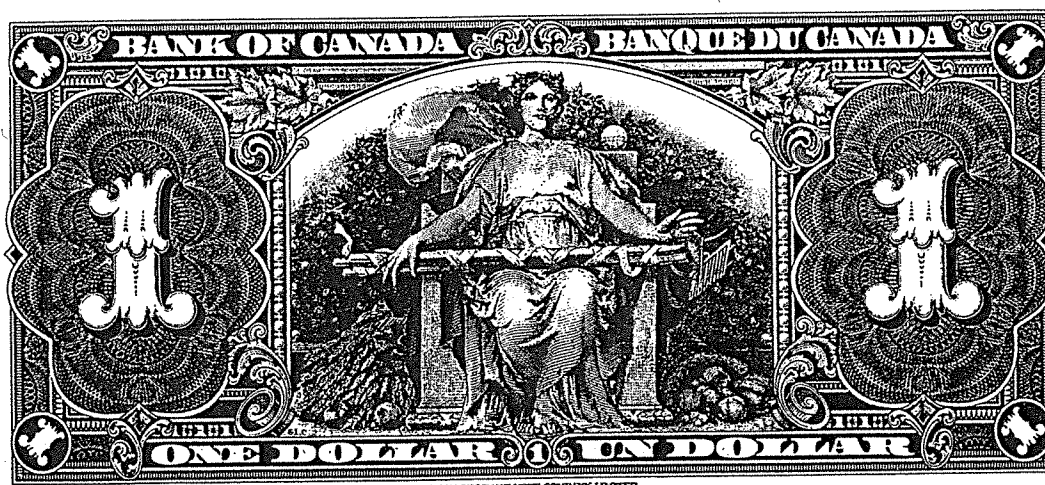


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1 Canadian Monetary Policy as a Reflection of Major Trends in Economic Theory: 1951-1981 *

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Abstract. The author examines Canada's monetary history in the light of trends in economic theory, discussing four policy periods characterized by classical monetary theory (1951-60), Keynesian demand management policies assuming a Phillips curve trade-off (1961-71), Keynesian expansionary policies unconstrained by fixed exchange rates (1972-75), and finally the current period wherein the role of money has been rediscovered and the long-run Phillips curve trade-off discredited. The author discusses how government economic policies tend to follow trends in economic theory. He evaluates these policy trends, concluding that Keynesianism resulted in faulty economic policies which were responsible for inflation and instability. Consequently, future problems of free market economies will be better dealt with by appropriate microeconomic policies.

1.1 INTRODUCTION

In this paper, Canada's post-war monetary history is analyzed in the light of major trends in economic theory. I believe that such a study provides useful insights into present problems and likely future developments. As will be seen, very similar unemployment and inflation conditions at different times have evoked completely different responses from policy makers. Such behaviour can be explained only by changes in perceptions of the role and efficacy of monetary policy held by

policy makers at different points in time[1].

The post-war years are characterized by a cycle of economic policies. During Phase I (1951-1960), policies were dominated by classical monetary theory with its emphasis on price stability and anti-cyclical variations in the money supply. Phase II policies (1961-71) were motivated by attempts to put into practice Keynesian theories of active demand management, and of trading lower unemployment for higher inflation. However, this phase was constrained by fixed exchange rates

and a monetary system designed to serve classical policies. During the third phase of the policy cycle (1972-75), Keynesian expansionary policies were pursued without external constraints in an international environment of floating exchange rates, and in an ideological framework where the cost of unemployment was considered to be extremely high and that of inflation negligibly small. After 1975, Phase IV policies were shaped by the rediscovery of the role of money in the determination of inflation, and the realization that there exists no trade-off between inflation and unemployment as a longer run policy option.

After tracing this 30 year cycle in theoretical emphasis and policies, I will conclude that, in all likelihood, the 1960s and 1970s were decades when faulty economic theories resulted in a temporary bout with inflation and economic instabilities, which will end with the readoption of classical theories and policies. The longer run emphasis of this study thus provides a greater perspective than would be possible in a study with a shorter focus.

Before turning to an analysis of each of these four phases, it is worth noting that Canada's post-war monetary history largely parallels that of the United States and other Western countries. The U.S. economics profession has dominated the world scene through its publications as well as through the training of individuals who become policy makers in many countries. Parallel economic developments in the United States also determined, or at least made possible, the Canadian cycle of policies. These interdependencies of the Canadian and U.S. economies and economics professions will not be discussed further in the following, though they loom large in the background[2].

1.2 PHASE I - CLASSICAL ANTI-CYCLICAL POLICIES

In the 1950s, monetary policy in Canada was dominated by classical concerns with price stability and the need to minimize the frequency and magnitude of business cycle fluctuations. The predominant model used for such policies was the quantity theory of money, with its clear-cut relationship between inflation and the money supply. Counter-cyclical policies were based on induced variations in the interest rate around a "normal" level: high rates were designed to choke off excessive booms and low rates induced recovery from recessions.

In the history of economic thought, the 1950s are known as the period when the Keynesian model was formalized, refined and extended, and when the first attempts were made to estimate its parameters. However, the influence of the Keynesian model on monetary policy in Canada during this period was minimal for two basic reasons.

First, the older generation of economists and politicians in charge of formulating policy were either not familiar with the new theories, or treated them with the kind of scepticism accorded all new economic theories. Second, the theory itself was imperfect and left many operational questions without satisfactory answers for monetary policy. Foremost of these unanswered questions regarded the roles of price level changes, the exchange rate and the definition of full employment[3]. Economists who were trained during this period and well into the 1960s will remember that the basic LM-IS model focused on the relationship between employment levels and the interest rate, leaving the above considerations as unsystematic extensions without clear im-

plications for the dominant concern with Keynesian unemployment. Only through Phillips' (1958) discovery of an apparent positive correlation between inflation and employment, and through Mundell's (1962) formulation of the monetary-fiscal policy mix model under fixed exchange rates, was the Keynesian model perfected to provide policy guidance on these important matters.

This delay in perfecting Keynesian theory caused Canadian monetary policy during the 1950s to be dominated by classical concerns with combating inflation and unemployment through counter-cyclical variations in the money supply and interest rate.

1.2.1 Actual Policies

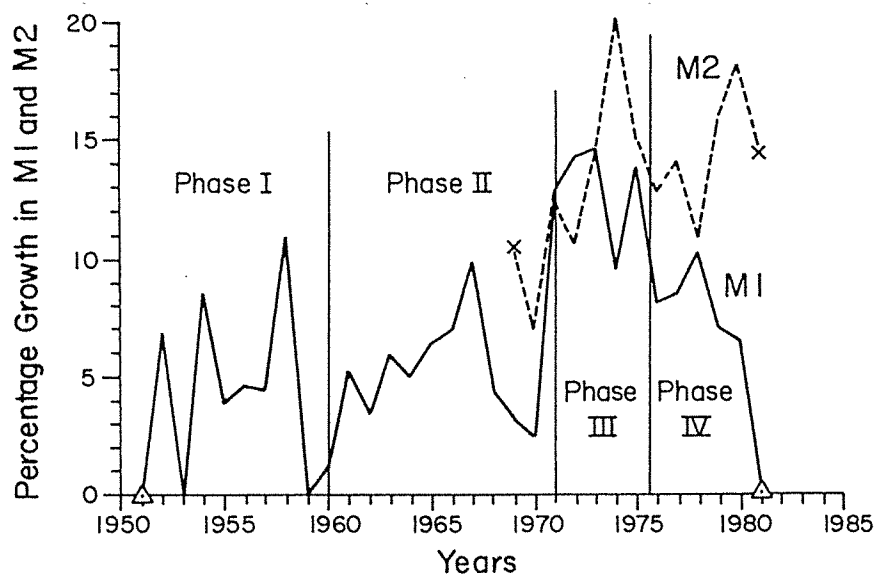
Figure 1 shows that in 1951, Canada experienced an inflation rate of over 10 percent. While it was primarily caused by global excess demand in the wake of the Korean War, Canadian monetary authorities responded with a very tight monetary policy. This appears graphically as a zero increase in the money supply in 1951 and 1953, with an average annual rate of 2.3 percent during the three-year period when real output grew at 6.3 percent annually. The results of this monetary tightness are seen in Figure 2. The Treasury Bill rate rose from .5 in 1951 to 1.6, a change which may appear negligible by today's standards, but which was a dramatic 300 percent rise at the time. The inflation rate did respond to this restrictive monetary policy and fell to a negative annual rate in 1953. However, real output growth also fell into the negative range in 1954, and the unemployment rate nearly doubled from about two percent in 1951-52 to four percent in 1954.

The control of inflation and the recessionary levels of output growth and unemployment in 1954 prompted a reversal of monetary policy and, as Figure 1 shows, the money supply was made to grow at an annual rate of 8.5 percent. In the following two years, unemployment dropped as output grew at 8.5 and 9.5 percent respectively. However, inflation also revived in 1955, and reached the peace-time high of 3 percent in 1957. In response, monetary policy became more restrictive with supply increases between 4 and 5 percent during 1955-57, and the Treasury Bill rate climbing steadily to a peak of near 4 percent in 1957. The result was a predictable slowdown in economic growth and a rise in unemployment.

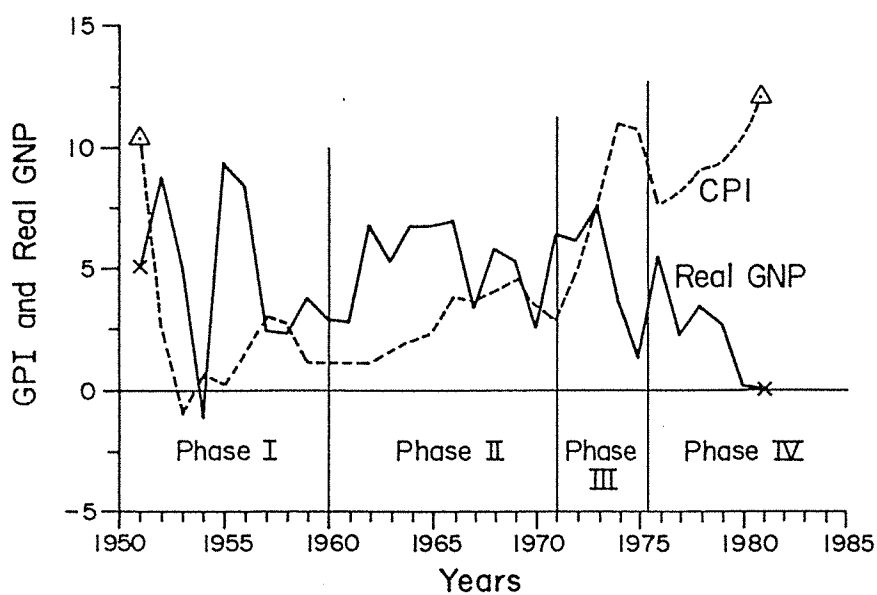
The next remarkable reversal in monetary policy took place in 1958 when the money supply was made to rise at an annual rate of 11 percent, causing a sharp drop in the Bill rate. This unprecedented growth was produced because the Canadian economy was perceived to be in need of liquidity at the time. The Federal government had engaged in a major debt policy initiative, and through the so-called "conversion loan," had considerably lengthened the average maturity of the debt. However, as soon as this conversion had been accomplished, late in 1958, the Bank of Canada returned to its fight against inflation, and reintroduced extremely tight monetary policy, with a zero increase in the money supply in 1959 and a one percent increase in 1960.

In 1959, the Treasury Bill rate reached a new post-war peak of 5 percent and the inflation rate dropped to one percent in the wake of this restrictive monetary policy. Real output growth, with the normal lags, had responded by a substantial drop in 1957 to the restrictive policies of the preceding year.

Figure 1-a+b
PHASES IN CANADIAN MONETARY POLICY*

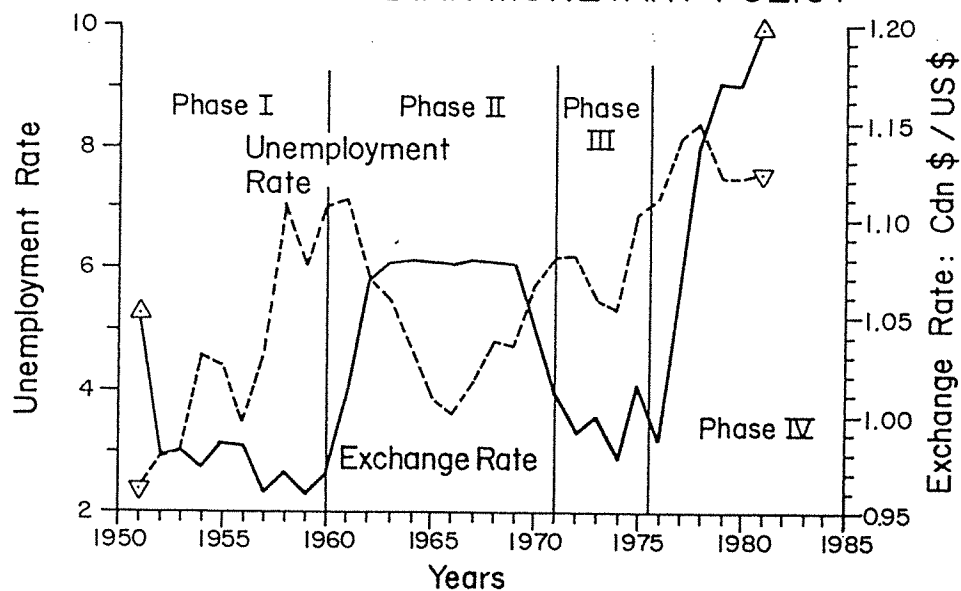


a

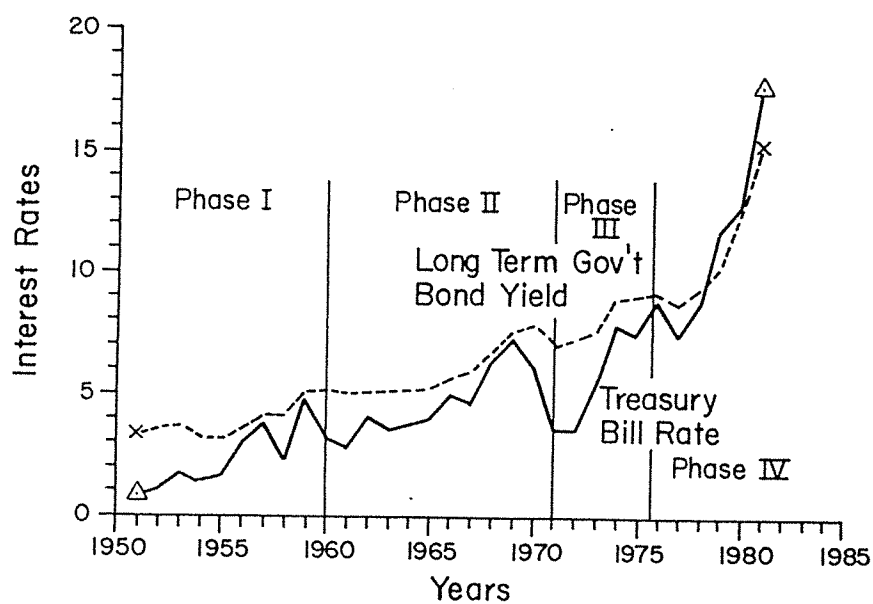


b

Figure 2-a + b
PHASES IN CANADIAN MONETARY POLICY*

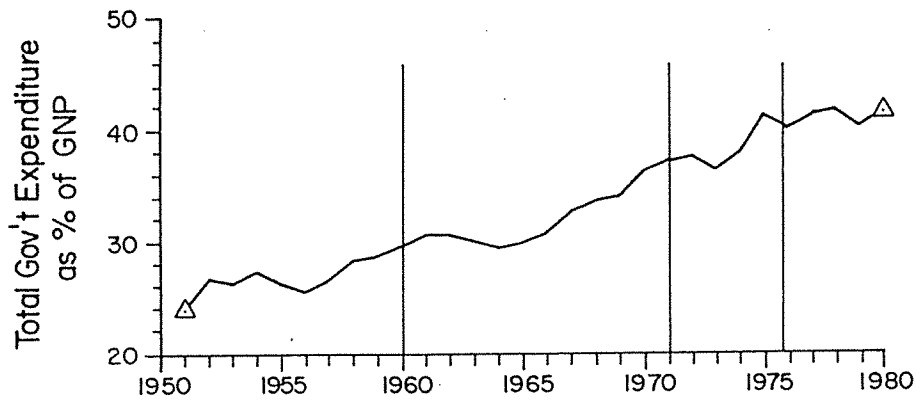


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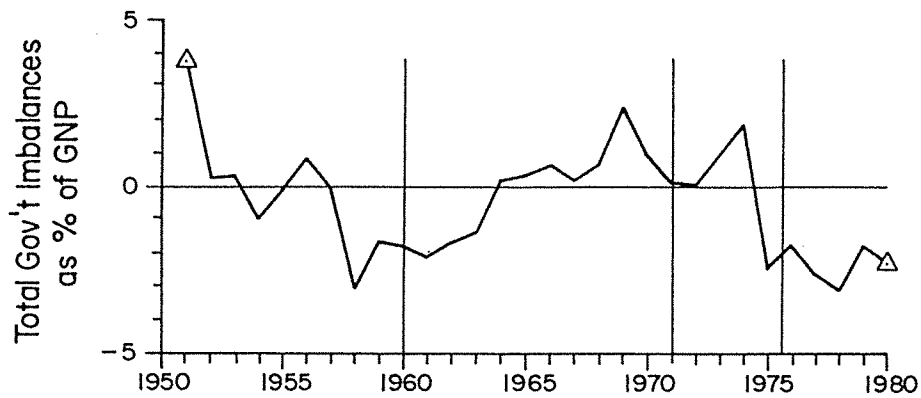


b

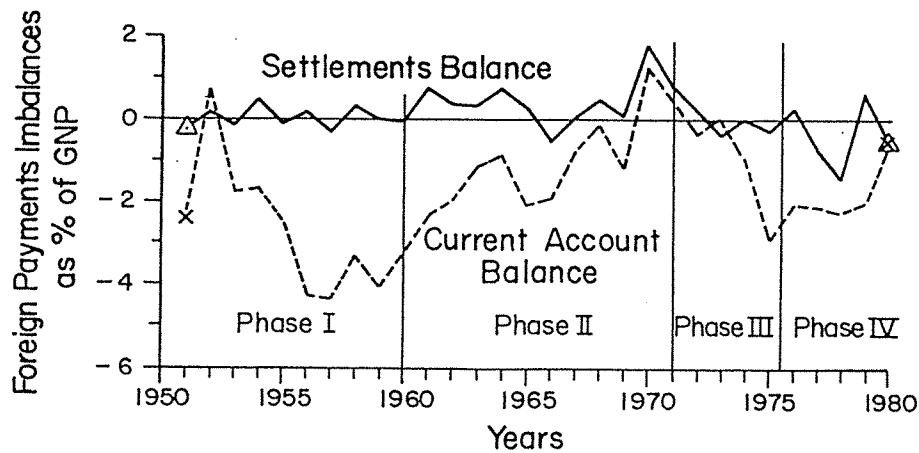
Figure 3 - a, b + c
PHASES IN CANADIAN MONETARY POLICY *



a



b



c

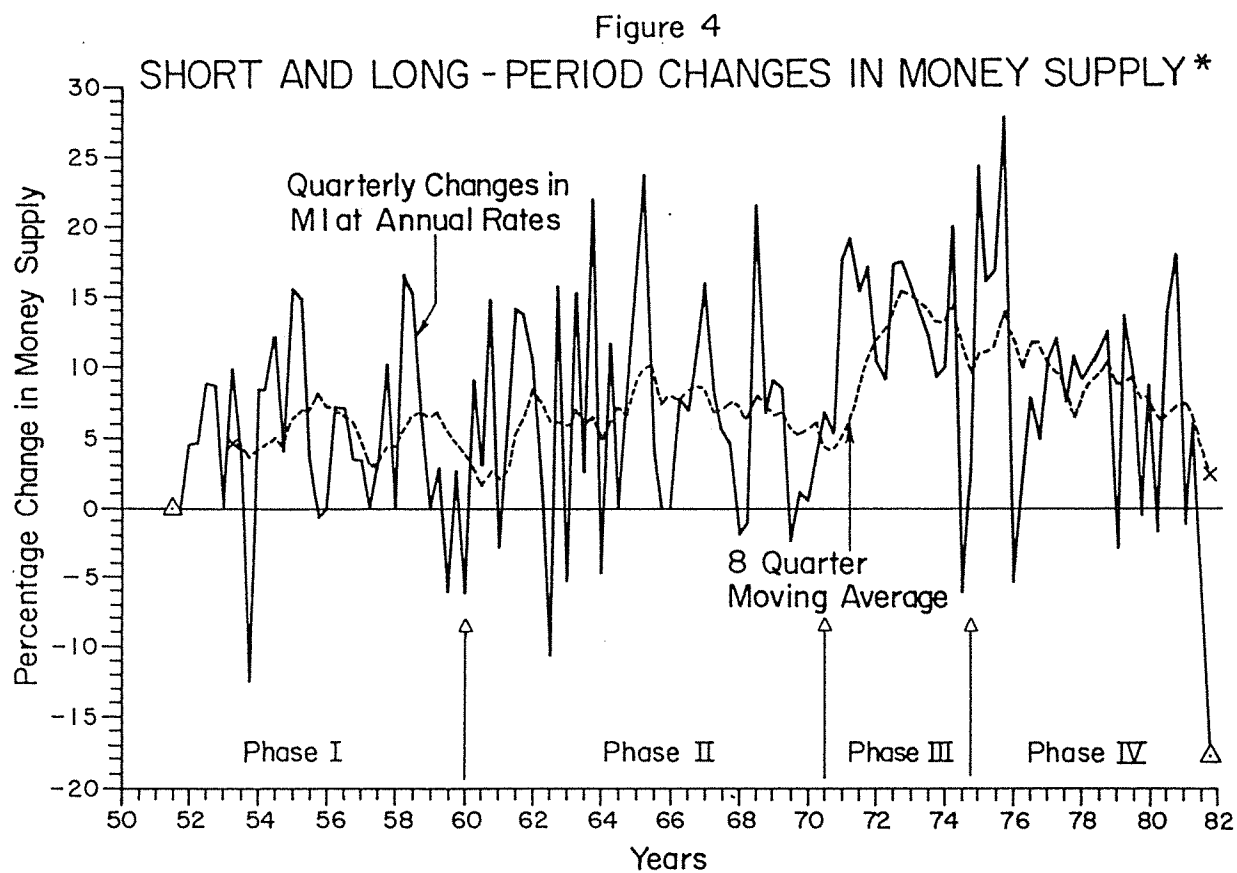
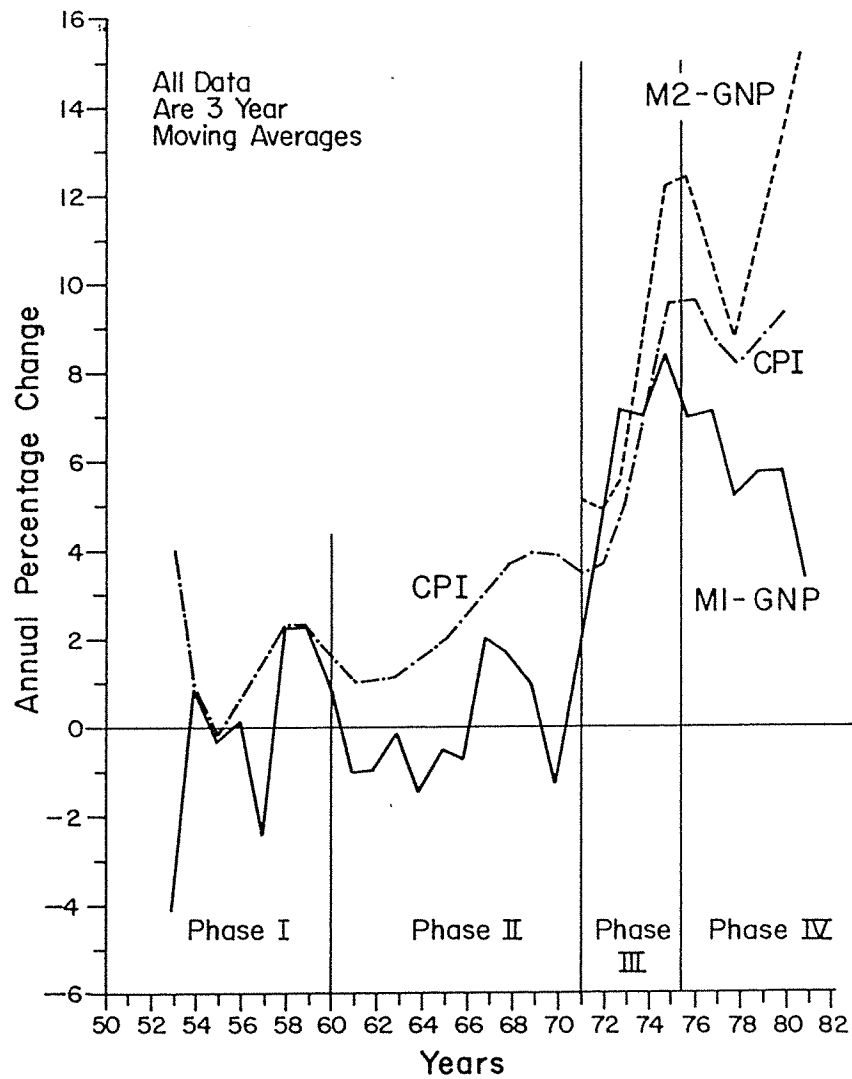


Figure 5
TEST OF MONETARIST THEORY*



It rose only slightly in 1959 after the easing of policy in 1958, but did not respond as sharply to the restrictiveness of monetary policy in 1960-61 as it had in previous episodes. Undoubtedly, this stability in output growth was the result of the fiscal policy of 1958, which had lowered tax rates and created a record peace-time deficit equivalent to 2 percent of GNP (see Figure 3).

The tight monetary policy of the late 1950s had two important consequences which ultimately led to the resignation of the Governor of the Bank of Canada, and the end of the era when the Bank's policy was dominated by classical concerns with inflation. First, as seen in Figure 2, Canada's unemployment rate rose throughout the last half of the 1950s, reaching a post-war peak of 7 percent in 1960. Second, throughout the 1950s, Canada's exchange rate, though nominally floating, was kept within a very narrow range (see Figure 2) through active intervention in the foreign exchange market. (Evidenced by the alternating sale and purchase of foreign exchange and recorded as the settlements balance in Figure 3.)

As a result of the high interest rates and shortage of domestic money balances, foreign capital flowed into Canada at record rates. This fact shows up clearly in the bottom panel of Figure 3, where the difference between the current account and settlement balances is equal to the capital inflows. These capital inflows, at the rate of about 4 percent of GNP for each of five years, have not been repeated in the following two decades. They were blamed for slack exports and high imports on trade account, and the resultant pressures on unemployment noted above. In addition, politicians questioned the wisdom of having such high capital imports with the resultant growth in foreign

ownership of Canadian industry.

The Minister of Finance, responding to political pressures from parliament during the late 1950s, attempted to persuade Bank of Canada governor James Coyne to ease monetary policy and bring about a reduction in unemployment and capital inflows. The governor insisted on his independence and argued that the control of inflation was the primary task of monetary policy. In mid-1961, Governor Coyne resigned under the threat of legislation designed to remove him from office. While the so-called "Coyne affair" is complicated by the governor's alleged lack of personal integrity, in retrospect, it is the conflict over classical and Keynesian aims of monetary policy that is the dominant theme of the affair. The resignation of the governor marked a symbolic end to the era of classical monetary policy in Canada.

1.2.2 Evaluation of Policies

While the annual data used in Figures 1, 2, and 3 are most useful in the description of major real trends and policy changes, the quarterly changes in money supply growth and 8 quarter moving averages shown in Figure 4 reveal some interesting facts not apparent from the annual data. First, as compared with quarterly fluctuations in the 1960s and 1970s, the short-run changes during the 1950s were quite small with the possible exception of the reversals of policy in 1953, 1955 and 1958. Second, the 8 quarter moving average graph shows distinctly that there were two full and one half cycles in monetary policy. Starting the period at a rate below 5 percent, the first expansionary phase lasted until 1955 when it hit a peak of 8.5 percent. The next trough was in the

middle of 1957 at an annual rate of 3 percent. The subsequent expansion peaked in 1959 and was followed by the prolonged and deep decline until the Coyne affair in 1961. The main impression gained from these data for Phase I of Canadian post-war monetary policy is that it was dominated by cyclical swings of expansion and contraction with relatively small quarterly fluctuations in a narrow overall range.

Figure 5 is designed to evaluate the monetary policy that is inspired by monetarist doctrine. It evaluates the degree of monetary tightness by subtracting from the percentage change in the money supply, the concurrent percentage change in real national income. To eliminate short-run fluctuations in these figures, the differences were computed annually, but the solid line in Figure 5 represents the 3 year moving average. According to monetarist theory, assuming an income elasticity of demand for money equal to one, and a constant velocity of circulation, monetary policy is neutral and leads to price stability if the difference between the growth rates in money and real output is zero. Figure 5 shows that during the 1950s, Canadian monetary policy was exactly neutral for the average 6 years 1951-57, though the trend was from expansionary to restrictive. During the following 3 years it was expansionary, averaging a positive 2.3 percent for the two 3 year averages ending in 1958 and 1959. Thereafter came the sharp decline which ended in the Coyne affair.

While the monetarist model implies that inflation is determined by the rate of money supply growth in excess of transactions demand in the longer run, in the short-run the relationship is only known to manifest itself through lags of variable and unknown length. In Figure 5, a 3 year moving average of the

Canadian CPI is plotted contemporaneously with the M1-GNP series. The two curves do not coincide, but the fit is remarkably close. Especially remarkable is the exact prediction of turning points in inflation in 1955, 1957 and 1958, though the 1956-57 episode of monetary tightness fails to show up in the development of prices. By almost all standards of evidence, Figure 5 lends strong support to the theory which relates inflation to excess money creation.

The great puzzle of the period is the steady upward trend of the unemployment rate from about 2 percent in 1951 to 7 percent in 1958-60 (see Figure 2). This phenomenon attracted much attention at the time[4] and evoked demands for Keynesian policy remedies for what was considered to be a fundamental pathology of market economies guided by classical theories. The Keynesian remedies were lowering of interest rates, depreciation of the currency, or both. As noted above, these policies were not followed and led to the Coyne affair.

Given today's understanding of Keynesian theories, the criticism of Canadian policies was eminently reasonable. Lower interest rates and exchange rate depreciation would have resulted in increased aggregate demand and lower unemployment. However, we also know today that such policies would have resulted in accelerating inflation and would have produced structural problems in the next decade. According to the analysis of what is now known as the "Dutch Disease"[5], Canada's unemployment problem in the 1950s was due to a world-wide natural resource boom in the wake of the post-war recovery of European industrial countries. This boom raised the productivity of capital in Canada, and attracted corresponding capital in-

flows from abroad which, according to straightforward balance of payments theory, can be transferred in real terms only through running a balance of payments deficit in the form of reduced exports and higher imports. Under such conditions, unemployment in these tradeable producing industries normally is "transitional" as workers move into the booming natural resource sector, until the capital inflows cease or relative wages in these industries decline. Keynesian policies would have prevented the operation of incentives for these real adjustments and slowed down the exploitation of Canada's comparative advantage in natural resource industries, which provides an important pillar for the country's high living standard.

1.3 PHASE II - CONSTRAINED KEYNESIAN EXPANSION

Economic theory of the 1960s was dominated by the perfection of the Keynesian system through the systematic incorporation of the concepts of the Phillips curve trade-off, and the monetary-fiscal policy mix, in ever more elaborate and mathematical, logically rigorous models. The ultimate use of these models of equal importance was the econometric measurement of parameters and especially the perceived trade-off between inflation and unemployment[6]. The model building and interpretation of their relevance for policy were strongly influenced by 3 assumptions that constituted the period's conventional wisdom and were rarely spelled out or defended.

First, the models were short-run, and concern over long-run implications were brushed aside by the famous quote from Keynes that "in the long run we are all dead." Second, the reduction of unemployment and its maintenance at low levels were

the primary focus of all economic policies on the grounds that unemployment represented social waste and was one of the most serious disasters that could befall human beings. Third, inflation was considered to be a minor evil, especially if it were anticipated, caused no relative price changes and was accompanied by appropriate policies to assure stability of real incomes of pensioners and welfare recipients[7].

On the more technical level of monetary and fiscal policy were two important changes introduced by developments in Keynesian theory. In monetary policy, the targets shifted from the money supply increasingly to interest rates, credit conditions and "more liquid assets" of commercial banks[8]. In fiscal policy, the idea of the "full-employment budget" rationalized government deficit spending by arguing that neutrality was achieved only when the budget was balanced at a certain level of unemployment. The Economic Council of Canada at one point endorsed 2.5 percent unemployment as the "official" full employment target.

In the early 1960s, economists thoroughly trained in Keynesian economics and who had usually experienced personally the hardships of the 1930s Depression, began coming into positions of influence and power. In the United States, President J.F. Kennedy instituted his famous intellectual Camelot, where prominent academic economists such as J. Tobin and W. Heller, as members of the Council of Economic Advisers, had ready access to the President and his cabinet and decisively influenced their thinking[9]. Canada does not have the equivalent of an Council of Economic Advisers, but many of the government's chief policy makers had studied at leading

U.S. universities under the same Keynesian economists as their U.S. counterparts, and their attitudes tended to be influenced strongly by intellectual and policy developments there. In addition, several of the leading Canadian policy makers had studied in England, and had come under the direct influence of Keynes and his disciples at Cambridge.

1.3.1 Actual Policies

During much of the 1960s, Canadian monetary policy was constrained by an agreement with the United States which placed strict limitations on the accumulation of reserves in return for getting Canada exempted from the 1963 interest equalization tax. However, prior to this, in 1960, a 15 percent withholding tax had been imposed on foreign owners of Canadian government securities, followed in 1962 by a temporary 5 to 15 percent surcharge on imports. There was a revision of banking law in 1967, which, taken by itself, is believed by some to have implied a severe tightening of monetary policy. In 1968, the United States imposed a set of stringent balance of payments guidelines, which had important repercussions for Canada's balance. In the following, I do not attempt to weave these and other episodes into the analysis. Instead, I focus mainly on the effects the spread of Keynesian ideas had on economic policy.

Figure 1 shows clearly that the annual money supply growth rate accelerated steadily from about 4 percent in 1962, to a peak 10 percent in 1967, while the Treasury Bill Rate remained stable at 4 percent until 1965 and rose to only 5 percent in 1966-67. Real output growth responded to this easing of monetary policy by averaging 6.5 percent in the period 1962-66. The

unemployment rate fell steadily from 6 percent in 1962 to 3 percent in 1966 (Figure 2).

However, the outstanding performance of real output growth and unemployment were acquired at the cost of inflation and balance of payments difficulties. As shown in Figure 1, inflation accelerated from a 1 percent annual rate in 1962 to 4 percent in 1967. Figure 2 shows that the exchange rate, which had been considered overvalued at \$.97 in 1960, was allowed to depreciate from then on, and was finally repegged in 1962 at \$1.08. This rise in the price of U.S. dollars discouraged imports and encouraged exports, and supported the recovery in real output growth at the beginning of the period. But the growth in real output and the money supply in the presence of the pegged exchange rate led to a deterioration of the current account and settlements balances of payments after 1964, as can be seen from Figure 3.

These inflation and balance of payments problems occurred simultaneously in Canada and the United States, and called forth restrictive monetary policies that are dramatically apparent from Figure 1. From the 1967 high of 10 percent, the money supply growth rate dropped sharply in each of the following years to a low of about 2 percent in 1970. Real output growth fell but averaged 4 percent between 1967 and 1971. However, inflation continued to accelerate into 1969 and the short-term interest rates rose sharply. Unemployment began a steady climb that lasted almost without interruption until 1982.

Phase II of Canada's post-war monetary history ended in 1970. During that year, the restrictive monetary policy of the preceding two years caused inflation to slacken. However, the big event of the period

was the dramatic development in the balance of payments accounts which was caused by the following. President Nixon was elected in 1968 on the promise of fighting inflation and reducing Vietnam war hostilities. Initially, he delivered on both fronts and, with the co-operation of the Federal Reserve and A. Burns, monetary policy in 1969 was tightened to the point where the U.S. money supply rose by only 3.8 percent. However, Vietnam war hostilities accelerated, budget deficits were large, interest rates high, Congressional elections were coming up, and the 1972 Presidential elections were on the horizon. So in 1970, U.S. monetary policy was eased sharply. The overheated U.S. economy responded by generating a negative balance of trade of unprecedented dimensions. As a result, Canada enjoyed a large current account surplus equal to 1.5 percent of GNP, while the overall surplus came to 3.7 percent of GNP. The Canadian response to these surpluses was the return to floating exchange rates on May 31, 1970, an event which ended the constraint of the full exercise of Keynesian expansionism that had characterized the 1960s.

1.3.2 Evaluation of Policies

Close inspection of the data in Figure 1 shows that the Canadian economy had entered a cyclical recovery well before Coyne's resignation and the following easing of monetary policy in 1961. However, this expansion was prolonged by the continued acceleration of money supply growth rates, even in the presence of unmistakable inflationary pressures. An interpretation of the above behaviour, in the light of the present study's notion of the influence of theory on policy, is that

Canada's policy makers persisted in their expansionary policy stance because they were so convinced of the existence of the Phillips curve trade-off that inflation was seen as being simply the cost of the lowered unemployment. Figure 4 shows in the 8 quarter moving average line that there was a steep climb in the rate of increase in the money supply in 1961, and thereafter a persistent but slower rise to a peak in 1967, and a subsequent decline ending in 1971. The quarterly changes throughout the period were large and continued in the same direction for a fairly long time. These changes were the result of the monetary authorities' responses to several of the above-noted crises. They also reflected a pre-occupation with stabilizing interest rates, and bank reserves and credit conditions, when shifts in domestic and foreign money demand functions took place repeatedly through foreign exchange crisis and changes in inflationary expectations. The reversal of monetary policy in 1967 prompted by the balance of payments constraint also shows up clearly in Figure 4. The moving average growth rate dropped slowly and consistently during the next four years.

The simple test of the monetarist model reflected in Figure 5 shows that the relatively high money supply growth rates of the first half of the 1960s were on average about one-half of a percent smaller than the growth rates in real output. Only in 1967-69, was monetary policy excessively expansionary, by an annual average of 2 percent. The consumer price index efficiently tracks the periodic pattern of the monetarist measure of ease and tightness. However, there is a remarkably constant excess of the inflation rate over that predicted by the basic monetarist model, amounting to an average of about 2 percent per year.

These facts imply logically that there has been either a technologically determined shift in the demand for money manifesting itself in an increase in the velocity of circulation, an income elasticity of demand for money less than one, or both. I cannot analyze and document the relative importance of those factors here[10]. However, I would tentatively attribute the main explanation to a persistent rise in velocity caused by high interest rates which in turn stimulated innovations that permitted reduction in the average size of cash balances in the economy. The fall in the real cost of electronic communication facilities made possible credit cards, Euro-currency banking, "near" banks and many other innovations that permitted economizing on cash balances and raised velocity.

The crucial issue raised by the experience with Canadian monetary policy in the 1960s is whether the high growth rates, low unemployment and inflation in the early period represent a vindication of the Keynesian model incorporating the Phillips curve, justifying policy activism more generally. According to this model, the success of the initial policies was cut short by the constraint imposed on monetary policy by the balance of payments under a pegged exchange rate. High growth levels, low unemployment and moderate inflation could have continued if the Canadian dollar had been allowed to adjust. The logical outcome of this kind of reasoning and interpretation of the experience of Canada and several other industrial countries was the development of the open economy Keynesian Phillips curve model in which countries could obtain "monetary independence" by the adoption of freely floating exchange rates. As we shall see below, this idea was very important in influencing policies in Phase III.

However, the favourable performance of the Canadian economy in the 1960s also has other explanations. Monetarists attribute it to a normal cyclical upswing and the subsequent temporary beneficial effects of unexpected increases in the money supply at a time when the public expected a continuation of the price stability that had prevailed for the preceding 20 peace-time years. The accelerating inflation over the period changed these expectations and the fine performance of the early 1960s was, in a sense, acquired at the expense of the depreciation of the social capital stock of expected price stability. After this capital had been used up, a repeat of the favourable experience of the early 1960s was impossible. Flexible exchange rates could bring monetary independence but not the possibility for a stable trade of some inflation for lower unemployment.

Even in the 1980s, there is no agreement among economists as to the validity of the Keynesian and monetarist explanations of the boom of the early (and troubles of the late) 1960s. However, it may be fair to say that the monetarist explanation is gaining increasing acceptance through both theoretical work and the interpretation of events in the 1970s.

Before we turn to the analysis of the next phase of Canadian monetary policy, it is useful to recall the expectations and government spending programs created under the euphoric conditions that existed after the very favourable growth rates of the early 1960s. This was the period when pundits predicted the arrival of the age of cybernetics and universal economic super-abundance, when mankind's main problem would be what to do with vast amounts of leisure. J.K. Galbraith and other lib-

erals argued that the rapid economic growth permitted a painless expansion of the welfare state, public goods expenditures and increased government intervention to force the elimination of externalities in product and factor markets. The luxuries of the good society were finally affordable.

Political consensus for legislation to expand welfare programs and regulation of the economy was obtained without difficulty. Some of the most severe problems of the late 1970s can be understood only in the light of these government programs which, seen in the context of Phase II of Canadian monetary policy, have their origin in the success of Keynesian expansionism of the early 1960s, and the interpretation that economic science could assure the perpetuation of this success into the future.

1.4 PHASE III - UNCONSTRAINED KEYNESIAN EXPANSIONISM

Policy makers in Canada as well as in most other industrial and developing countries continued to believe in the validity of the Keynesian Phillips curve model when, in 1970-74, developments in the international monetary system and the United States removed the balance of payments and exchange rate constraint that had previously limited their ability to follow through with strong monetary and fiscal expansion. On August 15, 1971, the United States renounced gold convertibility and with it what had widely been believed to be one of the cornerstones of the post-war international monetary system. Subsequent attempts to repeg the price of gold and major currencies failed and, in effect, the world abandoned the fixed exchange rate system. Up to 1972, the United States pursued

expansionary monetary and fiscal policies at rates unprecedented in history. Most countries refused to let their exchange rates appreciate and added U.S. dollars to their reserves in quantities that were the realization of earlier dreams.

It is important to recall these global events in the context of the basic economic theory which determined Canadian monetary policy in Phase III, not only because these developments were determined by the prevailing theory which stressed the benefits of monetary independence, but also because foreign influences had a strong impact on Canadian developments. In other words, the main new influences of the period of Canadian policy were not the evolution of economic theory, but a changing Canadian and global environment which made it possible to put into place Keynesian expansionary policy without balance of payments constraints.

1.4.1 Actual Policies

Figure 1 shows that in 1971, the Canadian money supply rose by nearly 13 percent. In the following two years, the money supply was expanded at even greater rates of 14 and 15 percent. Real output growth increased, hitting a peak of 7.5 percent in 1973. The unemployment rate dropped by only one percentage point during this boom of 1971-73 and rose again sharply thereafter (Figure 2). One of the main sources of the increase in Canada's real income of the period was the rise in export prices and an appreciation of the exchange rate from \$1.08 to \$.98. The massive increases in the Canadian economy's liquidity caused significant drops in long and short-term interest rates for the first time since the end of Phase I.

All of these favourable developments took place in the face of rapidly accelerating inflation. As seen in Figure 1, prices rose from an annual rate of 3 percent in 1971 to a peak annual rate of 11 percent in 1974 and 1975. Clearly, the big difference between the inflation of the early 1970s and preceding periods was that, unlike the latter, the former did not set off restrictive monetary policy. While there was a lower money supply growth rate in 1974, the 1975 rate was up again and for the years 1973-75, Canada's money supply grew at an historically record-setting annual average of over 12 percent.

Two important developments abroad need to be mentioned here because of their influence on Canadian conditions. First, after the Presidential election in 1972, U.S. monetary policy became restrictive and produced the sharp Nixon recession of 1973 and 1974, with U.S. real growth rates in the negative range. Canada, for the first time in post-war history, did not follow U.S. economic policies closely and instead pursued the expansionary policies noted above and let her exchange rate appreciate. The second international development was the formation of OPEC in 1973 and the subsequent escalation of petroleum prices. The Canadian government chose to keep energy prices at levels well below world prices until 1981, using special taxes and subsidies to achieve that objective.

Finally, we may note that during Phase III, interest rates fell initially but reached new post-war peaks in 1975. The unemployment rate dropped briefly in 1973-74, after real output growth had already begun to decline, and also reached a new post-war peak in 1975. The current and settlements balances of foreign transactions were positive from 1970 through 1973. Thereafter,

the current account balance deteriorated sharply as the Nixon recession reduced exports and world commodity prices.

1.4.2 Evaluation of Policies

In Figure 4, the trend of growth in the money supply during Phase III is easily seen. The moving average shows a sharp rise during 1971 and 1972, and thereafter a steady growth at a plateau that represents a post-war high.

The monetarist model underlying Figure 5 finds its most persuasive verification during Phase III. The percentage increases in excess money supply precede and track almost perfectly the increases in the price level, though there is some slight underprediction of the inflation rate for the full period. As compared with the Phase II experience, however, the evidence suggests that increases in velocity were relatively small.

The basic and most important lesson learned from the unconstrained Keynesian expansionism of Phase III in Canada is that the inflation-unemployment trade-off that appeared so favourable in the early 1960s could not be repeated in the early 1970s. Inflation soared and unemployment dropped very little. These facts strongly suggest that the trade-off was an illusion, and that national monetary sovereignty through flexible exchange rates did not provide the expected benefits. Keynesian macroeconomic theory was in crisis and policy makers were ready for new theories and policies. In the fall of 1975, the governor of the Bank of Canada announced a policy of gradual reduction in money supply growth. Phase III and an era had ended.

1.5 PHASE IV - MONETARY RESTRAINT

In 1968, M. Friedman's presidential address to the American Economics Association launched a convincing attack on the idea that market economies faced a stable trade-off between inflation and unemployment. He combined his theoretical arguments with references to the monumental study of U.S. monetary history (1963) which he had co-authored with A. Schwartz. There simply was no evidence over one hundred years of U.S. monetary history suggesting that money supply growth rates in excess of real growth rates resulted in anything but short-lived reductions in unemployment and inflation. Scholars, such as E. Phelps (1967), at institutions other than the University of Chicago, reinforced Friedman's arguments, but the same time lags which had characterized the working out of Keynesian models in the 1950s, and their policy influence in the 1960s, also manifested themselves in the case of the monetarist theories. Influential policy advisors in the United States, such as A. Okun, chairman of the Council of Economic Advisers and his colleagues at the prestigious Brookings Institution in Washington, had made their reputations in the development of the Keynesian policy models and had claimed credit for the successes of the early 1960s. They and people with similar backgrounds in Canada were not convinced by monetarist arguments and successfully pressed for the unconstrained expansion of the early 1970s.

However, the inflation of the 1970s, combined with rising unemployment rates, represented for most people a clear refutation of the validity of the Phillips curve analysis. Keynesians searched for alternative explanations of the 1970s experience. Cost-push theories of old were dusted off and dressed up

in new garb by reference to population explosions, vanishing supplies of natural resources and energy, and all kinds of other limits to growth. The policy consensus among Keynesians was that these special developments called for a new and innovative policy response in the form of wage and price controls[11], but that the basic Keynesian model and Phillips curve trade-off were valid, at least when inflation was being reduced. During the early 1970s, monetarist explanations of the economic situations gained increased acceptance. There was talk of a monetarist counter-revolution which derived its strength from a large body of empirical and theoretical evidence produced over many years at the University of Chicago but which had been considered irrelevant during the hey-day of Keynesianism. In addition, three fundamental theoretical and empirical insights helped explain the seeming failure of the Keynesian system.

First, there was the idea that the unemployment rate, ceteris paribus, is an increasing function of the level of unemployment insurance (Grubel and Walker [1978]) and of other social welfare benefits. Between 1951 and 1981, total government expenditures rose from 25 to 42 percent of GNP in Canada (see Figure 3), much of which is explained by increases in social insurance expenditures of all sorts (Grubel, [1982]). By disregarding the determinants of so-called "natural rate of unemployment," monetary policy during the early 1970s had been made more expansionary than was warranted by other indicators of capacity utilization considered relevant for counter-cyclical policies.

Second, nominal interest rates are a highly misleading guide as to the restrictiveness of monetary policy. Not only is there the old

distinction emphasized by monetarists between nominal and real interest rates, but there is also the interaction between taxation and inflation. If inflation is 10 percent, a 16 percent interest imposes a real cost of borrowing of 6 percent, but if borrowers can deduct the interest cost from income subject to a marginal tax rate of 50 percent, then the real cost of borrowing is -2 percent. Monetary authorities determining monetary restrictiveness on the evidence of real interest rates have tended to overestimate the restrictiveness and pursued a more inflationary rate of money creation than they believed they did[12].

Third, the idea of rational expectations led to the questioning of the usefulness of any policies that are based on the measurement of macroeconomic relationships undertaken in the absence of policies. It was postulated that maximizing economic agents would take into account rationally the effects of policies on their own conditions, and it can readily be shown that as they do so, they negate efforts to lower unemployment rates by demand expansion[13]. This line of analysis provided support for Friedman's proposition of the absence of a Phillips curve trade-off and represents an important generalization about the limited effectiveness of macroeconomic stabilization policies.

These ideas on rational expectations and the determinants of unemployment and the real cost of borrowing, together with the entire body of monetarist theories and empirical evidence, gained increasing acceptance among the general public in Canada and elsewhere during the 1970s. They provided not only a plausible and consistent explanation of the entire post-war history based on universally acceptable principles

of microeconomics; they also provided the rationale for Phase IV of Canadian monetary policy, the period of monetarist constraint after 1975.

1.5.1 Actual Policies

In 1975, accelerating inflation led to two major policy initiatives. First, the Bank of Canada announced that it would reduce the rate of growth of the money supply gradually until it had reached levels consistent with price stability. Figure 1 shows clearly that this policy program was pursued with success. The growth rates of M1 decreased on almost a linear trend from 14 percent in 1975 to 0 percent in 1981. The growth rate of M2 fluctuated widely, but remained at an average of about 14 percent throughout the period. I will return to this phenomenon below.

Second, in the fall of 1975, Prime Minister P. Trudeau instituted a system of wage and price controls that lasted until the end of 1977. Figure 1 shows the inflation rate dropped from about 11 percent in 1975 to 7.5 percent in 1976. Thereafter, it accelerated again and reached 12 percent in 1981.

The period saw dramatic unfavourable developments in all important Canadian economic indicators. During Phase IV, growth in real output fell almost continuously and reached zero in 1981. Interest rates rose strongly throughout the period and reached levels of 16 to 18 percent in 1981. The unemployment rate continued its steady rise through 1978 but stabilized thereafter, in spite of the continued drop in real output growth. Canada's exchange rate depreciated over 20 percent against the U.S. dollar. The current account balance improved with the depreciation of the dollar, though the settlements balance was strongly

negative in 1978 and strongly positive in 1979 in order to achieve the smooth depreciation of the exchange rate.

Fiscal policy was never used strongly in Canada. As can be seen from Figure 3, federal government budget imbalances throughout the period of policy activism in Phases II and III alternated between positive and negative within a narrow range, mostly in classical automatic response to exogenous changes in real output growth. The main impression received from an inspection of Figure 3 is the persistent growth in expenditures as a percentage of GNP, and the development of a very large deficit after income tax schedules were indexed to inflation in 1974 so that revenues ceased to grow automatically with price increases. At the same time, expenditure programs tended to be indexed to inflation and revenue increases due to real growth were curtailed by the slowdown in the growth rate for real output. At 5 percent of GNP in 1977, the financing of the deficit absorbed about 20 percent of Canada's savings.

1.5.2 Evaluation of Policies

Figure 4 shows that after 1975, the growth in the money supply remained around 10 percent and fluctuated narrowly every quarter until 1978. Thereafter, quarterly fluctuations became very large but trended downward. These large fluctuations also took place in the United States and were criticized by M. Friedman as being the result of the monetary authorities' concern with stabilizing interest rates, and as having an adverse impact on expectations for future stability[14]. After 1980, both the Federal Reserve and the Bank of Canada committed themselves to a new policy of stabilizing money

supply growth rates and paying much less attention to interest rates. If this policy is working, it does not yet show up in the quarterly data. The 8 quarter moving average on M1 growth rates in Figure 4 indicates that the Bank of Canada did indeed deliver on its promise to reduce the growth rate. Figures 4 and 5 show just how restrictive monetary policy has been by the standards of the monetarist models.

The big problem of policy evaluation is clearly the failure of the inflation rate to respond to the decrease in the money supply growth rates after 1978, most dramatically obvious from Figure 5. Not only are the rates of changes in these two variables different, but since 1977, they have opposite signs. What has gone wrong, if anything?

I think that a definitive answer to this question will not be found for a number of years, after further developments and research permits us to put the period into some perspective. Here I can only advance a number of hypotheses that suggest themselves to me.

First, there is the possibility that there has been a very great increase in the velocity of circulation of money defined as M1 caused by both technological advances[15] in electronics and institutional innovations which have served to make assets other than money increasingly useful for making payments and as temporary stores of value. In recent years, Canadian commercial banks and competitive savings institutions have introduced chequing privileges for savings accounts while at the same time paying high interest rates on daily balances.

This supply of financial innovations has been stimulated by an interaction between inflation and tax rates. To understand the power of this influence, consider a commer-

cial bank which has to pay the going rate of 14 percent to attract a \$100 deposit. Since it faces a reserve requirement of 10 percent it can lend out only \$90 at the assumed going rate of 16 percent. The resultant gross margin of $.16\$90 - .4\$100 = \$.40$ per \$100 deposit, goes for paying expenses, tax obligations and a normally competitive profit of, say 10 percent of the gross, or \$.04.

Now consider the advantage held by a competitive intermediary that can offer deposits and loans with characteristics that are only slightly inferior to those offered by the commercial bank. This competitor therefore can offer to pay slightly more than 14 percent on deposits and charge slightly less than 16 percent on loans to attract some of the money that previously had gone to the commercial bank. Since the non-bank competitor has no reserve requirement on deposits, it can lend nearly all of every \$100 attracted, except for some precautionary balances which are ignored here to keep the example simple [16]. Its gross margin therefore is $.16\$100 - .14\$100 = \$2$. If operating costs are the same as those of the commercial bank and amount to \$.36 per \$100 deposit, this competitor has a profit margin of $\$2 - \$.36 = \$1.64$ per \$100 deposit.

This is an enormous excess over the \$.04 margin of the commercial bank, and can be used to offer all kinds of services and concessions on interest rates to get wealthholders to switch from money balances counted in M1 and subject to reserve requirements, into balances that are imperfect but close substitutes for money and are counted in M2. The villain of this incentive is the seemingly innocuous tax implicit in the reserve requirement on commercial bank deposits, which, under the above example using high interest

rates, amounts to a 4000 percent tax rate on profits ($1.46/.04$).

In both Figures 1 and 5, we note that the growth rates of M2 have been above the growth rate of M1 by a substantial margin ever since 1974 when interest rates have been above 8 percent. The growth of M2 thus can explain the increase in the velocity of M1 needed to sustain the observed inflation during the period. However, as the data show, the annual growth rate in M2 has been quite unstable and more observations are required to clinch the case.

The second explanation of the failure of Phase IV policy relies on the fact that, in the United States, the monetarist policies followed since 1975 have produced price changes consistent with the monetarist model and preceding periods. One important difference between U.S. and Canadian conditions has been that President Reagan made an election promise to switch from liberal-Keynesian to monetarist-conservative monetary, fiscal and welfare policies. He delivered on this promise in a politically risky package of policies and, in spite of large budget deficits, his administration enjoys a high level of public credibility. Public confidence in the President's determination has helped to change inflationary expectations quickly and to lead to reduced wage demands and costs. Conservative measures of deregulation have, in 1980-81, led to lower prices in several sectors, most notably energy, which supported the decrease in costs and prices.

The same period in Canada was characterized by an entirely different political climate. There has been no monetarist-conservative platform adopted by any party. The Liberals under Trudeau remain committed to liberal-Keynesian philosophy. The monetarist policies of the

Bank of Canada are under heavy attack from many influential intellectuals and politicians, raising some doubts about its future. Government spending has continued its upward trend, and political rhetoric about the need for price stability is met with extreme scepticism by the public. As a result, inflationary expectations appear not to have changed substantially, and wage settlements being demanded and met reflect the conviction that inflation cannot and will not be eliminated. This prophecy can be self-fulfilling, to a considerable degree, as it raises enormously the temporary unemployment cost of fighting inflation, and may ultimately force an end to tight monetary policy and a stable exchange rate. The persistence of inflationary expectations in a particular Canadian political environment can explain the puzzle of Phase IV, especially when it is contrasted with the U.S. experience.

The third possible explanation of the puzzle in a sense complements the second. Liberal Keynesian interventionism in Canada had resulted in an unsustainable subsidy of domestic energy consumers until about 1980. Since then, there have been extraordinarily large increases in energy costs to consumers. The liberal interventionism had also created very powerful cartels and raised prices for food producers in the 1970s. The importance of these cartels may be appreciated by the fact that U.S.-Canadian food price indices had previously moved in unison (with deviations of 5 percent maximum in either country's favour between 1950 and 1977). Since the cartels' creation, U.S. prices have fallen and Canadian prices have risen, creating a gap of about 35 percent in 1980, all adjusted for exchange rate changes.

Upward pressures on Canadian

prices during the late 1970s in the face of extremely tight monetary policy can also be attributed to the depreciation of the exchange rate, which raised the costs of tradeables by 20 percent. In addition, repressed inflation after the 1977 relaxation of wage and price controls is likely to have added to the inflation in subsequent years.

As a final explanation of the puzzle, it may be worth considering that, historically, monetary policy works with a variable and unpredictable lag. Therefore, while the cost influences just mentioned are irrelevant to the monetarist theory of inflation in the longer run, since they only represent changes in relative prices, in the short-run the prices of goods in decreased demand may not fall. As a result, there are excess supplies, unemployment and stagnation, along with inflation. How long these conditions persist is not explained by monetarist theories and depends on many factors, including those noted as the other three explanations of the puzzle.

It is obvious from the preceding that, rather than call into question the model itself, I am inclined to search for explanations that, through extensions and modifications, will accommodate real world developments into the basic monetarist model. The reason for this approach is that I do not know of a better basic framework for analysis than the one which rests on the propositions that excess money creation is the necessary and sufficient cause for inflation in the longer run, and that full employment as the average over the business cycle is determined by labour market characteristics and the cost of not working. Until someone introduces theoretically backed empirical evidence showing that these

propositions are invalid, the Phase IV experience with Canadian monetary policy demands extension and modification of the monetarist model, not the development of a completely new paradigm.

1.6 SUMMARY AND CONCLUSIONS

This study of Canada's post-war monetary history shows once again the power which economic theories have over policies and events, but it also shows that the theories themselves are subject to revision in the light of experience. The analysis ended at a time when monetarist theory was in effect and early developments raised questions about its power to achieve price stability, full employment and economic growth. As a result, there are demands for replacement of monetarism by packages of non-doctrinaire pragmatism and renewed Keynesian interventionism.

If the past is a guide for the future, then monetarist theory will be re-evaluated and modified in the light of experience to better serve the technological and human environment of the last part of the 20th

century. It is also possible that a new paradigm, like the Keynesian one, will come along and replace monetarism. However, in the perspective of monetary history of Western countries over much more than the 3 decades considered here (see Friedman and Schwartz [1963]), the probability is very great that the Keynesian experiments are an isolated incident and that basic monetarist theory will predominate for a long time to come.

If this prognosis is correct, then the unemployment, stagnation and persistent inflation of the period 1975-82 will be evaluated and interpreted as the cost of adjustment following a failed experiment, which in turn creates conditions for sustained and stable growth in its wake. In the future, the persistent problems of free market economies in the form of business cycles and unemployment, will likely be tackled through appropriate microeconomic policies. This would leave monetary and fiscal policies the task of providing a stable environment within which automatic market adjustment processes and these microeconomic policies can be their most effective.

NOTES

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[1] After I had written this paper, I discovered Feldstein (1982) who explains U.S. inflation in terms of major trends in economic theory.

[2] In my research, I have drawn liberally on the following major studies of Canadian monetary policy. The early period of Canada's monetary policy, including pre-war years, is in Neufeld (1958). Wonnacott (1965) discusses policy up to 1962. One of the most efficient summaries of the 1960s is in Pesando and Smith (1973). Gordon (1961) deals with the issues from the perspective of the 1950s. The volume edited by Cairns et al. (1972) contains a thorough and broad coverage of issues and events of the 1960s. Courchene (1973), (1976), (1977) and (1981) is an early and consistent monetarist critic of Canadian monetary policy. Kaliski (1973) and Reuber (1964) present influential estimates of Canada's inflation-unemployment trade-off in the spirit of Phillips' study of U.K. conditions. Howitt and Laidler (1979), White (1978), Carr et al. (1976), Freedman (1978), Wirik (1979) and Laidler (1981) interpret monetary history in Canada from the monetarist perspective. Donner and Peters (1979), Barber

and McCallum (1980), Crane (1981) and Fortin (1979) articulate criticism of monetarism from a Keynesian perspective, suggesting modification of the Keynesian paradigm through the addition of permanent wage and price controls. Bordo and Choudhri (1982) present a thorough analysis of the 1970s experience from a monetarist point of view, and pay special attention to the influence of U.S. conditions on Canada.

[3] See Grubel (1978) for a discussion of the fact that Keynesian theory failed to deliver an operational definition of unemployment.

[4] See, most notably, Gordon (1961) and Wonnacott (1965).

[5] See Corden and Neary (forthcoming).

[6] For Canadian studies of the trade-off, see Reuber (1964) and Kaliski (1973) who surveys studies existing at the time.

[7] Even Friedman (1969) tended to concentrate only on the dead-weight loss of consumer surplus from money holdings, which was ridiculed as the "shoe leather cost of inflation." The Royal Commission on Banking and Finance Report was one of the few voices disagreeing with the conventional wisdom of the period.

[8] Schwartz (1972) found that the number of references made to the quantity of money decreased and that to interest rates, liquidity ratios and other control investments increased in several annual reports of the Bank of Canada during the 1950s and 1960. See Dean (1975) for a

discussion of liquidity ratios as instruments of monetary policy.

- [9] For an account of this period see Sorenson (1965).
- [10] See Friedman and Schwartz (1963) and Laidler (1977).
- [11] These ideas were articulated in the Canadian context by Barber and McCallum (1980). and especially Crane (1981).
- [12] See Feldstein (1982) for an elaboration of this point.
- [13] See Lucas and Sargent (1981) and Baily (1982) for summaries and discussions.
- [14] This criticism was published in his columns in Newsweek in 1981 and 1982.
- [15] Freedman (1981) considers the development of monetary aggregates in response to the control of one.
- [16] I have discussed this problem in Grubel (forthcoming). Since unexpected withdrawals reduce assets by much more than required reserves, commercial banks need secondary reserves almost as large as those needed by institutions that have no reserve requirements. See Bank Profits (1982) p. 83 for empirical evidence on the magnitude of the tax on banking.

REFERENCES

- Acheson, K. and J.F. Chant, "Bureaucratic Controls and the Choice of Central Bank Goals," Journal of Money, Credit and Banking, May, 1973.
- Baily, M.N., "Are the New Economic Models the Answer?" Brookings Review, Fall, 1982.
- Bank Profits, (1982). A Report by the Standing Committee on Finance, Trade and Economic Affairs, (Ottawa: Minister of Supply and Services).
- Barber, C.L. and C.P. McCallum (1980). Unemployment and Inflation: The Canadian Experience, (Ottawa: Canadian Institute for Economic Policy).
- Bordo, M. and E. Choudhri, "The Link Between Money and Prices in the Open Economy: The Canadian Evidence from 1971-80," Federal Reserve Bank of St. Louis Review, Aug./Sept. 1982.
- Cairns, J.P. et al., editors, (1972). Canadian Banking and Monetary Policy, (Toronto: McGraw-Hill Ryerson).
- Carr, J., et al. (1976). The Illusion of Wage and Price Controls, (Vancouver: The Fraser Institute).
- Corden, W.M. and D. Neary (forthcoming) "Booming Sector and De-Industrialization in a Small Open Economy."
- Courchene, T.E., "Recent Canadian Monetary Policy: An Appraisal," Journal of Money, Credit and Banking, May, 1973.
- Courchene, T.E. (1976). Money, Inflation and the Bank of Canada, (Montreal: C.D. Howe Institute).
- Courchene, T.E. (1977). The Strategy of Gradualism, (Montreal: C.D. Howe Institute).
- Courchene, T.E. (1981). An Analysis of Monetary Gradualism, 1975-80, (Montreal: C.D. Howe Institute).
- Crane, D., ed. (1981). Beyond the Monetarists: Post-Keynesian Alternatives to Rampant Inflation, Low Growth and High Unemployment, (Toronto: Canadian Institute for Economic Policy).
- Dean, J.W., "The Secondary Reserve Requirement as an Instrument of Monetary Policy," Manchester School, March, 1975.

- Donner, D.W. and D.D. Peters (1979). The Monetarist Counter-Revolution: A Critique of Canadian Monetary Policy, 1975-79, (Ottawa: Canadian Institute for Economic Policy).
- Feldstein, M., "Inflation and the American Economy," The Public Interest, Spring, 1982.
- Fortin, P. "Monetary Targets and Monetary Policy in Canada: A Critical Assessment," Canadian Journal of Economics, 1979.
- Freedman, C. "Gradualism: Theory and Practice," in Purvis (1978).
- Freedman, C., "Monetary Aggregates as Targets: Some Theoretical Aspects," Technical Report 27, Bank of Canada, July, 1981.
- Friedman, M. and A. Schwartz (1963). A Monetary History of the United States 1867-1960, (Princeton: Princeton University Press).
- Friedman, M., "The Role of Monetary Policy," American Economic Review, March, 1968.
- Friedman, M. (1969). The Optimum Quantity of Money and Other Essays, (Chicago: University of Chicago Press).
- Gordon, H.S. (1961). The Economists Versus the Bank of Canada, (Toronto: Ryerson Press).
- Grubel, H.G. and M.A. Walker, eds. (1978). Unemployment Insurance: Global Evidence of its Effect on Unemployment, (Vancouver: The Fraser Institute).
- Grubel, H.G. "Whither the Natural Rule of Unemployment?" in Purvis, 1978.
- Grubel, H.G. (1982). "The Costs of Canada's Social Insurance Programs," (Vancouver: Simon Fraser University) Discussion Paper 82-03-1.
- Grubel, H.G. (forthcoming). "Interest Payments on Required Reserves to Control Euro-Currency Banking," Festschrift in Honour of Herbert Giersch.
- Holbik, K., ed. (1973). Monetary Policy in Twelve Industrial Countries, (Boston: Federal Reserve Bank).
- Howitt, P. and D. Laidler, "Recent Canadian Monetary Policy: A Critique," in Wirik and Purvis (1979).
- Kaliski, S.F. (1973). The Trade-Off between Inflation and Unemployment: Some Explorations of the Recent Evidence for Canada, Special Study No. 27, Economic Council of Canada, (Ottawa: Queen's Printer).
- Laidler, D.E.W. (1977). The Demand for Money: Theories and Evidence 2nd ed., (New York: Dun-Donnelley).

- Laidler, D.E.W., "Inflation and Unemployment in an Open Economy: A Monetarist View," Canadian Public Policy, 1981.
- Laidler, D.E.W., "Monetarism: An Interpretation and an Assessment," Economics Journal, March, 1981.
- Lucas, R., "An Equilibrium Model of the Business Cycle," Journal of Political Economy, 1975.
- Lucas, R., and T. Sargent, eds. (1981). Rational Expectations and Econometric Practice, (Minneapolis: University of Minnesota Press).
- Mundell, R.A., "The Appropriate Use of Monetary and Fiscal Policy for Internal and External Stability," IMF Staff Papers, March, 1962.
- Neufeld, E.P. (1958). Bank of Canada Operations and Policy, (Toronto: University of Toronto Press).
- Pesando, J.E. and L.B. Smith, "Monetary Policy in Canada," in Holbik (1973).
- Phelps, E.J., "Phillips Curves, Expectations of Inflation and Optimal Unemployment over Time," Economica, August, 1967.
- Phillips, A.W., "The Relationship between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom 1862-1957," Economica, 1958.
- Purvis, D.D., ed. (1978). Issues in Canadian Public Policy (1), (Kingston: Institute for Economic Research, Queen's University).
- Reuber, G.L., "The Objectives of Canadian Monetary Policy, 1949-61: Empirical Trade-Offs and the Reaction Function of the Authorities," Journal of Political Economy, April, 1964.
- Schwartz, A., "Evaluation of Short-term Targets," in Cairns et al., ed., (1972).
- Sorensen, T.C. (1965). Kennedy, (New York: Harper and Row).
- White, W., "Controllability of the Money Supply," in Purvis (1978).
- Wirik, R.G., "Structural Constraint on Canadian Stabilization Policy: The Inflation Adjustment Problem," in Wirik and Purvis (1979).
- Wirik, R.G. and D.D. Purvis, eds. (1980). Issues in Canadian Public Policy (2), (Kingston: Institute for Economic Research, Queen's University).
- Wonnacott, P. (1965). The Canadian Dollar, 1948-1962 (Toronto: University of Toronto Press).

2

The Impact of the Alsands Cancellation on the Canadian and Provincial Economies

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Abstract. The article investigates the impact of the cancellation of the ALSANDS project on the Canadian and provincial economies, using the macroeconometric FOCUS and PRISM models. The years 1982-1990 are broken down into two stages - the "build" phase (1982-1987), and the "production" phase (1988-1990), - to assess the effects of both the cancellation of construction and the added importing of oil. Five scenarios with different assumptions are used. The results of the tests show it is the added importing of oil that has the most serious effects on the economy. This is a condensed version of Policy Study no. 82-1, Policy and Economic Analysis Program, Institute for Policy Analysis, University of Toronto.*

2.1 INTRODUCTION: ASSUMPTIONS

The ALSANDS mega-project has now been cancelled or postponed for several years. This study uses PEAP's FOCUS and PRISM models to examine the impact of the ALSANDS cancellation on the Canadian and provincial economies.

Several key assumptions had to be made concerning the ALSANDS cancellation and the economic environment of the 80s:

2.1.1 "Psychological" Impact

Since it was a "model" mega-project, the cancellation of ALSANDS may have repercussions on business confidence, investment plans, etc., far greater than would be "normal" for a similar reduction in investment or other autonomous expenditure which was less visible. It is in this realm that macroeconomic models are least useful; resort must be had to surveys, casual empiricism and just plain judgement. To keep the experiment "clean," no additional reduction in investment due to psychological reasons has been assumed. Of course, the FOCUS model will still generate the average or normal

reaction in investment and other expenditures. (The "extraordinary" impacts of the ALSANDS cancellation need not all be negative. Room may be opened for alternative energy, conservation, or other investment.) Note that while psychological impacts are ignored in this analysis, they could be quite important. However, it seemed best to leave what would essentially be a "judgement call" out of the initial model impacts, so that what the models themselves were saying would come through more clearly.

2.1.2 Profile of ALSANDS Construction and Output

There is no firmly agreed upon profile of what ALSANDS investment - and later petroleum output - would be. The schedule we adopted, shown in Table 1, is a rounded approximation and nothing more. It is assumed that investment was to begin in 1982 and peak in 1986, with the plant coming "on stream" in 1988 and achieving full output in 1989. Assumptions were made as to the profile of real investment in millions of 1971 dollars; these are eventual National Accounts impacts. Current dollar figures were obtained by multiplying the real estimates by deflators from the "base-case" projection.

Finally, it is assumed that 50 percent of the funds required for the project would have been borrowed outside of Canada. Cancellation of the project therefore entails a reduction in long-term capital inflows in 1982-88. Capital service on this borrowing is assumed to have been postponed until the plant was in production.

To test the sensitivity of the results to this assumption, an alternative scenario (Scenario No. 5

below) assumes instead that there was to be no foreign borrowing for the project. It turns out that results are sensitive to the level of foreign borrowing assumed.

2.1.3 Economic Environment

The impact of the ALSANDS cancellation is measured by removing the investment and output profiled in Table 1 from a base projection of the Canadian and provincial economies. Two features of the base-case have an important impact on the results of the ALSANDS cancellation experiment:

1. The base-case is a long-run trend projection assuming no major surprises in the 1980s. After the current recession ends, the economy is projected to expand at a rate of growth gradually approaching that of the economy's potential. This means that, through the 80s, the economy will be characterized by some slack, but much less so than in the 1982 recession. This intermediate degree of slack is such that the ALSANDS project could have crowded out some investment which might otherwise have taken place. However, since there do exist some unemployed resources, ALSANDS could have been built without displacing an equal amount of other expenditure.
2. The energy situation projected for the 80s is also important for determining the outcome of the ALSANDS cancellation - especially in its production phase of 1988-90.

TABLE 1

ALSANDS Cancellation
(Assumed Profile of Investment and Output)

	Change in Structures Investment	Change in Machinery & Equipment Investment	Change in Total Investment Outlays	Change in Output Mill. Bbl. Per Year	Thous. Bbl. Per Day
	- 1971 Millions -		\$ Millions		
1982	-120	-80	-531	-	-
1983	-200	-140	-982	-	-
1984	-250	-170	-1307	-	-
1985	-300	-200	-1699	-	-
1986	-350	-240	-2170	-	-
1987	-250	-170	-1636	-	-
1988	-100	- 70	- 701	-25	- 68
1989	-	-	-	-50	-137
1990	-	-	-	-50	-137

The projection assumed that world oil prices would remain approximately constant in real terms for 1982-85, and then rise in real terms at about 5 percent per year. Viewed from mid-1982, this projection may appear pessimistic, yet oil price projections have been very volatile in the past, and it was felt that a conservative estimate was warranted in the longer run. This pessimistic view of world prices means that the "lost" oil of the cancelled ALSANDS is relatively expensive in 1988-90 and has a larger effect upon the

Canadian balance of payments than would be the case under more optimistic oil price projections. Still, it will be seen that the balance of payments effects are of such magnitude that even considerably lower world oil price assumptions would continue to make them very important.

Second, in the base-case projections, Canada would still be importing petroleum in 1990, even with ALSANDS. The cancellation of the project would mean that additional oil would have to be imported - or that crash

conservation or rationing measures would have to be adopted instead. This impact of the cancellation on the balance of payments would remain even if Canada were closer to self-sufficiency (or beyond it) in 1990, so long as any excess production beyond domestic needs could be exported (at world prices). In the production phase, our balance of payments would be unaffected by the ALSANDS cancellation only in the unlikely eventuality that Canada were self-sufficient when the plant began production, and that no export markets were available.

rates and the exchange rate to adjust to clear their respective markets. There is no intervention in the foreign exchange market.

Scenario 2:

Exchange Rate Controlled by Monetary Policy: The Bank of Canada adjusts monetary policy so as to keep the exchange rate projected for the 80s unchanged after the cancellation of ALSANDS. In the late 1980s, this involves considerable monetary restriction and raising of interest rates to keep the Canadian dollar from depreciating.

2.1.4 Policy Response

The cancellation of ALSANDS has an appreciable effect on the economy, especially in the 1988-90 period when petroleum that would have been supplied by the project must be imported. When a shock has a major effect on the economy, it is appropriate to ask what policy response might follow the shock. We have confined the analysis to two possibilities with respect to exchange rate policy and monetary policy. Of course, other fiscal or monetary initiatives could also be undertaken, including schemes to boost investment in alternative energy projects or in other sectors of the economy.

The two policy stances investigated are as follows:

Scenario 1:

"Flexible" Exchange Rate: The Bank of Canada is assumed to follow the same monetary targets for the 80s after the cancellation of ALSANDS as it had before. It allows interest

Most likely, the policy stance adopted would be somewhere between the two extremes sketched above. That is, there would be some movement in both the exchange rate and in monetary policy in response to the cancellation. Unfortunately, it is difficult to judge exactly what the final mix might be.

2.1.5 The Behaviour of Prices

One of current controversies in applied macroeconomics concerns the formation of the aggregate price level. One view holds that prices are set to clear markets under profit maximization - at least, in all but the very short-run. The other holds that prices are largely set by major corporations on the basis of mark-ups over costs, and are changed only infrequently - at least, in all but the very long-run. Each side is probably willing to concede the other's case, but only in the "run" which is irrelevant. The "mark-up" group insists that the short-run is sufficiently long to worry about;

the "market-clearing" group suggests that it is not. Moreover, it is likely that at the sectoral level, some sectors are closer to one model, and some to the other.

The FOCUS model cannot reconcile this debate, but it can take it into account - at least in the formation of the aggregate price level[1]. FOCUS offers both price models: a mark-up price equation and a market-clearing price mechanism. Unfortunately, we have not yet been able to blend the two models together into an acceptable synthesis.

Scenarios 1 and 2 use the mark-up pricing approach. A Scenario 3 is offered which is the same as Scenario 1, except that the market-clearing price mechanism is used. When ALSANDS is cancelled, some aggregate demand is removed from the base-case projection and the price level tends to fall below the base-case level (that is, the inflation rate is somewhat lower). Under the mark-up price model, prices are "stickier" and fall less than under a market-clearing mechanism; there tends therefore to be more of a decline in real output, and less of a decline in prices. Since even the output declines in Scenarios 1 and 2 will probably strike most readers as low, it was thought best to standardize on the mark-up and leave market-clearing as an alternative. Note, however, that the market-clearing concept is not unimportant; implicitly it stands behind the notion that inflation can be fought effectively with fiscal and monetary restraint which reduces aggregate demand.

2.1.6 Provincial and Sectoral Impacts

Provincial and sectoral impacts of the cancellation are examined with the PRISM model based on the national results from FOCUS. A very simple set of assumptions is made:

1. The machinery and equipment (M & E) expenditures for ALSANDS are distributed across industries in PRISM in approximately the same way as is the average of all M & E expenditure in Canada. This is clearly an over-simplification; for example, ALSANDS might use more primary metal products (pipe, etc.) and less transport machinery than the "average" M & E expenditure.
2. All direct changes in value-added in the Construction and Non-Metallic Minerals industries due to the cancellation were placed in Alberta, as was all change in the value-added of the Mineral-Fuels sector during the production phase of the project (1988-90).
3. All M & E purchases were assumed to be of goods which were fully tradeable or "mobile." Thus, these purchases were assumed to be supplied from the different provinces according to the base-case provincial shares for their appropriate sectors, even though the purchases were all being put in place in Alberta. Again, this is an over-simplification, but a necessary one. Machinery and equipment industries in Alberta would probably have re-

ceived more of a boost from ALSANDS than those in the East. Impacts on Alberta and the West will therefore be somewhat understated in the results below. Yet it is important to realize how mobile even heavy machinery is, as evidenced from the volume of international trade in such goods. The claim that ALSANDS would have benefited at least certain sectors of the Ontario economy was not an empty one.

4. Following on the above, it was also assumed that M & E Expenditures for ALSANDS were made up of imports at the average economy-wide rate. More detailed study of the project might suggest an alternative coefficient (probably a lower one) and the FOCUS model can easily be adjusted to reflect it, but sensitivity tests with the model suggest that the overall macroeconomic results do not depend greatly on alternative import contents.

2.2 RESULTS - CANADIAN ECONOMY

Summary results for the ALSANDS cancellation are presented in Tables 2a - 2e, each table corresponding to one of the five scenarios discussed above. The scenarios again are:

- Scenario 1: - mark-up pricing
 - exchange rate fully flexible
 - money supply held at base-case levels (money supply targets).

- Scenario 2: - as in Scenario 1 except:
 - exchange rate held at base-case levels by altering money supply.

- Scenario 3: - as in Scenario 1 except:
 - market-clearing price mechanism

- Scenario 4: - as in Scenario 1 except:
 - import content of M & E for ALSANDS assumed to be 20 percent (not the economy-wide average of about 36 percent).

- Scenario 5: - as in Scenario 1 except:
 - no foreign borrowing assumed for project (instead of 50 percent); secondary, induced changes in capital flows are still permitted.

In discussing the results it will be useful to consider separately the build phase of the project (1982-87) and the production phase (1988-90).

2.2.1 Build Phase (1982-87)

It is no surprise that the cancellation of ALSANDS reduces real GNP in the build phase. What may perhaps be surprising is how little the cancellation reduces GNP[2]. Table 3 shows real GNP "multipliers" for the various scenarios. The multipliers are ratios of the change in real GNP to the change in real investment for ALSANDS (the sum of columns 1 and 2 in Table 1).

TABLE 2a

Summary of Projection (Percentage Change: * Indicates Change in Levels)

Scenario 1: Fully Flexible Exchange Rate: Mark-up Pricing

	1982	1983	1984	1985	1986	1987	1988	1989	1990
Gross National Product	-0.10	-0.16	-0.19	-0.21	-0.21	-0.09	0.50	1.69	2.47
Implicit Price Deflator for GNP	0.02	0.01	0.00	0.00	0.02	0.01	0.35	1.06	1.89
Real Gross National Product	-0.12	-0.17	-0.20	-0.22	-0.22	-0.10	0.15	0.62	0.57
Expenditure on Personal Consumption	-0.04	-0.07	-0.09	-0.11	-0.12	-0.09	-0.28	-0.15	0.06
Expenditure by Governments	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Investment Expenditure	-0.71	-1.11	-1.22	-1.31	-1.39	-0.75	-0.05	0.38	0.26
Residential Construction	-0.00	-0.00	0.04	0.04	0.04	0.04	-0.45	-1.13	-1.24
Non-Residential and Mach. & Equip.	-0.86	-1.33	-1.48	-1.58	-1.66	-0.89	0.01	0.63	0.48
Exports	0.00	0.04	0.06	0.07	-0.10	0.12	0.42	1.42	1.32
Imports	-0.24	-0.42	-0.46	-0.51	-0.55	-0.32	-0.74	-0.81	-0.39
Capacity Utilization Rate *	-0.00	-0.00	-0.00	-0.00	-0.00	0.00	0.00	0.00	0.00
Unemployment Rate *	0.03	0.05	0.06	0.07	0.06	0.03	-0.05	-0.27	-0.36
Employment	-0.04	-0.09	-0.10	-0.11	-0.11	-0.05	0.08	0.44	0.60
Narrowly Defined Money Supply, M1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
Finance Co. 90-Day Paper Rate *	-0.02	-0.04	-0.04	-0.05	-0.05	-0.02	0.11	0.37	0.54
Industrial Bond Rate *	-0.01	-0.03	-0.04	-0.05	-0.06	-0.06	0.13	0.28	0.39
Consumer Price Index	0.02	0.00	-0.02	-0.00	0.01	0.01	0.90	1.82	2.29
Average Annual Wages and Salaries	0.00	-0.01	-0.04	-0.06	-0.06	-0.06	0.40	1.33	2.26
Productivity Change (GDP/Employee)	-0.08	-0.08	-0.09	-0.11	-0.12	-0.05	0.12	0.29	0.08
Exchange Rate (U.S. \$/Cdn. \$)	-0.10	-0.12	-0.11	-0.16	-0.20	-0.12	-2.69	-4.15	-3.79
Terms of Trade (Px/Pm)	-0.06	-0.09	-0.08	-0.11	-0.14	-0.09	-1.59	-2.56	-1.95
Balance on Current Account (\$ Mill.) *	221	515	686	822	1038	801	-1217	-1275	-1110
Change in Foreign Reserves (\$ Mill.) *	0	0	0	0	0	0	0	0	0
Consolidated Government Balance (\$ Mill.) *	-167	-132	-373	-424	-459	-204	1555	3492	3353
Personal Savings Rate (%) *	-0.03	-0.02	-0.01	-0.02	-0.02	0.00	-0.20	-0.13	0.09
Nominal After-Tax Corporate Profits	-0.33	-0.18	0.12	0.36	0.63	1.19	2.24	3.60	2.63
Real Personal Disposable Income	-0.08	-0.09	-0.11	-0.14	-0.15	-0.09	-0.50	-0.27	0.20

TABLE 2b

Summary of Projection (Percentage Change: * Indicates Change in Levels)
 Scenario 2: Exchange Rate Fixed by Monetary Policy: Mark-up Pricing

	1982	1983	1984	1985	1986	1987	1988	1989	1990
Gross National Product	-0.16	-0.25	-0.30	-0.35	-0.39	-0.24	-0.91	-1.52	-1.39
Implicit Price Deflator for GNP	-0.00	-0.02	-0.05	-0.07	-0.08	-0.09	-0.36	-0.58	-0.58
Real Gross National Product	-0.15	-0.22	-0.25	-0.28	-0.30	-0.15	-0.56	-0.94	-0.82
Expenditure on Personal Consumption	-0.04	-0.09	-0.11	-0.14	-0.16	-0.14	-0.23	-0.39	-0.42
Expenditure by Governments	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Investment Expenditure	-0.79	-1.17	-1.32	-1.44	-1.54	-0.78	-2.17	-3.23	-2.57
Residential Construction	-0.12	-0.04	-0.10	-0.14	-0.16	0.06	-3.04	-4.38	-3.99
Non-Residential and Equip. & Equip.	-0.93	-1.41	-1.57	-1.70	-1.80	-0.93	-2.03	-3.05	-2.36
Exports	-0.02	-0.02	-0.00	0.02	0.04	0.08	0.02	-0.03	-0.10
Imports	-0.24	-0.40	-0.47	-0.50	-0.53	-0.31	-0.45	-0.51	-0.49
Capacity Utilization Rate *	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
Unemployment Rate *	0.04	0.07	0.08	0.09	0.09	0.05	0.15	0.26	0.26
Employment	-0.06	-0.12	-0.14	-0.15	-0.16	-0.08	-0.24	-0.42	-0.43
Narrowly Defined Money Supply, M1	-0.07	-0.17	-0.16	-0.24	-0.28	-0.30	-3.71	-6.62	-1.01
Finance Co. 90-Day Paper Rate *	-0.01	-0.01	-0.02	-0.01	-0.01	0.02	0.92	1.48	-0.06
Industrial Bond Rate *	0.01	-0.02	-0.02	-0.02	-0.02	-0.04	0.42	0.82	1.23
Consumer Price Index	-0.02	-0.04	-0.07	-0.08	-0.09	-0.07	-0.09	-0.11	-0.11
Average Annual Wages and Salaries	-0.02	-0.06	-0.10	-0.15	-0.18	-0.19	-0.32	-0.48	-0.41
Productivity Change (GDP/Employee)	-0.09	-0.11	-0.11	-0.13	-0.15	-0.06	-0.35	-0.46	-0.27
Exchange Rate (U.S. \$/cdn. \$)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Terms of Trade (Px/Pm)	-0.01	-0.03	-0.06	-0.08	-0.10	-0.09	-0.77	-1.32	-1.27
Balance on Current Account (\$ Mill.) *	252	495	642	789	982	697	-779	-2543	-2993
Change in Foreign Reserves (\$ Mill.) *	0	0	0	-1	0	1	1	1	0
Consolidated Government Balance (\$ Mill.) *	-223	-388	-472	-565	-661	-297	-2006	-3917	-3392
Personal Savings Rate (%) *	-0.03	-0.02	-0.03	-0.03	-0.03	-0.01	-0.18	-0.25	-0.18
Nominal After-Tax Corporate Profits	-0.48	-0.37	-0.09	0.14	0.35	1.08	-1.68	-3.87	-3.64
Real Personal Disposable Income	-0.07	-0.12	-0.14	-0.18	-0.20	-0.16	-0.26	-0.50	-0.51

TABLE 2c

Summary of Projection (Percentage Change: * Indicates Change in Levels)

Scenario 3: Fully Flexible Exchange Rate: Market-Clearing Pricing

	1982	1983	1984	1985	1986	1987	1988	1989	1990
Gross National Product	-0.19	-0.34	-0.50	-0.62	-0.69	-0.52	0.37	2.14	3.15
Implicit Price Deflator for GNP	-0.10	-0.23	-0.39	-0.52	-0.63	-0.59	0.09	1.48	2.50
Real Gross National Product	-0.09	-0.11	-0.11	-0.10	-0.06	0.07	0.28	0.65	0.64
Expenditure on Personal Consumption	-0.03	-0.05	-0.07	-0.10	-0.11	-0.08	-0.29	-0.17	0.14
Expenditure by Governments	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Investment Expenditure	-0.72	-1.15	-1.30	-1.34	-1.33	-0.56	0.32	1.00	0.91
Residential Construction	0.05	0.16	0.26	0.31	0.33	0.32	-0.31	-1.34	-1.62
Non-Residential and Mach. & Equip.	-0.88	-1.42	-1.62	-1.67	-1.64	-0.71	0.43	1.37	1.30
Exports	0.02	0.14	0.24	0.34	0.47	0.55	0.79	1.55	1.13
Imports	-0.33	-0.55	-0.62	-0.67	-0.69	-0.35	-0.55	-0.31	-0.04
Capacity Utilization Rate *	-0.00	-0.00	-0.00	0.00	0.00	0.00	0.00	0.01	0.00
Unemployment Rate *	0.04	0.07	0.09	0.09	0.08	0.02	-0.11	-0.40	-0.49
Employment	-0.06	-0.12	-0.15	-0.16	-0.13	-0.04	0.18	0.66	0.81
Narrowly Defined Money Supply, M1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
Finance Co. 90-Day Paper Rate *	-0.04	-0.08	-0.11	-0.14	-0.15	-0.12	0.08	0.47	0.69
Industrial Bond Rate *	-0.03	-0.07	-0.11	-0.14	-0.17	-0.16	0.07	0.33	0.43
Consumer Price Index	-0.08	-0.20	-0.34	-0.44	-0.51	-0.46	0.72	2.20	2.78
Average Annual Wages and Salaries	-0.03	-0.13	-0.28	-0.42	-0.53	-0.55	0.05	1.40	2.77
Productivity Change (GDP/Employee)	-0.02	0.01	0.03	0.04	0.05	0.08	0.11	0.07	-0.05
Exchange Rate (U.S. \$/Cdn. \$)	-0.05	0.01	0.13	0.16	0.18	0.20	-2.59	-4.46	-4.23
Terms of Trade (Px/Pm)	-0.13	-0.22	-0.28	-0.39	-0.46	-0.40	-1.70	-2.31	-1.61
Balance on Current Account (\$ Mill.) *	288	657	901	1118	1421	1167	-1054	-1687	-1728
Change in Foreign Reserves (\$ Mill.) *	0	0	0	0	0	0	0	0	0
Consolidated Government Balance (\$ Mill.) *	-263	-476	-606	-655	-643	-90	2465	5535	4450
Personal Savings Rate (%) *	0.01	0.02	0.03	0.01	0.01	-0.01	-0.30	-0.32	0.09
Nominal After-Tax Corporate Profits	-0.66	-0.53	-0.28	0.14	0.58	1.63	3.70	6.04	3.51
Real Personal Disposable Income	-0.03	-0.04	-0.05	-0.10	-0.12	-0.12	-0.63	-0.48	0.34

TABLE 2d

Summary of Projection (Percentage Change: * Indicates Change in Levels)

Scenario 4: As Scenario 1, Except Only 20 Percent of ALSANDS Machinery and Equipment Imported

	1982	1983	1984	1985	1986	1987	1988	1989	1990
Gross National Product	-0.11	-0.15	-0.16	-0.16	-0.15	-0.04	0.52	1.68	2.45
Implicit Price Deflator for GNP	0.02	0.03	0.04	0.05	0.08	0.07	0.39	1.07	1.89
Real Gross National Product	-0.13	-0.18	-0.19	-0.22	-0.23	-0.11	0.13	0.60	0.55
Expenditure on Personal Consumption	-0.04	-0.07	-0.09	-0.12	-0.13	-0.10	-0.28	-0.16	0.05
Expenditure by Governments	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Investment Expenditure	-0.71	-1.10	-1.21	-1.30	-1.40	-0.78	-0.11	0.32	0.21
Residential Construction	-0.00	-0.02	0.00	-0.01	-0.02	-0.01	-0.47	-1.14	-1.26
Non-Residential and Mach. & Equip.	-0.85	-1.32	-1.46	-1.56	-1.65	-0.92	-0.05	0.55	0.43
Exports	0.00	0.06	0.10	0.11	0.14	0.14	0.42	1.40	1.31
Imports	-0.23	-0.40	-0.45	-0.49	-0.53	-0.31	-0.74	-0.83	-0.41
Capacity Utilization Rate *	-0.00	-0.00	-0.00	-0.00	-0.00	0.00	0.00	0.00	0.00
Unemployment Rate *	0.03	0.05	0.06	0.06	0.06	0.03	-0.04	-0.25	-0.35
Employment	-0.05	-0.09	-0.10	-0.11	-0.11	-0.05	0.07	0.42	0.58
Narrowly Defined Money Supply, M1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
Finance Co. 90-Day Paper Rate *	-0.02	-0.03	-0.03	-0.04	-0.03	-0.01	0.11	0.37	0.54
Industrial Bond Rate *	-0.01	-0.02	-0.04	-0.04	-0.05	-0.05	0.14	0.29	0.39
Consumer Price Index	0.03	0.03	0.03	0.06	0.08	0.06	0.93	1.82	2.29
Average Annual Wages and Salaries	0.00	0.00	-0.01	-0.01	-0.00	-0.01	0.43	1.34	2.25
Productivity Change (GDP/Employee)	-0.08	-0.08	-0.09	-0.10	-0.12	-0.05	0.12	0.28	0.08
Exchange Rate (U.S. \$/Cdn. \$)	-0.13	-0.20	-0.21	-0.28	-0.33	-0.19	-2.70	-4.14	-3.80
Terms of Trade (Px/Pm)	-0.06	-0.11	-0.12	-0.16	-0.18	-0.11	-1.59	-2.55	-1.96
Balance on Current Account (\$ Mill.) *	198	475	657	777	988	791	-1223	-1287	-1127
Change in Foreign Reserves (\$ Mill.) *	0	0	0	0	0	0	0	0	0
Consolidated Government Balance (\$ Mill.) *	-165	-296	-339	-381	-429	-228	1464	3376	3281
Personal Savings Rate (%) *	-0.03	-0.03	-0.02	-0.02	-0.02	0.01	-0.19	-0.13	0.08
Nominal After-Tax Corporate Profits	-0.33	-0.17	0.17	0.38	0.62	1.13	2.12	3.48	2.57
Real Personal Disposable Income	-0.08	-0.11	-0.12	-0.15	-0.16	-0.09	-0.49	-0.28	0.19

TABLE 2e

Summary of Projection (Percentage Change: * Indicates Change in Levels)

Scenario 5: As Scenario 1, Except No Foreign Borrowing

	1982	1983	1984	1985	1986	1987	1988	1989	1990
Gross National Product	-0.19	-0.46	-0.64	-0.70	-0.73	-0.48	0.36	1.66	2.56
Implicit Price Deflator for GNP	-0.02	-0.14	-0.27	-0.36	-0.41	-0.37	0.08	0.89	1.87
Real Gross National Product	-0.18	-0.32	-0.37	-0.34	-0.31	-0.11	0.28	0.76	0.68
Expenditure on Personal Consumption	-0.04	-0.08	-0.14	-0.17	-0.18	-0.19	-0.32	-0.15	0.03
Expenditure by Governments	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Investment Expenditure	-0.76	-1.23	-1.34	-1.33	-1.30	-0.47	0.36	0.81	0.63
Residential Construction	0.05	0.14	0.23	0.22	0.24	0.20	-0.38	-1.05	-1.25
Non-Residential and Mach. & Equip.	-0.93	-1.51	-1.66	-1.64	-1.59	-0.59	0.48	1.11	0.91
Exports	-0.07	-0.19	-0.23	-0.13	-0.01	0.12	0.64	1.68	1.54
Imports	-0.17	-0.28	-0.36	-0.39	-0.35	-0.23	-0.67	-0.66	-0.32
Capacity Utilization Rate *	-0.00	-0.00	-0.00	-0.00	0.00	0.00	0.00	-0.01	0.00
Unemployment Rate *	0.04	0.10	0.14	0.14	0.11	0.05	-0.08	-0.33	-0.42
Employment	-0.07	-0.17	-0.24	-0.23	-0.19	-0.09	0.14	0.55	0.70
Narrowly Defined Money Supply, M1	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00	-0.00
Finance Co. 90-Day Paper Rate *	-0.04	-0.10	-0.14	-0.16	-0.16	-0.11	0.08	0.36	0.56
Industrial Bond Rate *	-0.03	-0.08	-0.12	-0.16	-0.20	-0.18	0.02	0.20	0.36
Consumer Price Index	-0.06	-0.21	-0.30	-0.35	-0.39	-0.24	0.74	1.73	2.40
Average Annual Wages and Salaries	-0.05	-0.16	-0.32	-0.44	-0.51	-0.46	0.11	1.17	2.23
Productivity Change (GDP/Employee)	-0.12	-0.17	-0.17	-0.15	-0.16	-0.06	0.16	0.29	0.07
Exchange Rate (U.S. \$/Cdn. \$)	0.25	0.54	0.56	0.52	0.60	0.10	-2.56	-4.03	-3.90
Terms of Trade (Px/Pm)	0.08	0.14	0.07	-0.04	-0.05	-0.25	-1.78	-2.72	-2.26
Balance on Current Account (\$ Mill.) *	239	343	319	415	622	255	-1308	-1437	-1698
Change in Foreign Reserves (\$ Mill.) *	0	0	0	0	0	0	0	0	0
Consolidated Government Balance (\$ Mill.) *	-286	-739	-953	-995	-1074	-400	1722	3691	3778
Personal Savings Rate (%) *	-0.01	0.00	-0.02	-0.05	-0.04	-0.05	-0.22	-0.12	0.04
Nominal After-Tax Corporate Profits	-0.69	-1.04	-0.60	0.13	0.60	1.78	3.32	4.52	3.56
Real Personal Disposable Income	-0.05	-0.09	-0.19	-0.26	-0.25	-0.27	-0.57	-0.26	0.13

TABLE 3

ALSANDS Multipliers*

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5
1982	.84	1.03	.59	.85	1.18
1983	.71	.91	.46	.72	1.29
1984	.68	.86	.39	.66	1.28
1985	.65	.84	.29	.64	1.03
1986	.59	.80	.16	.59	.82
1987	.38	.56	-.27	.42	.43

* The Multiplier is defined in each year as: (change from base-case in real GNP)/(change in ALSANDS investment [Table 1, cols. 1 and 2]).

Virtually all the figures are less than 1, indicating that the final effect on real GNP is smaller than the reduction in real investment in ALSANDS.

Readers familiar with the evolution of macroeconomic models may be less surprised when they recall that estimates of autonomous expenditure multipliers have been falling steadily over the years. For the more recent versions of FOCUS, government expenditure multipliers are now only initially greater than unity under particular policy configurations, and they almost invariably decay over time. It is not unreasonable that other types of autonomous expenditure should have similar effects - psychological impacts aside. Like government expenditure, the ALSANDS investment in its build phase does not contribute to the productive capital stock and can "crowd out" other spending - via the financial markets and the goods markets. However, the single greatest cause of the low multiplier in FOCUS

is "leakage" through foreign trade - not only from price and exchange rate changes but also simply through marginal income changes.

It is true that changing the import content of M & E for ALSANDS has a relatively small effect - it can be seen that multipliers for Scenario 4 are generally only slightly above those of Scenario 1. But the remaining 20 percent is still large and even the structures portion of investment has an 11 percent import content (mostly from intermediate input). Also important is the fact that the most sensitive consumption items (autos and other durables) also have large import coefficients. Indeed, inventories also have a hefty import component. Examination of the real import results in Tables 2a - 2e will show clearly how import reduction tends to mitigate the impact of the ALSANDS cancellation. The exchange rate has important effects on the results. In Scenario 1, the

multiplier of the ALSANDS cancellation is further reduced because the exchange rate depreciates, giving a boost to exports and further reducing imports. When the exchange rate is held fixed by monetary policy (Scenario 2), the multiplier is increased - although it is still held down by the interest rate increases required to protect the dollar. In Scenario 5, no foreign borrowing is assumed for ALSANDS, and with the cancellation the Canadian dollar appreciates by slightly over half a percentage point. In Scenario 5, the cancellation has no immediate effect on capital flows but there are reduced imports - both directly from the cancellation and secondarily from reduced GNP and a slightly lower price level - hence the appreciation. The appreciation, in turn, somewhat offsets the cushioning impact of import reduction and serves to reduce exports.

Thus, comparing Scenarios 1 and 5, it can be seen that the more a project is financed by foreign borrowing, the less the impact on Canadian real GNP - which is not surprising at all. Indeed, at a still higher level of foreign borrowing, the real GNP imports would have been virtually zero. Of course, assuming that 50 percent of the project is financed abroad does not necessarily mean that 50 percent of the imports come from abroad - and this is indeed not the case with ALSANDS. But if all the borrowed funds are not spent on imports for the project, the means by which the borrowing gets translated into command over real goods and services is via a movement in the exchange rate, which causes shifts from domestic to foreign goods in other areas of expenditure, freeing up more domestic resources for the project. Assuming ALSANDS was going to be 50 percent financed from abroad, its cancella-

tion means that less Canadian expenditures have to be switched from domestic production to "borrowed" foreign goods to free up resources for ALSANDS. The Canadian dollar therefore follows a lower path - or, alternatively, need not appreciate as much. Under the alternative assumption of not borrowing (Scenario 5), the cancellation means that the Canadian dollar need not depreciate to discourage other importers and encourage exporters so as to permit the necessary imports for ALSANDS.

It was noted above that assuming a lower import content of M & E (20 percent instead of 36 percent), had relatively little impact on the results. This is because opposite effects are at work under the assumption that 50 percent of the project is financed abroad - leading, in Scenario 1, to a slight depreciation after the cancellation. On the one hand, the reduced import content of M & E means that more of the ALSANDS investment would have gone directly into demand for domestic products and hence into GNP. When ALSANDS is cancelled the impact on GNP ought therefore to be greater than in Scenario 1. On the other hand, the assumption of lower imports means that, when ALSANDS is cancelled, there is less of a reduction in imports to offset the loss of borrowed foreign capital, and so the exchange rate tends to depreciate more than in Scenario 1, giving an offsetting boost to the economy. As it happens, the first effect outweighs the second, but only slightly. When a major project is extensively financed by borrowing, therefore, import-content concerns may not be so serious - one way or another the borrowing of capital abroad must be translated into flows of real goods via imports. Of course, worrying about import contents will still be

important from a sectoral or regional basis.

The question of the crowding in or out of other investments is examined for Scenario 1 in Table 4. The first column of the table shows the total change in real investment directly due to the ALSANDS cancellation. The second column is the final change in real investment in the scenario; it is invariably lower than column 1, increasingly so over time. As it happens, the major contributor to the offset in investment is the energy sector itself - and for no very profound reason. Cancellation of ALSANDS induces a small depreciation which, with export prices for oil and gas fixed in U.S. dollar terms, raises the Canadian dollar earnings of energy corporations in Canada - even post-tax. It is assumed in FOCUS and its Energy Module that some 90 percent of these extra earnings will be ploughed back into new investment, rather than distributed as dividends - hence the positive figures in column 3. For the non-energy sector, at least in early years, the enticement to invest offered by lower interest rates (with ALSANDS out of the financial market) is more than offset by reduced real output and profits, which discourages investment. As lower rates persist and profits resume a share of income closer to the base-case, investment picks up, so that it can be said that ALSANDS would have crowded out some private, non-energy investment by 1986-87.

Next, consider Scenario 3 (market-clearing prices) in relation to Scenario 1. If prices are more flexible, cancellation of ALSANDS has a much bigger (downward) impact on the price level in Canada. As a result, Canadian goods are more com-

petitive abroad and imports are less attractive, and Canadian production is indirectly stimulated. Also, with fixed nominal money supply targets for the Bank of Canada, a lower price level (and lower nominal GNP) reduces the demand for money relative to the supply and so causes interest rates to fall, also boosting domestic demand. Thus, under flexible prices, the effects of ALSANDS cancellation are much reduced.

Finally, consider the impact of the ALSANDS cancellation on employment and the unemployment rate. Again, the results may appear small in contrast to intuition: In the worst case - Scenario 5, the unemployment rate rises by no more than .15 percentage points. Employment falls by a little over .2 percent in the most seriously affected years (1984-85). In 1985, this translates into a net loss of about 27,000 jobs. But two effects mitigating the employment and unemployment rate results must be recalled: First, the FOCUS model exhibits a "labour-hoarding" effect. That is, employment is not immediately reduced in proportion to output, and instead a productivity decline is accepted. Such labour-hoarding is now a well-established cyclical phenomenon. Moreover, as the real effects get gradually worse for 1982-86, employment adjustment continually lags behind real adjustment, and is then caught up in the different disruptions of the production phase. Second, an additional factor keeping the unemployment rate response low is the "discouraged worker" effect, which is quite strong in FOCUS. On average, the FOCUS equations state that for every 10 jobs lost, 4 persons stop participating in the labour force.

TABLE 4

ALSANDS Crowding In/Out: Scenario 1
(Millions of 1971 Dollars)

	Alsands Investment (See Table 1)	Change in Total Business Investment	Change in Energy Sector Induced Investment	Change in Non-Energy Investment
1982	-200	-197	10	- 7
1983	-340	-328	30	-18
1984	-420	-387	50	-17
1985	-500	-439	72	-11
1986	-590	-492	95	3
1987	-420	-284	107	29

2.2.2 Production Phase (1988-90)

In the production phase, the result of the ALSANDS cancellation is that oil production which was present in the base-case no longer appears. It is assumed instead that the shortfall must be made up from additional imports purchased at world prices. The results vary dramatically with the assumed exchange rate response.

The increase in oil imports consequent on the cancellation of ALSANDS has a major impact on the balance of trade. Evaluated at the base-case exchange rate (approximately \$.87 U.S. in 1988-90), the additional imports cost \$2.5 billion in 1988, \$4.5 billion in 1989 and \$5 billion in 1990. Two possible policy responses are examined:

In Scenario 1, the exchange rate is permitted to float freely in response to the increase in imports. The result is a considerable depre-

ciation - reaching about 4 percent in 1989-90. The effects of this depreciation are as might be expected. There is a major boost to real output, such that real GNP surges a half percent above base-case in 1989-90. Virtually all the increase is in exports and import-reduction; consumption and investment are, if anything, negatively affected. The Canadian economy thus is geared up by the depreciation to produce the extra goods and services needed to pay for foreign oil through increased exports and import-substitution; but Canadians get almost none of this increased output in the form of real income. Note (for Table 2a) that loss of ALSANDS oil moves the terms of trade (the ratio of export prices to import prices) a full 2 percent against Canada.

A second effect of the depreciation and increase in real output is that domestic prices rise. The inflation rate for the GNP deflator in

1989-90 is somewhat over a half percent above the base-case - and not all of the exchange rate effects have yet worked through. The inflation effects on the CPI are greater, but come earlier.

Finally, note that the depreciation has not removed all the impact of the additional oil imports on the balance of trade. The current account still moves down by about \$1 billion in 1988-90. Higher Canadian interest rates and increased activity induce some long-term capital inflows and some short-term flows are induced by the exchange rate change. Together these offset the \$1 billion decline in the current account.

Scenario 2 shows a second policy response: The Bank of Canada is assumed to adjust monetary policy so as to keep the exchange rate from falling. In practice, this means that the money supply must be reduced, raising short-term interest rates and, after a lag, long-term rates. The rise in interest rates had the dual effect of stimulating capital inflows and of reducing domestic activity, which thereby reduces imports. The extra oil imported from abroad is "paid for" partly by increased borrowing abroad and partly by reducing the demand for other kinds of imports in Canada. As can be seen from Table 2b, the largest impact of the demand reduction through higher interest rates is felt in investment of all kinds. By 1990, there is yet little positive stimulus to exports, despite lower domestic prices. Partly to blame is "labour-hoarding", which reduces labour productivity. Also, in the FOCUS model, many exports are priced in U.S. dollar terms; lower Canadian prices are only translated into an export advantage with a long lag. A positive side effect of the

monetary restriction is a decline in the inflation rate, but it is less than a half percentage point.

As Figure 1 makes clear, the real GNP effects of the production phase of the ALSANDS cancellation dwarf those of the build phase. The same is also true for interest rate, inflation, exchange rate and unemployment rate changes. The lesson is that the oil lost from the cancellation of ALSANDS is probably more important than the activity lost in the construction phase.

2.3 THE PROVINCIAL ECONOMIES

Results for certain provincial economies are given in Tables 5 through 7 for Scenarios 1, 2 and 5. Basic results are given for the western provinces and Ontario, and more detailed results for Alberta (Table 7). Figure 2 depicts the results for real output in Canada, Ontario and Alberta under Scenarios 1 and 2. Once again, it will be convenient to discuss separately the results for the build and production phases.

2.3.1 Build Phase

For the most part, provincial results are qualitatively as might have been expected. Alberta takes the largest losses in real Gross Domestic Product (GDP). These amount to something over 1 percent of base-case GDP by 1985-86, when construction was to have been most intense. The important point for Alberta is the direct effect of the cancellation of the construction activity, and the secondary impact of the cancellation in reduced tertiary sector growth.

Figure 1- a + b
NATIONAL IMPACT

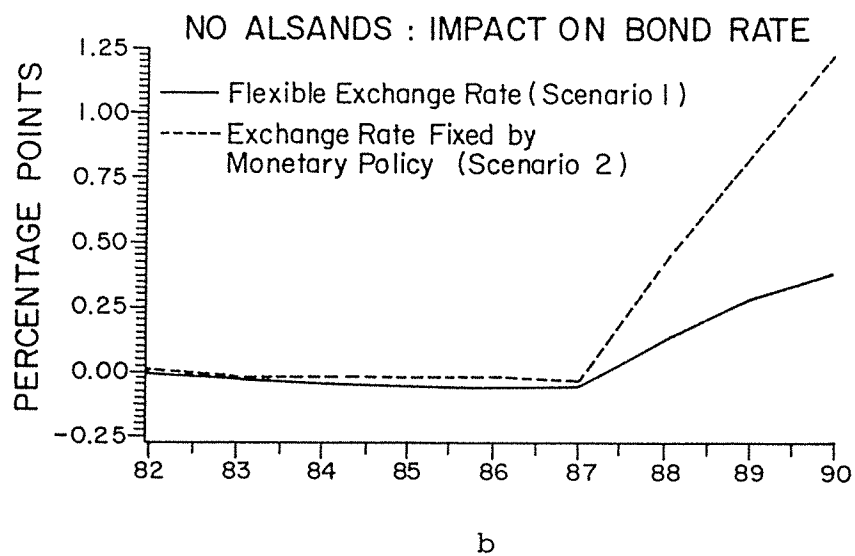
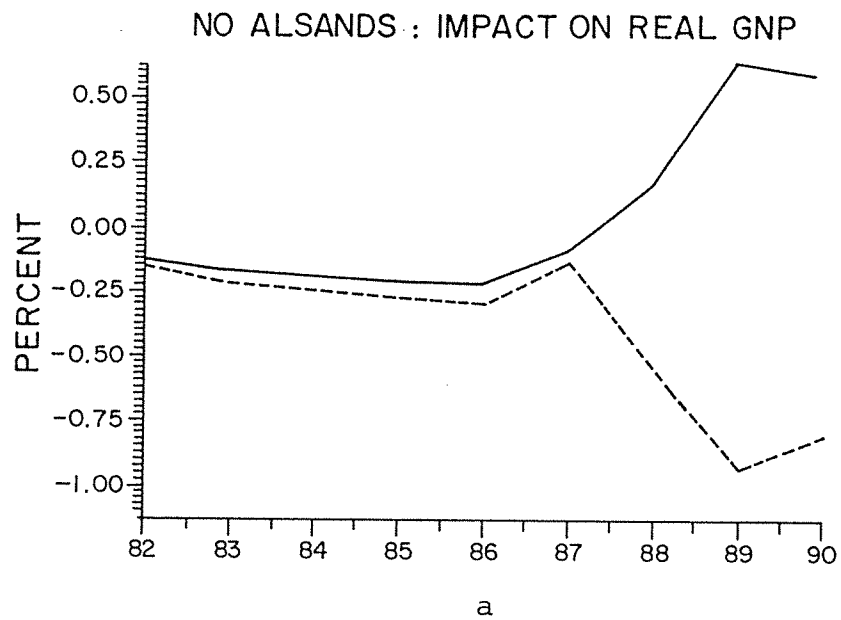
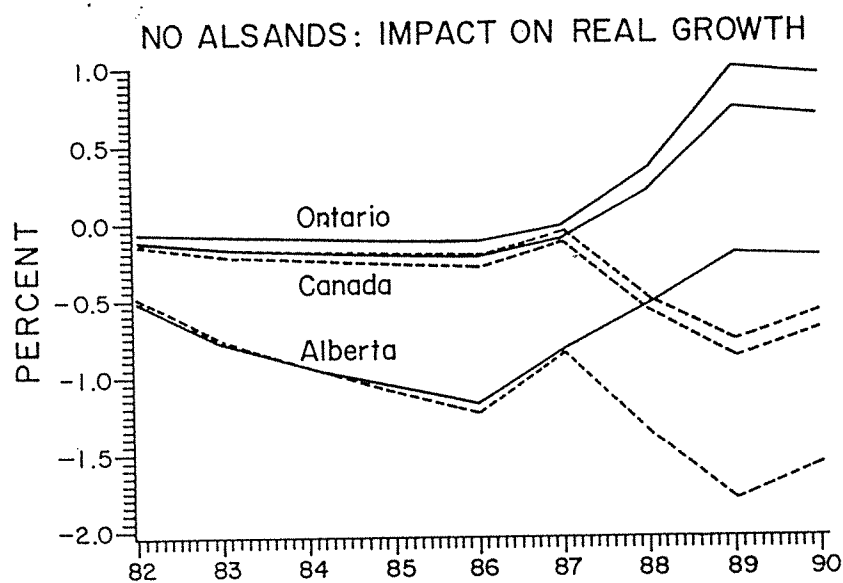
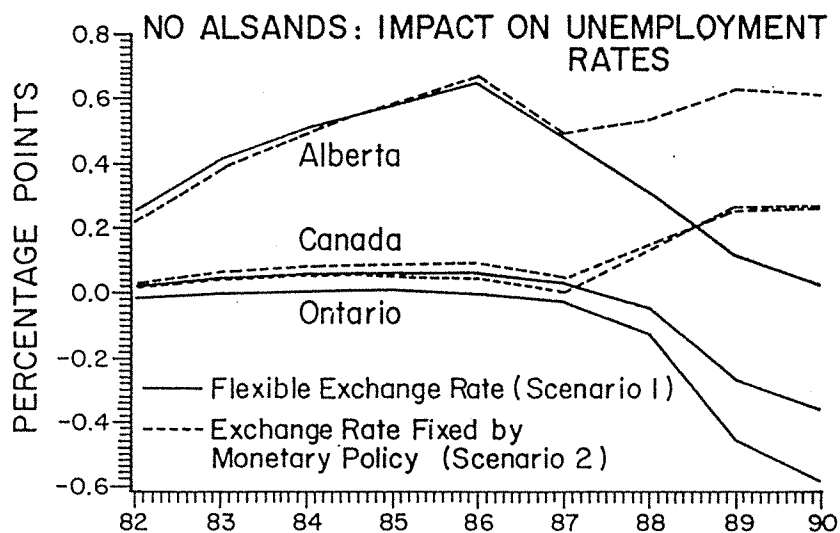


Figure 2 - a + b
PROVINCIAL IMPACTS



a



b

TABLE 5a

Real GDP (Percent Change vs. Base-case)

Scenario 1: Fully Flexible Exchange Rate: Mark-up Pricing

	1982	1983	1984	1985	1986	1987	1988	1989	1990
Canada	-0.12	-0.17	-0.20	-0.22	-0.22	-0.10	0.20	0.73	0.68
Ontario	-0.07	-0.09	-0.10	-0.13	-0.12	-0.02	0.34	1.00	0.95
Manitoba	-0.11	-0.13	-0.14	-0.10	-0.09	-0.00	0.29	0.78	0.72
Saskatchewan	-0.05	-0.05	-0.04	-0.03	-0.00	0.07	0.28	0.71	0.67
Alberta	-0.51	-0.78	-0.94	-1.06	-1.18	-0.83	-0.54	-0.21	-0.23
British Columbia	-0.11	-0.13	-0.13	-0.10	-0.08	0.01	0.29	0.76	0.69

TABLE 5b

Scenario 2: Exchange Rate Fixed by Monetary Policy: Mark-up Pricing

	1982	1983	1984	1985	1986	1987	1988	1989	1990
Canada	-0.16	-0.22	-0.26	-0.28	-0.30	-0.14	-0.59	-0.88	-0.70
Ontario	-0.13	-0.17	-0.19	-0.20	-0.21	-0.06	-0.50	-0.78	-0.58
Manitoba	-0.10	-0.14	-0.15	-0.15	-0.15	-0.03	-0.45	-0.69	-0.52
Saskatchewan	-0.08	-0.09	-0.09	-0.08	-0.07	0.04	-0.40	-0.67	-0.52
Alberta	-0.49	-0.77	-0.94	-1.10	-1.24	-0.85	-1.37	-1.80	-1.57
British Columbia	-0.11	-0.14	-0.15	-0.15	-0.15	-0.01	-0.50	-0.80	-0.62

TABLE 5c

Scenario 5: As Scenario 1, Except No Foreign Borrowing

	1982	1983	1984	1985	1986	1987	1988	1989	1990
Canada	-0.19	-0.34	-0.41	-0.38	-0.35	-0.15	0.30	0.84	0.77
Ontario	-0.14	-0.29	-0.35	-0.32	-0.28	-0.09	0.44	1.11	1.03
Manitoba	-0.17	-0.29	-0.33	-0.25	-0.21	-0.05	0.38	0.87	0.79
Saskatchewan	-0.11	-0.20	-0.23	-0.16	-0.11	0.03	0.37	0.81	0.75
Alberta	-0.57	-0.92	-1.10	-1.18	-1.26	-0.83	-0.42	-0.07	-0.11
British Columbia	-0.17	-0.29	-0.32	-0.24	-0.19	-0.01	0.39	0.88	0.79

TABLE 6a

Unemployment Rates (Percent - Solution Minus Base-case)

Scenario 1: Fully Flexible Exchange Rate: Mark-up Pricing

	1982	1983	1984	1985	1986	1987	1988	1989	1990
Canada	0.03	0.05	0.06	0.07	0.06	0.03	-0.05	-0.27	-0.36
Ontario	-0.01	0.00	0.00	0.01	-0.00	-0.03	-0.13	-0.46	-0.59
Manitoba	0.03	0.03	0.03	0.00	-0.01	-0.03	-0.08	-0.26	-0.34
Saskatchewan	-0.00	-0.00	-0.01	-0.02	-0.03	-0.03	-0.04	-0.11	-0.15
Alberta	0.26	0.42	0.51	0.58	0.65	0.48	0.31	0.11	0.02
British Columbia	0.03	0.04	0.03	-0.00	-0.02	-0.05	-0.10	-0.29	-0.39

TABLE 6b

Scenario 2: Exchange Rate Fixed by Monetary Policy: Mark-up Pricing

	1982	1983	1984	1985	1986	1987	1988	1989	1990
Canada	0.04	0.07	0.08	0.09	0.09	0.05	0.15	0.26	0.26
Ontario	0.02	0.05	0.06	0.05	0.04	0.00	0.13	0.27	0.27
Manitoba	0.01	0.02	0.02	0.01	0.01	-0.02	0.07	0.16	0.16
Saskatchewan	-0.00	-0.00	-0.00	-0.01	-0.02	-0.02	0.02	0.07	0.08
Alberta	0.22	0.38	0.49	0.59	0.67	0.49	0.53	0.63	0.61
British Columbia	0.01	0.03	0.03	0.01	-0.00	-0.04	0.12	0.26	0.27

TABLE 6c

Scenario 5: As Scenario 1, Except No Foreign Borrowing

	1982	1983	1984	1985	1986	1987	1988	1989	1990
Canada	0.04	0.10	0.14	0.14	0.11	0.05	-0.08	-0.33	-0.42
Ontario	0.01	0.08	0.12	0.12	0.08	0.02	-0.17	-0.54	-0.66
Manitoba	0.04	0.07	0.10	0.06	0.03	-0.01	-0.11	-0.31	-0.38
Saskatchewan	0.00	0.01	0.02	0.01	-0.01	-0.02	-0.05	-0.14	-0.18
Alberta	0.27	0.45	0.56	0.62	0.67	0.48	0.26	0.03	-0.05
British Columbia	0.05	0.09	0.11	0.06	0.01	-0.04	-0.15	-0.38	-0.46

TABLE 7a

Summary - Alberta Provincial Economy (Percentage Change: * Indicates Change in Levels)

Scenario 1: Fully Flexible Exchange Rate: Mark-up Pricing

	1982	1983	1984	1985	1986	1987	1988	1989	1990
Provincial Gross Domestic Product	-0.34	-0.53	-0.64	-0.75	-0.84	-0.58	-1.26	-1.60	-0.95
Real Provincial GDP at Factor Cost	-0.51	-0.78	-0.94	-1.06	-1.18	-0.83	-0.54	-0.21	-0.23
Deflator, Provincial GDP at Factor Cost	0.17	0.26	0.30	0.32	0.35	0.26	-0.71	-1.33	-0.65
Annual Wages and Salaries per Employee	0.01	0.01	-0.00	-0.03	-0.03	-0.00	0.18	0.80	1.76
GDP at Factor Cost per Employee	-0.01	0.03	0.06	0.08	0.11	0.13	0.08	0.04	-0.14
Labour Force	-0.23	-0.38	-0.47	-0.54	-0.61	-0.46	-0.30	-0.14	-0.06
Employment	-0.50	-0.81	-1.00	-1.14	-1.28	-0.96	-0.62	-0.25	-0.09
Unemployment Rate (%)	0.26	0.42	0.51	0.58	0.65	0.48	0.31	0.11	0.02
Real Domestic Product - Manufacturing	-0.39	-0.55	-0.65	-0.73	-0.78	-0.45	0.27	1.48	1.49
RDP - Goods-Producing Industries	-0.90	-1.37	-1.60	-1.81	-1.96	-1.22	-0.90	-0.62	-0.58
RDP - Service Industries	-0.23	-0.35	-0.45	-0.51	-0.59	-0.51	-0.17	0.29	0.22

TABLE 7b

Scenario 2: Exchange Rate Fixed by Monetary Policy: Mark-up Pricing

	1982	1983	1984	1985	1986	1987	1988	1989	1990
Provincial Gross Domestic Product	-0.36	-0.56	-0.70	-0.85	-0.97	-0.69	-2.40	-3.95	-3.72
Real Provincial GDP at Factor Cost	-0.49	-0.77	-0.94	-1.10	-1.24	-0.85	-1.37	-1.80	-1.57
Deflator, Provincial GDP at Factor Cost	0.12	0.20	0.24	0.25	0.27	0.17	-1.08	-2.23	-2.20
Annual Wages and Salaries per Employee	-0.05	-0.08	-0.11	-0.15	-0.18	-0.16	-0.50	-0.87	-0.81
GDP at Factor Cost per Employee	-0.04	-0.01	0.02	0.05	0.08	0.13	-0.33	-0.59	-0.40
Labour Force	-0.21	-0.36	-0.46	-0.55	-0.62	-0.47	-0.49	-0.56	-0.55
Employment	-0.44	-0.76	-0.96	-1.16	-1.31	-0.97	-1.04	-1.21	-1.18
Unemployment Rate (%)	0.22	0.38	0.49	0.59	0.67	0.49	0.53	0.63	0.61
Real Domestic Product - Manufacturing	-0.43	-0.63	-0.73	-0.82	-0.89	-0.51	-0.80	-1.02	-0.76
RDP - Goods-Producing Industries	-0.94	-1.43	-1.66	-1.88	-2.05	-1.26	-2.00	-2.71	-2.38
RDP - Service Industries	-0.17	-0.30	-0.41	-0.54	-0.64	-0.53	-0.94	-1.18	-1.01

TABLE 7c
Scenario 5: As Scenario 1, Except No Foreign Borrowing

	1982	1983	1984	1985	1986	1987	1988	1989	1990
Provincial Gross Domestic Product	-0.40	-0.73	-0.95	-1.09	-1.21	-0.86	-1.37	-1.63	-0.90
Real Provincial GDP at Factor Cost	-0.57	-0.92	-1.10	-1.18	-1.26	-0.83	-0.42	-0.07	-0.11
Deflator, Provincial GDP at Factor Cost	0.15	0.18	0.14	0.07	0.04	-0.04	-0.95	-1.50	-0.72
Annual Wages and Salaries per Employee	-0.03	-0.13	-0.25	-0.39	-0.47	-0.41	-0.13	0.62	1.72
GDP at Factor Cost per Employee	-0.05	-0.05	-0.00	0.04	0.06	-0.12	-0.11	0.03	-0.17
Labour Force	-0.24	-0.41	-0.52	-0.58	-0.63	-0.46	-0.26	-0.07	0.00
Employment	-0.51	-0.88	-1.10	-1.21	-1.32	-0.95	-0.52	-0.10	0.05
Unemployment Rate (%)	0.27	0.45	0.56	0.62	0.67	0.48	0.26	0.03	-0.05
Real Domestic Product - Manufacturing	-0.48	-0.84	-1.02	-1.02	-1.02	-0.58	0.43	1.65	1.59
RDP - Goods-Producing Industries	-0.96	-1.53	-1.80	-1.95	-2.06	-1.21	-0.73	-0.43	-0.41
RDP - Service Industries	-0.29	-0.51	-0.63	-0.64	-0.69	-0.53	-0.07	0.39	0.32

The depreciation which occurs in Scenario 1 is of some benefit to Alberta in reducing the impact of the cancellation; additional energy sector revenues stemming from the depreciation lead to more investment in Alberta and elsewhere. The greater depreciation in Scenario 4 reduces the impact on Alberta a trifle; the fixed rate of Scenario 2 and appreciation of Scenario 5 make the outcome for Alberta slightly worse than in Scenario 1.

Impacts on other provinces are of course a good deal smaller than on Alberta. Indeed, the percentage changes in provincial GDPs are sometimes so marginal that, especially for the smaller provinces, they must be considered impressionistic at best. The temptation to read too much into differences of several hundredths of a percentage point must be avoided.

The above understood, it is interesting that in Scenario 1 in the early years of the build phase (1982-84), the provinces most seriously affected after Alberta are Manitoba and British Columbia - and not Ontario. Partly, this is the result of a greater relative tertiary sector decline in these provinces compared to Ontario. However, in the later build phase (1985-86), Ontario does emerge as the province most affected after Alberta. Quebec, Manitoba and B.C. are together at a slightly lower level of impact.

Note that in Scenario 2 (no exchange rate change), and Scenario 5 (exchange rate appreciation), the reduction in real GDP is relatively more severe for the provinces other than Alberta than for Alberta itself. The "worst" number for any province other than Alberta is a loss of .37 percent of GDP for Ontario in 1984 under Scenario 5. It is interesting to note that while impacts on the Atlantic provinces are small, the model shows somewhat

less migration to Alberta with the ALSANDS cancellation.

2.3.2 Production Phase

Outcomes for the production phase are dominated by the choice of exchange rate assumptions. If the exchange rate is permitted to depreciate in response to additional oil importing, all provinces except Alberta immediately have their GDPs rise above base-case levels. The biggest increases are in Ontario, and then Quebec, Manitoba and B.C., in that order. Alberta's GDP in 1988-90 recovers from the reduced level of the build phase and benefits from the depreciation. But Alberta also suffers a GDP loss in the reduced output of its Mineral Fuels sector. Also, the tertiary sectors react sluggishly in PRISM; they take several years to adjust down in response to the build cancellation in Alberta, and also several years to adjust upwards when the Alberta economy begins to recover via the depreciation.

The alternative to a depreciation is monetary restriction, which affects all types of expenditure, but especially investment, which is projected - even without ALSANDS - to be especially concentrated in Alberta. The dual impact of Mineral Fuels and investment reductions pushes the Alberta economy even lower below the base-case than it was at any point in the build phase (the extreme is -1.8 percent in 1989). However, differences in GDP impacts among the provinces outside of Alberta are not large, especially in 1990 when indirect effects have begun to accumulate.

With respect to employment and unemployment rate impacts, in Scenario 1 virtually all of the impact is concentrated in Alberta, where

employment falls by over 1 percent in 1984-86, and the unemployment rate rises by over one-half a percentage point. But note also that in Scenario 1, by 1986, employment effects are marginally positive in all provinces but Alberta. These should also be discounted somewhat. They result from the implicit assumption in FOCUS-PRISM that the labour market is an aggregate, and that the effects of higher unemployment and a downturn in activity will lower wages and induce labour-hoarding to some extent on all sectors and regions. No doubt there is a certain amount of cross-regional and cross-sectoral labour market integration of this kind, but the FOCUS-PRISM system in its present form probably overstates it. Thus, the Alberta impacts for employment and unemployment are probably too high, and those for the other provinces somewhat too low. Nonetheless, even allowing for this adjustment, the indications in Scenario 1 are that they are not large. Note, finally, the considerably worse employment impacts in Scenario 5 for provinces other than Alberta.

2.4 CONCLUSION

It appears from the above that, considered alone and in its build phase, the cancellation of ALSANDS is no disaster for the Canadian economy, although in the absence of

alternative expenditures and in a period of slack, it is still a loss. In the build phase, a greater danger is posed by possible psychological after-shocks on confidence and expectations, but on these effects the macro-models must be mute. Alternative Scenarios demonstrate the importance, for the build phase, of relative price and exchange rate flexibility and of the extent of foreign borrowing. The degree of import content of the project may be of less importance - at least at the Canada-wide level - due to possible offsetting movements in the exchange rate.

A greater danger threatens the Canadian economy in the period after 1987 when ALSANDS oil fails to appear. As Scenarios 1 and 2 demonstrate, policy choices determine whether the loss of ALSANDS oil is translated into increased inflation and depreciation (although with a boost to real growth) or into loss in real output (to maintain a fixed exchange rate). Of course, mixed policy could leave the result somewhere in the middle.

There are few surprises for the provinces. In the build phase, Alberta is hurt the worst - but the other provinces also suffer. For all the provinces, including Alberta, the effects of the lost oil in the later 80s (positive or negative) can easily swamp in magnitude the build phase impacts of the cancellation.

NOTES

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Editor's Note: This article was written in early 1982 and is pub-

lished primarily as an example of the application of large scale modelling to policy analysis.

[1] Wage formation is market-clearing (in the sense of tending to full employment unemployment rate) only in the long-run.

[2] Again, it must be recalled that no psychological aftershocks are assumed.

3

Foreign Ownership and Canadian Manufacturing*

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Abstract. Theory and prior empirical investigation suggest that the effects of the presence of foreign owned firms in an industry on the productivity performance of domestically owned firms may be either positive or negative. This paper reviews the earlier work and then makes new estimates of these effects. When aggregated national data are used, the results suggest that foreign subsidiaries actually lower the productivity of Canadian firms, presumably because the forces such as increasing fragmentation of markets and lessened rationalization outweigh any positive contributions coming from enhanced competition, and the stimulus for better management techniques or more rapid adoption of new technology. Yet, when provincial data are used, these results are not supported. If anything, there is a hint that foreign activity in industries may have a favourable impact on the productivity of independent domestic firms. In general, the findings are not strong enough to warrant the holding of inflexible policy positions on either side regarding the continuation and role of such institutions as the Foreign Investment Review Agency.

3.1 INTRODUCTION

With the U.S. government strongly against the Foreign Investment Review Agency and the majority of the provincial government in Canada calling for abolishment of it, while the federal government believes it is an essential ingredient in the "development of an innovative and internationally competitive industrial structure," (MacEachen, 1982: 10) it seems timely to go behind this debate and once again examine

the contribution which foreign direct investment makes to the Canadian economy. The subject can be addressed from a variety of perspectives: the implications of such investment for the capital and current account flows and hence for the entire balance of payments; its effects on total investment, employment and the general macroeconomic situation; its influence on the structure and performance of industry in Canada; and its general

consequences for Canadian autonomy over a wide range of economic and cultural matters[1]. This paper of necessity will have to focus on a limited segment of this array of issues. Our concern will therefore be with the microeconomic effects of the presence of foreign owned firms in relation to the performance of domestically owned manufacturing plants. Even such a subject covers a substantial number of topics. Consequently, our approach will be first, to survey briefly what we know about the general performance of foreign relative to domestically owned firms, for this information has a bearing on our subsequent investigations. Then, we shall examine in more detail the few studies of the consequences of foreign subsidiaries entering Canadian manufacturing for the productivity of Canadian owned plants in the corresponding industries. As we shall see, the results obtained to date are conflicting. In the fourth section we develop a model to investigate this particular question once more, using different and more up-to-date data than utilized in the earlier work. Empirical results and their interpretation will comprise the fifth section. A few policy-oriented observations will conclude the paper.

To anticipate our findings and conclusions, the net effects of foreign plants on the productivity of domestic plants in the same industries are still not unequivocal, although the evidence causes us to lean toward the position that they may, on balance, be negative. Nevertheless, more research is needed - as is a good deal of caution on the part of policy makers on both sides of the debate.

3.2 THE BEHAVIOUR OF FOREIGN VERSUS DOMESTIC FIRMS

Over the years since Professor Safarian's pathbreaking work on the behaviour of foreign owned subsidiaries in Canada (1966, 1969), much has been learned about them. On some questions his findings have been clearly corroborated, while on other matters, new refinements have been added. A number of these research results warrant mention here, for they are relevant to the subsequent hypotheses we develop.

The observation that foreign owned firms import a larger proportion of their purchases than do domestically owned firms has been confirmed on a variety of occasions. (Safarian, 1966; Wilkinson, 1968). The most recent documentation on this is from Statistics Canada (1981), which found that even after excluding the automotive sector where the ratio of imports to sales for foreign firms is particularly large (60 percent)[2], the import propensity of foreign manufacturing firms is over twice that of comparable Canadian controlled firms (18.5 percent versus 7.8 percent for 1978). And most of what the alien firms purchased abroad (87 percent for U.S. firms of all types) is sourced in their home country. Moreover, there does not appear to be any clear tendency over time for these corporations to expand the proportion of their purchases coming from Canadian sources (Department of Industry Trade and Commerce: 14).

On the export side, across the board, there seems to be little to choose between foreign and domestically owned manufacturing firms. (Safarian, 1966; Wilkinson, 1968; and McFetridge and Weatherby, 1977). Yet in high research-intensive industries such as electrical products, machinery and chemicals, ex-

ports as a percentage of sales appear to be substantially less for alien firms (Bones, 1980).

As for research and development, early results suggested that no statistically-significant variation existed between foreign and Canadian owned firms (Safarian, 1966; Lithwick, 1969). Subsequent research has indicated that the matter is not that simple. McFetridge (1977) concluded that, after adjustment for firm size and variations among industries, foreign subsidiaries on average did less internal R & D and also had less R & D conducted for them outside the firm but within Canada than did domestically owned firms. In studying individual industries, he found that after standardizing for differences in profits, depreciation, and government R & D incentives, independent Canadian firms in the electrical and chemical sectors had superior research performances. In the machinery industry, no significant difference between the two groups of firms was identifiable. A recent Economic Council study (Palda and Pazderka, 1982) reported that foreign ownership adversely affected R & D spending in both electrical machinery and rubber, but that it was helpful in the non-electrical machinery sector. Gordon and Fowler (1981) observed that alien businesses in the pharmaceutical industry did little research in Canada other than to achieve acceptance of drugs developed elsewhere, whereas the few Canadian firms in this sector performed much better. Another Economic Council study (De Melto, et al. 1980) suggested that Canadian owned firms were more deeply committed to product research whereas foreign owned ones were focused on process innovations. Yet a third Council report (McMillen, 1982) concluded that alien firms contributed to the pace of

technological advance in Canada. The Daly and Globerman case studies (1976) on technological diffusion concluded that the presence of alien firms did not have a clear influence on the speed with which industry in Canada adopted new technology from abroad. But Baumann's work on the steel industry demonstrated that the almost entirely Canadian owned steel industry adopted new technology much more quickly than the huge U.S. steel industry. And finally, Rugman's more general work (1981) suggests that after standardizing for size, alien firms in Canada do less research, relative to sales than do independent domestic firms. So, although results are somewhat mixed, the evidence seems to be accumulating that foreign subsidiaries may be making an inferior contribution to research activity in Canada compared with independent firms.

In another way, however, the performance of manufacturing subsidiaries, at least those with U.S. parents, is clearly superior. (Shapiro, 1980). They are larger and have a better profitability record than do Canadian owned firms - and better still than non-U.S.-owned subsidiaries. This is true whether profits are measured as earnings on total capital before interest and taxes, earnings after interest and taxes on capital employed, or the gross margin or mark-up on labour and material costs. Moreover their profits show greater stability. Shapiro concluded "... that U.S. controlled firms possess a profitability advantage above and beyond that associated with market power, as it is traditionally measured." (p. 98). Since 80 percent of the foreign-ownership in Canadian manufacturing is of U.S. origin (Statistics Canada, 1982), this record of American owned firms is of considerable interest.

Nevertheless, it is noteworthy that Shapiro found no evidence that the profitability of domestically controlled firms was enhanced by an increased degree of foreign participation in them. Such minority participation seemed to be of a portfolio nature, not bringing with it any significant transfer of technology or skills. Also, he did not find that subsidiaries, in spite of their more distinguished profitability record, grew any faster than independent firms.

While the foregoing range of research findings focus primarily upon the behaviour of foreign owned firms in comparison to Canadian owned ones, they nevertheless provide some very preliminary indications of what we might expect to be the impact of alien corporations upon the performance of independent domestic companies. Consider the possibilities.

The inclination of subsidiaries to purchase more of their needs abroad, generally from their home country, may be one factor reducing the market for domestic manufacturers of these products and helping to augment the problem of achieving appropriate economies of scale. It is true that the input which firms in any one industry require will come from a variety of other industries. Hence, there may not be any major impact from this source upon domestic firms in the same industry. Nevertheless, if the level of aggregation used is the two-digit industry classification, as is so in the following investigations, then there is a much greater likelihood that the market for other firms in the same industry will be detrimentally affected by the import behaviour of the foreign subsidiaries. Thus, fewer production and marketing economies may be gained, and even exports could be adversely influenced.

With regard to research and de-

velopment, the investigations to date make it difficult to build an argument that foreign subsidiaries, by their research effort situated in Canada, have provided any sizeable stimulus to Canadian firms to undertake more research themselves, or that they have provided a pool of trained scientific talent which domestic firms can then draw upon, or finally, that they have contributed to the development of a substantial industry research environment affording economies of agglomeration available to both themselves and independent domestic firms. If one wishes to adhere to the view that the presence of foreign corporations has speeded up the pace of industrial scientific advance or technological diffusion in Canada, one has to fall back upon the position that the access which subsidiaries have to the technological resources of their parents provides a competitive incentive to domestic companies to undertake more research work themselves, or adopt, via purchase or licensing, the technology available from abroad.

As for the superior profit record of U.S. owned companies in Canada, it suggests that the subsidiaries presence may create a competitive environment which stimulates managers of domestic corporations to improve their performance via adoption of the latest management techniques or other measures which enhance X-efficiencies. (This may occur, even though, as Shapiro observed, the degree of minority foreign participation in Canadian owned firms did not seem to affect significantly their profit performance.) We might expect, too, that the positive effects upon Canadian firms will be greater the greater the proportion of the foreign ownership emanating from the U.S. Moreover, where there are entry barriers (such as those relating

to product differentiation) and the foreign subsidiaries, because of the greater financial resources available to them are better able to surmount the barriers, more competition within the industry may ensue so that all surviving domestic firms will be more efficient. And, we may be able to observe, as Gupta (1979) has done, that a larger proportion of foreign ownership in an industry will lower the percentage of suboptimal capacity in that industry.

Yet, from another perspective, the presence of strong foreign firms may have negative effects upon the performance of domestic industry. To the extent that they have come to Canada primarily as a consequence of a "follow-the-leader" or "get-on-the-bandwagon" type of behaviour, then, although they have larger plants and their inherent advantages permit them to obtain higher and more stable profits, they may nevertheless simply add to the number of plants serving the domestic market and stimulate production of too many lines for individual plants, either domestic or alien, to achieve the total possible length-of-run economies. Thus, there may not be the incentive for independent firms to improve their own performance beyond that necessary to retain a particular market share or whatever measure of performance they can live with. Indeed, the effect upon domestically owned companies may be quite stultifying if they are discouraged from adopting measures to enhance their efficiency and profitability because of the presence of foreign subsidiaries with the financial resources and general capability of their parent firms behind them. Domestic firms may think twice about rationalizing their production and possibly provoking a price war which they cannot be assured of winning. (Wilkinson, 111).

Thus, neither the types of research we have been discussing, nor any theorizing emanating from them provide us with a clear picture of what we should expect the impact of foreign direct investment in manufacturing to be on the efficiency of domestic industry. As we shall see in the following section, the research that has been addressed specifically to this question provides varying answers as well.

3.3 PRIOR STUDIES ON DOMESTIC FIRMS

Caves' (1974) position was that since transnational corporations tend to enter industries where barriers to entry are substantial[3], they will reduce monopolistic distortions and improve allocative efficiency in the use of domestic resources[4]. He tested this conjecture by investigating (for a sample of 49 manufacturing industries), whether the before-tax profits on equity of firms in Canada with less than 50 percent foreign ownership were, *ceteris paribus*, inversely correlated with the share of either industry sales or industry assets held by firms with at least 50 percent foreign ownership. His results, using CALURA data for 1965-67, gave a significant, negative coefficient for his foreign ownership variables as long as he kept his specification very simple[5]. When he introduced a variable to reflect differences in size of domestic firms and foreign firms, his variables for the influence of foreign ownership lost their significance. His attempts to use discrete instead of continuous measures of the importance of foreign ownership did not improve his results, so the empirical support for his position was not strong.

Globerman (1979) subsequently tested for positive spillover effects on domestic manufacturing of foreign ownership on value-added per employee in Canadian owned plants[6]. His results, using 1972 data for a sample of from 42 to 61 manufacturing industries, provided statistically significant support for his positive spillover hypothesis in half of the ten regressions reported. (The insignificant coefficients were nevertheless also positive.) Elasticities for foreign ownership and the two consistently significant variables in his models - a measure of capital to labour intensity and plant scale economies - indicated that foreign ownership was much less important than capital intensity and slightly less important than plant scale economies[7]. But he argued that the favourable spillover benefits were underestimated, for his model did not pick up indirect benefits from enhanced quality of output[8] or improvements from inter-industry spillovers.

A more recently published study by Saunders (1980), for 84 three-digit manufacturing industries, using data from the mid and late 1960s in a simultaneous equation model, offers quite different results. His dependent variable was different from Globerman's, however, being productivity per worker in Canadian manufacturing (both domestic and foreign owned) relative to productivity in comparable American industries. Both productivity measures were adjusted by use of effective tariffs to arrive at measures of physical productivity. The significant explanatory variables in his results were: a measure reflecting the combined influence of tariffs and relative size; the percentage of total employment in non-production jobs in Canada relative to that in the U.S.; the proportion of industry sales accounted for by

foreign controlled firms; and the percentage of employees in managerial professional positions in Canada relative to that in the U.S[9]. In contrast to Caves and Globerman, and unlike his hypothesis that the coefficient of his foreign ownership variable should be zero, he found that physical value-added per employee in Canadian industry relative to that in the U.S. was less, the greater was foreign ownership.

It is not easy to reconcile the Caves-Globerman and Saunders results, even though they do measure somewhat different things: the former, the relative efficiency of different Canadian manufacturing industries; the latter, the relative productivity of Canadian plants compared with their American counterparts. To do so, one has to argue something like this: that, on the one hand, foreign subsidiaries entering an industry so fragment it so that the industry never achieves the level of efficiency that exists in the U.S., and that the larger the proportion of foreign firms in the industry, the greater the degree of fragmentation and the greater the degree of inefficiency relative to the U.S. - hence Saunders' results. On the other hand, as foreign direct investment occurs, they stimulate domestic plants to improve their productivity within the limits that the fragmentation sets. That is, they may enhance their management skills, speed up their pace of adopting new technology and so on, all within the confines of their increasingly fragmented market - thus producing the Caves-Globerman observations. However, I am not convinced that this is all there is to it, or that each study picks up only one of the effects and not the other. So in what follows, another attempt, using more highly aggregated, yet also more complete, data for manufacturing will be undertaken.

3.4 THE MODEL

The dependent variable used will be essentially identical to that employed by Caves for Australia and Globerman for Canada, namely total value-added (in millions of dollars) divided by total employees in domestic owned manufacturing firms. It suffers from the usual limitations of cross-section value-added comparisons and of gauging productivity by the output per unit of labour rather than by some measure of total factor inputs. But at least it is comparable with these two earlier studies[10]. The data are for 1978. (Statistics Canada, 1982).

The presence of foreign ownership in Canadian industries and its possible influence upon the productivity of domestic owned firms can be expressed in diverse ways. We shall assume initially that the effects of foreign ownership are proportional to the foreign share of total industry activity measured in any one of three different ways[11]:

1. the ratio of value-added in foreign owned plants compared to total value-added for the industry in 1978: F0V
2. the ratio of employment in foreign owned plants compared to total industry employment for 1978: F0E
3. the ratio of total shipments by foreign owned plants compared to total industry shipments in 1978: F0S.

Because the initial results using each of these three variables in turn gave little to choose among them (the simple correlation coefficients between each pair are .98 or higher), subsequent regressions focused simply on the use of F0V. It is these alone which we report.

Three other measures of the foreign ownership were used. The first was to assume that the effects of alien firms will only become significant when they play a dominant role in the industry. Hence the dummy variable, FV, was established and set equal to zero where the share of total industry value-added accounted for by foreign subsidiaries was less than 50 percent, and equal to one where this share was 50 percent or more.

The second approach provided for two discrete gauges of foreign influence used simultaneously. The first, F, was set equal to zero when foreign ownership was 20 percent or more and equal to one if it was less than 20 percent. The second, F0, was given the value of zero when foreign ownership was not from 20 percent to 50 percent and one where it was within this range. Thus, when foreign ownership was 50 percent or greater both F and F0 were zero.

A third set of variables was designed to see if observable differences could be detected in the influence of U.S. owned foreign plants and plants owned by other foreign countries. (Recall that Shapiro, 1980, noted a clear divergence in the performance of these two groups.) Hence, USV was defined as the percentage of industry value-added produced by American owned plants, whereas OV was the percentage of industry value-added accounted for by other than American owned plants.

As we have indicated, neither theory nor earlier research provide a clear-cut answer as to what signs we should anticipate on these variables. It really boils down to whether one expects the adverse effects of foreign entry on the fragmentation of industry, and hence upon the size of domestic plants and length of production run in domestic

plants, to offset or to be offset by the possible benefits from an improved competitive environment, faster dissemination of technology, and the spillover of management skills and labour force training to domestic owned plants. I suppose my biases caused me to expect the adverse effects to predominate. Should this be so, then the signs of all the above foreign owned measures, except F and FO should be negative. The latter should be positive.

Most of the other variables that we anticipate will influence labour productivity are, for the most part, fairly straightforward. Labour quality, as reflected by education level of workers, has long been recognized as positively affecting employees' output, not only directly through the knowledge they acquire but also indirectly via the self-discipline, approaches to problem-solving and perseverance developed in the course of their formal training. Or, alternatively, their education level attained may be a proxy for the extent to which they possess these and other innate qualities contributing to their capacity to absorb on-the-job training and to their general productivity. Census data for 1971 (Statistics Canada, 1977) was utilized to calculate the average formal education level of workers in each industry, ED[12].

Variations among industries in the average number of hours worked, whether these be due to divergences in overtime, holidays, vacations or whatever, may also influence value-added per employee. If we can assume that hours of work are today sufficiently short that any increase in them does not reduce labour productivity (as it undoubtedly once did), then we can expect a positive relationship between hours per worker and labour productivity. Since

total paid hours are only prepared by Statistics Canada (1982) for production workers, we shall use total man-hours (in thousands) for such employees divided by total employees as a proxy for average hours worked annually by all workers in domestic owned plants, HPW[13].

Our fourth variable is one reflecting the importance of capital per unit of labour across industries. The greater this is, the greater would we expect value-added per employee to be. At the two digit industry level we have two Canadian measures of capital readily available. The first is the mid-year net fixed capital stock of each industry for 1978, (Statistics Canada, 1980) and the second is net depreciable assets for 1978 (Statistics Canada, 1981b). Accordingly, on the assumption that the services provided by capital are approximately in line with the capital stocks, or at least that no systematic bias exists, we used two variations for our capital-labour ratio: (a) mid-year net fixed capital stocks (in millions of dollars) divided by total employees, CLR1, and (b) net depreciable assets divided by total employees, CLR2[14]. Because the results using CLR2 were consistently better than those with CLR1, we report only the former.

Productivity in Canadian manufacturing has long been deemed to be partially a function of the extent to which scale economies are achieved. The two types germane to this discussion are those associated with the size of plant relative to the optimum sized plant for the industry, and possibly more important, the number of product lines produced in any plant and hence the length of production run, relative to the length which provides maximum unit cost.

A variety of measures of optimum plant size for industries have been utilized by researchers, such as engineering estimates, characteristics of surviving plants, and the average plant size of the larger plants in the industry. This latter measure, or some variation thereof, has tended to be the most popular (Comanor and Wilson, 1967; Esposito and Esposito, 1971; Caves, Khalilzadeh-Shirazi, Porter, 1975; and Globberman, 1979) even though it is recognized that the larger plants may be extended beyond the scale necessary to achieve minimum unit costs - and thus result in an overestimate of the potential economies of scale. (McFetridge, 1973). We have therefore employed two measures of the degree to which domestic owned firms have achieved available plant scale economies. The first, SCALE1, was defined as average value-added per plant in 1978 in domestically owned plants (Statistics Canada, 1982), divided by average value-added per plant in those plants accounting for approximately 50 percent of total value-added in the comparable American industry (U.S. Department of Commerce, 1981), adjusted to Canadian dollars at the 1978 exchange rate. The U.S. figure is used as an estimate of minimum optimum size.

The second scale variable, SCALE 2, was defined as the average value added per plant in 1978 in domestically owned plants divided by average value-added per plant in foreign owned subsidiaries in Canada. To the extent that these subsidiaries are smaller than those large plants accounting for 50 percent of value-added in the U.S., this variable probably errs on the side of underestimating the degree to which plant economies of scale are achievable. But it seemed reasonable to use it as an alternative to SCALE 1, which,

as indicated, may well overstate the available economies.

A variable reflecting the degree to which economies of scale are achieved with respect to length of production runs is more difficult to approximate. Diverse and often fairly complex methods have been adopted to reflect the combination of market size, share of the market held by the largest plants (concentration ratios of one sort or another), degree of tariff protection, cost disadvantage experienced by the smaller plants, and extent of product differentiation (as represented by advertising expenditures as a percent of sales or some similar measure) and other barriers to entry affecting product scale economies (e.g., Caves, Khalilzadeh-Shirazi and Porter, 1977; Globberman, 1979; Saunders, 1980). At least at the level of aggregation at which we are operating, if not also at lesser degrees of aggregation as well, the meaning of these measures used in some combination with one another becomes rather obscure at best. Consequently, it was decided to opt for a simple representation of the extent to which the industries are experiencing inefficiency because of a plethora of products and accompanying short production runs, namely the effective rate of protection (ERP). (Wilkinson and Norrie, 1975) As Spence (1977: 270-271) has noted, ERP may produce conflicting effects. On the one hand, as ERP is increased, products that were purchased abroad will be manufactured domestically. As the number of lines enlarges, output per worker and probably value added per worker will diminish. On the other hand, the greater protection may enhance price-cost margins and thus augment value-added per employee. He found that the first influence dominated - which is consistent with the large

body of literature in Canada on the effects of the tariff upon Canadian efficiency. Accordingly, we hypothesize that the sign on ERP should be negative.

Two other observations relating to this variable are pertinent. First, given that a measure of tariff protection is being employed, there is little need to include, as some researchers have done (Saunders, 1980), imports as a percentage of industry shipments as a separate explanatory variable on the hypothesis that the greater are imports (which would tend to occur with lower tariffs) the more efficient will be domestic industry and the higher will be value-added per employee. The tariff should pick up this effect. So it is perhaps not surprising that insignificant coefficients have been obtained from the import variable in such earlier studies.

Second, it has long been recognized that there are two aspects to the issue of inefficient length of production runs in Canadian manufacturing. On the one hand, the tariff structure has provided a protected market thus probably permitting a greater amount of inefficiency than would otherwise have occurred[15]. On the other hand, the entry of foreign subsidiaries, either to get behind the tariff or simply to follow-the-leader in having a plant in the Canadian market, does reduce the market for individual local plants and facilitate shorter production runs. By explicitly and directly including a tariff variable as well as separate foreign ownership variables, we are attempting to pick up both effects. In fact, we might note that the inclusion of the ERP variable actually improves the significance of the foreign ownership variables (although we do not bother to show these variations in our reporting of empirical results in the following section).

Variations in productivity per worker over time within industries are largely explainable by vicissitudes in the degree of capacity utilization. Possibly, then, divergences in capacity utilization across industries at a point in time may be responsible for some of the observed differences in industry productivity for our sample year, 1978. Accordingly, the average capacity utilization for that year (CAP) was added (Statistics Canada, 1981c) as an independent variable with a positive sign expected.

With this last variable, the specification of our model for the national Canadian data is complete. For the provinces, two-digit manufacturing industry data for 1978 were again used. But because of both the limited amount of industry in some provinces and confidentiality requirements, foreign ownership data were not available for all 19 industries in each province. (Again, tobacco products were initially removed because of the exclusive reign of foreign companies in this sector.) Only a maximum of 95 observations were available and where we wished to divide the source of the foreign ownership into U.S. and other countries, only 54 observations were possible.

The dependent variable as well as the explanatory variables for foreign ownership (F0V, FV, F and F0, USV and OV), labour quality (ED), hours worked (HPW) and SCALE were all defined as already indicated but using the relevant provincial data. SCALE 2, however, was average value-added in 1978 domestic owned provincial plants divided by average value-added per plant in foreign owned subsidiaries for all Canada. Lack of provincial data on capital and capacity utilization meant that the national variables for CLR2 and CAP were used as proxies for the respec-

tive provincial industries. National data was also employed for ERP.

A variety of other, not always easily identified, factors may cause value-added per worker to differ among provinces. General economic conditions relating to the industrial mix of the provinces, particular provincial policies, resource endowments and the like may be reflected in such magnitudes as unemployment rates, inflation rates, housing costs and in turn wages and salaries and/or price-cost margins, thus producing divergences among provinces in value-added per employee. Accordingly, to take account of them, four dummy variables were defined as follows:

- P1 = 0 - if the industry is not in the Atlantic provinces and one if it is in those provinces.
- P2 = 0 - if the industry is not in Quebec and one if it is.
- P3 = 0 - if the industry is not in Ontario and one if it is.
- P4 = 0 - if the industry is not in Saskatchewan and Manitoba and one if it is.

If each of P1 to P4 are zero, the industry is in Alberta or British Columbia. It is not clear what the signs of these variables should be so we are not making any prior hypotheses. We turn next to an examination of our findings.

3.5 EMPIRICAL RESULTS

3.5.1 National Data

Results for all of Canada are presented in Table 1. The overall fit of the model, as measured by the adjusted R^2 is quite good, better than one usually expects for cross-section regression analysis. Presumably, the level of aggregation has contributed to this result.

Consider the individual variables, starting with those other than foreign ownership. All of them except capacity utilization (CAP) have the expected signs and with few exceptions are significant at approximately the .025 level or better. Perhaps because CAP, of necessity, was an average of the four quarters for 1978, we should not have expected it to have produced good results. In any event, because it was of the wrong sign and insignificant, CAP was deleted from later regressions. As we shall see, the effect was to improve modestly the performance of the foreign ownership variables.

By far the most significant variable is the capital-labour ratio. Its effect upon labour productivity is very stable over different specifications. Clearly, the greater the amount of capital that each worker has to work with has an important effect upon his productivity. Labour quality, as represented by the average education level of work force (ED), is, with two exceptions (when SCALE 2 is used with FOV) [16], also a statistically significant contributor to productivity. Modest increases in average hours worked by production workers (HPW) enhances productivity as well, although generally the reliability of our results is not as great as for ED.

Effective protection (ERP) has a consistent, highly significant negative effect upon productivity.

TABLE 1

REGRESSION RESULTS¹ FOR NATIONAL DATA

	CONSTANT	FOREIGN OWNERSHIP MEASURES										SCALE		CLR2	HPW	ED	USV	OV	CAP	ERP	No. of observations	$\overline{R^2}$
		FOV	FV	F	FO	FO	USV	OV	1	2												
1) NATIONAL ¹																						
1 - .08996 (1.8051)	-.00552 (1.2659)							.00406 (3.0775)	.04071 (2.0627)	.20827 (11.6854)	.04645 (2.9393)							-.00843 (1.1124)	-.03113 (4.4360)	19	.9718	
2 - .07200 (1.8015)		-.00275 (1.6862)						.00374 (3.1322)	.03353 (2.1733)	.20738 (12.1914)	.03705 (2.1840)							-.00904 (1.2746)	-.03062 (4.5858)	19	.9744	
3 - .10516 (2.0429)				.00358 (1.9352)	.00147 (.6987)			.00420 (3.2543)	.04523 (2.2969)	.20306 (11.5040)	.04814 (2.3411)							-.00753 (1.0327)	-.03189 (4.6697)	19	.9742	
4 - .09188 (1.7041)							-.00573 (1.1163)	.00412 (2.8902)	.04121 (1.9510)	.20707 (10.5379)	.04677 (2.8224)							-.00813 (.9629)	-.03051 (3.9674)	19	.9689	
5 - .07343 (1.2085)	-.00657 (1.2122)							.00207 (1.5107)	.04074 (1.6682)	.21621 (9.8304)		.00429 (1.4280)						-.00299 (.3104)	-.03135 (3.3500)	19	.9576	
6 - .06917 (1.5237)		-.00390 (2.3982)						.00248 (2.1892)	.03695 (2.0685)	.21059 (11.0401)		.00348 (1.3434)						-.00432 (.5242)	-.03023 (3.9732)	19	.9684	
7 - .05741 (1.1313)				.00266 (1.1659)	.00436 (2.4895)			.00245 (2.1261)	.02980 (1.4712)	.20934 (10.757)		.00412 (1.4963)						-.00523 (.6180)	-.02807 (3.4241)	19	.9673	
8 - .11219 (2.4336)	-.00667 (1.5571)							.00408 (3.0648)	.04820 (2.5726)	.20847 (11.5833)	.04508 (2.8338)								-.03106 (4.3834)	19	.9713	
9 - .09016 (2.3540)		-.00303 (1.8327)						.00366 (2.9929)	.03912 (2.5780)	.20749 (11.893)	.03524 (2.0323)							-.03041 (4.4411)		19	.9730	
10 - .12686 (2.6913)				.00401 (2.2105)	.00140 (.6644)			.00425 (3.2809)	.05238 (2.8325)	.20214 (11.4321)	.04928 (2.3924)							-.03202 (4.6748)		19	.9740	
11 - .08217 (1.5871)	-.00678 (1.3091)							.00211 (1.5994)	.04360 (2.0040)	.21533 (10.2678)		.00454 (1.6328)						-.03105 (3.6575)		19	.9608	
12 - .08007 (2.0466)		-.00391 (2.4761)						.00249 (2.2643)	.04035 (2.5013)	.20925 (11.4200)		.00390 (1.6325)						-.02973 (4.0633)		19	.9703	
13 - .07198 (1.6491)				.00279 (1.2662)	.00432 (2.5387)			.00246 (2.1980)	.03458 (1.9019)	.20788 (11.0771)		.00455 (1.7587)						-.02771 (3.4881)		19	.9692	
14 - .11420 (2.3535)							-.00743 (1.5499)	.00424 (2.9941)	.04834 (2.4523)	.20525 (10.5289)	.04578 (2.7772)								-.02967 (3.8963)	19	.9691	

1. t-values are in brackets under each coefficient.

The critical values for t (one-tailed test) with 12 degrees of freedom are:

1.356 at the .1 level of significance
 1.782 at the .05 level of significance
 2.179 at the .025 level of significance
 2.681 at the .01 level of significance

The encouragement given to industry to maintain large numbers of product lines with smaller than optimal production runs and low productivity, apparently overwhelms the possible scope for higher price-cost margins and hence higher value-added in the more heavily protected industries.

We come next to the SCALE variables. The coefficients for SCALE 1 which compares plant size of domestically owned firms with the average size of those large plants in comparable industries in the U.S. responsible for 50 percent of industry value-added, are invariably statistically significant. In contrast, SCALE 2, comparing the size of domestically owned with foreign owned subsidiaries within each industry, produces statistically insignificant coefficients for itself as well as noticeably lowering the t-values of the ED, HPW, CLR2 and ERP variables, and for ED and HPW, to the point of their coefficients becoming statistically insignificant at the .05 level on occasion (see equations 5 and 7). Interestingly enough, however, when the CAP variable is removed, the t-values are raised again, and in some cases, statistical significance is restored (see runs 11 and 13). Concurrently, the elimination of CAP also improves the performance of SCALE 2 itself.

The foreign ownership variables, although not all statistically significant, give a consistent view - that the greater is the foreign presence, then, *ceteris paribus*, the less is our measure of labour productivity. It appears that the fragmentation effects of foreign firms entering industries outweigh the positive spillover effects on domestic plants of superior technology, management techniques and so on, possessed by foreign subsidiaries. Of the three forms of the total foreign ownership variable, FOV gives the poorest results. This

suggests that the adverse effect of foreign ownership upon the productivity of domestic industry is not continuous. However, the FV variable, measuring whether foreign ownership of an industry is at least one-half or not, is significant at the .05 level or better in three out of four instances. Its performance is superior when SCALE 2 is employed. In turn, both F and FO are consistently positive, implying that levels of foreign ownership below 20 percent or between 20 percent and 50 percent respectively, result in higher productivity in the affected industries than occurs in other industries where the alien presence is 50 percent or greater. The SCALE variables affect the significance of these measures however. F is only significant at the .05 level or better when SCALE 1 is used; in contrast, FO only takes on significance when SCALE 2 is employed.

Our attempts to differentiate the effect of American firms in Canada and firms from other nations were not particularly successful. The results do suggest, however, that U.S. owned firms have something approaching a significant negative influence on domestic productivity.

Finally, with respect to all the foreign-ownership variables, notice that when the insignificant and wrongly-signed variable, CAP, is eliminated, the t-values for all their coefficients are improved.

Casual observation of residuals in relation to the independent variables suggested heteroskedasticity might be a problem. Consequently, the Lagrange multiplier test (Godfrey, 1978; or Breusch and Pagan, 1979) was used to investigate this possibility. The ordinary least squares residuals were regressed on a linear combination of all the independent variables[17]. The results for each equation indicated

that this was not a matter that need concern us any further.

If we were to conclude this section of the paper at this juncture, any ensuing observations could presumably support a policy of encouraging more Canadian ownership of manufacturing, or at the least, a less open attitude towards more foreign investment. But we still have our provincial results to consider. As we shall see from them, the effects of foreign ownership become much less clear, so that policy conclusions or recommendations have to be tempered accordingly.

3.5.2 Provincial Data

Four sets of regressions were run using provincial information. The first set, involving 95 observations, included all manufacturing industries in each province where data were available on the percentages of domestic and foreign ownership. The second set, of 83 observations, included only those industries where domestic ownership was less than 100 percent. The third and fourth sets, corresponding to the first and second sets respectively, but with only 54 and 44 observations, encompassed those industries where the data provided details on the percentages of U.S. (USV) and all other foreign ownership (OV).

Results for the first two sets of provincial runs are presented in Table 2, Part A. The variations in labour productivity among industries are less completely explained than was true for the national data. The adjusted R^2 range from about .48 to .58. Nevertheless, all the variables corresponding to those used in the national regressions, other than

those relating to foreign ownership, have the same signs, and with the exception of ED (and to a much lesser extent ERP) are uniformly statistically significant. ED only attains significance at the .05 level in some regressions where SCALE 1 is used and the industries where foreign ownership is zero are removed from the sample (equations 4, 5). ERP in turn loses significance when both the industries with no foreign ownership are extracted and SCALE 2 is employed. Yet in contrast to these changes, both SCALE 1 and HPW are significant at an even lower level of significance than they had in the national runs, and the coefficients of SCALE 2 become significant where they were not so in the national regressions.

The dummy variables representing possible provincial differences uniformly have negative signs, which suggests that, *ceteris paribus*, compared with the provinces not represented by dummy variables, Alberta and British Columbia, the other provinces have lower average productivity. This effect takes on real statistical importance for the Atlantic provinces (P1) and Saskatchewan and Manitoba (P4) in those regressions including all 95 observations. Perhaps surprisingly, when SCALE 1 is employed, even the coefficients for Ontario take on significance.

The most important outcomes from the perspective of this study are those relating to foreign ownership. No longer is there any clear indication that an expansion of the foreign presence in industry reduces productivity. No coefficients are significant at the .05 level and the majority of them are even of the wrong sign.

TABLE 2

REGRESSION RESULTS² FOR PROVINCIAL DATA

FOREIGN OWNERSHIP MEASURES															PROVINCIAL DIFFERENCES (P)					no. of observations	R ²
Constant	FOV	FV	F	FO	USV	OV	ED	HPW	CLR2	SCALE		1			2	3					
Part A																					
1 -.06178 (1.8344)	.00192 (.4581)						.00165 (1.4531)	.03490 (2.4747)	.13739 (5.2636)	.04553 (3.3014)				-.00853 (2.6000)	-.00195 (.6631)	-.00490 (1.7969)	-.00343 (2.0832)	95	.5148		
2 -.06073 (1.8529)		.00080 (.3531)					.00170 (1.5019)	.03517 (2.4974)	.14028 (5.7338)	.04631 (3.2253)				-.00878 (2.7550)	-.00186 (.6344)	-.00479 (1.7727)	-.00348 (2.1022)	95	.5143		
3 -.05844 (1.7733)			-.00188 (.7503)	.00031 (.1262)			.00155 (1.3656)	.03504 (2.4936)	.13738 (5.5704)	.04288 (2.9119)				-.00780 (2.3174)	-.00205 (.6933)	-.00463 (1.7016)	-.00534 (2.0441)	95	.5135		
4 -.08754 (2.1531)	-.00138 (.2836)						.00303 (1.8061)	.04171 (2.5326)	.13105 (4.4098)	.04646 (2.7986)				-.00492 (1.0797)	-.00216 (.0620)	-.00361 (1.1831)	-.00735 (1.2271)	83	.4854		
5 -.08559 (2.1248)		-.00001 (.0033)					.00290 (1.7741)	.04114 (2.5293)	.12845 (4.4675)	.04711 (2.7349)				-.00491 (1.0759)	-.00345 (.0998)	-.00381 (1.2676)	-.00381 (1.2476)	83	.4848		
6 -.08188 (1.9920)			-.00083 (.3016)	.00050 (.1928)			.00269 (1.6062)	.04038 (2.4652)	.12800 (4.4293)	.04487 (2.5084)				-.00441 (.9422)	-.00055 (.1570)	-.00376 (1.2396)	-.00392 (1.2745)	83	.4795		
7 -.04889 (1.5980)	.00563 (1.3842)						.00018 (.1840)	.03570 (2.6996)	.12459 (5.0486)		.01345 (4.8700)			-.00857 (2.8037)	-.00506 (1.8784)	-.00747 (2.9329)	-.00615 (2.7746)	95	.5726		
8 -.05136 (1.6631)		.00148 (.6976)					.00033 (.3290)	.03706 (2.7868)	.13526 (5.8311)		.01299 (4.6343)			-.00954 (3.2103)	-.00482 (1.7781)	-.00701 (2.7454)	-.00682 (2.8395)	95	.5653		
9 -.04849 (1.5790)			-.00349 (1.4570)	.00010 (.0433)			.00025 (.2497)	.03659 (2.7833)	.13017 (5.6215)		.01284 (4.6154)			-.00778 (2.4763)	-.00484 (1.8040)	-.00669 (2.6159)	-.00640 (2.6714)	95	.5733		
10 -.07951 (2.1679)	.00398 (.8336)						.00084 (.5871)	.04723 (3.0930)	.11184 (3.9681)		.01465 (4.5251)			-.00715 (1.6810)	-.00481 (1.5468)	-.00740 (2.6176)	-.00343 (2.0091)	83	.5558		
11 -.08176 (2.2320)		.00121 (.5345)					.00104 (.7414)	.04791 (3.1366)	.11732 (4.3512)		.01428 (4.4331)			-.00718 (1.6808)	-.00454 (1.4685)	-.00707 (2.5274)	-.00358 (1.9841)	83	.5532		
12 -.07691 (2.0934)			-.00302 (1.1520)	.00033 (.1410)			.00084 (.6082)	.04704 (3.0850)	.11528 (4.2820)		.01423 (4.4266)			-.00610 (1.4012)	-.00461 (1.5031)	-.00686 (2.4387)	-.00533 (1.9733)	83	.5559		
Part B																					
13 -.05306 (1.4582)							-.00021 (.0419)	.02877 (1.9538)	.22970 (7.7053)	.03497 (3.1378)				-.01070 (3.2908)	-.00405 (1.4584)	-.00383 (1.4836)	-.01079 (3.3570)	54	.7978		
14 -.03101 (.89191)							.00372 (.7353)	.02646 (1.8536)	.23175 (8.0840)		.00812 (3.6249)			-.01175 (3.9087)	-.00815 (3.3222)	-.00748 (3.1509)	-.01237 (4.1362)	54	.8098		
15 -.05101 (1.0096)							-.00208 (.3659)	.02441 (1.1675)	.22848 (6.4183)	.03415 (2.2379)				-.00162 (.2651)	-.00227 (.6139)	-.00254 (.7973)	-.01451 (2.1873)	44	.8000		
16 -.03470 (.7144)							.00224 (.4105)	.02433 (1.2504)	.22984 (7.0259)		.00798 (2.9963)			-.00324 (.5608)	-.00720 (2.5681)	-.00682 (2.8710)	-.00168 (2.8710)	44	.8174		

1. t-values are in brackets under each coefficient.

The critical values for t (one-tailed test) with 60 degrees of freedom are:

1.296 at the .1 level of significance.
 1.671 at the .05 level of significance.
 2.000 at the .025 level of significance.
 2.390 at the .01 level of significance.

Possibly, those disappointed with these findings may obtain some small comfort from the fact that when those industries with 100 percent Canadian ownership are taken out of the sample, the signs of the coefficients either change so as to be consistent with the national data (compare equations 1 with 4, 2 with 5), or their coefficients keep the same sign but their t-values diminish (compare the remaining equations such as 3 with 6, etc.).

When we attempt to find whether the effects of U.S. and other foreign owned plants can be distinguished (using USV and OV), little, if anything, is added to our knowledge. The adjusted R^2 improves substantially, apparently due to the increased significance of the CLR2 ratio, but USV and OV are not of consistent sign or are they significant.

3.6 CONCLUDING REMARKS

What, then, do our diverse results tell us about the consequence of foreign ownership of industry for the performance of domestically owned plants as gauged by their labour productivity? If one accepted the view that reliance should be placed upon those findings based on aggregate data covering all manufacturing, and fairly consistently enjoying some degree of statistical significance as normally defined, then one might conclude that the presence of externally owned and controlled plants does aggravate the fragmentation problem in Canadian industry and thus hinders domestic plants from becoming as efficient as they otherwise might be. From this perspective, it may be argued that giving as much weight to small industries (such as many of those located in the Atlantic provinces) as

is given to large industrial complexes like those in Ontario - which the provincial regressions do - really distorts the "true" effects by adding just enough noise that the authentic message cannot be heard. Perhaps, with a little more astute selection of industries on some seemingly rational basis, such as would eliminate observations from small industries, or industries where the presence of foreign ownership is less than a certain percentage[18], results more closely approximating the national outcomes might be produced. To put the matter another way, possibly the standard approach of utilizing the data for only those industries where comparable data can be obtained - as earlier researchers have also done on occasion - does impart bias to the outcome[19], and that this is the reason for the conflicting answers obtained in this and prior studies[20]. Again, it may be that value-added data as prepared by Statistics Canada are unreliable for estimating productivity and that any studies based on such measures should be suspect[21].

Whatever the case, maybe the most we can say about the effects of foreign direct investment upon the productivity of domestic industry is that "It all depends." But what does it depend upon? Presumably, such things as the particular policies of foreign management in each individual industry - whether they are content to maintain a fairly stable niche in the Canadian market or are prepared to compete aggressively, thus forcing both their foreign competitors and the domestic firms to adopt a wide range of efficiency-improving measures, perhaps including a certain amount of industry rationalization. The initiative and vigour of domestic management in the face of challenges (or, as the

case may be, the lack of challenges) from abroad will also be important. Again, federal and provincial policies either encouraging or discouraging rationalization in particular industries, or encouraging new plants in certain industries to be built to a world-scale capacity - such as recent petrochemical ventures in Alberta or Sarnia - will also affect the final situation.

One thing does seem clear, however, even from our mixed results: a simple policy of either encouraging or discouraging foreign investment in Canadian manufacturing is not likely to be any panacea for all that ails this sector. In other

words, even the very limited insight that the current study sheds on one aspect of the foreign direct investment issue, should warn policy makers against assuming on the one hand, that unlimited direct capital inflows will somehow compensate for domestic policy weaknesses, or force the economy into new efficiency-improving measures that we are unwilling to undertake on our own initiative; or on the other hand, that discouraging foreign direct investment will suddenly cause domestic manufacturing to blossom into a paragon of progressiveness and efficiency.

NOTES

* This paper was originally read at the recent conference "Economic Policies for Canada in the 1980s," held in Winnipeg, October, 1982 by the Institute for Social and Economic Research.

- [1] For an excellent, broad review of most of the relevant literature on these topics, as well as of the theory of why such foreign direct investment occurs, see Safarian (1981).
- [2] The terms of the auto pact clearly affect the behaviour of alien firms. Notice, however, that the import propensity for such Canadian controlled firms as exist in the industry is a meagre .19 percent.
- [3] Gorecki's work (1976) supports this part of his hypothesis.
- [4] He has taken an alternate stance on occasion. See Caves (1975: 3) where he says, "Multinational corporations probably make the problem [i.e., inefficiency in Canadian manufacturing] worse; their sales-promotion abilities allow them to gain an advantage in the protected Canadian market and profitably sell small volumes of goods."
- [5] The other significant independent variable was the average profit before taxes on equity, for foreign owned corporations, which he utilized as a proxy for all structural factors affecting domestic corporate profits. Even so, the total explanatory power of his equations, as measured by the adjusted R^2 , was only about .15.
- [6] Value-added per employee was, in fact, the dependent variable that Caves used in the second half of the article referred to above when investigating the effect of foreign ownership on Australian manufacturing industry. He found statistically significant results for his hypothesis of positive spillover effects. He obtained a very high R^2 (over .90) by including value-added per worker of foreign subsidiaries as an independent variable. But such a variable does not, in any real way, contribute to the explanation of the forces determining domestic value-added per employee in different industries.
- [7] The total explanatory power of his model, as measured by adjusted R^2 , was in the .65 to .70 range.
- [8] He actually suggested that improvements in wages were not picked up in the productivity measure, but clearly wages are in value-added and therefore would be included.
- [9] Perhaps surprisingly, the ratio of labour to capital in Canada, relative to that in the U.S., did not produce anything approaching statistically significant results.
- [10] Value-added per employee includes not only labour productivity but also differences in wages and salaries, variations in price-cost margins, and differences in the amount of services purchased outside the firm. Saunders (1980), in following Michael Spence (1977) attempts to adjust wage differences and price-cost margins by deriving a measure of physical

value-added through the use of the assumption that firms price up to world price plus the tariff. But then, two of his concentration and scale variables and his labour-capital ratio variable all prove to be insignificant. His adjustments may simply have removed what these other types of variables would have otherwise picked up.

[11] All foreign ownership measures are from Statistics Canada (1982).

[12] The Census reports workers in seven categories of educational attainment. For grade 8 or less, we used grade 5. For grades 9 and 10, we used 9.5. Grade 11 was a separate category. For grades 12 and 13, we used 12.5. Some university was represented by 14 years, and a university degree by 16 years.

This gauge of labour quality is more precise than any of Globerman's three measures, namely: (a) the ratio of aggregate wages and salaries to total employees in foreign owned plants; (b) the proportion of male workers with some university or a university degree (This neglects the educational level of the rest of the work force); and (c) a two-stage least squares estimation of an average wage variable. The weak performance of these variables in his regressions, compared with the significant showing of ours, supports this observation, and denies his conclusion, based on his findings, that education is a poor reflector of human capital in the work place.

[13] Globerman used total paid man-hours of production work in do-

mestic owned plants divided by the total number of employees in domestic owned plants. At the time of writing, only total production hours were available for 1978 rather than hours subdivided into domestic and foreign owned plants. So we used total hours and total employees on the assumption that within any industry, union activity would generally ensure that at least regular hours of work would be much the same throughout the industry.

[14] Globerman used gross book value of depreciable assets in 1971 for firms in the U.S. to total employees in each U.S. industry as a proxy for the situation in Canada. This approach requires an assumption beyond what we have had to use, namely, that the U.S. capital-labour situation accurately reflects the Canadian scene. His results do not come in with as low a level of significance as ours either.

[15] We have worded this carefully so as to avoid leading the reader into the trap which many Canadian economists have fallen into, namely, the belief that a removal of the tariff will remove all productivity differences between Canada and the United States. A tariff-free environment has not eliminated sizeable productivity variations among the regions and provinces of Canada. So we should not expect such an environment to do so among countries either. See Wilkinson (1982) for an elaboration of this point.

[16] The reason for these exceptions is not at all clear. Average education level is a reasonable

indicator of labour quality and turns out to be generally significant. So it supports what we would expect. But the SCALE 2 variable (like SCALE 1 in fact) is very much an imperfect proxy for the degree to which domestic plant size may not be optimal. All we can say is that its imperfectness in some way reacts with ED to produce insignificant coefficients for the latter variable.

[17] I am very grateful to my colleague, Adolf Buse for helpful discussions on this work, particularly with respect to heteroskedasticity. See his recent paper (Buse, 1982) for a careful comparison and assessment of the various methods of testing for heteroskedasticity.

[18] Caves (1974: 181-182) argues that the effects of foreign firms can only be expected to apply when there are "significant populations of both types of firms." Accordingly, he initially removed industries where foreign ownership was less than five percent, but subsequently used ten percent when the latter boundary level produced results that were "superior" in the sense that they better correspond with his starting hypothesis that there should be positive effects on the efficiency of domestic plants from the presence of foreign owned subsidiaries.

[19] For example, Globerman's study at most used 61 of the 112 three-digit manufacturing industries (1970 Standard Industrial Classification) or 54.5 percent of them. The runs with 42 industries involved only 37.5 percent of all manufactur-

ing industries. Again, Saunders' data, based on the 1960 Standard Industrial Classification used only 84 of 140, or 60 percent, of the total number of three-digit manufacturing industries.

[20] We were able to achieve additional obfuscation about the effects of foreign ownership by using, in the provincial runs, just Ontario and Quebec on the rationale that these were the only two provinces for which data on all 19 two-digit industries (again excluding tobacco products) were available. This gave a total of 38 observations. The signs on the foreign-ownership variable were mixed and the coefficients nowhere near significant. Moreover, even the coefficients of several other variables as well as the intercept lost all significance. So much for my "astute selection" of industries!

[21] Denny and May (1967: 67) infer from their examination of the real value-added function that we should be "suspicious of the use of value-added output estimates."

REFERENCES

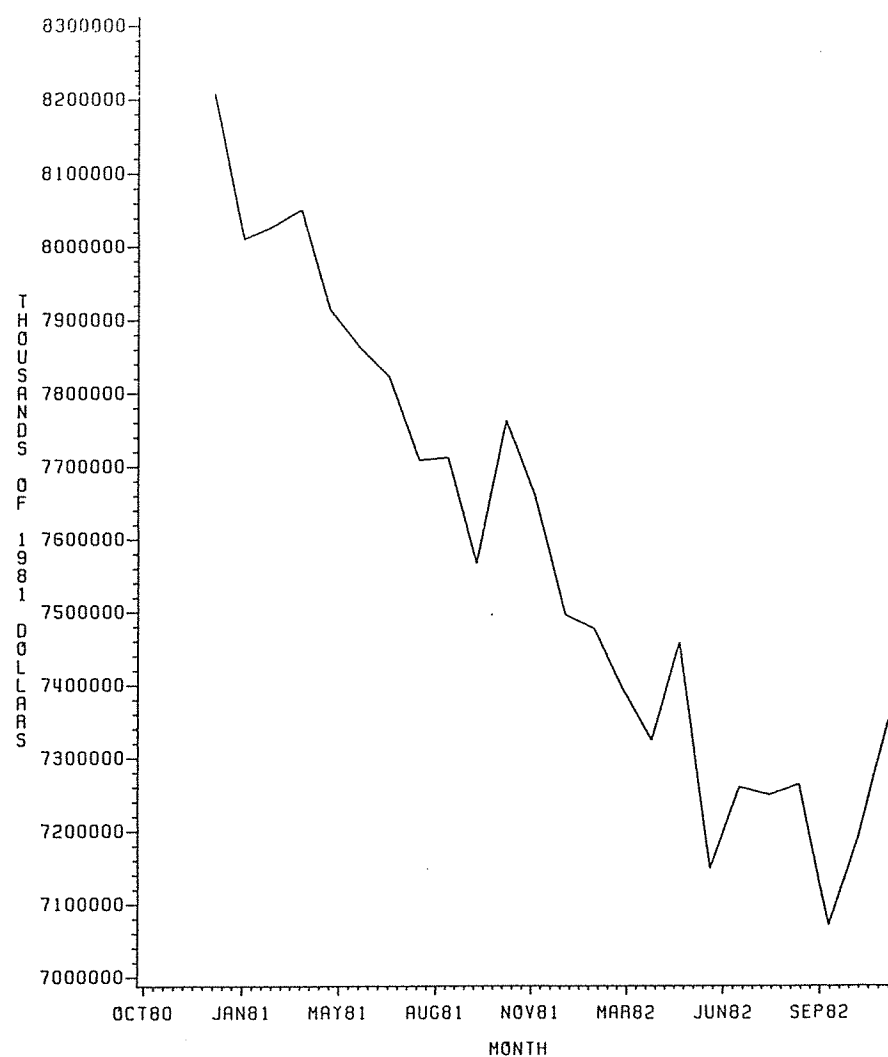
- Baumann, H. (1974). "The Relative Competitiveness of the Canadian and U.S. Steel Industries, 1955-1970," Economic Internazionale, February, pp. 141-145.
- Bones, H.P. (1980). "Are Foreign Subsidiaries More Innovative?" Foreign Investment Review, Spring, Vol. 3, No. 2.
- Breusch, T.S. and Pagan, A.R. (1980). "The Lagrange Multiplier Test and its Applications to Model Specification in Econometrics," Review of Economic Studies, Vol. 47, pp. 239-254.
- Buse, A. (1982). "Tests for Additive Heteroskedasticity: Some Monte Carlo Results," Working Paper No. 82-13, Edmonton, Department of Economics.
- Caves, R.E. (1974). "Multi-National Firms, Competition, and Productivity in Host-Country Markets," Economica, Vol. 41 (May), pp. 176-193.
- _____. (1975). Diversification, Foreign Investment and Scale in North American Manufacturing Industries, (Ottawa: Economic Council of Canada).
- Caves, R.E., Khalilzadeh-Shirazi, J. and Porter, M.E. (1975). "Scale Economies in Statistical Analysis of Market Power," Review of Economics and Statistics, Vol. 57, pp. 133-140.
- Comanor, W.S. and Wilson, T.A. (1967). "Advertising Market Structure and Performance," Review of Economics and Statistics, Vol. 49 (November) pp. 423-440.
- Daly, D.J. and Globerman, S. (1976). Tariff and Science Policies: Applications of a Model of Nationalism, (Toronto: Ontario Economic Council).
- Esposito, L. and Esposito, F.F. (1971). "Foreign Competition and Domestic Industry Profitability," Review of Economics and Statistics, Vol. 53 (November) pp. 343-353.
- Globerman, S. (1979). "Foreign Direct Investment and 'Spillover' Efficiency Benefits in Canadian Manufacturing Industries," Canadian Journal of Economics, Vol. 12, No. 1 (February) pp. 42-56.
- Godfrey, L.G. (1978). "Testing for Multiplicative Heteroskedasticity," Journal of Econometrics, Vol. 8, pp. 227-236.

- Gordon, Myron J. and Fowler, David J. (1981). The Drug Industry: A Case Study of the Effects of Foreign Control on the Canadian Economy, (Toronto: Canadian Institute for Economic Policy).
- Gorecki, P.K. (1976). "The Determinants of Entry by Domestic and Foreign Enterprises in Canadian Manufacturing Industries: Some Comments and Empirical Results," Review of Economics and Statistics. Vol. 58 (November) pp. 485-488.
- Gupta, Vinod, K. (1979) "Suboptimal Capacity and Its Determinants in Canadian Manufacturing Industries," Review of Economics and Statistics, Vol. 61, pp. 506-512.
- Lithwick, W.H. (1969), Canada's Science Policy and the Economy, (Toronto: Methuen).
- MacEachen, Allan J., Minister of Finance. Government of Canada (1982). The Budget.
- McFetridge, D.G. (1973). "Market Structure and Price-Cost Margins: An Analysis of the Canadian Manufacturing Sector," Canadian Journal of Economics, Vol. 6 (August), pp. 344-355.
- McFetridge, D.G. (1977). Government Support of Scientific Research and Development: An Economic Analysis, (Toronto: Ontario Economic Council and University of Toronto Press).
- McFetridge, D.G. and Weatherby (1977). Notes on the Economics of Large Firm Size, Study No. 20 for the Royal Commission on Corporate Concentration, (Ottawa).
- McMullen, K.E. (1982). A Model of Lag Lengths for Innovation Adoption By Canadian Firms, Discussion Paper No. 216, (Ottawa: Economic Council of Canada).
- Palda, Kristian S. and Pazderka, Bohumir (1982). Approaches to an International Comparison of Canada's R and D Expenditure, (Ottawa: Economic Council of Canada).
- Rugman, A.M. (1981). "Research and Development by Multinational and Domestic Firms in Canada," Canadian Public Policy, Vol. 7:4, pp. 604-616.
- Safarian, A.E. (1966). Foreign Ownership of Canadian Industry, (Toronto: McGraw-Hill).
- _____. (1969). The Performance of Foreign-Owned Firms in Canada, (Montreal: Canadian-American Committee).

- _____. (1981). Canadian Economists and the Study of Foreign Direct Investment: A Survey, A paper delivered to a Round Table sponsored by the Canadian Economics Association and le Centre National de la Recherche Scientifique, Paris, December 1-3.
- Saunders, R.S. (1980). "The Determinants of Productivity in Canadian Manufacturing Industries," Journal of Industrial Economics, Vol. 29 (December) pp. 167-184.
- Shapiro, D.M. (1980). Foreign and Domestic Firms in Canada: A Comparative Study of Financial Structure and Performance, (Toronto: Butterworths).
- Spence, A.M. (1977). "Efficiency, Scale and Trade in Canadian and United States Manufacturing Industries", in Study No. 26 Caves et al., for the Royal Commission on Corporate Concentration. (Ottawa: Supply and Services).
- Statistics Canada (1977). Census of Canada, Vol. 3, Part 5. (Ottawa: Minister of Supply and Services).
- _____. (1980). Fixed Capital Flows and Stocks, (Ottawa: Minister of Supply and Services).
- _____. (1981a). Canadian Imports by Domestic and Foreign-Controlled Enterprises, (Ottawa: Minister of Supply and Services).
- _____. (1981b). Corporation Financial Statistics, Ottawa: Minister of Supply and Services.
- _____. (1981c). Capacity Utilization Rates in Canadian Manufacturing, (Ottawa: Minister of Supply and Services).
- _____. (forthcoming). Domestic and Foreign Control of Manufacturing Establishments in Canada,
- U.S. Department of Commerce (1981). Census of Manufacturing, Vol.1. (Washington: U.S. Government Printing Office).
- Wilkinson, B.W. (1968). Canada's International Trade: An Analysis of Recent Trends and Patterns, (Montreal: Private Planning Association of Canada).
- _____. (forthcoming). "Canada-U.S. Free Trade and Some Options," Canadian Public Policy,
- Wilkinson, B.W. and Norrie, K. (1975). Effective Protection and the Return to Capital, (Ottawa: Economic Council of Canada).

4 Economic Summary

Figure 1
RETAIL TRADE



CANADA

Figure 2a - d

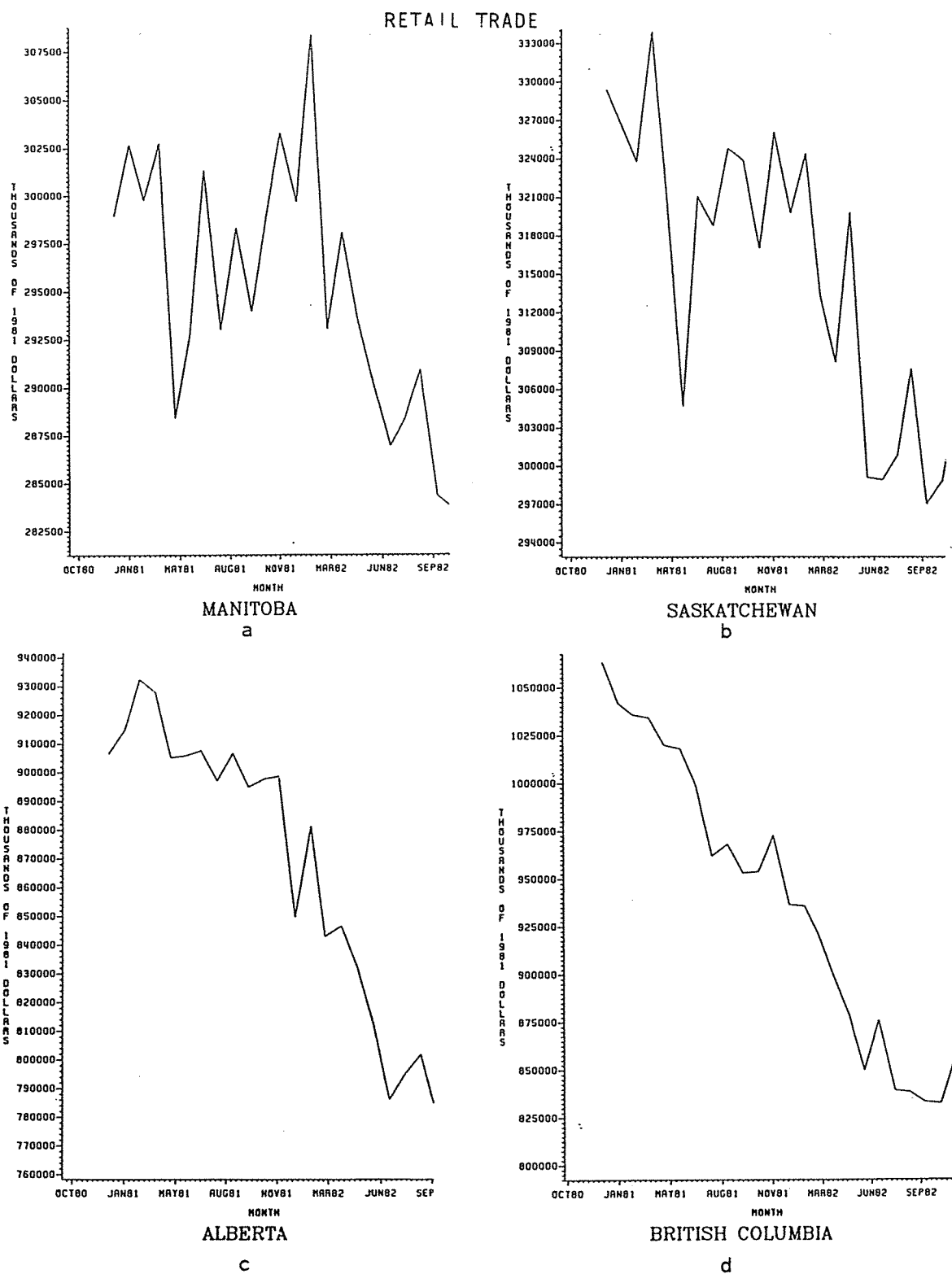
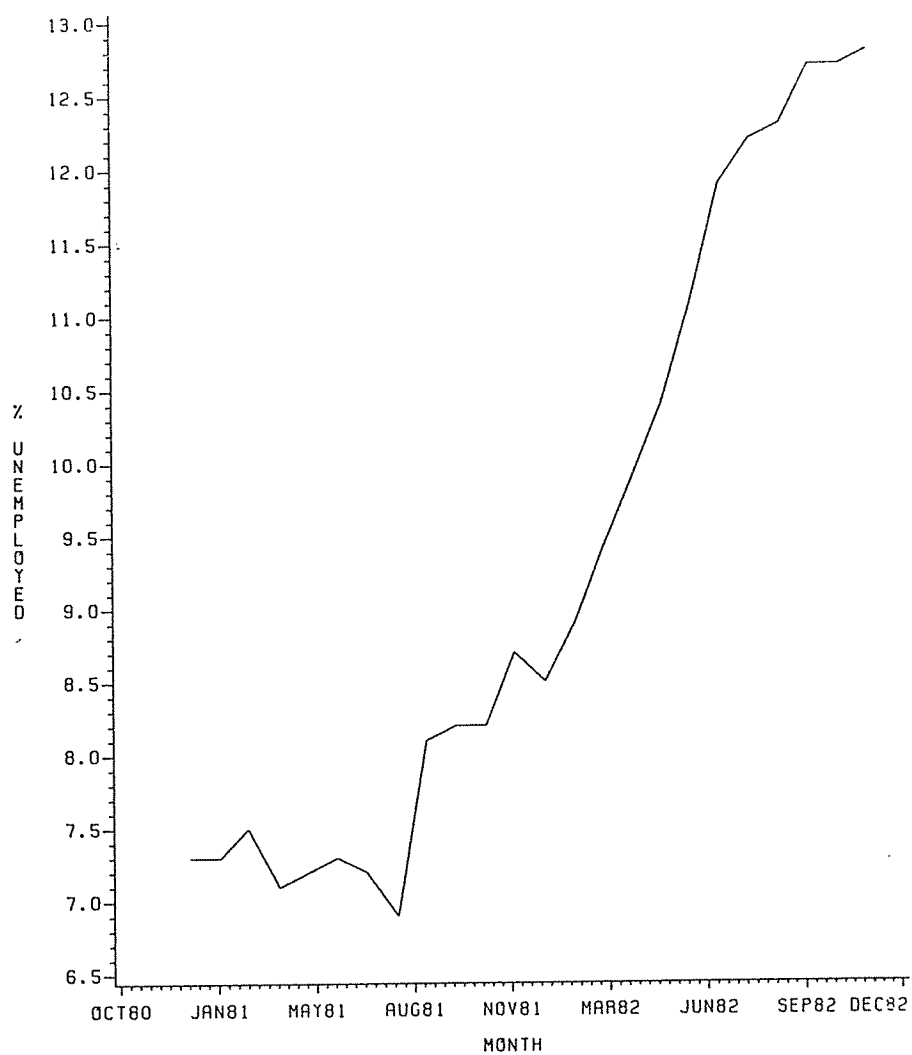


Figure 3
UNEMPLOYMENT RATE



CANADA

Figure 4a - d

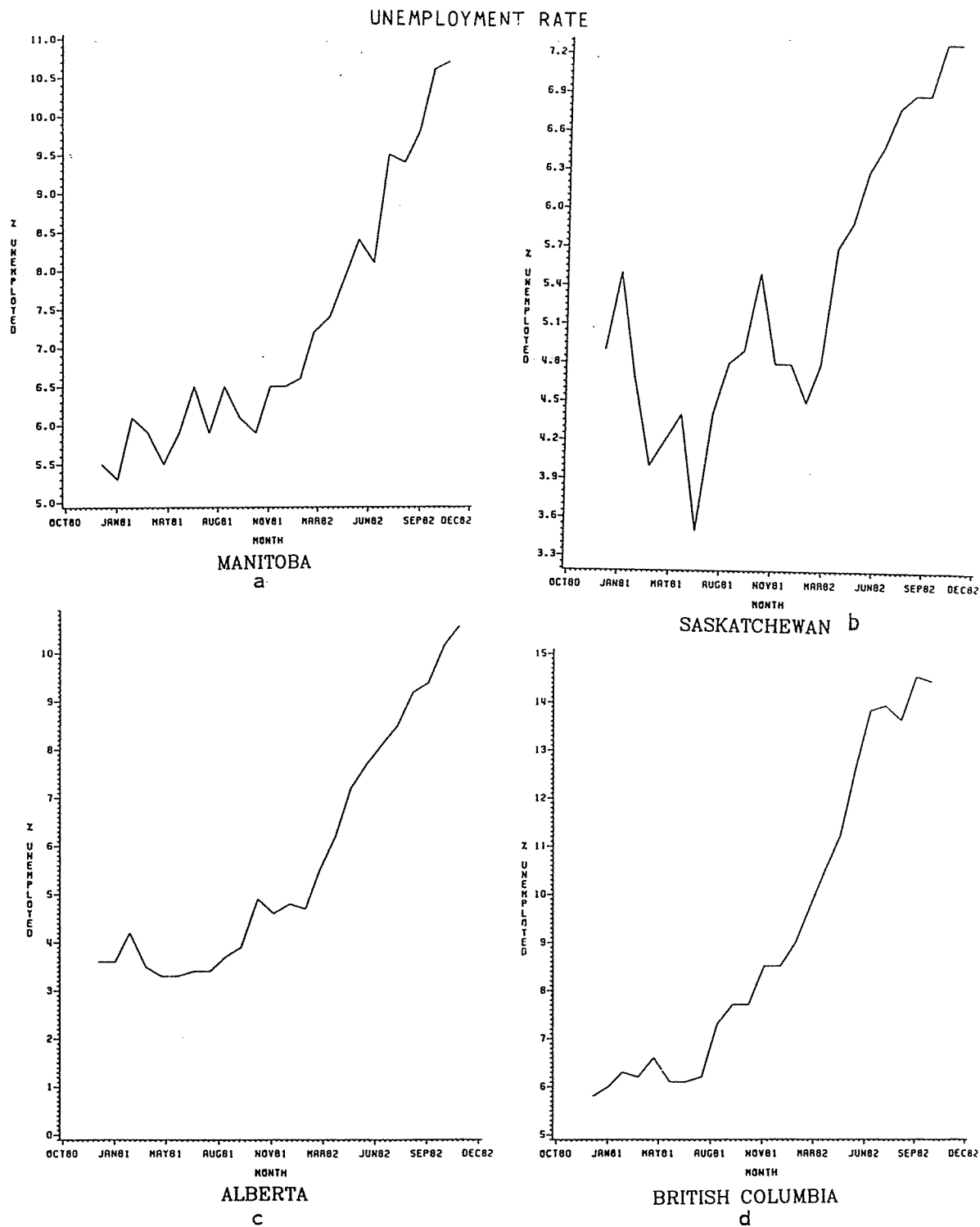
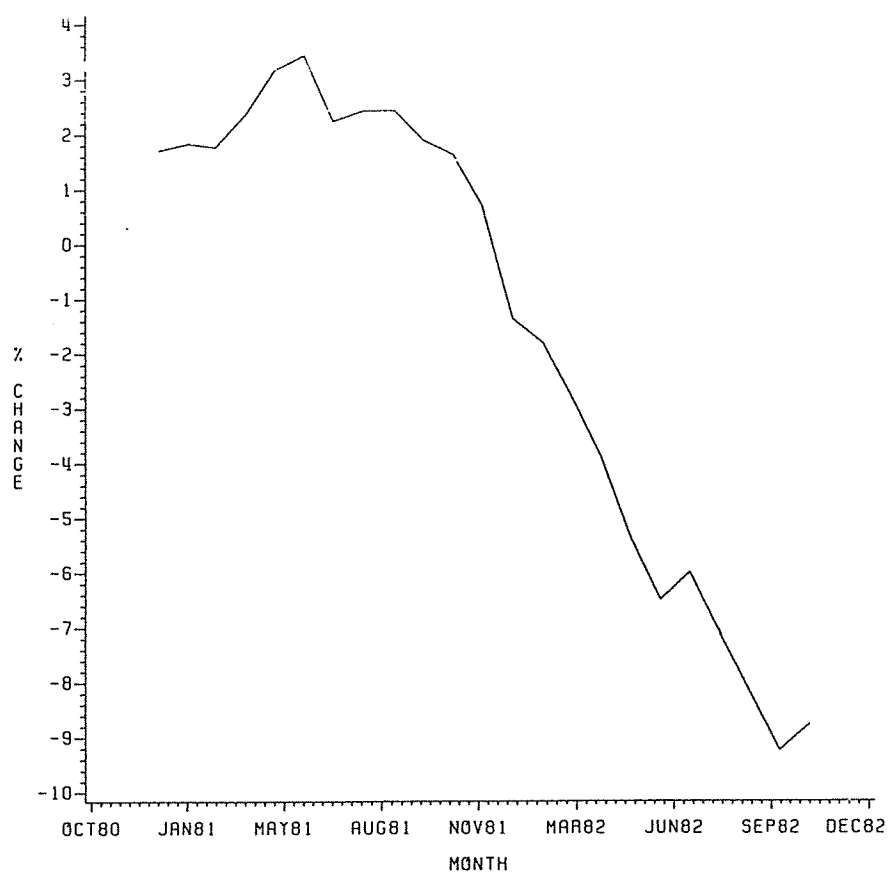


Figure 5
EMPLOYMENT INDEX
(Year to Year Change)



CANADA

Figure 6a - d

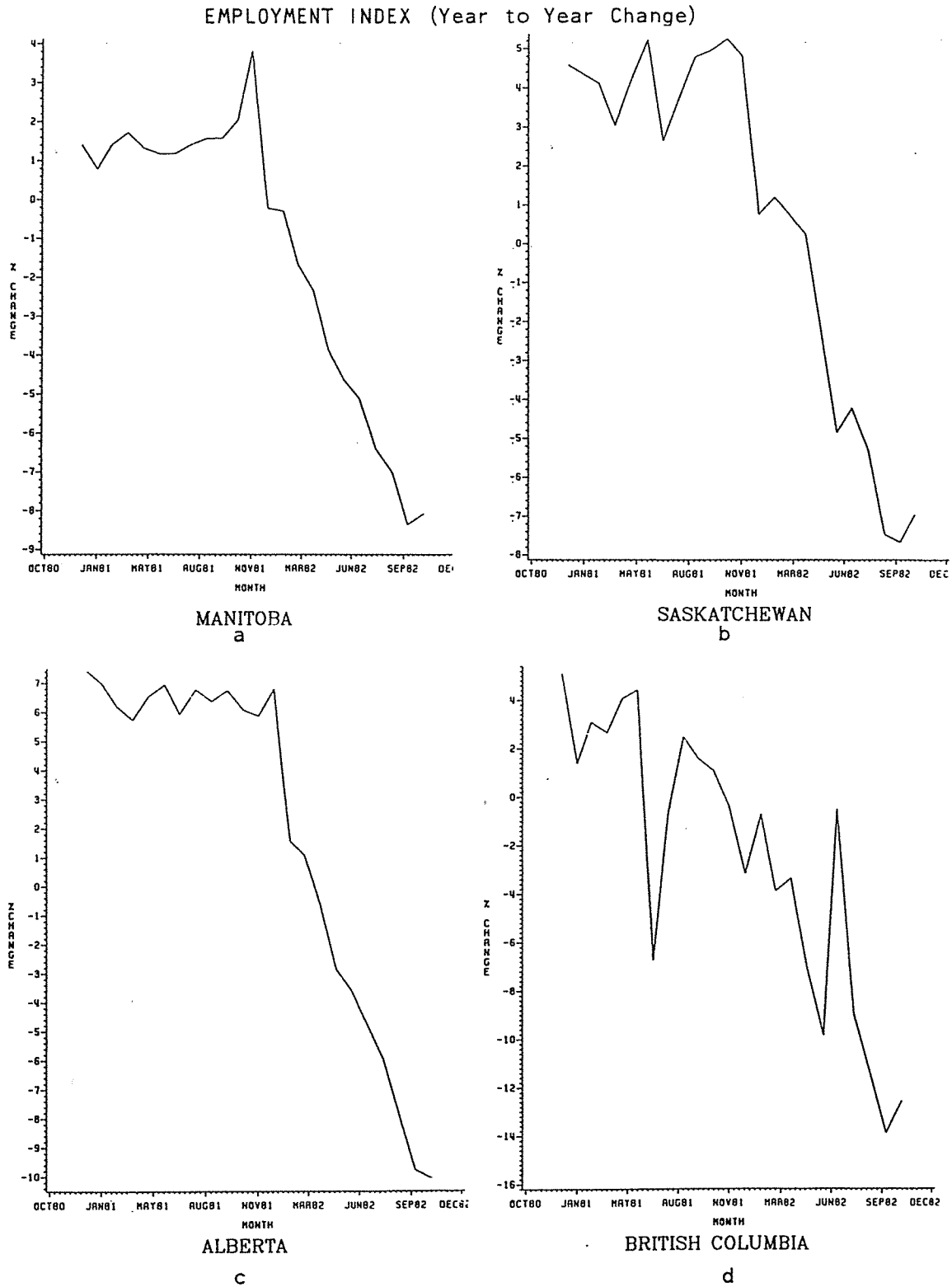
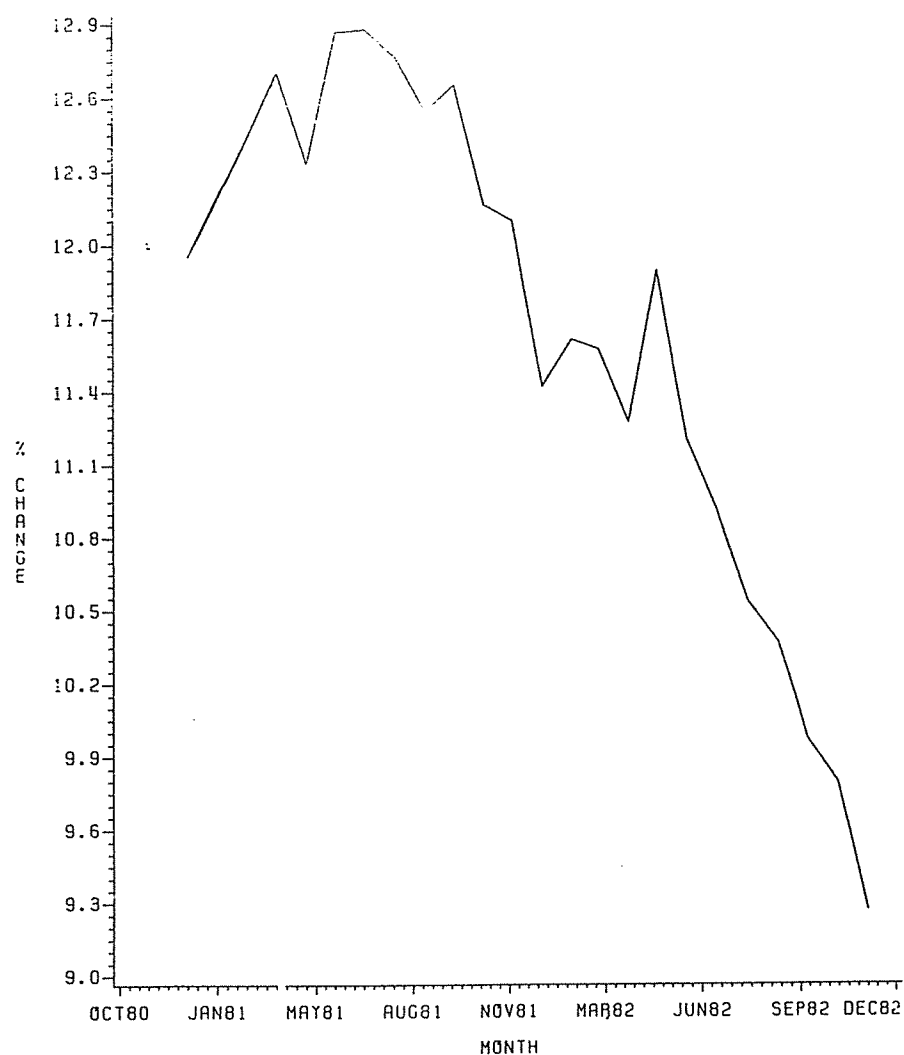


Figure 7

CPI: PERCENTAGE CHANGE FROM LAST YEAR



CANADA

Figure 8a - d

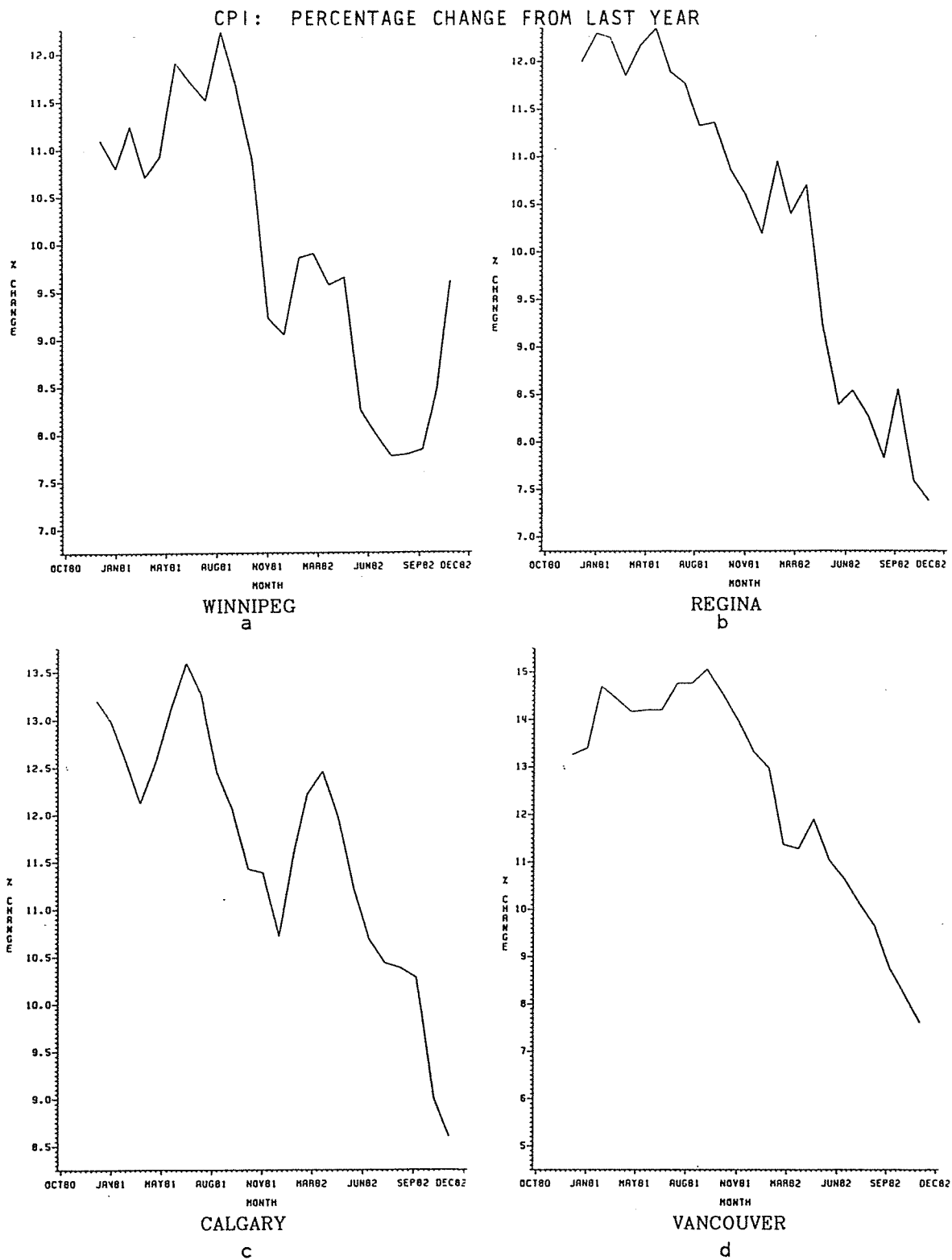


TABLE 1

Consumer Price Indexes: Change From Same Month Last Year

Month	Canada	Winnipeg	Regina	Calgary	Vancouver
(Percentage Change)					
JAN82	11.4	9.0	10.2	10.7	13.3
FEB82	11.6	9.9	10.9	11.6	13.0
MAR82	11.6	9.9	10.4	12.2	11.4
APR82	11.3	9.6	10.7	12.5	11.3
MAY82	11.9	9.6	9.2	12.0	11.9
JUN82	11.2	8.3	8.4	11.2	11.0
JUL82	10.9	8.0	8.5	10.7	10.6
AUG82	10.5	7.8	8.3	10.4	10.1
SEP82	10.4	7.8	7.8	10.4	9.6
OCT82	10.0	7.8	8.6	10.3	8.8
NOV82	9.8	8.5	7.6	9.0	8.2
DEC82	9.3	9.6	7.4	8.6	7.6

TABLE 2

Unemployment Rate: Seasonally Adjusted

Month	Canada	Manitoba	Saskatchewan	Alberta	BC
(Percent)					
JAN82	8.5	6.5	4.8	4.8	8.5
FEB82	8.9	6.6	4.5	4.7	9.0
MAR82	9.4	7.2	4.8	5.5	9.7
APR82	9.9	7.4	5.7	6.2	10.5
MAY82	10.4	7.9	5.9	7.2	11.2
JUN82	11.1	8.4	6.3	7.7	12.6
JUL82	11.9	8.1	6.5	8.1	13.8
AUG82	12.2	9.5	6.8	8.5	13.9
SEP82	12.3	9.4	6.9	9.2	13.6
OCT82	12.7	9.8	6.9	9.4	14.5
NOV82	12.7	10.6	7.3	10.2	14.4
DEC82	12.8	10.7	7.3	10.6	

TABLE 3

Retail Trade: Seasonally Adjusted

Month	Canada	Manitoba	Saskatchewan	Alberta	BC
(Thousands Of 1981 Dollars)					
JAN82	7495742	299630	319755	849817	936317
FEB82	7477055	308350	324344	881436	935905
MAR82	7398741	293007	313381	843048	920457
APR82	7324110	298034	308072	846715	898002
MAY82	7457670	293430	319774	832175	879035
JUN82	7147973	290000	299077	811894	849756
JUL82	7259765	286933	298908	786189	875875
AUG82	7249500	288364	300832	794993	839132
SEP82	7263364	290899	307571	801834	838423
OCT82	7070556	284339	297035	780966	833205
NOV82	7191280	283626	298836	808032	832302
DEC82	7350903	294905	305911	796708	857002

TABLE 4

Employment Index: Change From Same Month Last Year

Month	Canada	Manitoba	Saskatchewan	Alberta	BC
(Percentage Change)					
JAN82	-1.4	-0.2	0.8	6.8	-3.2
FEB82	-1.8	-0.3	1.2	1.5	-0.8
MAR82	-2.8	-1.7	0.8	1.1	-3.9
APR82	-3.9	-2.4	0.3	-0.7	-3.4
MAY82	-5.4	-3.9	-2.2	-2.9	-7.1
JUN82	-6.5	-4.6	-4.8	-3.6	-9.9
JUL82	-6.0	-5.1	-4.2	-4.7	-0.5
AUG82	-7.1	-6.4	-5.3	-6.0	-9.0
SEP82	-8.2	-7.0	-7.5	-8.0	-11
OCT82	-9.2	-8.4	-7.7	-9.8	-14
NOV82	-8.8	-8.1	-7.0	-10	-13
DEC82					

TABLE 5

Building Permits: Non-Residential

Month	Canada	Manitoba	Saskatchewan	Alberta	BC
(Thousands Of 1981 Dollars)					
JAN82	690466	4016	17699	106578	66860
FEB82	688099	9189	6147	220916	54911
MAR82	808124	4990	34682	307950	147583
APR82	541463	21330	15773	107326	84960
MAY82	449288	4602	18300	94433	81041
JUN82	446711	28200	18168	75978	93327
JUL82	586897	9435	9094	187418	69163
AUG82	385181	11168	10405	93708	65682
SEP82	443916	4232	18256	119402	104116
OCT82	420122	7989	9584	147528	46335
NOV82	343817	10227	8821	84040	23874
DEC82					

Errata: Permission to reprint Wassily Leontieff's "Letter to the Editor" (Western Economic Review, Vol. 1, No. 3) came from the American Association for the Advancement of Sciences rather than the American Science Association as previously stated.

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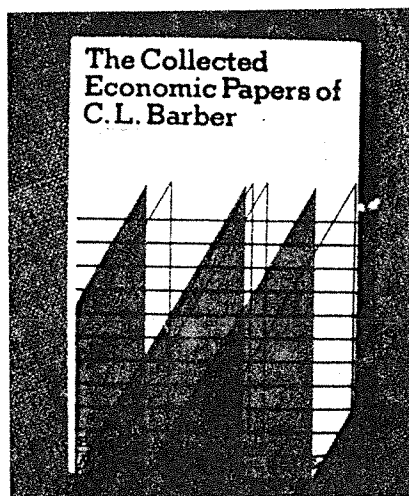
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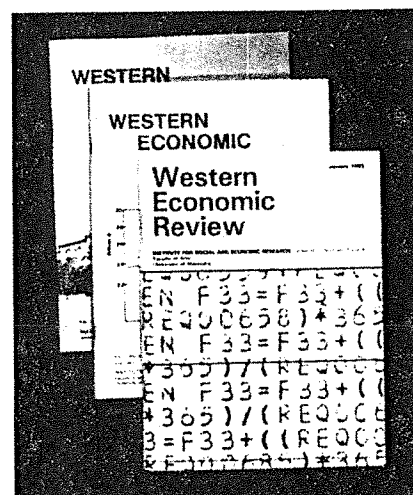
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