NUMBER 36 • FEBRUARY 1996

THE ECONOMIC IMPACT OF THE ALBERTA HERITAGE SAVINGS TRUST FUND ON THE CONSUMPTION-SAVINGS DECISION OF ALBERTANS

by Michael D. Hoffman
Department of Economics
University of Alberta

INTRODUCTION

The Alberta Heritage Savings Trust Fund was created in 1976, in recognition of the fact that the rapidly-increasing revenues received by the province from the sale of non-renewable natural resources, would not continue indefinitely. Since its inception, the Heritage Fund has had three basic objectives: (*i*) to save for the future; (*ii*) to strengthen and diversify Alberta's economy; and (*iii*) to improve the quality of life in Alberta. By 31 March 1995, the Heritage Fund held equity investments of almost $12 billion and had expended another $3.4 billion in capital projects.

The creation of the Heritage Fund has raised some important economic issues. First, do Albertans view collective savings (in the form of the Heritage Fund) differently than their own private savings? Second, do Albertans view the Heritage Fund as providing lower taxes at some future date? If the answer to these questions is yes, the Heritage Fund will have an impact on individual consumption-savings decisions. Next, in making their consumption-savings decision, do Albertans look at the Heritage Fund as a whole, or do they hold a different view about the more liquid portions of the Heritage Fund? If Albertans view components of the Heritage Fund differently, its composition will also impact the consumption-savings decision. Finally, the Heritage Fund was a transformation of wealth in the ground (in the form of oil and natural gas reserves) to wealth in the form of financial assets. As a result, do Albertans view wealth in the form of financial assets differently from wealth in the ground?

This paper assesses if the Heritage Fund has met its first objective: to save for the future. To determine if the objective has been met, I examine the consumption-savings decision of Albertans and the impact the Heritage Fund has had on this decision. The reason for this approach is straightforward. If the Heritage Fund represents savings that can be used to finance government expenditure in the future, an individual's future tax burden will be reduced when the savings is spent. If individuals take advantage of an expected future reduced tax liability, they can increase consumption in the current period. This is because the government could reduce taxes in the current period by the amount of the savings, or the savings could collect interest and the government could reduce taxes in the future by the amount of the savings plus the interest. In other words, since individuals should be indifferent between receiving a $1 tax break today and receiving a tax break in the future of $1 plus interest, consumption in the current period can increase by the present discounted value of the future tax reduction. Therefore, the consumption-savings behaviour of Albertans will change if it is the case that the Heritage Fund represents savings for the future.

BRIEF BACKGROUND TO THE ALBERTA HERITAGE SAVINGS TRUST FUND

When it was created, the Heritage Fund began receiving income through a transfer of a portion of Alberta's annual non-renewable natural resource revenue. Income has also traditionally come from the financial yields on investments held by the Heritage Fund. From 1976 to 1982, the government transferred thirty percent of non-renewable natural resource revenue (predominantly oil and natural gas revenue) to the Heritage Fund. From 1983 until 1987, the percentage was reduced to fifteen percent, and since 1987, no revenue has been transferred. In 1982, the government began transferring all the Heritage Fund's net annual income to the General Revenue Fund to pay for various government services. As of 31 March 1995, these transfers had accumulated to over $16 billion.

Initially, the income was to be invested in three separate divisions: the Capital Projects Division, the Alberta Investment Division, and the Canada Investment Division. In 1982, changes to the Heritage Fund resulted in the creation of the Commercial Investment Division, the Energy Investment Division, and a residual component known as the Cash and Marketable Securities Portfolio.

An initial investment in the Heritage Fund of $1.5 billion was made on 30 August 1976. Over the next seven years, the growth of the Heritage Fund was staggering. By 1982-83, the Heritage Fund had assets exceeding $11 billion and more than $1.5 billion had been spent on capital projects. Since then, the growth of the Heritage Fund has slowed due to the reduction and eventual elimination of non-renewable resource revenue transfers, and the transfer of the annual income from financial yields on investments to the General Revenue Fund. As at 31 March 1995, Heritage Fund equity was $11.895 billion. Current net assets of each division are summarized in Table 1, and Figure 1 provides an historical summary of the Heritage Fund.

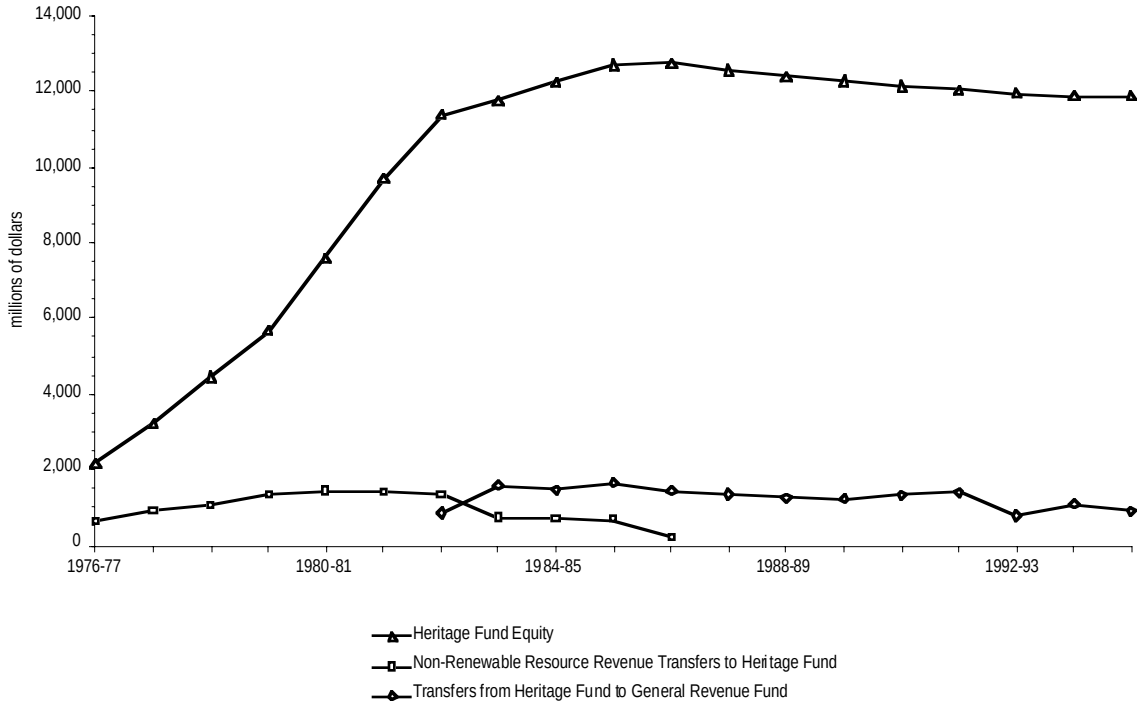
TABLE 1: ALBERTA HERITAGE SAVINGS TRUST FUND BALANCE SHEET

31 March 1995 (thousands of dollars)

	1995	% of Fund Equity
Alberta Investment Division	3,372,736	28.4%
Canada Investment Division	917,894	7.7%
Capital Projects Division Investments	136,241	1.1%
Commercial Investment Division	439,153	3.7%
Energy Investment Division	0	0%
Cash and marketable securities	6,768,099	56.9%
Accrued interest and accounts receivable	260,559	2.2%
Fund Equity	11,894,682	100%
Capital Projects Division Amounts Expended	3,436,733	

Source: Alberta Heritage Savings Trust Fund 1994-95 Annual Report

FIGURE 1: ALBERTA HERITAGE SAVINGS TRUST FUND HISTORICAL SUMMARY



A SIMPLE FRAMEWORK OF THE CONSUMPTION-SAVINGS DECISION

To develop a framework by which an individual's consumption-savings decision can be analyzed, we must determine what factors can affect the decision. First, consider the budget constraint of the individual. At a particular point in time, the individual has a stock of wealth. During the period, labour income is earned. A portion of this income goes to pay taxes that finance government expenditure. The remainder is either used for consumption or savings. The savings earns interest and increases the individuals stock of wealth at the beginning of the next period. It is possible for the individual to borrow against future income to finance purchases (such as the purchase of an automobile). Thus, wealth can be negative. However, it is not possible to borrow money forever so there is the restriction that all borrowing must be paid for at some point in the future.

Since the government provides goods and services to individuals, the spending habits of the government will have an impact on the individual's consumption-savings decision. For example, municipal governments provide residential garbage pick-up. If this service was no longer provided by the government, individuals would have to pay for the service using their disposable income, thus affecting their consumption of other goods and services. Consequently, the government budget constraint is also important in the analysis. The government can raise revenue through taxes and borrowing on the open market. The revenue is either used to purchase goods and services, or to repay maturing debt. Over the long run, government tax revenue must equal total expenditure.

The individual's consumption-savings decision will, subject to the two budget constraints, maximize the benefits gained from allocating resources between the private consumption of goods and services, and the consumption of government-provided goods and services. Given the two budget constraints and the maximization condition, we can deduce that the factors that affect the consumption-savings decision are: personal disposable income (income net of taxes), wealth, government expenditure on goods and services and government borrowing (debt).

INCORPORATING THE HERITAGE FUND INTO THE FRAMEWORK

The Heritage Fund is incorporated into the consumption-savings decision by including it as part of the provincial government debt. This is possible because the Heritage Fund represents financial assets that can be used to offset some of the government's liabilities. In other words, if the Heritage Fund were to be liquidated the proceeds could be used to reduce the outstanding provincial debt. However, the province's net debt (financial assets less liabilities) would be unchanged.

Incorporating the Heritage Fund into the consumption-savings decision is not difficult. However, it is less clear how the Heritage Fund assets should be accounted for in the empirical work. For example, should the per capita value of the Heritage Fund be included in the empirical analysis, or should the mere existence of the Heritage Fund be considered? Since there is no obvious answer, I consider three alternatives for including the Heritage Fund in the analysis and examine if the results differ among these alternatives.

In addition, it is not clear that only one value for the Heritage Fund should be used. The Heritage Fund contains some assets that are highly liquid (e.g., cash and marketable securities), and assets that are less liquid (investments in projects such as Syncrude). I examine two further alternatives, whereby the distinction is made between these two categories of Heritage Fund assets. Each alternative and the rationale for its use is outlined below.

Alternative #1: The "Heritage Fund Exist" Versus the "Heritage Fund Does Not Exist"

The first alternative looks at the Heritage Fund as an entity (i.e., it exists or it does not exist). In this case, the asset value of the Heritage Fund is not important. The rationale behind this specification is that Albertans do not view the Heritage Fund in dollar terms. Therefore, the important characteristic is simply the fact the Heritage Fund exists. Throughout the Heritage Fund's lifetime, we would expect Albertans to have increased consumption if they view the Heritage Fund as saving for the future (and thus a future reduced tax liability). Empirical analysis of this alternative allows us to determine what Albertans perceive their share of the Heritage Fund to be.

This specification is reasonable because Albertans may not know what their share of the Heritage Fund is at a particular point in time. Despite the fact the government releases quarterly financial statements on the Heritage Fund's equity, few people likely know what this amount is. Therefore, this specification hypothesizes that the actual value of the Heritage Fund is irrelevant, and rather, the simple existence of the Heritage Fund is all that is important.

Alternative #2: Heritage Fund in Constant, Per Capita Dollars

In the second alternative, the Heritage Fund is valued in constant per capita dollars (adjusted for any inflationary effects over time). Therefore, this alternative uses each Albertan's share of the Heritage Fund to estimate the impact on consumption. Unlike the first alternative, this one assumes each Albertan is able to determine the value of their portion of the Heritage Fund (i.e., total fund equity divided by current population). In this case, the empirical analysis will indicate how much an individual's consumption will change for each $1 change in the per capita equity of the Heritage Fund. It is important to realize that it is not necessary for Albertans to sit down and actually determine their share of the Heritage Fund. All that is important is that they alter consumption in a manner that is consistent with having determined their share.

Alternative #3: Heritage Fund in Real Total Dollars

The third alternative method for accounting for the Heritage Fund assets in the analysis uses total Heritage Fund equity. This is a simple variation of the second alternative; the difference being that the per capita Heritage Fund equity is not determined. The rationale of this alternative is that Albertans may know how much the Heritage Fund is valued at, but they do not know what their personal share is. While it could be calculated on a per capita basis, some people who have lived in Alberta since the Heritage Fund was created may believe that their portion of the Heritage Fund is greater than the portion of a recent migrant. For this reason, individuals are unable to place an exact dollar value on their share. The empirical analysis will indicate the impact on consumption of a $1 change in total Heritage Fund equity, whereas the second alternative showed the impact of a $1 change in *per capita* Heritage Fund equity.

Alternatives #4 and #5; Heritage Fund Defined by Section 10 Investments and All Other Investments

Alternatives #4 and #5 do not define the Heritage Fund in terms of total Heritage Fund equity. Instead, the Heritage Fund is defined

by two major investment groups: Section 10 investments and all other investments. Section 10 investments are represented by cash and marketable securities which could be liquidated reasonably fast. All other investments are defined to be the investments of the Alberta Investment Division, the Canada Investment Division, the Commercial Investment Division, and the Capital Investment Division. The investments in these divisions are less liquid than Section 10 investments and, while they are marketable, it is not guaranteed that a market exists at any given time. Therefore, it may take some months, perhaps years, to liquidate these assets. The Capital Projects Division is not included in the analysis since these investments are not considered liquid.

For the purposes the analysis, the distinction is made between these two groups of investments because it is hypothesized that Albertans may view the two groups differently; using total Heritage Fund equity may not accurately reflect the impact of the Heritage Fund on consumption. Therefore, alternatives #4 and #5 repeat the analysis of alternatives #2 and #3 respectively (assets in per capita terms, and assets in total dollars) using this new distinction of the Heritage Fund assets.

WEALTH IN THE GROUND VERSUS WEALTH IN THE FORM OF FINANCIAL ASSETS ANALYSIS

One additional piece of analysis uses the wealth variable in the model. Since there is no private wealth data available for Alberta, it was necessary to find a reasonable proxy. The importance of natural resources, specifically oil and natural gas, to the Alberta economy is well known. Thus, it seemed only natural to develop a proxy for wealth based on these resources. The proxy represents wealth in the form of oil and gas in the ground. The use of this proxy permitted further analysis to determine if the Heritage Fund represents a transformation of this wealth into financial assets. If Albertans have acted rationally, they should not distinguish between the two. Consequently, wealth (as proxied here) should have the same impact on the consumption-savings decision as the Heritage Fund. This analysis tests the various alternatives to see if Albertans consider wealth in the ground to be the same as this wealth transformed into financial assets.

EMPIRICAL RESULTS

As explained earlier, the consumption decision is determined to be a function of the following variables: personal disposable income, wealth, government expenditure on goods and services, government debt, and some measure of the Heritage Fund. Using data from Alberta from 1947 to 1992, the model is estimated for each alternative specification of the Heritage Fund From this estimation, I assess the impact of the Heritage Fund variable on the consumption-savings decision. By examining the sign on the estimated parameter on the Heritage Fund variable, we can determine if the impact on consumption is positive or negative, In some cases, however, it may not be possible to say with a reasonable amount of certainty that the impact is either positive or negative. In this case, I conclude that the Heritage Fund has no impact on the consumption-savings decision The results of the estimation of the alternatives are summarized in Table 2 and are detailed below.

TABLE 2: EMPIRICAL RESULTS OF THE ALTERNATIVES

Alternative method of accounting for Heritage Fund assets	Impact of the Heritage Fund on Consumption			Wealth in the Ground Versus Wealth in the Form of Financial Assets Analysis
	Total Heritage Fund Equity	Section 10 Investments	All Other Investments	
1. Heritage Fund Exists Versus Does Not Exist	No Impact	N/A	N/A	Different impact on consumption
2. Heritage Fund in Real, Per Capita Dollars	Negative Impact	N/A	N/A	Different impact on consumption
3. Heritage Fund in Real Dollars	Negative Impact	N/A	N/A	Different impact on consumption
4. Heritage Fund in Real, Per Capita Dollars	N/A	No Impact	Negative Impact	Schedule 10 investments have same impact; all other investments have different impact.
5. Heritage Fund in Real Dollars	N/A	No Impact	Negative Impact	Schedule 10 investments have same impact; all other investments have different impact.

N/A indicates the result is not applicable to the specification. Results are considered accurate 19 times out of 20.

In the first alternative where Albertans are hypothesized to view the Heritage Fund on the basis of either existing or not existing (and actual Heritage Fund equity is not important), the results indicate the Heritage Fund has no impact on consumption. Therefore, the Heritage Fund is not seen as providing a future reduced tax liability.

In alternatives #2 and #3, the Heritage Fund has a negative impact on consumption. This indicates that when Albertans associate a dollar value with the Heritage Fund, either in terms of total Heritage Fund equity or on a per capita basis, the Heritage Fund causes consumption to go down! This is opposite to what we would expect if the Heritage Fund represents savings for the future and a reduced future tax liability.

When the Heritage Fund equity was broken down into two categories, Section 10

investments and all other investments, the analysis indicates that Section 10 investments have no impact on consumption, whereas assets in all other investments have a negative impact on consumption. The result for all other investments, however, is similar to the results with alternatives #2 and #3.

With respect to the analysis of wealth in the ground versus wealth in the form of financial assets, there appears to be a difference between the two forms of wealth in alternatives #1, #2, and #3. In alternatives #4 and #5, there is also a difference between wealth in the ground and non-Section 10 investments. These results are inconsistent with our expectations that Albertans should not distinguish between wealth in the ground and wealth in the form if financial assets.

CONCLUSIONS

This study examined how the Heritage Fund impacts the consumption-savings decision of Albertans. First, the analysis shows that the Heritage Fund is not viewed by Albertans as providing a future reduced tax burden as Albertans have not altered their consumption-savings behaviour in a manner that is consistent with this hypothesis (i.e., the Heritage Fund has not caused consumption to increase).

Second, the manner in which the Heritage Fund is defined in the analysis is somewhat important. When the Heritage Fund is measured as total fund equity and in terms of real dollars or real per capita dollars, the Heritage Fund has a significantly negative impact on consumption. When the distinction is made between Section 10 investments and all other investments, the Section 10 investments have no significant impact on consumption. This is an important result when one considers Section 10 investments currently comprise over fifty percent of the total Heritage Fund equity. Also, if the Heritage Fund is treated in the analysis on an existence versus non-existence basis, there is no significant impact on consumption.

What do these results mean? Regardless of the specification, the Heritage Fund has not caused Albertans to alter their consumption-savings decision in a manner that is consistent with the Heritage Fund representing a future reduced tax burden. In fact, with some specifications, the Heritage Fund has had a negative impact on consumption. Given the fact one of the three objectives of the Heritage Fund was to save for the future, it appears Albertans have not responded to the Heritage Fund in a manner that would indicate this objective has been achieved.

REFERENCES

Alberta Bureau of Statistics. *Alberta Economic Accounts.* (various years)

Alberta Heritage Savings Trust Fund. *Annual Reports.* 1976-77 to 1994-95

Alberta Heritage Savings Trust Fund. *Quarterly Reports.* 1977:2 to 1994:4

Aschauer, David Alan (1985). "Fiscal Policy and Aggregate Demand." *American Economic Review*. 75, 117-27

Barro, Robert J. (1974). "Are Government Bonds Net Wealth?" *Journal of Political Economy*. 82, 1095-1117

Barro, Robert J. (1989). "The Ricardian Approach to Budget Deficits." *Journal of Economic Perspectives.* 3, 37-54

Bernheim, B. Douglas (1987). "Ricardian Equivalence: An Evaluation of Theory and Evidence," in *Macroeconomics Annual 1987.* Stanley Fischer, ed. National Bureau of Economic Research. Cambridge: M.I.T. Press, 263-304

Canadian Association of Petroleum Producers. *Statistical Handbook.* Calgary

Collins, A. F. (1980). "The Alberta Heritage Savings Trust Fund: An Overview of the Issues." *Canadian Public Policy*. Supplement, 158-65

Department of National Revenue. *Taxation Statistics.* Ottawa. (various issues)

Friedman, Milton (1957). *A Theory of the Consumption Function.* Princeton: Princeton University Press

Gapinski, James H. (1993) "Questions of the Economics of Saving." in *The Economics of Saving.* James H. Gapinski, ed. Boston: Kluwer Academic Publishers, 1-46

Government of Alberta. *Public Accounts.* (various years)

Hoffman, Michael D. (1995). "The Economic Impact of the Alberta Heritage Savings Trust Fund on the Consumption-Savings Decision of Albertans," *Master of Arts Thesis.* University of Alberta

Kormendi, Roger C. (1983). "Government Debt, Government Spending and Private Sector Behaviour." *American Economic Review*. 73, 994-1010

Seater, John J. (1982). "Are Future Taxes Discounted?" *Journal of Money, Credit and Banking.* 14, 376-389

Seater, John J. (1993). "Ricardian Equivalence." *Journal of Economic Literature.* 31, 142-190

Smith, Roger E. (1992). "Income Growth, Government Spending, and Wasting Assets–Alberta's Oil and Gas." *Canadian Public Policy*. 18, 387-412

Smyth, David J. (1993). "Toward a Theory of Saving," in *The Economics of Saving.* James H. Gapinski, ed. Boston: Kluwer Academic Publishers, 47-92

Statistics Canada. *Corporation Financial Statistics.* Ottawa. (various years)

Statistics Canada. *Financial Statistics for Enterprise.* Ottawa. (various years)

Statistics Canada. *National Accounts.* Ottawa. (various years)

Statistics Canada. *Provincial Economic Accounts.* Ottawa. (various years)

Warrack, Allan A. (1985). *The Alberta Heritage Savings Trust Fund as a Policy Instrument for Resource Management.* Western Resource Program, Institute for Research on Public Policy, (November)