UNIVERSITY OF CALGARY

Economic Commentaries (EC)

Alberta Legislature

Alberta Centennial

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Volume 3, Issue 2, November 2005

Introduction

Daniel V. Gordon

Welcome to the Fall (05) issue of **EC.** In this issue, the Alberta Legislator pictured on the front page takes centre stage in celebration of Alberta's centennial. Alberta's prosperity is founded on resources, business and people. Getting the economic polices and economic incentives correct will ensure future growth and continued prosperity. **EC** is a venue for discussing and debating economic issues of importance to Alberta and Canada.

We welcome to our department **Dr. Francisco Gonzalez** as a full-time associate professor. Dr. Gonzalez held a faculty position in economics at UBC before joining the University of Calgary. Dr. Gonzalez is an applied economic theorist with an interest in macroeconomic issues. His research has appeared in prestigious academic journals such as the *Journal of Economic Theory, The Economic Journal and the Canadian Journal of Economics*. Dr. Gonzalez will contribute to future issues of **EC.**

Dr. Francisco Gonzalez

In this issue of **EC**, we present four reports. The first is a commentary by Professor Scott Taylor, Canada Research Chair in International, Energy and Environmental Economics, examining the issues and relationship between free trade and increased environmental damage. Dr. Taylor argues that empirical evidence supports the conclusion that free trade is good for the environment.

In the second commentary, Professor Jim Gaisford and Liping Zhang (MA graduate economics 2005) recognize that the softwood lumber dispute with the US is likely to be with us for some time. Under this restrictive trade environment the authors consider managed trade regimes that are less punitive to Canadian producers and Canada's overall welfare.

The third commentary is an article by Professor Eugene Beaulieu who argues that Canada and it's trading partners have achieved a substantial reduction in tariff barriers to trade but that there still exists substantial protectionism through 'trade remedy laws'. Professor Beaulieu points out that protectionist measures by the US in the softwood lumber dispute are similar to polices used by Canada to protect steel production in Ontario.

The final article by Professor Kurt Klein, Professor of Economics and Board of Governor's Research Chair, University of Lethbridge describes the purpose, objectives and some recent research projects of the Alberta Ingenuity Centre for Water Research (AICWR).

We include in this issue of **EC** an announcement for the Stephen G. Peitchinis Memorial Graduate Scholarship.

Finally, a new feature to this issue of **EC**, we profile three recent graduates of the Graduate programme in economics at the University of Calgary.

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International Trade and the Environment

M. Scott Taylor

Is free trade good for the environment? Should existing trade rules be changed to make sure that future trade liberalizations have a benign environmental impact? Should countries be allowed to tax goods coming from other countries where their less strict controls on pollution amount to an implicit subsidy? Should trade agreements reached in the WTO, and Multilateral Environmental Agreements such as the Kyoto protocol be linked, and if so how? To answer these questions we need to have a good understanding of how international trade affects a country's environment, and how differences across countries in their environmental regulations may affect trade patterns worldwide. To some involved in trade policy debates, the effects of free trade are obvious – obviously good to some because free trade raises national income and makes affordable new investments in pollution control – obviously bad to others because it shifts pollution intensive industries to poor countries while allowing unfairly subsidized foreign goods into the domestic market. Academics must have logical arguments supported by empirical evidence if they are to convince their peers, the policy community, and eventually the public at large. As such, the Academic debate over the impact of free trade on the environment is far more nuanced than discussions we see in the press, and relies very heavily on weighing empirical evidence for and against competing hypotheses.[1]

[1] For an overview of current theoretical and empirical work in this area see B.R. Copeland and M. S. Taylor, "Trade, Growth and the Environment", Journal of Economic Literature, 42 (1), 2004.

At the center of the trade and environment debate is the "Pollution Haven Hypothesis" (PHH). Simply put, the hypothesis predicts free trade will lead to the relocation of pollution intensive industries from high income and stringent environmental regulation countries, to low income and lax environmental regulation countries. In the NAFTA debate, the PHH was used to predict both an environmental disaster in Mexico (because Mexico would specialize in pollution intensive goods) and a jobs disaster in partner countries (because jobs in pollution intensive industries would be lost as imports from Mexico surged). If the PHH is true, it can be used to argue against a policy of liberalized trade; if false, the environmental impact of liberalized trade is likely to be far more benign.

To examine this issue, economists have proceeded in three steps. The first step was to recognize that differences in environmental control costs across countries may not be the most important factor affecting industry location. The profitability of firms also depends on access to good infrastructure, the availability of skilled workers, respect for the rule of law and contracts, etc. This view of world trade is represented by what we might call the "Factor Endowments Hypothesis" (FEH). The FEH predicts that conventional determinants of costs are in fact key to location decisions and hence trade flows. Under the FEH, countries which are abundant in the factors used most intensively in pollution intensive industries will tend to attract and keep these industries even if their environmental control costs are relatively high. Under the FEH hypothesis, rich developed countries are the natural exporters of many pollution intensive products because pollution intensive industries are typically quite capital intensive and employ skilled workers. Rich developed countries are abundant in both skilled workers and have high ratios of capital per worker.

Once the FEH was in play as a competing hypothesis, researchers turned to consider the empirical evidence for and against each hypothesis. In this second step, simple statistics and trends were reported. For example, researchers noted that while environmental control costs have been rising since the early 1970s these costs are still very small as a share of total firm costs. For example in US data, pollution abatement control

expenditures by manufacturing firms represent only 1 to 2% of total production costs.[2] This observation cast doubt on the PHH since it requires location and production decisions to rest entirely on differences in control costs across countries. If these costs are small, how could they be pivotal to location decisions? In contrast, the FEH was strengthened by this observation because it predicts that other factors – those making up the remaining 98 to 99% of costs are instead critical.

To examine how important other factors are to location decisions and trade flows, simple cross country comparisons were employed. For example, we could look at US net imports[3] from Canada and Mexico across a broad range of manufacturing industries some of which are quite clean in their production methods while some are very dirty. Suppose we take the top 20 industries which spend the most on pollution abatement (as a fraction of their total costs) and label these "dirty industries". Using this definition of dirty industries, we find that on average the US imports dirty products from Canada while it exports dirty products to Mexico! This finding is inconsistent with the PHH. The alternative FEH however provides us with a very natural explanation: Mexico's comparative advantage is in low-skilled, labour-intensive industries which are, on average, relatively clean industries; Canada's comparative advantage lies in more capital-intensive and often resource based industries, which are, on average, relatively dirty industries; therefore, in the case of US-Canada-Mexico trade, other factors of production (cheap low skilled labour in Mexico and abundant capital and resources in Canada) have proven to be more important in determining trade flows than are differences in environmental control costs across countries.

While these results are suggestive, they are not conclusive. To go further researchers in this area developed a series of explicit economic models containing sharp predictions on trade flows, pollution levels, and the composition of national output. This third step allowed researchers to be more precise about what features of real-world data constituted evidence for or against each hypothesis. Using this more theory-based method, researchers then examined two new pieces of evidence. Researchers looked at how trade flows from tightly regulated countries (like the US) have changed *over time* as US regulations *became* stricter. The results from this exercise showed that while US production and exports have shifted towards "cleaner" industries over the last twenty years, the composition of US exports has remained quite pollution intensive. This finding demonstrated that although the US has some of the strictest environmental regulation in the world and has undergone several significant trade liberalizations in the past twenty years, freer trade has not led to the flight of its pollution intensive industries to trading partner countries.[4]

Another branch of the empirical research looked at how increased trade affected measures of environmental quality such as air or water quality. The results from this research also supported the FEH. After controlling for the impact of economic growth on the environment (which may be positive or negative), researchers found that increases in trade flows have at best a small impact on environmental outcomes as measured by pollution concentrations. Surprisingly, this research also found that while differences in environmental control costs have some impact on trade flows, when trade liberalization alters the composition of national output it tends to raise pollution concentrations in rich developed economies and lower them in poor undeveloped ones.[5] This result is again consistent with the FEH. Rich and highly developed economies such as Canada, the US and other members of the OECD have a natural comparative advantage in relatively dirty and capital intensive industries despite their more stringent regulation. Poor and less developed economies primarily export relatively clean and labour intensive manufactures despite their lax environmental regulation. Freer trade should shift pollution intensive production away from relatively poor countries making the composition of their national output cleaner while it makes the composition of output for relatively rich countries dirtier. While this composition effect of trade is predicted to be negative for rich countries and positive for poor countries, for both sets of countries researchers found that the national income gains created

[2] Data on pollution abatement costs and trade flows employed in this paragraph come from "Unmasking the Pollution Haven Hypothesis," A. Levinson and M.S. Taylor, National Bureau of Economic Research Working paper No. 10629, July 2004.

[3] Net imports are the value of imports minus the value of exports. For example if Canada exports wheat but imports none, Canada's net imports of wheat will be negative.

[4] See "Trade Liberalization and Pollution Havens,", A. Levinson, J. Ederington and J. Minier, *Advances in Economic Analysis and Policy*, 4(2) 2004 (Berkeley Electronic Press).

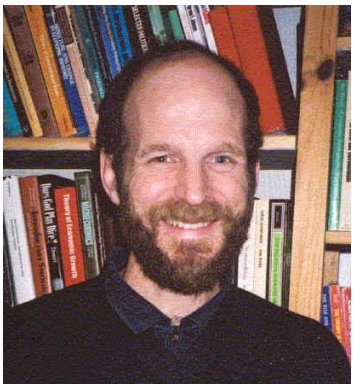
[5] The original research in this area is "Is Free Trade Good for the Environment", W. Antweiler, B.R. Copeland, and M. S. Taylor, American Economic Review, Sept. 2001.

by trade had an additional and significant beneficial effect in lowering pollution concentrations.

In total, the empirical evidence to date is consistent with the predictions of the FEH and largely inconsistent with the PHH. If this conclusion holds up to further empirical scrutiny, environmental arguments against liberalized trade will lose much of their force. If differences in environmental control costs have only small impacts on trade flows, then unfairly "subsidized" foreign goods from lax regulation countries cannot be causing material damage to national industries. And if ongoing trade liberalization shifts pollution intensive industries to the rich and tightly regulated developed countries and away from poorer and laxly regulated developing countries – as the current empirical evidence suggests – then yes, free trade is good for the environment.

Choosing the Lesser of Evils in the Canada-US Softwood Lumber Dispute

Jim Gaisford and Liping Zhang



After the expiration of the US-Canada Softwood Lumber Trade Agreement (SLA) on March 31, 2001, US softwood lumber imports from Canada increased sharply. US timber companies claimed that Canada was dumping softwood lumber into the US market and that Canadian provincial governments were indirectly subsidizing their timber industries. With this, the long-standing Canada-US softwood lumber dispute entered a new phase. The US softwood lumber producers mounted a successful case for protection from unfair trade practices, and the US implemented substantive countervailing and anti-dumping duties. Canada has used both the NAFTA and WTO disputes resolution processes to challenge these US actions with mixed results. A recent NAFTA panel ruled the US had erred in the application of its own law when it found a threat of material injury from Canadian exports, while a WTO panel found that the US decision was consistent with its WTO commitments.

Whatever the merits of US claims of dumping and subsidization, it appears to be naïve for either producers or governments in Canada to expect free trade in softwood lumber without further harassment from US producers in the near future. Consequently, it may be worthwhile to consider types of managed trade regimes that are less punitive to Canadian producers and Canada's overall welfare.

During the Canada-US softwood lumber dispute, three broad types of trade policy instruments have been used: tariffs, export taxes, and quantitative export restrictions, which have similarities with voluntary export restraints. The dispute has gone through five distinct phases, which can be referred to as Lumber I-V:

- During Lumber I (1982-1986), US authorities ruled against countervailing duties, and free trade remained in effect despite the protests of US producers.

- In Lumber II (1986-1991), Canada and the US reached a Memorandum of Understanding (MOU) requiring Canada to impose a 15% export tax.

- In Lumber III (1991-1996), the US imposed a countervailing duty of 6.5%.

- During Lumber IV (1996-2001) a complex export tax and quota system comprised the Softwood Lumber Agreement (SLA). At its centre, the SLA specified that exports up to 14.7 billion board feet (bbf) could enter the US without taxes or fees, exports greater than 14.7 bbf but less than 15.35 bbf were subject to a $50 per thousand board feet export tax and exports in excess of 15.53 billion board feet were subject to an export tax of $100 per thousand board feet.

- Lumber V (2001-present) involves antidumping and countervailing duties totaling 27.22%.

The policies in place during the Lumber II-V phases have each succeeded in restricting Canadian softwood lumber exports to the US market. Since this caused increased US lumber prices, there have been subsequent increases in US softwood lumber production and increased substitution of other materials such as steel and concrete in US housing construction. Meanwhile, prices in Canada have been lower than would have been the case under free trade. To a greater or lesser extent depending on the magnitude of trade taxes and other market conditions, US producers and Canadian consumers have gained, while US consumers have lost in each of these phases.

The Lumber II-V regimes, however, have had substantively different effects on Canadian producers and national welfare in both countries. Under the tariffs of Lumber III and Lumber V, welfare was transferred from Canadian producers and US consumers to US producers and the US treasury. In spite of the trade distortion, theory points to the possibility of an overall US welfare gain from buying at depressed Canadian prices. Quantitative analysis shows that, relative to free trade, US welfare did rise by an average of $115 million per year under Lumber III and by $450 million in 2001 under Lumber V. Under the MOU export tax of Lumber II, the Canadian treasury rather than the US treasury gained. Welfare was transferred from Canadian producers and US consumers to the Canadian treasury and US producers. Canadian welfare rose by an average of $9.87 million per year because the reduction in exports allowed Canada to sell at the inflated US price.

The analysis of the Lumber IV phase from 1996 to 2001 when the Softwood Lumber Agreement (SLA) was in effect is of particular importance. Recent works by Kinnucan and Zhang (2003) has shown that it is theoretically possible for Canadian producers to have gained under the SLA. While Canadian producers are harmed by a lower Canadian price, they gain rents from quota system governing exports. Further, using estimates of elasticities of demand and supply from previous studies, Kinnucan and Zhang argue that Canadian producers would have experienced overall gains during the SLA phase.

Based on new estimates of Canadian and US elasticities of supply and demand, Zhang (2005) demonstrates that Canadian producers did *not* gain relative to free trade from the SLA. While Canadian welfare rose by an average of $356 million per year during Lumber IV, Canadian producers experienced an average overall loss of $300 million per year. Nevertheless, producer losses were much smaller under the SLA than any of the other regimes. This leads to important implications for policy formulation.

Even if the policy regime for trade in softwood lumber is likely to be driven by producer interests on both sides of border, there appear to be grounds for consensus as well as conflict. On the one hand, for given taxes, US producers are no worse off with an export tax and quota regime such as the SLA. On the other hand, Canadian producers are much better off with an export tax and quota regime where they obtain rents from the export restrictions that allow them to sell at the high US price. For example, it is estimated that Canadian producers lost $973 million in 2001 under the 27.22% antidumping and countervailing duties of the Lumber V regime. By contrast, the Canadian producers would have only lost $186 million in 2001 under an export tax quota regime similar to the SLA but with a high export tax of 27.22%. In both cases US producers would have gained $957 million relative to free trade. Consequently, in the face of current political reality, a new agreement similar to the SLA may be the best way to manage Canada-US softwood lumber trade. Of course, Canadian producers would prefer the lowest possible over-quota tax rate on Canada-US softwood lumber trade, but US producers would clearly prefer a high rate.

Much research still needs to be undertaken in this area; calculating current and theoretically consistent elasticities of demand and supply for both Canada and US, determining supply side differences between provinces, and perhaps most importantly, determining whether there is substance to US claims of dumping and subsidization.

Reference:

Kinnucan, H.W. and Zhang, D. 2003. Incidence of the 1996 Canada-US Softwood Lumber Agreement and the Optimal Export Tax. *Canadian Journal of Agricultural Economics*, 2 (December).

L. Zhang. 2005. The Canada-US Softwood Lumber Dispute: Economic Welfare under Alternative Trade. Masters Thesis, Department of Economics, University of Calgary.

The New Protectionism of Trade Remedy Laws

Eugene Beaulieu

We live in an era of liberalized trade. By 1990, 90 percent of the goods imported into Canada entered duty-free and on average the tariff rate is very low. The World Bank reports that Canada's weighted average tariff rate in 2002 was 1.1 percent. Canada faces a similarly free trade regime when exporting goods to its major trading partners. Successive rounds of the GATT trade negotiations lowered tariffs among member countries and the Canada US Free Trade Agreement (CUSTA) and North American Free trade Agreement (NAFTA) further lowered tariffs.

Although international trade is generally free from the high tariffs common only a generation ago, protectionism is alive and well in Canada and in all of Canada's trading partners. Countries have lowered their tariffs in accordance with international agreements but have retained mechanisms – called trade remedy laws - to protect local industries. The most visible and widely used protectionist tools are anti-dumping (AD) and countervailing (CV) duties. AD duties are applied when a domestic firm complains to their government that they are being injured by foreign firms selling their products below cost or below the price they charge at home. CV duties are applied when a domestic firm shows that it is being injured by competition from a foreign firm that is subsidized by a foreign government. A third tool in the protectionist arsenal is the safeguard duty. According to the Canadian International Trade Tribunal (CITT – the body that administers protection in Canada) safeguard duties are used when "the goods subject to the inquiry are being imported into Canada in such increased quantities and under such conditions as to be a principal cause of serious injury, or threat thereof, to domestic producers of like or directly competitive goods." Thus safeguard actions are the antithesis to how countries are supposed to benefit from international commerce. If Canadians start importing goods from a lower cost foreign supplier, higher cost domestic suppliers can use safeguard measures to protect the domestic market and charge higher prices than they could if they had to compete. Under safeguarding the domestic firm need only show that it has lost market share to imports!

Recently Canadians are very much aware of the pernicious consequences of this type of protection with American duties on imports of Canadian softwood lumber. This case illustrates the damage a protectionist policy in the US can have on industry in Canada.

The softwood lumber case illustrates the downside of the policy from the receiving end of AD and CV duties. However, firms and governments generally support the status quo. Firms want protection from foreign competition and governments want the ability to protect local constituencies. In fact most people seem to accept the dubious premise that the purpose of AD duties are to ensure competition by punishing foreign firms that sell their products at "unfair" prices in their home market. Imagine that you are a steel worker employed at a steel plant in Hamilton, Ontario. Regardless of which steel company you are working for, it is clear that the company is suffering and you are in danger of loosing your job. For a variety of reasons foreign firms are able to supply steel at a lower cost than the Hamilton plants.

Historically, Canada protected the domestic steel industry from foreign competition with import restrictions including tariffs. The owners of the domestic steel plants, the unions and workers benefited from this protection. On the other hand, the steel customers, including the auto industry, paid a higher price for steel. Unfortunately for the inefficient Canadian steel producers today, Canada has systematically reduced the level of protection provided to domestic producers. Moreover, the Canadian government has tied its hands through international agreements such as the WTO and NAFTA, and is prohibited from protecting domestic industries by raising tariffs. Fortunately for the Canadian steel workers and investors the steel industry has become the main beneficiary of AD and CV duties. So for example, when Canadian steel producers were unable to compete

with foreign imports in 1993, the Canadian International Trade Tribunal (CITT) imposed duties of between 23 and 54 percent on imports of carbon steel plate.

While Canadians may be upset about the Americans charging AD and CV duties on softwood lumber and Canadian politicians may threaten to play the energy card in response to these duties - there is no vocal opposition when Canada uses these same policies to protect domestic industries. In fact, AD duties are considered by many to be a practical tool for dealing with "unfair" foreign competition. The irony is that AD duties imposed by Canada are an expensive policy that increases the cost of affected products to all purchasers – consumers and downstream producers alike. Adding 54 percent to the price of steel is an expensive way to protect domestic steel production.

The lack of opposition to the costly protection of AD, CV and safeguard duties is a combination of two factors: one is the fallacious notion that any kind of foreign competition is fundamentally "unfair"; and the other is nothing more than the "collective action" problem identified by Mancur Olson in his seminal work on political economy. Softwood lumber is front page news in Canada and has the direct attention of the Prime Minister because the softwood lumber interest group is small and well organized. Softwood duties are not an issue in the United States because the strong lumber interests are protected and the cost of the protection is borne by the disperse interests of consumers and a small diffuse home building industry. The AD duties imposed by Canada on steel does not make the front page of the newspaper because the well-organized steel industry benefits from the status quo and steel consumers are disperse.

Although trade remedy laws have become known as "new" protectionism they originated over 100 years ago. While Canadians lament the US AD duties on softwood they likely do not realize that Canada invented antidumping duties in 1904 to block imports sold at "less than fair value." The target of the initial Canadian AD measure was the same domestic steel industry that Canada continues to protect today. By the way, the 1904 duty on steel from U.S. Steel increased the prices of the materials used to build Canadian railroads.

The rationale that countries have for using antidumping measures is to prevent the sale of foreign goods "at less than fair value" and generally cite "predatory pricing" as the target of the policy. Predatory pricing is when a foreign company uses temporary low prices to drive its competitors out of a market and then raises prices. Predatory pricing does seem worthy of a policy response because predatory pricing harms not only domestic producers but, in the long run, consumers as well. However, predatory pricing is extremely rare and possibly never observed. In practice, antidumping measures around the world have never been undertaken in the name of preventing predatory pricing – they have targeted the nebulous "unfair" pricing of foreign firms. There is no economic rationale for using policy to eradicate selling at prices below "fair value." This is simply normal business practice. Lower prices are often the result of healthy competition and benefits consumers. What is more, AD measures may actually facilitate unfair and anticompetitive behaviour as domestic firms reduce foreign competition. As well, a domestic firm adversely affects its foreign competition simply by bringing a case forward. The sheer threat of antidumping action is a useful tool for a domestic firm to impede competition from abroad.

If AD and CV duties weren't bad enough – firms do not even have to show that foreign firms are being "unfair" – let alone "predatory" – with safeguards they need only show that they are being injured by increased imports. Two recent cases reveal a disturbing direction for Canadian trade policy. Within the last year, both barbeque and bicycle manufacturers in Canada have failed to convince the Canada Border Services Agency (CBSA) that these goods should be granted AD or CV duties. However, subsequently both of these producers convinced the CITT that they should get safeguard protection because of lost market shares to China (and Taiwan in the case of bicycles). These cases have significantly lowered the bar for obtaining trade protection. Based on lost market share, the CITT concluded that the government of Canada should impose a 30 percent surtax on bicycles and a 15 percent surtax on barbeques.

The bicycle case provides a good example of the problem with the status quo. The case is in reference to lower-end bicycles that retail for less than $500. The market share of domestic producers declined from 58 percent in 2000 to about 30 percent in 2004. The size of the market was around 1,545,000 bicycles in 2004 with about 481,000 provided by domestic producers. The

average cost of imported bicycles was $187 – whereas the cost of domestically produced bicycles was about $209 in 2004. You can see why the domestic producers are in trouble. When they were unable to convince the CBSA that the importers were dumping bicycles – they managed to convince the CITT that the domestic industry was in trouble because of imports. Using very rough approximations we can get a sense of the costs and benefits of this safeguard measure. Assuming that Canada is a small player in the world bicycle market, the CITT 30 percent surtax would increase the price of a $187 per bicycle to $243 per bicycle. Depending on the elasticity of demand, the total cost to consumers of the surtax will be around $80 million per year. The low-end bicycle makers in Canada directly employ 478 workers and pay them on average $15.42 per hour. If they work 38 hours per week, for 50 weeks per year they earn $29,298 per annum. The cost to Canadian consumers for each of the $29,298 dollar per bicycle assembly jobs is around $170,000 per year. This is an expensive employment-generating program.

The good news is that the safeguard surtaxes are just recommendations by the CITT. The bad news is that the government will have to make a political decision over whether to provide support to two well-defined and organized industry lobby groups. We are back to Mancur Olson's thesis that political activity is a public good (the benefits of such activity accrue to all members of the group). When political action is a public good policies that impose large losses in total, but small losses on any individual may not face effective opposition. This can explain why policies that yield higher costs than benefits - and also hurt far more voters than they help - can nonetheless be adopted. The well-organized barbeque and bicycle lobbies will point out that they are talking about 1162 jobs in a few federal ridings in southern Ontario and Quebec.

Water Use and Conservation in Alberta

Kurt K. Klein

Ensuring a safe and plentiful supply of surface water is an issue crucial to the well-being of every resident of Alberta. Its effective and efficient use is central to economic growth and environmental sustainability. As the necessary but competing demands on surface water resources intensify, the awareness of its limited supply increases. This is particularly evident in the semi-arid

area of southern Alberta where there has been significant agricultural, industrial and population growth. Surface water in the South Saskatchewan River Basin is fully allocated at present and there is little opportunity to increase supply by enhancing off-stream storage facilities. Alberta Environment has prohibited the allocation of additional surface water from the southern tributaries of the Oldman River.

In southern Alberta, irrigation accounts for about 90% of the consumptive use of surface water. Water also is required for many industrial processes ranging from food processing to thermal electricity generation to oil and gas extraction. In addition to these consumptive uses of surface water, it also has many non-consumptive uses including hydroelectricity generation, fisheries, recreation and effluent dilution. Many non-consumptive uses alter the quality of the water and affect the stability and channels of flow. For example, the salinization or contamination of surface return-flows or ground water by nutrients, microbes or pesticides can lead to environmental degradation. This is important as southern Alberta's extensive network of irrigation canals, reservoirs and sloughs create wetlands and habitats for some of the regions most threatened rare and endangered species of birds and animals.

In March 2003 Alberta Environment released a draft document entitled *Water for Life: Alberta's Strategy for Sustainability*. One recommendation in that report was to establish a research program to address new and emerging water management issues. A major priority of the recently established Alberta Ingenuity Centre for

Water Research (AICWR) is to undertake socio-economic studies that address these issues.

Socio-economic research is required to address the many roles that water plays within society, focusing on the efficiency and sustainability of its use and reuse, the accompanying distribution of costs and benefits, and the role of institutions and economic incentives in promoting socially optimal use of this valuable resource.

We have assembled an experienced group of socio-economic researchers at the University of Lethbridge that, with colleagues at the University of Calgary and elsewhere in the province, has developed an ambitious and innovative research program. A number of projects have been completed or presently are underway. Three are described briefly below.

The first study used a survey of irrigators in the St. Mary's River Irrigation District to determine their use of the market for water during the exceptionally dry year of 2001. It was determined that the ability of producers to buy water on a temporary basis helped ensure high-value crops were successfully grown to meet processing contracts that year. The study showed that, like newly formed water markets elsewhere in the world, the market was "thin" with relatively few purchases and sales and prices were erratic. However, the study also showed that water moved from low to higher value uses and from producers who used relatively less efficient irrigation equipment to those with more efficient equipment. Many sellers viewed the market as an opportunity to earn additional income because the water was worth more to sell than to use on some crops.

The second study involves the construction of a mathematical programming model of the Bow River Irrigation District. This model selects the level of activities that maximize an objective function (usually stated as a measure of profitability) subject to a series of technological and policy constraints. The model incorporates the demand for and the supply of irrigation water in a typical growing season for twelve crops. Early results suggest that achieving efficiency gains by using substantially less irrigation water will imply changes to cropping patterns and a negative impact on net farm income. Farmers will expand the production of crops with lower yield elasticities with respect to irrigation water.

The third study seeks to understand some of the important sociological and public health factors related to water use and disposal that affect rural families. A survey is being conducted of farms that contain cattle feedlots in the Lethbridge Northern Irrigation District. Men and women are being asked about health and safety issues related both to their family lives and to their feedlot businesses during the floods in 2005, 2002, and 1995. It is hoped that preliminary results will be available before the end of 2005. Already, follow-up studies are being planned.

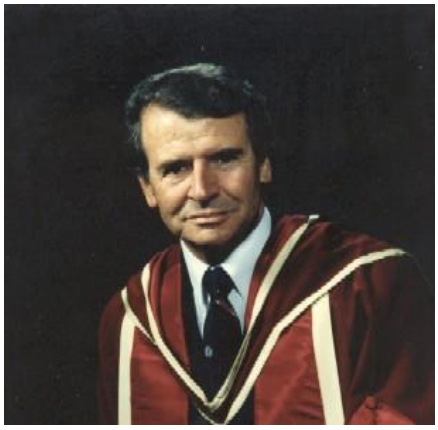
The three studies noted above indicate the types of studies that are necessary to understand how surface water in Alberta can be more effectively managed. Future economic growth and a healthy environment in the province depend on efficient and sustainable use of surface water resources. It is our hope that information from our socio-economic research program will contribute to the public debate and ultimately help policy makers to make the necessary critical choices.

Stephen G. Peitchinis Memorial Graduate Scholarship

In a career that spanned more than three decades—from 1960, when he obtained his Ph.D. in labour economics from the prestigious London School of Economics, to 1992, when he retired from the University of Calgary—Stephen Peitchinis was one of Canada's most respected and influential commentators on economic policy. This success arose from an uncanny ability to redraft the arcane writings of academic economists into terminology that could easily be understood by policy makers and citizens everywhere; from a prodigious capacity for work; and from a sympathy for the less well off—the working class, students, single mothers, and the disabled—that led him to investigate issues that were of great topical importance to all Canadians.

These abilities led him to be sought after by policy makers at every level of government in Canada. Federally, he was a member of the Board of Governors of the Canadian Council on Social Development; chairman of the federal Conciliation Board on Labour Disputes; and a major contributor to the Royal Commission on the Economic Union and Development

Prospects for Canada. Provincially, he was the chairman and director of research for the Commission to Inquire into the Financing of Post-Secondary Education in Canada (established by the Council of Ministers of Education); associate director of the Human Resources Research Council of Alberta; and a member of the Banff School of Fine Arts Council. In Calgary, he chaired the City's task force on the audit committee and was a member of the Economic Society of Calgary's executive committee.



Professor Stephen G. Peitchinis

Dr. Peitchinis was also an immensely talented educator—both as a writer of popular textbooks and as a teacher, in and out of the classroom. For many years, his textbooks—*The Economics of Labour: Employment and Wages in Canada*, *Canadian Labour Economics: An Introductory Analysis*, and *The Canadian Labour Market*— were widely used in universities and colleges across Canada. And his books *Computer Technology and Employment* and *Women at Work: Discrimination and Response* provided popular supplementary readings to many courses in labour economics. At the time of his passing he was hard at work on *CYBERECONOMICS: The Internet's Influence on Global Employment*, which has since been completed by his nephew Chris Peitchinis.

As a teacher, Dr. Peitchinis was widely respected for his ability to present materials in a manner that was easily understood and to excite student's interest in issues of public policy. But it was for his role outside of the classroom that he is best remembered by his former students. There, he encouraged students both to continue their education and to apply their learning to issues of public importance. For example, Stephen Harper, the Leader of the federal Conservative Party, recalls that Dr. Peitchinis was:

". . . a man who encouraged his students to think in both a disciplined and pragmatic manner about economic policy. He actively encouraged me to become a full-fledged (PhD) economist. When I got sidetracked into politics, he never discouraged that, but always challenged me to apply my education to public policy issues."

And David Peever, another of Dr. Peitchinis' former students, recounts:

"In 1985, as I was completing my undergraduate degree, Dr. Peitchinis approached me with the suggestion that I consider graduate work [and provided] encouragement throughout the application process. Completing the M.A., and the pursuit of a career as an economist in Ottawa and later in Calgary, would never have happened without his intervention . . . [Dr. Peitchinis] recognized and cultivated excellence, and actively encouraged people to stretch their limits".

Stephen Peitchinis left an important legacy to the people of Canada in general, and the people of Calgary in particular, both through the extensive body of his writings and through the encouragement he gave to his students, many of whom have become the leaders of their generation.

The Department of Economics and the Faculty of Graduate Studies at the University of Calgary are pleased to announce the establishment of the Stephen G. Peitchinis Memorial Graduate Scholarship.

Those interested in contributing to the endowment for this scholarship can send a cheque made out to the University of Calgary, indicating that their gift is a contribution to the Stephen G. Peitchinis Memorial Graduate Scholarship. The address to send contributions is

The Development Office
CHD 6th floor
The University of Calgary,
2500 University Drive NW
Calgary, Alberta T2N 1N4

Graduate Student Profiles

Syed Ayub

Master of Arts, Economics, University of Calgary, 2004
Bachelors of Arts, Honours Applied Economics, Queens University 2001.

Syed has worked in Natural Resources Canada (NRCan) since April 2004. Within NRCan his work is with the Industry and Trade Division of the Canadian Forest Service. Syed's responsibilities include researching, analysing and reporting on market access issues related to Canadian forest products and the potential for bio-energy in Canada.

Matthew Foss

Master of Arts, Economics, University of Calgary, 2001.
Bachelors of Arts, 1st Class Honours Economics, University of Calgary, 1998

Matt is the Director of Gas Business Analysis, Alberta Department of Energy. As Director of Gas Business Analysis it is Matt's responsibility for the economic and technical analysis of policies and business directions affecting the long-term strategic development of the province's gas resources and the quantum of royalty collected.

Kelly Gunsch

Master of Economics, University of Calgary, 2005
Bachelor of Science, University of Calgary, 1994

Kelly is responsible for ensuring the strategic and effective management of TransAlta's contracted and uncontracted revenues and commercial matters for all power generation and existing transmission assets across Canada, U.S., Australia and Mexico. She is part of the leadership team of TransAlta's Corporate Development and Marketing organization.

Kelly joined TransAlta in 1995 and has held various positions within the company, including roles in Sustainable Development, Regulatory Affairs, and Business Development. Prior to her current role, Kelly led the commercial management of the company's assets in Western Canada.

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