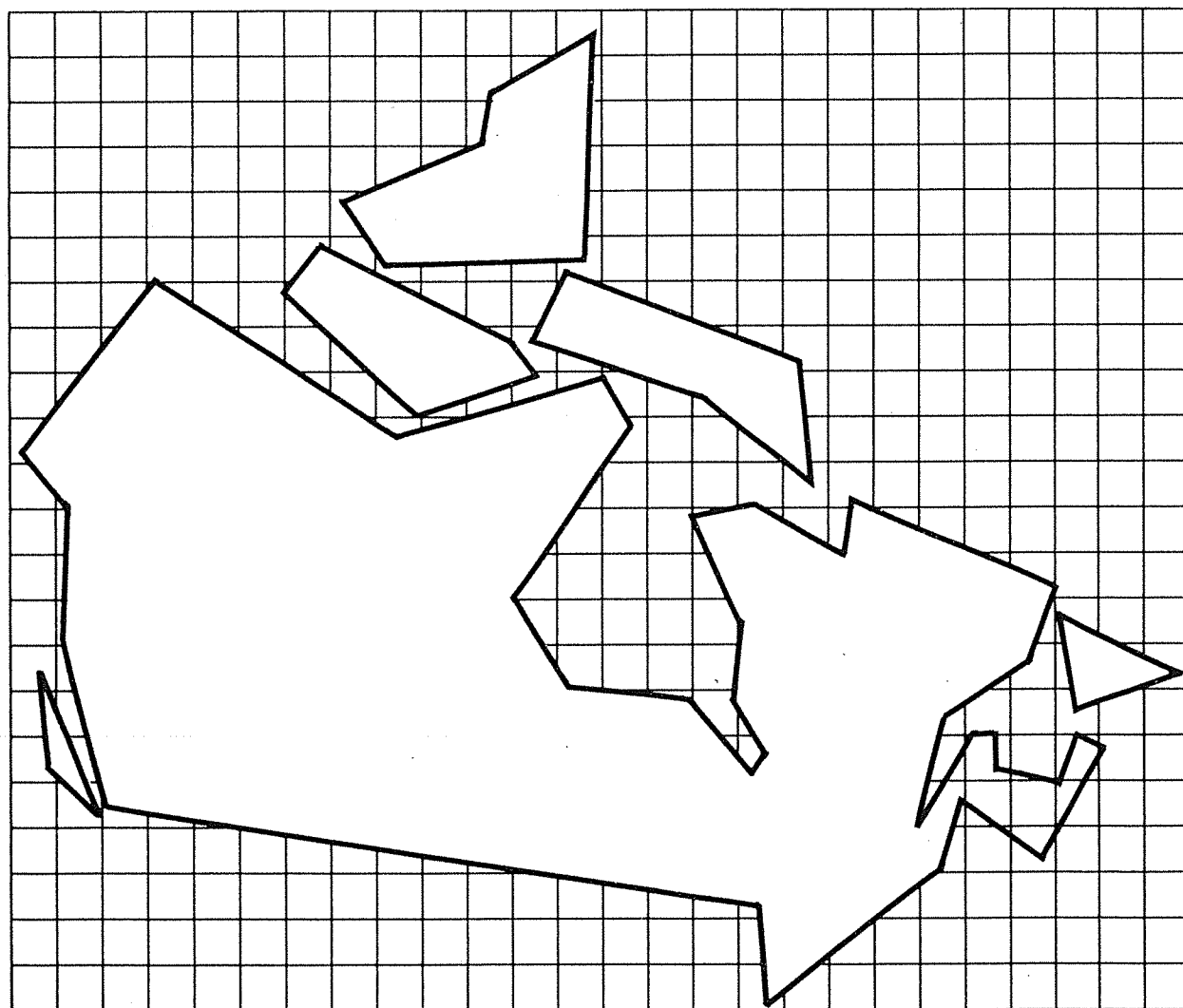


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Financial Innovation and the Control of Monetary Aggregates: The Canadian Experience

R. F. Lucas,
St. Thomas More College,
University of Saskatchewan.

This paper presents an empirical test of the proposition that control of a monetary aggregate will generate a rise in its velocity. The test is carried out utilizing the Canadian experience of controlling M1 growth from 1975:3 to 1982:3. The paper develops a specific form of the hypothesis which emphasizes the role of asset substitution between classes of chartered bank deposits. A relative asset demand equation is derived from a wealth maximization model subject to a technological transactions constraint and this equation is estimated from 1961 through 1982. The results lend support to the proposition that central bank control of M1 generated a rise in M1 velocity.

1.1 INTRODUCTION

Over the past nine years there has been extensive documentation of instability in the U.S. M1 demand for money function. Since this instability implies less predictability between money and nominal income, it raises serious doubts about the ability of the monetary authorities to control nominal income through a policy of targeting the growth rates of monetary aggregates.

The evidence on the instability of the money demand function has been reviewed recently by Judd and Scadding (1982) and they note that it has spawned two distinct research agendas. First, it is argued that financial innovation has changed the meaning of the monetary aggregates

which the authorities are attempting to control. The solutions implied by this argument are either to redefine the aggregates to include the new instruments which are substituting for M1 money in the payments mechanism, as the Federal Reserve has done recently, or to attempt to model the process of innovation thereby restoring predictability to the relationship between money and nominal income.

The second line of research has followed the suggestion that the perceived stability of the demand for money prior to 1973 was in fact a misconception. The reality, it is maintained, was that a number of issues regarding the appropriate specification of money demand were swept under the rug because the data could

not generate a resolution of them[1]. Consequently the pre-1973 debate has been reopened in the hope of generating a more robust specification of the demand for money.

In this paper I focus on the first approach and attempt to shed some light on the process of innovation utilizing Canadian data. The basic framework is that of Silber (1975, 1982) who suggests that innovation results from the attempt of banks to circumvent constraints imposed upon the banking industry or its customers. These constraints can arise either through centralized policy of the government or through the normal functioning of markets. Regardless of the source, however, this framework suggests that if changing conditions increase the shadow price of adhering to a constraint firms will have an incentive to undertake or intensify the search for new financial instruments.

One application of this constraint-induced innovation hypothesis has been carried out by Simpson and Porter (1980) who concentrate on the effects of high interest rates on the interest elasticity of M1 demand. Given higher opportunity costs of holding money, individuals will impute a higher rate of return to investment in new techniques of money management. In addition, the restriction on the payment of interest on demand deposits will induce banks to innovate in this area. This two-fold effect, it is alleged, results in new instruments such as lock boxes or ATS accounts which lower the demand for M1. Furthermore, should interest rates subsequently decline, the process will not reverse itself because the resource costs of the new techniques and instruments have been incurred. Simpson and Porter attempt to capture this effect through an interest rate ratchet variable which allows for a lag between peaks in interest rates

and subsequent innovations. Their results, however, do not suggest that this technique is sufficient to restore confidence in the M1 function.

Furthermore, it does not appear that the Simpson-Porter hypothesis can be applied to the Canadian scene. The experience of the Federal Reserve with targetting on monetary growth rates coincided with an environment of high market rates of interest and restrictions on the payment of interest on deposits. As argued above, this combination could be the trigger for innovation. Yet, this restriction is not present in the Canadian regulatory scheme.

A more fundamental interpretation of circumventive innovation is suggested by the Kaldor hypothesis (1970) that an attempt by the authorities to control the growth rate of any monetary aggregate will result in a rise in the velocity of that money as private agents substitute to another payments mechanism[2]. That is, even in the absence of restrictions on private activity, individuals will attempt to offset the effect of the control policy.

If this hypothesis is correct, it has profound implications for policy. In particular, any single-minded pursuit of a narrow monetary aggregate is destined to fail both because private agents will have an incentive to innovate to escape the cutting edge of the control and because the choice of a narrow aggregate offers the greatest scope for substitution to other monies. Thus, it would appear appropriate to provide empirical evidence for or against the Kaldor hypothesis.

The Canadian experience with controlling monetary aggregates appears to be appropriate for an empirical test of the Kaldor hypothesis for the following reasons. First, the stated policy of the Bank of Canada

from the fourth quarter of 1975 until the fourth quarter of 1982 was a gradual reduction in the rate of growth of M1 and, of equal importance, this policy was effected to a considerable degree[3]. Second, during this period there was no restriction on the payment of interest on deposits nor was there any substantial change in the regulatory environment facing the banking industry. Third, over the period in question there has been substantial financial innovation and, unlike the U.S. experience, this has occurred within the chartered banking system[4]. Finally, during this same period there has been a significant rise in M1 velocity after accounting for both trend and the rapid rise in interest rates[5].

In what follows, Section 1 discusses the nature of financial innovation in Canada. Section 2 models the Kaldor hypothesis in the context of circumventive innovation and presents a test of the hypothesis. Section 3 summarizes the main conclusions of the paper.

1.2 NATURE OF FINANCIAL INNOVATION IN CANADA[6]

The financial innovations of the past eight years which have influenced the demand for M1 have occurred both in the corporate and household sectors. In the former category, the first major innovations occurred in the mid-seventies and they took the form of new cash management techniques which allowed corporations to minimize daily working balances. One of the more important of these is the centralized concentration account which allows for consolidation of several, perhaps geographically dispersed, accounts. A report is issued to the corporate treasurer the morning following deposits and he may allocate

these funds as he sees fit. In addition, this period witnessed the introduction of regional lock boxes and preauthorized account withdrawals which reinforced the tendency to minimize working balances.

In the past few years, banks began to accept standing orders on how to employ surplus funds overnight. Two of the options offered are interest-bearing notice deposits (which are not included in the definition of M1) or the automatic pay-down of outstanding demand loans. Either of these options would tend to reduce the demand for M1 balances.

On the household side, the major innovations have been the introduction of daily interest savings accounts and daily interest chequable savings accounts. Prior to the third quarter of 1979, chartered banks calculated interest on savings accounts based on the minimum monthly balance. Consequently, funds received during the month such as salary payments were deposited typically in personal chequing accounts. With the advent of daily interest accounts in August and September 1979, individuals would have a much greater incentive to economize on demand deposits within the month.

The second innovation occurred in the latter half of 1981 with the introduction of daily interest chequable savings accounts. Prior to this change savings accounts could not as a rule be used for transactions purposes. The new accounts are actually hybrids of saving and demand in that interest is paid above a minimum balance and withdrawals, while subject to a fee, are not restricted. Since this is technically a notice deposit, it is not included in the definition of M1 and the spread of this account would tend to reduce M1 balances[7].

The combined effect of these

innovations has had a significant effect on the M1 demand function and the effect has been documented by Landy (1980). Utilizing the technique of out-of-sample dynamic forecasting, she identifies a break (downshift) about the second quarter of 1976. Daniel and Fried (1983) suggest that the increase in velocity noted by Landy can be attributed to currency substitution between Canadian and U.S. money. However, both of these studies utilize a lagged real money demand equation to derive their results. As Laidler (1982) had demonstrated, the rationale for a lagged dependent variable based on portfolio adjustment costs, while valid for an individual, cannot be applied to the market experiment since real balances are endogenous at the macro level. Consequently, he argues that the lagged real money demand equation should be interpreted as a price level adjustment equation, and as such it represents not a structural relationship but rather a mixture of a long-run money demand and some reduced form of the aggregate economy. That this relationship shows instability following a change in the operating procedure of the central bank should come as no surprise to one familiar with the policy invariance analysis of Lucas (1976).

Alternatively, Goodfriend (1984) suggests that the lagged real money demand rises from a situation where money demand adjusts completely within each period of current interest rates and transactions variables, but empirical measures of these regressors are contaminated by stochastic measurement errors. Furthermore, he demonstrates that the regression coefficients are not invariant to shifts in the interest rate generating process. It is widely recognized that the method of control of M1 which the Bank of Canada employed from 1975(4) to 1982(3)

did in fact generate a change in the process generating interest rates[8]. Consequently, we conclude that the analysis of either Goodfriend or Laidler provides sufficient grounds to reject the conventional lagged real money demand equation as a vehicle to test the hypothesis of this paper and instead we model and test asset demand equations directly.

1.3 KALDOR HYPOTHESIS AND TEST

The maintained hypothesis under investigation is that the rise in M1 velocity above trend over the period 1975(4) to 1982(3) is a result of deposit substitution initiated by chartered banks in order to circumvent the effects of a Bank of Canada policy of a gradual reduction in M1 growth. This hypothesis is motivated by a simple analysis of the velocities of currency, demand deposits and time deposits over the period in question. Table 1 demonstrates that the rapid acceleration in M1 velocity since 1975, after allowing for interest rate effects, can be attributed primarily to an increase in demand deposit velocity[9]. This result together with the fact that the time deposit velocity growth rate increases in absolute value by 150 percent over this same period indicates that significant deposit substitution has occurred since the targeting of M1 began.

The rationalization for this hypothesized attempt at circumvention is straightforward. An announced policy of a reduction in the growth rate of a particular monetary aggregate should generate a reduction in expectations of future inflation, assuming that these expectations are formed in a rational manner, and subsequently, to a decline in nominal interest rates. If, however,

TABLE 1

Estimated Rates of Growth of Currency, Demand and Time Deposit Velocities

Velocity Growth Rates (% per quarter)			
Period	Currency	Demand Deposits	Time Deposits ¹
61:4 - 68:3	0.62	0.49	-0.42
68:4 - 75:3	0.19	0.54	-0.66
75:4 - 82:3	0.65	1.14	-1.65

¹ Time deposits are defined as M3 - M1.

the stance of fiscal policy is inconsistent with this announced policy (as it was in Canada over the period in question) then rational individuals may find the monetary policy lacking in credibility and they may not revise their expectations of inflation[10]. As a result, the ensuing reduction in liquidity will raise interest rates.

As individuals perceive higher opportunity costs of holding money balances, they may attempt to substitute towards interest-bearing deposits. Substitution will be constrained by the fact that interest-bearing deposits are a less efficient payments mechanism than M1 money and individuals may look outside the banking system for alternatives.

Chartered banks have two options open to them to prevent competitors from attracting their deposits. They can pay interest on chequing accounts or they can enhance the efficiency of other types of deposits as mediums of exchange through innovation. The tradeoff banks face in choosing between these alternatives is the eight percent differential in

reserve requirements between demand and time deposits and the cost of innovation. Presumably the greater the increase in interest rates for a given cost of innovation, the greater the incentive to innovate. By increasing the monetary effectiveness of broader monetary aggregates, this innovation will lead to greater deposit substitution from M1 to time deposits then in previous periods.

The above argument suggests that the rise in M1 velocity is linked directly to deposit substitution. It follows, therefore, that to test the proposition that M1 velocity is a function of the degree of control of M1, one requires a model of the decision process by which private agents determine the relative holdings of various monies.

Following Chetty (1969) and Moroney and Wilbratte (1976), we assume that households maximize financial wealth subject to a monetary transaction constraint[11]. Formally, define financial wealth in period t as

$$W(t) = M(t) + \sum_i X_i(t) / [1 + r_i(t)], \quad (1)$$

where $M(t) \equiv$ nominal M1 money balances;

$X_i(t) \equiv$ nominal holdings of the i^{th} class of interest-bearing assets;

and $r_i(t) \equiv$ nominal interest rate of the i^{th} asset.

We assume that households have a fixed quantity of transactions services to perform and the technology by which they combine M1 money and interest-bearing financial assets is given by equation (2).

$$TS(t) = [\beta(t)M^{-\rho}(t) + \sum_i \beta_i(t)X_i^{-\rho_i}(t)]^{-\frac{1}{\rho}}, \quad (2)$$

where $TS(t) \equiv$ volume of transactions services undertaken in period t ;

$\beta(t), \beta_i(t) \equiv$ technical coefficients on money and interest-bearing assets respectively;

and $\rho, \rho_i \equiv$ substitution parameters of money and interest-bearing assets respectively.

As Moroney and Wilbratte note, the above formulation assumes that the decisions affecting the relative portfolio holdings of money and assets X_i are independent of the yields on physical and human capital; an assumption which Bisignano (1975) tests and accepts using U.S. data. If, in addition, we assume that $\rho = \rho_i = \rho_j$ for all i and j (an assumption which Moroney and Wilbratte could not reject) then we can

approximate equation (2) by its CES form.

Maximizing equation (1) subject to the CES form of equation (2) yields the following first-order condition.

$$m_i(t) = \tilde{\beta}_i^{-\sigma}(t) g_i^{\sigma}(t), \quad (3)$$

where $m_i(t) \equiv$ the optimal ratio of M1 to X_i ;

$\tilde{\beta}_i(t) \equiv \beta_i(t)/\beta(t)$, the relative technology coefficient of the i^{th} asset;

$\sigma \equiv 1/(1+\rho)$, the elasticity of substitution between M1 and X_i ;

and $g_i(t) \equiv 1/(1+r_i(t))$.

Finally, we note that there is no reason to assume that $\tilde{\beta}_i$ remains constant over time, especially given our knowledge of the trend rate of increase in M1 velocity. As a working hypothesis we assume that $\tilde{\beta}_i$ is a function of permanent income as specified in equation (4).

$$\tilde{\beta}_i(t) = \tilde{\beta}_0 Y^{\alpha_i}(t), \quad (4)$$

where $Y(t) \equiv$ permanent income

and $\alpha_i \equiv$ the difference between the coefficients on β_i and β respectively.

The justification for equation (4) is two-fold. First, the inventory approach to modelling money demand suggests that there are economies of scale associated with the level of income. We assume that these scale economies may be approximated by a rise in $\tilde{\beta}_i$ which is the relative technology coefficient of the i^{th} asset. Second, permanent income is a trend-dominated variable

and as such it may be expected to capture the effects over time of changes in the transactions demand for M1 money which are unrelated to the control of M1.

Substituting equation (4) into equation (3), taking logs and adding a dummy variable and an error term yields the equation to be estimated [12].

$$\ln m_i(t) = a_i + b_i \ln Y(t) + c_i \ln g_i(t) + \delta \text{DUM1} + \varepsilon_i, \quad (5)$$

where $a_i \equiv -\sigma \ln \tilde{\beta}_{i0}$;

$$b_i \equiv -\sigma \alpha_i;$$

$c_i \equiv \sigma$, the elasticity of substitution between M1 and X_i ;

and $\text{DUM1} \equiv 1$ for 1974:2 and 1975:4, 0 otherwise.

We can utilize equation (5) to test directly whether banks pursued a policy of deposit substitution as a result of central bank control of M1. If the hypothesis is correct, some form of structural instability of equation (5) should appear about the breakpoint of 1975:4 and with the addition of a suitable proxy variable we should be able to model this instability.

Defining M3-M1 as the interest-bearing asset and the chartered bank three-month deposit rate as the relevant interest rate, we estimated equation (5) using quarterly data from 1961:1 to 1982:3. $Y(t)$ and $g(t)$ were estimated in distributed lag form since the estimation results of lagged money demand suggests a mean lag in adjustment of actual to desired money balances of close to four quarters prior to 1975:3. The lags were estimated with a second degree polynomial. We imposed an endpoint restriction of

zero for the seventh and fourth lags for $Y(t)$ and $g(t)$ respectively.

The initial estimate by ordinary least squares yielded a D.W. statistic which indicated positive autocorrelated disturbances and likely a specification error. Two possible sources of error are the assumption that the transactions technology is of a CES type and that the portfolio relationship between M1 money and time deposits of chartered banks is independent of the yield on physical or human capital.

Utilizing equation (2) which implies a more general technology, we derived an equation corresponding to equation (5) and estimated it over the same sample period with M2-M1 and M3-M1 as the relevant alternative assets. Again, the D.W. statistic indicated positive autocorrelation and the correlation correction yielded estimates of ρ which were not significantly different from that of equation (5).

If the assets in the transactions constraint are not separable from physical or human capital, then the $m_i(t)$ which we estimated would not be invariant to changes in the yields on these assets. In order to test for this type of relationship, we included an inflationary expectations proxy in equation (5). The proxy variable is that of Riddell and Smith (1982) who generate forecasts from an ARIMA model estimated from a moving sample of 384 monthly observations beginning in 1921. The method of moving sample insures that agents form expectations on previous experience only rather than on the basis of experience over the entire sample [13]. Again, the estimation yielded an estimate of ρ not significantly different from that of equation (5). We conclude that, to the extent that our proxy accurately measures inflationary expectations, the assumption of separability of physical capital from financial

assets in the transactions technology is not the cause of the specification error [14].

Accordingly, equation (5) was reestimated using the Cochrane-Orcutt method of correction for autocorrelation [15]. Prior to the presentation of the regression results let us review the a priori restrictions on the coefficients. First, since the sum of the c coefficients is the elasticity of substitution between M1 and time deposits, it should be positive. Second, given our knowledge of the trend rates of growth of M1 and time deposit velocities, the sum of the b coefficients is expected to be negative. Third, $\tilde{\beta}_0$ is the initial estimate of the technical coefficient of time deposits relative to M1 money in the transactions technology and as such we expect it to lie in the unit interval. Since the elasticity of substitution is positive, the restriction on $\tilde{\beta}_0$ can be restated as a restriction that the constant is nonnegative.

Consider the first row of Table 2 which presents the results of the regression of equation (5) over the sample period 1962:4-1975:4. The constant is positive and highly significant. The coefficients on current and lagged permanent income are significant and their sum is negative as expected but the first two coefficients are positive. This result tends to support the view that individuals view M1 money, among other things, as a temporary abode of purchasing power until it can be allocated in an optimal fashion among all assets.

The coefficients on current and lagged interest rates are significant and possess the correct sign. The sum of these coefficients which represents the elasticity of substitution between M1 and time deposits is 2.91. This compares to an elasticity of 6.09 between M1 and

chartered bank personal savings deposits obtained by Short and Villanueva (1977), using annual Canadian data over the period 1951-1973. The calculated initial value of $\tilde{\beta}$ is 0.26 which satisfies the a priori restriction.

Since rho is insignificant from one of the 5 percent level, the equation was reestimated in first difference form. The individual lag coefficients and the mean lags are statistically identical as in the elasticity of substitution. We conclude that equation (5) is a robust specification of the relative asset demand of M1 and M3-M1 over the sample period in spite of the restrictive assumptions used in its derivation.

Row two of Table 2 presents the results of the regression over the post-policy-change sample. The results indicate significant structural instability. The constant is of the wrong sign and together with the elasticity of substitution of 4.44 implies an initial value of $\tilde{\beta}$ of 1.67. Also, the sum of the b coefficients is positive counter to a priori expectations. The calculated F statistic of 11.01, utilizing the results of row three, exceeds the one percent critical value of 4.11, a value which supports a rejection of the null hypothesis of structural stability.

Perhaps the most striking result of this regression is the fact that the coefficient of serial correlation is insignificant for the post-1975:4 sample. Given the difficulty in eliminating autocorrelation in the sample 1962:4 - 1975:4, this is indeed surprising. Since the total sample still exhibits autocorrelation, one might be tempted to explain the disappearance of autocorrelation with technical arguments such as problems with the number of degrees of freedom. However, we are unable to find any other

TABLE 2
Regression Results of Equation (5)

Period	Coefficients ¹										Summary Statistics ²					Calculated Parameters				
	a	b ₀	b ₁	b ₂	b ₃	b ₄	b ₅	b ₆	c ₀	c ₁	c ₂	c ₃	δ	R ²	S.E.E.	rho	σ	$\tilde{\theta}_0$	Σb	α
1962:4	3.94	1.60	0.61	-0.13	-0.61	-0.83	-0.83	-0.54	1.09	0.87	0.62	0.33	0.05	0.99	0.0167	0.77	2.91	0.26	-0.70	0.24
1975:4	(8.50)	(2.43)	(2.14)	(10.01)	(3.31)	(3.01)	(2.91)	(2.87)	(3.06)	(4.30)	(2.60)	(1.72)	(4.26)			(8.13)				
1977:3	-2.27	5.00	2.15	-0.03	-1.39	-2.10	-2.11	-1.41	0.67	1.33	1.44	1.00		0.98	0.0229	0.05	4.44	1.67	0.16	-0.04
1982:3	(0.42)	(4.16)	(3.71)	(0.21)	(5.97)	(5.33)	(5.11)	(5.00)	(1.93)	(5.90)	(6.68)	(6.26)				(0.20)				
1962:4																				
1975:4	3.63	3.34	1.36	-0.12	-1.10	-1.57	-1.55	-1.03	0.93	1.24	1.18	0.77	0.05	0.99	0.0216	0.83	4.11	0.41	-0.66	0.16
1977:3	(5.46)	(5.27)	(4.90)	(6.83)	(6.46)	(6.05)	(5.92)	(5.85)	(3.89)	(9.01)	(7.43)	(6.02)	(3.66)			(12.67)				
1982:3																				

¹ All numbers in parentheses are absolute values of t-statistics.

² rho is the Cochrane and Orcutt estimate of AR1 serial correlation.

twenty quarter sample which does not possess autocorrelation. Consequently we interpret the disappearance of autocorrelation as evidence of a fundamental change in the actions of private agents resulting from the policy change of the Bank of Canada which occurred in 1975.

If the hypothesized relationship between control of the money supply and innovations in the underlying transactions technology is valid, then it should be possible to model these innovations with an additional variable which reflects the degree of control. In other words, equation (5) is incompletely specified for the post-control sample and we require another variable which measures the degree of central bank control of M1.

The hypothesis suggests that chartered banks will have an incentive to utilize costly resources to effect deposit substitution when they perceive a reduction in the rate of growth of money relative to some average of past rates. There are many reasons for believing that this relationship may be subject to significant lags. Banks will wish to insure that current down-turns reflect a permanent reduction in the rate of growth of money before undertaking expenditures for innovations. There may be delays before research and development efforts culminate in innovations. Also, bringing the new technology on line may involve significant lags. Consequently it seems appropriate to model these effects with a variable which provides flexibility in the relationship between the rate of growth of money and innovations.

With the above in mind, we propose a variable defined as the difference between two moving averages of the rate of growth of M1[16]. Formally, let μ denote the quarterly growth rate of M1. We define $S(t)$ by[17]

$$S(t) = \frac{1}{m} \sum_{i=t-m+1}^{i=t} \mu_i - \frac{1}{n} \sum_{j=t-n+1}^{j=t} \mu_j, \quad (6)$$

$m > n.$

Since m exceeds n , a positive S reflects a sustained reduction in the rate of growth of M1 which, by hypothesis, should result in deposit substitution from M1 to time deposits.

The evidence in Table 2 indicates that the structural change in the relative asset demand equation is centered primarily about the constant term and by implication β_0 . Accordingly, we propose as a working hypothesis that β_i is a function of S as well as permanent income. Formally, we assume that

$$\tilde{\beta}_i(t) = \tilde{\beta}_0 Y^{\alpha_i(t)} e^{\gamma_i S(t)}, \quad (7)$$

where $\gamma_i > 0$.

That is, a rise in S will generate innovations which, by assumption, impact on the relative technology coefficient of time deposits. Substituting equation (7) into equation (3), taking logs, and adding a dummy variable and error term yields

$$\begin{aligned} \ln m_i(t) = & a_i + b_i \ln Y(t) \\ & + c_i \ln g_i(t) \\ & + \delta \text{DUM1} + d_i S(t) \\ & + \varepsilon(t), \end{aligned} \quad (8)$$

where $d_i = -\sigma \gamma_i$.

A priori, we expect d to be zero for the period 1962:4 - 1975:4 and negative for the period 1977:3 - 1982:3.

TABLE 3

Regression Results of Equation (8)

Period	Coefficients ¹												Summary Statistics ²					Calculated Parameters			
	a	b ₀	b ₁	b ₂	b ₃	b ₄	b ₅	b ₆	c ₀	c ₁	c ₂	c ₃	δ	d	R ²	S.E.E.	rho	σ	\bar{b}_0	Σb	α
1962:4	4.06	1.50	0.57	-0.13	-0.58	-0.80	-0.77	-0.51	0.98	0.75	0.51	0.26	0.04	-0.61	0.99	0.0171	0.78	2.49	0.20	-0.72	0.18
1975:4	(7.78)	(2.20)	(1.91)	(8.95)	(3.09)	(2.79)	(2.69)	(2.64)	(2.45)	(2.63)	(1.71)	(1.17)	(2.68)	(0.68)			(8.88)				
1977:3	3.66	3.60	1.47	-0.12	-1.18	-1.69	-1.67	-1.01	0.73	0.94	0.89	0.58		-6.25	0.99	0.0104	-0.56	3.14	0.31	-0.68	0.22
1982:3	(2.33)	(9.31)	(7.98)	(3.06)	(14.51)	(12.65)	(12.04)	(11.74)	(6.56)	(12.15)	(9.49)	(7.85)		(8.43)			(3.03)				
1962:4	4.02	2.87	1.15	-0.13	-0.97	-1.39	-1.36	-0.90	0.81	1.03	0.97	0.63	0.03	-1.78	0.99	0.0211	0.92	3.43	0.30	-0.72	0.21
1975:4	(3.32)	(3.80)	(3.42)	(4.11)	(5.05)	(4.61)	(4.47)	(4.40)	(3.33)	(6.04)	(5.26)	(4.49)	(1.89)	(2.31)			(19.26)				
1982:3																					

¹ All numbers in parentheses are absolute values of t-statistics.² rho is the Cochrane and Orcutt estimate of ARI serial correlation.

TABLE 4

Regression Results of Equation (8)¹

Period	Coefficients ²											Summary Statistics ³				Calculated Parameters					
	a	b ₀	b ₁	b ₂	b ₃	b ₄	b ₅	b ₆	c ₀	c ₁	c ₂	c ₃	δ	d	R ²	S.E.E.	rho	σ	\tilde{g}_0	Σb	α
1962:4	3.94	1.60	0.61	-0.12	-0.61	-0.83	-0.81	-0.53	1.09	0.87	0.62	0.33	0.05	0	0.99	0.0172	0.77	2.91	0.26	-0.70	0.24
1975:4	(8.41)	(2.40)	(2.12)	(9.89)	(3.27)	(2.98)	(2.88)	(2.83)	(3.02)	(4.26)	(2.57)	(1.70)	(4.22)				(8.66)				
1977:3	3.66	3.60	1.47	-0.12	-1.18	-1.69	-1.67	-1.10	0.73	0.94	0.89	0.58		-6.25	0.99	0.0104	-0.56	3.14	0.31	-0.68	0.22
1982:3	(2.33)	(9.31)	(7.98)	(3.05)	(14.51)	(12.65)	(12.04)	(11.74)	(6.55)	(12.15)	(9.49)	(7.85)	(8.43)				(3.03)				
1962:4	3.90	3.0	1.21	-0.13	-1.01	-1.44	-1.41	-0.93	1.02	1.05	0.88	0.54	0.05	-6.19	0.99	0.0189	0.83	3.49	0.33	-0.71	0.20
1975:4	(6.84)	(5.43)	(5.0)	(8.45)	(6.81)	(6.34)	(6.18)	(6.11)	(4.91)	(8.40)	(5.87)	(4.43)	(4.30)	(4.79)			(12.5)				
1977:3																					
1982:3																					

¹ These results are obtained under the constraint that d = 0 for the period 1962:4 to 1975:4.² All numbers in parentheses are absolute values of t-statistics.³ rho is the Cochrane and Orcutt estimate of AR(1) serial correlation.

Equation (8) was estimated for the periods in question and the results are presented in Table 3. For the period 1962:4 - 1975:4, the coefficient on S is insignificant as hypothesized. The constant term standard error declines but there is no appreciable change in the lag structure or sum of lags on permanent income. The last two lags on the interest rate turn insignificant. The standard error of the regression shows little change.

For the period 1977:3 - 1982:3, the coefficient on S possess the correct sign and is highly significant. The constant term turns positive and is highly significant. The estimate of β_0 accordingly declines to 0.31 from 1.67. The standard errors of the b coefficients decline appreciably and the sum of these coefficients is now negative. The standard error of the equation declines by 55 percent. The addition of S also induces negative serial correlation.

Since the results in Table 3 indicate that the innovation proxy performs as hypothesized, we reestimated equation (8) with the restriction that $d = 0$ for the period 1962:4 through 1977:4. The results of these regressions are presented in Table 4.

A comparison of rows one and two reveals surprising similarity in the underlying parameters of the transactions services technology. The elasticity of substitution is 2.91 in the first sample and 3.14 in the second sample. The standard errors are 0.68 and 0.41 respectively. The initial values of β are of the correct magnitude and are very close. The sum of the b coefficients should be considered identical.

Given the rather large differences in technology between the two samples implied by Table 2, we consider the conformity achieved by the addition of S to be quite

remarkable. Recall that we assumed innovations impact on the relative technology coefficient rather than on the elasticity of substitution. Also, our proxy variable for innovations could be considered crude at best. Yet, in spite of these restrictive assumptions, we are able to achieve a high degree of conformity in parameters over the two samples. We conclude that this evidence supports the hypothesis that the rise in the velocity of $M1$ above trend over the past eight years can be linked causally to the decision of the Bank of Canada to target on the growth rate of $M1$.

1.4 CONCLUSIONS

The experience of Canada with a central bank policy of targeting $M1$ growth suggests that there may be a fundamental difficulty in controlling the rate of inflation through a policy of targeting on this variable. The evidence presented in this paper indicates that the degree of control of $M1$ growth does have a significant role to play in explaining the rise in the velocity of $M1$ and, as a consequence, the inflation rate has taken much longer to respond to restrictive monetary policy than most observers would have predicted prior to the policy enactment.

It would appear that the noninterest-bearing characteristic of $M1$ plays an important role in explaining this causal link since it may, on occasion, provide chartered banks with an incentive to increase the monetary effectiveness of other classes of deposits. However, this interpretation is not necessarily warranted. Recall that Canada is free from restrictions on the payment of interest on any type of deposit. Accordingly, chartered banks could have initiated interest

payments on demand deposits in the face of sharply higher market rates of interest. We argued that the differential reserve requirement probably influenced the decision to innovate rather than pay interest. Yet, as long as the option of innovation is open to the private sector, there will always be the possibility of nonprice competition through the enhancement of the transactions efficiency of deposits.

The characteristic which appears to be critical in explaining the rise in M1 velocity is the scope of the targeted aggregate. A narrow definition insures a wide selection for deposit substitution through innovation. Therefore, the case for control of a narrow aggregate would appear to be weakened considerably by the evidence presented in this paper.

NOTES

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- [1] See Laidler (1980) for a discussion of some of these issues.
- [2] Kaldor appears to be the first to present this view although it has been proposed as well by Holland (1975) who coined the phrase circumventive regulation. Note that this interpretation inverts the adage that expansionary monetary policy is akin to "pushing on a string."
- [3] The annual rate of growth of M1 from 1975:3 to 1982:3 was 7.3, 8.7, 10.2, 7.9, 4.6, 4.3, and 0.1 percent respectively. This compares to an average annual rate of 13.1 percent over the previous five years.
- [4] See Landy (1980) and Silber (1982) for a discussion of the innovations in the U.S.
- [5] A regression of the log of M1 velocity on a constant term, the log of the three-month treasury bill rate, and time between 1954 and 1982 indicates that the quarterly growth rate in M1 velocity average 0.47 percent from 1954:4 to 1975:3 and 1.1 percent since the advent of targetting.
- [6] This section draws heavily upon Freedman (1983) and Landy (1980). The interested reader is referred to these articles for a more complete discussion. See also Courchene (1983).
- [7] The reluctance of banks to offer pure interest bearing chequing accounts is no doubt due to the differential of eight percent in the reserve requirement on these and savings accounts.
- [8] The method of control involved operating directly on interest rates to insure that money demand would equal the target supply and allowing supply to respond to demand.
- [9] All variable definitions and data sources can be found in the Appendix.
- [10] For a formal derivation of this proposition the reader is referred to Sargent and Wallace (1981).
- [11] This interpretation is due to Moroney and Wilbratte (1976). In the original article Chetty assumed a CES utility function and maximized utility subject to a wealth constraint. The difficulty with this interpretation is that it assumes the only motive for holding assets is to facilitate transactions services.
- [12] The addition of a dummy variable is necessitated by the apparent willingness of the Bank of Canada to accommodate the temporary increase in demand for liquidity which occurs dur-

ing a postal strike. A strike tends to delay households' payments to firms but it does not interrupt some of the firms' financial obligations such as payrolls. Consequently, an uncorrected relative money demand will tend to underestimate relative money at the time of a strike.

[13] See Friedman (1979) for the theoretical argument for this type of approach.

[14] Moroney and Wilbratte also report positive autocorrelation in their estimates of equation (5) for the U.S. using government debt and corporate debt as well as time deposits of commercial banks. Nor are they able to explain the cause of the specification error.

[15] A reviewer noted that this correction implies a common-factor restriction which should be tested directly. Godfrey (1978) suggests a Lagrange multiplier test as follows. Using OLS, regress the residuals from the estimation of equation (5) (with the correction for autocorrelation) on a lagged dependent variable and all independent variables with lags extended one period. The resulting R^2 times the number of observations is χ^2 with two degrees of freedom (equal to the number of independent variables). The null hypothesis is that the common-factor restriction holds. The value of the test statistic is 4.83 which compares to a critical value of 5.99 at the 95 percent confidence level. Hence we cannot reject the hypothesis that the data supports the common-factor restriction.

[16] In an earlier attempt we constructed a ratchet variable utilizing rates of growth of M1 of a type proposed by Simpson and Porter (1980). The use of a ratchet variable seems warranted because once the costs of an innovation have been incurred, it will be maintained even if the forces leading to its adoption are mitigated. However, we found that the use of this type of variable results in insignificant b coefficients. We interpret this result as evidence of multicollinearity between permanent income and the ratchet variable, as might be expected, since both variables are dominated by trend. Consequently, we followed the approach described in the text.

[17] The values of m and n were determined by the data. The best results were obtained with m equal to 20 and n equal to 5.

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APPENDIX

All data in this study were supplied by CANSIM. Interest rate observations and money holdings are quarterly averages of seasonably adjusted monthly data.

- M1: Currency and demand deposits - Series B1609.
- M3: Currency and all chequable, notice, and personal term deposits plus Canadian dollar non-personal fixed term deposits and bearer term notes - Series B1603.
- r: Chartered Bank 90-day deposit rate - Series B14018.
- rp: Prime Corporate 90-day paper rate - Series B14017.
- rt: 90-day Treasury Bill yield - Series B14007.
- Y: The permanent income series was constructed using de Leeuw's (1965) formula:
- $$Y(t) = 0.114 \sum_t (0.9)^t (y)_{-t}, \quad t = 0 \dots 19,$$
- where y is GNP deflated by the implicit price deflator.
- GNP: Gross national product at market prices - Series D40252.
- P: GNP Deflator - Series D40625.

Aquaculture of Atlantic Salmon in Canada — Opportunities and Constraints

M. Kabir,
Assistant Professor of Economics,
University of New Brunswick.

N. B. Ridler,
Professor of Economics,
University of New Brunswick.

This paper examines the economic aspects of farming the Atlantic salmon. This is of interest because farming of Atlantic salmon is expanding rapidly; output in Canada reached 174 tonnes in 1984 from a mere 6 tonnes in 1979. Norway's output might reach 50,000 tonnes in 1986 compared with 98 tonnes in 1971.

This paper focuses on the feasibility of aquaculture, with as point of departure the technology of salmon culture and potential financial feasibility.

2.1 INTRODUCTION

The Science Council of Canada has identified aquaculture as a leading sector of new technology, yet a sector in which Canada lags behind most industrialized countries. This paper examines some economic aspects of the culture of Atlantic salmon, the fastest growing cultured species in Atlantic Canada, and the one that offers greatest potential given the sharp decline in wild salmon catch. Alternative techniques of culturing Atlantic salmon have been analyzed in terms of financial and biological feasibilities. Sea-cage salmon farming which is a fast expanding technique in Europe as well as in Canada seems to be the most practical technique. An examination of various market parameters indicates

that the demand (both domestic and export) for fresh and frozen Atlantic salmon is highly elastic. This suggests that the market can absorb additional quantities without any significant reduction in price. The paper also comments on the possible economic impact of fish-farming on the economy of the region.

The Canadian fishing and fish processing industries must be set in a regional context in order to assess its relative importance. In terms of their contribution to the Gross National Product, these industries are relatively unimportant nationally. But, in Atlantic Canada, the industry is important, accounting for about 10 percent of total employment and 13 percent of total value added in the region (Statistics Canada, various).

Canada's Atlantic coast fisheries remain in a precarious economic position; unemployment and under-employment, low and in some provinces declining catch per fisherman, and significant government subsidies are symptomatic of the Atlantic fisheries. As a common property resource facing external diseconomies and subsequent over-fishing, Atlantic Canada's fisheries have been described as "the most troubled industry of Canada's economically most troubled region." [1]

Recently, aquaculture, the cultivation of fish and shellfish in managed systems, has received increasing attention as an alternative source of fish. Several species are currently cultivated on the east coast of Canada. The more important ones are the Atlantic salmon, rainbow trout, American lobster, American oyster, and blue mussel. Aquaculture, however, plays a minor role in Canada, with only 6,000 tonnes (metric tonnes) of output in 1983 compared with 180,000 tonnes in the United States and 950,000 tonnes in Japan [2]. The small role played by aquaculture in Canada is in part due to the large resource base of the marine fisheries and the excess supply over domestic needs. However, certain species that are threatened by over-fishing could be farmed to complement the commercial fisheries.

The objective of this paper is to examine some economic aspects of the farming of one species - the Atlantic salmon. Aquaculture of Atlantic salmon is of interest for several reasons. First, farming of Atlantic salmon is expanding rapidly; output in Canada reached 174 tonnes in 1984 from a mere 6 tonnes in 1979 [3]. Norway's output might reach 50,000 tonnes in 1986 compared with 98 tonnes in 1971 [4]. Norway's success in farming the Atlantic salmon is perhaps the most significant event in the history of European

aquaculture. Secondly, the wild catch of Atlantic salmon has declined dramatically, Canadian landings fell from 1,894 tonnes in 1973 to 1,221 tonnes in 1983, as shown in Table 1. Canada has now imposed a total ban on commercial fishing of Atlantic salmon to save the species from extinction, and to rebuild fish stocks. The world wild catch has declined from 14,800 tonnes in 1973 to less than 10,000 tonnes in 1983 (F.A.O., various). Thirdly, Atlantic salmon is a high value species, farming of which, while risky, can be profitable. In Norway salmon farming is regarded as a "miracle sector" second only to petroleum, with annual rates of returns on farms sometimes exceeding 100 per cent of the investment [5].

This paper focuses on the feasibility of aquaculture, with as point of departure the technology of salmon culture and potential financial feasibility. The second section provides an overview of the Atlantic salmon market and estimates various parameters for the market, while the third section uses economic criteria to examine the impact of salmon farming.

2.2 THE TECHNOLOGY AND FEASIBILITY OF SALMON CULTURE

Of all the techniques for cultivating salmon the least costly is that of sea ranching. Juvenile fish (smolt) are released to freely forage in the wild, until as adults, they will instinctively return to their stream of origin where they are harvested. The profitability of this technique depends on the rate of return of adult fish. A return rate of 17.6 percent of pink salmon smolts has been recorded, but Atlantic salmon have typically much lower rates of return (of approximately one percent). A return rate of five

TABLE 1

Canadian Landings and Exports of Atlantic Salmon 1973-83

Year	Landings					Exports				
	Volume ¹ (tonnes)	Value (\$000)	Landing Price Index	Consumer Price Index ²	Volume (tonnes)	Fresh		Frozen		Export Price Index
						Volume (tonnes)	Value (\$000)	Volume (tonnes)	Value (\$000)	
1973	1,894	3,470	100.0	100.0	79		264	621	2,193	100.0
1974	1,931	3,658	103.4	110.8	125		420	292	974	94.6
1975	1,929	3,618	102.3	122.8	82		338	467	1,714	103.9
1976	1,909	4,270	122.1	132.0	57		295	596	3,554	168.8
1977	1,856	5,488	161.4	142.5	73		437	575	3,434	169.1
1978	1,217	4,455	199.8	155.2	83		494	363	2,067	161.2
1979	943	3,713	214.9	169.5	103		870	175	1,347	218.1
1980	2,393	8,966	204.5	186.7	129		927	474	3,681	219.8
1981	2,074	7,608	200.2	210.0	198		1,521	402	2,667	187.8
1982	1,464	5,606	209.0	232.7	124		988	267	1,534	162.6
1983	1,221	4,833	216.0	246.1	152		1,392	147	761	146.7

Source: Calculated from the Department of Fisheries and Oceans, Annual Statistical Review of Canadian Fisheries, Ottawa: various issues; and Statistics Canada, Exports by Commodity and Country, Catalogue Nos. 65-202.

¹ Dressed or round weight

² Consumer Price Index includes all consumer goods and services.

percent is the minimum to be financially feasible[6]. Early indications of Icelandic attempts to commercially ranch Atlantic salmon appear promising. Rates of return have fluctuated between one to 16 percent with an average of six percent of released smolt returning as marketable salmon. If other countries follow Canada's example with a moratorium on commercial fishing of Atlantic salmon, return rates should increase, with improved prospects for profitable ranching.

The most capital intensive technique is that of enclosures. Water between islands, or in inlets, is enclosed by man-made or natural barriers. The salmon are raised for the 18 months until harvested within the enclosures. The largest enclosure is that of Mowi's Veloy plant in western Norway with a 200,000 m³ capacity and an annual salmon production of 1,000 tonnes. While the initial capital cost is high, operating costs are reduced by the semi-permanence of the barriers, although Mowi has found it necessary to provide constant aeration through pumping. A limitation is that few suitable sites exist, so that there are only four or five such farms in Norway and one in New Brunswick. The most common technique employed in Canada, Norway and Scotland is that of sea-cages. The young smolt are put into cages (usually 500 m³ in Norway) that are located in sheltered inlets of temperate sea-water. Sea cages must be robust enough to withstand inclement weather, but are relatively cheap to install. Unlike enclosures, however, they are vulnerable to predators such as seals which caused considerable damage to one farm in New Brunswick, and humans who have been blamed for the disappearance of fish in Scotland. Moreover, Norway with its temperate sea-water (between 4° and 18°C) is more fortunate than Atlantic Canada,

where water temperature could become lethally cold. The danger of cold water can be offset by another technique that uses land tanks for salmon cultivation. The water within the land can be heated, but they are more expensive to install than sea-cages; moreover, heating and pumping costs are high. There is one farm in New Brunswick using tanks.

The biological conditions for farming Atlantic salmon in Canada are less propitious than in Norway, largely because of water temperatures, nonetheless the area suitable for farming could at a conservative estimate produce 10,000 - 15,000 tonnes a year[7]. This is approximately ten times the Canadian wild catch of Atlantic salmon in 1983. Growth of the industry has been hindered primarily by lack of smolt, but the newly established hatchery (a Norwegian subsidiary) should alleviate that shortage. The 2.5 million dollar hatchery anticipates producing half a million smolt in 1986. As a result, output of farmed salmon should reach 1,200 tonnes in 1987, with an immediate potential of 2,000 - 3,000 tonnes (at a value between \$14 and \$21 million). A further handicap facing salmon farming has been reluctance of private financial institutions to provide credit. This is not surprising given the infancy and riskiness of the business. However, for two years operating costs exceeded revenues, and for a small sea-cage operation of 3,000 m³, it is only in the fifth year that capital and operating costs (even when undiscounted) are covered[8]. With a discount rate of 20 percent, capital costs and operating losses are only recouped in the seventh year. Credit is therefore needed to face this negative cash flow. Fortunately government assistance is more available now that the cash flow problem has been recognized. It should be noted that

such assistance has been available in Norway, even in the form of guaranteed loans for the giant Mowi operation.

The financial (and biological) viability of salmon aquaculture in Atlantic Canada has been demonstrated by feasibility studies and by actual experience. Financial feasibility studies using both sea-cage and tank techniques have indicated profitability over a ten-year period[9]. Another study on socio-economic aspects of Atlantic salmon farming in Canada, using Norwegian cost data (due to lack of Canadian data) and a 15 percent discount rate, estimated the rate of return over the initial ten years of a small farm at 31 percent[10]. Actual experience also indicates the potential profitability of farming. Unfortunately information on rates of return are difficult to obtain, either from producers or from governments. Certainly one hatchery and one grow-out facility have failed, but the continuation of other operators and the recent entrance of new producers suggest profits can be made. A recent sample of one-quarter of the 400 Atlantic salmon (and sea trout) farms operating in Norway, indicated that average profit per farm (annual revenues minus annual costs) exceeded \$100,000 Canadian, with the amount varying from \$29,000 for the group of smallest farms to more than a quarter of a million for the largest size farm group[11]. For some farm groups, annual profits exceeded fixed investments. The optimum size of farm in terms of lowest unit cost and highest profit was between 7,000 m³ to 15,000 m³ with a mean annual output of 128 tonnes.

Norwegian and Canadian experience indicate that salmon farming is biologically and financially viable in New Brunswick. Although perhaps ten years behind Norway in its

development, Canadian salmon farming has an existing domestic market that now cannot be met by the commercial fisheries, and a potential export market in the United States.

2.3 THE ATLANTIC SALMON MARKET

The eventual growth of Atlantic salmon aquaculture will depend on the future trends in demand (both domestic and export), supply (both farmed and wild), and the resulting prices. If the current conservation measures are successful in restoring the stock of wild Atlantic salmon then the supply is expected to increase in the late eighties. It is difficult to predict the size of the supplies in the late eighties but if both the farming and conservation measures are successful then the combined output of farmed and wild salmon will far exceed the maximum landings of wild salmon recorded in the past few years.

With an increase in supply, the market outlook for Atlantic salmon can be better understood by examining the various elasticities of demand. What follows is an attempt at estimating the demand elasticities using data for the wild salmon market. In this study wild and farmed salmon are assumed to be perfect substitutes and this assumption is supported by the findings in the European and North American markets.

Atlantic salmon produced in Canada is generally sold in central Canada and the United States. The domestic market is the most important market for the Canadian production of fresh Atlantic salmon. About 75 percent of the production of fresh Atlantic salmon is consumed domestically. Since Atlantic salmon is heavily traded internationally, ideally a simultaneous system of equations describing the international market (mainly the U.S.

market), as well as the local market, should be estimated. The interrelations and feedbacks between the two markets are important. However, lack of sufficient observations on U.S. production, imports and prices prevented us from modeling that market.

In choosing an estimation technique, it has been recognized that the demand equation is embedded in a system of simultaneous equations. The system consists of a domestic demand equation, an export demand equation, a supply equation, and a

market clearing identity which equates the demand to the supply. This four-equation model determines the value of four endogenous variables, which are price, supply, domestic demand and export. The domestic demand equation was over-identified and the method of two-stage least squares was used to estimate this equation[12]. Two versions (one for fresh salmon and the other for fresh and frozen salmon combined) of this equation are reported below.

$$(1) \ln P_f = -3.451 + 0.376 \ln I - 0.088 \ln Q_f - 0.176 \ln S_m$$

(3.711) (3.407) (2.144) (0.110)

$$\bar{R}^2 = .83 \quad DW = 1.39 \quad F = 38.46$$

$$(2) \ln P_t = -3.890 + 0.380 \ln I - 0.092 \ln Q_t - 0.018 \ln S_p$$

(3.699) (3.460) (2.052) (0.146)

$$\bar{R}^2 = .82 \quad DW = 1.49 \quad F = 38.42$$

Where P_f = price index of fresh Atlantic salmon;

P_t = weighted average of prices of fresh and frozen Atlantic salmon;

I = per capita disposable income;

Q_f = per capita consumption of fresh Atlantic salmon;

Q_t = per capita consumption of fresh and frozen Atlantic salmon;

S_m = price index of meat;

and S_p = price index of Pacific salmon.

All nominal variables were deflated by the consumer price index to ensure that the demand function is homogeneous of degree zero[13]. The data for this study were collected from various Statistics Canada publications. The data period extends from 1955 to 1982[14]. A log-linear version gave decidedly better

results and hence only this version has been reported. There were no serious problems of multicollinearity and autocorrelation. The t-values are included in the parentheses. The equations were estimated in inverted form because this form often gives a better fit for commodities whose supplies do not adequately

respond to the current price. The price of Pacific salmon was tried to test if there was any degree of substitutability between the two varieties of salmon.

On the basis of the estimated parameters, we can now compute the own price elasticity, income elasticity and cross price elasticity. Since we have estimated the equation in its inverted form, the estimated coefficient of the quantity variable measures the direct price flexibility. The inverse of the direct price flexibility forms the lower limit, in absolute terms, of the own price elasticity[15]. However, if the cross elasticities are not significantly different from zero, then the reciprocal of price flexibility will be equal to price elasticity. The estimated price elasticities are quite high. The value of price elasticity is 11.36 for fresh salmon and that for fresh and frozen taken together is 10.86. Income elasticity of demand for fresh and frozen combined is 4.13. Income elasticities are reasonably high and indicate that Atlantic salmon is a superior good. Since cross price flexibilities are not significantly different from zero, we refrained from computing the cross elasticities. The results compare well with similar studies on Atlantic and Pacific salmon for the United States and Canada[16].

As regards the export market, Canada exports approximately one-quarter of its total landings of Atlantic salmon, for a total volume ranging from 600 tonnes in 1980 and 1981 each, to 300 tonnes in 1983. A growing share of exports is of fresh (rather than frozen) salmon. The principal destination of fresh Atlantic salmon exports is the United States, which typically absorbed more than 90 percent of all fresh salmon exports. A recent study indicates that the United States

market should expand; dealers in Boston and New York estimate that the demand for Atlantic salmon from Canada could reach 3,000 tonnes by 1990[17]. The United States market is a growing export market for the Norwegians. Compared with Norway, Canada enjoys a geographical advantage for northern United States. Fresh salmon from Norway must be air-freighted at a cost of 10 percent of the f.o.b. (free on board) price. Yet, the Norwegians have succeeded in marketing to the U.S. through strict quality control and ensuring regular supply; if Canada follows their example, its farmed salmon would be competitive.

2.4 THE ECONOMIC IMPACT OF SALMON FARMING

Salmon farming can play many important roles in the economic development of Atlantic Canada, but most of these can be summarized under three headings:

- a. providing productive employment, and
- b. reducing regional income inequality, and
- c. generating foreign exchange.

2.4.1 Employment Potential

Increased salmon farming would have a positive impact on employment. At present there are more than 50,000 registered fishermen in Atlantic Canada. While not all of them are employed full-time (the full-time equivalent in that industry is approximately half-time), the fisheries remain an important source of employment and income. Salmon farming, though not labour-intensive, will create expanded employment opportunities and new sources of income for fishing communities.

Seasonal unemployment in the fishing and fish processing industries can be moderated by making farmed salmon available for processing and marketing in the off-peak period. Salmon farming will also provide indirect jobs by creating demand for various inputs required for fish farming (such as cages and food for salmon). Additional income generated by the production process will have a multiplier effect on the fishing communities. In 1982, the Scottish salmon farms produced 2,151 tonnes of salmon and directly employed 297 people with another 200 indirectly employed in related activities[18]. In Norway, the direct employment in 1978 was estimated to be 170 man-years and the output of farmed salmon was 3,300 tonnes[19]. The current output of farmed salmon in Norway is about ten times the 1978 level and thus, one could claim that more than 2,000 jobs have been created there by salmon farming[20].

In Norway much of the employment is in isolated communities and of relatively unskilled people. Whether in the Highlands of Scotland or in northern Norway, salmon farming has been a means of providing employment where few alternatives exist; in Norway, 43 percent of salmon farmers and their employees came from the fishing sector and 17 percent from agriculture[21]. In New Brunswick, about 40 people are employed currently in salmon farming[22]. The present output level is about 200 tonnes. If the output reaches the projected level of 10,000 tonnes per year then the number of those directly employed could rise to 2,000[23].

2.4.2 REGIONAL INCOME INEQUALITY

Salmon farming can alleviate the problem of regional income inequality through creating jobs and generating income. Norway has chosen to make salmon farming a tool of regional policy, to keep people in rural communities. Norwegian salmon farming is regulated and farms require licences; a principal determinant of who receives a licence, and the extent of financial assistance, is location. More than a quarter of the issued licences are from the three northern counties. In addition, Norway has attempted to maximize the number of farms, by restricting the size of new farms. The size restriction has been increased, with recognition of market potential for salmon, and the advantages of large-scale operations, but in all there are approximately 400 farms. Commercial fishermen have been able to begin farming with the capital acquired from the sale of their boats. Salmon farming has provided them with productive, year-round employment.

While salmon farming in Norway is largely regulated by the government, in Scotland, farming is concentrated among a few producers, often subsidiaries of multi-nationals (such as British Petroleum and Unilever). Twelve farms account for approximately two-thirds of the output. Foreign ownership (usually Norwegian) is permitted; and there is no licencing. New Brunswick also has no regulation as to the maximum size or nationality of owners. The disadvantage of this free market approach is the loss of socio-economic externalities. The regional dimension of the Norwegian experience and the multitude of small farms are absent. On the other hand, large-scale, and perhaps foreign, companies can take the risks and undertake the investment in new

technology, that otherwise taxpayers would be obliged to shoulder.

2.4.3 FOREIGN EXCHANGE EARNINGS

In 1983 Canada exported 152 tonnes of fresh and 147 tonnes of frozen salmon for a total value of \$2.15 million Canadian. The export prices of both fresh and frozen variety fluctuated considerably during the sample period (Table 1). The fluctuations originate mainly from two sources: the price of Atlantic salmon in the international market and the value of the Canadian dollar. Since Atlantic salmon is a luxury food item, its price has been influenced significantly by fluctuations in per capita real income in the consuming countries. During 1980-82, real export prices (export price indices deflated by the consumer price index) declined consistently and a major reason for this was the depressed state of economic activity experienced by the United States.

The volume of frozen salmon exports shrunk to a fourth of its 1973 level, and this is reflected in the value; frozen salmon earned less in 1983 than in 1973. The nominal price has increased by 46.7 percent during the sample period, but the real price has declined by about 40 percent suggesting that demand has fallen. The situation for fresh salmon is more positive. Quantity, value and nominal price have increased (intermittently) over time, with the real price rising to 1979 before declining. The United States typically absorbs more than 90 percent of Canada's export of fresh Atlantic salmon but it imports only a small portion of Canadian frozen Atlantic salmon (typically less than 30 percent). West Germany, the United Kingdom and France have been major purchasers of frozen Atlantic

salmon from Canada, and in 1983 their combined imports were more than three times those of the United States. However, Canada has increasingly concentrated on exporting fresh rather than frozen Atlantic salmon. The volume, value and share of fresh salmon exports have increased; the opposite has occurred with frozen salmon. Between 1973 and 1983, fresh Atlantic salmon exports almost doubled in volume and more than doubled in real value (nominal value increased more than five times); as a share of total volume of salmon exports, fresh salmon rose from 10 percent to 65 percent.

The foreign exchange benefit can be considerable. Over ten years, with one-third of its output exported, a 45 tonne sea-cage operation could earn almost one million U.S. dollars in net foreign exchange[24]. A higher proportion exported would, of course, earn more. Norway exports more than 80 percent of its production.

2.5 CONCLUSION

Of all fish species, the Atlantic salmon appears to offer the best prospect for profitable farming in Atlantic Canada. The species may disappear from the captive fisheries; it is also a luxury product. Although several methods of culturing Atlantic salmon are available, it seems that the sea-cage farming is the most practical one. One major advantage of sea-cage farming is its low initial investment requirement, a significant part of which a fisherman can raise by selling his boat and equipment. Estimates of price and income elasticities of demand indicate a large potential market within Canada; there is also clear evidence from Canadian and Norwegian exports that a sizeable

market exists within the United States. The potential impact on Atlantic Canada could be significant; farming could be a means of generating incomes, foreign exchange and, to some extent, jobs. Small-scale farming could be a means of retaining population in the countryside by providing additional employment opportunities to fishermen and farmers.

The above conclusions should, however, be contrasted with the following limitations of the study. First, a rigorous financial feasibility study based on actual data from the fish farms currently operating in Atlantic Canada could not be carried out because the farms and the provincial governments are not yet ready to divulge the data. Thus, the study had to rely on experimental Canadian data and actual data from Norway but these are considered to be reasonable proxies for

the required data. Second, the elasticity estimates are good enough only to assess the effects of marginal changes. If salmon farming is successful in Atlantic Canada, the supply will increase considerably and the above estimates of elasticity will be of little help. Finally, the paper has not addressed the issue of intertemporal implications of the current conservation measures taken in Canada and elsewhere. The restrictive measures taken by salmon fishing nations should increase the wild stock of salmon in the future. If this at all happens, then the supply of salmon, both wild and farmed, may increase considerably in the near future. Thus, the quantitative estimates and conclusions of the study should be viewed as suggestive until the implications of the above concerns are explored more fully.

NOTES

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- [1] Copes, 1983, page 1.
- [2] Anderson and Levi-Lloyd, 1983.
- [3] Saint John Fundy Region, 1985.
- [4] United States Department of Commerce, 1984.
- [5] Edwards, 1978.
- [6] Stokes, 1982.
- [7] Anderson, 1980.
- [8] Ridler, 1983.
- [9] Sutterlin, 1981; Anderson, 1982.
- [10] Ridler, 1984.
- [11] Kabir and Ridler, 1985.
- [12] The estimated export demand and domestic supply equations are not reported here. The export demand equation was estimated as a function of export price, foreign exchange rate, and per capita disposable income in the United States. The domestic supplies of Atlantic salmon were estimated as a function of landings and relative price of fresh salmon. Several versions

were estimated but none of the equations had much explanatory power.

- [13] To be more accurate, all nominal figures should be deflated by the consumer price index adjusted for the price of Atlantic salmon.
- [14] The entire set of data is available from the authors.
- [15] Houck, 1965.
- [16] De Voretz, 1980, 1982; Kabir and Ridler, 1984.
- [17] Woods Gordon, 1983.
- [18] Scottish Salmon Growers Association, 1983.
- [19] Gerhardsen and Berge, 1978.
- [20] The claim is based on the assumption of a constant labour-output ratio. The appropriateness of this assumption is, however, questionable.
- [21] Gerhardsen and Berge, 1978.
- [22] This figure is on the basis of personal communications with the Department of Fisheries and Oceans office in Saint John, New Brunswick.
- [23] This is based on the assumption of a constant labour-output ratio (see note 20).
- [24] Ridler, 1984.

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Canada's Weak Industrial Balance Sheet: An Important Public Policy Issue

J. S. McCallum,
Faculty of Administrative Studies,
University of Manitoba.

Tables 1 and 2 illustrate that Canadian industry is not well capitalized by either its own pre-1981/82 recession standards or by the standards of comparable U.S. industry. Table 1 provides selected annual Canadian capitalization ratios since 1980. Table 2 provides a comparison of large Canadian and U.S. corporations using equity to total assets as a measure of capitalization.

This undercapitalization of Canadian industry is a serious public policy issue. Poorly capitalized firms are particularly vulnerable to the business and interest rates cycles. But also, when industry is not well capitalized, vital private sector investment is slower than would otherwise be the case increasing the economy's vulnerability to both recession and instability.

Capitalization is the amount of equity, or owner's capital, on a firm's books relative to its debt. The beauty of equity is that dividend payments to shareholders can be deferred, should the firm's financial circumstances warrant it, without directly threatening the organization. In sharp contrast, interest and principal payments, associated with debt obligations, must be met,

as they fall due. Failure to do so provides creditors with the option of having their claims discharged through a court directed distribution of the firm's assets, which usually is the end of the firm in its present form.

A hostile business and/or interest rate environment will clearly greatly inconvenience a well capitalized firm. It may even reduce the standard of living of the shareholders. That, however, is minor compared to what the poorly capitalized firm faces in the same circumstances: failure. Paradoxically, well capitalized firms often delight in slow growth/high interest rate economies that at first glance, they should intensely dislike. The reason: poorly capitalized firms always encounter critical financial difficulties first and well capitalized firms can often acquire assets at well below their replacement costs from such firms, as they liquidate major assets to meet interest obligations in an effort to avoid outright failure.

The worrisome state of Canada's industrial balance sheet can be adequately summarized in just a few statistics from Tables 1 and 2.

TABLE 1

Capitalization Ratios - All Industries

	1980	1981	1982	1983	1984
Long term debt to equity	.49	.57	.69	.67	.62
Short term debt to equity	.21	.22	.26	.22	.21
Total debt to equity	.70	.79	.95	.89	.83
Total liabilities to equity	1.28	1.44	1.52	1.42	1.37
Interest coverage ratio	5.1	3.4	2.1	3.0	3.4

Source: Bank of Nova Scotia, Business and Finance Report; Wood Gundy, Forecast; Statistics Canada, Financial Flow Accounts, and Industrial Corporations Financial Statistics.

The total debt to equity of Canadian industry stood at .83 in 1984, down from .95 in 1982, but nonetheless still significantly above the 1980 level of .70. Long-term debt to equity and total liabilities to equity showed a similar pattern over the 1980 to 1984 period going from .49 to .62 and 1.28 to 1.37. A related measure of financial health, and paramount in the minds of bond raters, the number of times industry is able to cover its interest obligations, declined by one-third from 5.1 to 3.4 over the same period. Large U.S. industry with an average equity to total assets ratio of .48 is considerably better capitalized than large Canadian industry at .30. Similar quality data is not available on smaller Canadian industry but the perceived wisdom among financial professionals is that, while smaller Canadian industry is better capitalized than larger Canadian industry, it still falls well short of the U.S. Interestingly, Canadian industry is not as well capitalized as American industry at a time when

American capitalization is causing a consternation in their financial circles that does not remotely exist here. Finally, foreign controlled firms operating in Canada are now about one-third better capitalized than their Canadian counterparts versus a quarter ten years ago. This should be of particular concern to Canadian nationalists in that it virtually guarantees that Canadian controlled firms will fail, in a difficult business climate, before their American controlled competitors. It is important to note too, that if anything, these statistics understate the capitalization problem in Canadian industry. The reason is the data does not distinguish between common equity and term preferred equity, which has a specific maturity and, therefore, must be repaid. If quasi debt, term preferreds were included as debt, rather than equity, then, Canadian capitalization ratios would deteriorate quite significantly because of the magnitude of the term preferreds outstanding. As well, were term

TABLE 2

Capitalization of Large North American Public Corporations¹ (Equity as a percent of total assets, fiscal year 1983)

Rank		Capitalization Percent	Sales \$Bill.	Assets \$Bill.
<u>Canadian-Owned Corporations</u>				
1	Canadian Pacific	23	12.8	17.6
2	Bell Canada Enterprises	39	8.9	14.9
3	George Weston	31	7.8	2.2
4	Alcan Aluminum	44	6.5	8.2
5	Loblaws	36	6.1	1.2
6	Hudson's Bay	32	4.4	3.7
7	Provigo	27	3.9	0.7
8	Canada Development Corp.	15	3.8	7.6
9	Nova Corporation	21	3.8	6.8
10	TransCanada Pipe Lines	<u>29</u>	3.5	5.0
	AVERAGE ²	<u>30</u>		
<u>Foreign-Owned Corporations in Canada</u>				
1	General Motors of Canada	50	13.8	3.0
2	Imperial Oil	53	8.9	8.0
3	Ford Motor Co. of Canada	32	8.6	2.3
4	Texaco Canada	56	5.7	3.3
5	Shell Canada	45	5.3	5.2
6	Gulf Canada	45	5.1	5.1
7	Canada Safeway	59	3.4	1.1
8	Simpson-Sears	30	3.3	2.0
9	Imasco	32	2.9	2.0
10	F.W. Woolworth	<u>56</u>	1.7	0.6
	AVERAGE ²	<u>46</u>		
<u>United States Corporation</u>				
1	Exxon	47	88.6	63.0
2	General Motors	45	74.6	45.7
3	Mobil	40	54.6	35.1
4	Ford	32	44.5	23.9
5	IBM	62	40.2	37.2
6	Texaco	54	40.1	27.2
7	du Pont	47	35.4	24.4
8	Standard Oil (Indiana)	48	27.6	25.8
9	Standard Oil of California	59	27.3	24.0
10	General Electric	<u>48</u>	26.8	23.3
	AVERAGE ²	<u>48</u>		

¹ Balance sheet data as reported in Canadian Business (June 1984) and Fortune (April 30, 1984).

² Simple unweighted averages.

NOTE: Corporations are ranked by sales.

preferreds of short maturity and floating rate term debt included as short-term debt, which is what they really are, it would make the short-term debt to total debt ratio of Canadian industry look considerably worse than it does. Short term debt to equity on Canada's industrial books was .21 in 1980, jumped to .26 in 1982 and in 1984 was back down to .21.

There are a number of reasons why Canadian capitalization has declined since 1980 and does not compare favourably with the U.S. First, the 1981/82 recession, arguably the worst since the 1930s, took a terrible toll on Canadian corporate earnings, traditionally the most important source of new Canadian equity capital. The worst year was 1982 when return on shareholders' equity was 5.9 percent with inflation at 10.8 percent. This does not leave much for retained earnings and especially given a shareholding public that takes a very dim view indeed of having their nominal dollar dividends cut. Second, because interest payments to debt can be written off against taxable income, while dividend payments to equity cannot, boards of directors usually see it as in their shareholders' short-term best interests to finance with debt rather than equity as improvident as that strategy may be over time. Third, U.S. industry was capitalized long before Canadian industry, when costs of capital were much lower than now. Also, at least partly because Canadian banks are better capitalized than their U.S. counterparts, Canadian banks provide proportionately much more semi-permanent capital to business than do U.S. banks. Our chronic shortage of entrepreneurial capital is an issue here, too. Additionally, U.S. tax law is more hospitable to equity accumulation. Fourth, for a variety of reasons, including a separatist

government in Quebec and the National Energy Policy, a great deal of equity grade Canadian capital has left Canada in the last decade reducing the pool of capital available to Canadian corporations. The argument aside of whether there has or has not been crowding out in the Canadian capital markets, what government takes to finance deficits is not generally available to corporations for investment and balance sheet reconstruction. The Canadian public sector has required \$161.5 billion over the last five years or 53.3 percent of the funds raised by major non-financial borrowers. In 1982 and 1983, the public sector respectively took 72.1 percent and 75.6 percent of the funds raised by major non-financial borrowers. Fifth, the cost of new equity capital was unacceptably high for much of the post 1981/82 recession period. Some financial observers even go so far as to argue that recent unacceptable levels of real and nominal interest rates have been substantially caused by the huge debt imbalances of major sovereign borrowers and large corporations.

Aside from the obvious tendency for poorly capitalized firms to career from financial crisis to financial crisis with every serious downturn in the economy, the most important public policy issue associated without weak capital base is the effect on private sector investment. The link between capitalization and private sector investment is straightforward. Poorly capitalized firms which have great difficulty attracting reasonably priced capital to finance investments, must be particularly careful in undertaking new investments that they do not expose themselves to too much risk and must concentrate on getting their balance sheets back in order to keep their bankers happy, as opposed to investing in productive

assets. When private sector investment is weak, jobs and growth are inevitably lost now in that new plant, equipment and machinery is not put in place. But also, jobs and growth are lost later in that international competitiveness in the crucial, high employing manufacturing industries is highly dependent on investment in state-of-the-art workplaces. As well, the tendency for investment in poorly capitalized firms to be more volatile than in well capitalized firms likely makes the whole economy more unstable, when poorly capitalized firms dominate the industrial sector, as they do in Canada.

The behaviour of the Canadian oil and gas industry since 1980 provides a graphic illustration of the effects of weak balance sheets on investment. The National Energy Policy was clearly an important factor in the staggering contraction of exploration and development but so was the marked deterioration in the industry balance sheet. Bluntly, new investment slowed to a trickle not so much because returns on investment were not attractive but even more, because the equity base needed to support new investment was not there.

The weakness of our industrial balance sheet and our weak business investment growth record of -9.1 percent, -12.4 percent and .5 percent in 1982 to 1984 are almost certainly more than coincidence. The non-residential construction growth rates were -7.2 percent, -16.2 percent, and -2.6 percent with machinery and equipment -10.9 percent, -8.8 percent, and 3.3 percent. Other factors are clearly involved but it is interesting to note also the comparative Canadian/U.S. industrial capitalization situations in the context of the depth and length of the 1981/82 recessions in Canada and the United States. By just about

any measure, the recession we experienced was far worse than what they experienced in the U.S.

Improving Canadian industrial capitalization is obviously desirable. A number of public policy initiatives are consistent with this objective. A meaningful reduction in the government sector deficit would reduce government demands on the domestic capital markets freeing up funds for Canadian corporations, while in the process probably lowering capital costs and lessening the need for Canadian firms to go to foreign capital markets for expensive and risky funds. Tax changes that improve corporate profitability, such as lower tax rates and more liberal capital cost allowances, would increase the potential retained earnings pool. A more hospitable national attitude to foreign capital would lower capital costs to the extent there was an increase in capital inflows. Finally, as interest rates decline, it is unusual that equity costs do not follow suit meaning that any reduction in interest rates would likely make it that much easier for firms to rebuild their balance sheets by improving their capitalization. Better capitalization is not, however, only a public policy problem; corporations can help themselves by aggressively controlling costs, carefully managing dividend policy, wisely investing and resisting the temptation to finance with only debt until they are absolutely forced to use equity.

The state of Canada's corporate balance sheet is an important and often overlooked public policy issue. Canada's business capitalization problem warrants more attention from our public policy community than it has received to date. If a 1981/82 type recession occurs soon, it will become immediately apparent just how serious the capitalization problem is because many corporations

certainly do not appear to have the balance sheet resiliency to easily withstand it.

ANALYSTS' NOTEBOOK:

Trade Liberalization and its Employment Effect

B. Yeung,
Faculty of Business,
University of Alberta.

4.1 INTRODUCTION

Trade liberalization is attracting considerable public attention in Canada. Much of the discussion focuses on its effects on the economic well-being of various groups of Canadians and on its effect on employment. There are however two confusing aspects in the public debate. First, there are many different forms of trade liberalization and they do not have uniform economic consequences. In public debates the term is often used arbitrarily and different discussants may be referring to different forms of trade liberalization. Second, the relationship between trade liberalization and employment has rarely been discussed systematically. This paper attempts to provide a taxonomical introduction to trade liberalization and to clarify the connection between free trade and employment.

Economic textbooks often argue that, in an otherwise distortion-free world, trade barriers lead to inefficient resource allocation and trade liberalization improves global economic welfare. However, it is not correct that each nation taking part in trade liberalization must gain, nor will the economic welfare of every group of economic agents in

a nation necessarily improve. Also, in reality, there are many market distortions besides trade barriers so that the textbook result is questionable at a practical level. The actual economic effects of trade liberalization on a nation and on its economic agents depend on the changes in important economic parameters, e.g., consumer prices, producer prices, factor prices and the terms of trade. These changes, in turn, depend on the actual form of trade liberalization implemented: which distortions are eliminated, which are left unchanged and which new distortions are introduced. Hence, in assessing the economic consequences of trade liberalization, we first need to make clear the form of trade liberalization being assessed. This paper will provide a brief taxonomical introduction of trade liberalization. Trade liberalization will be described in two directions:

- a. the freedom in the international movement of goods and services and factors of production, and
- b. the international co-ordination of trade liberalization.

To save space and to retain a manageable scope of foci, we do not

conduct a detailed examination of the different effects of the various forms of trade liberalization. Only very general remarks are made.

The textbook presumption on the benefits of trade liberalization does not extend to employment creation. In a standard textbook discussion of the benefits of free trade the full employment assumption is often made and, therefore, the employment issue cannot be addressed effectively. Indeed, even for articles in economic journals the same is often true. Yet, the employment effect of trade liberalization is a major focus in the current public debate of the subject. The main purpose of this paper, therefore, is to discuss the connection between trade liberalization and employment. We shall first describe the cyclical and structural components of unemployment and the factors affecting them. We shall then argue that trade liberalization will not reduce Canada's cyclical unemployment; it may have a favourable permanent effect on structural unemployment, and it may lead to a transitory change in structural unemployment, the direction of which is an empirical matter.

This paper commences by presenting a taxonomical introduction to trade liberalization. It then provides a discussion of unemployment as a policy target in section three. Section four analyzes the connection between trade liberalization and unemployment. Section five presents the conclusions.

4.2 AN INTRODUCTORY TAXONOMY TO TRADE LIBERALIZATION

In this section we discuss the economic content of trade liberalization along two dimensions:

- a. the freedom in the movements of goods and factors of production, and
- b. international co-ordination of trade liberalization.

4.2.1 THE FREEDOM OF GOODS AND FACTOR FLOWS

Trade liberalization generally refers to improvements in the freedom in international flows of goods and services and of factors of production. In the most straightforward form of trade liberalization, international flow of goods and services is free of tariff and non-tariff barriers. The various rounds of tariff reduction in the General Agreement on Tariffs and Trade (GATT) represent this form of trade liberalization. A more complicated form of trade liberalization also includes the improvement in the freedom in the international flow of production factors. This form of free trade arrangement is often found in customs unions, for instance, the European Economic Community. Presently, there is no completely free factor mobility in North America. For example, Americans cannot be readily hired in Canada (and vice versa) and direct investments in Canada have to be reviewed (and approved) by Investment Canada.

It is important to realize that trade liberalization will promote economic efficiency with certainty only when the eliminated barriers are the only market distortions. When many market distortions exist, eliminating only some and leaving

some intact does not necessarily improve overall economic efficiency. This is the essential message of the theory of second best[1]. In the current state of economic affairs, domestic distortions in both the goods and factor markets abound (e.g., consumption taxes, production subsidies, differential corporate taxes, and minimum wage laws). In this situation, there is no presumption that getting rid of some or even all of the international barriers will necessarily improve either the global or the domestic economic efficiency[2]. Most domestic market distortions are claimed to be domestic matters and the handling of them remains a sovereignty right. It is then very difficult to include the elimination of domestic market distortions as a clause in a free trade agreement. Consequently, the "benefits" of trade liberalization need to be approached with much caution[3]. Also, as far as the domestic economic welfare is concerned, getting rid of the domestic market distortions is as important, if not more so, than getting rid of the distortionary trade barriers.

4.2.2 INTERNATIONAL CO-ORDINATION OF TRADE LIBERALIZATION

There are several forms of international co-ordination of trade liberalization: multilateral (global), bilateral, simultaneous bilateral, and unilateral. In a multilateral trade liberalization, Canada and several countries (or regions) engage in a mutually free trade arrangement. The tariff reduction of the GATT is actually a form of global trade liberalization. In a bilateral trade liberalization, Canada engages in a free trade arrangement with only one country. In a simultaneous bilateral free trade arrangement, Canada simultaneously

engages in bilateral free trade arrangements with more than one country. In a unilateral trade liberalization, Canada unilaterally removes her own trade barriers.

Given that most nations are having domestic economic problems, especially with employment, and given the current sentiment of labour groups and governments everywhere, it is clear that trade liberalization on a global scale is not presently possible. This form of trade liberalization is appropriately not the focus of public attention in Canada.

Unilateral trade liberalization is not desirable for Canada from a strategic point of view and from an income (and the distribution of it) perspective. The strategic point of view is simple: why open up our market alone and bear all adjustment costs when we may be able to use our trade barriers as bargaining chips to negotiate for the opening of foreign markets and consequently achieve a greater extent of elimination of distortions[4]? The latter argument is more complicated and is taken from Burgess (1980). He argued that a reduction of tariffs in Canada would lower the real wage rate and would increase the price of the ownership of natural resources which was partly in the hands of foreigners. This outcome is unfavourable to the young and future generations of Canadians because they must save from their wage earnings to accumulate wealth[5].

Bilateral trade liberalization falls between the two aforementioned polar cases. Canada does not necessarily have to restrict bilateral trade liberalization to bilateral trade with the U.S. Canada can actually negotiate bilateral trade liberalization with several nations (regions) e.g., the U.S. and Europe. For the purpose of export expansion, and possibly also for some other

economic purposes, what Canada really wants is the reduction of trade barriers by her trading partners. Elimination of domestic trade barriers in Canada is of secondary importance[6]. Also, according to Wonnacott (1982), Canada stands to gain a lot in simultaneous bilateral free trade arrangements because Canada then has free access to all the foreign markets with which free trade agreements are arranged, while the same is not necessarily true for foreign businesses.

While simultaneous bilateral trade liberalization is desirable, the most important and relevant case is still our bilateral free trade arrangement with the U.S. The importance of this case is self-evident: the U.S. and Canada are the largest trading partners of each other, the two economies are integrated to a significant extent and they face the same foreign import competition. The relevance of this case is also obvious as it is the current focus of the public attention on free trade and both the U.S. and Canadian governments are hinting for it. In the following discussions on the relationship between trade liberalization and employment, the bilateral free trade arrangement with the U.S. will be referred to when appropriate.

4.3 UNEMPLOYMENT REDUCTION AS A POLICY TARGET[7]

In assessing the relationship between employment and trade liberalization, it is convenient to have an operational definition for the first term. The obvious operational indicator for an employment situation is the rate of unemployment, which is naturally a very important policy target. This section discusses the nature of the unemployment rate and also tries to shed some light on the

appropriate policy choices in dealing with unemployment.

The rate of unemployment has two components, namely, cyclical unemployment and structural unemployment. The cyclical component is a consequence of the fluctuations of aggregate economic activity. For instance, a transitory increase in domestic or foreign aggregate demand will lead to a transitory decrease in unemployment. While cyclical unemployment is transitory, it may, nevertheless, last a few years.

Structural unemployment is determined by the structural frictions within an economy. An economy is inevitably in a state of flux. The structure of the relative values of production activities often changes in response to

- a. "acts of nature" (e.g., diminishing supply or new discovery of raw materials),
- b. changes in technology and knowledge, so that new products and new production processes are introduced,
- c. demographic changes, and
- d. perhaps, also of preference changes.

Subject to these changes, some sectors of the economy shrink, while others expand. Workers (and other production factors) leave their employment either voluntarily or involuntarily, and search for new opportunities. When a person is searching for a job, he or she is counted as unemployed. The school-leavers and re-entries of the labour force who are seeking jobs are also counted as unemployed.

The extent of structural unemployment depends on two factors:

- a. the more extensive the periodic structural changes in the relative values of production activities are, the more frequent job

- switch requirements will be, and hence, higher structural unemployment; and
- b. the longer it takes job searchers to find jobs, the higher structural unemployment is.

The duration of job search depends on the costs of being unemployed, of retraining, of reallocation, job information and other related search costs[8]. It also depends on the job search's probability of finding a matching job offer. One way to increase this probability is to assist firms to move with less friction from labour shortage areas to labour surplus areas, and from low profit sectors to high profit sectors.

Structural unemployment, defined in the above framework, is a long-run equilibrium phenomenon. Its expected value (and also its statistical behaviour) depends on the structural behaviour of the economy at the long-run equilibrium. The level of structural unemployment will change when the structure of the economy changes. A transitory unemployment change will then take place[9]. This type of transitory unemployment can also occur if there is a one-time, non-permanent but significant disruption in the structure of the economy. The direction and magnitude of this transitory unemployment change depends crucially, among other factors, on the transitional behaviour of two terms:

- a. the difference between the actual probability of finding a job and the job searcher's expectation of it, and
- b. the difference between the actual wage offer and the job searcher's expectation of it.

(At equilibrium, reality and expect-

tations are compatible.) A positive (negative) spur of either will lead to a transitory reduction (increase) in unemployment[10].

In Canada, both the cyclical and structural components of unemployment have increased and have stayed at a fairly high level in the past few years. The recent recession has effected a high cyclical unemployment rate. Artificial barriers, like minimum wage laws, investment restrictions, monopsonistic union behaviour and increased unemployment insurance benefits, just to name a few, tend to prolong job search activities, so that structural unemployment has stayed high. It is worth pointing out, however, that the tightening of unemployment insurance since the late seventies should have a reduction effect on structural unemployment. Moreover, the expected reduction in the relative size of the younger generation in the labour force will have a similar effect in the future. Finally, it is noteworthy that the cyclical and structural breakdown of the unemployment rate is fundamentally unobservable and we can only obtain a measurement of the sum of them.

These two types of unemployment call for substantially different policy treatments[11]. A policy which deals with the structural component of unemployment is, and ought to be, long-run in nature. Therefore it cannot and should not be used to counter cyclical unemployment. Similarly, a demand management policy which deals with cyclical unemployment is and ought to be transitory in nature and cannot deal with structural unemployment. It is important to understand the policy's influence on the causal factors of the two types of unemployment.

4.4 IMPACT OF TRADE LIBERALIZATION ON UNEMPLOYMENT

This section discusses the relationship between trade liberalization and each of the three types of unemployment. For concreteness, the discussion will often be related to a bilateral free trade arrangement with the U.S. which allows only free international flow of goods. When it is also meaningful to relate to other types of trade liberalization, we shall do so.

4.4.1 On Cyclical Unemployment

Trade liberalization affects the structure of an economy permanently and it should have, at best, only second order effect on cyclical unemployment which is transitory in nature. A part of the cyclical component of unemployment emanates abroad: from the fluctuations of the prices, or of the demand for and the supply of tradeable goods. For instance, when a trade partner of Canada is having a positive income shock, it increases its demand for Canadian goods. Subsequently, both income and employment in Canada are temporarily increased. The more open the Canadian economy is, the more susceptible it is to these trade sector shocks. The point is that if a foreign business cycle is positively correlated with ours, trade liberalization with that country increases the volatility of the cyclical component of unemployment, and vice versa. Canada's major trading partner is the U.S., and the two countries' business cycles are positively correlated. There is therefore reason to believe that trade liberalization will increase the volatility of cyclical unemployment in Canada. Trade liberalization therefore does not appear to be an appropriate remedy for Canada's

cyclical unemployment. In particular, free trade with the U.S. will not affect Canada's cyclical unemployment favourably.

From the above perspective, a geographically diversified simultaneous bilateral free trade (with many different economic regions) will lead to a better result. The scheme allows the cyclical fluctuations of Canada's trading partners' aggregate demands, as well as her own, to offset one another so that Canada's cyclical unemployment is smoothed out. Therefore for the purpose of reducing the volatility of Canada's cyclical unemployment, a multi-national bilateral trade liberalization scheme is preferred to a bilateral trade liberalization with just the U.S.

4.4.2 On Structural Unemployment

The impact of trade liberalization on the structural component of unemployment is more complicated. Trade liberalization can effect changes in the structural frictions in factor movement, which in turn cause a long-run change in structural unemployment. This subsection discusses this point. Trade liberalization also leads to some significant but non-recurring adjustments in almost all sectors of an economy. These adjustments constitute a disruption to the long-run structural equilibrium of the Canadian economy. Consequently, a transitory change in unemployment will take place and may last several years. The next subsection discusses this point.

If trade liberalization is built not only on a more frictionless movement of goods, but also on a more frictionless movement of factors, the long-run impact of trade liberalization on structural unemployment probably will be favourable. When artificial factor market

frictions are removed, firms can move more freely from labour shortage areas to labour surplus areas and also from low profit areas to high profit areas. Also, workers face fewer distortions in job switching. Consequently, the duration of job search is reduced. However, this favourable result relies on the assumption of increased mobility of factors, which is not necessarily realistic, even in a bilateral free trade with the U.S. (Yet it is politically easier to achieve the condition in a bilateral free trade with the U.S. than in other forms of trade liberalization.) If trade liberalization does not include the liberalization of factor mobility, the favourable long-run effect disappears.

Trade liberalization can have an additional favourable long-run effect on structural unemployment if it eliminates market interferences by governments, unions and cartels. Job switch requirements (which lead to structural unemployment) are due to sectoral market adjustments, some of which are inevitably consequences of changes in market interventions by governments, unions and cartels. If trade liberalization includes elimination of these market interferences, it reduces one source of structural unemployment. Once again, this form of trade liberalization is not politically realistic even in a bilateral free trade with the U.S.

The above discussion of two unrealistic forms of trade liberalization is not completely futile because it brings forth two important points:

- a. the competitive pressures stemming from freer trade may act upon the domestic economic institutions constructively, albeit indirectly, so that artificial domestic barriers to factor

mobility may be broken and are harder to introduce. Also active market interventions by governments, unions and cartels may be mitigated. Of course, this outcome is basically an optimistic conjecture;

- b. the thrust of the arguments in this sub-section is that, if trade liberalization leads to less friction in economic adjustments and/or it reduces turbulence in artificial market interventions, it will reduce structural unemployment. The argument highlights an important point - long-term structural unemployment depends closely on the behaviour of domestic institutions. In dealing with unemployment, it would be better to create regulations that encourage the behaviour of these institutions to effect favourable changes directly rather than rely on free trade to do so indirectly.

4.4.3 The Transitory Unemployment Change

The transitory impact of trade liberalization on unemployment is due to the non-recurring sectoral adjustments it causes. If these adjustments lead to a net increase (decrease) in job opportunities (or wage offers), the short-run effect is favourable (unfavourable), for job seekers have a temporarily higher (lower) probability of finding acceptable offers of employment. This is a first round effect. Conceivably, these sectoral adjustments will also lead to changes in job seekers' wage and employment expectations. The expectation changes lead to a second round effect which reduces the magnitude of the overall short-run effect on structural unemployment of trade liberalization. These two phenomena deserve separate

attention[12].

On Employment Opportunities

Due to trade liberalization, imports increase and their consumer prices decrease. Also, exports increase and their prices may increase. (The price increase in exportable goods is certain in a bilateral free trade with the U.S., because the U.S. terms of trade will decrease following the elimination of the U.S. tariffs.) The former displaces employment opportunities and the latter does the opposite. It is not clear which effect dominates. There are three worrisome concerns.

- a. If it is true that Canada exports capital-, technology- and raw material-intensive goods, and it imports labour-intensive goods, the employment displacement effect of importation will presumably outweigh the employment creation effect of exportation. The fact that the current trade protection measures are built for labour intensive industries reinforces this presumption. Hence, the short-run effect of trade liberalization on structural employment is likely negative. This result is more relevant to a multilateral free trade but is not as clear-cut in a bilateral free trade with the U.S.

Trade in North America is more regional than it is national. Western Canada exports mineral, agricultural and forestry products to the U.S. and "imports" manufactured goods from eastern Canada and the U.S. Eastern Canada exchanges manufactured goods with the U.S. and buys mineral products from western Canada. The maritimes export fisheries to the rest of Canada and the U.S.

and buys manufactured goods from the U.S. and eastern Canada. (New Brunswick and Quebec export wood and paper and energy to the U.S.) The mineral and energy products are not much penalized by trade barriers currently. Automobile (and parts) trade, which occupies about two-thirds of Ontario's exports, is also not affected much by trade barriers. Trading of other manufactured goods faces trade barriers. In a bilateral free trade with the U.S., the employment opportunities in western Canada will increase because the demand for mineral products will increase due to a more active manufacturing sector in North America. Also, when there are no duties in trading of manufactured goods, some industries such as the petro-chemical industry may come to western Canada where the raw materials are, in order to save on transportation cost. Not as pronounced, the same is true for other provinces, except eastern Canada, because the demand for their products will likely increase. The change in the employment opportunities in eastern Canada, and Ontario in particular, will be different. Less of its manufactured goods will be sold to the rest of Canada, and this will have a negative effect on its employment opportunities. Its level of exchange of manufactured goods with the U.S. will also change, which will lead to a change in its employment opportunities. As stated above, about sixty percent of Ontario's exports to the U.S. is in transportation, which is not suffering from trade barriers now. Therefore, the trade creation effect of North American free trade will not increase Ontario's exports of manufactured goods to the U.S. by

much. (The trade creation effect is due to Canadians and Americans having free access to each other's market while outsiders still face either Canadian or American trade barriers.) Also, as will be discussed next, some of the manufacturing plants came to Canada (Ontario) because of trade barriers; they may leave when the barriers are eliminated. Thus, it is quite possible that, in the short-run, employment opportunities in Ontario will decrease following a bilateral free trade agreement with the U.S.

- b. Trade liberalization leads to arbitrage of wage demands by capital owners, which may have a negative employment effect. (We assume that there is no increase in capital investment restrictions after trade liberalization.) When trade is liberalized, all commodity prices (transportation cost adjusted) are equalized. Producers in the previously protected sectors, who presumably have the proprietary right of output, will choose to produce in locations where the real labour wage is low (and labour productivity is high.) The real wage (labour productivity) in Canada, however, is currently high (low) by the standards of successful trading countries, or when compared with the U.S. Trade liberalization allows capital owners to arbitrage real wage demands; that is to produce in low real wage - high productivity countries and to import their products back to Canada without duty. Employment opportunities in Canada would be reduced as a consequence. This is true both in a multilateral free trade and in a bilateral free trade agreement with the U.S.[13].

c. Attention should also be paid to the types of people who represent the bulk of the "unemployed" in Canada. They are teenagers, unskilled workers, and secondary income earners who rejoin the workforce after a substantial period of absence. In fact, the increase in these groups of unemployed contributes much to our current unemployment problem. The major employment opportunities for these groups of people appear to be in the service sector (non-traded). They may also find jobs with low skill requirements in the labour intensive manufacturing sector which is protected now. Therefore, immediately after trade liberalization, employment opportunities in the manufacturing sector likely will be reduced due to increased import competition. Over time the relative price of the output in the service sector will increase because prices of tradeables are reduced by trade liberalization. Employment opportunities in the service sector for them will improve. The final net effect of trade liberalization on employment opportunities for these groups of "currently unemployed" workers is not clear-cut.

On The Job Seekers, Wage and Employment Expectations

All other things being equal, the duration of job search will decrease (increase) if job searchers' economic expectations are revised downward (upward). If the net effect of trade liberalization on employment and wage offers is positive, there is no reason for downward revision of workers' wage expectations. Indeed, upward revision is likely so that the job seekers are less prompt to accept jobs. It is unlikely that

this second round effect can nullify the original positive impetus of the increase in employment opportunities so that structural employment is temporarily decreased. Still, the net impact of increased employment opportunities on the aggregate number of employed is made less pronounced. If the net effect of trade liberalization on employment and wage offers is negative, downward revision of wage expectations is likely. Results would then be the opposite.

Attention should be paid to the speed of adjustment of wage expectations. Job seekers usually revise their wage expectations with a substantial lag after a change in wage offer. Thus, the second round effect of trade liberalization due to the change in wage expectations will only come with a significant delay. The situation in the interim may or may not be desirable from an employment point of view, depending on the direction of the first round effect. When the first round effect on wage offer is positive, wage expectations in the interim are unrealistically below the actual wage offer. Job seekers will be prompted to accept offers of employment. Consequently, structural unemployment is temporarily reduced. Unfortunately, in theory, the effect of trade liberalization on wages is likely negative. One sound argument is due to Burgess (1980), and which has already been mentioned in section two[14]. During the transition then, wage expectations are unrealistically high and the job search is prolonged. Consequently, the transitional change in structural unemployment is predictably abnormally high.

4.5 CONCLUSION

The important points advanced in this paper are as follows:

1. There are many forms of trade liberalizations which do not have uniform economic consequences. In the discussion of trade liberalization, we need to specify the form of trade liberalization being discussed and need only concentrate on the politically feasible ones.
2. The benefits of trade liberalization need to be approached with caution, as there are many market distortions which cannot be eliminated. According to the theory of second best, eliminating some but not all market distortions does not necessarily improve our economic efficiency.
3. Trade liberalization has insignificant effect on Canada's cyclical unemployment and this effect is unfavourable in the case of a bilateral free trade with the U.S.
4. Structural unemployment is closely related with the frictions in domestic factor movement. Many of these frictions originate from the behaviour of domestic economic institutions. Therefore, structural unemployment can and ought to be dealt with directly within Canada. Trade liberalization has only indirect impact on structural unemployment and is not an effective means to deal with structural unemployment.
5. Trade liberalization leads to transitory change in unemployment. The change is likely unfavourable, especially for the provinces where, at present, import substitutes are produced. The effect is unfavourable for a variety of reasons. First, trade liberalization will lead to international reallocation of companies which

are selling and are currently producing in Canada because of the present Canadian trade barriers. Second, trade liberalization will lead to a decrease in the real wage in Canada. If wage expectations can only catch up with reality with a substantial lag, job search will be prolonged and unemployment will be temporarily raised. Finally, it seems that the adverse employment effect will be significantly borne by the main bulk of the currently unemployed: teenagers, unskilled workers and secondary income earners who rejoin the workforce after a substantial period of absence. (In establishing the above points, bilateral free

trade with the U.S. is often referred to.)

Finally, we assert that the results of this paper do not imply that trade liberalization is definitely undesirable. The first part of this paper is purely pedagogical and contains no value judgments. The second part merely shows that unemployment cannot be dealt with by trade liberalization alone. The scope of the discussion has been kept very narrow; the paper has not discussed the real benefits of free trade, which may make a very strong case for trade liberalization.

NOTES

I would like to thank Edward Chambers, Edward Fisher, Rolf Mirus and Seha Tinic for their helpful suggestions. I am also grateful to an anonymous referee for his very constructive comments. All shortcomings are mine.

[1] (Lipsey and Lancaster, 1956)

[2] Examples are plenty. If trade liberalization allows the importation of heavily subsidized foreign steel, there is no improvement in global economic efficiency. When domestic consumption subsidy and production tax exist in the exportable good sector, elimination of only the trading partner's export subsidy will actually reduce imports beyond the optimal level. When domestic income tax is higher than the neighbour country, trade liberalization which affects the terms of trade adversely and which promotes international factor mobility will encourage out-migration of labour and possibly also of capital.

[3] Although the alleged improvement in economic efficiency following trade liberalization may not be an economic reality, it does not follow that an improvement cannot exist at all. Indeed, some empirical studies (e.g., Wonnacott and Wonnacott (1967), and Harris (1982)) estimated that Canada would gain from trade liberalization.

[4] This argument is suggested by an anonymous referee.

[5] In Burgess' model, Canada is di-

vided into two production sectors; a primary product sector and a manufactured good sector. The primary product is partly exported and partly used as an input in the manufacturing sector. The manufacturing sector faces import competition. In the primary product sector, factor inputs are labour, capital and natural resources. In the manufacturing sector, factor inputs are labour and capital, besides the primary product. The price of capital, return to capital, the trading prices of the primary product and of the manufactured good are all internationally given (a small open economy assumption). When the tariff on the imports of the manufactured good is reduced, the home price of the manufactured good is reduced. This leads to a reduction in the wage rate in the manufacturing sector. The decrease in the wage rate is proportionally larger than the decrease in the home price of the manufactured good because there is no other factor price change. The decrease in the wage rate in the manufacturing sector will spill over to the primary good sector. The return to the natural resources increases because the wage rate decreases and the price of the primary good remains intact. Subsequently, the price of the ownership of natural resources increases.

[6] (Wonnacott, 1982)

[7] Some may argue that unemployment is a result of persistent labour market disequilibrium. The view here is more that of the neo-classicists.

[8] The sign of these relationships

can be easily deduced.

- [9] I am grateful to an anonymous referee for inspiring the discussion of this point.
- [10] The behaviour of this transitory unemployment change warrants a much more extensive discussion. Due to space limitation, we only mention the points relevant to subsequent discussions.
- [11] If unemployment is the result of persistent labour market disequilibrium, the impact of trade liberalization on unemployment depends on its net effect on job opportunities, which is discussed later.
- [12] The employment impacts of these effects are not permanent because they do not affect the workers' long-run rate of entering into and exiting from the pool of job searchers. The equilibrium size of the pool of job searchers, expressed as a fraction of the total pool of workers, is determined by these two rates.
- [13] We have described a short-run disequilibrium. Of course, in a long-run equilibrium, no wage-productivity discrepancy exists. This is not a flaw of the current discussion. This sub-section's concern is short-run in nature and the short-run disequilibrium is actually created by trade liberalization. Indeed, it is precisely the action described here that corrects the short-run disequilibrium.
- [14] Burgess' argument is long-run in nature, therefore, it is appropriate to advance a short-

run argument. We can do that by making use of a two-sector, specific capital model like the one analyzed in Mussa (1974). In a two-sector specific capital model, when the price of a good decreases, the wage rate will decrease when measured in terms of the price of the other good and increases when measured in terms of the good whose price is decreased. The change of the wage rate measured in terms of the cost of a consumption basket depends on the composition of the consumption basket and also on the elasticities of the demands for labour in the two sectors. The real wage rate is more likely to decrease, the more inelastic is the demand for labour in the other good's sector, the more elastic is the demand for labour in the sector whose output price is decreased and the more weight the other good has in the consumption basket. It is then not difficult to construct a realistic case that the real wage in Canada decreases after trade liberalization, say, a bilateral one with the U.S. We can let the two sectors be the non-traded and traded good sectors. After trade liberalization, the price of the traded good decreases because tariffs are eliminated. It is not unrealistic to assume that the demand for labour in the traded goods sector is quite elastic while the demand for the non-traded goods sector is quite inelastic. The weight of non-traded goods in our consumption basket is not small. Thus, we have the result.

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Book Review

Derek P.J. Hum,
Book Review Editor.

Canada: The State of the Federation 1985 edited by Peter M. Leslie. Kingston, Institute of Intergovernmental Relations, 1985. (222 pp.) ISBN 0-88911-442-0.

This volume is the inaugural issue of a new annual series entitled Canada: The State of the Federation. The series promises to recap significant events on the federal-provincial agenda as well as probe aspects of Canadian public life and general politics from an intergovernmental perspective. Contributions are therefore expected to do more than annotate a year's supply of headlines; they will furnish historical background, analytic insight, and policy interpretation. There can be no disputing the worth of such an enterprise.

Peter Leslie, Director of the Institute of Intergovernmental Relations, provides a lengthy introduction describing present day problems of Canadian federalism. These include: economic regionalism, intergovernmental transfers, the Charter of Rights, and relations with the United States. The perennial question of language rights is again prominent. Leslie's essay is both useful and insightful. It provides a coherent point of departure for the serendipitous collection of chapters that follow and, in this respect, fulfills the minimum

requirements of an effective introduction. But more important, the point is made that explanation of federal-provincial affairs must go deeper than changes in personalities and parties. Matters are more than personal viewpoints held by incumbents. Some provinces will have different positions on an issue, but other issues may transcend both geographical boundaries and provincial leaders. The remaining seven chapters are, consequently, divided into those having a particular provincial focus (part two), and those dealing with specific issues (part three).

The chapters are, of course, the work of individual scholars, all of whom except one are political studies specialists. The contributions are clearly meant as independent essays and should be read as such, despite misleading editorial classification. Gerald Boismenu reviews Quebec's constitutional position and explains why the Constitutional Accord of 1981 was unacceptable to Quebec. Accompanied by two appendices, this important essay is still likely to appeal only to constitutional aficionados. Bruce Pollard's examination of Newfoundland's

dependency captures well the economic quandaries and frustration of that region, which still regards the "mainland" with suspicion. Roger Gibbin's probe of the Alberta psyche in Chapter four of part three is more properly grouped with those focusing on individual provinces in part two.

The remaining essays do focus on particular issues. Chapter six by David Hawkes describes the attempt to accommodate aboriginal self-government within constitutional reform; chapter eight, again by Bruce Pollard, reports the issue of minority language rights in four provinces. Given the volume's intention, the exemplary essays, in my judgment, are Donald Savoie's review of regional development policy, and John Whyte's accessible discussion of federal-provincial tensions in justice administration. Savoie combines policy description with the conventional economic theory of the day to explain why programs evolved as they did, and why provinces and Ottawa interacted as they did. In the course of this exegesis, we learn as much about the perfidy of economics as we do about federal-provincial relations. Whyte's examination of the administration of justice alerts us to many complexities. It is not merely a matter of provincial consultation for federal judicial appointments. The issues are seen to be broader, more compli-

cated, and touching upon constitutional conventions and principles of jurisprudence.

Any volume having the year so prominently featured in its title is exposed to great risk when released in such advance of year end. Interpretations were doubtlessly committed to paper well before such events as: the release of the Macdonald Commission Report, the election of a Liberal government in Quebec, and the sharp gain of the federal Liberals in closing the popularity gap behind the Conservatives. It is also interesting to speculate whether the glowing spirit of cooperation and consultation in federal-provincial relations heralded by several of the authors would have been differently rendered in the harsh light of the Halifax First Ministers Conference. Finally, while recognizing that issues covered are subject to the constraints of space and available authors, it is hoped that future volumes will broaden the subject range and contributors. Especially welcome for the 1985 record would have been chapters on federal transfers (a matter which unequivocally signalled in Halifax that intergovernmental squabbling has returned to normal), and social policy (a topic that captured public attention as perhaps did no other). This year's volume is highly recommended.

Derek P.J. Hum, Department of Economics, St. John's College, University of Manitoba.

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