and Quebec are crown monopolies, Bernard et al. (1982, p. 2) abstract from the possibility of monopolistic pricing. Slade (1982) attempts to test if the existence of monopoly rent is revealed by the cost curve. Heuristic arguments and parameter estimates suggest that the U.S. copper industry no longer is able to extract monopoly rents, but a Chow test cannot reject the hypothesis that such rents exist.

Cairns starts from the premise that Inco exerted monopoly power during the time period of his study (1961-74), not necessarily as a profit maximizer, but through a constant mark-up on long-run marginal cost. Like Copithorne, he found data on costs difficult to obtain; he relied on published information for a single, albeit important, project. There are also some conceptual problems in his analysis: while the mark-up pricing model is consistent with some of the literature in industrial organization, it is not obvious how such behaviour may fit the engineering decision model for mine development implied by Mackenzie and Bilodeau. It is possible to argue that the two are consistent, but it is also possible that monopoly power could be expressed, at least in part, through use of an elevated discount rate to evaluate projects. Appendix 1 indicates how, under a plausible assumption, a

discount rate mark-up may appear to be a price mark-up. Another of Cairns' results is that the capital asset pricing model indicates a lower-than-average risk for Inco (a "beta" of 0.8), and hence a low cost of capital. The low risk may in part be due to Inco's ability to maintain stable prices, the main method by which it exerted monopoly power. Thus, there may have been a further benefit to Inco from monopoly power, not captured in Cairns' results.

Estimation of Ricardian rents also shows some differences, within the constraints of theory. Bernard et al. obtain estimates of potential hydroelectricity rents through a painstaking comparison of alternative sources of power. Arguing that "metal price is both the most important and the most uncertain variable in the assessment of cash flows," Mackenzie and Bilodeau (1982b, pp. 21-6) innovatively consider the effects of price fluctuations (with different phases) about trend (instead of only the sensitivity of results to different trend prices). By econometrically estimating the cost curve, Slade finds total Ricardian rents to the U.S. copper industry to be about half a billion dollars at 1979 price and output levels.

Cairns takes the total Ricardian rent to be the residual of returns above costs (including the cost of capital) and directly calculated monopoly rents. This is in keeping with a theoretical view of Ricardian rents as a residual. Copithorne's model is capable of yet further sub-division of Ricardian rents into location, quality of reserves, etc. Copithorne is also able to treat directly the possibility of rents being gained by other factors of production, such as labour; his recognition of possible rents to labour in the B.C. forest industry is

an important contribution of his model, with many policy implications.

A comparison can be made between the results of Cairns and Copithorne in the division of rents between monopoly and Ricardian components for Inco. Both find the two to be significant. Over the period 1961-74, Cairns finds the former to be about half the latter. Copithorne (1979, pp. 156-9) finds the division, in his prospective model for the period 1972-96, to be highly sensitive to projections of ore availability, investment and growth in demand, but in his optimistic "B2" scenario, finds the former to be about double the latter. This is an anomalous divergence, given Inco's loss of market power in the late 1970s, especially as Copithorne assumes rather high growth in demand and low additions to reserves. One reason for it is likely Copithorne's implicit assumption that Inco is able to maintain market share. Another may lie in his use of the price paid for exports to Japan as the opportunity cost of Canadian nickel concentrate; the "market access" rents so calculated perhaps should not be entirely adduced to Inco's monopoly power. A third may be that several years in Cairns' sample were years of shortage, during which Inco's efforts were directed at holding price down to its "long-run level," while attempting to fill demand as much as possible at that price; monopoly rents were reasoned to be nil in those years and, on the basis of certain historical considerations, treated as Ricardian rents. Without benefit of appeal to special historical considerations, and with a more detailed procedure, Copithorne's method might perceive a substantial portion of those rents as quasi-rents to capital.

Given that Ricardian rents may, then, be substantial, the question

of appropriate taxation arises. Bradley (1977) has argued that, contrary to the Ricardian single period model, neutral taxation in a dynamic resource industry is not possible, especially given the uncertainties inherent in exploration. Most authors - Helliwell and McRae, Copithorne, Cairns - simply evaluate the present value of taxes collected as part of the rent. Mackenzie and Bilodeau, however, explicitly model the allocative effects of different types of tax. They come very close to advocating the adoption of a rate of return tax - one which would extract a portion of receipts in excess of the cost of capital. Anomalous, while Manitoba did have such a system in effect at the time of their study, they found Manitoba taxation to have the poorest allocational effects among the four main provincial systems in Canada. No attempt is made to explain this result. One might speculate that there may have been unusual effects resulting from the combination of the federal and provincial systems (compare Helliwell, 1978, p. 44).

A final issue of importance is that of environmental quality. Bernard et al. consider neutrality with respect to effects on the environment in evaluating the costs of alternative sources of electrical energy. Estimates of the cost of pollution controls by Mackenzie and Bilodeau (1982b) indicate that environmental effects could substantially reduce many of the rent estimates here described - for example, the rents to the Sudbury nickel deposits discussed by Copithorne and Cairns, or the U.S. copper industry discussed by Slade.

It has been argued by Bradley (1977) that we cannot, and may not find it desirable to implement a neutral taxation scheme to appropriate natural resource rents. The papers discussed here indicated that

it is difficult to even obtain a rough estimate of the size of those rents. Sometimes heroic assumptions must be made about such fundamental matters as the choice of discount rate, the treatment of exploration, or the measurement of monopoly and Ricardian components. Familiarity with technology and other engineer-

ing considerations is a definite asset. Some indications have been made here of how further research might improve estimating procedures. But the measurement of natural resource rents remains an art. We may expect the sharing of these rents to continue to generate controversy.

NOTES

*M. Bilodeau, L. Copithorne and A. Scott provided comments on an earlier draft, but are exonerated from blame for what is said herein. Financial support for the preparation of this paper from FCAC is gratefully acknowledged.

[1] The issue is by no means just a Canadian one, although the bulk of work, to my knowledge, has been done in and about Canada. Two important exceptions are Hughes and Singh (1978) who treated several third world mineral products and Slade (1982) who discussed the U.S. copper industry. One might also mention Cury-Paniagua (1981) and Pettigrew (1982).

[2] A number of authors express rents as annual equivalents to the capitalized value. This is a natural procedure, for example, for Bernard et al., who deal with a renewable resource (hydroelectric power) and are interested in the effects of rents on the equalization system.

[3] Given the fact that L.C. Gray (1914) found that depletion (scarcity) rent formed a part of the net rent of the orebody, it is of some use to clarify the distinction made here between depletion rents (user costs, degradation charges, and other terms have been used as well) and Ricardian rents. We view the latter as a differential rent, arising because ores of different qualities are mined at the same time, and the former as a discounted value of future cost increases incurred by producing a unit of metal now rather

than in the future (cf. Levhari and Liviatan, 1977). These cost increases arise because production now forces future production further into the margin. They are thus the same for all units produced now.

Slade argues heuristically that depletion rents should be small but the statistical tests are inconclusive. A simple test of this hypothesis (whether a parameter was significantly non-zero), was, however, overlooked. Slade assumes that the cost function in the U.S. Copper industry is $TC = c(p, T) \cdot f(Q, X) = c(p, T) \cdot aQ^\eta X^\delta$ where $c(p, T)$ is a flexible form, linearly homogeneous in prices, $p = (p_i)$; T is a technology index; Q is current output; X is cumulative output; and η and δ are assumed constant. In the model, if δ is significantly greater than zero, there is evidence that depletion has an important effect on cost. In fact, Levhari and Liviatan (1977) find the depletion rent to be (if we can assume there are deposits of so low a grade that it will never pay to exploit them)

$$\int_t^\infty e^{-r(s-t)} \frac{\delta C}{\delta X} ds = \delta e^{rt} \int_t^\infty e^{-sr} \frac{C}{X} ds,$$

so that the depletion rent, under Slade's assumptions, is a multiplicative function of δ . (The exponent δ also appears inside the integral, in the factor C/X .)

[4] A policy implication is that not observing rents in company returns would be evidence that access to exploration lands should be regulated, but observing some rents is not evidence that it should not.

- [5] For example, Copithorne (1976, p. 4-22, 4-32) indicates that the difference between the Inco price for refined metal and the price of concentrate sent to Japan was only about 25 cents in 1972 and 1973. This amount would have to cover processing plus transportation. The former alone would be at least 35-40 cents. It is not clear that Inco could have sold concentrates to Japan at the quoted price, even if permitted by Ontario law to export concentrates.

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Appendix A

DISCOUNT RATE MARK-UPS VS. MARK-UP ON MARGINAL COST

For simplicity, assume a fixed capacity K , for the life of a project, constant operating cost, c , and constant output, Q . Let the discount rate used by the company for evaluation be r , and the true discount rate (opportunity cost of funds) be ρ .

Then $K + \sum_{t=1}^T \frac{cQ}{(1+r)^t} \leq \sum_{t=1}^T \frac{pQ}{(1+r)^t}$ is the condition for proceeding

with the project, if the discount rate is "marked up" from ρ to r .

Let $k = \frac{K}{Q} \frac{1}{\sum_{t=1}^T \frac{1}{(1+r)^t}} = \frac{K}{Q} \frac{r}{1-v^T}$ where $v = \frac{1}{1+r}$

Then the condition becomes $\sum_{t=1}^T \frac{p-c-k}{(1+r)^t} \geq 0$

or $p \geq c+k$

Let $k' = \frac{K}{Q} \frac{1}{\sum_{t=1}^T \frac{1}{(1+\rho)^t}} = \frac{K}{Q} \frac{\rho}{1-\phi^T}$ where $\phi = \frac{1}{1+\rho}$

The marginal cost pricing condition would be $p \geq c+k'$.

Now, $k-k' = \frac{K}{Q} \left(\frac{r}{1-v^T} - \frac{\rho}{1-\phi^T} \right)$

Percent mark-up = $\frac{k-k'}{c+k'}$

$$\frac{1 - \frac{r}{\rho} \frac{1-\phi^T}{1-v^T}}{1 + \frac{cQ}{K} \frac{1-v^T}{r}}$$

If expected operating costs are approximately a constant proportion of capital costs, an interest rate mark-up in the engineering valuation analysis may generate a percent mark-up on marginal cost.

A referee has questioned the theoretical appropriateness of the discount rate mark-up concept as an expression of monopoly power. We would suggest that it might be explained as follows. A monopoly firm will usually have an inventory of potential projects for development. Mining companies commonly use discounted cash flow techniques to value potential projects. At the monopoly price there would be projects that engineers using this technique would find profitable but that would be beyond the cost margin for the

firm (simply extend the line at P in Figure 1 to the MC curve). This discount rate, a precise measure in theory, is in practice very fuzzy: especially in the extractive industries, imprecise measures of the cost of capital grossed up for "risk" abound. An exaggerated interest rate would be comparatively easy to rationalize, especially if the firm were accustomed to a high accounting rate of return on capital. The exaggerated interest rate could roughly serve the purpose of disqualifying (perhaps only for the time being) higher cost projects, at once preserving the monopolists' mark-up of price over marginal cost and a (false) aura of scientific resource use which is responsive to the public interest.

2

Work Incentives and Welfare: Evidence from the Mincome Baseline for Adult Males*

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Between 1974 and 1979 the Federal and Manitoba governments conducted a rare social experiment, the Manitoba Basic Annual Income Experiment or MINCOME, to investigate the effects of income supplementation on recipient behaviour. The experiment followed four similar experiments conducted in the United States. The data gathered from the Canadian experiment is being prepared for analysis by the Institute for Social and Economic Research. This paper reports some initial analysis of the results from the baseline data.

2.1 MINCOME

The basic idea of MINCOME was to provide low-income households with alternative income support programs to the existing welfare assistance program in Manitoba in order to observe and assess their responses. Specifically, the alternative programs offered different levels of guaranteed income, below which household income could not fall, and different rates of taxation on earnings than the current welfare assistance program. MINCOME also monitored a "control group" on the existing welfare assistance program

in Manitoba, since the intention was to observe behaviour under the experimental plans in relation to the existing welfare program.

2.1.1 The Question of Work Incentives or Labour Supply

One important concern of MINCOME and the experiments in the United States was to measure the effect of different experimental income supplementation programs on work effort or work incentive. In practical terms, this reduces to the measurement of the effect of the different programs on hours worked by household members. The greater the work incentive effect of a program - that is, the greater the average hours worked by household members under the program - the more attractive would be the program, other factors being the same.

The incentive to work, or labour supply, is normally based on the receipt of income, including an after-tax hourly wage as compensation for time diverted from other activities inside or outside the home. Individuals choose whether to work, or whether to work additional hours, on the basis of two conflicting

objectives: a desire for more income, which is available by working, or more non-work time (or "leisure") which can be considered to be purchased at the cost of foregone earnings. A high level of unearned income, such as a high guarantee in MINCOME, can be expected to encourage the consumption of leisure and discourage work. This is called the income effect. Higher after-tax wages, or lower tax rates on earnings, make work more attractive or leisure more expensive, other things (specifically, the level of satisfaction or utility) held constant. This is called the substitution effect. Higher after-tax wages would, however, also generate greater income and hence discourage work (the income effect) to offset the substitution effect. The sum of the income and substitution effects, called the gross wage effect, may therefore be either positive or negative.

The work incentive or labour supply effect of any change in a welfare assistance program, such as the experimental changes introduced through MINCOME, depends upon the magnitude of the substitution and income effects for low-income households, since these two effects summarize the labour supply response to changes in income guarantees and tax rates. These magnitudes are also useful in answering a variety of other economic questions related to taxation, wage subsidization and other matters. (See Keeley, 1981, Chapter 3 for a partial review). MINCOME, by generating variations in income guarantees and tax rates, facilitates the assessment of labour supply effects both by direct comparison with control group results, and by estimation of substitution and income effects.

The actual experimental data is not necessary for the estimation of income and substitution effects,

however. Any data source which records differences in hours worked across households, along with differences in wage rates, and unearned income, may be used to estimate the income and substitution effects of labour supply. While awaiting the results from the experiment, therefore, use can be made of the pre-experimental interviews, or baseline data, to estimate income and substitution effects and thereby labour supply responses to welfare assistance.

2.1.2 Empirical Results from the MINCOME Baseline Data

A standard linear labour supply model for males has been estimated from the MINCOME baseline data using multiple regression techniques. The model is of the form:

$$H = a_0 + a_1WM + a_2WF + a_3YN + a_4A + a_5SCHOOL + a_6DEP + a_7EDUC + a_8RACE + e... (1)$$

where:

H is annual hours worked by the male household member;

WM is the imputed male wage rate[1]

WF is the imputed female wage rate;

YN is unearned income;

A is age;

SCHOOL equals 1 if attending school, 0 otherwise;

DEP is the number of dependent children under the age of 16;

EDUC is the number of years of education;

RACE equals 1 if white, 0 otherwise;

and

e is a random error term.

Economic theory suggests that the income effect will be negative. That is, hours worked will decline as income rises and more leisure is consumed. As a result, the effects of WF and YN on H, a_2 and a_3 , should be negative. The sign of a_1 , on the other hand, depends upon the sum of the substitution and income effects, as mentioned earlier, and may be either positive if the substitution effect dominates or negative if the income effect dominates[2].

The remaining variables - A, SCHOOL, DEP, EDUC, and RACE - are normally included to standardize for the stage of the life cycle, child care requirements, tasks or preferences for employment and other factors not captured elsewhere in the model. The effects of these variables are not involved in the calculation of the income and substitution effects that summarize labour supply behaviour. Hence, the results for these variables will not be discussed further. This does not mean that the inclusion of these variables is irrelevant, however, since their presence affects the values of a_1 , a_2 , and a_3 that determine the income and substitution ef-

fects[3].

The model might be estimated by ordinary least squares (OLS) regression, but problems are created by the fact that a significant proportion of the observations on the dependent variable H are zero (for those who do not work) [4]. Ad hoc attempts to correct this problem by discarding the zeros and using least squares estimation will lead to biased estimates. A more appropriate estimation procedure is Tobit regression on the entire sample, which specifically takes account of the fact that H is truncated at zero[5]. For comparison, Table 1 presents OLS estimates for the full sample and the truncated sample, which deletes observations for which H is zero, along with the more appropriate Tobit estimates. Coefficients a_2 and a_3 are negative as expected, while a_1 is positive in the Tobit regression but negative in the OLS regression on the truncated sample. Indeed, it is clear by inspection that there are significant differences between the Tobit estimates and the OLS estimates, particularly when OLS is applied to the truncated sample. Hence, caution should be used in interpreting ordinary least squares regression analysis of labour supply models.

From the Tobit regression estimates for a_1 , a_2 and a_3 , income and substitution effects may be measured. The first column of Table 2 presents these income and substitution elasticities and their sum, or the gross wage elasticity[6].

TABLE 1

Regression Estimates of the Labour Supply Equation (1) from the MINCOME Baseline Data for Adult Males.

Variable	Coefficient	<u>Estimates</u> ^a		
		OLS-Full Sample	OLS-Truncated Sample	Tobit-Full Sample
Constant	a	1376.2* (4.1)	2377.3* (10.0)	1132.5* (2.9)
WM	a	71.6 (1.0)	-87.5 (1.7)	111.8 (1.3)
WF	a	-23.6 (0.9)	-7.5 (0.4)	-23.5 (0.8)
YN	a	-0.15* (8.8)	-0.10* (7.6)	-0.18* (8.4)
A	a	-1.95 (0.6)	3.53 (1.5)	-2.9 (0.7)
SCHOOL	a	-421.1* (3.8)	-269.9* (3.3)	-505.5* (3.9)
DEP	a	80.8* (3.5)	41.1* (2.5)	94.1* (3.5)
EDUC	a	-10.2 (1.0)	-20.3* (2.7)	-9.4 (0.8)
RACE	a	170.7 (1.7)	-28.0 (0.4)	233.1 (1.9)
F		14.6*	12.9*	
X ²				107.3*

*Indicates statistical significance at the 5 percent level.

a t-values are in parentheses. These values are appropriate for the usual statistical tests of significance for OLS coefficient and, in large samples, for Tobit coefficients.

The remaining columns summarize the numerous estimates from non-experimental data in the United States for comparison. It is noteworthy that both the income and substitution effects are relatively strong (in absolute terms) in comparison with studies from the United States. Their combined effect, the gross wage elasticity, shows a dominance of the substitution effect over the income effect in opposition to most U.S. studies. That is, the labour supply curve for low-income households slopes upward according to our results rather than bending backward, as has been suggested by U.S. research[7]. This may be due to the fact that MINCOME data is restricted to low-income households, whereas most U.S. studies are not. One of the U.S. studies (Hill) is also restricted to low-income households, however, and is in broad agreement with the other U.S. research. Hill's results show a negative gross wage elasticity of about -0.2 in contradistinction to our estimate of +0.28 for the MINCOME baseline.

2.1.3 Tentative Policy Implications

The results from the MINCOME Baseline for Adult Males suggest fairly strong income and substitution effects in comparison with U.S. studies. A ten percent increase in income, such as a ten percent increase in the guaranteed level of welfare assistance, will reduce hours worked by 7.1 percent according to the income elasticity estimate. A ten percent increase in wages will increase hours worked by ten percent (utility held constant) and by 2.8 percent when income is allowed to increase.

These initial labour supply estimates should be used cautiously, since further modelling and estimation of labour supply is required[8]. Furthermore, the experimental results must be carefully analyzed. Nevertheless, some brief comments on the policy implications of these results may be useful.

TABLE 2

Labour Supply Elasticity Estimates^a for Adult Males from the MINCOME Baseline and U.S. Non-Experimental Data.

	<u>MINCOME</u> ^b	<u>U.S.</u> ^c		
		<u>Low</u> ^d	<u>Median</u>	<u>High</u> ^d
Income Elasticity	-0.71	-0.55	-0.21	0
Substitution Elasticity	+1.00	0	+0.06	0.67
Gross Wage Elasticity	+0.28	-0.31	-0.15	+0.30

^a The elasticities estimates are calculated as:

$$\eta_y = WM \cdot a_3 \text{ (income elasticity)}$$

$$\eta_s = (a_1 - HM \cdot a_3) \cdot WM/HM \text{ (substitution elasticity)}$$

$$\eta = WM \cdot a_1/HM \text{ (gross wage elasticity)}$$

where $\eta = \eta_y + \eta_s$ and all elasticities are evaluated at the mean values for WM and HM in the sample. For further details, see Keeley, Chapter 2.

^b Based on the Tobit estimates in Table 1.

^c Keeley, p.98.

^d First decile of estimates.

The large estimated income effect suggests that raising income guarantees may have more undesirable work disincentive effects for adult males than would be expected from U.S. research. Furthermore, the large substitution effect suggests that reductions in tax rates on earnings may have more powerful work incentive effects for adult males than expected. Hence, if these empirical conclusions are borne out in other studies, social assistance programs that offer low tax rates on earnings and low-income guarantees may be most attractive in terms of work incentive. Since welfare assistance programs in Canada now have relatively high tax (or benefit reduction) rates on earnings[9], tax rate reductions (perhaps with compensating income guarantee reductions to keep welfare costs constant) may offer a promising direction for welfare reform[10].

2.1.4 Further Research on MINCOME

As emphasized in the previous section, the results of the paper require substantial consideration and corroboration, or correction, before policy prescriptions are drawn. This paper has concentrated exclusively on the estimation of male labour supply behaviour using

the non-experimental baseline data.

Important further areas of research are female and household labour supply behaviour. While single females may be investigated by models similar to the one used in this paper, married female labour supply is normally analyzed in a household context (Ashenfelter and Heelsman, for example). That is, the labour supply of the husband and wife are considered to be interdependent in the model-building and estimation procedures. Analysis of household labour supply may alter our estimates for adult males, although this is generally considered to be a less serious problem.

Ultimately, however, the richest source of data for the evaluation of labour supply behaviour is expected to be the experimental data. As mentioned earlier, MINCOME was designed to offer significant variation in the income guarantee and tax rates facing households with low incomes. As a result the actual responses to alternative possible welfare assistance schemes may be directly observed. Only rarely do economists have the luxury of such controlled environments to investigate important economic policy questions.

NOTES

*We would like to acknowledge the assistance of the Institute for Social and Economic Research, particularly Greg Mason and Don Sabourin. Remaining errors and omissions are our responsibility.

- [1] Wage rates must be imputed where individuals are not working and hence no wage is observed. Other wage rates (actually observed) are therefore also imputed to avoid problems of bias and heteroscedasticity. See, for example, Hall.
- [2] That is, the supply curve for labour may either slope upward or bend backward.
- [3] See da Vanzo et al. for further discussion and some evidence on this question. Unlike da Vanzo et al., however, we do not find our estimates to be very sensitive to the presence or absence of EDUC.
- [4] Specifically, this violates the least squares assumption that e is normally distributed with zero mean since H , and therefore e , is truncated.
- [5] An explanation of Tobit regression may be found in Maddala, pp. 162-163. The SHAZAM regression package (White) has been used to perform these regressions.
- [6] Elasticity measures the percentage change in hours worked resulting from a one percent change in income or wage rate.
- [7] Note, however, that a_1 (and hence the gross wage elasticity) is not significantly different from zero in Table 1. Hence we cannot reject a backward bending supply curve with acceptable (95 percent) confidence. Like U.S. results reported in Keeley, our discussion is restricted to point estimates and must be treated as tentative. Further words of caution are reserved for the next section.
- [8] Keeley and Brown discuss the problems involved in the estimation of labour supply behaviour. Also worrisome are the large standard errors for a_1 and a_2 which lead to insignificant estimates and an insignificant gross wage elasticity.
- [9] That is, assistance payments are normally reduced by a large proportion of the amount earned, sometimes being as much as 100 percent.
- [10] Such reform would require renewed commitment to full employment since further incentives to earn income would only provide effective household income maintenance if employment were available to all who sought it.

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ANALYSTS' NOTEBOOK

3

Regression: A Primer*

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3.1 INTRODUCTION

Regression is a basic tool of economic analysis and forecasting. It is used to establish the strength and significance of behavioural relationships in micro and macroeconomics as well as being the basic building block for prediction. This note is intended to review the essential features of the regression model, explain how regression results are to be interpreted and provide some cautionary notes on the use of this statistical methodology.

Statisticians frequently criticize economists (and other social scientists) for misuse of procedures such as regression by failing to adhere to the strict interpretation of their methodology. Social and economic theory are general in their formulation of behavioural relationships unlike in the natural sciences where one can often develop precise mathematical formulas for hypotheses and laws. For example, the consumption function developed by Keynes, which postulates that as income rises consumption also rises, but at a lower rate, is quite vague. There is power in this generality, since good social science recognizes that specific relationships pertain to certain social and historical

situations.

These relationships are likely to change for reasons which are not clearly understood until the change is well underway or even completed. Much of the current dissatisfaction with economics and its inability to produce precise predictions fails to recognize the inherent difficulty in predicting social and institutional change. A seemingly precise regression model is merely an indicator of direction and serves as part of the evidence in support of a particular theory. The verification of an economic relationship is never accomplished by one particular regression, but by an analytical procedure which may include a variety of models and tests, none of which by themselves constitute a solid case for accepting the proposition in question, but which together provide a strong argument for belief.

This note begins by examining the two basic types of data used in regression analysis. The mathematical basis for regression is then presented, followed by a discussion of the concept of "functional form." Next some guidelines on judging the quality of a particular regression model are provided, along with some problems which can occur in the use of the model. This brief discussion

is certainly not rigorous, and a short bibliography is provided for more complete discussion.

3.2 THE REGRESSION MODEL: TWO APPLICATIONS

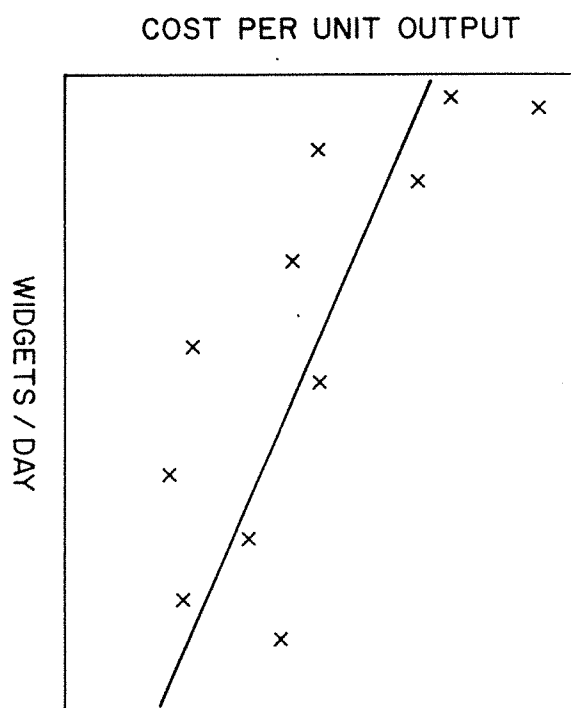
First, consider the nature of costs at the level of the individual enterprise or firm. Basic microeconomic theory indicates that the cost per unit output (average total cost) will decline as the production run increases. Economies of scale and the phenomena of "learning by doing" makes the entire enterprise more efficient as the amount produced increases. Economies of scale are most frequently associated with the possibility that labour and machin-

ery can be better matched for high output levels. For some enterprises, there comes a limit to production runs and inefficiencies begin to outweigh the efficiencies of high output levels. The unit cost then begins to rise. In other instances there may be a very large production run needed to produce such efficiency losses and the firm's cost per unit may apparently continue to fall for all observed levels of output.

Regression modelling can be applied to data on a number of firms at a given point in time as shown in Figure 1. Such "cross-sectional" models (so termed because they "freeze" time) are most commonly used in the analysis of behavioural relationships at the microeconomic level.

Figure 1

Application of Cross-Section Regression to
Cost Data on Firms



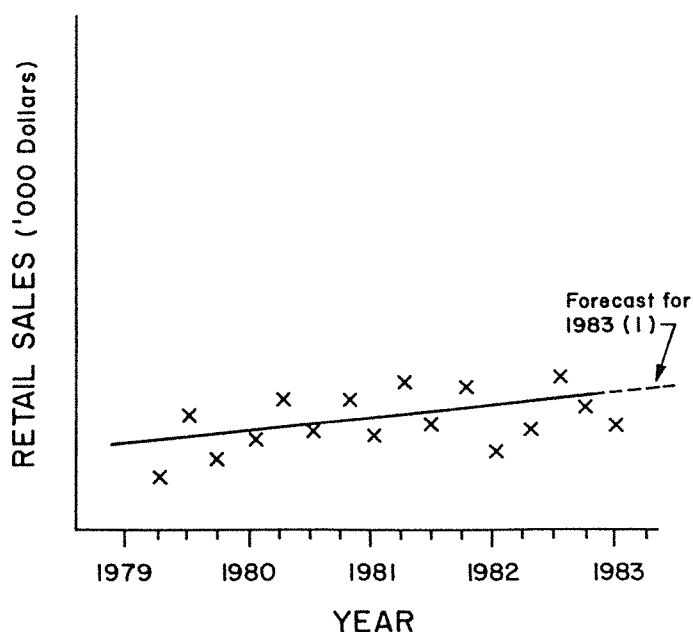
The regression line is "fitted" to the data mathematically to produce a summary of the relationship between costs and output (here measured by the number of widgets per day). In this case, a linear or straightline relationship is used, but non-linear relationships are possible as discussed below.

The other major use of regression in economics is for "time-series" data, where historical data are used to establish behavioural relationships, but more commonly used as the basis for prediction. In Figure 2, the retail sales for a single firm

are plotted against time and a regression line is fitted which summarizes this historical relationship. Such a line is also referred to as a trend line, (since time is on the horizontal axis) and it is extrapolated to produce a prediction for the first quarter of 1983. Notice that these data are also cyclical and appear to move systematically around the trend line. Time-series regression removes seasonal fluctuations in the data and must account for serial correlation (also known as auto-correlation).

Figure 2

Application of Regression to Time-Series Data



Note the distinction between the cross-sectional and time-series data. In the first case time is frozen and data collected on members of a class while in the second case historical information on a given member of the class (i.e., a single

firm) is used. Also note that for time-series regression one need not use actual dates on the horizontal axes. One could estimate the relation between retail sale and advertising budget for example.

3.3 THE MATHEMATICAL BASIS FOR REGRESSION

Although the explicit mathematical formulas used to calculate the regression line are complex and will not be presented here, it is possible to give an intuitive geometric picture of the estimation process (an alternative term for "fitting" the regression line).

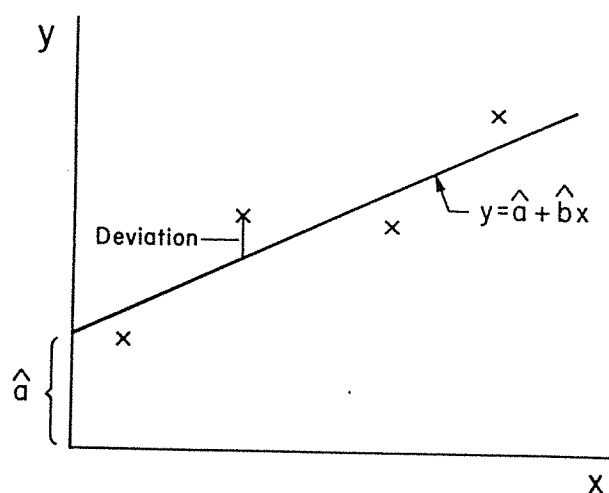
Shown in Figure 3 is an idealized representation of a regression equation. Mathematically, this relation is given by the equation

$$Y = \hat{a} + \hat{b}X,$$

where Y is termed the dependent variable or "effect" (retail sales), X is the independent variable or "cause" (advertising), a is the intercept and b the slope parameter. It is important to note that regression does not allow one to identify cause and effect; this relationship is imposed by the researcher. Here it is reasonable to suppose that advertising expenditures influence retail sales directly, rather than the other way around. The signs above a and b in the formula indicate these are estimated parameters.

Figure 3

Estimated Regression Equation and Associated Deviation of Observed Data Points



Mathematically, the estimation proceeds by placing a line within the cluster of data such that all the deviations, squared and taken together (summed) are as small as

possible. It is important to square the deviations prior to summing because negative deviations cancel positive. This method of estimating statistical relationships

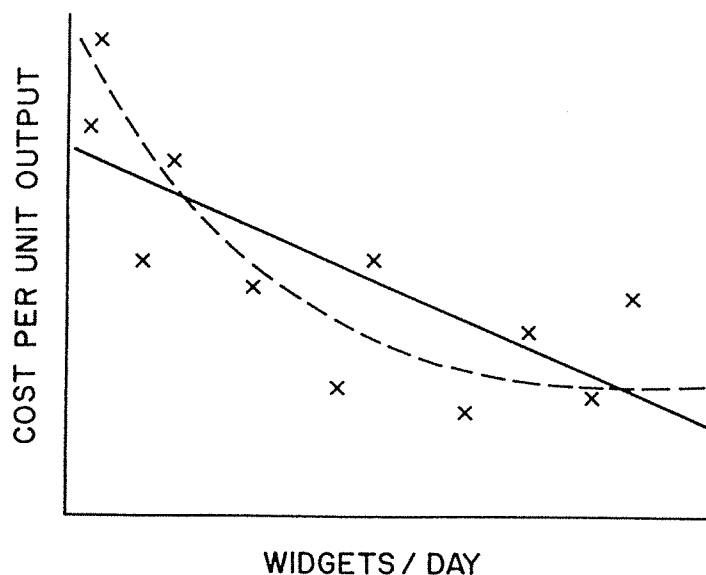
is known as "least squares." This discussion omits some important issues in sampling and the statistical basis for regression modelling, but these can be pursued by referring to the bibliography.

The most common form of regression relationship is the straight line. Aside from their mathematical simplicity, the reason linear relationships are so frequently used is that in the face of no specific information on the "true" relationship between say retail sales and adver-

tising expenditures, the straight line has the fewest assumptions. However, if the theory predicts that retail sales rise with advertising expenditures but at a declining rate, or that the average cost for a firm falls at a declining rate, then a non-linear equation can be used as shown in Figure 4. These non-linear relationships can be implemented by transforming the data using logarithms or by advanced estimation methods.

Figure 4

Linear and Non-Linear Regression Applied to Cost Data and Evaluating



3.4 INTERPRETING REGRESSION RESULTS

The interpretation of regression results is complex and many tests can be undertaken to evaluate the quality of an estimation. The first step in interpreting the regression is to examine the estimated parameters a and b . Assume that the relationship between average total cost (Y) and output (X) is given by

$$Y = \$50,000 - 20.3x.$$

If, for example, output is 1000 widgets per day, then average total cost is

$$\begin{aligned} Y &= \$50,000 - (20.3 \times 1000) \\ &= \$29,700 \end{aligned}$$

It is possible to estimate the unit cost merely by substituting a value for X (output) and then computing the result from the estimated regression equation.

The first test of regression quality is always an evaluation of the "reasonableness" of the results. Does it make sense for this industry that unit costs decline continuously? Does a unit cost of some \$29,000 make sense for a production run of 1000 widgets per day?

Second, there are a number of statistical tests of regression quality, two of which are "significance" tests on the parameters and overall "goodness of fit."

3.4.1 Significance Tests

A central concern in the application of regression is whether or not the estimated equation allows one to state with confidence that a relationship between the dependent and independent variables does in fact exist. More precisely, one frames a "null hypothesis" in which it is postulated that no relationship

actually exists. Then, depending upon the value of the regression parameters, one may reject this hypothesis with a certain (hopefully small) probability of actually being wrong. This may appear to be a clumsy way of establishing the truth, but it is important to recall that statistical procedures never allow one to prove things definitively, only to disprove certain hypotheses with a fixed probability of being wrong. This is a crucial point which is all too often ignored.

Intuitively, belief in the existence of a relationship between two variables is based upon the size of the parameter b and the dispersion of data points around the estimated regression line. As shown in Figure 5a, belief in the existence of a relation between Y and X is clearly stronger in Case 1 than in Case 2. Therefore, as the magnitude of the slope parameter (b) increases, confidence increases in rejecting the null hypothesis that there is no relationship between Y and X (i.e., $b=0$). Assuming that the variability around the regression line remains constant.

Consider Figure 5b, where both cases show regression equations with the same value of b (although the parameter a is different). Confidence in the validity of Case 1 is higher than Case 2 simply because the data are more closely clustered around the estimated line.

In summary, confidence in the slope parameter is indicated both by its value, and a measure of the dispersion of data points around the regression line (known as the standard error of estimate). The greater the t statistic on a regression parameter (either a or b), the greater one's confidence in rejecting the hypothesis that the actual value of the parameter is zero.

Figure 5a

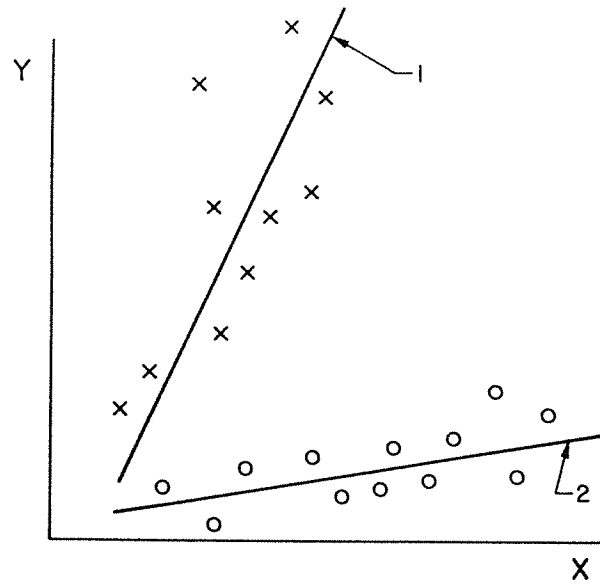
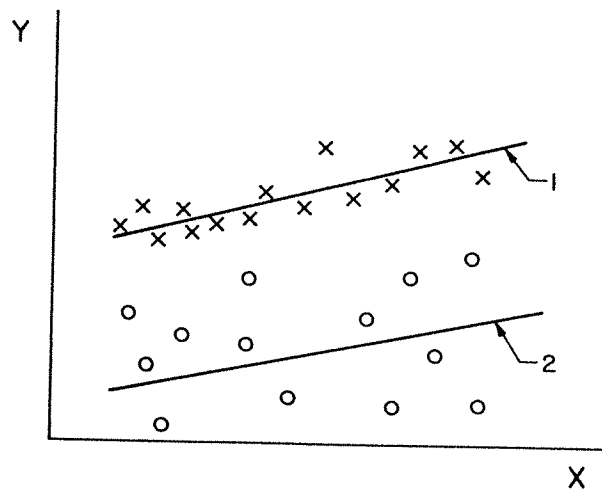


Figure 5b



It is most common to report t statistics along with the regression parameter values, but growing in popularity, and favoured by the statistics profession is the reporting of probability estimates that allow one to directly state the probability of being wrong in the rejection of the null hypothesis that a particular parameter value is zero. The ratio of the regression parameter value and its standard error follows the t distribution (assuming a number of conditions are met as discussed in any of the references cited) and it is possible to calculate the exact probability of rejecting a true hypothesis (i.e., that a or b are zero). Common practice among econometricians is to report t statistics and then indicate which are significant at the 5 percent or 1 percent level - that is, which of the parameters are statistically different from zero with a 5 percent or 1 percent chance of being wrong.

3.4.2 Goodness of Fit

The other common measure of regression quality is the overall goodness of fit or R^2 . In Figure 6a a regression line with closely associated data points is presented. The correlation between Y and X is quite high, as indicated by the close proximity between the estimated line and the data, and the R^2 is relatively close to 1. In the case of Figure 6b the dispersion of points around the estimated line is wide and the linear correlation is low implying an R^2 which is relatively close to zero.

3.5 REPORTING REGRESSION RESULTS

Most analyses and forecasts estimate a number of regression equations. To use diagrams for each equation is cumbersome. Regression results are therefore normally reported equation by equation or in tabular form. Consider the following estimate equations:

$$Y = 2.56 + 5.62x \quad R^2 = .57$$

(2.78) (4.97)

$$Y = 1.89 - .98x \quad R^2 = .89$$

(4.66) (1.19)

These can also be presented in a table.

TABLE 1

Dependent Variable (Y)	Equation	
	1	2
Independent Variables	Parameter Values	
Intercept	2.56 (2.78) *	1.89 (4.97) **
X	5.62 (4.66) **	.98 (1.19)
R^2	.57	.89

(values in brackets are t statistics)

* significant at the 5 percent level

** significant at the 1 percent level

Figure 6a

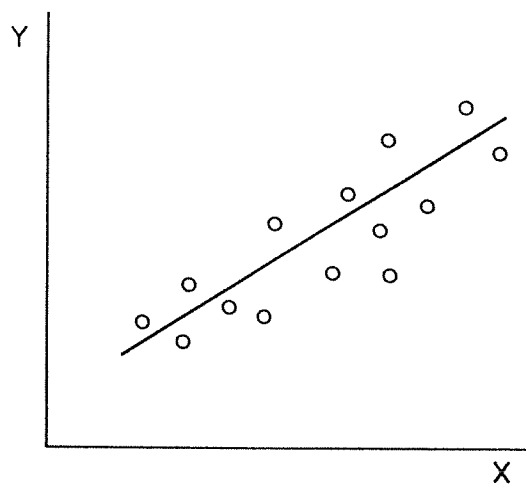
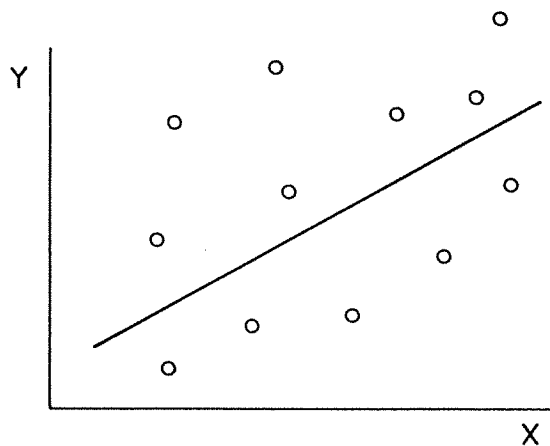
High Correlation (R^2 close to 1)

Figure 6b

Low Correlation (R^2 close to 0)

3.6 MULTIPLE REGRESSION

It is straightforward to extend the model to more than one independent variable, and the above discussion on significance and overall goodness of fit also pertains to the multiple regression case. Reporting usually is done in tabular form, frequently with some greater description of the independent and dependent variables as shown below in Table 2.

TABLE 2

<u>Dependent Variable</u>	<u>Equation</u>	
<u>Retail Sales</u>	<u>1</u>	<u>2</u>
<u>Independent Variables</u>	<u>Parameter Values</u>	
Intercept	4.67 (7.10)	6.72 (6.01)
Advertising Expenditures	1.23 (3.42)	2.70 (3.78)
Personal Disposable Income	.67 (1.72)	
Real Gross National Product	1.32 (2.47)	2.45 (1.96)
R ²	.63	.57

Note that in the second regression, the third independent variable is dropped from the equation. This is very common when the results of different model specifications are being reported.

3.7 PROBLEMS IN REGRESSION ANALYSIS

The regression model is based upon a number of important assumptions about the data being analysed. Evaluating the results of a particular estimation is a combination of judgment concerning the reasonableness of the results and statistical judgment based upon the results of explicit tests (such as t statistics and R²). It is frequent to find research in which the evaluation proceeds largely by examining the R² with a high value being judged to be superior to low values. However, such a conclusion is quite wrong, as there are situations where the basic assumptions of the regression model are violated and yet produce equations with high R² values. Also it is always possible to arbitrarily increase R² by including other independent variables in the regression regardless of their relevance to the theory at hand.

In general, cross-sectional data tend to have a high degree of variability whereas time-series data, because they follow historical trends are somewhat less variable, although exceptions certainly exist. Consequently, cross-sectional data often produce regression equations with R² values in the .2 - .4 range, while time-series regressions often have R²'s around .8 or higher.

Of more importance than the R² is the test of significance on individual parameter values as these determine the degree to which the independent variables are related to the dependent variable, and ultimately the degree of support provided by the regression for a particular theory or conjecture.

Figure 7a
Positive Serial Correlation

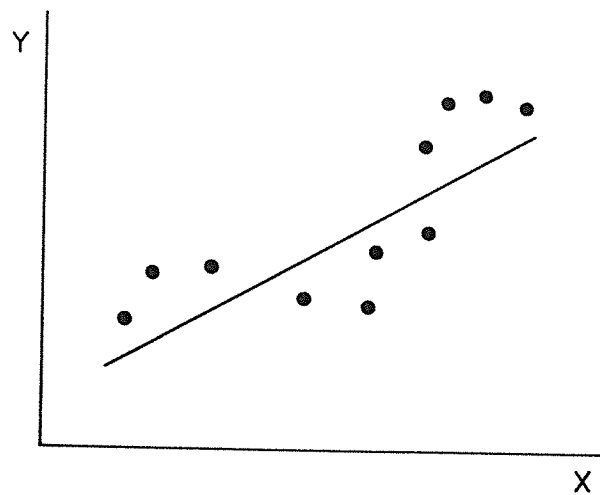
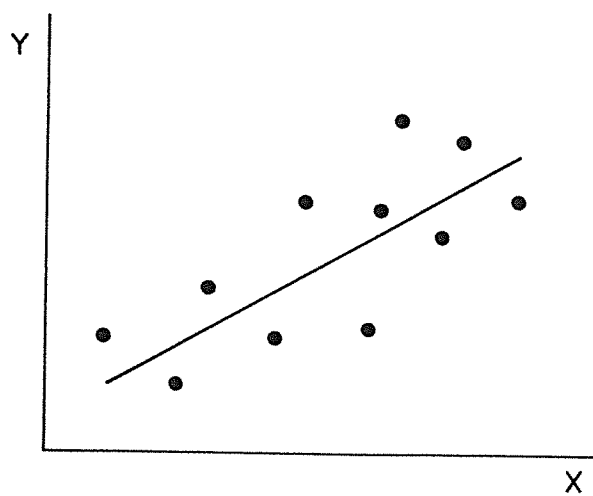


Figure 7b
Negative Serial Correlation



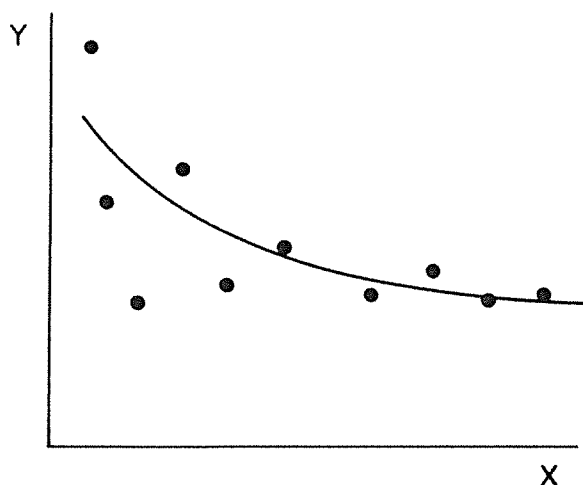
A number of problems can confound regression analysis in economics. For time-series regression perhaps the most important is the problem which occurs where the data are serially correlated. Essentially, this occurs when successive deviation terms are not mutually independent. In Figure 7a and 7b, negative and positive serial correlation are shown. Positive serial correlation occurs when successive deviations tend to act together, while negative serial correlation tends to have successive deviations on opposite sides of the regression plane. The effect of serial correlation is to distort the basis for evaluating the significance of parameter estimates. Individual t statistics become unreliable and the evaluation basis for the regression is destroyed. While

there are specific tests and corrections for serial correlation, discussion of these is beyond the scope of this presentation.

A second common disturbance to the regression model is heteroscedasticity pictured in Figure 8. Here, the deviations change in step with the value of the independent variable. A common case is in cross-sectional analysis of costs. Since larger firms tend to keep better and more accurate information, the variability of the data may lessen as larger units are surveyed. Again, the result of this disturbance is to invalidate the significance tests associated with the regression.

Figure 8

Heteroscedasticity (Variance Declines With X)



Third, a problem arises when two or more independent variables are correlated. For example, in Table 2 the variables Personal Disposable Income and Gross National Product could be closely related. This interdependence of independent variables, known as multicollinearity, is quite common in time-series data and produces erroneous estimates for the parameter values. There are no strong diagnostic procedures for detecting multicollinearity and researchers who perform regression must undertake a number of more or less ad hoc steps. Typically, these include calculating the correlation coefficients for all possible pairs of independent variables, and experimenting with the stability of the equation by removing suspect variables such as shown in Table 2. If removing a variable from the equation alters significantly (doubles, changes positive values to negative, changes the level of significance) other parameters of the regression, multicollinearity should be suspected. Unfortunately, the only secure corrective procedure is to obtain more information and data, and to reconsider the specification of the

model.

3.8 SUMMARY

This brief note has reviewed the main features of the regression model as implemented by economists. It is intended as a descriptive overview of a major methodological tool in constant use. The following references will provide the interested reader with additional material for study and are recommended:

1. Achen, Christopher, Interpreting and Using Regression. Sage University Paper Series, Number 29, Beverly Hills, Sage Publications, 1982.
2. Cassidy, Henry J., Using Econometrics: A Beginner's Guide. Reston, Virginia, Reston Publishing Co., 1981.
3. Gujarati, Damodar, Basic Econometrics. New York, McGraw Hill, 1978.
4. Orr, Dale, Applied Econometrics. Institute for Policy Analysis, University of Toronto, 1977.

NOTES

*The assistance of Donald Sabourin and Richard Lobdell is gratefully acknowledged.

4

The Story of M: A Layperson's Guide to Monetary Aggregates

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The major uncertainty about the economic recovery of 1983-84 is whether the level of interest rates is still too high to permit sustained recovery, and whether the central banks in Canada and in the United States will force those interest rates still higher in 1984 if the recovery continues to be as rapid as in early 1983. Any discussion on this point inevitably hinges around whether the money supply has been growing too fast or too slow. Economists all seem to have their own favorite definition of the money supply - M1, M2, M3, the new definition M1A introduced in Canada in March 1983, or even the monetary base[1]. The monetary base is actually not even a money supply total, even though it is called M0 in the United Kingdom; it is rather a total

of banks' cash reserve assets.

What is worse, the different definitions of the money supply have been growing at quite different rates, as Figures 1 and 2 show clearly. In the recession of 1981-82, M1 grew much more slowly than M2. In the recovery of 1983, M1 has grown much more rapidly than either M2 or M3. In the years up to 1981, M3 grew fastest of all, fuelling a very confusing debate about whether monetary policy was irresponsibly tight, or irresponsibly loose. Now the same sort of debate is going on, but the earlier discussants are in opposite positions. This article reviews the different definitions of money supply, and isolates the main issues involved in picking and using monetary aggregates.

Figure 1

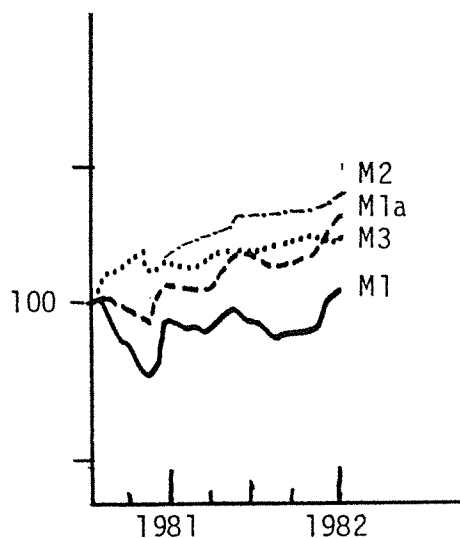
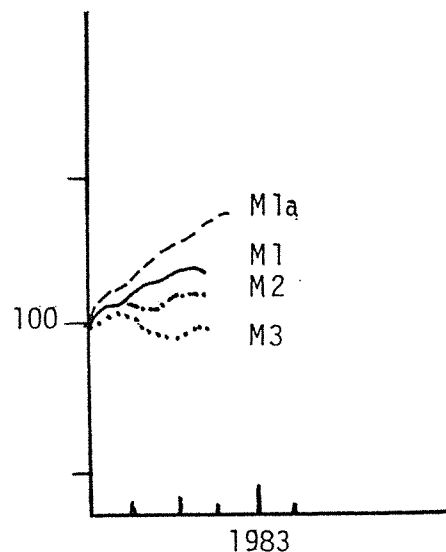


Figure 2



4.1 DEFINITIONS

Basically, M1 and M1A include only those assets which are used to make payments. That means currency and chequing deposits. In principle, chequing deposits in near-banks should be included, but because of reporting lags, they are not. Trust company and credit union chequing deposit totals are not collected fast enough to be of use for monetary policy, so the money supply definitions all refer just to deposits in chartered banks[2]. Of the two definitions, M1 is by far the better known. It includes currency outside banks, plus demand deposits (current accounts of firms, and personal chequing accounts of households), net of any double-counting

which is caused by cheques in transit. The amount of double-counting is known as float, and is due to cheques having been added to the receiver's deposit but not yet deducted from the sender's deposit. Float has to be estimated, and is subject to wide swings from month to month[3].

M1A includes, besides the assets in M1, three kinds of deposits which are not demand deposits, but which are or can be used for making payments. One is daily-interest chequable savings deposits of households. Another is daily-interest chequable notice deposits of firms, a kind of deposit introduced only in July 1980 for large customers. A third, less obvious, is non-chequable notice deposits of firms; such

deposits cannot be used directly to make payments, but since 1976 an increasing number of firms have had available to them what are called "cash management accounts," in which all surplus funds in chequing accounts at the end of each day are automatically transferred to a notice deposit to earn interest overnight. Since deposit totals are recorded by chartered banks at the end of each Wednesday, all deposits in cash management accounts will be recorded as being in notice deposits even if they are really to be used the next day for chequing purposes. In 1976, the total of these three quasi-demand deposits was only \$1.4 billion (relative to an M1 total of \$17.9 billion), but by January 1983, it had grown to \$6.3 billion or 23 percent of the M1 total.

M1 and M1A are alternative definitions of what economists refer to generically as narrow money. M2 and M3 are both definitions of broad money. Broad moneys include not only assets which can be used to make payments, but also some liquid assets which are easily convertible into money. M2 includes all assets in M1A, plus non-chequable savings deposits and term deposits of households. M3 adds to M2 the fixed term deposits of firms, and also all foreign-currency deposits of residents (whether households or firms) which are recorded in bank head offices in Canada (rather than in foreign subsidiaries abroad). Table 1 shows the relative sizes of each aggregate,

and the relative importance of the different ingredients.

The other monetary aggregate which is often discussed is not a money supply total, but rather a total of bank reserve assets. The monetary base, MB, consists of all assets which could be used by chartered banks to satisfy their legal cash reserve requirement. That means currency and Bank of Canada deposits. For this measure, all currency in circulation is included, even though much of it is in the hands of the public rather than in bank vaults serving as cash reserves. If we ignore the relatively small total of coin, which is a cash reserve asset but is issued by the Royal Canadian Mint, and if we ignore also the few other liabilities that the Bank of Canada has outstanding other than currency in circulation and deposits owed to the chartered banks, the monetary base also corresponds to the total of Bank of Canada assets. The monetary base is therefore under the direct control of the Bank of Canada insofar as the Bank of Canada has direct control over how many assets it holds at any point of time. We will return to the matter of control later on, but note for now that it is the monetary base which the Bank of Canada controls directly, rather than any of the money supply definitions given above. This is a point about the carrying out of monetary policy which is often missed.

TABLE 1

Monetary Aggregates, September, 1983.

	\$ Billion Seasonally Adjusted	Percent of M3
1. Currency outside chartered banks	11.8	6.4
2. Demand deposits, excluding float	<u>17.0</u>	<u>9.2</u>
3. Narrow money M1 (= 2+1)	<u>28.8</u>	<u>15.6</u>
4. Daily-interest chequable, and non-personal notice deposits	<u>8.2</u>	<u>4.5</u>
5. Narrow money M1A (= 3+4)	<u>37.0</u>	<u>20.0</u>
6. Non-chequable personal savings deposits*	51.9	28.1
7. Personal term deposits*	<u>42.7</u>	<u>23.1</u>
8. Broad money M2 (= 5+6+7)	<u>136.3</u>	<u>73.9</u>
9. Non-personal term deposits*	39.3	21.3
10. Foreign-currency deposits of residents, booked in Canada*	<u>10.2</u>	<u>5.5</u>
11. Broad money M3 (= 8+9+10)	<u>184.5</u>	<u>100.0</u>
Chartered bank reserves*		
12. Deposits in the Bank of Canada	3.7	2.0
13. Vault cash	<u>2.2</u>	<u>1.2</u>
14. Monetary base MB (= 1+12+13)	<u>17.7</u>	<u>9.6</u>

Source: Bank of Canada Review and Weekly Financial Statistics.

*Not seasonally adjusted

4.2 BEHAVIOUR OF THE MONEY SUPPLY TOTALS

The various money supply totals are obviously related. All of them contain the narrow money assets, and the extra assets added to arrive at M2 and M3 are clearly close substitutes for chequing deposits. For households in particular, savings deposits are the logical first alternative when considering where to put excess holdings of either currency or chequing deposits. The transactions costs of transferring funds between types of bank deposit are much smaller than the costs of transferring funds to other assets.

Because chequing, savings, and term deposits are such close substitutes, we expect that any increase in the yield on term deposits, relative to that on demand deposits, will reduce the demand for demand deposits and increase the demand for term deposits. This substitution will of course cause the growth rate of M1 to slow down, with some lag if M1 demand responds slowly, but will not affect the growth of M2. For M2, all that has happened is that there has been a substitution of one kind of asset for another kind of asset in M2. The total size of M2 is unaffected. M3 would likewise be unaffected. Conversely, when term deposit rates fall, as they did by early 1983, we expect demand deposit demand to grow and term deposit demand to fall off; this will cause M1 to grow relative to M2 and M3, just as has actually occurred in Figure 2 above for 1983.

Households and firms make other substitutions - between term deposits in chartered banks and term deposits in trust companies and credit unions, or between term deposits in banks and commercial paper or Treasury Bills - in response to relatively small changes in the interest differentials for such pairs of

assets. Whenever such substitutions occur, they cause fluctuations in the growth of M2 and M3, but not in M1 or M1A. Changes in interest differentials between liquid assets are quite common in the financial system in the short-run of a few months, so fluctuations in M2 and M3 growth are to be expected as well. In 1982-83, for instance, the differential between one-year federal government bonds and one-year residential mortgages swung from 4.5 to 0.7 percent. Arbitrage between financial markets does tend to keep relative interest rates in line and therefore prevent wide swings in interest differentials, but in doing so, the arbitrage causes wide swings in financial flows and large changes in relative growth rates for broad monies.

4.3 MONETARY AGGREGATES AS POLICY INDICATORS

The difference between money supply definitions, and the various interest rates which affect their growth, do not matter that much until monetary aggregates come to be used as indicators for policy. Before 1975, little attention was paid to the definition of the money supply, even by economists. In 1975, however, the Bank of Canada started using M1 as essentially the leading indicator of nominal output on which it would base its counter-cyclical interest rate policy. The Bank needs a leading indicator of nominal output growth because nominal output itself is measured only with a substantial lag of several months, and even then the estimates are subject to large revisions. The Bank is also aware that responses to its policies occur only with a lag, so the Bank cannot wait to be sure about output growth before making its policy decisions. To act that

slowly would be to act too late.

In 1975, the Bank was also looking for a simple leading indicator for nominal output growth so that it could set out its policy in a way that would be clearly understood and easily predicted by the other participants in the economy. The more predictable the Bank's policy, the lower the degree of uncertainty in the private sector about the future course of the economy. Central banks are sometimes accused of not explaining their policies clearly in order to avoid criticism, but that charge certainly does not fit the Bank of Canada's action in 1975.

In 1975, the Bank of Canada announced its policy strategy in very simple, clear terms: it would henceforth attempt to hold the growth rate of one of the money supply definitions, M1, within a relatively narrow band; further, it would attempt to lower that band gradually over time[4]. That was the Strategy of Gradualism, as it came to be called. Stated more fully, the Bank's strategy was to change interest rates, by changing the monetary base, so that demand for M1 assets would grow at rates within the target band. The fuller statement makes it more obvious that it is demand for M1 which determines its growth rate, and that the Bank of Canada does not have direct control over M1 supply. The Bank of Canada directly controls only the monetary base.

The Bank's strategy was useful only because it was believed (on the basis of exhaustive empirical research by the Bank's staff[5]) that demand for M1 assets depended reliably on nominal income and interest rates. Changes in nominal income growth would therefore cause changes in the growth of M1, which of course can be observed much more easily and quickly than the change in nominal income. It is expected that M1

demand will grow approximately as fast as nominal income (to be more specific, M1 will grow proportionately with the price level, and a bit less than proportionately with real income). If the growth of nominal income is too fast, which means faster than the Bank's target band for M1, it will cause M1 to grow outside its target band, and the Bank of Canada's policy will call for raising interest rates. The higher interest rates would cause a once-for-all drop in M1 demand to get it back into the target band, and of course would reduce aggregate demand and slow down nominal income growth as well[6].

It is implied by the Bank's policy rule that as long as nominal income continues to grow faster than the target band, the Bank will continually raise interest rates. Eventually, interest rates will reach a level sufficient to cause a recession, and nominal income growth would slow down. That is precisely what happened in 1981-83, the years whose monetary footprints are shown in Figures 1 and 2 above. The Bank hoped that price increases would slow down quickly, and that real output growth would only slow down a little, but it worked out the other way around.

Of course, when interest rates rise to curb growth of M1 demand, they do so by causing many holders of M1 assets to switch to term deposits instead. Term deposits are part of M2 and M3, so those broad-money aggregates tend to grow more rapidly. Among some commentators on monetary policy, such as Michael Walker of the Fraser Institute, the fast growth of M2 and M3 was prima facie evidence that the Bank of Canada was not really tightening monetary policy enough[7].

4.4 INSTABILITY IN THE DEMAND FOR MONEY

For the Bank's policy to work, it is crucial that the demand for M1 be a stable function of only nominal income and interest rate levels. If it is not, then an increase in M1 growth, at unchanged interest rates, could be caused by some other factor than nominal income, and the Bank's response of raising interest rates to bring M1 back into line would cause inappropriate changes in nominal income levels. Monetary policy would be a generator of disturbances in the economy rather than a stabilizer. In this respect, technological change and the high level of interest rates both have caused problems for the Bank.

Technology, in the form of computerized accounting at all bank branches, allowed banks to offer daily-interest savings accounts for the first time in 1979. This greatly increased the effective yield on savings accounts for households, and as a result caused a large drop in holdings of chequing deposits, without any change in either nominal income or the prevailing level of interest rates; in short, the demand for M1 shifted downwards. M2 and M3 were not affected, since savings and chequing deposits are both ingredients of M2 and M3. If the Bank had known exactly how large the downward shift would be, it would have been no great effort to lower the M1 target appropriately to allow for it, but such precise information was not available.

The higher level of interest rates caused problems by creating incentives for banks and other institutions to make demand deposits more attractive, or to find cheaper ways for firms to switch from demand into other types of deposits. Their successes undermined the stability of the demand for money by causing

it to shift around by unpredictable amounts.

Banks had incentives to attract more funds because at high interest rates, their return on assets is higher. The standard method of attracting more funds is to raise term deposit rates, which they did. However, chartered banks also innovated with new types of accounts. The true savings deposit, introduced in 1968, was the first such innovation. Cash management accounts, discussed above, are another, dating from 1976 and spreading gradually downwards from the banks' biggest customers to their smaller ones. Daily-interest savings deposits and daily-interest notice deposits for nonhousehold customers followed in 1979. Daily-interest chequing accounts were introduced by some of the banks in July 1980 for their larger accounts.

By early 1982, the Bank of Canada was sufficiently unsure of the influence of all these changes on the demand for narrow money (M1), that they decided to abandon their rule of adjusting interest rates according to an M1-feedback rule. In November 1982, the Governor of the Bank formally announced that the M1 target was being abandoned, and the Bank ceased to publish its chart showing the path of M1 relative to the target bands. The innovations were designed to ease funds out of demand deposits so that banks could make more loans, and the innovations were successful. In March 1983, the Bank formalized M1's fall from grace by starting to report a new aggregate, M1A, to catch some of the new forms of chequing account. The Bank started to report not only the money supply definitions in Table 1, but also a whole set of credit aggregates as well. The single leading indicator had been replaced by a committee of indicators[8].

4.5 FUTURE STABILITY?

It is possible that, at some point in the future, M1A will reveal itself to be determined by interest rates and nominal income in a simple, reliable manner, in which case the Bank might be tempted to revert to its approach of 1975-82 using M1A rather than M1. This is unlikely, however, because of how interest rates behave for the new assets included in M1A. Many of the daily-interest chequing deposits receive interest at rates which float in the general neighbourhood of money-market interest rates. Demand for money will always depend on the net opportunity cost of money - the difference between yields on substitute non-money assets and yields on money - and the M1 strategy was based on manipulation of M1 demand by changing that net opportunity cost. The Bank could change the net opportunity cost of M1 by changing money market yields, through changes in the monetary base, since the yield on demand deposits always stayed fixed. For daily-interest chequing accounts, there is no assurance whatsoever that an increase in money market yields will also cause an increase in the net opportunity cost of money, since the chequing account interest rate might just move up as well and leave the difference unaffected. As long as the chequing account rate is unpredictable, the behavior of M1A will also be unpredictable, and M1A will be useless as a leading indicator.

The Bank of Canada cannot simply switch its allegiance from M1 to the broad money measures, because they are even less reliable leading indicators of what is happening to nominal income growth. Term deposit demand responds quite sensitively to interest differentials between term deposit rates and a wide range of other financial assets. There are a

large set of such differentials, and the Bank is unable to predict accurately, either which differentials will change, or what effect each change will have on the demand for M2 or M3. The demand relationships for broad money are not stable now any more than they have been in the past. Introduction of new types of financial assets only complicates the job of estimating demand for broad moneys by introducing new interest differentials into the problem, and the 1970s witnessed more new types of financial asset than the preceding four decades.

4.6 THE MONETARY BASE

The discussion so far has hardly mentioned the monetary base, MB. MB is the public's holding of currency, and the cash reserve holdings of the chartered banks. Cash reserve holdings are obviously related to the money supply totals, since the banks hold cash reserve assets in fixed proportion to various types of deposits: 10 percent of demand deposits, roughly 3 percent of notice deposits, short-term term deposits, and foreign currency deposits of residents, and nil for the remainder. Chartered banks in Canada hold very close to the legally required minimum, holding significant excess cash reserves only in the period just before their year-end in order to make the books look better in the annual report.

Currency holdings of the public are an ingredient of M1 and all the other Ms, but appear to be a relatively stable fraction of M1. Currency demand fluctuates relative to chequing deposit demand by season - more in the Christmas season and during the summer, less the rest of the year - but that fluctuation is predictable. It is alleged that currency demand is particularly

sensitive to growth of the underground economy, but since the underground economy is unmeasurable, such hypotheses are really just conjecture.

The monetary base is not a useful indicator of nominal income. It behaves like an average of M1, M2, and M3, and these totals are not particularly good indicators of nominal output levels. The significance of the monetary base is that it is directly controlled by the Bank of Canada. It can therefore be used as an index not of nominal output levels in the economy, but as an index of monetary policy of the Bank of Canada. A drop in M1 could always be blamed on a slowdown of the economy rather than on the Bank of Canada, while a drop in the monetary base could only be laid at the door of the Bank.

Those who argue that the Bank of Canada should be explicit and clear about its policies, and who also believe that the Bank's policy should be simple and stable itself, argue that the Bank should concentrate on keeping the growth of the monetary base constant, and ignore what happens to other aggregates[9]. Such a policy would force banks to restrict growth of reservable deposits to that of the monetary base. If faster nominal income growth drives up demand for narrow money M1, interest rates will be driven up until the entire increase in M1 demand has been offset, or until the banks have persuaded depositors to shift from high-reserve deposits (chequing deposits) to low-reserve deposits (notice, term, and foreign-currency deposits) in sufficient volume to lower the banks' total required reserves to the level they have available. In the short-run, this could require a large interest rate adjustment, since demand for narrow money does not seem to adjust to interest rates very quickly. Such

interest rate changes would therefore have significant effects on nominal income growth, choking income growth off if greater than growth of the monetary base, and spurring it on if less than growth of the monetary base.

The problem with using the monetary base as an indicator of nominal income levels is the same as with the use of M1. Since demand for the monetary base comes from not only demand for narrow money, but also from demand for term deposits, the monetary base is likely to be even more unstable than demand for M1. The chances of a disturbance in the demand for MB that would cause an inappropriate runup or rundown in interest rates is therefore even larger than for M1. Any change in interest differentials which caused lenders to prefer three-year to six-month deposits, for instance, would cause demand for cash reserves by the banks to fall, since three-year deposits are not reservable but six-month deposits are. The monetary-base rule would translate that drop in demand for cash reserves into a fall in interest rates, even though nominal income levels might not have changed at all. In short, the monetary base rule stands a good chance of being a generator rather than a stabilizer of disturbances in output levels.

The Bank of Canada has therefore fallen back on a policy of using all the leading indicators it can get for nominal output growth, and of designing its interest rate response month by month on the basis of those forecasts. This policy implies offsetting changes in nominal income growth, but accommodating changes in money demand growth that are not caused by income growth. Unfortunately, it is not always clear that that will occur, so the level of uncertainty in the rest of the economy is higher than if a simple, explicit monetary policy rule were available.

NOTES

- [1] For discussion of the new monetary aggregate, see Bank of Canada Review, March 1983, p. 5.
- [2] Chequing deposits of trust and loan companies amount to about 10 percent of M1. Those of credit union locals are over 15 percent of M1. Notice and term deposits of trust and loan companies and of credit union locals are even larger relative to the M2 total.
- [3] See "M1, M1, Has Anybody Seen M1?" Western Economic Review, for discussion of the huge swings in float in early 1983.
- [4] The policy was announced in a speech given by the Governor in Saskatoon, published in the Bank of Canada Review, September, 1975.
- [5] See in particular W.R. White, The Demand for Money in Canada and the Control of Monetary Aggregates. Ottawa: Bank of Canada, 1976.
- [6] There is still serious question about whether this is a good strategy to stabilize nominal income, rather than just M1. The issues are well discussed in Pierre Fortin, "Monetary Targets and Monetary Policy in Canada: A Critical Assessment," Canadian Journal of Economics, November, 1979. pp. 625-46.
- [7] Symmetrically, such commentators ought to believe that monetary policy is very tight today in late 1983, since M3 has actually fallen over the year.
- [8] These are all reported as "Selected Indicators of Money and Credit," in the Bank of Canada Review. Table 9.
- [9] Professor Thomas Courchene in particular has argued for this policy rule, in (among other places) No Place to Stand? Abandoning Monetary Targets: An Evaluation. Montreal: C.D. Howe Research Institute, 1983.

5

Book Reviews

Supply-Side Economics: A Critical Appraisal edited by Richard H. Fink, University Publications of America, Frederick, Maryland. 1982. (488 pp.)

The attack on the Keynesian system is exemplified by the Monetarist challenge and more recently by "supply-side" economists, most notably the work of Arthur Laffer. Like the monetarists, supply-siders draw upon classical economics, and argue that Keynesianism forged in the depths of the Great Depression, was a response to a particular perturbation in the capitalist economies, and does not reflect underlying economic verities.

At the crux of the supply-side critique of Keynesian economics is the relatively simple proposition that the response of individual decision makers to government policy is key to an understanding of how that policy will ultimately influence macroeconomic aggregates. This is best illustrated by considering the example of an increase in government spending.

The typical Keynesian doctrine, and care is taken in this volume of readings to point out that there may not be such a thing as a typical Keynesian anymore, is that increased deficits, in response to perceived unemployment and low growth, raises aggregate demand and gross national product by an amount greater than the original stimulus provided by the new spending. For example, the "balanced budget theorem," a standard subject on first year as well as doctoral examinations, argues

that government can raise GNP by raising taxes and spending the increased revenues. This is accomplished by a simultaneous decrease in consumption and saving in response to the increased levels of tax. This reduction in consumption is less than the increase in government spending, ergo the economy will expand.

Supply-side economics disputes this completely. Instead, emphasis is placed upon the reaction of individuals to an increase in taxes. It is argued that the usual response is for individuals to work less as taxes increase, simply because the "cost" of leisure falls relative to the reward of work. The "cost" of leisure is simply the foregone wages resulting from offering labour services; as after-tax incomes fall, the attraction of leisure increases. Supply-side economists predict that rather than an increase in GNP resulting from the simultaneous increase of taxes and government spending, aggregate output will fall because there is a withdrawal of labour.

Of course, there is much contention over these propositions. A standard refutation is that few can vary their work week, but the rejoinder is that absenteeism is a form of labour hours reduction. Others claim that few are the rational homo economicus and that

marginal tax rates are really not noticed by the vast majority of workers. But again, the reply is that at the margin, these changes do have impact, especially upon those whose labour decisions are most critical, namely entrepreneurs.

This is a valuable set of articles and readings. The editor does acknowledge there is much ideology and polemic clouding the basic issues, but the virtue of this collection is that there are solid analyses. For example, the first essay by Paul Roberts is perhaps the most lucid presentation of the core of supply-side economics. A second essay by George Gilder is drawn from an emerging classic, dare one say underground, work entitled Wealth and Poverty. Economists trained any time in the post-war period would be startled to see Say's Law raised to high mast as the touchstone of supply-side economics.

In essence, supply-side economists argue that for the last two generations policy has emphasized demand when it is supply, namely the decisions made by producers, risk-takers and entrepreneurs, which really is the source of growth. Here the ideological basis for much of what passes as supply-side theory becomes evident.

In opposition to these two works, a number of essays are offered in relief. By far the most useful is by Thomas Hazlett who neatly disposes of much of the supposed "theory" proffered by supply-siders.

Hazlett notes that there is little new in this alternative paradigm. Indeed, according to Hazlett, this new theory makes a retrograde step right back to classical price theory. The basic error is to suppose that the value of any good and service is composed of the sum of values which are used to produce that commodity. It was the contribution of the "Austrian" school of

economists, in particular Menger, Jevons and Walras, to clearly demonstrate that the value of anything is determined by the demand for that commodity. In turn, this demand is a complex function of how that commodity fulfills human wants and desires, coupled with its scarcity. The dependency of supply on demand, and not the other way as argued by the supply-side economists, is shown by considering two goods - Hazlett uses Burgers and Fries. Assume these are the only goods in existence and each uses the same resources in production. As the demand for Burgers rises, so will the opportunity cost of Fries (remember the simplifying assumption that both goods require exactly the same resources for production). Accordingly, the supply (opportunity cost) curve for Fries is a mirror image of the demand curve for Burgers.

Admittedly this is a simple and somewhat artificial example, yet it does demonstrate the fact that demand predominates. Hazlett clearly shows that the supply-side theory is driven more by the ideological need to redress perceived imbalances in the treatment of suppliers relative to consumers, than by clear economic theory. The crux of the matter is well understood by any supplier: the crucial task is to discover consumer demands. Without this knowledge most quickly go out of business.

Of course, supply-siders are not ready to retire from the field. For them the supplier is omniscient, determining what the consumer wants through all manner of manipulation, insight and persuasion. Curiously, a supply-side thinker such as Gilder finds much in common with the liberal Galbraith, who twenty years ago deplored the apparent market power of large multinational corporations.

Where supply-side economists have exposed the Achilles heel of Keynesian economics is in the question of

aggregation. By subsuming away all individual demands, Keynes removed from centre stage the critical element of a free enterprise economy, namely the importance of individual consumer demands in directing the allocation of resources. It is in the particular interaction of the plethora of taxes, subsidies and regulation that the free enterprise economy has become emeshed. Supply-side economics may appear to be arrayed with deregulation as widely proposed by Friedman and Von Hayek, yet in the popular writing of the school is a set of proposals which would direct and reward the industrial capitalist at the expense of those who offer rock and roll records and designer jeans. The Soviet Union is just such an economy.

There is a very interesting discussion of the supply-side in macroeconomic models. It is common to hear criticisms of the large forecasting models allegedly designed by Keynesians for interventionist fiscal policy, yet Lawrence Klein, the eminent econometrician, disputes that these models are uniformly demand driven. Citing the Wharton model, Klein argues that "nothing could be further from the truth that mainstream, large scale econometric models neglect the supply-side of the economy." The point made by Klein is that neither the demand, nor the supply-side are by themselves necessary and sufficient for econometric modelling. The key to the assertion that the Wharton model does incorporate the supply-side is simply that at the centre is an input-output model, which despite the limitations of fixed prices and technology, does capture many of the

supply adjustments required by supply-side theorists.

Another useful section is a discussion of the Laffer curve. Allegedly scribbled on a napkin at a Washington restaurant in 1974, this curve has become the symbol of supply-side fiscal policy. No economist disputes that at zero and 100 percent tax rates, government revenues would be nil; the key question is how the relationship between tax rates and government revenues behaves between 0 and 100 percent marginal tax rates. Laffer proposed a simple and smooth relationship and further asserted that the U.S. was in the portion where increases in tax rates had such profound disincentive effects that government revenues would fall. Hence the argument for a reduction in tax rates to stimulate government revenues. In a rebuttal piece, David Henderson questions whether there is a smooth relationship between tax rates and revenues and introduces some plausible evidence from labour markets to suggest a more complex Laffer curve. The real virtue of this section of the book is to remind us that arm-chair empiricism rarely suffices for sensible policy design.

In summary, this is a valuable collection of readings. It serves to sharpen the debate, and while my own predilection is to view the supply-side "revolution" as a minor and confused revolt, there is little comfort in the current state of macroeconomic policy. This is recommended reading, especially for Progressive Conservatives who have brave new visions of economic policy for Canada. We do well to avoid cheap imports.

Greg Mason, Institute for Social and Economic Research, University of Manitoba.

Learning A Living in Canada Employment and Immigration Canada, Ottawa. Report to the Minister of Employment and Immigration Canada by the Skill Development Task Force, Vol. 1 and 2, 1983, (260 pp.)

The modern economy is both exciting and worrisome. Rapid technological changes offer the prospect of new consumer products and labour saving devices. Yet economic growth is sluggish, unemployment is high and inflation remains a serious threat to plunge us into a further period of restraint. Moreover, technological developments threaten further losses of employment and an uncertain future for many Canadians. How can technological progress, and the benefits it proffers, be realized without adding to the hardship created by current economic problems?

The answer, according to Marshall McLuhan and the Skill Development Leave Task Force, is for Canadians to retrain, re-educate and develop new skills for new jobs - in other words to "learn a living" rather than relying upon outdated or non-existent skills. The Task Force (originally to be called the Paid Educational Leave Task Force) was asked to study the question of educational or training leave for skill upgrading and to prepare options for consideration. The result is a two volume, wide ranging report on the question of skill development leave options for Canada.

Chapter one outlines the current economic situation facing Canadians, in particular high unemployment and sluggish productivity, investment and employment growth. Even the rapid recovery in output in 1983 has had little impact on employment. If the recovery stalls, unemployment will likely begin to rise again, whereas, if the recovery continues, Canadians still face the prospect of a ten percent unemployment rate throughout the 1980s.

Rapid technological development means displacement of labour and skill obsolescence. Yet such development is essential if Canadian industry is to remain competitive with the rest of the world. The problem then, is to encourage technological progress and innovation while also encouraging employment and skill development such that the social burden of economic growth is minimized.

The opening chapter also examines the major demographic patterns in the Canadian population and labour force. The "baby boom" population bulge will reach young adulthood in the 1980s, placing a greater burden on adult education programs in the future. Steady growth in the female and native component of the labour force may also place new pressures for flexibility on the workplace and adult educational and training programs.

Chapter two examines Canada's adult education programs. Although lifelong learning has always been considered an important social goal, it has acquired additional importance as an economic goal to meet rapidly changing skill requirements in the labour market and avoid production bottlenecks. In particular, a shortage of graduates in the Applied Sciences (but not Education or Arts) is expected, unless enrollment patterns in universities and community colleges change dramatically.

The new National Training Act provides for expanded industrial training and institutional training more closely tied to areas of excess labour demand and middle and higher level skills. It includes a Skills Growth Fund to develop centres for training in national occupations and a new manpower forecasting system

(the Canadian Occupational Projection System or COPS) to anticipate skill shortages by at least three years in order to implement training programs. The study notes that the concentrated thrust of the new Act represents a shift away from basic, general adult education programs. This may create barriers to skill development and employment for educationally disadvantaged adults. If the economy is to grow equitably, a more comprehensive national human resource development strategy is required. This strategy should consider the potential of educational leave to promote greater versatility in adult training and retraining.

Chapter three reviews the international (essentially European) experience with educational or skill development leave. The value of such a system is seen to be its responsiveness to changing educational requirements in the work place and its potential for promoting more effective integration of industrial and institutional training programs. Educational leave is normally financed through a tax on employers (Belgium, United Kingdom, West Germany and Sweden) or a legislated level of expenditure on educational leave or training (France). It could, however, be part of a larger program of work-sharing to reduce unemployment with workers earning sabbaticals as is the current practice in universities.

Chapter four examines industry's view of skill development leave. The frequent resistance of educational institutions to changing skill requirements (since such changes often imply skill obsolescence and retraining for educators!) is an important problem. Further co-operation between educational institutions and industry, including encouragement of part-time education, is required. Similarly, government Unemployment Insurance and

tax programs should be examined with a view to encouraging adult education and retraining. Not surprisingly, industry is less than enthusiastic about skill development leave which would impose financial obligations upon employers.

Labour's perspective on educational leave is discussed in chapter five. The response to such leave, from the Canadian Labour Congress to the average Canadian worker, is overwhelmingly favourable - and impatient since the recommendations of the Adams Commission (1979) concerning paid educational leave have not been seriously considered.

The provincial view (chapter six) is that skill development and skill development leave are needed to keep Canada competitive in a rapidly changing world. It is encouraging to hear the provinces express optimism that Constitutional conflicts arising from federal initiatives in this area could be resolved satisfactorily! (To dampen my enthusiasm, there was some mild dissension on this issue.)

The federal government's view toward skill development is considered in chapter seven. The Labour Market Development in the 1980s Task Force Report supports ongoing training of the labour force but rejects the levy-grant (or employer tax) method of financing in favour of a Registered Educational Leave Plan financed by workers, employers (if they wish), and government through tax concessions. It also advocates local training councils involving unions, employers, governments and educational institutions to initiate and co-ordinate skill development programs.

Chapter eight begins Volume II of the report with a summary of the employment problems posed by growth and technological change and the potential of skill development leave to address those problems. It also

enumerates the obstacles to skill development: lack of financial support for training, lack of information and counselling to employers and workers, lack of portability of credentials, absence of training programs outside large urban areas, educational and age barriers to educational and apprenticeship programs, attitudinal barriers to adult education, inappropriate scheduling of courses and campus residency requirements. (Many of these problems would likely disappear if a substantial market for adult education were established through skill development leave or other such programs implemented on a large scale.)

Chapter nine supposedly gets down to the business of proposing design considerations for a national skill development policy. In fact, the proposals are mostly vague generalizations and restatements of previous ideas - such as the need for basic as well as technical education, long-term as well as short-term training programs, and decentralized decision-making.

Chapter ten does contain some interesting specific proposals in addition to skill development leave. Job Creation Programs could be expanded to include support for re-training of workers. The Skills Growth Fund could include all post-secondary delivery systems. The Thrust Fund could be available to establish modular career accelerated learning co-operatives at all working levels. The Canada Student Assistance Program could be expanded to embrace both full-time and part-time adult students. Unemployment Insurance entitlement could be expanded to include education and training of the unemployed with additional funding from other government programs, employers, educational institutions and the unemployed themselves. Human rights legislation could be rewritten to include

the "right to learn." Arrangements could be made to encourage employees to draw a four year salary over a five year period, as is common in Alberta and Ontario. Vouchers might be issued to purchase required and approved training as was done in Canada under the Veteran's Rehabilitation Act after World War II. Tax incentives to employers pertaining to training costs could be developed (perhaps along the lines of accelerated depreciation provisions for physical capital).

Chapter ten also proposes three policy options regarding educational leave. First, a Skill Development Plan would involve tax credits to employers for approved programs and taxation of employers who did not meet basic target expenditure levels. Secondly, a Levy-Grant System would tax all employers and provide grants to employers who achieved training targets or who otherwise qualified (e.g., small enterprises). Finally, a Registered Educational Leave Savings Plan would provide tax exemptions for designated savings used for skill development programs.

The Report covers a lot of ground, some of it vaguely and with apparent haste. Yet it ignores several important questions concerning skill development policy. One is the question of the capability of governments to forecast manpower requirements over the medium-to-long-term. Although the Report does note the sorry record of manpower forecasters (Volume II, p. 27), it does not seem to realize that this is a serious liability to the federal government's plans to gear training to future skill requirements. The value of educational leave programs is that they are industry-based and thereby sensitive to employers' and workers' forecasts of skill requirements (which are likely the most accurate); they are flexible, taking advantage of whatever educational

and training programs are available rather than simply approved federal programs; and they are general, promoting an adaptable work force with fundamental skills rather than narrowly defined training based upon manpower forecasts that have a good chance of being wrong.

Another important question is the mobility of the labour force. Although migration patterns are reviewed in chapter one, no assessment is made of the impediments to immigration which cause very slow adjustments to regional imbalances between unemployed workers and jobs. Similarly, the unwillingness of certain groups (in particular older workers) to retrain is not addressed. Whether educational leave would be effective in cases where these problems arose is an open question.

No mention is made of economic policy in the Report. Yet appropriate monetary and fiscal stimulus is

clearly needed if paid educational leave is going to work. If employers and employees do not see pressing demands for new skills throughout the economy, educational leave is unlikely to be an acceptable expense. In a sense, this places Canada (and other countries) in a Catch-22 situation: balanced growth requires more skill development and vice versa.

Finally, most of the emphasis in the Report is on new or extended programs. In a period of restraint, new expenditures are unlikely to be welcome, however landable. Indications of programs that could be eliminated to redirect government expenditures would have been useful. These tough decisions may properly belong to politicians, but they are likely necessary if important policy initiatives such as skill development leave are ever to get off the written page.

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Western Economic Review

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1

The Year in Review

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After the substantial downturn in economic activity in 1980-81, output in Canada began to recover early in 1983, with real gross national product growing at 1.8 percent during

both the first and second quarters of the year, or 7.2 percent at annual rate.

TABLE 1

% Change in GNP (1971 Dollars)
(from same period as year before)

GNP		
		(¹)
1979	3.2	
1980	1.0	
1981	3.4	
1982	-4.4	
1982 - I	-2.6	(-2.1)
1982 - II	-5.0	(-1.4)
1982 - III	-5.1	(-0.7)
1982 - IV	-5.0	(-0.7)
1983 - I	-1.1	(1.8)
1983 - II	2.2	(1.8)
1983 - III	n.a.	.
1983 - IV	n.a.	.

(¹) Figures in parenthesis are % change from previous quarter.
Source: Canadian Statistical Review, October 1983.

Expectations are that these rates of growth will slow down during the second part of the year, to bring the overall rate of growth in 1983 to a range of 3.1 to 3.4 percent compared to the decline of 4.4 percent in 1982.

This strong recovery was essentially consumption-led, as consumers raided their savings to make all the purchases they had been withholding for two years. The index of consumer confidence of the Conference Board showed a very steep ascent during the first semester of 1983, and reached an eighteen-year high point in June. This index is based on answers to the following four

questions:

1. Is it a good time to buy a major item (such as a house or car)?
2. Will there be more jobs six months from now?
3. Is your family better off financially now than six months ago?
4. Do you think you will be better off six months from now?

TABLE 2

Savings Rate
(Savings as % of Personal Disposable Income)

Savings Rate	
1979	11.3
1980	12.1
1981	13.8
1982	15.1
1982 - I	15.9
1982 - II	15.0
1982 - III	15.2
1982 - IV	14.3
1983 - I	12.5
1983 - II	10.4
1983 - III	n.a.
1983 - IV	n.a.

Source: Canadian Statistical Review, October 1983
and CANSIM University Base.

Interestingly, another indicator of consumer confidence undertaken by Decima research remains somewhat sluggish. Respondents to the

question "What would be done with a "windfall" of \$10,000?" remain conservative, with the typical reaction to consolidate debts and mortgages rather than purchase "big ticket"

durables. This points to the fragility of consumer confidence as well as the inherent instability of a survey research technique to probe this ephemeral phenomena.

The savings rate fell from 14.3 percent during the 4th quarter of 1982 to 12.5 percent during the first quarter of 1983, and 10.4 during the second quarter.

The strong pick-up in private consumption and the resulting drop in savings during the first semester was of course mainly due to the renewal of confidence by consumers (since real disposable incomes grew sluggishly), and also to the fact that most consumers pre-spent their income-tax refunds, although these were delayed and only appear in the statistics of the third quarter. Consumption of durable goods was up, as well as automobile purchases and housing. The boost in housing and home furnishings was accentuated by

special government incentive programs, which ended in the summer, resulting in a slower growth of these items during the second half of the year.

Public (government) purchases of goods and services and investments more or less stagnated throughout the year, with an estimated 7 percent growth in nominal terms, or about 2 percent in real terms. Expenditures on wages continued to grow.

Residential construction was favoured by the Canadian Home Ownership Stimulation Plan, as well as by the regain in confidence and the fall in interest rates (Table 3). The rate of growth, however, softened somewhat in August with the ending of the special program, and housing starts (seasonally adjusted) even showed a year-over-year decline in October for the first time since February.

TABLE 3

Interest Rates

	Bank Rate	Conventional Mortgage Rate (5 years)	Prime Rate	Real Interest Rate ¹
1979 ²	12.10	11.97	12.90	3.7
1980 ²	12.89	14.32	14.25	4.1
1981 ²	17.93	18.15	19.29	6.8
1982 ²	13.96	17.89	15.81	5.0
1983 1	9.81	14.05	11.0	2.7
2	9.43	13.60	11.0	3.6
3	9.42	13.45	10.5	3.3
4	9.46	13.26	10.5	3.9
5	9.38	13.16	10.5	5.1
6	9.42	12.98	10.5	5.5
7	9.51	13.08	10.5	5.0
8	9.57	13.57	11.0	5.5
9	9.52	13.88	11.0	.
10	.	.	11.0	.
11	.	.	11.0	.
12	.	.	.	.

¹Prime Rate - % Change in CPI.

²Average for the Year.

Source: Bank of Canada Review, October 1983 and December 1981,
Canadian Statistical Review, October, 1983.

Non-residential construction remains in very poor shape, primarily due to the low degree of utilization of production capacities in the economy. The general consensus is that to stimulate activity in con-

struction, a 90 percent utilization of production capacities is required, but current capacity in the industry as a whole is only a little over 70 percent utilized (Table 3).

TABLE 4

Degree of Utilization of Production Capacities (%)

	Mining	Manufacturing	Construction	Total Industry
1979	77.3	91.5	68.8	89.7
1980	79.3	85.9	66.3	85.3
1981	74.4	83.6	68.1	82.6
1982	64.7	71.3	59.5	71.6
1982 - I	72.4	74.6	63.7	75.5
1982 - II	66.0	72.3	60.4	72.6
1982 - III	58.6	70.9	56.8	70.4
1982 - IV	61.8	67.5	57.2	67.9
1983 - I	62.8	71.6	58.2	71.1
1983 - II	65.5	73.4	61.0	73.0
1983 - III	.	.	.	.
1983 - IV	.	.	.	.

Source: CANSIM, University Base (Various Series).

These capacity utilization figures must be treated with great care. In many industries, protracted idleness over the past few years have produced plants and equipment which is obsolete, and if demand warrants, we could see a re-activation of new capital purchases as firms, wishing to remain competitive, install new technology. It is possible that capacity utilization levels of 75-80 percent would produce such a reaction, especially in manufacturing. (In the U.S., Business Fixed Investment started to pick up when capacities were still only used at 75 percent.)

If this indeed is the case, and many economists see this as the key for a sustained recovery, then business fixed investment in plant and equipment could turn around in 1984. Certainly the previous performance, which saw a decline in business investment of 11 percent to 14 percent

both in 1982 and 1983, has been dismal in the extreme. The most widely-held view as to the cause of this decline in private-sector investment has been high real rates of interest which continue to persist at levels between 5 and 6 percent. One benefit of this sluggish performance has been on the balance of payments, which improved because both consumers and firms were no longer making purchases abroad. This has helped stabilize the dollar and encouraged the Bank of Canada to allow interest rates to decline. Most economists, however, agree that the current balance surplus is only a very modest contribution to Canada's economic health.

On the international trade front, the major cause of the large surplus of the balance of goods is the recovery of exports (up 2.3 percent during the first seven months of the year over a year earlier), and in

particular, the strong pick-up in lumber (due to the recovery of the U.S. housing sector), and automobiles and parts to the U.S. Demand for big cars built in Canada was up, thanks to the drop in oil prices. The energy trade surplus (gas and electricity sales) has doubled due to a decline of 48 percent of crude petroleum imports during the first half of the year (on top of a decrease of 37 percent last year), compared to a slow growth of exports.

Surprisingly, despite tax-induced price increases, natural gas exports were reasonably strong due to a strong U.S. recovery. Concern remains, however, that Canadian suppliers are in a precarious position and that further price increases provoked by the National Energy Program may jeopardize these exports. It is likely that growth in exports of gas to the U.S. will show a decline for the second and third quarter of 1983, and possibly even register a decline in absolute terms. However, continued stability in real energy prices will likely mediate demand in this area for some time.

Two key export areas remained depressed - pulp and paper, and metal ores and iron and steel. The key to recovery here, especially in minerals and semi-processed iron and steel, hinges on sustained recovery in the United States, leading to expansion in plant and equipment investment.

Exports of grain remained more or less stable during the recession, with increases in volume compensat-

ing for the fall in prices. This year, both volumes and price are expected to remain constant, due to large world stocks and sluggish demand. Concern is expressed in some quarters over the longer run prosperity of agriculture. There is the fear that much of the past stability in grain sales is due to the regular inability for the command economies (China, Russia and Eastern Europe) to resolve difficulties in agricultural performance, coupled with good weather, could dramatically soften the market for Canadian grain.

In general, due to the depressed European market and the slow growth of the developing economies, the pattern of exports has recently shifted away from Europe and the rest of the world toward the United States. This causes some concern as it inevitably links the two North American economies even closer, and produces a less diversified base for Canada's prosperity.

On the imports side, in addition to the declines in foreign purchases of crude petroleum and capital equipment noted above, there is every chance that the consumer and tourist will become more active. With the strong indications of consumer confidence, imports of home electronics and personal computers, as well as travel abroad, could more than counteract any support from surpluses generated by exports. The consensus appears to be that these will roughly balance, leading to balance of payments and exchange-rate stability.

TABLE 5

Labour Market

	Employment		Unemployment Rate			
	% Change Same Period Last Year	Total	Both Sexes 15 - 24	Male > 25	Female > 25	
	1					
1979	4.0	7.5	13.3	4.5	7.0	
1980	2.8	7.5	13.2	4.8	6.5	
1981	2.6	7.6	13.3	4.9	6.7	
1982	-3.3	11.0	18.8	8.1	8.8	
1983 - 1	-3.5	0.0	12.4	20.5	9.7	10.1
2	-2.9	0.3	12.5	20.7	9.7	10.2
3	-2.4	0.3	12.6	21.3	9.5	10.4
4	-1.3	0.6	12.5	21.5	9.4	10.0
5	-0.4	0.6	12.4	21.1	9.6	9.6
6	0.6	0.5	12.2	20.1	9.8	9.6
7	1.4	0.6	12.0	19.7	9.6	9.4
8	2.3	0.1	11.8	19.4	9.2	9.4
9	2.9	0.4	11.3	18.9	8.7	9.2
10	2.9	-0.2	11.1	18.5	8.6	9.2
11	.	.	.	.	.	.
12	.	.	.	.	.	.

¹Figures in parenthesis are % change from previous month.

Source: Canadian Statistical Review, October 1983, No.11-003E.

Employment also started to recover in late 1983 and most economists are looking for a rate of growth of 0.5 percent to 0.6 percent this year, which is an improvement, albeit modest. During the recession, about 800,000 jobs were lost, 370,000 of which had been regained by September. However, due to the growth of the labour force (about 500,000 to 600,000 additional entrants are expected between mid-1981 and mid-1984) the unemployment rate remains well in the double-digit level at 11.1 percent in October

1983 (seasonally adjusted), still an improvement compared to December 1982's 12.8 percent rate of unemployment.

The category worst hit by the recession was the population aged 15 to 24: employment for youth fell by more than 15 percent during the recession, and remained down 13 percent in October of 1983. In contrast, employment for those 25 years or over only declined by 3 percent, and those jobs were recovered by October. Men were also more affected than women, due to the fact that

there is a greater proportion of men in the sectors that are more sensitive to the recession (manufacturing, as opposed to services). Participation rates were down for men and young people, due to a "discouraged-worker effect," and was up for women, which may be partly due to an

"additional-worker effect." This additional-worker effect is such that if one member of the family unit is unemployed, another member might join the labour force and search for a job.

TABLE 6

Wages and Prices (% Change From Same Period Last Year)

	CPI		Average Hourly Earnings in Manufacturing		Real Hourly Wages ²
		1		1	
1979	9.2		8.8		-0.4
1980	10.2		10.1		-0.1
1981	12.5		12.0		-0.4
1982	10.8		11.8		0.9
1983 - 1	8.3	(-0.2)	8.6	(0.6)	0.3
2	7.4	(0.4)	8.0	(-0.2)	0.6
3	7.2	(1.0)	8.0	(1.0)	0.7
4	6.6	(0.0)	.		.
5	5.4	(0.3)	.		.
6	5.0	(1.1)	.		.
7	5.5	(0.4)	.		.
8	5.5	(0.5)	.		.
9	.	.	.		.
10	.	.	.		.
11	.	.	.		.
12	.	.	.		.

¹Figures in parenthesis are % change from same month last year.

²Average Hourly Earnings deflated by CPI.

Source: CANSIM, University Base.

Wage increases were moderate in 1983, as many firms decided to follow the 6/5 guideline set by the Federal Government. This alleviated wage pressure on prices. Productivity gains were, however, still very low, so that unit costs of storage kept pace with inflation.

The very tight monetary policies that many feel triggered the

recession two years ago finally achieved their goal of cutting back the rate of inflation; the debate will continue for years whether the goal was worth the pain.

Besides the recession and the wage moderation (which is in part a result of the recession), a number of factors contributed to slow down the rate of inflation:

1. Exceptional grain harvests led to a decrease in agricultural prices.
 2. Food price increases dropped gradually from 15.5 percent in 1979 to 11.4 percent in 1981, 7.2 percent in 1982, and an expected 4.7 percent this year. Beef prices, for example, have not increased for four years, and are expected to remain stable for the next year.
 3. Oil prices were down, although Canada had less relief from this than other countries because of the National Energy Policy. Only this
- winter did the price of oil in the country reach the benchmark of 75 percent of world prices, which ends oil price increases as long as the world price remains unchanged or another agreement is reached between the Federal Government and Alberta.
4. Finally, the decline in interest rates itself had a positive effect on inflation by lowering housing costs.
- The continuation of the recovery in 1984, and the expansion in subsequent years, is conditioned by many factors, which will be reviewed in the next section.

TABLE 7

GNE Forecasts for 1984

	Time of Forecast	GNE (1984/1983) (% Change)
Midland Doherty	(October)	5.2
Data Resources	(October)	5.0
Bank of Nova Scotia	(October)	5.0
Conference Board	(October)	2.7
Financial Post (Survey of Business Economists)	(October)	3.75
Royal Bank of Canada	(October)	5.0
Wood Gundy Ltd.	(October)	4.75
Informetrica Ltd.	(October)	5.0
Pitfield Mackay-Ross Ltd.	(October)	4.5

Source: Various Issues of Financial Post and Conference Board Quarterly Canadian Forecast.

2

The Year Ahead*

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2.1 THE EXTERNAL ENVIRONMENT

Due to the openness of the Canadian economy, the forecasts for Canada depend strongly upon economic developments in the United States, and to a lesser extent on economic developments in Europe, Japan, and the rest of the world. As noted in the previous article, there are winds of change in these relationships.

The United States had a very strong recovery in 1983, with much faster growth rates than Canada, although historically Canada usually had high growth rates. One of the reasons for this is that consumers are in much better shape in the U.S. than in Canada; the U.S. tax system is not yet indexed on inflation, so with U.S. inflation at a moderate 3.2 percent, fiscal pressure on the households is not likely to increase very much, and incomes growth won't be slowed.

On the other hand, Canada depends much more on natural resources than the U.S., and the recovery has not yet spread to such sectors as mining or forest products, and has only spread in a limited way to the energy sector. The trauma of the energy crisis appears, at least for industry, to have provoked very serious

and substantial conservation in the United States, so that even with a rapid recovery, the Canadian energy sector can expect to benefit only marginally. While this is useful strategically for the United States, and could even be construed as a stabilizing influence on world tensions, it does mean that the energy "card" has become weak for Canadian recovery.

Forecasts for next year depend, therefore, on the policy of the Federal Reserve Board, and on its ability to control the growth of money supply and to keep a lid on inflation without boosting the rates of interest and throwing the economy into a new recession. Two conflicting views now appear in the U.S., and can be summarized as follows:

1. On the one hand, pure monetarists argue that the present rates of growth of money supply are only threading the way to high inflation, and must therefore be cut short by higher interest rates and slowed expansion in money supply.
2. Others believe that the current rate of growth of M1 is necessary to accommodate the

recovery, but is not in itself inflationary, since real rates of interest remain very high. It is only a lax monetary policy with low real interest rates that may lead to such an increase in demand that it would create inflationary pressures in the economy. The feeling is that if high real rates of interest persist or increase even further due to monetary constraint, this will depress future growth. New investment is mandatory to restructure and expand capacities, increase productivity, and improve competitiveness. If recovery is to go beyond a simple inventory cycle once pent-up demand has disappeared, much lower real rates of interest are needed.

Another debate, linked to the previous, relates to the role of the public sector's deficit on money markets, and on the possible crowding-out effect that this may have by pumping funds that may be needed for private investments to cover the deficit, and thereby pushing up interest rates.

The U.S. deficit, at record levels and growing, primarily caused by military expenditures and to a lesser extent by tax cuts, is seen by many as the basic threat to world recovery. The fear is that the financing requirements, and the procurements inherent in expanding the military base, may leave little room for industry in general to gain access to finance or strategic capital goods and workers. This, it is feared, will produce high rates of interest and inflation.

The general feeling, however, is that with the upcoming U.S. presidential election, there will be no dramatic tightening of U.S.

monetary policy, so nominal rates of interest should remain stable throughout the year (or even come down a little bit, by a half percentage point or so), perhaps at the cost of slightly higher inflation. Now that growth has switched from the torrid 7.9 percent at annual rate during the third quarter to a much more moderate pace will also cool fears of a new upsurge in inflation. Given this expectation of stable interest rates, and given the existing high deficit of the U.S. Balance of Payments, the U.S. exchange rate might well continue to lose some ground to the main European currencies and the yen.

In Europe, the recovery is very slow, so little stimulus can be expected from that direction. It is essentially the U.S., and to a lesser extent, Japan, that are leading the way out of the world recession.

Until recently, most forecasters expected oil prices to remain stable throughout next year. The recent events in the Middle East (especially tensions between Iraq and Iran), however, lend support to fears a new upsurge in oil prices might occur if Iran carries out its threat of closing the Gulf.

As M.A. Adelman (MIT) pointed out at a meeting of the Conference Board, oil price is not determined by overall supply, since there was not and has never been any geological shortage of oil. Oil is second to water as the most abundant substance on the planet.

The reason the price rose so much in the seventies was the insecurity of ready supply, and the over-reaction and panic of major consumers (industry) and government. This is not going to go away because oil suppliers as a group are unstable and unco-operative. Secondly, Adelman argues it is impossible for OPEC to accurately predict demand because consumption data are incomplete and

out of date. The threat of oil price instability remains and should be acknowledged in any forecast for Canada. Nonetheless, the forecasts following are based on the expectation of stable oil prices in 1984.

In summary, at the end of this year, the U.S. economy is running with an inflation rate just over 3 percent, an estimated 3.1 percent growth in real GNE, and only 8.8 percent unemployment compared to double-digit joblessness at the trough of the recession. However, it has to face a record deficit of the Balance of Trade and a rapidly growing public deficit. Moreover, the consumption-led recovery resulted in a savings rate which dropped to 3.9 percent during the second quarter, the lowest rate for three decades. Finally, growth of money supply has started to accelerate again, with M1 and M2 expanding at a rate of 13-14 percent during the last months. These are important storm signals for forecasters in Canada.

2.2 DOMESTIC ENVIRONMENT

Within Canada, monetary policy is expected to remain stable, essentially mimicking U.S. monetary policy. As Lipsey and Purvis argued, the U.S. Federal Reserve System has recently added a 13th district with headquarters in Ottawa. By implication, Canadian interest rates will follow U.S. interest rates, and, as in the past, the exchange rate will not be allowed to depreciate, but may be allowed to appreciate somewhat in view of the U.S. current balance deficit, as opposed to the large Canadian surplus.

No particular fiscal policy measure that may have an impact on the economy in 1984 is foreseen at the Federal level. Provincial policy measures are discussed in the

"Provincial Outlook" in the second part of this paper.

2.3 PRESENTATION OF THE FORECASTS

2.3.1 Expenditures

Forecasts for Real Gross National Expenditure (dating from August or September 1983) in 1984 range between 2.7 percent (for the Conference Board) and +5.2 percent (for Midland Doherty Ltd.). Most forecasters, however, agree on a rate of growth of 5 percent next year, after this year's expected 2.7 to 3.0 percent growth.

To give a point of reference, a growth of +2.8 percent in 1983, and about +4.5 percent in 1984 implies that output in Canada would only get back to its pre-recession peak in the fourth quarter of 1984, although the U.S. has already completely recovered.

The source of growth next year would still be private consumption, due this time to the recovery of personal disposable incomes. Forecasts for private consumption vary, however, between +2.5 percent for the Conference Board, and +3.75 percent to +4 percent for Wood Gundy Ltd. Government expenditure on goods, services, and capital is expected to remain stable, in an effort to reduce the deficit of the public sector.

The business sector, a key player, on the contrary, is expected to slowly recover and start spending anew on machinery and equipment, and non-residential investments. Business Fixed Investments should be favoured by the soaring of profits that took place this year, increasing by about 50 percent in 1983, and continuing to grow at a rate of 25 percent or so next year.

This strong recovery of profits should, however, be considered in

view of the fact that their share of GNE fell from about 13.6 percent in 1974 to less than 6 percent of GNE during the recession. If the expected rates of growth of 50 percent and 25 percent this year and the next are matched, their share of GNE would still only represent approximately 9.2 percent in 1984; well below historical levels in the early seventies.

As noted earlier, there is still a lot of excess capacity in the economy, especially in mining, though it may well be the case that some of these idle plants and equipment will never be re-activated. If this is the case, business fixed investment in machinery and equipment might recover faster than is commonly expected.

Against this must be considered real interest rates, which if they remain in the 6 percent range, will serve to discourage new business investment despite higher pre-tax profit levels. The key to any recovery, (real or forecast) is whether Canada can shift from the temporary inventory cycle fueled by consumers to a genuine recovery, based upon expansion of business investment. This should become clearer by late next spring.

The trade balance is expected to remain in surplus, but this time with an increase in both exports (which usually pick up faster than imports in a recovery), and imports, especially because of increased personal expenditures and tourism. The dollar is not expected to change throughout 1984, and the balance of trade should reflect stronger imports than exports, but remain in surplus. With government, especially the province, reluctant to increase public debt levels, the capital account should not move significantly into deficit.

2.3.2 Labour Market

This increase in economic activity should trigger additions to the work force, although this will most certainly be mediated by increases in productivity (in the short-run), and advances in technology. Long-run productivity is, however, expected to continue its downward trend, though this should have little effect in 1984. This downward trend remains a puzzle with explanations ranging from the effect of Unions to greater service sector employment. None of these are particularly persuasive.

The Conference Board estimates that employment must increase at an annual rate of at least 2 to 3 percent if the unemployment rate is to be brought back to a level of 6 to 8 percent four or five years from now, implying that real GNP growth should average 5 percent per year - a difficult target to achieve.

In the short-run, given the recent trends in employment in the country, it seems that firms are now working at maximum "overtime" capacity and that any further increase in output must lead to new full-time jobs. Indeed, it is doubtful whether such overtime will be endured for protracted periods, as labour seeks to enjoy some of the benefits of renewed growth. The prospect is for continued modest reduction in unemployment rates, perhaps dipping to below 10 percent by next summer. Employment perspectives, however, differ widely across sectors and provinces, and this is a particularly difficult figure to forecast.

2.3.3 Wages and Prices

Wage growth is likely to remain moderate next year, as Unions fear that if wages cause inflationary pressures, this would lead to another tightening of monetary policy and stall the recovery, or even push the economy into another recession. Another reason for moderate wage increases is the still high, though declining, rate of unemployment.

A survey of 432 companies[1] by Toronto-based consultant Sobeco Chapman, shows that companies forecast an average 6 percent increase for all personnel, with 61 percent of the firms giving increases between 5 and 6.4 percent, while 19 percent intend giving increases of 6.5 to 7.4 percent.

The Conference Board's Survey of Business found a 5.5 percent expected increase, with 7.5 percent increase for outstanding employees. In general, the larger the firm, the lower the planned increase.

Finally, these moderate figures are confirmed by a Financial Post telephone poll cross-country which shows that most firms intend to follow the 6/5 guideline. This, along with the expected increase in productivity, should lower unit costs of labour and have a favourable effect on Canada's international competitiveness.

Most economists forecast a further decline or a stabilization in the inflation rate next year, with

estimates ranging from 4.5 to 6.3 percent, compared with 5.5 to 5.91 percent for 1983.

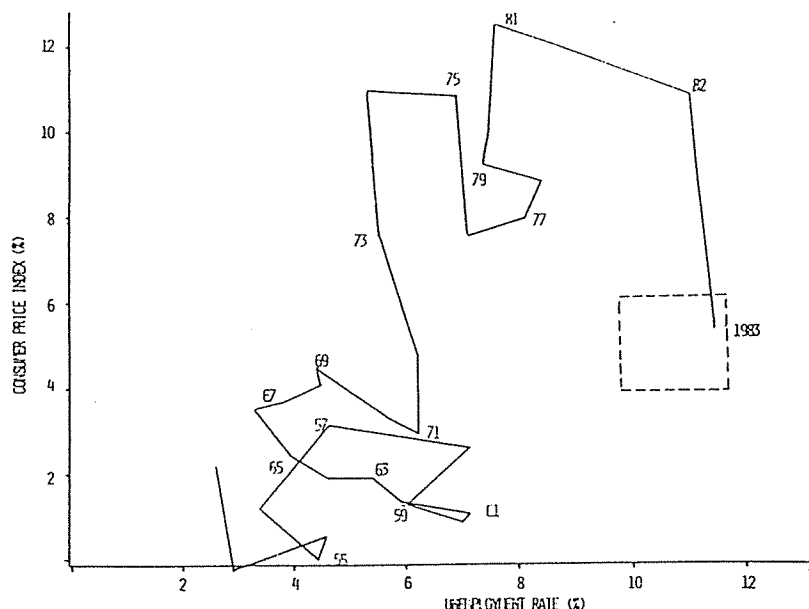
Productivity gains, typical in a recovery, should contribute to cap prices, as well as wages.

Large inventories should help keep energy and food prices stable, and steady interest rates should prevent any pressure from housing costs.

The big unknown, however, is the U.S. consumer price index, since some economists believe that the Federal Reserve Board would prefer another recession than let inflation take off again. It was argued above that this was not likely to be the case, due to the upcoming presidential election in the U.S. The possibility of a tighter monetary policy should, however, not be completely neglected.

Consider Figure 1, which shows the course of inflation and unemployment over the past three decades. In the short-term, few expect movement in a northeast direction (more inflation and more unemployment). Monetarists typically are concerned with movements in a northwest direction from the 1983 point, while Keynesians worry about movements in a southeast direction. The consensus is that for 1984, there will be a continuing tendency to move in a southwest direction, with more potential for reduction in the inflation rate than unemployment rate.

Figure 1
Inflation and Unemployment



Around the 1983 point a box is depicted which roughly shows the 80 percent confidence limits to the predictions for 1984. A few other forecasts are included in this box. Caution should be used in interpreting this region, since the dividing line is not sharp as indicated by the boundaries of the box. Also, expect the box to shift as more data arrive, especially the performance of real gross national product in the fourth quarter of 1984.

A more interesting question is where we will be in 1985. Based upon historical trends, it is likely that we will move toward the northwest and possibly even start to spiral around to the northeast by late 1985. Certainly, another major energy shock could produce a significant run of inflation and sharp movement away from the origin, the

mecca for all macroeconomic policy.

2.4 WESTERN CANADA - OUTLOOK '84

Although the nation as a whole appears to be emerging from the recession, regional distribution of the recovery is uneven. This is true also when we examine Western Canada. Generally, Manitoba and Saskatchewan are well-positioned for the recovery, whereas Alberta, and to a greater extent British Columbia, remain stagnant.

Consider estimates of recent performance in Gross Domestic Product and employment shares as shown below in Tables 1 and 2. These sectoral breakdowns provide insight into the probable sources of economic renewal in each province.

TABLE 1

Recent Trends in Provincial GDP (% Growth) (Estimated)

		Manitoba	Saskatchewan	Alberta	B. C.
1982	(CB)	-2.3	-1.1	-4.4	-6.5
	(RB)	-3.1	-2.8	-3.3	-6.9
1983	(CB)	1.0	2.7	-0.8	1.2
	(RB)	2.7	2.7	0.6	3.6

Source: CB: (Conference Board)

RB: (Royal Bank)

TABLE 2

Sectoral Employment as % of Total Employment
(average share in 1982)

	Canada	Manitoba	Saskatchewan	Alberta	B.C.
Agriculture ¹	27.4	20.9	35.1	15.0	17.2
Mining/Resources	3.9	1.3	2.3	5.7	2.8
Manufacturing	16.2	11.5	4.5	7.3	12.1
Construction	3.9	2.8	3.2	7.1	4.5
Transportation, Communication and other services	7.8	10.4	6.8	8.6	9.3
Trade	1.6	15.8	13.1	15.7	14.4
Finance and Real Estate	5.1	4.6	4.0	4.7	5.2
Community, Business and Personal Services	28.0	26.8	24.7	29.5	28.9
Public Sector	6.1	5.9	6.3	6.4	5.6
TOTAL	100.0	100.0	100.0	100.0	100.0

¹Share in agriculture is determined as a residual.

Source: Statistics Canada, CANSIM University Base.

2.4.1 Manitoba

Due to the relatively large share of the agricultural (and the related trade) sector in Manitoba, and to the diversity of its manufacturing and service sector, Manitoba is one of the provinces that suffered least

from the recession: Gross Provincial Product declined by only 2.9 to 3.1 percent in 1982, compared to a national average of 4.4 percent. This year was also a very good year in agriculture, and grain exports volume increased substantially, compensating the fall in prices.

TABLE 3

Manitoba: Percent Changes From Same Month Last Year

DATE	CPI	REAL WAGES & SALARIES	SHIP- MENTS	UNEMPLOY- MENT RATE	EMPLOY- MENT	REAL RETAIL TRADE	REAL AVERAGE WEEKLY WAGES & SALARIES	LEADING INDUSTRY EMPLOYMENT: MANUFACTURING
1981.01	11.1	2.0	3.9	5.5	1.3	1.7	-0.1	-3.3
1981.02	10.8	1.1	10.4	5.3	2.0	4.2	-0.9	-3.2
1981.03	11.2	2.3	15.6	6.1	1.5	1.7	-0.8	-4.0
1981.04	10.7	3.3	17.6	5.9	0.9	5.4	-0.6	-2.3
1981.05	10.9	3.5	10.4	5.5	1.3	0.2	0.3	-5.7
1981.06	11.9	2.0	19.2	5.9	1.3	1.8	-0.1	-3.2
1981.07	11.7	2.2	19.8	6.5	1.3	5.4	-0.9	-0.1
1981.08	11.5	2.9	18.9	5.9	0.2	0.6	0.9	2.2
1981.09	12.2	1.1	17.7	6.5	0.2	0.2	-0.8	6.0
1981.1	11.7	2.1	14.3	6.1	0.2	-0.8	-0.6	5.7
1981.11	10.9	2.2	13.8	5.9	-0.2	2.1	0.2	4.9
1981.12	9.2	4.9	6.9	6.5	-1.1	2.5	1.4	3.9
1982.01	9.0	2.1	2.5	6.5	-0.6	1.4	0.1	1.7
1982.02	9.9	3.1	8.6	6.6	1.3	0.8	1.2	0.9
1982.03	9.9	2.7	0.4	7.2	-0.2	-4.7	0.7	-1.9
1982.04	9.6	1.5	-4.9	7.4	-0.2	-0.8	1.0	-4.3
1982.05	9.6	-0.5	5.3	7.9	-1.5	3.4	0.1	-2.0
1982.06	8.3	2.1	-3.5	8.4	-1.3	-0.4	1.7	-5.2
1982.07	8.0	2.5	-9.7	8.1	-1.9	-4.1	2.6	-7.6
1982.08	7.8	-0.2	0.4	9.5	-2.4	-0.7	1.8	-11.7
1982.09	7.8	0.1	-5.3	9.4	-1.5	-2.6	1.9	-14.3
1982.1	7.8	-0.8	-11.5	9.8	-2.0	-1.8	2.4	-15.3
1982.11	8.5	-2.7	-7.0	10.6	-3.0	-6.5	1.6	-14.1
1982.12	9.6	-3.5	-6.3	10.7	-2.0	-3.6	1.2	-14.8
1983.01	7.7	-2.3	-1.5	10.0	-0.9	-2.5	0.9	-13.0
1983.02	7.5	-3.7	-9.3	10.1	-2.8	-3.9	-0.1	-12.9
1983.03	7.3	-3.6	-4.9	9.7	-0.9	0.7	1.0	-10.7
1983.04	8.2	-4.1	-3.2	9.6	-0.4	-6.6	.	.
1983.05	7.6	-2.4	-0.5	10.3	0.9	-3.2	.	.
1983.06	7.0	-2.1	-0.0	9.8	0.4	4.3	.	.
1983.07	7.1	-1.5	2.3	9.6	1.3	3.9	.	.
1983.08	7.1	.	.	8.8	3.6	4.8	.	.
1983.09	6.0	.	.	9.1	2.6	.	.	.
1983.1	.	.	.	.	.	.	.	.
1983.11	.	.	.	.	.	.	.	.
1983.12	.	.	.	.	.	.	.	.

During the recession, employment only fell by 3.9 percent from its peak pre-recession level, which implies a loss of 18,000 jobs. All these jobs were recovered in August 1983, and the unemployment rate dropped to 8.8 percent - the second lowest rate in Canada.

The consumer price index in Winnipeg decreased more slowly than in the rest of the country, and still remained around 6.0 percent in September, compared to a national average of 5.5 percent. This is essentially due to the increase in costs of housing and transportation.

Industrial wages tended to rise somewhat faster in Manitoba than in the rest of the country, which may be linked to the higher inflation rate.

Retail sales recovered in 1983 at the same rate as the national

average, and housing starts picked up sharply during the first semester, though they still remain well below their peak level of the mid-70s.

The outlook for Manitoba is, however, a slower growth than in the other provinces, due in part to the fact that the recession itself was milder. As noted earlier, all the jobs lost during the recession have now been recovered, which is not the case at the national level.

The agricultural sector is hard to predict since it depends upon climatic conditions, which have been very unusual lately, as well as international markets for grain. The Soviet Union is expected to have a very good harvest this year. However, assuming a normal crop year, real output could grow about 3.5 percent next year, compared to a

national average of 4-5 percent.

The rate of unemployment is, therefore, expected to continue to fall, although this improvement might be mediated by in-migration to the Province, which adds to the labour force.

2.4.2 Saskatchewan

Even more than Manitoba's, Saskatchewan's economy is characterized

by a large agricultural sector, which is relatively insensitive to economic fluctuations in the rest of the economy. Consequently, Saskatchewan's output only declined by about 2.1 percent in 1982, and increased by about 2.7 percent this year. According to the Conference Board, Saskatchewan is benefiting both from the fact that it has (for now at least) a "good" mix of sectors, and that these perform better than the national average.

TABLE 4

Saskatchewan: Percent Changes From Same Month Last Year

DATE	CPI	REAL WAGES & SALARIES	REAL GDP PER PERSON	UNEMPLOY- MENT	EMPLOY- MENT	REAL RETAIL TRADE	REAL AVERAGE WEEKLY WAGES & SALARIES	LEADING INDUSTRY EMPLOYMENT AGRICULTURE
1981.01	12.0	4.7	4.0	4.0	0.7	0.5	-1.9	-9.4
1981.02	12.3	4.3	5.2	0.5	0.5	0.5	2.1	-4.9
1981.03	12.3	2.9	10.4	2.1	2.0	2.0	-1.6	-4.7
1981.04	11.9	3.8	34.7	1.4	6.1	-0.3	3.3	3.3
1981.05	12.2	2.7	22.1	1.9	5.0	0.6	2.0	2.0
1981.06	12.3	3.5	28.6	1.9	7.2	1.3	3.2	3.2
1981.07	11.9	4.3	19.5	1.6	3.4	0.1	4.3	4.3
1981.08	11.8	-0.1	27.9	1.5	-0.9	-0.4	5.2	5.2
1981.09	11.3	4.0	13.2	1.0	0.4	0.8	7.9	7.9
1981.10	11.4	1.9	11.7	4.5	0.5	-1.2	0.0	0.0
1981.11	10.9	2.2	12.4	3.5	1.9	-3.8	-0.6	2.6
1981.12	10.6	2.0	7.9	1.4	1.4	1.8	0.1	-2.5
1982.01	10.2	1.0	-2.0	4.6	1.2	-2.6	1.1	-3.9
1982.02	10.3	2.1	1.1	4.5	3.5	-0.5	1.7	-5.2
1982.03	10.4	3.7	3.9	4.8	1.9	-5.1	1.9	-8.6
1982.04	10.7	4.2	-15.4	5.7	0.5	-7.1	1.2	-12.4
1982.05	9.2	-0.2	1.7	5.9	0.0	0.2	0.1	-9.0
1982.06	8.4	-1.2	-2.2	6.3	0.0	-0.5	1.5	-3.1
1982.07	8.5	-3.4	-11.3	6.5	-0.9	-5.9	1.5	-1.0
1982.08	8.3	3.5	-6.9	6.8	-2.5	-6.0	2.6	0.0
1982.09	7.8	1.1	-5.4	6.9	-1.1	-7.0	1.7	9.4
1982.10	8.6	0.7	-12.6	6.9	1.6	-6.1	2.8	14.0
1982.11	7.6	-0.2	-4.6	7.3	0.5	-6.3	3.7	7.5
1982.12	7.4	-2.1	-12.1	7.3	0.2	-4.6	2.4	7.8
1983.01	6.9	-2.1	-1.4	7.7	0.0	-1.7	2.1	13.5
1983.02	6.4	-3.0	-5.3	7.6	-0.2	-2.8	0.6	16.4
1983.03	6.2	0.0	-9.8	7.4	0.2	-3.2	0.9	10.8
1983.04	6.7	-6.4	-2.0	7.6	0.7	-3.7	.	9.0
1983.05	7.1	-2.0	0.6	7.5	2.3	-6.4	.	6.6
1983.06	5.9	2.4	3.5	7.1	3.2	0.2	.	2.1
1983.07	6.9	3.5	8.2	6.7	3.9	3.5	.	0.0
1983.08	6.8	.	.	7.3	4.7	162.9	.	0.0
1983.09	6.6	.	.	7.5	3.5	.	.	1788.7
1983.10	.	.	.	.	.	.	.	.
1983.11	.	.	.	.	.	.	.	.
1983.12	.	.	.	.	.	.	.	.

Growth in the Province could be favoured by higher demand for heavy oil exported to the U.S., and by the strong recovery of potash, which is expected to continue to grow at rapid rates next year.

About 11,000 jobs (or 2.5 percent of employment) were lost during the recession, all of which had been regained early in 1983. By July, employment was even up 2.0 percent from pre-recession levels. As a result, the unemployment rate in Saskatchewan is the lowest in the country (7.4 percent in October).

Inflation rates remained fairly high in the province compared to national levels, due to the recovery of retail sales.

The outlook for Saskatchewan in 1984 depends critically upon the performance of agriculture and non-mineral mining (potash). If next year turns out to be a bad year in agriculture, the rate of growth of

GNE might be well below the 5.4 percent forecasted by the Royal Bank of Canada, or even the 3.6 percent of the Conference Board, or our 3.8 percent forecast.

The rate of unemployment will also continue to fall, coming close to 6.0 percent.

2.4.3 Alberta

Alberta - the next year country - is still only struggling its way out of the recession. Badly hit by the decline in oil prices and the NEP, the Alberta economy is only expected to experience a 0.6 percent growth this year (estimated by the Royal Bank of Canada) (-0.8 percent according to the Conference Board). Employment dropped by more than 4 percent during the recession, and the unemployment rate rose to as much as 11.1 percent (compared to only 3.5

percent in 1981). By October, only half of those jobs had been recovered.

TABLE 5

Alberta: Percent Changes From Same Month Last Year

DATE	CPI	REAL WAGES & SALARIES	SHIP- MENTS	UNEMPLOY- MENT RATE	EMPLOY- MENT	REAL RETAIL TRADE	REAL AVERAGE WEEKLY WAGES & SALARIES	LEADING INDUSTRY EMPLOYMENT: CONSTRUCTION
1981.01	13.2	9.0	21.1	3.6	6.5	5.2	2.1	2.8
1981.02	13.0	7.6	19.7	3.6	7.2	6.4	1.1	2.4
1981.03	12.6	6.9	26.0	4.2	6.0	7.7	0.6	4.7
1981.04	12.1	9.2	31.0	3.5	7.6	7.7	2.1	11.5
1981.05	12.6	11.6	24.5	3.3	7.3	5.6	4.0	13.3
1981.06	13.1	11.6	33.9	3.3	6.7	3.1	2.8	18.6
1981.07	13.6	8.6	36.2	3.4	6.7	1.5	0.5	13.0
1981.08	13.3	8.2	28.9	3.4	7.2	1.6	1.0	10.6
1981.09	12.4	8.7	30.7	3.7	6.1	2.3	1.6	6.5
1981.1	12.1	6.7	21.5	3.9	4.7	0.8	0.0	3.6
1981.11	11.4	8.0	20.5	4.9	3.1	1.1	0.6	3.2
1981.12	11.4	4.4	20.0	4.6	3.0	-0.3	1.1	3.8
1982.01	10.7	5.8	3.9	4.8	2.1	-3.7	-0.2	-0.3
1982.02	11.6	5.2	5.5	4.7	1.1	-3.9	0.9	-2.8
1982.03	12.2	6.3	5.2	5.5	2.0	-10.3	1.1	-3.6
1982.04	12.5	4.1	-7.5	6.2	-0.7	-9.7	1.3	-17.2
1982.05	12.0	-0.6	-3.5	7.2	-2.3	-8.5	-1.6	-25.5
1982.06	11.2	0.1	-3.9	7.7	-2.1	-10.1	-1.1	-19.9
1982.07	10.7	0.3	-14.1	8.1	-1.7	-12.8	0.7	-20.3
1982.08	10.4	0.4	-3.8	8.5	-2.3	-10.9	1.4	-22.5
1982.09	10.4	-1.3	-9.9	9.2	-2.7	-11.3	1.0	-17.3
1982.1	10.3	-2.1	-14.6	9.4	-2.8	-10.4	0.8	-18.3
1982.11	9.0	-3.7	-8.0	10.2	-3.1	-11.3	1.4	-19.6
1982.12	8.6	-1.7	-11.7	10.6	-2.6	-9.7	2.7	-22.6
1983.01	8.3	-3.1	-8.8	10.1	-3.4	-6.7	2.0	-24.1
1983.02	7.4	-4.0	-6.9	10.1	-3.7	-9.7	0.3	-24.5
1983.03	6.6	-5.0	-6.9	11.0	-4.4	-2.7	0.8	-24.7
1983.04	6.9	-6.5	-2.6	10.5	-2.5	-8.6	.	.
1983.05	6.2	-4.7	2.9	10.5	-0.6	-6.4	.	.
1983.06	5.8	-4.4	3.4	11.1	-0.6	-2.2	.	.
1983.07	5.7	-5.1	4.0	11.1	-1.1	0.0	.	.
1983.08	5.3	.	.	11.1	-0.5	6.4	.	.
1983.09	4.7	.	.	10.5	-0.1	.	.	.
1983.1	.	.	.	.	.	.	.	.
1983.11	.	.	.	.	.	.	.	.
1983.12	.	.	.	.	.	.	.	.

Alberta is still trying to adjust to a new economic environment, with lower prices and depressed demand for its two main natural resources, oil and natural gas.

The rate of inflation in Calgary is one of the lowest in the country, due to the decline in oil prices and the very poor economic situation. The real estate market, plagued by mortgage foreclosures, will produce declining house prices which will further reduce inflation rates in 1984.

Hopes for a strong recovery are not likely to be supported by evidence, as the already slow growth in

incomes will be even more jeopardized by the increase in provincial income taxes due to take effect in January 1984. (This increase in the provincial rate of taxation would cost about \$184 to a family earning \$30,000 a year.) Retail sales remained very depressed throughout the year, as well as the construction sector.

The outlook for next year is still very pessimistic, with forecasts ranging from 2.2 percent (Conference Board) to 4.8 percent (Royal Bank of Canada).

2.4.4 British Columbia

One of the provinces worst hit by the recession (GNE declined by 6.9 percent in 1982, according to the Royal Bank of Canada), B.C. could also be the one with fastest growth in 1984, due to the long-awaited pick-up in private consumption and retail sales which some think might take place next year. The B.C. economy is one of the most sensitive

to cyclical downturns, with most of its activity concentrated in mining and forestry. Lumber has already shown a good performance in 1983 due to higher demand from the U.S. housing sector, and pulp is expected to recover by the end of the year. There is, however, little hope of a recovery in paper, due to large worldwide excess capacity.

TABLE 6

British Columbia: Percent Changes From Same Month Last Year

DATE	CPI	REAL WAGES & SALARIES	SHIP- MENTS	UNEMPLOY- MENT RATE	EMPLOY- MENT	REAL RETAIL TRADE	REAL AVERAGE WEEKLY WAGES & SALARIES	LEADING INDUSTRY EMPLOYMENT MANUFACTURING
1981.01	13.3	3.5	8.1	5.8	6.6	7.1	-1.9	0.0
1981.02	13.4	0.9	6.0	6.0	6.1	6.0	0.5	1.0
1981.03	14.7	-0.2	12.8	6.3	6.1	6.2	-2.2	2.3
1981.04	14.4	0.2	17.8	6.2	5.1	9.4	-1.8	4.1
1981.05	14.2	3.3	15.2	6.6	5.0	5.1	-0.9	6.1
1981.06	14.2	3.8	24.5	6.1	5.8	1.7	-0.5	5.3
1981.07	14.2	-3.4	-6.3	6.1	5.6	-1.3	-2.8	-20.3
1981.08	14.8	-6.5	-21.1	6.2	4.5	-5.6	-4.2	-5.1
1981.09	14.8	0.0	-0.7	7.3	4.3	-4.8	-1.7	1.9
1981.1	15.1	-0.4	1.0	7.7	3.5	-6.9	-2.2	-0.2
1981.11	14.5	-0.7	4.7	7.7	2.2	-7.1	-1.8	-0.3
1981.12	14.0	-1.5	6.1	8.5	2.1	-6.7	-3.9	-3.6
1982.01	13.3	-0.8	-9.3	8.5	-0.6	-8.0	-0.5	-5.2
1982.02	13.0	0.9	-6.7	9.0	-2.0	-8.7	-2.7	-6.6
1982.03	11.4	0.6	-5.2	9.7	-2.0	-12.7	-0.8	-9.4
1982.04	11.3	-1.0	-17.8	10.5	-4.3	-12.0	-0.8	-9.5
1982.05	11.9	-4.9	-10.3	11.2	-3.9	-12.3	-2.0	-12.2
1982.06	11.0	-6.1	-15.4	12.6	-6.0	-14.0	-2.2	-16.0
1982.07	10.6	-3.2	-2.1	13.8	-6.7	-11.0	-0.5	9.4
1982.08	10.1	-8.7	25.8	13.9	-6.5	-11.8	0.1	-9.1
1982.09	9.6	-9.9	-7.1	13.6	-7.0	-11.8	-2.3	-17.0
1982.1	8.8	-9.6	-17.7	14.5	-7.1	-10.0	-1.8	-17.9
1982.11	8.2	-8.9	-9.3	14.4	-8.0	-13.3	-0.9	-17.6
1982.12	7.6	-8.4	-9.3	14.7	-7.2	-10.6	2.8	-16.9
1983.01	6.8	-6.3	-0.5	14.2	-6.4	-9.1	1.1	-17.0
1983.02	6.6	-7.1	-0.1	13.8	-4.6	-9.0	0.9	-14.0
1983.03	6.7	-6.7	-5.2	14.0	-3.8	-5.6	1.0	-12.8
1983.04	6.5	-6.6	7.0	13.4	-0.6	-6.0	.	.
1983.05	5.1	-2.4	11.0	13.9	-1.7	-4.8	.	.
1983.06	5.1	-2.0	14.6	14.1	0.3	0.2	.	.
1983.07	5.8	0.1	23.9	13.7	0.9	-1.2	.	.
1983.08	5.2	.	599.0	14.1	0.4	-99.8	.	.
1983.09	5.0	.	.	13.4	1.5	.	.	.
1983.1	.	.	.	.	.	.	.	.
1983.11	.	.	.	.	.	.	.	.
1983.12	.	.	.	.	.	.	.	.

Employment fell by 8 percent during the recession, and in October 1983, was still 7 percent below the pre-recession peak. The unemployment rate is among the highest in the country, at 13.5 percent in October.

The rate of inflation in Vancouver is close to the national average. The prospects for employment

growth next year rely almost exclusively on the private sector, given the recent measures of the Bennett government, which will lead to a decline of public employment, though probably a much smaller decline than the Social Credit government hopes for.

Housing starts picked up sharply in B.C., though they still remain

about 23 percent below their level during the second quarter of 1981.

Our pessimism for B.C. is based upon an uncertain labour environment

influencing consumer spending. This could change, which would lead us to be more optimistic.

TABLE 7

Summary of Forecasts for Western Canada

	Manitoba	Saskatchewan	Alberta	B. C.
Real GDP (Conference Board)	2.9	3.6	2.2	4.1
Real GDP (Royal Bank)	4.8	5.4	4.8	5.7
I. S. E. R. Forecasts 1984				
Real GDP	3.5	3.8	3.1	4.0
Employment	2.1	2.0	0.8	1.7
Unemployment Rate	9.1	6.2	9.9	12.9
Consumer Price Index	6.9	5.4	7.0	6.0

NOTES

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[1] Financial Post, 12/11.

3

Leading Indicators*

Figure 1

Canada-United States Composite
Leading Indicator

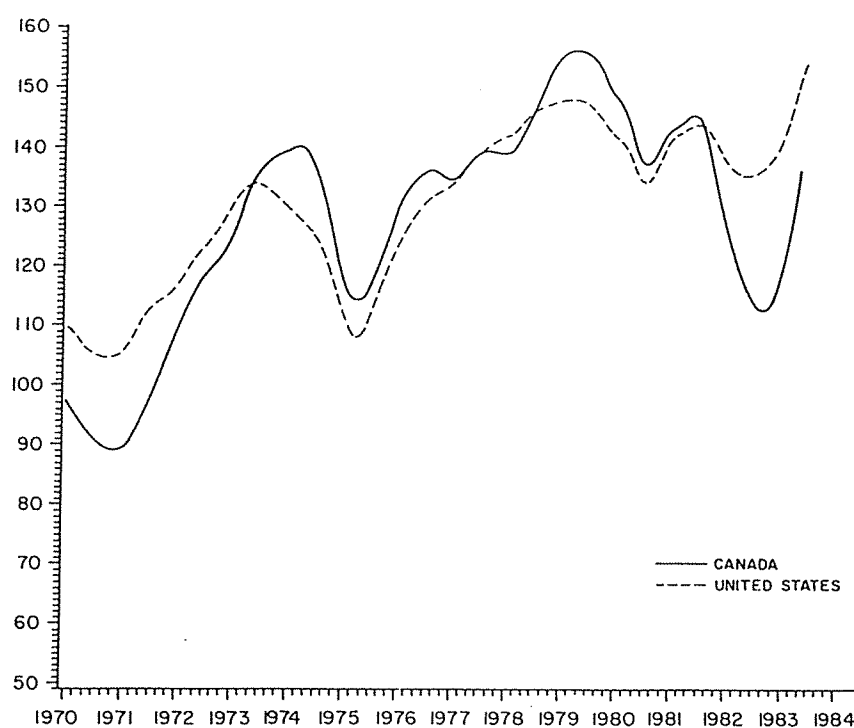


TABLE 1

Employment and Prices, % Change from Previous Quarter
and From Same Quarter Last Year
(Third Quarter of 1983)

	3 Months	1 Year
Labour Force	0.5	1.7
Employment	1.3	2.2
Unemployment Rate ¹	11.7	12.1
Real Wages ²	1.5	-0.6
CPI	1.6	5.3
Industry Selling Price	0.7	3.3
Exchange Rate	0.1	-1.4

¹Average rate of unemployment in the last three months
and one year before.

²First quarter of 1983.

Figure 2

Unemployment Rate

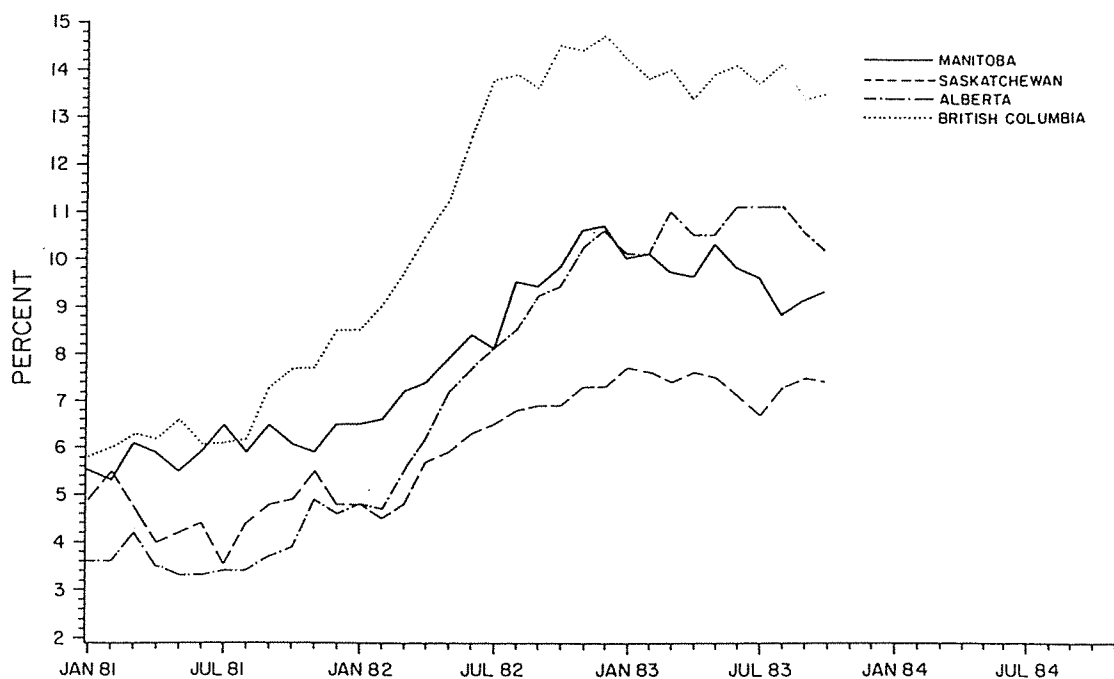


Figure 3

Employment
(Percent Change From Same Time Last Year)

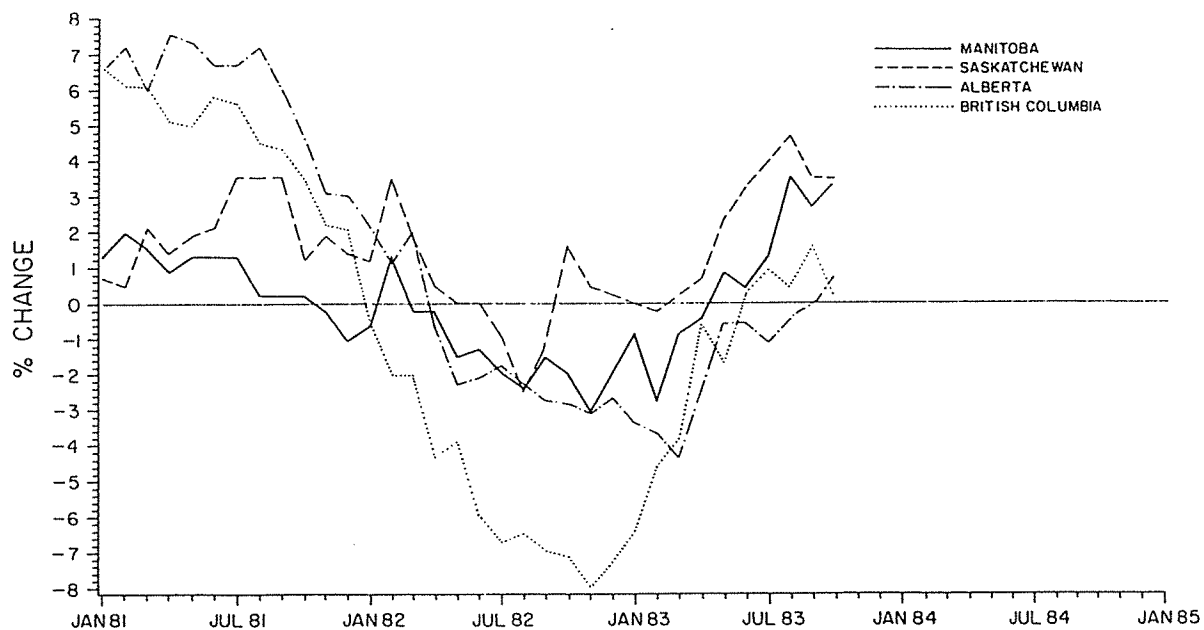


Figure 4

Help Wanted Index
(Quarterly)

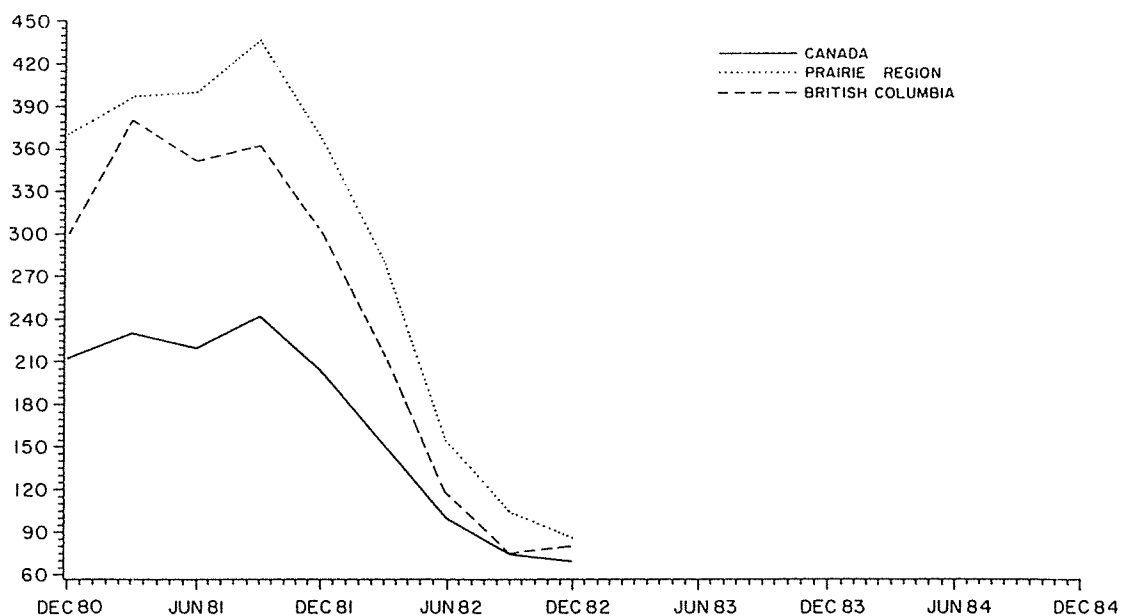


TABLE 2

Employment and Labour Force, % Change From Previous
Quarter and From Same Quarter Last Year
(Third Quarter of 1983)

	Total Employment		Average Unemploy- ment Rate	
	3 Months	1 Year	Last 3 Months	Previous Year
Manitoba	1.0	2.5	9.2	9.0
Saskatchewan	1.1	4.0	7.2	6.7
Alberta	0.3	-0.6	10.9	8.6
B.C.	-0.1	1.0	13.7	13.8
Canada	0.2	-2.9	11.7	12.1

TABLE 3

Prices and Wages, % Change

	Wages and Salaries ₁		Real Average Weekly Wages ₁		CPI ₂	
	3 Months	1 Year	3 Months	1 Year	3 Months	1 Year
Manitoba	0.9	4.1	0.9	0.5		
Winnipeg					1.2	6.8
Saskatchewan	-0.0	4.7	-0.1	0.1		
Regina					1.9	6.8
Saskatoon					1.9	7.1
Alberta	-0.3	3.1	1.8	0.8		
Edmonton					0.9	5.3
Calgary					-0.1	3.0
B.C.	2.3	-0.5	2.0	0.1		
Vancouver					1.8	5.3
Canada	0.4	2.3	1.5	-0.6	1.6	5.3

¹First quarter of 1983.

²Third quarter of 1983.

Figure 5

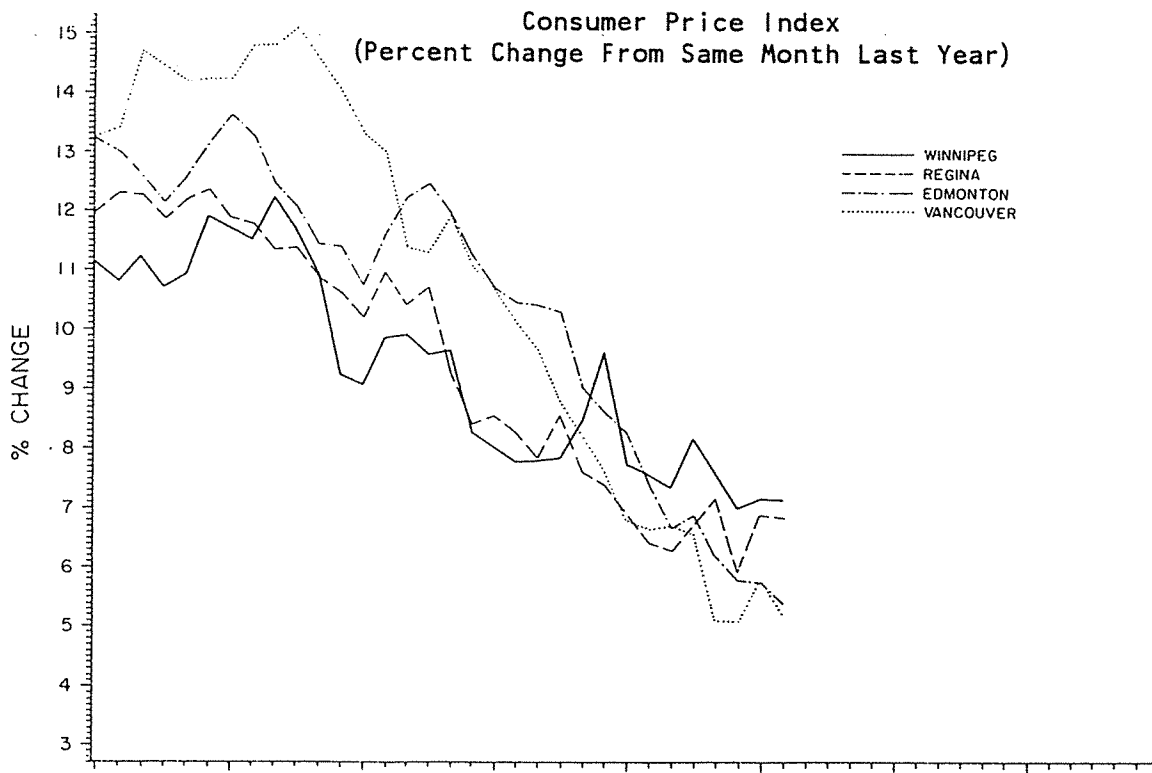
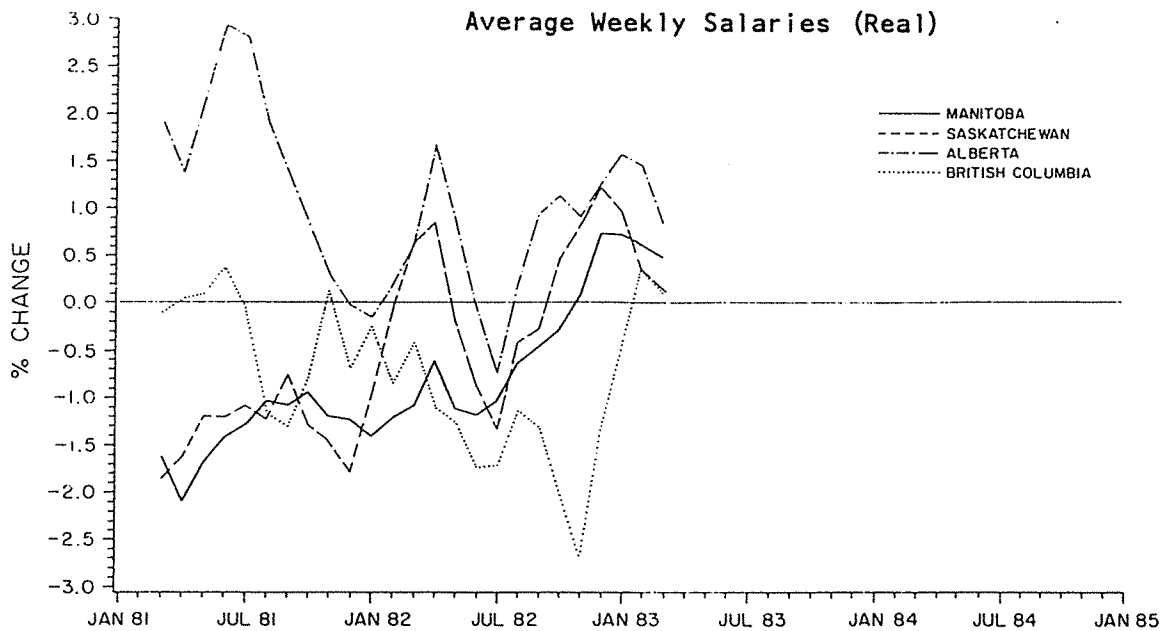


Figure 6



Note: Three month moving average.

TABLE 4

Measures of Activity, % Change From Previous
Quarter and From Same Quarter Last Year
(Third Quarter of 1983)

	Leading Industry Employment ¹		Shipments		Retail Sales		Housing Starts	
	3 Months	1 Year	3 Months	1 Year	3 Months	1 Year	3 Months	1 Year
Manitoba	-0.4	-12.2	0.9	1.8	3.4	9.5	-25.0	500.0
Saskatchewan	-6.0	13.6	5.9	10.3	4.5	9.3	-54.5	-16.7
Alberta	-8.3	-24.4	3.6	4.4	2.3	4.3	-43.5	-40.9
B.C.	-0.7	-14.6	-3.1	16.9	2.1	4.6	-47.2	46.2
Canada	0.2	-2.9	4.5	10.7	3.0	8.3	-40.7	36.5

¹Manufacturing (including saw mills and pulp and paper) in Manitoba and B.C., construction in Alberta, agriculture in Saskatchewan, total employment in Canada.
Those figures refer to the first quarter of 1983.

Figure 7

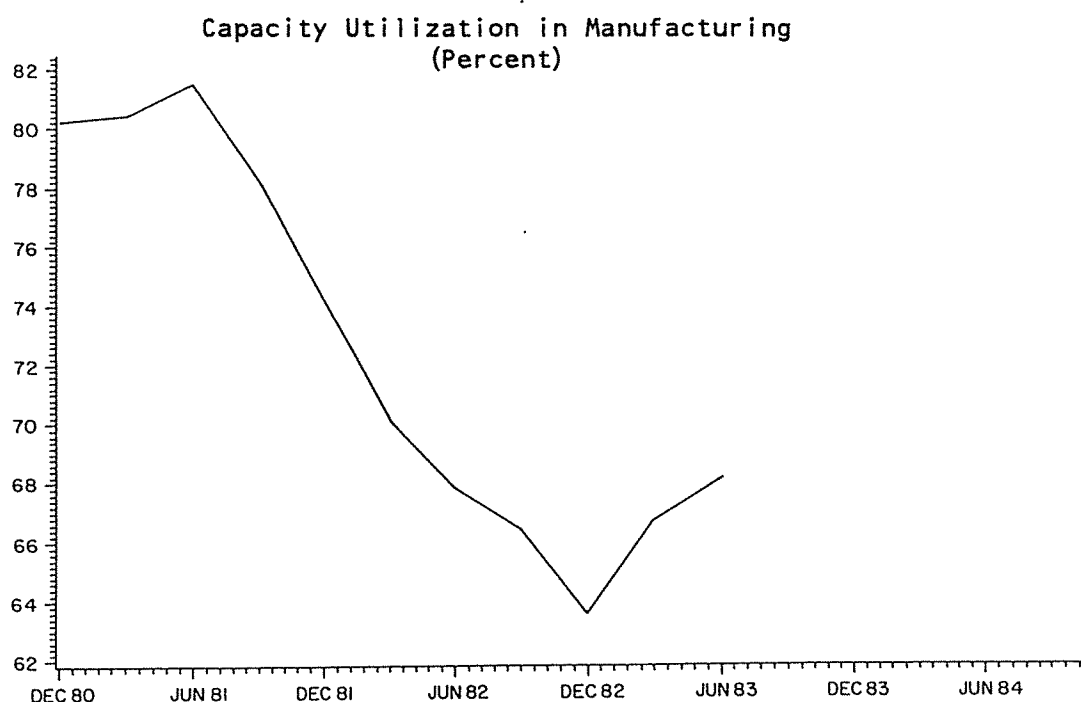
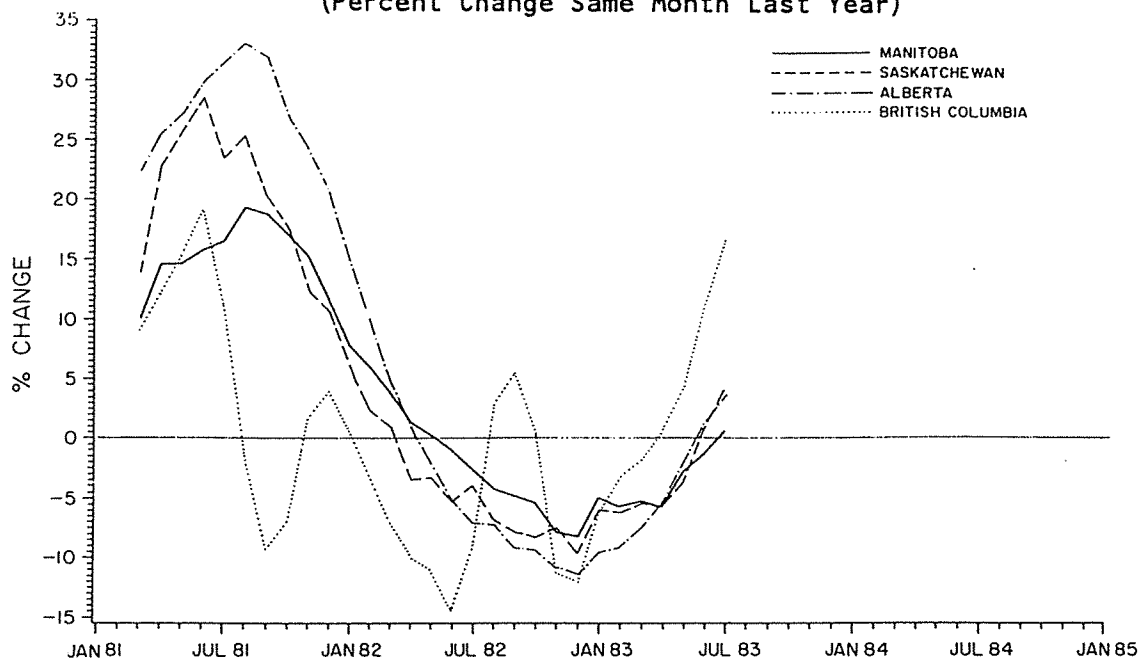


Figure 8

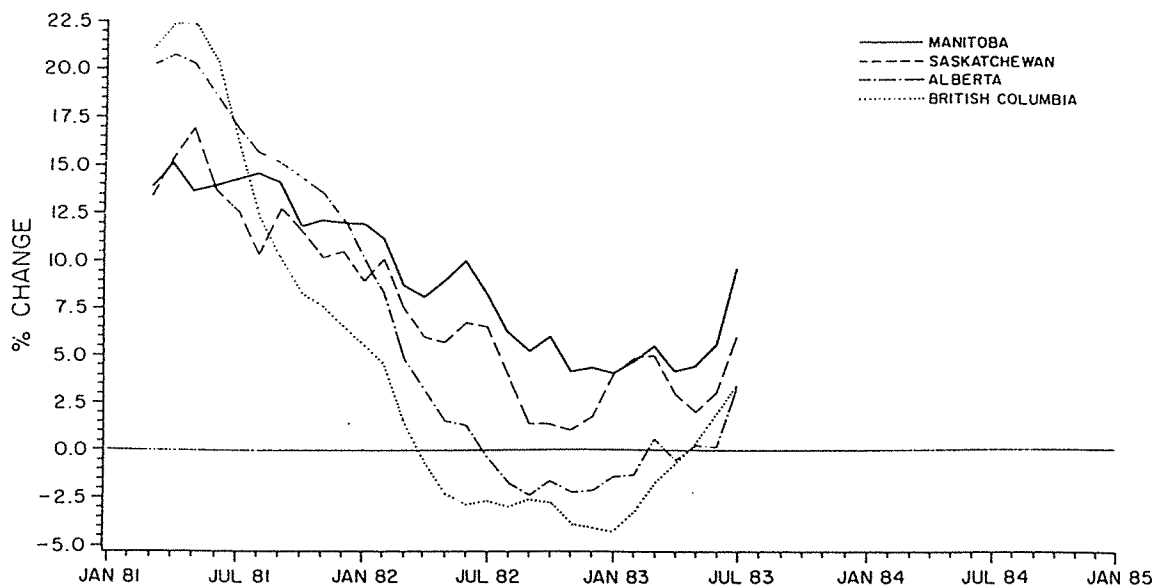
Shipments (Manufacturing).
(Percent Change Same Month Last Year)



Note: Three month moving average.

Figure 9

Retail Trade
(Percent Change Same Month Last Year)



Note: Three month moving average.

Figure 10

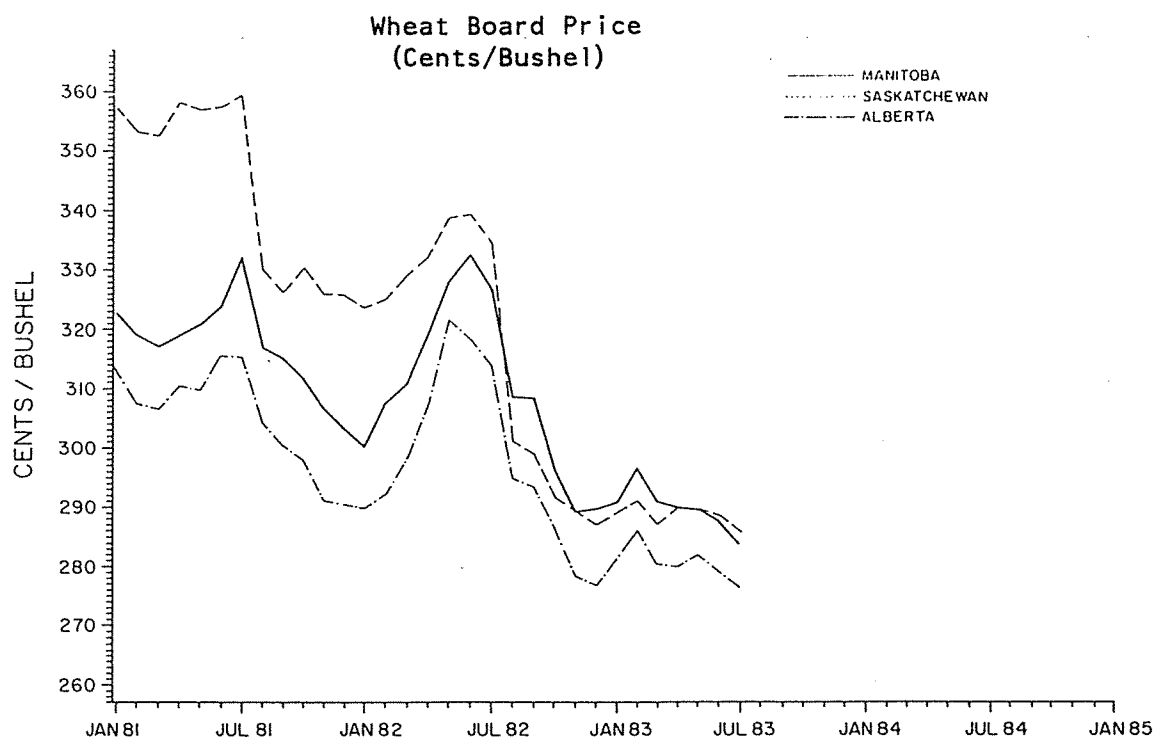


Figure 11

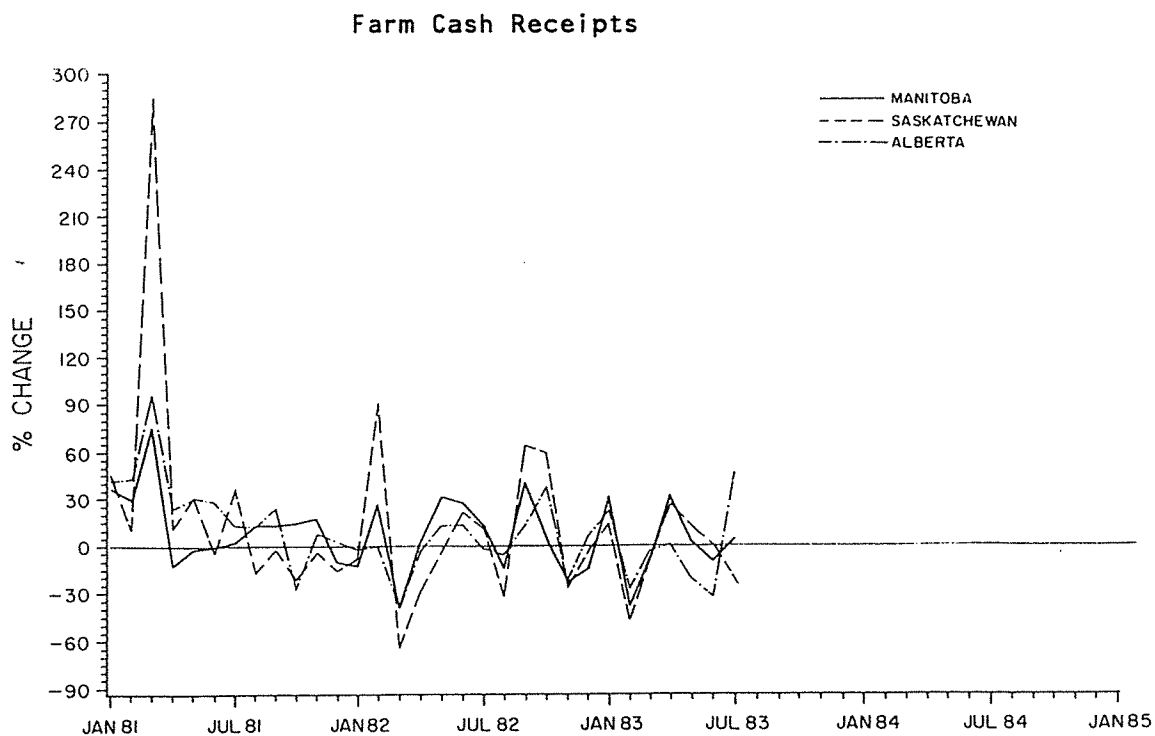


TABLE 5

Public Finances, Federal Government, % Change From
Previous Quarter and From Same Quarter Last Year
(Second Quarter of 1983)

	3 months	1 Year
Total Revenue	13.7	5.7
Direct Taxes		
-On Persons	16.6	9.0
-On Firms	39.6	1.1
-On Non-residents	-16.0	9.1
Indirect Taxes	4.7	1.3
Other Transfers	12.7	4.9
Investment Income	15.3	2.4
Transfers from other levels of Government	14.4	9.3
Current Expenditure	12.4	2.5
Goods and Services	8.2	2.3
Transfers	17.8	1.8
Subsidies	-4.5	-15.6
Capital Assistance	171.2	-19.6
Transfers to Non-residents	16.7	- 4.6
Interests on the Public Debt	7.0	4.3
Transfers to Other Levels of Government	14.4	9.3
Surplus or Deficit ¹	-11820	-12568
% of Current GNE	-3.1	-3.6

¹Millions of dollars.

NOTES

*All data presented here were extracted from the CANSIM, University Base and processed using the Statistical Analysis System.

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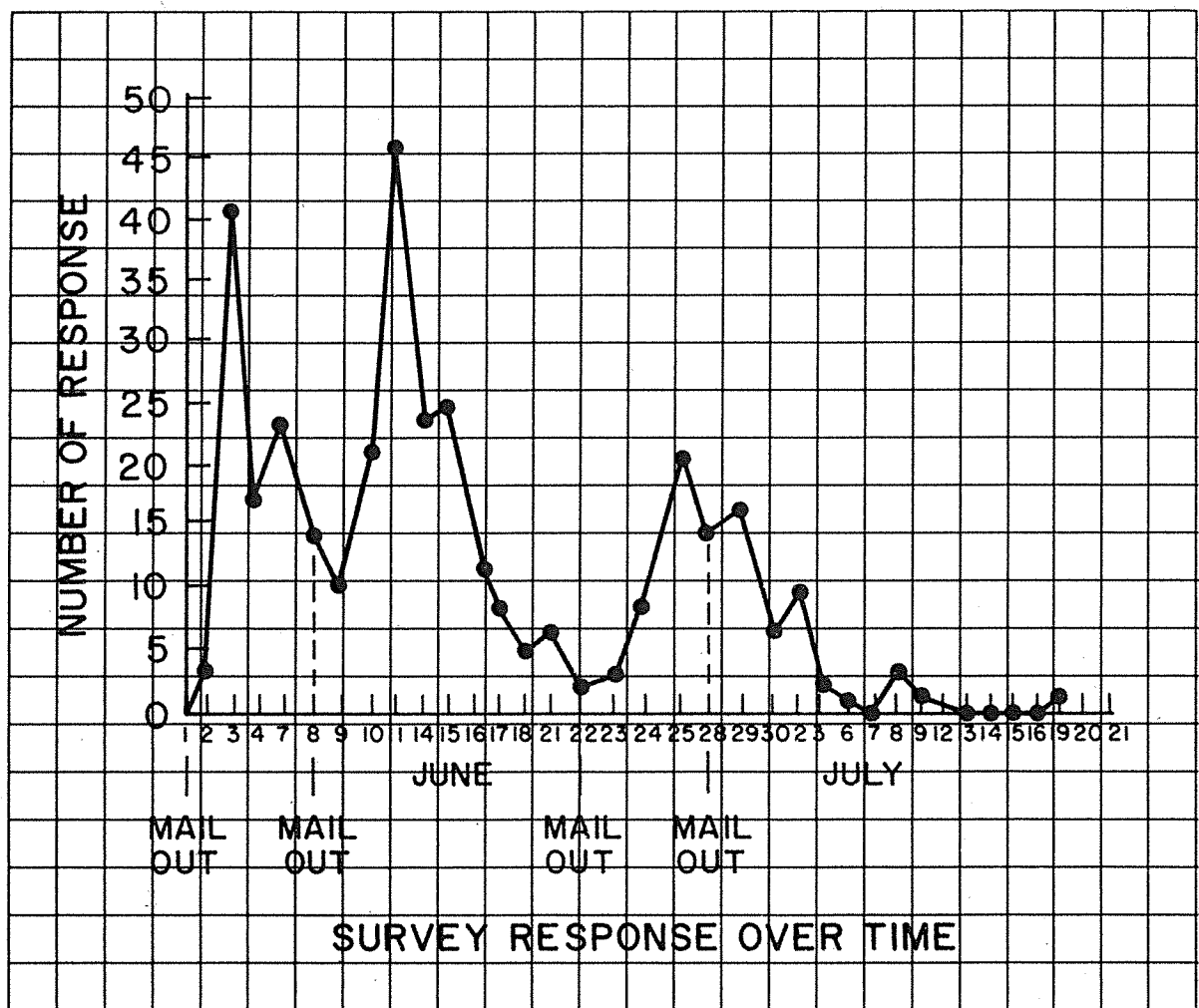
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