

au courant

Economic Council of Canada

Volume 7, No. 2, 1986

The Council's annual review of the economy



- More on technology
- A new project on trade policy

PUBLICATIONS

New on Technology

The Economic Council has released two new publications on technology: a survey of Canadian employers, describing their experience with computer-based innovations; and a guide to new technologies in the workplace (see insert in this issue for more details). Both publications can be ordered in accordance with the information below.

Working with Technology: A Survey of Automation in Canada, by *Gordon Betcherman* and *Kathryn McMullen* (EC22-133/1986E; \$3.95 in Canada, \$4.75 elsewhere).

Workable Futures: Notes on Emerging Technologies, by *Words Associated* and *Keith Newton* (EC22-132/1986E; \$5.95 in Canada, \$7.15 elsewhere).

Annual Report

The Economic Council's Annual Report for 1985-86 is now available. It includes a

message from chairman Judith Maxwell, as well as details on Council activities and research projects currently under way. For a free copy, write to the Information Division (address below).

Twenty-Third Annual Review

Changing Times (EC21-1/1986E; \$6.95 in Canada, \$8.35 elsewhere).

In its 1986 review of the economy, the Council looks at the prospects for freer trade with the United States, some problems in the resource sector, and the role of government. In addition, it includes the Council's medium-term outlook for the Canadian economy.

Discussion Papers

Discussion papers are typically of a technical nature and are intended for distribution in limited numbers to individuals who may have a particular interest in these or related fields of research. Of varying length and complexity, these papers are reproduced only in the language in

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No. 308 "The role of tax-deductible saving in the transition from a progressive income tax to a progressive consumption tax," by *Michael J. Daly*, *Gary J. Lastman*, and *Fadle Naqib*.

No. 309 "The impact of RRSPs on capital accumulation with progressive personal taxes," by *Robert Androkovich*, *Michael J. Daly*, and *Fadle Naqib*.

No. 310 "Current financial difficulties in Canadian agriculture," by *Pierre Cloutier* and *David MacMillan*.

No. 311 "Micro-computer simulation with a general equilibrium model of Canada," by *Sylvester Damus*.

No. 312 "Hydro-Québec : Les relations entre l'État et son entreprise," by *Roland Parenteau*.

No. 313 "Taxation of life insurance in Canada," by *B. Dahlby* and *A. Macnaughton*.

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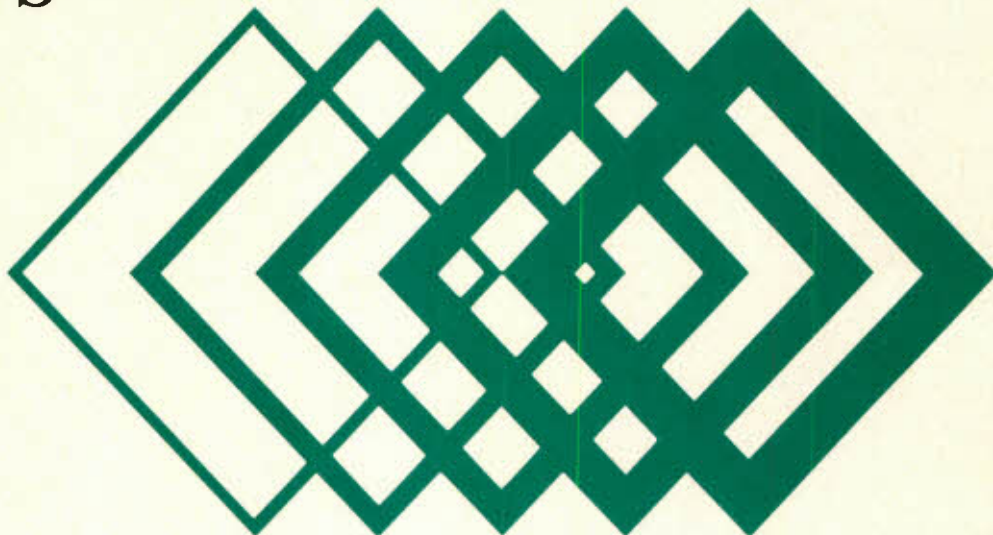
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CHANGING T·I·M·E·S



Canada must redefine its role in the resource sector, rethink its approach to public policy, and pursue its options with respect to freer international trade, says the Economic Council of Canada in its Twenty-Third Annual Review of the economy.

These issues require careful attention, the Council says, in response to the risks and uncertainties of changing economic times. The current climate of instability, it observes, is largely the result of the integration of national economies into the world economy, marked by a dramatic increase in the international flow of savings and trade, and in the transmission of knowledge and new technology. As national economies become increasingly interdependent, new policies are needed to facilitate adjustment and to reinforce Canada's ability to compete in world markets, says the Council. Given the unprecedented imbalances in world trade, debt, and budgets, national governments must also engage in more international coordination of effort, it adds.

Despite these uncertainties, the Council finds there have been some encouraging signs recently that the Canadian economy will grow significantly over the medium term. Real gross national product (GNP) is expected to average 3 per cent in 1986 – a performance that is superior to that in many other industrialized nations. Moreover, domestic demand has replaced net exports as the engine of economic growth. There have been impressive gains in productivity since the 1981-82 recession. Canadian interest rates have fallen significantly in response to lower U.S. interest rates and a decline in inflationary expectations. About 400,000 new jobs were created last year. And, for the first time in the current recovery, the contribution of real investment to growth was "substantial," the Council says.

Some problems have persisted, however. Unemployment has become particularly worrisome in western Canada, as well as in the Atlantic provinces. While real investment expanded at a healthy pace in 1985, the

investment/GNP ratio remained historically low. Weak commodity prices, high real interest rates, and excess capacity may inhibit investment in the years ahead. As well, the size of the federal debt continues to be cause for concern.

International developments

A number of positive developments on the international scene should help prolong the current recovery, the Council observes. Inflation remains low and shows no sign of accelerating; the collapse in world oil prices should be of overall benefit to the consuming countries; and most industrialized nations have improved their fiscal/monetary policy mix and have shown increased willingness to cooperate in order to correct some of the serious imbalances in the world economy (such as the high value of the U.S. dollar and Third World debt problems).

The extraordinary pace of change in the global economy and here in Canada means that it is time to rethink policies in many areas. There are key changes to be made in the regulation of financial institutions; the government is beginning to reform the tax system and review some of the social programs in Canada. These initiatives will, in turn, alter the way in which businesses and individuals respond – their patterns of consumption, saving, and investment, for instance – which will inevitably affect the nation's overall economic performance. So the Council takes a look at the role of government in the years ahead (see page 6). Another area of uncertainty lies in the future of Canada's resource sector (see page 8), particularly with respect to energy, agriculture, and the condition of the environment. Above all, there is the prospect of freer trade with the United States and its impact on output and employment in Canada (see page 5). All of these issues are discussed against the background of the medium-term economic outlook, which is described on the next two pages.



Outlook for the economy

The Council's main projection of the key economic indicators – which it calls the “base case” – is founded on certain specific assumptions (on the past performance of the economy, for example, as well as its present position, on current information about its future course, on the outlook for foreign economies, and so on). Using this basic projection, the Council then tries out various scenarios or alternative cases to see how the economy would be affected.

According to this year's base case, the medium-term outlook suggests that over the next 10 years economic growth will average 3 per cent; inflation will dip below 4 per cent – the lowest level since the 1960s – but will subsequently rise above that level later in the period; and the unemployment rate will gradually fall to under 7 per cent by 1995. The commodity price slump, however, is likely to result in sharply increased regional pressures and will undermine, to some extent, the prospects of a strong surge in business fixed investment in regions that are heavily resource-dependent.

The charts on the next two pages indicate the outlook for six key economic indicators over the next five years. In each instance, the base case is compared with a “high-growth” alternative that assumes lower oil prices, a stronger Canadian dollar, higher productivity growth, and a more favourable U.S. performance; it is also compared with a “low-growth” scenario essentially assuming the reverse.

Unemployment

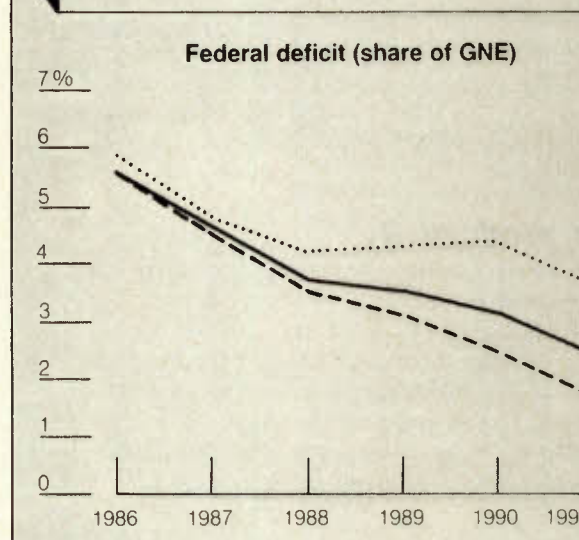
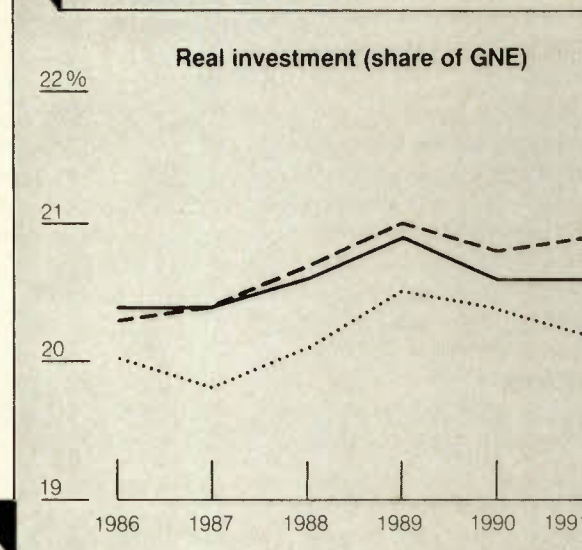
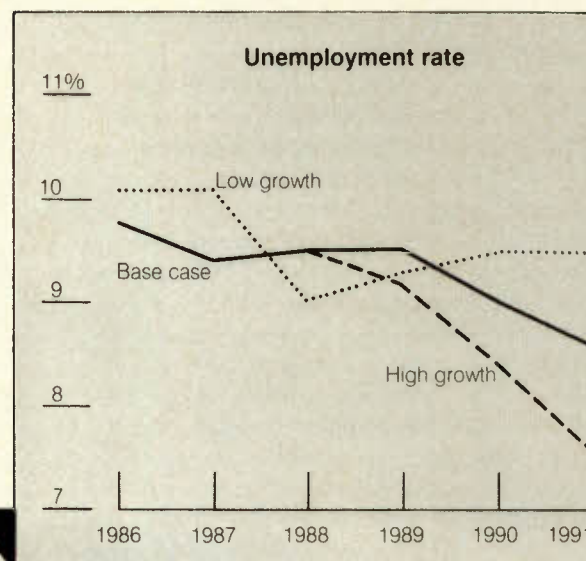
In the short term, the Council expects only modest improvement on this front. In the base case, the unemployment rate averages 9 per cent over the next five years, partly because growth in the labour force continues to keep pace with new job creation. In subsequent years, however, the reverse will occur, contributing to a gradual decline in the unemployment rate to below 7 per cent by 1996.

Real investment

The weakness in investment spending (a concern in 1985) is another worrisome aspect of this year's outlook. The base case implies a modest recovery in business investment over the medium term, but investment as a percentage of GNP is not expected to recover significantly from its current low levels for a number of reasons: high real interest rates, depressed commodity prices for resource-based products, a dismal outlook for energy investment, excess capacity in many parts of the resource and manufacturing sectors, and general government restraint. The low level of business investment will constrain what are otherwise significant gains in productivity and real incomes, the Council explains.

The deficit

The initiatives taken in the last two federal budgets, combined with an improved outlook for employment, inflation, interest rates, and output, should lead to a



decline in the federal deficit – from \$32.3 billion in 1985 to around \$20 billion by 1990. Moreover, the federal budget balance (if interest payments are excluded) will show a healthy surplus over the next decade, similar to its record in the 1960s. As a consequence, the ratio of federal debt to GNP and the proportion of government expenditures required for debt servicing will peak around the turn of the decade and decline steadily thereafter.

Growth (GNP)

Economic growth should average 3 per cent annually over the projection period, with consumer spending and residential and nonresidential investment providing most of the stimulus. Strong gains in real incomes, supported by improved productivity and employment and a decline in the personal savings rate, account for much of the strength in consumer spending, the Council says. Real expenditures on goods and services by government will grow at a slower pace than aggregate output, reflecting government restraint. Despite fairly strong growth in exports, the contribution of the trade sector to real growth will remain slightly negative over the medium term – the result of extensive debt-servicing expenditures. The Council is in fact projecting a small current-account deficit over the period. Thanks to a better inflation projection and significant improvement in the federal deficit, however, the value of the Canadian dollar in relation to U.S. currency will continue to hover in its present range.

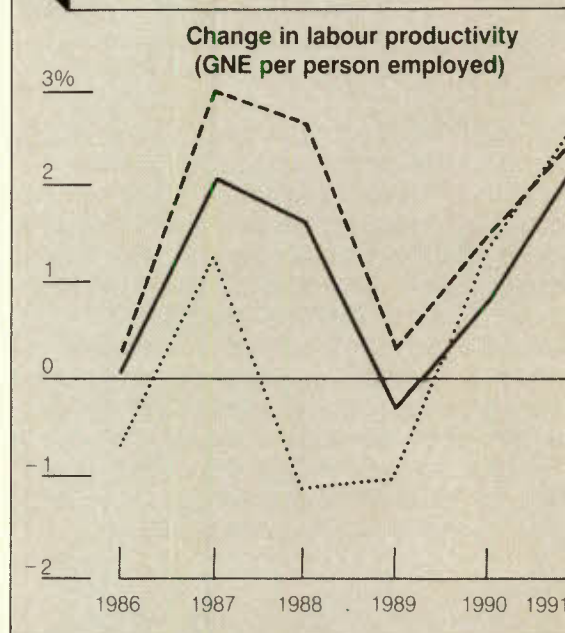
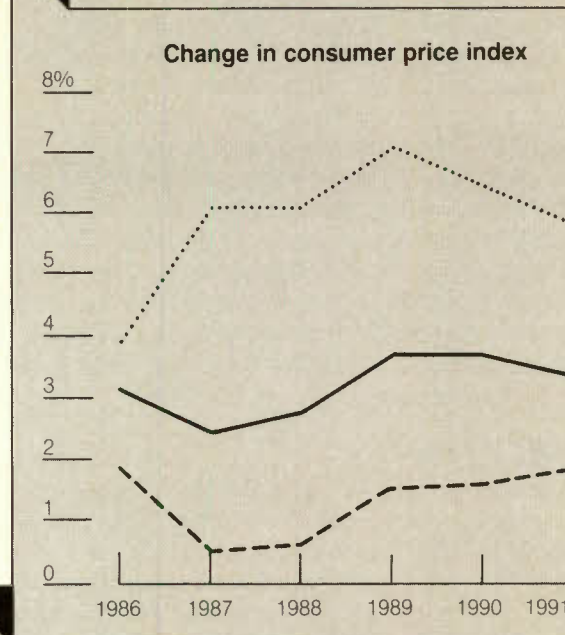
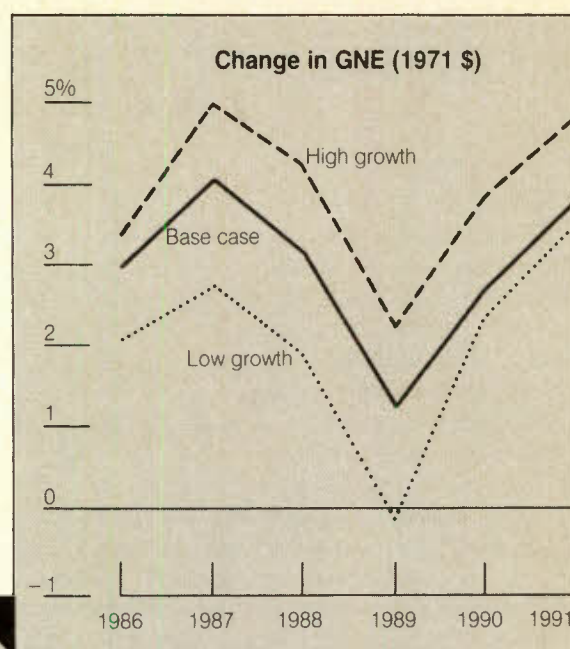
As might be expected, the Council's high-growth scenario indicates a substantially better economic performance for Canada over the medium term. Real economic growth averages 4 per cent a year, and there are marked improvements in the inflation rate and the federal deficit. In contrast, the low-growth scenario lowers economic output, raises unemployment and inflation, and increases the federal deficit.

Inflation

Over the next five years, an unusual combination of favourable factors – the oil-price collapse, weak commodity prices, productivity gains, moderate wage settlements, and continued fiscal restraint – will keep inflation under 4 per cent. Unless monetary growth diverges markedly from its current path, in fact, the Council regards the risks on the inflation front “as being small.” As the economy moves towards its potential, however, and as the favourable impact of declining oil prices wanes, inflationary pressures should increase, the Council observes.

Labour productivity

A much better outlook for productivity than in most previous years is permitting substantial gains in real incomes, the Council says. Productivity growth is expected to average 2 per cent a year over the projection period, while real wages will increase at an even stronger rate. The strong performance in productivity is due mainly to a maturing labour force, strong and stable output growth, new technologies, and low real energy prices.





The move to freer trade

Most Canadians are watching the Canada-U.S. freer-trade negotiations with mixed emotions. In the Council's view, the trade talks will certainly require give-and-take, as well as a firm bottom line on each side of the border. Should a major protectionist confrontation arise, on the other hand, "there would be immense losses for Canada, particularly in employment," it finds.

The accompanying charts illustrate the changes likely to occur under freer trade with respect to the Council's base-case projections for three key economic indicators. The Council also attempts to measure the potential long-term gains of trade liberalization – greater economies of scale, product specialization, and so on – by assuming a 5 per cent increase in manufacturing productivity, in combination with freer trade. A variation of this scenario looks at the impact of phasing-in the reductions in trade barriers over the 1987-92 period. A final option looks at the impact of increased protectionism, by assuming a 20 per cent surcharge on most manufactured goods imported from each country, and of retaliation by trading partners.

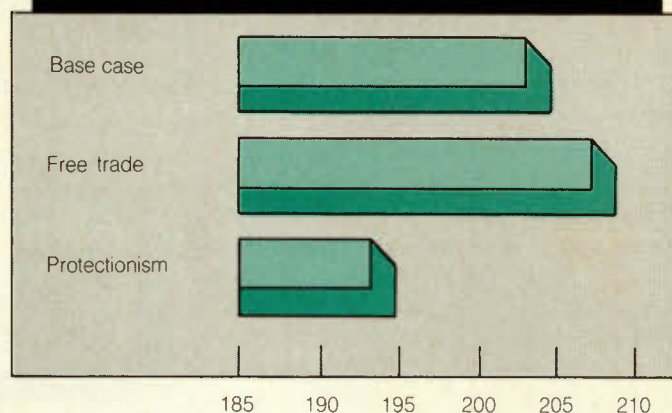
The Canadian economy falters considerably under increased protectionism, as industries adjust to a more restrictive trading environment, the Council finds. Real growth in GNP is 5 per cent below the Council's base-case projection. By 1995, the unemployment rate reaches 2.4 percentage points above the base case, as employment declines by 525,000 jobs. The current-account trade balance worsens, and with declining revenues and rising inflation, the federal fiscal position weakens. Later in the period, inflationary pressures abate, dampened by high unemployment.

Freer trade, on the other hand, is generally beneficial to the Canadian economy, the Council discovers. Indeed, while some of the industries previously protected by high tariffs encounter adjustment problems, all sectors of the economy gain in output – the result of lower inflation, growth in exports, and increased investment and consumption. The unemployment rate dips one percentage point below the base case, while inflation is 2.8 per cent lower. The increase in real economic output attributable to bilateral trade liberalization would be approximately 2 per cent by 1995.

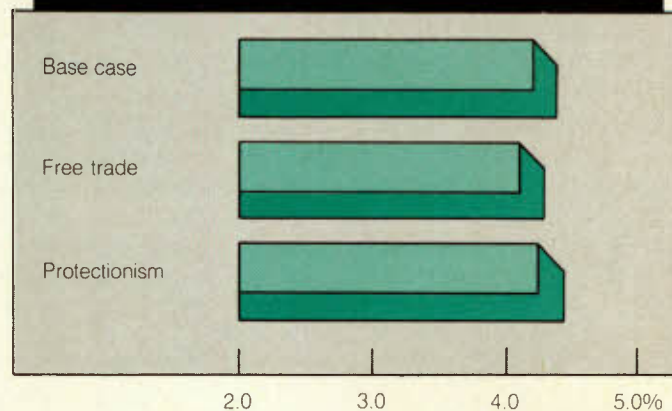
With freer trade and increased productivity, the gain in economic output by 1995 is almost double what it was under the free-trade scenario. As would be expected, the manufacturing sector gains the most. The unemployment rate falls 1.5 percentage points below the base case. Inflation is considerably lower as well. Because of higher import consumption, however, Canada's balance-of-payments situation deteriorates in comparison with the freer-trade scenario. The effect of phasing-in trade barrier reductions over the 1987-92 period would be to cushion and stretch out the adjustment process.

How trade policy affects the economy, 1995

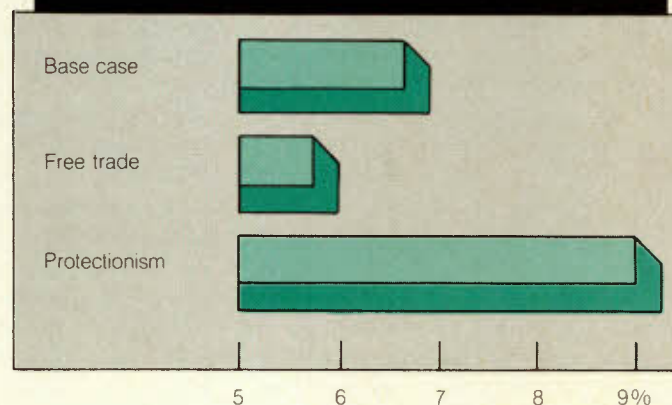
Real GNP (billions of 1971 \$)



Consumer price index, 1995



Unemployment rate, 1995





Need for reform in key areas

Governments are re-examining their role in the marketplace in order to keep pace with changing economic times.

While deficit reduction is often cited as the main objective of government reform, the Council believes that fundamental problems in this area run much deeper. New needs and priorities have been emerging; markets have been changing; and new technologies have been developed. Consequently, many of the policy initiatives introduced in the 1960s and 1970s "are no longer in tune with the times," the Council says. In some instances these initiatives hurt the economy, it adds, "because they box people into old ways of thinking and doing."

As part of its ongoing research, the Council has been studying the role of government in various spheres: specifically, the regulation of financial institutions, the reform of social programs and of taxation, and the organization of health care. Undertaking reform in these areas will be particularly difficult, the Council acknowledges, given the opposition to change from vested interests and the reluctance of governments to dislocate workers or taxpayers. But it insists that substantial reform is necessary, noting that the burden of adjustment is in fact widely distributed.

Financial regulation

Shock waves rippled through Canada's financial sector in 1985, as nine financial institutions failed and numerous mergers and acquisitions took place. New financial instruments and practices have emerged in recent years as well, as part of a major reorganization of Canada's financial sector.

Legislation in this area has become increasingly outdated. With the emergence of as-yet-unregulated financial holding companies, for example, the system is governed by what might be called "regulation by looking the other way," the Council says. The regulatory standards of the various federal and provincial bodies whose jurisdiction overlaps in this area also

lack uniformity, as do province-to-province regulatory requirements. Also, as new legislation is developed, care must be taken not to limit Canada's opportunities in international markets.

In a forthcoming report on the financial sector, the Council points out that regulatory reform must begin with "a good understanding of the roles of a financial system."

ance company. As well, incentives cause a loss in tax revenues, the Council observes.

With respect to recent changes in the corporate tax system, the Council applauds the initiatives taken by the Department of Finance to increase tax neutrality. It also believes that a tax base using corporate cash flow instead of profits warrants careful study.

Many of the policy initiatives introduced in the 1960s and 1970s are no longer in tune with the times.

It notes that many of the previous studies in this area put forward different, and sometimes contradictory, conclusions and recommendations. The process of regulatory reform must also recognize the trade-offs involved in pursuing various objectives, such as increased competition versus enhanced solvency. It must take a global view of the system, since changes in the Bank Act affect other financial institutions; changes in trust legislation affect the banks; and so on.

Tax reform

In its bid to introduce major tax reform, the federal government should strive for a system that is more neutral (or even-handed) in its impact on the economy, the Council maintains.

The current corporate tax system distorts investment and impedes economic growth by encouraging certain types of investments over others, it points out. These incentives create a lack of uniformity in the tax system. Tax rates vary enormously, depending on the industry in which the investment takes place; on whether the investment is in machinery, inventories, or buildings; on whether it is financed by debt, new share issues, or retained earnings; and on whether the investor is a household, a tax-exempt institution, or an insur-

The manufacturers' sales tax is highly flawed as well, since it, too, varies widely across products and industries. But the plan to replace it with a business transfer tax – which would tax the value added to a product by each firm in the production process – should be explored with caution, the Council warns, since its introduction may require compensating changes in other tax measures. It could exacerbate the bias in the corporate tax that favours investment in machinery and equipment, for example.

Though it is politically and technically difficult, the Council believes that tax reform is vital to improving economic efficiency in Canada. Much can be gleaned from the debate on tax reform in the United States, it adds, since "Canada cannot afford to have tax structures that are so out of line with U.S. alternatives that they discourage this nation's investment effort and economic growth."

Social reform

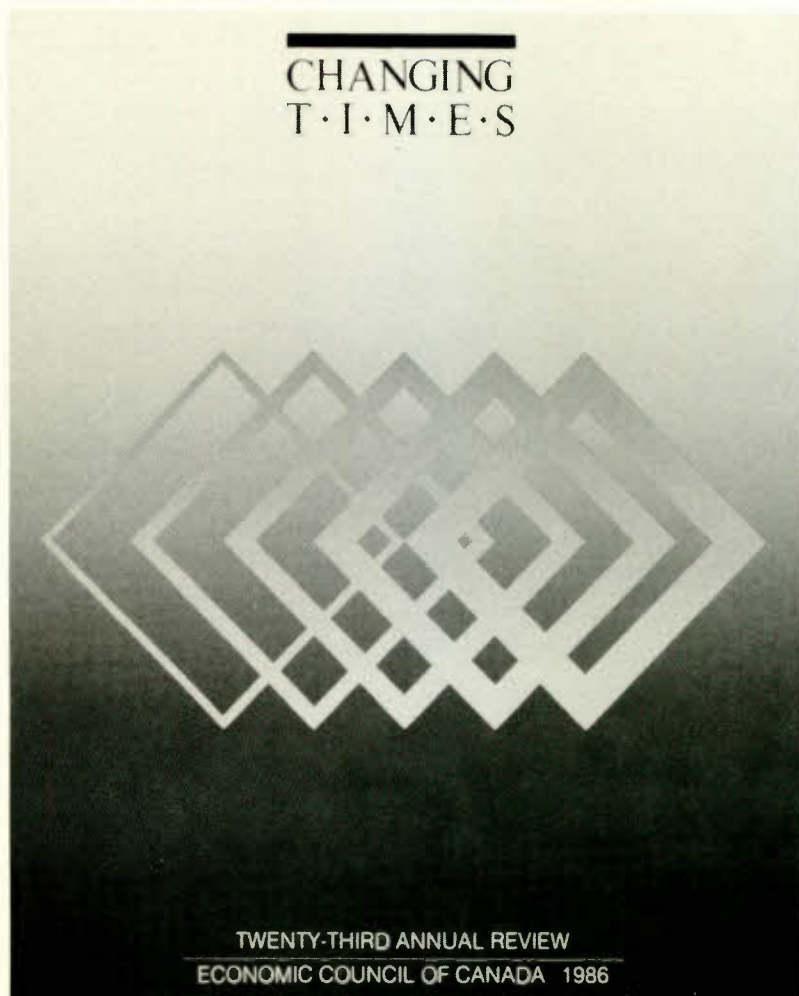
Mounting pressure to reform social policy is largely the result of the changing industrial structure and the aging of Canada's population, the Council says.

Despite an improving economy, for instance, high unemployment persists. Furthermore, many of the jobs that are being created today offer limited

New publications from the Economic Council

A glimpse of Canada's economic future

Changing Times



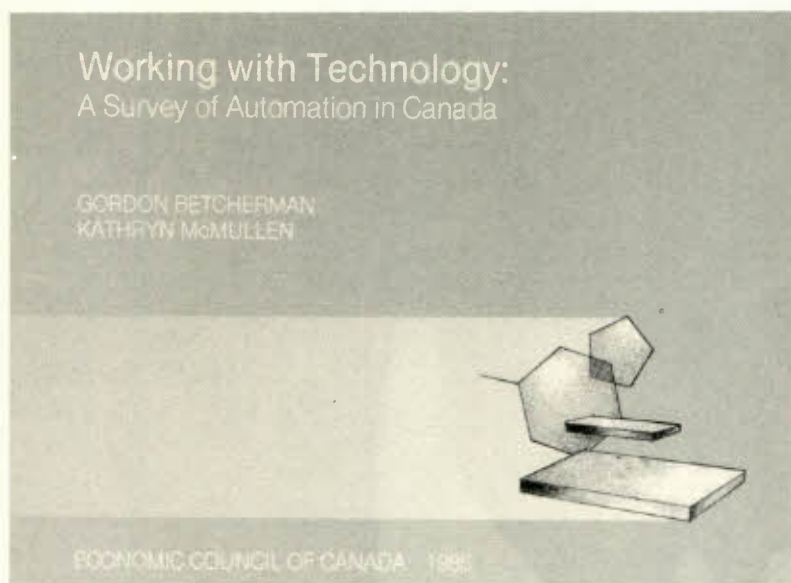
This is the Economic Council's Twenty-Third Annual Review of the economy, which focuses on Canada's economic performance and its opportunities for future growth.

In particular, this year's report looks at the prospect of freer trade with the United States and its impact on output and employment in Canada. It also examines some important policy issues in Canada — the regulation of financial institutions, the reform of the tax system and of the social system, and the organization of health care — since initiatives in these areas would inevitably affect the nation's overall economic performance. As well, it touches on the troublesome issue of resource management, in the areas of agriculture, oil and gas, and the environment.

(EC21-1/1986E; \$6.95 in Canada, \$8.35 elsewhere.)

Tech change and the job market

Working with Technology



Despite fears to the contrary, technological change is apparently creating as many new jobs as it eliminates.

A new survey by the Economic Council asks employers in a wide range of industries across Canada to describe their experiences with computer-based innovations between 1980 and 1985, and to report on their plans to 1990. Analysis of the responses from close to 1,000 establishments reveals that although job losses to tech change were offset by the new employment generated through increased sales, tech change did lead to new skill requirements. So far, white-collar workers have been the most heavily affected by the new technologies. But blue-collar workers can expect greater changes in their working environment soon, as computer-based innovations in manufacturing processes become more common.

(EC22-133/1986E; \$3.95 in Canada, \$4.75 elsewhere.)

A guide to new technology

Workable Futures: Notes on Emerging Technologies



Here's one guide to emerging technologies that's more than bland buzzwords and fad gadgetry.

This new Economic Council publication takes the non-specialist behind the scenes to survey arenas of technical growth that are changing the shape of tomorrow. Imaginative and compelling, *Workable Futures* is the indispensable sourcebook for business people, administrators, students, teachers, workers — everyone who wants to understand the opportunities and challenges of today's high-speed technological development. The Council commissioned *Workable Futures* to get at the issues behind the new tech: What's DNA got to do with GNP? What does office automation hold in store for the white-collar workforce? How are working robots creating opportunities for labour in the factory-of-the-future? Find the answers in this new guide to technology.

(EC22-132/1986E; \$5.95 in Canada, \$7.15 elsewhere.)

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tenure or career-building opportunity. With an ever-growing elderly population, expenditures on public pensions, supplemental income programs, and health care are now rising faster than some measures of economic growth.

The Council is concerned that social programs are not providing assistance to all who need it. In addition, it points to distortions in the economy caused by weaknesses in the funding and delivery of programs (income-tested programs, for example, can discourage workers from seeking employment). The Council offers the government four guidelines for reform: it should be comprehensive, embracing all the tax and transfer programs targeted at a particular group; it should allow for the diverse needs of Canadians, possibly consolidating some of the overlapping programs but not regrouping them into one or two major omnibus systems; it should avoid making large reductions in program expenditures in the first few years; and it should keep in mind that the best social program of all is a healthy and vigorous economy. The Council reiterates its position that "the need for deficit reduction should not be the determining factor in the current review of social policy."

Health care

Health care expenditures in Canada have risen dramatically over the past two decades – from \$2.1 billion in 1960 to more than \$35 billion in 1985. Rising costs are particularly worrisome in light of the growing elderly population. About 2.5 million Canadians have now reached retirement age, and some six million will be there by the year 2026.

The volume of health care services is likely to expand as a result, the Council says. Advances in medical technology will compound the financial problem by prolonging life and easing pain at considerable expense, it points out. Rationing these medical services will make for difficult choices in the future.

While Canada has a first-class health system by world standards – its payment system is a model for other countries, since it effectively controls costs – there are no incentives to manage existing resources wisely, the Council notes. It urges governments and health care profes-

sionals to continue experimenting with ways to reduce costs, "always mindful that accessibility and the quality of care are of paramount concern." Progress in this regard includes the possibility of new treatment-oriented accounting procedures that tie health care payments to average treatment costs, based on

national or regional statistics. Other proposals now being considered in Canada include imposing tighter control on hospital expenditures, introducing community health clinics, having nurse practitioners compete with physicians where appropriate, and substituting nursing-home care for acute hospital care.

Tax rates vary substantially

Marginal effective tax rates, 1986

Industry

Manufacturing

Commerce

Other

Type of investment

Machinery

Buildings

Inventories

Type of financing

Debt

New share issues

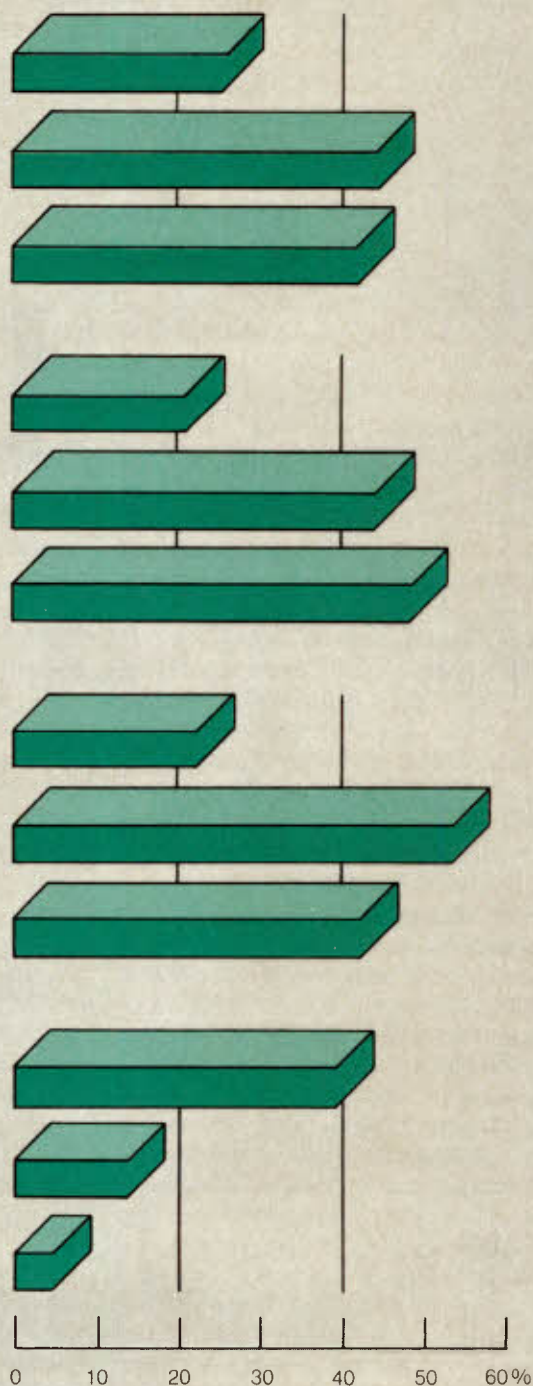
Retained earnings

Source of savings

Households

Tax-exempt institutions

Insurance companies





Problems in the resource sector

Canada's resource sector is no longer the engine of economic growth that it used to be.

The prices of primary products have slumped badly, forcing many producers to cut back on output in order to curb losses. The Council looks at agriculture and energy in particular, and at the impact of environmental damage on the resource base as a whole.

Energy

In the near term, Alberta will be the hardest hit by the precipitous drop in oil prices. But the current low oil prices are not expected to continue throughout the next decade, it adds.

As for recent moves to reduce government intervention in the oil and gas markets, the Council notes that some important restrictions remain. In the case of oil, long-term exports still require federal approval, while Alberta has a pro-rationing scheme for light-oil production. These factors, along with pipeline capacity limitations, contribute to a discounting of Canadian oil prices in the U.S. market, since Canada is viewed as an insecure supplier.

In the gas market, the key question is whether price deregulation should proceed on schedule this fall. The Council finds that even a partially regulated gas market would create distortions in the energy sector, since it would operate next to a relatively decontrolled oil market and thus could, in the short term, reduce demand for gas in Canada.

Within the industry, the junior oil and gas producers are the most vulnerable to financial hardship, since many of them are financially extended, the Council says. Compared with foreign-owned firms, the Canadian-controlled segment of the industry is on shakier ground because of higher per-unit interest costs, lower per-unit revenues, and higher cost reserves.

Other energy sectors will feel the impact of lower oil prices too, with both positive and negative consequences. At current oil prices, for example, some of the unused capacity in the industrial sector will be

harnessed at the expense of other fuels, the Council notes. Electricity costs are expected to fall, however, since coal and oil are inputs to electricity production.

The farmer's plight

The agricultural sector in Canada is in serious trouble. Net farm income declined from \$4.3 billion in 1984 to \$3.7 billion in 1985. The outlook for the grain sector is particularly bleak because of the likelihood of continuing low export prices.

Today, far from being a locomotive of growth, the resource sector is acting as a brake. The emphasis has shifted to damage control.

— *Changing Times*

High real interest rates and a decline in the value of farm assets are adding to farmers' financial woes, as a result of the widespread debt incurred in the 1970s. (Farm debt rose an average of 16 per cent a year throughout most of that decade.) This created cash flow problems, as farm commodity prices fell sharply in the 1980s, causing a dramatic rise in the number of farm bankruptcies. Drought, soil degradation, and other problems continue to threaten agricultural output. Moreover, the plethora of government programs introduced to ease the burden of debt repayment and to stabilize farm incomes may now come under fire in the context of freer-trade negotiations with the United States.

Environmental issues

The Council is deeply concerned about environmental neglect, since it not only threatens to damage or destroy the resource base, but it also poses risks to human health. At the moment, environmental issues usually surface as crises demanding immediate attention. But they also serve as warnings to put environ-

mental policies in order, the Council notes. It finds some encouraging trends in this regard. For example, many air pollutants have been reduced considerably in recent years. New technologies can better detect and measure toxic substances in the environment. Governments, too, have tightened regulations, particularly with respect to the transport of dangerous goods. Ottawa is soon to announce a major overhaul of environmental law within federal jurisdiction.

Reasons for concern remain, however. About half of Canada's productive forests are threatened by acid rain. Canada is uncovering a legacy of potentially dangerous dump sites. The unlimited or unregulated use of water is no longer feasible. Most of the accessible mature timber stands for use as forest products will be depleted in 60 years. Protecting the environment is costly as well, amounting to as much as 2 per cent of a country's gross national product. To achieve environmental objectives at minimum expense, the "polluter pays" principle makes economic sense, the Council says.

The Council also notes that differences in interests very often prevent joint government action on air, water, and other pollution problems that traverse political boundaries. In particular, Canada must continue to press its pollution concerns with the United States, especially the acid rain problem, the Council says. It also urges other provinces to follow Ontario's lead in cases of environmental abuse, by stiffening enforcement, prosecution, and penalties.



Risks and opportunities

Increased employment and real wage gains should make Canadians more than 10 per cent better off by 1990, the Economic Council concludes.

That would represent "a significant improvement in economic performance," the Council says. It would also bring Canada closer to the targets set for it by the Council in the past (see box). The economy is moving in that direction, the Council says, after some wrenching adjustments in recent years, which saw an increase in the number of working-age families living in poverty and dramatic growth in the number of women and part-time workers in the labour force. While the adjustment process is far from complete – severe and persistent unemployment has become a disturbing problem in western Canada, for example – there is clear evidence that Canadians are making a serious effort to adapt to the tough economic climate.

Over the medium term, the Council expects Canada to beat the target for inflation, to enjoy significant productivity growth, and to achieve further reductions in the federal deficit, despite the loss of oil-based revenues.

At the same time, the Council identifies three major elements of uncertainty on the international scene that could alter its outlook:

- slower-than-anticipated U.S. growth, linked to higher real interest rates and commodity price pressures, including a new escalation of oil prices;
- heightened U.S. and worldwide protectionism, and the failure of the Canada-U.S. freer-trade negotiations; and
- financial instability and interest rate increases arising from the inability of key countries or institutions to meet their debt burdens.

New opportunities

While the turbulence in the marketplace increases the risks for Canada, it also makes new opportunities possible. On the trade side, manufacturing and service items should continue to grow in impor-

tance, while the nation's primary resources remain a mainstay of the economy.

These changes will entail some adjustments, but the Council is confident of solid growth in employment within the manufacturing sector and elsewhere. In the freer-trade talks with the United States, Canada is aiming to eliminate tariff and nontariff barriers, to obtain full exemption from U.S. contingency-liability action against Canadian goods and services

TARGETS

- 1 — Employment growth of 2 to 3 per cent a year in order to lower unemployment to a range of 6 to 8 per cent by 1990.
- 2 — Productivity growth of 1.5 to 2.0 per cent a year.
- 3 — Annual inflation of 5 per cent or less.
- 4 — Net capital inflows of about 2 per cent of GNE or less.
- 5 — The maintenance and improvement of existing social policies.
- 6 — A gradual reduction of the federal deficit to an easily manageable level.

and to establish a mechanism for settling bilateral trade disputes, the Council says.

There is room for change in other areas as well. Governments must revamp many of the outdated regulations in the financial sector, as well as elsewhere in the economy. Part of the long-range solution to fiscal problems lies in reforming the tax system to eliminate tax preferences and to enlarge the tax base. Social reform must be carried out cohe-

rently and incrementally, and it should be clearly focused. In health care, controlled experimentation would improve efficiency.

Canada must also redefine its role in the resource sector. Global developments are threatening the viability of the traditional family farm and the programs designed to maintain it. There is no easy or quick solution to this situation, the Council maintains. In the energy sector, the Council supports market pricing and a restructuring of the oil and gas industry to strengthen its debt/equity base. At the same time, "if governments decide that further assistance is appropriate," the Council concludes, the support measures that would be most fruitful would be those which create incentives for further oil exploration and development. In the gas market, while there may be some grounds for temporarily delaying the deregulation of gas prices, on balance the Council favours moving in that direction, since it is the "only way to reduce Canada's surplus reserves of gas over the longer term."

Finally, there is a need in some provinces for more vigorous action to protect the environment and to encourage sound forest management practices.

Fiscal prudence

In responding to these changes, the federal government, in particular, must exercise prudence. While acknowledging that the decline of oil and wheat prices has knocked the federal fiscal plan somewhat off course, "these are setbacks that the federal government must be prepared to absorb," the Council says. Over the medium term, there is scope for a monetary policy that would encourage lower interest rates and stronger economic expansion, it adds.

In commenting on the Annual Review, three members of the Economic Council suggested that more research be done on the effects of freer trade with the United States. They also felt the Review did not sufficiently explore the consequences of failure in the freer-trade negotiations. As well, it did not adequately deal with the problem of unemployment in Canada, they said.

A guide to new technology

The average Canadian may well be baffled (or even intimidated) by the mystifying array of new technologies on today's market. With that in mind, economist Keith Newton (director of the Economic Council's project on tech change and labour markets) and consultants from *Words Associated* have put together a high-tech guide for the non-expert. Entitled *Workable Futures*, the handbook covers topics ranging from artificial intelligence to office automation and includes a glossary of technical terms. Some excerpts from this newly released Council publication are featured below.

Factories on autopilot

The scene: Midnight at a deserted showcase "factory of the future." Inside, the sound of machines in motion, producing parts for tools and robots. Finished trays of parts are automatically stacked and removed for packaging and distribution. Countless details of production, from microprocessors throughout the factory, are relayed to a central computer. The factory operates untended by humans during the nightshift. The lights stay off all night.

Suddenly computer sensors detect a malfunction in one of the automated

tools. Within milliseconds, production at this work area or "cell" is halted. A central computer calls the homes of the technicians on duty to request repairs. Suppliers and head office are automatically advised of any changes to the production schedule resulting from the breakdown.

This is the fully automated factory – still largely the stuff of management dreams and labour nightmares. Today, only a few hundred fully automated factories are operating around the world. And, for the time being, most experts expect the factory of the future to remain just that. Introduction costs are high, and paybacks are still uncertain.

But computers, data links, industrial robots, and automated machinery are winning an increasingly central place in industrial production. In the process, they are inspiring a new vision of what manufacturing is all about.

Advanced materials

- An experimental race car screams down the backstretch of a racetrack. At full power its 2-litre engine churns out 318 horsepower, at 9500 rpm. The ultralight engine is made from a new heat-resistant, injection-moldable plastic.

- Respondents to a recent survey conducted by the Canadian Manufacturing Association ranked *advanced industrial materials* as the most interesting of the new technologies.

At the beginning of this decade, plastics replaced metals as the most common industrial material used in North America after wood and concrete. Now, a new generation of plastics and other synthetic materials is poised to alter the material composition of even more products of the industrial system, revolutionizing the way things are designed and made.

Knowledge to go

- Computer: "Question 11. Has patient 219 had symptoms of persistent headache or other abnormal neurological symptoms (dizziness, lethargy, etc.)?" User: "YES."

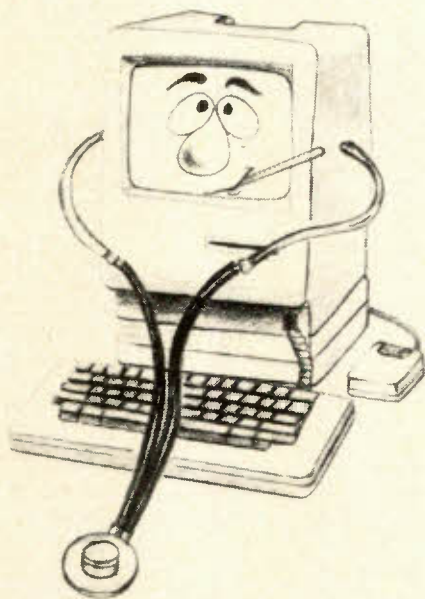
The computer is running Mycin – the classic "expert system" program

developed at Stanford University in the mid-1970s to diagnose blood infections. The program asks the user a series of directed questions about the patient: symptoms, lab test results, and medical history. Answers lead to a qualified diagnosis (in this case, meningitis), usually about as accurate as a human specialist's. After diagnosis, Mycin considers patient weight, allergy history, and other factors to recommend appropriate medication.

Expert systems are the fastest-breaking commercial product in the fast-lane field of computer artificial intelligence. Many successful programs demonstrate that expert systems provide valuable support to human experts in some kinds of problem-solving work. Enthusiasts predict a brave new future for expert systems, as the software becomes more widely available and starts to enter the personal computer market. Some foresee libraries of canned consultants in every business and home – more than a match for problems from auto repair to heart surgery. Insiders caution that present knowledge-processing techniques are still saddled with very severe limitations. Mycin knows a lot about blood diseases. But it has no idea what a "patient" is.

Expert systems organize knowledge acquired from experts and apply it to assist in problem-solving. The inference-procedure component of the program – the logic allowing the computer to arrive at decisions – is quite distinct from the knowledge base or specific expertise. Inference procedures follow a variety of formulas. Mycin, for example, is a "rule-based" system using a "situation-action" or "if-then" line of reasoning to arrive at solutions. A sample rule:

"If (i) the infection is meningitis, and (ii) the organisms were not detected by culture colouration, and (iii) the type of infection could be viral, and (iv) the patient is severely burned, **then** it is probable that **Pseudomonas aeruginosa** is one of the organisms responsible for the infection."



New survey on tech change

Computer technology is pretty much an established fact in Canadian industry these days, particularly in the case of large companies and U.S. subsidiaries. So far, white-collar workers have been the most heavily affected by the new technologies, since most of these have appeared in the office. But blue-collar workers can probably expect to see greater changes in their working environment soon, as computer-based innovations in manufacturing processes become more common.

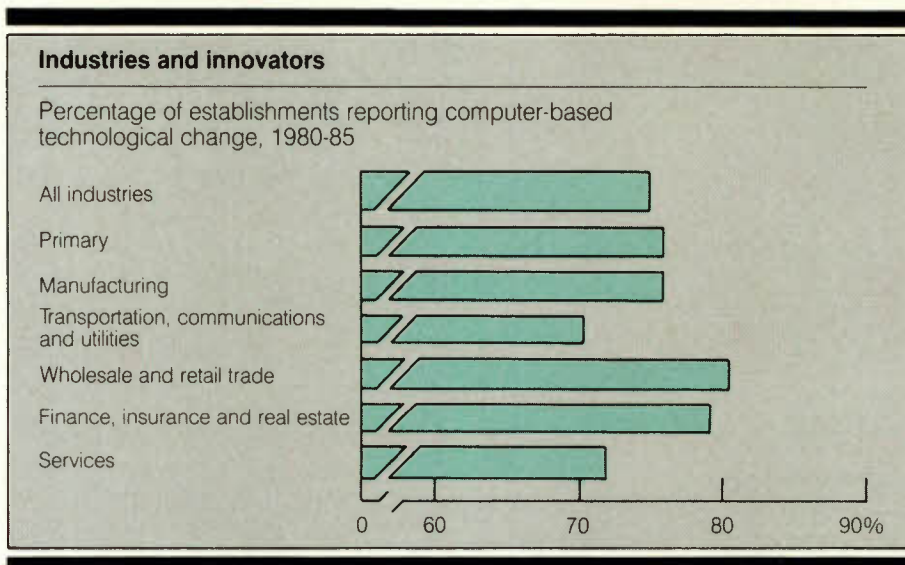
This and other information was collected in the course of a new "Working with Technology" survey, conducted by the Economic Council. As part of the Council's study on the labour market implications of technological change (Au Courant, vol. 5, no. 4), economists Gordon Betcherman and Kathryn McMullen asked employers in a wide range of industries across Canada to describe their experiences with computer-based innovations between 1980 and 1985 and to report on their plans to 1990. Using the responses from close to 1,000 establishments, they catalogued the new technologies that were reported and described the employment and organizational changes that accompanied the innovations. (A detailed analysis of these findings will be made available at a later date). Highlights from the survey include the following:

- Three-quarters of the organizations surveyed reported the introduction of some computer technology during the first half of the 1980s.
- Large companies and those with foreign parents (particularly from the United States) were the biggest innovators. Regionally, western Canada had the highest rate, followed by Quebec and Ontario, and finally, the Atlantic provinces.
- Wholesale trade; communications and utilities; and business services had particularly high innovation rates (see top chart).
- In general, the employment record of the innovators was neither better nor worse than that of the non-innovators, as indicated by the fact that their employment growth

was about the same over the five-year period (see bottom chart). Any job dislocation resulting from the innovating process, the authors explain, was apparently offset by new employment, generated through increased sales. Tech change did, however, lead to new skill requirements, which were usually met by

and 32 per cent for non-innovators.

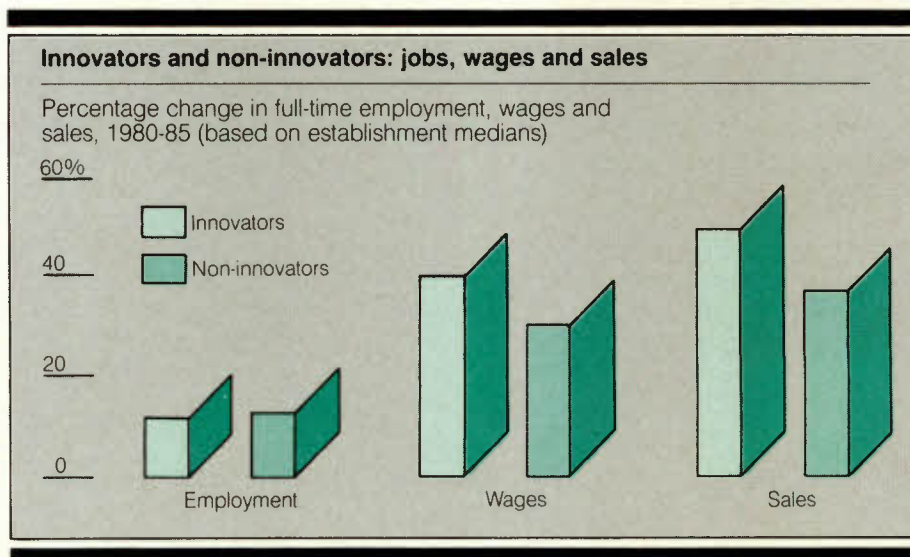
- Almost two-thirds of the technological changes introduced were relatively inexpensive office innovations, such as word processors, personal computers, and office networks. The dominance of office over production-process automation (such as robots in factories and automated parts



retraining existing workers through short-term, on-the-job programs.

- Wages were consistently higher in innovating organizations for all the occupations surveyed. Wage gains were greater too, having increased 40 per cent on average for innovators

warehouses) – as well as the stronger performance of large firms over small ones – can be explained in part by the very high cost of process automation technologies, the authors suggest.



S·P·E·A·K·I·N·G·O·U·T

As a major trading nation, Canada is always on the lookout for new export opportunities.

But the prospect of freer trade with the United States, as well as further trade liberalization under the General Agreement on Tariffs and Trade (GATT), presents both opportunities and risks for Canada. Fewer bilateral and multilateral trading restrictions would be a boon to some Canadian industries, but the spectre of industrial dislocations and job layoffs in other sectors of the economy is a cause for some concern. The Economic Council looks at both sides of the equation in a new project examining trade-policy options and structural adjustment in Canada. To find out more about this undertaking, *Au Courant* interviewed project director Sunder Magun.

Au Courant: *Why is the Council undertaking this project?*

Magun: Since nearly a quarter of all the output in Canada is exported, trade represents a large part of the economy. So it is important to know how this sector will adjust to bilateral and multilateral trade liberalization, in order to assess the kind of industrial adjustment policies that might be needed and to help the country design better bargaining strategies for entering trade negotiations with other countries.

Part of the project involves simulating the impact of a freer-trade agreement with the United States and the subsequent impact on investment flows between the two countries. We shall also measure the effects of the tariff reductions that have occurred under the GATT framework, as well as the likely impact of further cuts that are expected to follow the next round of GATT negotiations. In this regard, the project will study the process and speed of industrial adjustment in Canada by estimating the output and employment effects of trade liberalization – by province, by industry, and by occupation.



Sunder Magun

Au Courant: *Have there been any preliminary findings?*

Magun: Yes. Using the Council's CANDIDE econometric model, we have found that trade liberalization with the United States is beneficial for Canada. The output of the economy increases, and in many sectors employment goes up. But we are not yet at the stage in our analysis where we can pinpoint, in precise terms, the gainers and the losers with respect to who will benefit or suffer as a result of trade liberalization. Later on we expect to have some answers, since we will be studying 40 Canadian industries and 80 occupational groups in detail.

Au Courant: *Will your information be useful in terms of the current Canada-U.S. trade talks?*

Magun: Yes. We intend to release the analyses and the supporting information as they become available. Right now we are focusing exclusively on the Canada-U.S. trade initiative, though, as I mentioned earlier, some of our research will be helpful in the GATT negotiations. In both respects it is worth noting that the Council is raising a number of questions that have not been asked before.

For example, there has been no research into the extent of nontariff trade barriers that exist between

Canada and the United States and the effect on trade flows of removing such barriers. At this point we are working with various U.N. agencies to compile a first-ever list of those barriers in Canada and other major industrial countries.

A second area where we are breaking new ground is in our examination of the impact of trade liberalization on investment flows. At present, the bulk of Canada-U.S. investment activity is conducted through Canadian and U.S. multinational firms. Therefore it is crucial to have some idea of how these firms will respond to freer trade. Finally, there has been very little research in the area of structural adjustment on an industry-by-industry basis. The difficulty of identifying the gainers and the losers in the move to freer trade, both in the short run and in the long run, is still with us. We intend to examine this issue in detail. The results will provide the background information needed to help Canada restructure existing manpower, regional, and industrial programs, as well as design new, specially targeted measures.

Au Courant: *But what about the arguments we hear from the various interest groups who either support or oppose freer trade on the basis of their own research?*

Magun: I do not think that any detailed study to date has come up with reliable results insofar as identifying the impact of freer trade on specific industries, occupations, or communities. One thing is for sure: some industries will be affected positively and some negatively. We should also keep in mind that Canada will undergo greater structural adjustment than the United States, since our economy is more protected than theirs (Canadian tariff rates are higher, for example), and our exports to the United States account for about three-quarters of our total trade.

Au Courant: *What happens if there is a breakdown in the Canada-U.S. trade talks?*

Magun: I would say there are two possibilities. First, the Americans may decide, after leaving the bargaining table, to become more protectionist. Canada would lose considerably in that case. The second scenario is that, upon failure of the talks, Canada would return to its traditional approach of liberalizing trade with the United States through the GATT framework, which it has been doing for some 30 years. This approach would be much more time-consuming, however, since there are so many other countries involved. Furthermore, the GATT negotiations have, in the past, had little success in controlling nontariff barriers, which pose the largest threat to Canada-U.S. trade. Indeed, in recent months our access to the U.S. market has become increasingly uncertain with the

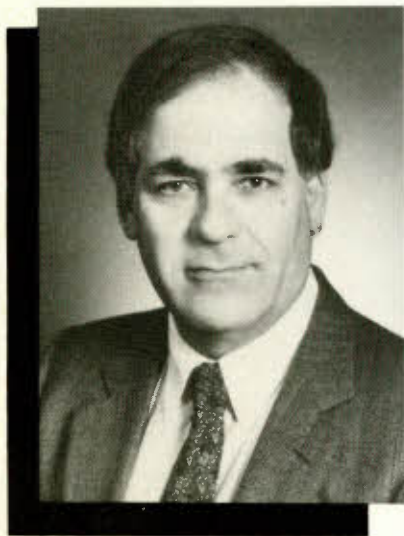
application of U.S. anti-dumping laws, the imposition of countervailing duties on Canadian exports, and other forms of contingency protection. This situation is particularly worrisome, not only because it affects Canadian exporters but also because it discourages those forms of investment in Canada which depend on access to the U.S. market. For example, many Canadian investors are establishing plants in the United States, in order to avoid the nontariff barriers. At the same time, investors whose businesses in Canada require access to the U.S. market are now more reluctant to invest in such things as new technology and human resource development. Essentially we are losing investment to the United States.

Au-Courant: *How important are*

the GATT negotiations to Canada?

Magun: We consider these negotiations as complementary to the U.S. talks. There is considerable scope for expanding our trade with other countries, particularly in the Asia-Pacific region. In the next GATT round, Canada will be searching for ways to help restore greater discipline and openness to the existing multilateral trading environment. We will also be stressing the benefits of removing trade barriers against agricultural and forest products, transport and communications equipment, nonferrous metals, petrochemical goods, and services. Canada, incidentally, is supporting the development of rules for regulating trade in services, which offers tremendous potential to Canadian exporters.

New members appointed to the Economic Council



Raymond Koskie is a partner in the law firm of Koskie and Minsky in Toronto, Ontario, and a past partner of Robins and Robins. He has acted as legal counsel to trade unions and is a specialist in the field of Employee Benefit Plans.



Raymond Nelson is president of Nelson Lumber Company in Lloydminster, Alberta. He is also a director of a number of Canadian companies, including Alberta Energy Company Ltd. and British Columbia Forest Products Limited.

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WORKING TO IMPROVE CANADA'S POLICY PERFORMANCE

... that has been the chief concern of the Economic Council of Canada since its creation as an independent advisory body in 1963.

Over the past two decades, the Council has focused on public policy issues of key importance to Canadians — including economic growth, the role of new technology, the impact of government regulation and the changing job market, to name only a few.

The Council pursues its goal of improving Canada's economic performance in three ways:

Consultation

Members of the Council, representing a wide cross-section of Canadian society, meet regularly with governments and groups to study, analyse, and make

recommendations on significant economic issues.

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An expert staff originates research and provides background information on a variety of topics, with particular stress on the medium- and longer-term problems of the Canadian economy.

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