

**The Canada-U.S. Transborder Trucking Industry:
Regulation, Competitiveness and Cabotage Issues**

by

Darren James Prokop

A Thesis

**Submitted to the Faculty of Graduate Studies
in Partial Fulfillment of the Requirements
for the Degree of**

DOCTOR OF PHILOSOPHY

**Department of Economics
University of Manitoba
Winnipeg, Manitoba**

(c) November, 1998



**National Library
of Canada**

**Acquisitions and
Bibliographic Services**

**395 Wellington Street
Ottawa ON K1A 0N4
Canada**

**Bibliothèque nationale
du Canada**

**Acquisitions et
services bibliographiques**

**395, rue Wellington
Ottawa ON K1A 0N4
Canada**

Your file Votre référence

Our file Notre référence

The author has granted a non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of this thesis in microform, paper or electronic formats.

The author retains ownership of the copyright in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author's permission.

L'auteur a accordé une licence non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de cette thèse sous la forme de microfiche/film, de reproduction sur papier ou sur format électronique.

L'auteur conserve la propriété du droit d'auteur qui protège cette thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

0-612-35046-0

Canada

**THE UNIVERSITY OF MANITOBA
FACULTY OF GRADUATE STUDIES

COPYRIGHT PERMISSION PAGE**

**THE CANADA-U.S. TRANSBORDER TRUCKING INDUSTRY:
REGULATION, COMPETITIVENESS AND CABOTAGE ISSUES**

BY

DARREN JAMES PROKOP

**A Thesis/Practicum submitted to the Faculty of Graduate Studies of The University
of Manitoba in partial fulfillment of the requirements of the degree**

of

DOCTOR OF PHILOSOPHY

Darren James Prokop ©1998

**Permission has been granted to the Library of The University of Manitoba to lend or sell
copies of this thesis/practicum, to the National Library of Canada to microfilm this thesis
and to lend or sell copies of the film, and to Dissertations Abstracts International to publish
an abstract of this thesis/practicum.**

**The author reserves other publication rights, and neither this thesis/practicum nor
extensive extracts from it may be printed or otherwise reproduced without the author's
written permission.**

Table of Contents

	Page
ABSTRACT	iv
ACKNOWLEDGMENTS	vi
LIST OF FIGURES	viii
INTRODUCTION	ix
(1) THE NATURE OF THE CANADA-U.S. TRANSBORDER TRUCKING INDUSTRY UNDER REGULATION AND DEREGULATION	1
(1.10) A brief history of trucking regulation and deregulation in Canada and the United States	1
(1.11) General	1
(1.12) Canada	3
(1.13) The United States	12
(1.14) Two common threads between Canada and the United States: CUSTA and NAFTA	18
(1.20) Cabotage regulation	23
(1.21) General	23
(1.22) Cabotage regulation of transborder trucking in Canada and the United States	24
(1.23) Current proposals for reform	30
(1.30) Cabotage and the issue of regulatory compliance	35
(1.31) General	35
(1.32) Results from a previous survey of trucking firms	36

(1.33) The 1996 Cabotage Survey	43
(1.34) Summary of the hard copy survey	49
(1.40) Chapter conclusions	56
Chapter endnotes	57
(2) A MODEL OF THE TRANSBORDER TRUCKING INDUSTRY UNDER REGULATION AND DEREGULATION	63
(2.10) General	63
(2.20) The supply side: a diagrammatic approach	63
(2.21) The supply side: a mathematical approach	74
(2.30) The demand side: a diagrammatic approach	78
(2.31) The demand side: a mathematical approach	85
(2.40) Equilibrium and cabotage reform	94
(2.50) Chapter conclusions	97
Chapter endnotes	99
(3) APPLICATIONS AND EXTENSIONS OF THE TRANSBORDER TRUCKING MODEL	103
(3.10) General	103
(3.20) Regulatory rents and rent seeking behavior	103
(3.21) Rent Seeking: Definition	104
(3.22) Rent seeking in regulated for-hire trucking: evidence	112
(3.23) Rent seeking games and the transborder trucking model	116

(3.30) Cabotage reform and marginal welfare analysis	137
(3.40) Chapter conclusions	146
Chapter endnotes	148
(4) CONCLUSIONS	152
BIBLIOGRAPHY	157

Abstract

The trucking industries in Canada and the United States have been deregulated on national bases for many years now. Transborder deregulation, however, has not yet been achieved; even in the midst of trade agreements designed to allow for greater ease in moving goods across the Canada-U.S. border. The existence of cabotage regulations, which limit the transport activity of a foreign truck driver and his tractor-trailer while on domestic soil, is a major impediment to transborder deregulation.

Chapter 1 provides a history of trucking regulation and deregulation in Canada and the United States along with a discussion concerning how the Canada-U.S. Trade Agreement and the North American Free Trade Agreement have brought the issue of transborder trucking to the fore. Cabotage regulations are carefully outlined and evaluated while the recent "reforms" to these regulations are appraised in the light of potential efficiency gains to transborder truckers. Because of the complicated nature of these regulations, a survey of Canadian trucking firms is provided in order to gauge understanding, compliance and attitudes toward reform. The results obtained impact on the economic theory of regulation that, in general, states that firms understand, and even influence, the body of regulations under which they operate.

In chapter 2, a model of the for-hire trucking industry is developed in order to establish the welfare gain accruing from deregulation. The model is also used to show the further welfare gain that is expected to arise from cabotage reform. A supply-side approach is developed using the for-hire industry combined with a representative trucking firm. The demand-side is developed combining the fronthaul and backhaul markets so that inferences with respect to cabotage reform may be had. The combined supply and demand models provide a useful means for comparing the welfare effects of regulatory change.

The implications of the complete model are extended, in chapter 3, by use of: (1) rent seeking theory that serves to highlight the strategic behavior of trucking firms operating under regulatory protection; and (2) marginal welfare analysis that will show the marginal welfare gain from cabotage deregulation.

Finally, chapter 4 provides concluding remarks with respect to the model and its policy implications for deregulation and cabotage reform in North America.

Acknowledgments

I would like to give thanks to the following individuals that each played a role in my efforts to successfully complete this dissertation.

I wish to thank my advisory committee for all of their patience as well as for the wide-ranging expertise they brought to my research. Their influence and vigor is, I hope, duly reflected in this work. Barry Prentice provided a tremendous source ideas; indeed it was he who had suggested the exploration of the cabotage issue. His appreciation for the uniqueness of the transportation function within the economy has been a constant source of inspiration. Irwin Lipnowski provided precision and an attention to detail that firmly left its mark on the economic model that is here developed. His pointed questions, tempered with active encouragement, have made it a pleasure to test the limits of my economic reasoning. John Munro was kind enough to act as external examiner to this work and, in that regard, he provided fine questions and comments that have added to my respect for transportation research. Finally my advisor, James Dean, must be cited as my academic mentor over the entire doctoral program. His careful approach towards focus and synthesis in research has shown me how to make my work manageable as well as enjoyable. I will always admire his depth of knowledge of economics; and he will continue to serve as my example of what it means to be a true economist, social thinker and professional.

I thank John Loxley, Wayne Simpson, and Barry Prentice once more for generously giving me many opportunities to teach in the Department of Economics and at the Transport Institute. Not only was the accompanying financial support greatly appreciated, it was the exposure to the joy of teaching to which I will always be grateful. Clarity of thought and communication— skills so necessary for academic instruction— were also a source of self-discipline that I used in the writing of this dissertation.

I thank my family for their undiminished encouragement as I sowed the long road of doctoral work, and for the many great discussions, arguments, and humour-filled conversations we have shared over the years. Without these I would not have formed my interest in the discipline of economics. And without my family's example of patience and prudence in my early years, I would not have developed the character necessary to complete this work.

Thanks of an ethereal nature go out to my musical champions; those immortals whose sounds were always there for me during my long hours spent at the computer and during my many moments of respite and contemplation. I single out Berlioz, Liszt and Wagner for all their daring; Strauss and Mahler for clarifying the message; and Shostakovich for revealing the irony of it all. Their inspired sounds were an indispensable part of the atmosphere in which I chose to work.

Finally, I wish to thank God for allowing me to live a life that included the completion of this work and for the honour of being allowed the company of those individuals cited above. I further thank Him for revealing to me Psalm 119:66-72 which has always been my prerequisite to academic learning.

List of Figures

	Page
(2.1) Demand Expansion and Contraction	66
(2.2) Demand Expansion and Contraction with a Sticky Freight Rate	68
(2.3) Demand Contraction and the Representative Firm	70
(2.4) Demand Expansion and the Representative Firm	73
(2.5) Backhaul Demand and the Cabotage Effect	80
(2.6) Joint Demand and the Cabotage Effect	82
(2.7) The Effective Demand Curve	84
(2.8) Industry Supply and the Cabotage Effect	95
(3.1) Harberger Triangle and the Cabotage Effect	142
(3.2) A Marginal Change in Cabotage Regulations	144
(3.3) Joint Demand and a Marginal Change in Cabotage Regulations	145

Introduction

This dissertation involves a great deal of detail regarding for-hire trucking regulation and deregulation in Canada and the United States; especially as they relate to cabotage regulations. In order to carry the reader comfortably through the analysis of this material— which is used as the foundation for the economic model of the for-hire trucking industry, to be developed— the following summary is provided.

The two applicable trade agreements between Canada and the United States, as well as these countries' initiatives leading to for-hire trucking deregulation, are as follows:

<u>Free trade</u>	<u>Inter-prov./state deregulation</u>	<u>Intra-prov./state deregulation *</u>
CUSTA (1988)	MCA (U.S., 1980)	Airline Improvement Act (U.S., 1994)
NAFTA (1994)	MVTA (Canada, 1987)	Interprovincial Trade Agreement (Canada, 1994)

CUSTA: Canada-U.S. Trade Agreement; NAFTA: North American Free Trade Agreement; MVTA: Motor Vehicle Transport Act; MCA Motor Carrier Act.

* While it may seem curious that an Act relating to airlines precipitated intra-state trucking deregulation, it is in fact true. As defendant in a court challenge, Federal Express courier service won the right to move its private truck fleet between states. For-hire carriers demanded, and won, reciprocity through this subsequent Act. With respect to Canada, the 1994 Interprovincial Trade Agreement set in motion a process that would lead to complete intra-provincial deregulation by 1998.

Cabotage regulations in Canada and the United States, as well as their reform and re-interpretation, are summarized as follows:

Cabotage Regulations (Canada and the U.S.)

Foreign driver *
Immigration Act

Foreign tractor-trailer #
Customs Act

*** In both Canada and the U.S., this Act requires a foreign driver engaged in cabotage to possess dual-citizenship or be at least a 50 per cent by-blood aboriginal.**

In both Canada and the U.S., this Act treats all equipment crossing an international border as a temporary import with zero duty assessed.

Types of Trucking Cabotage

(1) Incidental move (Canada and U.S.): part of an import or export move combining domestic freight on the foreign vehicle. The domestic freight may only precipitate minor deviations from the transborder route of the import or export.

(2) Repositioning move (Canada): carriage of solely domestic freight by the foreign vehicle. This move must be used for the purpose of moving freight to an export pick-up point leading to departure from the country.

(3) Return-trip/outward (U.S.): a restricted repositioning move. It forces Canadian vehicles to proceed northward when moving domestic freight to the export pick-up point.

Cabotage Reform (Canada and U.S.)

The American Trucking Associations (ATA) and the Canadian Trucking Alliance (CTA) began reform talks in 1993. Only the Customs Act was discussed. Immigration was not on the table because it was considered too political an issue given the status of Mexico with respect to trade relations. Canada's Goods and Services' Tax (GST) prevented reform due to the federal finance department's unwillingness to exempt the market value of U.S. equipment from this levy when cabotage is to be undertaken.

Cabotage Re-interpretation (Canada and U.S.)

Customs officials, beginning in 1996, would use the freight's bill of lading as the distinguishing characteristic for separating a transborder move from a cabotage move. Freight that crosses a border, but not yet reaching its final destination, will still be considered international. In this way, a foreign carrier's transport of such freight— picking it up on the other side of the border— will not be considered as cabotage. Such was the compromise worked out given the inability to negotiate revisions to the Customs Act in either Canada or the United States.

Chapter (1): The nature of the Canada-U.S. transborder trucking industry under regulation and deregulation.

(1.10) A brief history of trucking regulation and deregulation in Canada and the United States.

The purpose of this chapter is to firmly establish the context under which future regulatory reforms of transborder trucking activity in North America may take place. To this end, an overview of the history of the regulatory and deregulatory processes of the trucking industries of Canada and the United States serves to highlight their particular structures as well as their responses to market forces and governmental policy. From this foundation a greater appreciation of the economic model of the transborder trucking industry, to be developed over subsequent chapters, will be achieved.

(1.11) General

A history of the relationship between the trucking industry and the government that regulates it serves to introduce the major players that interact in the regulatory process. Much has been written on both a theoretical and empirical basis concerning the process of regulation. While this process with respect to the trucking industry is discussed here, it is necessary to examine how and why the drive towards deregulation of that industry occurred. It should be borne in mind that deregulation involves the removal of regulations that govern business conduct but by no means implies the removal of *all* regulations that may exist.¹

The trucking industry developed into a viable means for freight transporta-

tion more than half a century after rail became recognized as the most efficient land transport mode when the shipping distance was taken to be the critical factor. When technological advances in the horsepower of internal combustion engines allowed motorized trucking to be seen as a substitute for the horse-drawn carriage, the process of urbanization was already well established and a large infrastructure of rail lines existed in all developed countries. In this sense, trucks were used as an exclusive part of urban transport along the increasing network of paved roads. The hegemony of rail would not yet be challenged. Of course, with an increasing availability of motor vehicles to the general public due to the introduction of the assembly line process of production, the desire to travel ever-greater distances in a personalized manner led to the development of inter-urban highway systems. Once the infrastructure for roadway travel expanded, trucks would be put into service for longer distances and it would not be too long before trucks would play an active role in merchandise trade on an inter-provincial, interstate and, ultimately, international basis. For North America, rail development was biased toward *intra*-national transport which was to be expected given: (1) the *National Policy*/high tariff outlook of the Canadian government in terms of bringing, and keeping, the Prairie and Pacific regions within Confederation²; and (2) the preoccupation of the United States with westward expansion beyond the industrial northeast. While rail tended to follow an east-west travel pattern in both countries, trucking came to be seen as a more flexible means for international trade between Canada and the United States. Of course, the distance factor would remain in favor of the rail mode for many years.

Starting in the 1950s two specific forces would enhance long distance trucking in the eyes of shippers. The first was the railways' own drive toward inter-modalism by way of piggy-backing trailers on flat bed railcars. While the inter-

est of the railways to engage in trucking operations with their own fleets may have been for the purpose of mitigating competition from the trucking firms themselves, it introduced shippers to the benefits of trailer haulage. Secondly, the rail strikes that were to take place in both countries at various times through the 1960s and 70s would expose shippers to trucking as a viable shipping alternative.

The next three sections examine the history of trucking in a North American context. Canada and the United States will be examined as separate historical cases in sections 1.12 and 1.13, respectively, after which section 1.14 takes up a common thread running through the evolution of the transborder trucking markets of Canada and the United States— the formation of trade agreements. The *Canada-United States Free Trade Agreement* (CUSTA) and the *North American Free Trade Agreement* (NAFTA) are the two specific treaties that will be examined in terms of their implications for the transborder trucking industry.

(1.12) Canada

The regulation of commercial trucking activities in Canada was passed onto the provincial governments *de facto* during the mid-1920s, more officially in a federal/provincial trucking accord in 1932, and finally with legislation by way of the *Motor Vehicle Transport Act* (MVTA) of 1954. This process was natural since the provinces already had jurisdiction over the roadways. In a simple sense, the federal government recognized that very little trucking activity in the 1920s was interprovincial in nature, meaning that the provincial governments would be able to effectively oversee practically all of the activity of the trucking firms situated in the provinces. A report prepared for the federal government in 1937 showed that only 3% of trucking activity in Canada was interprovincial

(Kaplan, 1989). In this sense, trucking activity would be regulated by nine autonomous boards³ while the federal government maintained sole regulatory control over the railways. The autonomous nature of the provinces meant that each individual board varied in terms of its interventionist philosophy. Ontario and Quebec represented the interventionist extreme while Alberta represented the noninterventionist extreme. Of course, the federal government always possessed the constitutional authority to regulate trucking activity and the provincial boards would be considered the agents of the federal government.

The *Royal Commission on Transportation* or "MacPherson Report" of 1962 stated that all modes of transport in Canada should find and maintain their market niches so as to attain efficiency; that is, no intermodal competition was considered to be a desirable goal. **Kaplan (1989)** paraphrases the thrust of this Report in the following words: "there is a need for all and a place for each". This point of view was very much the way the federal government felt about transportation as a national issue and such views were reaffirmed over the ensuing years between 1928 and 1962. It was in 1928 that Canada's rail interests began lobbying the federal government to curtail trucking activities that had begun to operate over areas once served only by rail. Of course, at the heart of the protests were the railways' inability to adjust as fast as they would have liked to the onset of trucking competition. Some reasons for this inability include: excess rail capacity owing to overly optimistic rail line expansions between 1900-1914; the relative strength of the trade union presence in the rail industry and the generous wage settlements made through the 1920s; and finally the improvements in road infrastructure that began to limit— only somewhat, in reality— the comparative advantage the railways enjoyed over trucks with respect to distance traveled. It may be argued that the railways practically gave away the portions of market share lost to trucks from the 1930s through the 1960s in the sense that

railway managers, while operating within a regime of federal *Crow Rate* regulation of wheat and barley shipping, acted as if their jobs were merely to move trains instead of, first and foremost, providing customer service.

The trucking industry continued to extend its routing distances and was able to counter some of the arguments of the railways. They argued that the government either directly or indirectly subsidized the railways beginning in the 1920s through the *Maritime Freight Rate Assistance Act* and the 1927 re-affirmation of the famous *Crow Rate*. It should be noted that the Maritime subsidy was extended to trucking as well beginning in 1969 by the federal government in response to the interests of the Atlantic region. But when the *Western Grain Transportation Act* (WGTA) of 1985 replaced the *Crow Rate* with a managed-but-floating freight rate, the rail interests were successful in lobbying the federal government to keep the subsidy applicable to rail-only transport since they feared an extension of it to trucking would necessitate the phasing out of unprofitable branch lines. Nonetheless, grain transport subsidies were never payable to the railways. The artificially low statutory rates were, in effect, a tax on the railways rather than a subsidy which was quite contrary to the views of the trucking industry which only perceived the obvious government-induced incentives for shippers to move grain via rail.

In the drive toward piggy-back intermodalism Canada's two largest railways, Canadian National and the Canadian Pacific Railways, had begun purchasing trucking firms as early as the 1950s.⁴ But it would take until 1967, under the *National Transportation Act* (NTA), for legislation to be enacted to prevent these railways from cross-subsidizing their trucking operations through the diversion of their rail profits. In fact, the "Part III" portion of the NTA was set to re-establish federal control of all interprovincial and international trucking but

this portion was never proclaimed as part of the NTA. Federal/provincial discussions at the time highlighted some of the difficulties over a re-establishment of federal control: federally regulated carriers would operate on a provincially controlled highway; and solely intraprovincial trucking firms, remaining under provincial regulation, might have to compete with federally regulated interprovincial firms which could operate along the same routes. The provinces foresaw that the disaffected firms under their control might request harmonization with federal regulations in order to compete more effectively. According to **Shultz (1980)** it seemed that the provincial governments did not want their boards' jurisdictional powers reduced and be forced to appear before a federal panel as just another special interest group. Furthermore, the provinces, through licensure, could affect economic development in remote regions by promoting trucking licenses for these areas and requiring regulated amounts of servicing as conditions for entry. In short, the provinces would stand to lose a lot of power.

The 1932 federal/provincial trucking accord, in order to diminish uncertainty in this inherently volatile industry, stipulated jurisdictional licensure for the first time, freight rate regulation, safety standards, and insurance requirements. In effect, entry control was brought about in the trucking industry to the benefit of the incumbent firms. The operating authority would be a source of windfall benefits to the first recipient and become a cost of entry capitalized into the value of firms. Furthermore, the onus was on any new applicant appearing before a provincial regulatory board to make the case for its entry on an efficiency or "public convenience and necessity" (PCN) basis. And, of course, incumbents would be able to rebut any and all arguments. As mentioned above, the diversity of the provincial boards meant that the regulation of rates could involve no regulation, simple rate filing, or rate filing subject to board approval. And with respect to entry, all provinces but Alberta would enforce, to varying

degrees, the PCN requirement. With a lack of coordination among the provincial boards, rates to be set for interprovincial routing were not very restrictive. **Boucher (1991)**, for example, examined the entry decisions made by the Quebec Transport Commission over the years 1976-1980. One of the findings showed that views of the incumbent firms dominated the decisions made by the Commission and that the success of entry was positively related to the size of the firm wishing entry.⁵

Deregulation of the interprovincial trucking industry came to Canada by way of the new MVTA of 1987 which was in response to the deregulatory process that had occurred in the United States several years earlier coupled with the near-completion of the CUSTA discussions. The new MVTA became effective on January 1, 1988. Trucking firms in Canada and the United States were competing more frequently along transborder routes through the 1980s anyway and, while by no means possessing a unanimous view, the Canadian trucking industry leaned toward deregulation as a means to level the playing field. The U.S. *Motor Carrier Act of 1980*, which provided for the deregulation of interstate trucking in the United States, allowed for Canadian entry into transborder markets. The initial act of trucking deregulation in Canada began in 1985 when the federal and provincial Ministers of Transport signed their "memorandum of understanding" as to the agreed process of reform to interprovincial and transborder trucking. This culminated into, given the pro-business attitude of the federal government, the "Freedom to Move" plan which sought deregulation in all federally regulated transport modes. Important shipper groups such as the Canadian Manufacturers Association also supported the move and would certainly have been in a position to foresee potential efficiency gains for Canadian trucking given that their members made use of transport services in both Canada and the United States.

A major point to note is that the nature of the regulatory process meant that deregulation in Canada would never need to be as comprehensive as it was in the United States. Jurisdictional licensure was of course the norm but rate regulation was never as strong as it was in the United States by way of its Interstate Commerce Commission (ICC) and more interventionist tariff bureaus. The extra competition that would arise in Canada would be due more to incumbents breaking out of their "micro-market" restrictions and competing in other markets as opposed to new entrants to the industry itself. And, of course, U.S.-based firms would be allowed entry and would, by 1992, account for 28.5% of total license applications (Chow, 1995). Nonetheless, the presence of owner-operators would increase in the industry.

The deregulation process set out in the MVTA of 1987 allowed for a five-year transition period where all rate regulations, routing and commodity-type restrictions for a license were to be removed. Entry control would wane over the transition period through a reverse-onus system whereby the incumbents would have to show public harm as opposed to the previous system of the entrant having to show PCN. By 1993, the entrant would merely have to prove fitness based upon the requirements to be fulfilled for insurance and the maintenance of safety standards. Each province would administer a nationally uniform market fitness test as well as a National Safety Code. The provincial regulatory boards would oversee individual applications for intra-provincial operations while the applications for interprovincial operations would be governed through the uniform, nationwide fitness standard set up for 1993 and beyond.

As for intra-provincial regulation, some provinces began to follow the example set by the MVTA and, by 1989, five of them along with both territories

abandoned PCN and adopted the reverse onus method of entry. By 1995, British Columbia, Saskatchewan, Manitoba, and Nova Scotia were bystanders as the other provinces and territories adopted fitness-only entry standards. Alberta, of course, was never a regulated province in the first place. However, it should be noted that all provinces and territories became signatories to the *Interprovincial Trade Agreement* of 1994 which effectively called for deregulation of intra-provincial trucking by 1998.⁶

As noted above, deregulation added competitive forces to Canadian trucking operations. There is a greater presence of U.S.-based firms; the less-than-truckload (LTL) sector has been consolidating into larger firms with fewer as a result; and owner-operators⁷ bore the brunt of the freight rate competition that was unleashed under the requirements of the MVTA coupled as well with the recession of 1990-91.

Evidence gathered has shown deregulation to have been beneficial overall to shippers. Collins and Bowland (1989) in an early study of the impact of deregulation looked at a sample of 174 firms comprised of shippers and carriers in a variety of geographic locations across Canada. These firms were to report on the state of their business roughly 8 months after the introduction of the MVTA and the all-mode-encompassing NTA of 1987. One-third of the shippers that used for-hire trucks reported decreases in freight rates with only a "small minority" reporting an increase. At the same time, 83% of surveyed shippers over all modes claimed that service quality remained stable while 15% claimed an increase. It may be concluded that deregulation led to a lowering of transport costs faced by shippers.

The impetus for the lowering of trucking costs, which lead to the lower

rates, was also due to the increased competition within the trucking industry after 1987. But Collins and Bowland also cite over-capacity of new entrants as a cause for the fall in profitability that occurred over the period as well. Certainly firms that were merely expanding operating authority during the years of regulation would find themselves with over-capacity as they emerged out of once-protected marketplaces. With respect to freight rates and competition the picture would be the same over the next few years (*Annual Review of the NTA of Canada, 1993*).⁸ The difference would be that the recession of 1990-91 would also be a force in driving rates down and many firms would begin to create alliances with U.S. ones. Between 1989 and 1993, TL and LTL domestic rates would follow the same cyclical pattern except that LTL rates enjoyed a roughly 0.5 percentage point premium. Transborder rates for the TL and LTL classes would be roughly 0.5 percentage points lower than their domestic counterparts. Using LTL rates to indicate the pattern, freight rates inflated around 1.5% in 1989 to 2% in 1990 followed by disinflation leading to nearly 0% in 1992 before a 0.5% increase in 1993.

One benefit derived from a U.S. alliance is the ease of interlining as part of transborder operations. Still, applications by Canadian firms to the ICC for interstate operating authority continued to rise from the late 1980s with 200 applications in 1986 to nearly 900 by 1993. This shows that routing patterns for Canadian trucking firms grew increasingly north-south in an attempt to compete more effectively within U.S. territory. In contrast, U.S. applications through the MVTA for provincial authorities between 1989-1993 had been stable between one to two thousand applications per year.

In the post recessionary period of 1992 onward, a representative sample of carriers showed that the large unionized carriers faced the more severe effects of

restructuring while the non-unionized ones were more flexible and found it easier to adapt to the more competitive environment. To give an idea of the change in the industry, consider that 37 of the top 100 Canadian trucking firms (based on fleet size) in 1988 either shut down or merged with another firm by 1993. And by 1993 the top 40 carriers used 26% fewer vehicles than did the top 40 in 1988. A final aspect of fleet rationalization concerned the use of owner-operators. While the period 1988-93 saw the number of vehicles in the top 40 firms drop between five and ten thousand units from year to year, owner-operator usage would peak in 1990 and drop by no more than one thousand vehicles in a given year. And owner-operators may be paid on a distance basis or out of a percentage of revenue per shipment but, of course, the real savings arise to the firm due to the absence of employee benefits. Unionized firms would resist or limit the use of such labour thus adding to their inability to adjust to market changes.

It is interesting to note that of the 35,000 owner-operators working for Canadian firms in 1991, 11,000 of them incorporated their business (Mathieson, 1994). Such a move shows the serious presence of owner operators in the industry as well as their attempts to minimize business risk. The distinction between for-hire carrier and owner-operator has become somewhat blurred to the extent that some incorporated owner-operators are hiring drivers of their own to maintain larger fleets. The average fleet size of owner-operators earning between three-quarters to one million dollars per year was seven trucks in 1991.

Deregulation of trucking in Canada in 1987 was a function of the overall trend towards liberalization of markets occurring in various industries and across various countries. The economy and industry were benefiting from continued expansion since 1982 and the U.S. economy carried along Canada's.

Furthermore, the deregulation efforts in the United States became something for Canada to emulate. Such initiatives might have been tempered had the effects of the next recession been anticipated.

(1.13) The United States

State regulation of trucking began in Pennsylvania in 1914 followed by thirty-five other states in the years up to 1925. These regulations affected entry and rate maxima and minima and were overseen by state commissions that were also used, incidentally, for the regulation of railroads. The regulation of interstate commercial trucking activity in the United States, however, began with the *Motor Carrier Act* (MCA) of 1935. The MCA served to clarify the division of federal and state powers since the states, which had control of intrastate trucking activity for some time, had attempted to control the firms on their soil that wished to engage in interstate activity. Such activity on the part of the states was not regarded with much concern during the 1920s since: (1) the U.S. Supreme Court set a precedent in 1851 whereby states could regulate all activities that affected interstate commerce provided that the issue was of local concern but the interstate effect was "indirect or incidental"; (2) ICC estimates for 1929 showed that only 20% of total ton-mile activity by truck was interstate and, of that, three-quarters were attributable to private trucking (Felton, 1989).

However, by the 1930s, economic depression as well as lobbying efforts on the parts of railways— federally regulated since 1887 by the newly-created ICC— and certain large trucking firms set the stage for formal federal regulation of interstate trucking activity.⁹ The only effective opposition came from agricultural organizations which managed to secure an exemption from MCA regulation for trucks that exclusively carried livestock and farm produce.¹⁰ But the final hurdle was overcome when the U.S. Supreme Court in 1935 ruled that the *National In-*

dustry Recovery Act (NIRA) was unconstitutional in terms of its delegation of Congressional legislative authority to industry representatives. In effect, the American Trucking Associations (ATA) lost their power to self-regulate and from that point they supported federal regulation. In the absence of being able to set codes of conduct for its members, the ATA found it preferable to become more of a lobby group to work closely with the ICC rather than to continue to oppose some semblance of control over the industry.¹¹

The system of entry, service, and rate regulation would continue in the for-hire trucking industry for another 45 years with only a few points of refinement along the way. The ICC's application of the PCN requirement was so strict that placing the burden of proof on the entrant resulted in incumbent carrier protection. The time and monetary costs of entry applications meant that it was easier for a firm already in the trucking industry to expand into another jurisdiction than it would be for a strictly new entrant into the trucking industry to obtain a first-time license. In fact, the ICC was more approving of mergers of firms where interlining was already occurring, since that, in its view, represented evidence that minimal disturbance to existing routes would occur. Operating authorities were required on both a commodity and territory basis and it was not uncommon for a carrier to possess over 200 certificates outlining its operational limits. More significantly, it has been shown that some did not or could not possess authority to serve intermediate points or engage in backhaul service.¹² The extra consumption of fuel and labour due to unnecessary circuitry combined with low load factors represented an obvious source of X-inefficiency in the regulated industry.

In terms of ICC rate regulation, there was no Congressional oversight or guidelines meaning that the regulatory process was open to influence by the

trucking firms, shippers groups, rate bureaus, and the courts. The rate bureaus were regional organizations supported by the dues of participating carriers. The member carriers would meet to set rates subject to ICC approval. To the extent that these bureaus were seen as price-fixing entities, they were nonetheless exempt by Congress from any antitrust action by way of the *Reed-Bulwinkle Act* of 1948. The ICC had no choice but to largely approve the set of literally thousands of daily rate quotes sent to it from the bureaus due to the cost involved in analyzing the merits of each. The bureaus made it easier for firms to pass the extra cost of unionized labour onto freight rates and, furthermore, the aggregation mechanism of the bureaus meant that a general rate increase was based upon average as opposed to marginal cost increases. All inefficient firms in the mix would be able to force a general rate increase for all. And, of course, the bureaus made sure that any firm that attempted to cut rates was subject to protest.¹³

An important aspect of the rate approval process of the ICC was that it did not wish to consider the joint cost and peak-load pricing problems involved in trucking supply in the sense that it did not endeavor to allow for the setting of differential fronthaul/backhaul and peak/off-peak rates. The ICC's working concept was "equal rates for equal miles" which led to discriminatory rate setting in that fronthaul/backhaul and peak/off-peak breakdowns in transport demand were not to be a consideration by the firms. In this setting of uniform, distance-based rates a shipper could easily be either overcharged or, in effect, subsidized by another's overcharge. Instead of acknowledging the fundamental traceability problem in joint cost allocation, the ICC developed its own method of setting backhaul rates.¹⁴ In its belief that market based backhaul rates would lead to destructive competition on those routes that other firms used as their fronthaul, the ICC entrenched excess capacity through empty backhauls as a permanent feature

of the regulated interstate trucking industry.

A final source of discriminatory rates came in the form of setting rates in direct proportion to the ratio of the good's value to transport cost. Using typical price discrimination theory the rate bureaus and ICC realized that the higher the ratio of the market value of the good to the shipper's transport cost the more price-inelastic would be the shipper's demand for transportation service.¹⁵

A rule of thumb used between 1935 and 1969 was that rates should provide carriers with operating ratios (i.e. costs to revenues, both before interest and taxes) of around 93% and that these rates should be on par or higher than federally regulated rail rates (Anderson and Huttshell, 1989). Alternative financial measures such as return on investment per time period were rejected. When rate of return evidence was finally considered an adequate criterion after 1969 there was to be no indication from the ICC as to what constituted an adequate return until 1978 when a return to stockholder equity of 14% was considered acceptable.¹⁶ As well, this benchmark was to replace officially the operating ratio criteria.

The changes to the trucking industry from 1935 through the 1970s lead to demands for regulatory reform. Interstate trucking grew rapidly in the 1950s as the interstate highway system came into full bloom bringing trucking firms into increasing awareness as to just how complicated ICC control had become. Recession in the mid-1970s coupled with railway reforms led the ICC, under pressure from the trucking firms, to begin to relax some of its strictness with respect to entry and operating rights. The liberalization process would continue in an *ad hoc* manner through to 1980.

Deregulation of interstate trucking would come to the United States in 1980. The new MCA of that year allowed the ICC to remove its PCN entry rule and replace it with a reverse onus rule as Canada would do seven years later. With respect to rates, the ICC would establish a band width or "zone of reasonableness" that would not lead to too much volatility in freight rates but would allow for a semblance of competition in the trucking markets. Collective rate making as set through rate and tariff bureaus was eased somewhat and independently filed rates to these bureaus were encouraged. The bureaus would continue to collectively set intra-state rates for interline servicing or where antitrust was an issue. As in Canada's experience with trucking regulation, the extent of regulation across the states themselves differed greatly.

Without geographic barriers to operations, interlining became less prevalent among U.S. firms while, as mentioned above, Canadian firms could now enter the U.S. market. At the same time, the fall in rates coupled with the recession of 1982 led, ironically, to market concentration and destructive competition in the country's largest sub-market, long haul LTL. By 1987 bankruptcies in this sub-market climbed to a level 10 times what they were in 1978 (Chow 1995). The lack of reciprocity for entry of U.S. firms into Canada did not go unnoticed by U.S. firms during the years when only their country operated under deregulation. The *Motor Carrier Safety Act* of 1984 banned entry of Canadian and Mexican firms into transborder markets in the U.S. but Canadian authorities managed to work out an exemption from this legislation. Essentially "memoranda of understandings" (MOUs) were exchanged by each federal government that outlined guidelines under which transborder disputes would be settled.

Even though the United States did not achieve entry reciprocity between

1980 and 1987, the fall in rates on the U.S. side of the border would have an effect upon the Canadian firms using their new transborder routes. The presence of some U.S. firms with so-called "single line authority" allowed them to undertake pick-ups/drop-offs at specific Canadian sites close to the border. This allowed these firms to apply the same discount programs to these transborder routes as they would to their U.S. domestic routes, to the detriment of the regulated Canadian carriers. Furthermore, some Canadian shippers would find it cheaper to by-pass Canadian for-hire truckers altogether in that they would simply rent their own vehicles to move their goods to the U.S. border in order to interline with a U.S. carrier netting discounts as high as 65% in doing so (Skorochood and Bergervin, 1984). Canadian regulators had no choice but to allow a discount of the rates applicable to transborder markets and it was always possible for the U.S. firms to simply put in a bid for a targeted Canadian operation for the purpose of acquiring its operating authority and thereby create an affiliate. It would be episodes such as these which would set Canada on its own track to deregulation in 1988.

In 1994 deregulation in the United States was expanded by way of the *Transportation Industry Regulation Reform Act (TIRRA)* which abolished ICC authority over freight rates for the trucking industry. The ICC itself would be abolished in 1996 and its powers shifted to the U.S. Department of Transportation. Of course, the remaining authority over rates left in the hands of the bureau was, for a time, not threatened.

The issue of intra-state deregulation also came to a head in 1994, around the same time as it would in Canada. Ironically, it would be a court case involving an air carrier that would be the catalyst. Federal Express, an official air carrier with a private fleet of trucks, could operate freely in any state while its for-hire

trucking competitors could not. When Federal Express won its court case allowing freedom of movement, the trucking industry pushed for intra-state deregulation and this was accomplished through the *Federal Aviation Administration Authorization Act* or *Airline Improvement Act* of 1994. Similar to the situation in Canada, states would control safety and insurance issues. Bureaus would now lose the power to make collective rates under previous antitrust exemption.

Canada and the United States were moving down a common path of deregulation. However, they took to this path in the fashion of a parallel movement in two separate lanes rather than a shared interaction. Each country undertook deregulation for domestic reasons but it would be the advent of general trade negotiations between Canada and the United States that would bring into focus the need for harmonization of continental trucking.

(1.14) Two common threads between Canada and the United States: CUSTA and NAFTA

While both Canada and the United States were wrestling to deregulate their domestic trucking markets on provincial, state and federal bases, initiatives were simultaneously developing for deregulation of international trade; that is, free trade in the more common term. The first step towards economic integration of the North American economies took place through the Canada-U.S. Free Trade Agreement (CUSTA) in 1988 followed by the most recent step through the North American Free Trade Agreement (NAFTA) in 1994 which brought Mexico into the free trade area. The Canada-U.S. Automotive Products Agreement, or "AutoPact", of 1963 may be seen as merely sectoral in nature.

The role of transportation as a facilitator of trade is obvious but CUSTA is

noteworthy in that the transportation sector was not subject to any part of the final agreement. A timetable for bilateral tariff removal was set in place but the issue of transport modes was left unresolved. Both Canada and the United States would continue to maintain separate systems of truck weight and configuration regulations to the detriment of the spirit of free movement of goods. What CUSTA did manage to do was to focus attention on North-South trade flows and increase the importance of transborder trucking because of the tendency of trucks to be the transport mode of choice in trade between Canada and the United States.¹⁷

NAFTA negotiations brought the transportation sector to the table because of the special case that Mexico posed with respect to this and other sectors of the continental economy. While Canada and the United States benefited from a long-established trade relationship and similar degrees of industrial and infrastructural sophistication, Mexico was an emerging economy with a less than stable record of industrial development. In fact, infrastructure issues made safety and the environment specific topics to be addressed which, in that regard, made it impossible to ignore the transportation sector. Of course, the trilateral aspects of the negotiation process meant that Canada and the United States would begin to address some of the difficulties with respect to transport harmonization. The role of operating authority for trucking firms would be an important point to clarify for the firms that wished to take advantage of the trade opportunities to be found among the NAFTA partners. An agenda was put in place whereby foreign trucks would eventually no longer be required to interline with Mexican trucks with their goods destined for Mexico. This provision alone would save on the provision of the necessary infrastructure such as transfer terminals and staging areas while relieving the congestion that occurs at border towns. At least with the new provisions a foreign LTL carrier that still wishes, for example, to

interline may now do so deeper into Mexico soil to where the domestic Mexican carriers have their natural "breakbulk" terminals.

The NAFTA environment will also rationalize trucking operations between Canadian and Mexican carriers. Consider a technical but significant problem: when the necessary interlining operation between the Canadian and Mexican carriers took place, the prohibition of Canadian entry meant that the transfer took place on U.S. soil. The implication was that if a Canadian carrier picked up U.S. transborder freight destined for Mexico as part of the Canadian carrier's LTL transborder shipment it would be guilty of a cabotage violation when this U.S. freight was interlined on the U.S. side of the border.¹⁸ A point-to-point transport of domestic freight by foreign-based equipment and/or driver at that time, as well as currently, is subject to the laws governing allowable cabotage. In the spirit of allowing Canadian carriers to have transport access to the Mexican markets, both countries signed a MOU in March of 1994 that allowed Canadian carriers to undertake entry into the six U.S.-adjoined Mexican states up to a distance of 20 km from the border in order to interline.

The first Canadian crossing into Mexico took place on October 7, 1994 by Cambridge, Ontario-based Challenger Motor Freight Inc. The United States would sign its own MOU with Mexico in April, 1994 but it is worth noting that the Mexican government has been dealing with the United States very cautiously since it is concerned with the ability of its firms to modernize fast enough to meet the expected U.S. competition for transborder markets. Toll (1994) notes that the average ages of U.S. and Mexican trucks are 3 years and 10 years, respectively. Furthermore, the typical trailer used in Mexico is shorter than the standard 53-foot type popular in the United States and, in that regard, the Mexican government has not as yet allowed U.S. carriers to enter with that type of

trailer when being pulled by a tractor with an attached sleeper unit (Chow, 1995). Specifically, Mexico's current regulations allow for an overall 53-foot tractor-trailer combination. In this way, a significant portion of U.S. carriers are effectively barred entry into Mexico. The United States, for its part is to allow, by reciprocity, access by Mexican carriers to its border states but that measure too has been restricted by the federal government, because of its concern over safety issues, to small zones within these states. The American Trucking Associations (ATA) and the border state governments accept an open border policy but one view is that the real issue is politics rather than safety. The U.S. Teamsters union used election year pressure to lobby the federal government to keep the border closed (Truck West, April 1997). The U.S.-Mexico border dispute puts Canada in the middle since its own 53-foot trailers are barred and, ironically, Challenger Motor Freight Inc. cannot use equipment from its U.S. division for Mexican operations, thus creating needless inefficiencies. Fortunately for Canada its primary trade market is still the United States with Mexico at about 2% of import/export flows as compared to the United States.¹⁹ As of 1998 the U.S.-Mexico international border dispute shows no signs of letting up.²⁰

The on-going NAFTA agenda includes the following:

(1) adjacent states on both sides of the U.S.-Mexico border may be serviced by the respective foreign carriers as of December 17, 1995. Country-wide transborder access is to be achieved by January 1, 2000. Canada will receive the same privileges as the United States.

(2) Mexican carriers that engage in transborder business may be up to 49% foreign owned as of December 17, 1995. As of January 1, 2001 foreign firms may

own a majority interest (51%) in a Mexican carrier engaged in transborder operations. Finally, by January 1, 2004, complete foreign ownership of these carriers is possible with, in that year, reciprocity allowed for Mexican investors as well. Again, Canada receives the same privileges as the United States.

(3) A set of five transport system harmonization committees were set up to deal with issues of standardization. Their respective responsibilities are:

- (a) vehicle weights, dimensions, brakes, tires and emissions
- (b) driver standards and medical requirements
- (c) dangerous goods movement
- (d) road signing and traffic control devices
- (e) rail safety

The process of standardization involved in point three is one of the toughest areas to resolve. The United States possesses the most restrictive set of regulations governing weight and dimensions at the federal and state level.²¹

Canada and the United States have gone a long way since the 1980s along the road of deregulation. A remaining question concerns how trucking activity will adapt to the current openness. Strictly speaking, how "level" is the current playing field between the two countries? The question is important since several Canadian carriers have been concerned about how deregulation would affect their transborder market. The fear was either of dominance by the U.S. carriers or relocation of the Canadian carriers to the United States. **Chow and McRae (1989)** examined nine non-tariff barriers (NTBs) in force in the United States and Canada and concluded that they were all non-discriminatory in nature. Furthermore, it should be borne in mind that after the publication of that paper, as

noted above, both the U.S. states (in 1994) and Canadian provinces (in 1989-1998) would deregulate as well. What is most important to realize is that comparative disadvantage can arise due to government regulation from a variety of sources.²² However, the authors did cite cabotage regulations as the only significant source of concern for Canadian carriers wishing to operate in the U.S. while being exclusively based in Canada. Cabotage reform is the next and final step on the deregulation road.

(1.20) Cabotage regulation

Cabotage regulations are specific to transborder trucking operations but they are by no means subject to straightforward interpretation on the parts of either the officials responsible for enforcement or the trucking firms that must operate under them. This section examines the form of these regulations and discusses how firms have come to cope with them. Finally, an analysis of the current cabotage reforms is provided.

(1.21) General

The word cabotage derives from the french word *caboter* meaning to coast or to move from cape to cape. Another variation is the spanish word *cabo* which specifically means a cape. From these it can be seen that cabotage is a transport activity that first applied to ocean vessel shipping; specifically pick-up and delivery along a coastline. In the United States, ocean vessel restrictions were covered by the *Merchant Marine Act* of 1920 which is also referred to as the "Jones Act" after its author, Senator Wesley L. Jones. Ocean vessel traffic along the United States coastline was restricted to ships built and registered in

the United States and owned and operated predominantly by its citizens. The Jones Act was justified in terms of ensuring a sufficient merchant marine capacity in order to meet defense needs. Naval power and commercial sea lane access are equated with protection of commercial power.²³ While cabotage became a regulated activity in ocean vessel shipping through the restrictions of foreign flagged vessels on a particular coast line, the term came to be used in description of all forms of transport activity that took place on sovereign territory by a foreign conveyance. As alternative modes of transport developed, the same protections were transferred to them.

(1.22) Cabotage regulation of transborder trucking in Canada and the United States

Cabotage regulations are an interesting phenomenon from an economic point of view. Economic theory predicts that regulations will be put in place for the benefit of the firms being regulated since they are able, through their intimate knowledge of the industry, to "capture" control of the governmental bodies that regulate them (Stigler (1971); Peltzman (1976)). Many examples of such "capturing" occur in terms of associations for teachers, lawyers, accountants, physicians, *etc.* that advise, or even sit on, the regulatory boards that oversee their industry.²⁴ Indeed, as noted in sections 1.12 and 1.13, in the days of jurisdictional licensure, the provincial and state motor carrier regulatory boards put the onus on new entrants to rebut the arguments of any incumbent firms that felt that further entry would be a detriment to the industry as a whole. Cabotage regulations, which oversee the operations of a foreign truck while on domestic soil, are a different matter. These regulations are international in scope and are, to a great extent, subject to ambiguities which thus makes compliance difficult. As a result, many firms that engage in transborder operations may find it safer

to empty backhaul if transborder freight cannot be found, rather than attempt a cabotage move only to face delays in terms of establishing legality or facing fines if the move were found to be in violation.

The limitation of foreign operators and their equipment in domestic jurisdictions came to be applied to all modes of transport, and the effects it has had on trucking in the United States and Canada have come to the fore since deregulation in each country opened up international borders to increased foreign trucking competition. In both Canada and the United States, cabotage regulations have been divided into a set of regulations applying to the equipment used— which is treated as an import; albeit a temporary one— and another set applying to the driver, who is permitted only to move goods directly in and directly out of the country concerned. The equipment is covered under the respective *Customs Acts* while the driver is covered under the respective *Immigration Acts*.

The details under each Act for Canada and the United States are not reciprocal and, of course, the level of enforcement on each side of the border is always subject to variation and interpretation. Two specific cabotage moves of note are known as: (1) incidental domestic moves; and (2) repositioning domestic moves.²⁵ Highlights of the regulations as applied to each will be examined in turn. It should be borne in mind that while Canada provides for both types of moves, the United States prohibits what may be called "flexible" repositioning moves.

A foreign trucker may engage in domestic "incidental" operations when domestic goods are delivered while carrying less than a full load of imports or exports. The domestic operation is incidental in the sense that it takes place totally within the country in question and the route is consistent with the transborder route itself. Only minor detours off of the transborder route are acceptable. While "minor" is subject to

interpretation, a maximum 20 km deviation might be considered acceptable by customs officials (House, 1993). Still, the regulations for both countries are not specific and this subjectivity adds to compliance costs in terms of, say, a carrier's time cost in investigation of operational legality or in its turning down of technically legal operations out of risk-aversity due to lack of clarity. A further insight into these regulations comes from noting that, for foreign trucks operating in Canada, the domestic "incidental goods" cannot exceed 30% by weight *and* value of the international goods carried. For example, a U.S. truck that was 99% loaded with furniture imported into Canada could not, as part of a Canadian incidental operation, pick-up and drop-off while still in Canada, an extremely valuable diamond that could fit in the 1% of space available because the 30% of value rule would be violated. The United States does not appear to have a weight or value restriction applicable to incidental moves. Since incidental movement regulations apply to exportables and importables, a U.S. truck transporting U.S. items from a U.S. origin to a U.S. destination but happening to cross into Canada (through, for example, southern Ontario north of Lake Erie) as part of that U.S. operation would not be eligible to engage in the transport of Canadian goods. There are no limits to the total number of incidental moves undertaken as part of a transborder operation so long as each conforms to the regulations.

Both Canada and the United States allow for incidental moves to be undertaken as part of the inbound and outbound portions of the transborder route. The foreign trucking firm and its equipment must, however, be licensed by the particular province or state and the driver must meet the provisions of the respective Immigration Act of which more will be said below. In the United States, unlike in Canada, the provisions for incidental moves require that they be part of a "regularly scheduled" transborder operation which implies, it would seem, that only Canadian trucking firms with an established record of U.S. entry over specific routes would receive the privilege to engage in incidental operations by U.S. customs officials.

During an incidental move, exportables or importables must be carried simultaneously with the domestic items (and conforming with the 30% rule in Canada). If the domestic items are transported alone, the move is not illegal; the only difference is that the operation has changed from an incidental move to a repositioning move. Again, note that this operation would only be legal under the Canadian regulations. Thus, straight domestic Canadian goods can be transported alone by U.S. trucking firms so long as that operation puts them in position to make a transborder move. The key difference overall between Canada and the United States is that, for the latter, the international route must be a regularly scheduled part of the trucking firm's business no matter how much freight is actually carried each and every time; it is the travel frequency that is important. This provision on the part of the United States ensures that any international move is not "artificially structured" so as to foster a cabotage move since cabotage must always be incidental to the overall purpose of the transport.

A repositioning move occurs whereby *one, and only one* trip involving solely domestic goods may be transported anywhere between the drop-off point of the original transborder move and the pick-up point of an export load; that is, the repositioning move must place the vehicle into a position such that a transborder operation out of the country will take place. To qualify as a repositioning move Canadian officials require that: (1) the export load for movement out of the country must be pre-arranged before pick-up of the domestic goods under which the repositioning move is to take place; (2) this export load must be available for pick-up once the repositioning move has been completed meaning that there can be no stopping over; and (3) the domestic load drop-off point must be in *direct line* of the export pick-up point meaning that only a minor deviation off of the international route is admissible in a similar fashion to

incidental movements. To elaborate further upon point (3): between transborder drop-off point (A) and transborder pick-up point (B), the repositioning move must occur with only a minor deviation off of the A to B direct line and the repositioning drop-off need not be anywhere near B; it just has to be in direct line (collinear) to it and the point of exit. One can also infer that doubling back is not allowed since the reposition drop-off must be reached with point B in-- between the drop-off and the international border. Note that even though only one repositioning move is allowed by a U.S. truck while on Canadian soil, the length of the move is unrestricted. Also the direction of the repositioning move is unrestricted only so long as doubling back is not occurring; that is, all directions but northward of point B are possible for a repositioning move in Canada. Finally, any repositioning move in Canada has a time-limit involved since all foreign trucks, tractors and trailers must leave Canadian soil after 30 days from the date of entry. Since Canadian routes follow east-west patterns, by and large, Canadian repositioning moves will usually follow that pattern.

As stated, the United States does not provide for repositioning moves. However, a variation is allowed in the form of the so-called return, outward trip. In a sense the repositioning move loses any flexibility on the part of the Canadian trucking firm in that it is restricted by U.S. officials to be in a northward direction. Furthermore, U.S. Customs Service regulations specify that this cabotage move be "reasonably incidental to [the truck's] economical and prompt departure from a foreign country" (House, 1993). The interpretation of this provision on the part of U.S. Customs officials has been overly restrictive in that the departure must be northward to Canada and the border exit must be at, or very close to, the original point of entry. Assuming that U.S. authorities would ever allow multi-directional, repositioning cabotage it might work to Canada's advantage in a fully integrated North American free trade area in that,

if a drop-off is made in the United States, a repositioning move could be made into the U.S. deep-south if a transborder move immediately out of the U.S. and back to Canada could be arranged.²⁶ Perhaps a relatively short move out of the United States to Mexico would be possible thus allowing a re-entry to the United States with the possibility of taking more domestic U.S. goods up north through *another* repositioning move that might be long enough to allow for the arrangement of a transborder move back to Canada.

Immigration legislation for both Canada and the United States is such that all cabotage activity requires the use of domestic labour. This is what makes cabotage such a difficult activity for transborder trucking firms. The equipment is granted certain freedoms of transport but the driver must not be foreign. Immigrant status or a work visa is required and, of course, the latter would be difficult to obtain given that cabotage activities are always "incidental" or "secondary" to the overall value of the international operation. Only drivers that had dual citizenship as well as aboriginals would be able to engage in cabotage under these conditions. Neither CUSTA nor NAFTA provide any relief from these restrictions.²⁷

One complication involved in U.S. Customs rules that might affect the possibility of Canada invoking the NAFTA legislation so as to use the United States as an intermediate transport area while proceeding into Mexico is to note that the rules specify, it will be recalled, that the exit point from the United States must be at roughly the border crossing from which original entry took place. Does this eliminate a Canadian truck's exiting the United States from the south into Mexico first and then eventually making its way to the *same* Canada-U.S. border crossing some time later? The legislation is not clear; the matter will turn on interpretation. Furthermore, do the interests of the NAFTA override U.S.

Customs legislation? The answer appears to be no.

Unlike the United States, Canada does provide for switching procedures for U.S. carriers engaged in a transborder movement. If the U.S. tractor and/or trailer needs to return, for whatever reason, back to the United States while in the midst of its transborder trip in Canada, U.S. replacement equipment may be dispatched from a Canadian location to keep the load moving provided that such a movement of the equipment qualifies as a repositioning move. Since the goods are on Canadian soil they are considered domestic as far as the replacement equipment is concerned. But another U.S. driver may be used as well if the cargo were solely a U.S. export or import indicating that only the replacement equipment must follow the cabotage regulations in this case. In terms of emergencies such as equipment breaking down while in Canada, any U.S. equipment and/or drivers may be used as replacements to keep the freight moving even if such a movement of replacements did not constitute a repositioning move. Only such emergency procedures are, in point of fact, allowed in the United States as well.

(1.23) Current proposals for reform

After deregulation of the trucking industry came into effect in Canada and the United States, freedom of entry allowed foreign trucks to enter strictly domestic markets. At first, transborder markets were only to be used for the movement of exports and imports but as the presence of more (foreign) carriers increased, domestic shippers became aware of greater opportunities in which to move their goods. The federal governments of Canada and the United States began, in partial response, to draft regulations that would allow for limited point-to-point domestic transportation on the parts of foreign carriers. The elimination

of forced interlining and the greater ability of the mostly TL Canadian carriers to obtain a backhaul when traveling deeper into the United States would add to the efficiency of the long haul portion of the industry. However, the implementation of NAFTA combined with the rapid growth in transborder activity in the 1980s, would make cabotage reform an issue for discussion in the early 1990s.

In 1995 the CTA and the ATA designed proposals that would reduce some of the restrictions on cabotage activity on both sides of the border. Harmonization and reform discussions had been taking place since 1993. The proposals in general recommended that each carrier would be allowed one free point-to-point domestic movement. The problem was that the proposals addressed only customs regulations and not the more politically charged issue of immigration regulations. In this way the foreign equipment would be liberated, so to speak, but not the foreign driver.²⁸

While the modest proposals of the CTA-ATA had been taken up by the two federal governments early in 1997 the acceptability of the proposals from the point of view of U.S. trucking firms had diminished. The reason was due to the relationship between U.S. equipment cabotage and the provisions of the federal *Excise Tax Act* governing Canada's Goods and Services Tax (GST). The current view of Revenue Canada is that cabotage would trigger a GST levy on U.S. trucking firms for both the domestic service they provide as well as the full market value of their foreign equipment itself and it is the latter levy that primarily concerns U.S. carriers.²⁹ With respect to the tax on cabotage *service* provided, there is even some concern by small U.S. carriers that, while they may receive input tax credits on the GST they pay, they are not able to wait the time required for reimbursement. In addition, these firms must comply with the pro-

cedures for GST registration and filing which may be looked upon as an extra administrative burden. However, the CTA-ATA are of the view that it is reasonable to allow the GST to apply to domestic services provided by foreign carriers since domestic carriers are subject to the same levy.

The CTA-ATA do feel that a GST levy on the value of U.S. equipment is indeed unfair. Revenue Canada is of the view that the U.S. equipment entering for the purpose of cabotage is an imported conveyance that is subject to GST in order to ensure equitable tax treatment with domestic goods subject to tax. Under the provisions of the *Customs Act* of Canada the status of the equipment as an import (albeit, at a duty rate of zero) has always prevailed but it is interesting that at this time of reform Revenue Canada now wishes to claim GST within a more liberalized cabotage environment. Certainly the U.S. equipment was not subject to GST when purchased in the U.S. while the value of Canadian equipment purchased in Canada was. The view of Revenue Canada may level the playing field regarding taxes but it also provides a disincentive for U.S. carriers to engage in cabotage.³⁰

The difficulties with the GST issue have put plans for new cabotage regulations on hold and, instead, the focus has shifted to a re-interpretation of the existing rules governing equipment cabotage on the parts of Canadian and U.S. Customs officials. The more lenient interpretations³¹ proposed apply to the following areas: (1) loading and re-loading foreign trailers with goods from the domestic country; (2) moving empty foreign equipment; and (3) transport of domestic goods on foreign trailers engaged in incidental or repositioning moves. The implications of these points will be considered in turn.

Point (1) serves to create efficiency gains for LTL carriers in terms of their

consolidation operations at the terminals. For example, consider a U.S. trailer that arrives at a Canadian terminal carrying U.S. exports. After its initial cargo is unloaded and the trailer is loaded with other U.S. exports to be transferred elsewhere within Canada, such an operation would no longer be interpreted as a cabotage operation. The new goods, despite having already been exported to Canada, are still considered to be an export in transit and thus not domestic goods. In this way, all export goods that cross the border are eligible to be transported by equipment from the exporting country. Furthermore, this move will not be considered incidental since the goods are deemed international thus avoiding the cabotage regulations.³²

Point (2) indicates that the movement of empty foreign equipment will not fall under a strict cabotage interpretation; in fact, their movement will be considered as a "non move". The applicability of the cabotage regulations to goods-laden equipment only will remove the question of illegality with respect to trailer spotting of Canadian trailers in the United States. For example, a Canadian tractor-trailer may arrive in a U.S. city, have its cargo unloaded, and then proceed to another U.S. city whereby the empty trailer is switched with a loaded trailer to go back to Canada. The empty trailer's transport will not be governed by cabotage regulations. It is also the case that the new loaded trailer may be U.S. equipment as well. What is important is that the total contents are international freight.

Finally, point (3) addresses the more specific forms of cabotage. The current system in Canada, it will be recalled, requires that a repositioning move be completed within 30 days of entry while the U.S. system does not allow for such a move at all. In the United States the Canadian trailer must exit the country after the delivery of its transborder goods meaning that any cabotage under-

taken after the initial drop-off must be in a backhaul direction. In this area, U.S. Customs proposes not to enforce the restrictive words "regularly scheduled" so that such moves need not be part of established transborder operations for Canadian carriers.³³ Of course, the restriction to northward backhaul directions will remain in place and the point-to-point domestic move must involve a pick-up of exports back to Canada when the domestic cargo is dropped off; otherwise, the move would be an illegal repositioning. The new interpretation increases the likelihood of loaded backhauls because, in the past, some backhauls had to be turned down since they existed at points where backhaul runs were not "regularly scheduled".³⁴

The reinterpretations of the *Customs Act* in both countries thus involve what is to be meant by a domestic and an international move. The emphasis also changes from a focus on the movement of the equipment to an emphasis on the origin and destination of the cargo. What is not explicit in the new interpretations, and is a problem for the LTL sector, is the disposition of a trailer that contains both U.S. and Canadian cargo or, for that matter, goods that are both international and domestic and yet from the same country. For example, in applying point (1) above, when a Canadian tractor-trailer engages in a point-to-point movement of U.S. export goods in transit, may U.S. domestic goods also be transported between these two points or between any two intermediate points in-between? It would seem that the domestic goods movement would have to satisfy the regulations governing incidental movement cabotage.

As can be seen the complete reform of cabotage regulations will be a slow process because of the political nature of: (1) taxation in an era of deficit and debt reduction; and (2) immigration policy in regard to domestic employment

possibilities. The current border dispute between the United States and Mexico highlights the point concerning immigration and it would seem that the NAFTA environment would force any side-deal worked out between the United States and Canada to be eventually applicable to Mexico. Furthermore, neither Canada nor the United States are averse from securing employment protection at the expense of one another.

(1.30) Cabotage and the issue of regulatory compliance

This section serves to take what was developed in sections 1.20-1.23 and discuss how the transborder trucking firms actually operate in an environment where cabotage operations may or may not be seen as viable. The lack of clarity and overt misinterpretation of the regulations on the parts of trucking firms are a source of economic inefficiency that cannot be discounted.

(1.31) General

Sections 1.21-1.23 highlighted the complicated nature of cabotage regulations in both Canada and the United States. The regulations pose difficulties for trucking firms engaged in transborder operations because they are governed by regulations enforced by officials of another country and, furthermore, cabotage regulations are split into a *Customs Act* jurisdiction overseeing foreign trucking equipment and an *Immigration Act* jurisdiction overseeing foreign drivers. The issue of compliance is important because it is useful to know whether or not efficiency gains due to cabotage reform will be had because firms will either: (1) now find it easier to engage in legal cabotage; or (2) not be subject to fines due to inadvertently violating these protectionist regulations. Certainly, if most firms

find themselves in point (1) after reform the efficiency gains to the trucking industry will be greater.

(1.32) Results from a previous survey of trucking firms

The results of the **Transmode (1991)** survey of Canadian and U.S. trucking firms will be summarized here before the results of the 1996 survey, completed specifically for this dissertation, are examined. Note that the Transmode survey took place before any official public overtures with respect to cabotage reform were made. Problems with some of the technical points raised by the writers of this survey will be pointed out since, it would seem, they were not aware of certain specifics related to the cabotage regulations. This does not call into question the overall results; rather it serves to further add to a perception of innocuousness that pervades the transborder trucking industry. The 1996 survey completed as part of this dissertation does not include opinions on the parts of the surveyed firms with respect to the specific ATA-CTA proposals since they were not in the public domain at that time. But the effects of the NAFTA environment would certainly be expected to be more clearly understood by these firms than by those surveyed in the 1991 study.

For the Canadian part of the Transmode survey the contact set comprised of 78 mostly TL general freight and specialty firms selected by various provincial trucking associations, as opposed to straight random sampling. One-third were in Ontario, another one-third in Quebec and the remainder in the rest of Canada. It should also be noted that the firms need not have been Canadian-owned; rather, some could be U.S. subsidiaries located in Canada. The greatest demand for cabotage operations comes, incidentally, from TL carriers due to their incidence of empty backhauls.

The survey technique was a mailed-out questionnaire with telephone follow-up for

purposes of clarification. A total of 33 responses were returned out of the 78 solicitations. The information sought was: (1) quantity of transborder operations (in revenue, tonnes, and kilometers); (2) describing the current cabotage undertaken and outlining any regulatory difficulties found in the United States; and (3) benefits and costs to the particular firm, as well as those anticipated to befall the entire industry, if a change in environment from status quo to complete cabotage were to occur. Furthermore, how these cost and benefits would affect location of offices, terminals, and maintenance facilities was also a requested part of point (3).

The problems and biases involved in this survey, according to Transmode, were: the low response rate due to apparent cynicism concerning the government's intentions; conflicting, though strongly-held, opinions concerning points (1) and (2); and the difficulty for the firms to speculate enough to address point (3).

Of the small sample, the conclusion drawn in the report was that, of the empty hauls occurring in transborder operations, 70% of them were in the northbound direction. This meant that Canada would stand to achieve efficiency gains from relaxed U.S. cabotage rules by filling empty backhauls. Of course, the question remained at the time as to whether or not Canada would agree to reciprocate in its own rules. Of note as well was the fact that several of the specialized carriers experienced empty hauls on more than 20% of total transborder operations. Of the 33 respondents, 10 indicated that "triangulation" was an important tool for the maintenance of efficient loaded mile ratios; that is, traveling to the United States from a point in Canada, returning to another Canadian destination, and then proceeding back to the point of origin (usually in an east-west fashion).

Another interesting point, highlighting the ambiguities of the regulation, was that most Canadian carriers believed *all* forms of driver cabotage in the United States were

prohibited while such a view of U.S. Customs legislation was clearly too strong. What some Canadian firms did was employ U.S. drivers and tractors (i.e. owner-operators) for the U.S. legs of their operations. There was also the perception by the firms that U.S. cabotage rules were more vigorously enforced than were the rules to restrict their U.S. counterparts operating in Canada. Of course, such feelings can be overblown. Two common problems Canadian firms cited were: (1) a U.S. shipper has a domestic and Canadian trailer in his yard and inadvertently loads the latter for a U.S. operation (which is certainly a hazard involved in trailer spotting); and (2) when a Canada-based trailer is consigned to a U.S. Customs yard awaiting clearance, which can take several days at times, problems can arise if the driver returning to make the pick-up is not the original one. These ambiguities work against legitimate cabotage operations or force fines upon firms inadvertently performing illegal cabotage.

In terms of moving from *status quo* to limited or unlimited cabotage, of the 33 respondents, 13 saw no new benefits, 10 felt that the number of empty hauls would be reduced, and the other 10 identified specific efficiency gains such as:

- (1) greater opportunities to include 2 U.S. points in a triangular route for either repositioning or simply using more available domestic opportunities to reduce empty miles.
- (2) building on point (1), the triangle route could be turned into a square route which would have the effect of equalizing and rationalizing east-bound and west-bound traffic in Canada.
- (3) both limited, and complete, cabotage allow for a greater prevalence of repositioning moves while complete cabotage, specifically, would allow for the complete integration of trailer pools as a source of efficiency

gains for the industry.

Under a new regulatory regime, legality of cabotage moves would have to be more clearly defined. For example, "repositioning" would need a specific definition in that: "... would a move from Boston to Florida be considered a repositioning if it permits a truck to pick up a load of produce bound for Canada?" (Transmode, 1991). It is surprising that the writers of the report would ask that question since: (1) the answer to their question is yes; and (2) repositioning moves were, and are, illegal in the United States barring a revision to its *Customs Act*. Nonetheless, the survey results, despite being sparse, show evidence of regulatory inefficiencies. However, some respondents questioned the Canadian side of the transborder industry's ability to compete with their U.S. counterparts in a more open regime. Another result from the sample was that western Canadian trucking firms favored greater cabotage more so than their eastern counterparts.

In terms of the U.S. side of the survey, TL carriers were used since they are the part of the industry more likely to experience cabotage difficulties in Canada. The LTL sector is dominated by large carriers likely to maintain a Canadian subsidiary or interline with Canadian carriers. Thus, they tend to make use of Canadian drivers and equipment in their U.S.-to-Canada operations. For these reasons, they were excluded from the survey. The portion of TL sector sampled was basically U.S.-based and operated, using only U.S. equipment in its transborder operations.

The survey for the United States was more informal since cabotage was considered to be less of an issue for U.S. trucking firms. Telephone and in-person interviews were carried out covering a standard set of questions. For the large firms contacted, Canada was seen merely as an extension of the U.S. market. Their primary market in Canada was southern Ontario. As well, firm size was not directly related to the size of its Ca-

nadian operations. While U.S. carriers actively solicited U.S.-bound Canadian freight for their return trip,

Carriers were asked directly if their [*sic*] felt their loaded mile ratios would be higher if they were able to carry domestic freight within Canada. The response was unanimously 'no'. They indicated that not only were they generally not interested in carrying Canadian domestic freight as part of their international operations, but that their operations were not geared to short-haul movements. In their performance-oriented environment, they found no room for domestic cabotage movements within Canada. They were of the view that if Canadian freight was to be carried, it would have to be carried using Canadian drivers and equipment in order to most effectively utilize Canadian operating rules, financial conditions and market circumstances (Transmode, 1991; pp. 59-60).

While the survey produced a generalized response along the lines that Canadian cabotage regulation did not present a problem, the respondents were not aware of the technically illegal actions that could be undertaken by carriers with respect to such things as vehicle breakdown, equipment repositioning and demurrage. According to the writers of the report a typical, though potentially illegal response to vehicle breakdown while on route in Canada was to deploy a fresh U.S. driver and/or tractor and many respondents were surprised that such a move could be deemed illegal. Of course, it was shown in the review of the regulations above that legitimate emergency procedures were legal, according to Canadian officials. But with respect to repositioning through trailer-spotting, many firms were surprised to learn that only the driver that physically brought the trailer into Canada, or the driver that would physically take the trailer out of Canada, would be allowed to move a trailer between trailer pools in Canada. Finally, the demurrage aspect whereby a U.S. trailer cannot stay in Canada beyond 30

days was also new information for some of the respondents.

In terms of relaxed rules of cabotage, the U.S. respondents felt that less regulation was better than more but that no substantive change in their Canadian operations would result. Again, it seemed that the cabotage issue was perceived as more important to the Canadian side of the industry and it would have to be decided whether or not cabotage rules in Canada are in place because they are seen as a useful form of non-tariff barrier or seen as an antiquated impediment to a Canadian industry interested in flexibility and competition. The technicalities mentioned above were seen as simple constraints to the realities of transborder trucking; that is, how might deploying another U.S. driver to keep a shipment moving, or repositioning an empty trailer between pools, or letting it remain in Canada past 30 days, affect business?

The survey did make clear the point that while trucking firms might not have been able to articulate definite positions with respect to cabotage, the industry's organizations and associations were very much able to do so. An interest group framework of analysis was hinted at: "In many cases, industry organizations recognized diverging interests among their membership. They can, nevertheless, put forward an overall position without dissent among their ranks. Similarly, industry organizations recognize the apparent regional differences, but can compromise sufficiently to endorse the national position articulated by the Canadian Trucking Association." (Transmode, 1991; p. 68).

In terms of the Canadian regional aspects involved in the information gathered, since western Canadian TL carriers have developed a strong position in transborder markets and penetrate deeply into the United States, they would clearly benefit from cabotage reform in that better repositioning opportunities in the U.S. may be afforded. While the Alberta, Saskatchewan, and British Columbia trucking associations favored

cabotage reform, it is claimed, such reform was not a high priority issue in that region. The survey also specified that these provinces, although supportive, did not feel that the benefits they would receive were high enough to reverse the overall industry view—which was probably influenced and formed in central Canada— as being against cabotage reform. This highlights the compromise within the Canadian industry. The Manitoba Trucking Association is more concerned about east-west transport and is also more concerned about U.S. competition than are the more western provinces meaning that, while Manitoba acknowledges benefits to *some* carriers, its preference is for the *status quo*. In Ontario, the presence of U.S. competition is more clearly felt in terms of the strong presence of U.S. LTL carriers serving the province and interlining with local carriers, and recently the U.S. TL carriers' expansion of operations into southern Ontario and the Toronto-Montreal corridor. In the Ontario and Quebec region, the belief that U.S. trucking firms possess a cost advantage is strong enough to outweigh any visible benefits that might accrue from relaxed cabotage regulations. Geography is such that, while cabotage creates more operating efficiency through greater available opportunities wherever one may travel, the travel costs of penetrating deeply into the United States would still exist and this is seen as a hollow benefit in Ontario and Quebec. In other words, cabotage reform is seen to improve operating efficiency but cannot overcome cost differentials between the United States and Canada in terms of line-haul operations.

In contrast to the western region's lack of fear concerning U.S. competition, the Ontario and Quebec trucking associations highlighted the fact that their markets are bigger and more lucrative than the western ones, thus serving as a better target for U.S. encroachment. Finally, Atlantic Canada, somewhat like the west, does not fear cabotage reform since those provinces did not claim to feel vulnerable to U.S. competition. Because of the triangular routes developed by Atlantic-based transborder trucking firms a move to the U.S. is followed by a northward move into Ontario, which puts an At-

Atlantic carrier in a position to take advantage of more favorable eastbound rates. The Atlantic region would benefit from greater opportunities for repositioning and more incidental operations in the United States. What was of concern by the interests in that region was the extent to which the route from Ontario eastward would become dominated by U.S. carriers or whether U.S. carriers would arrive in the Atlantic region and move freight westward in order to reposition in Ontario or Quebec in the event of a relaxed cabotage environment. It should also be emphasized that the provincial governments themselves across Canada echoed by and large the views of the industry in their respective jurisdictions, meaning that cabotage reform was supported in the west, opposed in central Canada, and cautiously endorsed in Atlantic Canada. Of course, the industry line at the time was for *status quo* along with more vigorous checks for compliance on the part of U.S. carriers operating Canada.

In summary, deregulation of the trucking industry in the United States and to a lesser extent in Canada has led to increased transborder operations. U.S. TL carriers have increased their presence in Canada (especially in southern Ontario) in this regard. The cabotage issue pits the view of increased efficiency in north-south operations against the view, held in Canada at the time of the survey, that the United States is better equipped to compete in a market subject to cabotage reform. If the *status quo* is desired then the relevant regulations must be further clarified in both countries and stricter enforcement to insure compliance must be met in order to eliminate irregularities. The spirit of the reform proposals covered in section 1.23 seem to highlight this.

(1.33) The 1996 Cabotage Survey

To update the findings of the Transmode survey, this dissertation undertook another survey, over the months of April through September of 1996, dealing mostly with Canadian carriers. The survey covered Canadian firms in all prov-

inces, except Quebec, with the Atlantic provinces being covered as a regional block. A list of prospective firms likely to engage in, or have opinions concerning, cabotage was obtained from the relevant provincial trucking associations. Firms were first contacted by telephone and an employee at the executive level was asked to identify knowledge of, and engagement in, cabotage activities in the United States. If one or both of these criteria were satisfied a hard copy survey questionnaire was faxed to the firm. What stands out in the results to be presented are the differences in knowledge of the regulations by firms claiming to engage in transborder operations and the tiny percentage of firms that actually identify an undertaking of cabotage (i.e. only one Canadian and one U.S. firm indicated cabotage activities out of 16 hard copy surveys sent out and approximately 100 separate telephone inquiries).

What follows is a documentation of the results obtained from the faxed questionnaires as well as the, albeit anecdotal, views of various firms on related issues most of which were given at the telephone interview stage. The results of this survey will be compared to the findings of the Transmode survey.

A common thread that ran through the inquiry of firms was, in many cases, ignorance as to the proper use of the word "cabotage". When the definition was explained, many firms identified it with the word "interstating" instead. The two terms can be taken as synonymous as far as Canadian carriers are concerned. Nonetheless, the majority of transborder Canadian firms contacted cited strictly transborder moves and to the extent that U.S. operations took place at all, they were facilitated by interlining with a U.S. subsidiary or contracted partner employing the necessary domestic equipment and drivers which thereby avoided the need to engage in cabotage in the United States.

The following represents some of the firms' views, gathered in telephone conversation, with respect to allowable and non-allowable transborder and cabotage activities. In order to protect the anonymity of the surveyed firms, they will be identified only by province of head office residence. A case/opinion provided by a firm(s) will be presented in each point below and then commented upon.

(1) Movement within a state is fine but one cannot cross its border to another state with a load originating in that state (**Manitoba firm**). This highlights the common opinion that "interstating" is illegal when a Canadian firm undertakes a U.S. cabotage move. The review of the regulations provided in section 1.22 does not hold up to so rigid a view. The U.S. route for the cabotage move must be regularly scheduled (i.e. a part of normal U.S. routing) with only minor deviations if any. There is no mention in the regulations of such a move being restricted to an individual state. Certainly, though, the more states that come into play the more the firms run up against different U.S. Customs officials which may thus explain their aversion to legal interstating via allowable cabotage moves.

(2) "Repositioning" moves in the U.S. are fraught with difficulties.

(a) Take the specific case of trailer-spotting. A Canadian trailer is dropped off at consignee (A) in Chicago and then the tractor is moved to pick up another Canadian trailer in Chicago at consignee (B) to be moved back to Canada. This is felt by U.S. Customs to be illegal; especially when another tractor and/or driver picks up the original trailer at consignee (A) (**Manitoba firm**). Similarly, a Canadian driver delivering a load in the United States and driving empty to pick up a pre-loaded trailer while spotting the empty one at the pick-up point is

considered by U.S. Customs to be cabotage while Canadian firms do not accept that view (**Saskatchewan firm**).

Trailer-spotting is not a form of cabotage and, furthermore, trailer-spotting of Canadian equipment is illegal in the United States but not in Canada so long as the move qualifies as a repositioning move (**House, 1993**). This is where the confusion on the part of the Saskatchewan firm arises: the activity described is not cabotage but is still illegal nonetheless. The problem with the Manitoba firm's case, as described, is that it is not really an example of trailer spotting. In Canada, where the practice is indeed allowed, the movement of the tractor from point A to B, carrying an empty trailer picked up at point A and dropped off at B, represents true trailer-spotting. The case described by the Manitoba firm is perfectly legal as long as the trailer picked up at B is carrying international freight bound for Canada and departure is through approximately the same border point as entry. The case of a different tractor and/or driver doing the pick-up can indeed lead to difficulties with U.S. Customs officials in terms of time costs because such officials are using their discretion in the administering of ambiguous regulations that do not specify one way or the other that the pick-up must be by the original tractor and/or driver. Coincidentally, an official of the Alberta Trucking Association has said that he has received complaints from Canadian firms experiencing problems with U.S. Immigration in Chicago regarding the (completely legal) movement of an empty trailer with its Canadian driver.

(b) The view of the Saskatchewan Trucking Association and the CTA is that only south-to-north repositioning in the U.S. is allowed. This is indeed true since the "repositioning" allowed in the United States, it will be recalled, would be better characterized as "return trip, outward". For example, consider a load

that is dropped in Oregon. If a load were available in California to go back to Canada it would not be legal to take a domestic load from Oregon to California. A Canadian carrier must move back to Canada after the transborder drop has taken place. But in Canada the geography is such that U.S. repositioning moves in Canada are usually east-west (**Saskatchewan firm**). Once a U.S. load is dropped off, the general direction of Canadian equipment from that point must be northward. The ambiguity arises, however, with respect to exiting to Mexico as opposed to returning to Canada. A movement to Mexico would then facilitate a move back to California later in order to pick up the Canada-bound shipment. The interplay of NAFTA and existing U.S. Customs regulations is not as yet resolved especially given that, approximately two years after these comments were solicited, officials have only now undertaken a reinterpretation of the regulations. Nonetheless, according to the Saskatchewan firm, Saskatchewan Government Insurance (SGI) would not at that time provide insurance to Canadian carriers wishing to transport to Mexico. A reform desired by a few of the firms contacted is the allowance of east-west U.S. repositioning moves similar to those currently allowed in Canada (**New Brunswick, Prince Edward Island and two Nova Scotia firms**).

(c) Repositioning moves by U.S. trucking firms are occurring in Canada while they are illegal in the United States (**Ontario and Alberta firms**). The Ontario firm gave the indication (which was claimed to represent the views from various of its customers) that U.S. trucking firms were using U.S. drivers in such repositioning moves in Canada. While it is true that repositioning moves are allowed in Canada they are illegal in the United States except for the restrictive "return trip, outward" move. Of course, the U.S. firm must always employ a Canadian or dual-citizen driver when making such a move with U.S. equipment. The regulations governing repositioning seem to be the place where reciprocity is

least and it is understandable that Canadian firms may falsely believe that reciprocity with the United States is the case since they readily observe their U.S. counterparts engaging in such activity in Canada.

(3) Cabotage enforcement is tougher in the United States than in Canada (Manitoba, Ontario, Nova Scotia, and Alberta firms) and there is a lack of clarity in the U.S. laws and different degrees of enforcement in each state (Saskatchewan firm). These findings mirror those of the Transmode survey. Some firms are aware of the possibility of engaging in repositioning moves but such moves are avoided because of the hassle involved (Ontario firm). Lack of clarity is the case for both the United States and Canada. Because of this lack of clarity the different degrees of enforcement seem a natural outcome on the part of officials that find themselves by necessity acting in an *ad hoc* manner. But as noted in point 2 (c) above, a view on the part of firms that reciprocity is "supposed" to exist may lead them to believe that officials are more stringent in the United States when they are really enforcing a legal prohibition on the type of repositioning move allowed there.

(4) Cabotage in theory may be possible but a realistic barrier to any such lucrative activities is that, even after all the red tape is cleared, there is a problem in finding a sufficient number of U.S. drivers so as to legally use the Canadian equipment in allowable U.S. cabotage (Saskatchewan firm). The inability to use Canadian drivers is a problem when a great percentage of a firm's business necessitates moving into U.S. territory (Ontario firm). The problem with the current immigration regulations is that the drivers of the Canadian equipment in the United States must have U.S. citizenship or equivalent status. The mobility of the equipment across the border makes no difference in the cabotage issue unless the driver has dual citizenship or a U.S. driver can be located. And this

situation shall remain a problem into the future since the immigration side of the regulations were not the subject of reform discussions; nor are they expected to be in the near future on the part of the ATA and CTA.

(5) The whole area of transborder moves is grey and thus rules can be "bent" as necessary. For example, domestic U.S. transport of goods can be done "on route" with the export from Canada (**Ontario firm**). This opinion shows a lack of understanding of the current regulations since such a move may indeed be legal under certain circumstances: the transborder move into the United States must have been regularly scheduled; and the move with domestic freight must be northward once the original international freight is dropped off. But the significant requirement is that the driver must be a U.S. citizen when transporting domestic freight. A way around the problem is to interline with a U.S. firm because, even if a U.S. driver were hired to move the Canadian tractor/trailer, there is still a limit to the number of cabotage moves that are allowed while on U.S. soil. Interlining allows complete freedom of movement in the United States when the interlined firm acts as the Canadian one's agent (**Ontario firm**).

A final point of note is that, in its returned survey, a Saskatchewan firm indicated that it was not even aware that cabotage was at all legal in the United States. This seems significant given that this firm also estimated that one-quarter to one-third of its total sales revenue was obtained from transborder operations.

(1.34) Summary of the hard copy survey

16 hard copy surveys were returned. The breakdown by location is: 4 from Manitoba; 4 from Saskatchewan; 1 from British Columbia; 2 from Alberta; 3 from Ontario; 1 Atlantic Provinces; and 1 from the United States.

Respondents were asked to indicate, roughly, the contribution of transborder activity as a percentage of total operations in terms of total revenue, tonnage and kilometers. The three time periods were pre-1981 (U.S. and Canada regulatory environment), 1981-87 (U.S. motor carrier deregulated environment), and 1987-present (both countries deregulated). Many of the firms had trouble completing this table in full. The results that were obtained are as listed below.

U.S. operations as a percent of total

<u>firms</u>	<u>pre-1981:</u>	<u>1981-1987:</u>	<u>1987-present:</u>
Manitoba:			
(1) revenue	0	4	20
(2) revenue	3-5	3-5	10
tonnage	3-5	3-5	10
kilometers	3-5	3-5	10
(3) revenue	40	50	60
Ontario:			
(1) revenue	0	0	45
tonnage	0	0	45
kilometers	0	0	60
<i>note: this was the only firm to claim cabotage activity, as will be discussed below.</i>			
(2) revenue	0	0	10
tonnage	0	0	10
kilometers	0	0	15
Alberta:			
(1) revenue	50	75	85
tonnage	50	75	85
kilometers	50	75	85
(2) revenue	85	90	80
tonnage	85	90	80
kilometers	85	90	80

U.S. operations as a percent of total (Continued)

<u>firms</u>	<u>pre-1981:</u>	<u>1981-1987:</u>	<u>1987-present:</u>
Atlantic:			
(1) revenue	0	0	40
tonnage	0	0	40
kilometers	0	0	40
Saskatchewan:			
(1) revenue	35	30	20
tonnage	30	20	5
kilometers	40	35	5
(2) tonnage	0	0	40
kilometers	0	0	65
British Columbia:			
(1) revenue	2	5	55
tonnage	2	5	55
kilometers	1	4	65

note: each number in parentheses indicates a separate firm in the particular province.

The surveyed firms were asked to indicate the nature of their cabotage activities (if any). Only two indicated such activity. An Ontario firm, noted in the above table, indicated involvement in both repositioning moves and incidental moves on U.S. soil. What is significant is that repositioning moves are illegal with Canadian equipment. The remaining firm to indicate was a Wisconsin, U.S.A. firm which did not form part of the table above. This firm claimed to engage in repositioning moves in Canada which are of course provided for in the regulations. However, the firm also indicated that it engaged in "Small 'dedicated' operations, operating in a closed loop system with all-Canadian equipment" which, of course, would get around any cabotage problems if the drivers were Canadian as well.

It is interesting that such a small amount of evidence for actual cabotage was found. Since Canada and the United States were, at the time of the survey, involved in a cabotage reform process there should have been significant pressure put on both federal governments by the various trucking associations. This pressure would have arisen out of the need to open up markets further for: (1) firms interested in undertaking cabotage; and (2) those firms that illegally engaged in cabotage but wished to see their operations made legal. The greyness of the issue suggests a greater prevalence of this activity than this survey was able to capture. In this regard, the firms were asked to indicate problems with compliance in their transborder operations with respect to U.S. authorities. The potential problem areas are: U.S. Customs, U.S. Immigration; State Authorities; and domestic U.S. shipment availability. Eleven firms responded in this area. The results are given below.

Difficulties with U.S. Customs:	YES	NO
	2 Saskatchewan	1 Saskatchewan
	2 Manitoba	1 Manitoba
	2 Alberta	2 Ontario
	1 Atlantic	

Difficulties with U.S. Immigration:	YES	NO
	2 Saskatchewan	1 Saskatchewan
	1 Ontario	1 Ontario
	1 Alberta	1 Alberta
	3 Manitoba	1 Atlantic

Difficulties with State authorities:	YES	NO
	2 Saskatchewan	1 Saskatchewan
	1 Ontario	1 Ontario
	1 Manitoba	2 Manitoba
		2 Alberta
		1 Atlantic

Difficulties with U.S. shipment availability:

All answered "No" except for one Saskatchewan firm.

With respect to reform issues 14 firms responded. The firms were to answer "in favor; against; or indifferent" to the following three statements/questions pertinent to the reform discussion taking place in 1996 :

"The Canadian Trucking Association and American Trucking Association are jointly proposing that the Customs Act regulations for both the U.S. and Canada— which currently limit the use of tractors and trailers on foreign soil— be amended so as to allow complete freedom of movement for all such equipment on foreign soil. What is your company's view on this issue?"

All answered in favor.

"Please indicate your company's view regarding a complete relaxation of all U.S. Customs *and* Immigration legislation to give complete freedom of movement in the U.S. for all Canadian equipment as well as Canadian drivers."

All answered in favor.

"Would your view in the previous question be different if similar freedoms were given to U.S. companies to operate in Canada?"

YES

1 Alberta

NO

1 Alberta

4 Manitoba

4 Saskatchewan

3 Ontario

1 Atlantic

Firms were asked to indicate a ranking of the cabotage and transborder regulations. 14 firms responded and the results are indicated below.

The three choices are given below:

(1) No difficulty with current regulations whatsoever: 0 responses.

(2) Slight difficulties with the current regulations: 1 Saskatchewan; 1 Ontario.

(3) The current regulations seriously impact business prospects in the U.S.:

3 Manitoba

3 Saskatchewan

2 Ontario

2 Alberta

1 Atlantic

1 Wisconsin, U.S.A. *

* Since this is a U.S. firm the answer is in the context of current Canadian regulations. Also, this firm cited only a problem with Canada Customs as opposed to Immigration and provincial authorities and, like most of the Canadian responses, this firm is in favor of Customs and Immigration reforms on both sides of the border. Its other comment was: "The biggest problem with the regulations is not compliance *per se*. Rather, the problem with the regulations (in both the U.S. and Canada) is that they hinder development of a 'continental' fleet and require segregated equipment operation. This is inherently more costly and less flexible, and thus harmful to the consumer. The significance of the U.S.-Canada [reform] proposal is that it will allow for greater flexibility. Thus, the real gain is flexibility and not explicit cost savings." Of course, it should be pointed out that cabotage regulation is only one hindrance to the formation of a truly continental fleet; another is the patchwork of weight and dimension regulations on both sides of the border (*q. v. supra*-note 21).

The revenue, tonnage and distance data collected show that most of the Canadian firms in the survey have significantly increased the percentage of their transborder activities after the 1987 deregulation of Canadian motor carriers. In terms of compliance, there seems to be no problem for these firms in locating shipping opportunities in the U.S. but, at the same time, 64% of the firms responding indicated problems with U.S. Customs and Immigration and 36% with state authorities. If cabotage is a rare activity, as found in this survey, then the difficulties cited here must be in terms of what the authorities consider to be routine checks that the firms feel are a time and red-tape cost. In this environment it may be reasonable for the firms to shy away from an attempt at cabotage.

In terms of reform, the result seems to be unambiguous. Reform, of any

kind, is greatly desired by the firms and they are willing to accept reciprocity with the United States in order to achieve it. This seems to be a reasonable response given that the general view by these firms is that current regulations represent a serious impact to business prospects in the United States.

In summary, the current regulations are costly to the firms and they desire reform. If these firms feel that gains will be made even under reciprocity then the case can be made for an unambiguous welfare gain from deregulation of transborder activities. With transborder activity significantly rising since the 1987 deregulatory moves in Canada, it seems reasonable to argue that the remaining issue of cabotage represents a theoretical "marginal" adjustment to the current regime in place in both Canada and the United States and that firms on both sides of the border are in a position to take advantage of the increase in shipping opportunities afforded in a complete cabotage environment.

(1.40) Chapter conclusions

This chapter has presented a history of trucking regulation and deregulation. It has also discussed the nature of the cabotage problem and appraised the reform process that has taken place. It is obvious from both the historical discussion and the survey of firms that compliance with cabotage regulations is difficult for trucking firms operating in transborder markets. One is led to the conclusion that a gain in efficiency is likely to occur under a cabotage reform process. Indeed, this process has begun but there is a long road ahead before the process is complete. The next chapters deal with the development of an economic model of the transborder trucking industry that should serve to shed some light on the nature of these expected efficiency gains.

Chapter 1 Endnotes

¹ It is by no means efficient to remove all governmental presence in the operation of business activity. Regulations for the purpose of contract enforcement and the establishment of property rights are essential for the efficient operation of any firm.

² In context it is worth noting that the *National Policy*, enacted in the 1879 federal budget of the recently elected Liberal-Conservative government was in part a response to the previous Liberal government's failed attempt to negotiate a "Reciprocity" agreement with the United States in 1874-75. The economic nationalism unleashed at that time would be pervasive for many decades to come and political rhetoric would be cast into an implied choice between the two seemingly diverse concepts of Canadianism or Continentalism.

³ Newfoundland would join Confederation in 1949 bringing the number up to ten. Of course, as a region, the Maritimes tended to act in unison as witnessed by the formation of the Atlantic Trucking Association.

⁴ An aside is the different courses of development that intermodalism took in Canada and the United States. Most U.S. railways were content to act as "wholesalers" and provided piggy-back service to the trucking firms without attempting to capture their shippers by way of building their own truck fleets. The Canadian railways, on the other hand, became multi-modal by their purchase of ocean vessels, trucks, airplanes and even hotels. With respect to trucking services, the Canadian railways became "retailers" with the result being that any trucking firm that consigned a trailer to a railway's piggy-back service might soon find the railway "back-soliciting" that shipper for an exclusive contract for use of their own trucks. In this sense, piggy-backing in Canada was mostly an in-house affair for the railways.

⁵ The findings of this paper will be further elaborated upon when the concept of *rent seeking* is introduced in chapter 3.

⁶ British Columbia deregulated on October 1, 1997 while the other four provinces would follow suit on January 1, 1998.

⁷ Less-than-truckload operations involve the carriage of freight from various shippers that are consolidated at terminals for pick-up and delivery to another terminal. Truckload (TL) operations usually involve the transport of freight wholly owned by a single shipper. Owner-operators are persons that own one or more tractors or tractor-trailers that are leased out to for-hire carriers. A complete analysis of the effects of deregulation on owner-operators is provided in *Heads et al. (1991; chp. 6)*. Statistics Canada, in its annual *Trucking in Canada* publication, employs a weight-based definition of LTL and TL operations. These are: an LTL carrier transports shipments of no more than 10,000 lbs. or 4,500 kgs; while a TL carrier transports shipments of weight greater than 10,000 lbs. or 4,500 kgs.

⁸ The data cited in the remainder of this section refer to this report unless otherwise specified.

⁹ **Robyn (1987)** states that a special interest group of investors with interests in railroad securities formed and was made up of more than 1,500 banks and insurance companies. The group was called the Security Owners' Association and, in 1932, helped to establish the National Transportation Commission which would, in 1933, recommend federal regulation of interstate trucking.

¹⁰ **Felton (1989)** provides a complete analysis of this exemption. For example, a for-hire trucking firm that exclusively transported farm equipment was not exempted from rate and entry regulation while one that exclusively transported unprocessed agricultural products was.

¹¹ The actions of the ATA are exactly the type that economic theory would predict concerning special interest group behavior. The model presented in chapter 3 will elaborate fully on this literature.

¹² **Anderson and Huttzell (1989)** cite a survey of intercity common and contract trucking firms which found that 70% of the regular-route common carriers did not possess full authority to serve intermediate points and more than 10% of these had no authority at all. Approximately one-third of the carriers had limited backhaul authority and 10% had no authority to accept backhauls at all.

¹³ **Robyn (1987)** notes that protests by the bureaus on behalf of their members to rate undercutting on the part of firms was practically an automatic process. The author cites a case whereby an exasperated trucking firm filed a rate with the ICC to carry yak fat from Omaha to Chicago. Thirteen carriers filed protests through their bureau; but the interesting part of this dispute was that yak fat was an imaginary product.

¹⁴ The ICC's calculation method was as follows: (1) line-haul cost (i.e. transport cost exclusive of pick-up and delivery charges at terminals) per mile was calculated independently of the load factor; (2) the result would be divided by the average (100 pound weight) load for the *round trip* in order to obtain the line-haul cost per 100-weight-mile; and (3) the result would be multiplied by the fronthaul or backhaul distance as appropriate (**Felton, 1981**). In this way, backhaul shippers would be forced to pay for a portion of costs inclusive of fronthaul costs.

¹⁵ The price-elasticity of transport demand can be said to be more price--inelastic for manufactured goods as opposed to primary goods since transport demand is a smaller source of value-added for the former. A rise in freight rates to this class of shipper will lead to a fall in their quantity of transport demanded with the net effect of total revenue to the trucking firm rising. On the other hand, the price-elasticity of demand for any transport service may increase when more viable substitutes become available. Shippers began to increase their usage of air freight as well as make use of private fleets. As **Robyn (1987; pp.**

24-5) notes: "The loss of 'good freight' — freight assigned rates that were especially high relative to cost— eventually became one of the most serious problems faced by the regulated trucking industry." To effectively price discriminate it is indeed necessary to separate demand classes based upon price-elasticity but the firm must also maintain market share within these classes as well.

¹⁶ As might be expected, rates of return to protected firms were higher than those that were not. The trucking firms were not held to a maximum rate of return. Because of entry regulation, operating rights could be acquired through merger. In the United States the most comprehensive was the "general commodity, regular route" certificate. The operating authority itself acquired market value and became acceptable by banks as collateral. It should be kept in mind that the ICC granted operating rights free of charge to those firms that satisfied its criteria. **Robyn (1987)** notes that the eight largest trucking firms, in 1977, to hold general commodity, regular route certificates earned a rate of return on equity double that of the average Fortune 500 company. **Moore (1978)** estimated the total market value of operating rights of U.S. trucking firms. This study found that out of 23 attempts made by firms to acquire operating rights, they would pay on average 15 percent of the expected annual revenue to be earned under those rights. Using that average, Moore went on to estimate the total value of operating rights for large and medium-sized trucking firms to be between \$2.1 to \$3 billion.

¹⁷ **Kingham (1996)** shows that for 1988-90 the modal split for exports and imports was: 68% truck, 20% rail, 10% air and 2% water.

¹⁸ As will be seen in section 1.22 there are specific requirements for the U.S. freight to meet in order to be considered allowable incidental move cabotage. **Prentice and Guzman (1992)** examine cabotage and the Mexico border. The compliance problem facing the carrier is that it may incorrectly think that it is not necessary to meet these requirements given that the freight is, in effect, an export rather than domestic freight. Section 1.23 shows how recent changes now support this view. Compliance is discussed in section 1.30 in full.

¹⁹ Border control legislation passed by the U.S. Congress in 1996, and to be implemented in September, 1998, was designed primarily to stem the tide of illegal immigration to the United States from Mexico. The legislation is referred to as the *U.S. Illegal Immigration Reform and Immigrant Responsibility Act*. The problem for Canadian carriers was that, without an exemption, all entrants would have to fill out visas before entry and, from that point, carry a passport with fingerprints and other data. Under the threat of reciprocity action by Canada it is likely that Canada will obtain an exemption from the legislation. With current daily Canada-U.S. trade of around \$1 billion, and around two-thirds of it moving by truck, the bottlenecks at major border crossings such as Windsor and Niagara Falls, Ontario would be horrendous. The Canadian Trucking Alliance (CTA) estimated that waiting times at the busiest crossings would be anywhere between five to seventeen hours. (Note that in 1997 Canada's provincial trucking associations merged with their federal counterpart, the Canadian Trucking Association, to form this new CTA). This new and enlarged federal body has now increased its coast-to-coast membership from 50 to 2,000 firms

and it would seem that a federation approach to its lobbying efforts will put the CTA in a better position to lobby concerning the larger NAFTA issues that must still be resolved. The voting power is distributed among the provincial associations as follows: Ontario and Quebec have five votes each; B.C., Alberta, Manitoba, and the set of Atlantic provinces possess four votes each; and Saskatchewan has three votes.

²⁰ New technology is slowly being implemented whereby a computer chip installed in a tractor would allow for identification of trucks, loadings, and drivers in advance of the border check point and thus be processed by customs and immigration officials before arrival. A paperless system would serve to eliminate border delays. To date, demonstration projects have been occurring in all three NAFTA countries but no specific program has been implemented.

²¹ For a comparison of these regulations among the NAFTA countries see: **Kingham (1996)** and **Montufar and Clayton (1997)**.

²² The interface between operating efficiency and government regulation is the true environment in which a trucking firm must work. The type of trucking operation, geographic market, and exchange rate are the major factors determining comparative advantage/disadvantage. **Chow and McRae (1989)** found that Canadian firms faced input costs 10 to 14 percent lower than their U.S. counterparts which, they claimed, more than offset any government-created disadvantages. A study by **Trimac Consulting Services (1991)** covering only Canadian owner-operators found a mean input cost premium of 7 percent over their U.S. counterparts with the assumption of an exchange rate of \$1 CDN=\$0.85 U.S. As well, Canadian owner-operators earned 73 to 86 percent of the revenue received by their U.S. counterparts over routes of comparable distance. The parity-exchange rate was calculated to be \$1 CDN=\$0.75 U.S. With respect to tax differences a study by **Peat Marwick Thorne (1991)** sampled specific state and provincial jurisdictions. Federal corporate tax rates were higher for U.S. carriers than they were for Canadian ones but when provincial/state tax rates were included, the effective tax rates tended to equalize. Only for "small" carriers with income less than \$200,000/year did Canadian carriers enjoy tax rates around 10 percentage points lower.

²³ **Francois et al. (1996)** examine the welfare effects of a relaxed Jones Act on domestic merchant marine activity. The welfare gain to the merchant marine market was found to be in the range of \$2 to \$3.4 billion annually. Note that cabotage was also an issue between Canada and the United States with respect to airline route expansion. While talks in that area have concerned freedom of entry in transborder markets (i.e., a city pair separated by the international border), local traffic rights, whereby a foreign commercial airplane may land in the destination city and then fly beyond to another in order to carry domestic passengers, was also subject to discussion. The hitch is that the extra flight must carry some foreign passengers from the originating point so that the flight is a *de facto* continuation of the transborder service. Some aspects of trucking cabotage are similar to that provision. Finally, intercity bus operations are also subject to these regulations when crossing the Canada-U.S. border. For example, a Canadian bus and driver may enter the United States to pick-up U.S. citizens to

take them on a tour of Canada. The driver enters the U.S. as a NAFTA "business visitor" but may not take those passengers back to the United States. If he had, a point-to-point U.S. move would have occurred, despite the entry into Canada, and would thus be a cabotage violation since all passengers were from the U.S. and the bus and driver were Canadian. An actual case along these lines is discussed in Joyce (1997b).

²⁴ Dean and Prokop (1996) provide an application of the "capture thesis" to the area of teacher certification and University training.

²⁵ A third type of cabotage move, peculiar to the Canadian regulations, is the so-called "sufferance warehouse pick-up" sanctioned by Canada Customs in January of 1991. In this operation the delivery concerns international freight that had been originally dropped off at a sufferance warehouse in Canada pending a customs release. Any foreign trailer (including the original that dropped off the goods at the warehouse) may be used to pick up those goods when released so long as the conveyance equipment entered Canada in accordance with tariff item 9801.00.00 meaning that it must have entered Canada with a load of inbound foreign freight. As far as the tractor used in the pick-up is concerned, in a similar sense, if it is not the original tractor used in the transport of the newly released goods, the tractor is required to have entered Canada with an international load. More detail is provided in Transmode (1991).

²⁶ The reform discussions that have taken place, combined with a NAFTA environment whereby Mexico may be looked upon by Canadian trucking firms as a viable "exiting" point from the United States, serves to question the reasoning behind a "northward" interpretation. Section 1.23 will outline the latest reform discussions. Furthermore, some Canadian transborder trucking firms have questioned why they observe U.S. competitors engaging in east-west cabotage in Canada but face a restriction to northward cabotage in the United States. What these firms do not realize is that, while reciprocity is indeed not the case, U.S. officials were mandated to ensure that the move was strictly outward as opposed to parallel to the border. Section 1.32 deals with the issue of interpretation and compliance on the parts of the transborder trucking firms. While neither CUSTA nor NAFTA provide for explicit integration mechanisms for transport policy it is interesting to note that it is only recently that Europe began this process even though the economic integration process itself began in 1958 with the *Treaty of Rome*. A review of the European transportation experience is found in Plehwe (1997).

²⁷ CUSTA has a designation known as Business Visitor (B-1) that provides for temporary entry into the host country for a specific occupation. In the section dealing with "distribution occupation" there is an explicit prohibition against transportation of domestic commodities or passengers by such persons. NAFTA does not over-ride these provisions in any way. As to aboriginals, it is the case that they are treated as dual citizens under both Immigration Acts. For example, section 289 of the U.S. Immigration Act provides for this right. But it also states "[that] such right shall extend only to persons who possess at least 50 per centum of blood of the American Indian race." Status is proven by the possession of a Band card.

²⁸ Transport law expert Daniel Joyce, who writes a newspaper column concerning international trucking laws, indicated that his law office received several calls from drivers asking for clarification of the CTA-ATA proposal since the immigration issue was not at all mentioned as even a *caveat emptor* (Joyce, 1996). Such concerns and omissions drive at the heart of the compliance issue.

²⁹ While Revenue Canada collects the GST, the *Excise Tax Act* itself is governed by the Department of Finance. There is no reciprocity in this regard since the U.S. Federal Excise Tax, currently at 12%, would not apply to the value of Canadian equipment entering the U.S. for cabotage purposes. The Department of Finance has indicated no signs of reviewing the possibility of exempting the total market value of U.S. cabotage equipment from the GST.

³⁰ It is interesting to ponder the trade-off that would occur in terms of increased GST revenue on the value of U.S. equipment on the one hand versus lost revenue on cabotage services that are not undertaken because of the disincentive created. It is certainly the case that the current and limited cabotage of U.S. trucking firms is not subject to GST but, for some reason, the tax authorities desire to tax the same activity when carried out under *Customs Act* reform. Furthermore, it is not clear how the GST on the market value of U.S. equipment would be administered. A one-time levy on the straight-value of the equipment upon entry seems to be most likely. Also, that levy could not be refunded by claiming an input tax credit since only imports *resold* within Canada enjoy a GST tax credit. Of course, an input tax credit may be claimed for the cabotage *service* but the tax on cabotage equipment is unrecoverable for the firm.

³¹ These interpretations are administrative rulings based on legal opinions which, as such, over-ride all prior rulings inconsistent with the new interpretations. The United States Customs Service has announced that it would apply these new interpretations effective Dec. 1, 1997.

³² Joyce (1997a) notes that there is nothing to prevent the international goods from being transported intermodally as well. For example, goods bound for the United States could be transported from Canada by rail or air and picked up by a Canadian tractor-trailer for further transport within the United States.

³³ At this point one cannot say how U.S. Customs officials will in fact proceed with respect to this proposal. Currently customs officials interpret regularly scheduled shipments to mean those occurring hourly, daily, or weekly. Monthly is likely to be considered too infrequent. In this way, TL international shipping is disadvantaged with respect to cabotage possibilities over the more frequent LTL international shipments.

³⁴ Joyce (1997a) notes that goods picked up in the United States by Canadian trucks that are to be interlined with a Mexican truck on the U.S. side of the border would not be involved in cabotage since the goods are now to be interpreted as international since they are ultimately an export. This point removes what was once considered to be a source of uncertainty for Canadian trucking firms that shipped freight destined for Mexico.

Chapter (2): A model of the transborder trucking industry under regulation and deregulation.

(2.10) General

This chapter draws upon the historical overview of chapter 1 in order to build an economic model of the transborder trucking industry. Sections 2.20-2.21 discuss how for-hire trucking firms respond to temporary changes in demand for their services when placed within either a regulatory regime or one characterized by deregulation; the two types discussed in the previous chapter. Basically, deregulation will be taken to mean complete freedom for all firms to set freight rates competitively and to operate without the need for jurisdictional licensing in any domestic trucking market. Sections 2.30-2.31 discuss the nature of temporary demand and will incorporate the effects of transborder trucking operations into the model. Section 2.40 discusses the nature of the equilibrium to be found in the model. Finally, section 2.50 draws some conclusions from the model.

(2.20) The supply side: A diagrammatic approach

A theory as to how the trucking industry responds to cyclical demand shocks under regulatory and deregulatory regimes has been given in **Prentice (1994)**. That analysis proposed industry supply curves which were specially "kinked" to highlight the fact that the industry chose to either rate-adjust or quantity-adjust to an expansionary or contractionary demand shock depending upon which of the two regimes was in place. It is through comparisons of these temporary

equilibria that estimates of the welfare gain accruing from deregulation, to be fully discussed in chapter 3, can be made. What is interesting is that this welfare gain through a regime change exists independently of whether the industry is facing demand expansion or contraction.

Consider how the trucking industry responds to a temporary demand shock while under a regulatory regime that controls both freight rates and entry.¹ The long run/short run distinction of supply used for the building of typical supply curves is not used here in the traditional microeconomic sense because time periods for adjustment, and the presence of fixed factors of production, are not really the issue; rather it is the firms' response to regulations that are important. The point is that the price elasticities with respect to industry supply differ depending on the context; that is, firms choose to quantity-adjust during a recession (i.e., a cyclical contraction of demand) when in a regulatory environment but, in a deregulatory environment, choose to rate-adjust instead.

Consider the regulatory environment and its effect on industry supply. During an expansion in demand, regulatory barriers to entry (i.e., operating licenses, geographical operation limits, jurisdictional weight and dimension restrictions) mean that industry size, in terms of the number of firms, is fixed and freight rates expand faster than do the quantity of services supplied due to the ability of incumbent firms to co-ordinate prices because of regulatory protection.² During a contraction in demand, the regulatory regime serves to prevent competitive rate cutting which thus allows firms to scale back their operations by letting a part of their fleets remain idle and by laying off drivers and other related personnel. This quantity-adjustment process on the firms' part allows them to ride out recessions and maintain limited competition by implicit cooperation serving to reduce capacity and keep rates higher than otherwise.

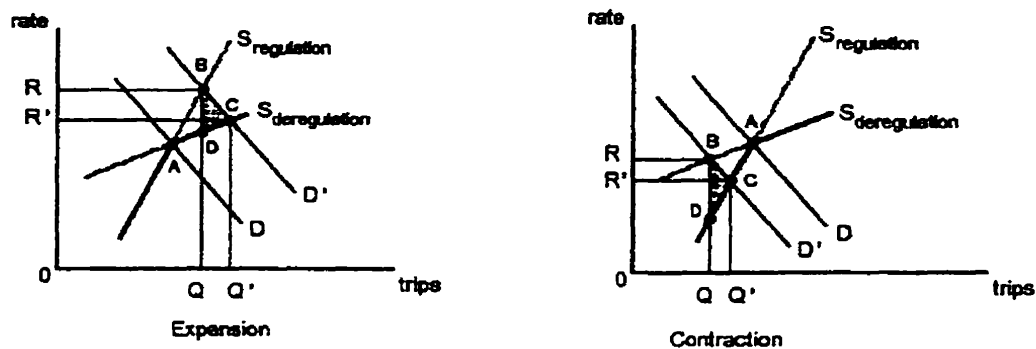
In the deregulatory environment the situations are essentially reversed from those above. During an expansion in demand there is a greater incentive for firm entry which serves to dampen the rate-adjusting process found in the regulatory environment. Not only does entry occur, the incumbent firms would more effectively compete by running their own fleets longer hours and perhaps limiting truck turnover (which makes the case that fleets become overworked and less safe, leading to an argument for at least some safety regulations to remain in place). To the extent that the deregulated trucking industry relies to a large degree on, and indeed creates incentives for, owner-operators, the expansion of fleets involves very short time lags. During a contraction, competitive rate cutting will indeed occur since owner-operators face the fixed costs of their vehicle, forcing them to stay in business and "loss-minimize"; that is, while a large trucking firm may be able to afford to idle one or even a few trucks (as in the regulatory case), an owner-operator cannot do likewise so easily, owing to having to personally bear the fixed cost of the vehicle. The indivisibility problem facing owner-operators is a reason for the greater cyclical variations expected to occur under deregulation.

Freight rates would be lower under the deregulated supply than under the regulated supply which will turn out to be the theoretical source for the welfare gain found to occur under a change from regulation to deregulation of the trucking industry. In this regard, an industry demand curve can be joined with the industry supply curve.³

As can be seen in the two panels of figure 2.1 below, a relative welfare gain occurs when supply characterized by regulation is discarded in favor of that allowing for deregulation, irrespective of whether demand is contracting or

expanding. The welfare gain associated with a move to deregulate is given by the familiar Harberger welfare triangle BCD. The deregulatory result brings about a greater quantity at a lower rate (point C as compared to point B). Point A represents a long run, steady state equilibrium in the sense that the equilibrium rate and quantity are not affected by a change in regime because all firms are, by assumption, fully adjusted to the permanent (non-cyclical) demand (D) in the market. In the expansion and contraction cases, the demand curve shifts appropriately to point B which represents the initial regulatory equilibrium from which the welfare gain from deregulation may be examined.⁴

Figure 2.1: Demand Expansion and Contraction

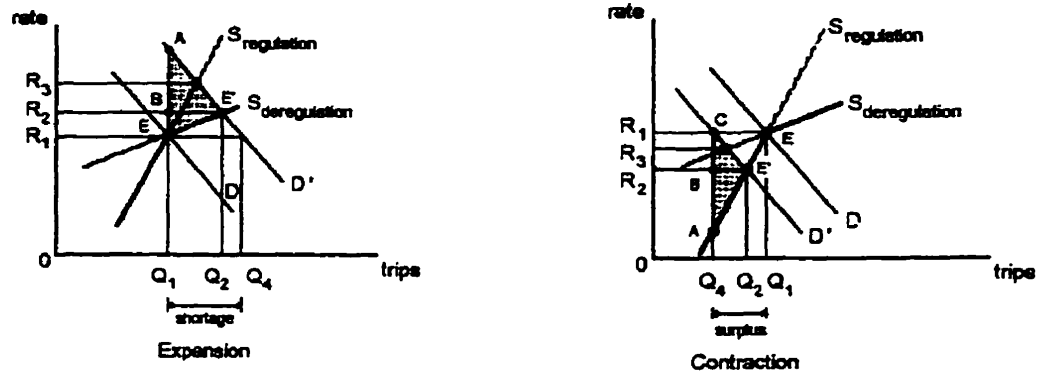


The welfare gain of BCD represents the sum of the expanded consumer and producer surpluses obtained in achieving point C instead of point B. The breakdown of the welfare triangles is as follows. Point D represents the minimum cost of provision of quantity Q while point B represents the rent-laden industry rate set under regulation. Thus, the line segment BD represents the incremental rent earned on the marginal output unit Q. At point C there are no rents since the number of firms in the industry has expanded to a competitive equilibrium.⁵

The incumbent firms do not exit the industry if they have regulatory protection and owner-operators do not exit so long as they can loss minimize. At point C, there are more firms in the industry as compared to point B (likely owner operators trying to thrive in the deregulated environment) and the competitive rate-cutting expected during a contraction allows for no rents to obtain. Again, it should be noted in the contraction case that point C is not a long run equilibrium; rather, it is a short run equilibrium. Since the incumbent firms are simply riding-out the recession, they are waiting for an expansion of demand to move the industry back to point A. This point highlights the cyclical nature of the trucking industry in that the movement back to point A is completely demand--determined and the demand for trucking services is itself, of course, a derived-demand.

In figure 2.1 it was assumed that the industry freight rates adjusted fully to temporary demand shocks even when operating within a regulatory regime. However, as was discussed in chapter 1, rate regulation was prevalent in the United States through the ICC. The application process for rate changes in response to real or expected demand shocks meant that rate adjustments lagged behind those required by the market to bring about a temporary market equilibrium at point B. Looking at the applicable long run freight rate at point A as an effectively fixed rate in the immediate run under regulation, the implications for the welfare gains from deregulation may be restated under conditions of a regulated freight rate that is sticky. This is shown in the two panels of figure 2.2.

Figure 2.2: Demand Expansion and Contraction with a Sticky Freight Rate



It is assumed under rate regulation that the observed market outcome in the immediate run is generated by: $Q(R_1) = \min [Q_D(R_1); Q_S(R_1)]$. In the expansion case, the effective rate control yields a transfer from producers to consumers of (R_2BER_1) , relative to the uncontrolled case of (R_2, Q_2) , and the welfare gain from deregulation would be $AE'E$ given the fixed supply point of (R_1, Q_1) . In the contraction case, a transfer of (R_1CBR_2) occurs from consumers to producers and the welfare gain from deregulation would be ACE' given the fixed demand point of (R_1, Q_4) ; not Q_1 in the 2nd panel because $\min(Q_1, Q_4)$ is Q_4 . In each case, the respective welfare gains found in figure 2.1 are wholly contained within those of figure 2.2 which implies that rate regulation is potentially a more serious problem for the trucking market than is entry regulation alone.

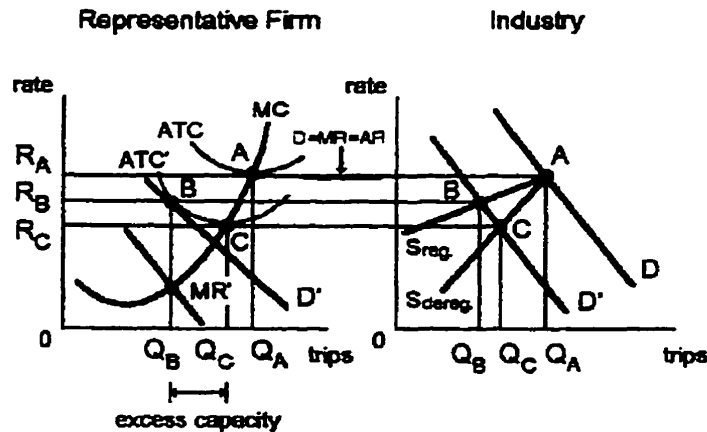
The nature of the supply functions may be better understood when combined with a representative firm that faces adjustment in the midst of temporary demand shocks. In the regulatory regime the behavior of the representative firm will approximate that of a monopolistically competitive firm⁶ while, under de-

regulation, the firm will approximate a perfectly competitive one. Thus, under deregulation the firm is a price-taker while under regulation, barriers to entry afford the incumbent firms a degree of market power. Operational and geographic restrictions specified under licensure represent the source of product differentiation that is approximated here. Basically, shippers derive a brand loyalty based upon a trucking firm's running rights. As will be recalled from chapter 1, multiple jurisdictional licenses held by firms were known to alter the routing patterns so that uniformity in terms of routing or carriage need not have been the case even by firms in close proximity to each other and to their shipper clients. The model below assumes that the representative firm under regulation is large in terms of fleet size while, under deregulation, the representative firm is an owner operator reduced to a fleet size of one vehicle.

Consider the case of a temporary contraction in industry demand as translated down to the firm level. This is illustrated in the two panels of figure 2.3. This figure and the one to follow allow for a comparison of the adjustment process under both regulation and deregulation regimes. At point A, the steady state equilibrium, the firm is making zero economic profit and is operating at minimum average total cost (ATC). The firm is fully adjusted to its operating environment and the permanent industry demand curve (D) is taken by the firm to be the expected and non-cyclical demand meaning, in this sense, that it is fitting to consider point A to be a long run equilibrium. The firm's demand curve (D) comes from the price-taker attribute of the representative firm when facing freight rate (R_A). If one wished to imbue market power on the initial state of the firm then point A for this firm would be somewhat to the left along its ATC and excess capacity would be the result. Such a result would, however, be unrealistic in the long run, because it would require an assumption of permanent regulatory protection which does not conform to the historical record of the

trucking industry.⁷ Nonetheless, the purpose here is to compare the adjustment processes at the firm-level to unexpected, and temporary, demand shocks.

Figure 2.3: Demand Contraction and the Representative Firm



With a temporary contraction in industry demand from D to D' , consider first the regulatory regime. Firms need not exit the industry readily in the midst of a recession. The representative firm will create excess capacity by idling a portion of its fleet. Such a response is easily observable by other firms, leading to the *implicit* cooperation involved in the quantity-adjustment process allowing the firms to ride-out the recession.⁸ Both the firm's and industry's output level and freight rate will fall as point B is achieved. Point B is characterized by a drop in the firm's ATC since it will likely be the case that as trucks are idled: (1) the variable cost of labour will drop as excess drivers and maintenance staff are laid-off; and (2) the fixed costs of insurance and licensure for the fleet will drop. However, the analysis used here may safely assume that only fixed costs are dropping so as to conveniently allow only the ATC to drop without the need for adding the further complication of a fall in marginal cost which would thereby make the location of point B at the firm-level less straight forward and

dependent upon the relative sizes of the marginal productivities of each variable factor of production.⁹ The fall in industry demand and the idling process on the part of incumbent firms works such that the rate set out at point B in the industry panel defines the degree to which ATC falls in the firm panel in order to equate with D' for the firm so as to reach point B in the firm panel.¹⁰ In the firm panel it can be seen that point B is characterized by zero economic profit which is the only consistent outcome at the bottom of the recession or trough of the cycle. If one firm succeeded in making a positive economic profit during the recession, other firms within the jurisdiction would respond by putting another truck on the road so as to compete until these profits were removed.

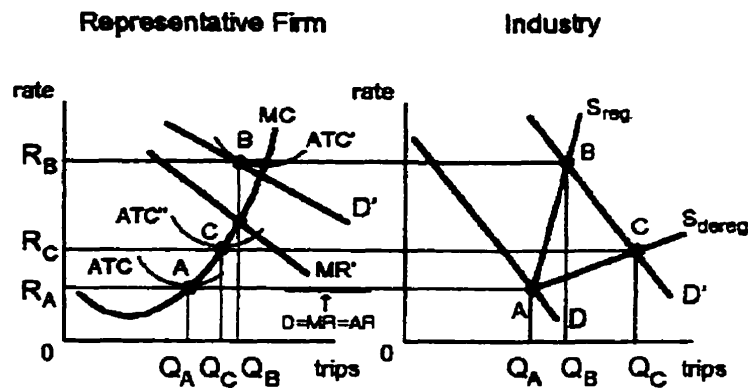
When contraction occurs under deregulation the existing firms, as owner operators, cannot so easily idle their trucks since their fixed costs of operation represent a large part of total costs. Since the owner operator is assumed to own only one truck, he faces an indivisibility problem that the large firms did not face. In order to ride-out the recession, the owner operator chooses to loss--minimize as shown by the movement from points A to C in both panels. As long as factors are supplied through competitive markets, the recession causes the ATC of trucking services to fall so as to allow the firm to make only zero economic profit once the bottom of the recession is reached at point C. The trucks still on the road will, in this sense, see their re-sale value drop as the industry moves through the recession. To the extent that the truck is on loan there would be a sunk cost faced under liquidation. Furthermore, in Canada, employment insurance benefits would not be payable to an owner operator who is essentially both employer and employee. These penalties to exit force the loss--minimization process to continue.

In order to facilitate comparison between the owner operator and the large,

fleet-based trucking firm one may re-consider the latter whereby the firm panel is the demand for a *single* truck in the down-sized (contraction) or harder-worked (expansion) fleet; in other words, it is assumed that the large firm's demand curve is symmetric and proportional across every vehicle in its homogeneous fleet. It will then be noticed that ATC has fallen equally in both regimes since the fixed costs per truck are reasonably assumed to be equal in both of these regimes.¹¹ The regulatory regime is characterized by excess capacity as measured by $(Q_C - Q_B)$ along with the positive freight rate differential of $(R_B - R_C)$. The excess capacity represents the price society pays for the product differentiation process by way of geographic and commodity restrictions imposed by the regulatory boards.

Now the effects of a temporary demand expansion will be considered. In a regulatory regime the representative firm is operating under the benefit of a barrier to entry administered by a regulatory board that requires a new entrant to show PCN. When the barrier to entry is fully enforced to the benefit of the incumbent it is then in a position to price-adjust in the midst of a demand expansion as shown by the movement from point A to B in both panels of figure 2.4. At the peak of the expansion process, the price that is paid for such regulatory protection comes in the form of market capitalization of profits and rent seeking payments to the regulators that force the ATC for the firm to rise to ATC' where it makes zero economic profits.¹² Such rent seeking payments derive from the costs of licencing and board hearing competition. The equilibrium for the representative firm is, of course, characterized by excess capacity due to it possessing the negatively sloped demand curve D' . The firm charges the industry rate (R_B) that will become merely compensatory once the shift to ATC' occurs.

Figure 2.4: Demand Expansion and the Representative Firm



In the case of deregulation there are no effective barriers to entry under an expansion. Incumbent owner operators will work their trucks harder in the midst of the temporary demand increase while new entry will occur which puts upward pressure on the costs of necessary factors. The quantity-adjustment process takes place at the industry level forcing the representative owner operator to operate under costs reflected by $ATC'' < ATC'$. Entry occurs until economic profits become zero for all firms.

In comparing the two regimes under a demand expansion, $Q_C > Q_B$ at the industry level while the opposite occurs at the firm level. Again, to aid in comparison, the regulated firm would have to be recast in terms of the demand conditions facing one truck in a homogenous fleet. The regulated firm is creating more output with a given truck than is the owner operator but the industry is larger when made up of competitive owner operators.¹³ As well, $ATC' > ATC''$ because of the lack of competition in the regulatory environment leading to inefficiencies as outlined above. This is in contrast to the comparative result under a contraction when ATC fell equally in both regimes. Under regulation, firms

were in a position to implicitly cooperate during a contraction in an effort to ride out a recession. The fixed cost effects of an idled truck and one operating under loss-minimization were taken to be approximately equal.

(2.21) The supply side: a mathematical approach

The market supply function for the model outlined in the previous section may be derived from the industry profit function:

$$\pi(Q,R) = RQ - C(Q)$$

$$\text{where } (\delta\pi/\delta Q) = R - C'(Q) = 0$$

$$\text{or } R=C'(Q).$$

Q is the number of trips per time period per either fleet or individual truck as appropriate and R is the freight rate (or price) for a given load. $C(Q)$ is the total cost function of which a simple form is $C(Q) = F + c(Q)$. $F > 0$ is the fixed cost and $c(Q)$ is the variable cost. It may be assumed that: $c(0)=0$; $C(Q)$ is: continuous and increasing; $\lim_{Q \rightarrow \infty} C(Q)=\infty$; and $[C(Q)/Q] > 0$ meaning that average total and variable costs (ATC and AVC) are always positive.

For a given R the short run supply curve is the locus of the marginal cost curve above the average variable cost:

$$Q_S = Q_S(R) \tag{2.1}$$

as from $R=C'(Q)$ bounded by $AVC(Q)=C'(Q)$. Since $\pi_{QR}=(\delta^2\pi/\delta Q\delta R)=1$, it follows that $(dQ_S/dR) > 0$ as expected. Note that the general criterion, $\pi_{QR}(dQ_S/dR) > 0$, is discussed in Samuelson (1983; p. 39). Basically, the change in the Q -variable with respect to its corresponding parameter must be the same sign as π_{QR} . In a competitive setting, total revenue is directly related to the output price so that profit must rise over all Q . Thus, the quantity supplied rises when the price rises, *ceteris paribus*. Equation

(2.1) corresponds to the steady state supply based on a permanent demand (D) at point A as illustrated in figure 2.1.

Deregulation supply curve

The deregulatory regime assumes that there is a large set of owner-operator firms that each possess one truck. In keeping with this, the following industry supply curve is constructed:

$$Q_S = Q_S(R, E) \tag{2.2}$$

where $(\delta Q_S / \delta E) > 0$ and $E = \text{number of firm entry decisions}$.

Specifically,

$$E(\pi^t); \text{ for } \pi^t = \sum_{i=1}^N \pi_i, \text{ for every } \pi_i > 0. \tag{2.3}$$

$$E = \begin{cases} \\ 0; \text{ otherwise.} \end{cases}$$

where $\pi^t = \text{temporary economic profits}$, and (i) indicates an incumbent firm.

Firm entry will take place so long as *all* firms within the industry are making positive economic profits. In (R, Q) space, entry will shift the supply curve (eq. 2.1) rightward based upon the rise in ATC as given by:

$$ATC(Q^*, E) = MC(Q^*, E) \tag{2.4}$$

where: $(\delta ATC / \delta E) > 0$; $(\delta MC / \delta E) > 0$; $Q^* = Q_D = Q_S$; and $MC = \text{marginal cost}$.

Under contraction, $E = 0$ which means that the number of incumbents is stable. The supply curve remains as given in equation (2.1) with the requirement that:

$$ATC(Q) > MC(Q) \geq AVC(Q) \tag{2.5}$$

which represents loss minimization until temporary equilibrium whereby $ATC(Q^*)=MC(Q^*)$.

Regulation supply curve

The regulatory regime assumes a large number of firms with large fleets divided into differentiated sub-markets. The firms will supply services to national shippers that demand transport through multiple jurisdictions. This indicates the following supply curve:

$$Q_S = Q_S(R, F) \tag{2.6}$$

where $(\delta Q_S / \delta F) > 0$ and $F =$ number of fleet units contracted. As the fleet contracts ($F < 0$), quantity supplied falls ($Q_S < 0$) giving the positively signed derivative.

Specifically,

$$F(\pi^t); \text{ for } \pi^t = \sum_{i=1}^N \pi_i, \text{ for every } \pi_i < 0. \tag{2.7}$$

$$F = \begin{cases} \\ 0; \text{ otherwise.} \end{cases}$$

There are N firms, N sub-markets, but (m) preferences of firm-types for each national shipper. Fleet contraction occurs when all N , and thus all (m) , firms are making losses. The possession of a demand curve with price-elasticity less than infinity brings about an equilibrium such that:

$$ATC(Q^*, F) > MC(Q^*, F) \tag{2.8}$$

where: $(\delta ATC / \delta F) > 0$; $(\delta MC / \delta F) > 0$; and $Q^* = Q_D = Q_S$.

The short run supply curve (eq. 2.1) will shift to the left under fleet contraction and thereby trace out the regulation supply curve based upon: (1) a specific fall in ATC that is characterized by excess capacity; and (2) a demand curve whose price-elasticity is induced by the form of the regulated sub-market.

Under temporary demand expansion, $F=0$ and equation (2.1) applies along with $ATC(Q^*) > MC(Q^*)$ meaning that excess capacity remains. While it is true that monopolistically competitive firms do not possess supply curves *per se* due to the non-existence of a one-to-one correspondence between price and quantity supplied at the firm level, the supply curve for the industry is approximated, under regulation, by:

(1) Requiring a *unique* temporary equilibrium at the firm level to obtain based upon the predictable firm demand derived out of the industry demand. Again, predictability comes through the specific proportion of the (m) to N firm-types desired to be used by the national shipper.

(2) Requiring a specific change in ATC based upon fleet size changes during contractions and specific X-inefficiencies to occur during expansions, as captured in the former by $(\delta ATC/\delta F)$.

Note that while $(\delta MC/\delta E)$ and $(\delta MC/\delta F) > 0$ at the industry level, these partial derivatives were assumed to be zero in figures 2.3 and 2.4. For simplicity, fixed costs alone were the cause of cost changes meaning ATC would change while MC would not at the firm level.

Allowing both MC and ATC to change in the midst of a change in demand would leave the effect on Q to be ambiguous. In a competitive model if the fleet (F) is defined as a factor of production with a per unit cost of (f) then:

$$(\delta ATC/\delta f) = F^*/Q. \tag{2.9}$$

Furthermore, it may be shown that:

$$(\delta Q^*/\delta f) = (\delta MC/\delta Q^*)^{-1} (F^*/Q) (1 - \varepsilon_{FQ}) \quad (2.10)$$

where ε_{FQ} is the output elasticity of the percentage change in the fleet size.

$(\delta MC/\delta Q^*) > 0$ since Q^* exists at min-ATC and $(F^*/Q) > 0$ must also be the case since $F^*=0$ would necessitate $Q=0$ as well. Thus, $(\delta Q^*/\delta f) > 0$ if and only if ε_{FQ} is inelastic meaning that MC rises less than does ATC. Therefore, the simplifying assumption of changes in ATC occurring with MC held constant would be a reasonable one.

Is $0 < \varepsilon_{FQ} < 1$ reasonable? The implication is that under a contraction, when fleet size is reduced, a 1% drop in fleet size means a less than 1% drop in output. The remaining trucks are worked harder which is at the heart of why the firm is able to ride out the recession and avoid losses once the temporary equilibrium is achieved.

(2.30) The demand side: a diagrammatic approach

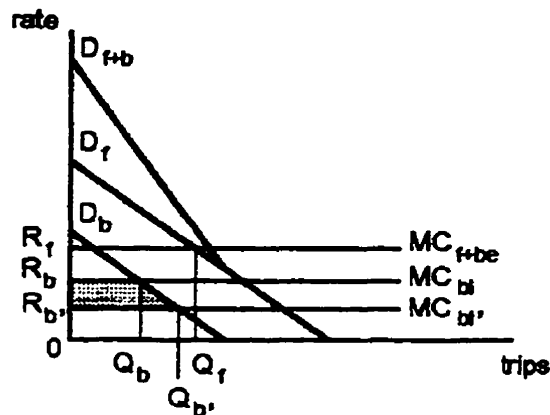
This section will discuss the demand side of the model in greater detail than was provided in the previous two sections. It is here where the issue of cabotage may be introduced into the model. Specifically, only incidental movement (Canada) or return trip, outward (U.S.) cabotage will be examined since this requires only an adjustment to the cost structure of the industry whereas repositioning move (Canada) cabotage would require, in addition, an expansion in backhaul demand since, after cabotage reform, other backhaul markets become legally accessible to the foreign trucking firm.¹⁴ A trucking firm supplies output, from its own perspective, in the form of round trips while shippers have two distinctive forms of demand in terms of what amounts to either a fronthaul or a backhaul. In this sense, demand is separable while supply is joint. The trucking firm faces the classic problem that involves the pricing of two separate goods under joint supply.¹⁵ This section will develop a distinction between industry demand with and without cabotage reform.

For every fronthaul there is a corresponding backhaul (either empty or loaded) as part of the joint production aspect of a round trip. Cabotage regulations restrict the

possibilities of domestic activity on the part of a foreign driver and his equipment while engaging in transborder trucking. A relaxation of such regulations would make that equipment eligible to compete more effectively on foreign soil and thus increase the possibility of obtaining a backhaul. Furthermore, an increase in backhaul prospects allows for a deeper penetration of a Canadian truck into U.S. soil. Currently about a 200 km penetration from Ontario and Quebec is the norm (with the western provinces extending about triple that distance) while U.S. counterparts have access to all urban areas of Canada due to its population, by and large, straddling the U.S. border. The demand model set out here will be taken to apply to the entire North American truck freight market. Since cabotage reform represents a further deregulatory initiative on the part of the two federal governments, there are expected to be further welfare gains from deregulation in the following forms: market rationalization in terms of increased competition in all traffic lanes due to a level playing field; and removal of regulatory uncertainty and the lowering of customs/immigration compliance costs.

In the fronthaul/backhaul model employed by Felton (1981), empty backhauls occur in the industry when the backhaul demand is low *vis a vis* the fronthaul demand and/or the marginal cost of a loaded backhaul is high *vis a vis* the summed marginal costs of a fronthaul and empty backhaul. To simplify the analysis it is assumed, to follow Felton, that all marginal costs are constant which will serve to more easily highlight the welfare effects of cabotage reform as specified below. Of course, the problem of nontraceability in joint production of round trips is highlighted through the marginal cost curve that combines both the loaded fronthaul and the empty backhaul costs (i.e. MC_{f+bc}).

Figure 2.5: Backhaul Demand and the Cabotage Effect



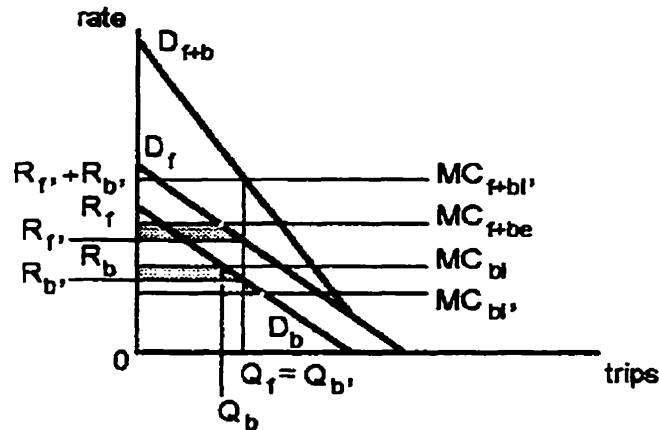
where: D_{f+b} =joint fronthaul and backhaul demand; D_b =backhaul demand; D_f =fronthaul demand; MC_{f+be} =marginal cost of loaded fronthaul and empty backhaul; and MC_{bl} =marginal cost of loaded backhaul.

To the extent that the equilibrium fronthaul quantity of trips exceeds the equilibrium backhaul quantity, that difference is the quantity of empty backhaul trips in equilibrium. When cabotage reform is introduced, MC_{bl} will be reduced due to the removal of the regulatory restriction on domestic activity on the part of foreigners which thus increases the potential for backhaul opportunities. The fall in MC_{bl} can be thought of in terms of, for example, lower administrative and search costs through red-tape elimination, and more direct routing. When the fall in MC_{bl} is not enough to totally remove the presence of empty backhails in equilibrium, the welfare gain accrues to backhaul shippers alone as shown by the shaded trapezoid in figure 2.5. The simplifying assumption of constant marginal costs means that producers' surplus is always zero. At this point it can be

said that if both Canada and the U.S. face situations where the backhaul demand in each of their respective transborder markets consists mainly of opportunities on the other's territory then the unilateral removal of cabotage restrictions by the respective government represents a welfare gain to its domestic shippers. In other words, the removal of a non-tariff barrier (NTB) will increase welfare in a positive-sum sense. It will be assumed for simplicity throughout that the backhaul demand curve consists of the demand for the domestic carriers by foreign shippers which, in a free-cabotage environment, means the demand to carry the foreign country's exportables as well as allowable cabotage moves.¹⁶

A special equilibrium is proposed in figure 2.6 whereby MC_{bl} has fallen such that $Q_b = Q_f$ (at the hollowed out point on the fronthaul demand curve). This would be as if MC_{bl} fell farther in figure 2.5 until $Q_b = Q_f$. At this point the joint demand function D_{f+b} becomes operative for the transborder trucking industry and there are no empty backhauls in this equilibrium. As will become apparent below, when $Q_b = Q_f$ a point has been reached whereby all the efficiency gains from lower costs stop accruing exclusively to backhaul shippers.¹⁷ In any case, if MC_{bl} should fall any farther the welfare analysis becomes slightly more complicated. There is no *a priori* reason to assume that the full cabotage reform effect would preclude MC_{bl} from falling below this special point and so its implications must be examined; however the narrow focus of the model on incidental movement cabotage alone may perhaps mitigate this problem to some extent. When MC_{bl} intersects D_b such that it *seems* that $Q_b > Q_f$ obtains (referring to the hollowed out point on D_b), the true Q_b will have to equal Q_f as given by the joint demand curve as shown in figure 2.6.

Figure 2.6: Joint Demand and the Cabotage Effect



where: MC_{f+bl} = marginal cost of loaded fronthaul and loaded backhaul.

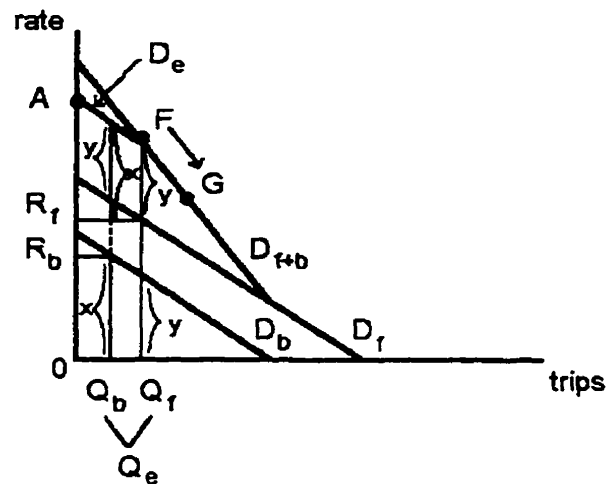
The result is that a portion of the fronthaul costs will be borne by the backhaul shippers due to the jointness of production leading to a welfare gain for fronthaul shippers and an incremental welfare loss for backhaul shippers. At this point the case for unilateral cabotage reform is dulled in that the net welfare gain occurs over the two countries taken as a unit. Following a typical Kaldor-Hicks compensation scheme, a country whose shippers received a welfare loss from unilateral cabotage reform may still undertake reform if it is part of some overall international negotiation. Thus, it must be shown that the shaded welfare gain always exceeds the shaded incremental welfare loss. This is best accomplished through the use of marginal welfare analysis whereby it is assumed that MC_{bl} falls incrementally (to MC_{bl}') and the resulting additions to the welfare triangles are examined. It is appropriate to use marginal welfare analysis since, in the incidental movement cabotage framework, MC_{bl} cannot be expected to fall

greatly under cabotage reform anyway because the transborder route is still intact and all route-specific cabotage opportunities exist *ex ante*. It is just somewhat easier to locate and act on them. Figure 2.6 shows a visibly smaller welfare loss triangle as compared to the trapezoidal gain meaning that there is still a net welfare gain to backhaul shippers after a further incremental fall in marginal backhaul cost. It is important to note that the entire trapezoid bounded by R_b and MC_{bf} is not considered in the welfare analysis because the hollowed out point is unachievable given that it implies a quantity of trips in excess of Q_f . The shaded triangle is, again, the incremental welfare loss in not obtaining the hollowed out point beyond $Q_f=Q_b$.

The result of complete cabotage reform would be to rationalize transborder trucking networks and lead to the elimination of some empty backhauls as a consequence. Thus, in this model the relevant industry demand curve should be the joint demand curve reflecting the reform. In the industry supply framework of figure 2.1, demand curve shifts were taken as temporary while its permanent position was given by the kinked point on the supply curve where it was assumed that the number of firms currently in the market was fully adjusted to the current regulatory regime. If cabotage reform is taken to be a permanent change in regulatory regime then, given that the higher joint industry demand is now relevant, demand is thus seen to permanently increase *vis a vis* the pre-reform demand curve which is taken to be only a fronthaul/backhaul demand curve with empty backhauls occurring. The consequence of empty backhauls occurring in the pre-reform case is to generate an effective demand curve¹⁸ (D_e) as shown in figure 2.7. Since empty backhauls are inevitable in the pre-reform case, this effective demand curve is obviously lower than the joint demand that would obtain under a zero empty backhaul situation after cabotage reform. Fur-

thermore, the effective demand curve cannot, itself, be taken as permanent in structure since Q_b and Q_f are formed independently, thus leaving Q_e endogenous and in a state of flux. But the main result is that when empty backhauls are present, the effective demand curve is unstable and always lower than the stable joint demand curve. An assumption involving a fixity with respect to Q_f will serve to stabilize D_e . Changes in D_f , D_b , or MC_{f+be} (which determines R_f)¹⁹ are shift variables for the effective demand curve.

Figure 2.7: The Effective Demand Curve



where: Q_e = quantity of empty backhauls.

Point A is the sum of the given fronthaul rate (R_f) and the R-intercept of the backhaul demand curve. The effective demand is the set of vertical sums of the stationary fronthaul rate and the set of possible backhaul rates.

(2.31) The demand side: a mathematical approach

Deregulation

The formulation employed in this section follows **De Vany and Saving (1977)** and **Talley (1989)**. Consider trucking firm (i) which operates in a competitive marketplace and is an expected-full-price-taker whereby:

$$R_f = r_f^i + n_f W_f \quad (\text{fronthaul market}) \quad (2.11)$$

and

$$R_b = r_b^i + n_b W_b \quad (\text{backhaul market}) \quad (2.12)$$

where:

n = the cost of holding a loaded truck in inventory per unit of time at the origin (A) through to the destination (B).

W = expected time elapsed in transport.

N^i = truck capacity for firm (i). Note that $W = W(N^i)$; $(dW/dN^i) < 0$.

R = expected full rate which is assumed constant across all firms.

r = actual transport charge which may be variable across firms.

nW = expected cost of in-transit delivery time.

If the firm is truckload (TL) then firm (i) may also ship one, and only one, good labeled (i) which removes the need to distinguish the shipment from its conveyance. Since the firm is a price-taker in R , a change in (r) must lead to a one-to-one change in N ; that is, a doubling, say, of capacity doubles the arrival rate of goods per unit of time which is a variation on the assumption that a firm in a competitive market can sell all that it wants at the equilibrium price. The firm may choose (r, N) or (Q, N) but not both.

The fronthaul demand facing firm (i) is derived as the number of arrivals at point B from point A and in the reverse for the backhaul demand. Noting that R is a parameter for the firm, these demands may be expressed as:

$$Q_f^i = Q_f^i(r_f^i, N^i) \quad (2.13)$$

- + (expected signs)

and

$$Q_b^i = Q_b^i(r_b^i, Q_f^i) \quad (2.14)$$

- +

The fact that Q_f enters Q_b highlights the jointness aspect of the problem in that a fronthaul is required before there can be a backhaul. Technically, these may be characterized as the expected net flow of shipments made to resemble a demand function.

From equations (2.11) and (2.12) the following partial derivatives are obtained:

$$\begin{aligned} (\delta Q_f^i / \delta r_f^i) &= 1 / (\delta r_f^i / \delta W_f) \times (\delta Q_f^i / \delta W_f) = (-1/n_f) \times (\delta Q_f^i / \delta W_f) = \\ &= -1/n_f (\delta W_f / \delta Q_f^i) < 0 \\ &\text{since } r_f^i = R_f - n_f W_f \text{ from equation (2.11)}. \end{aligned} \quad (2.15)$$

$$\begin{aligned} (\delta Q_f^i / \delta N^i) &= -(\delta W_f / \delta N^i) / (\delta W_f / \delta Q_f^i) > 0 \\ &\text{from the implicit function theorem.} \end{aligned} \quad (2.16)$$

$$\begin{aligned} (\delta Q_b^i / \delta r_b^i) &= 1 / (\delta r_b^i / \delta W_b) \times (\delta Q_b^i / \delta W_b) = (-1/n_b) \times (\delta Q_b^i / \delta W_b) \\ &= -1/[n_b (\delta W_b / \delta Q_b^i)] < 0 \end{aligned} \quad (2.17)$$

$$\begin{aligned} (\delta Q_b^i / \delta Q_f^i) &= -(\delta W_b / \delta Q_f^i) / (\delta W_b / \delta Q_b^i) > 0 \\ &\text{from the implicit function theorem.} \end{aligned} \quad (2.18)$$

The industry (I) demands are functions of the expected full prices alone:

$$Q_f^I = Q_f^I(R_f, R_b) \quad (2.19)$$

$$Q_b^I = Q_b^I(R_f, R_b) \quad (2.20)$$

$$N^I = N^I(R_f, R_b) \quad (2.21)$$

while the effective demand (shown in figure 2.7) may be written as:

$$Q_b^E = Q_b^E(R_f^C, R_b) + R_f^C \quad (2.22)$$

Equation (2.22) is a positive affine transformation of Q_b^I with a *constant* expected full fronthaul price (R_f^C) and a trivial monotonic transformation by 1. By examining figure 2.7, the portion of D_b traced out given (R_f^C, Q_f^C) is taken and vertically raised by R_f^C thus putting it the distance (y) above R_f^C . Finally, the joint demand is:

$$Q^J = Q^J(R_f + R_b) \text{ such that } Q_f^I = Q_b^I \text{ for every } R_f \text{ and } R_b. \quad (2.23)$$

The equilibrium fronthaul and backhaul rates, as well as $(\delta C / \delta N^i)$, may be found through the profit function for firm (i):

$$\pi^i = r_f^i Q_f^i(r_f^i, N^i) + r_b^i Q_b^i(r_b^i, Q_f^i) - C(Q_f^i, Q_b^i, N^i) \quad (2.24)$$

where: C is the expected total cost function, and
 $(\delta C / \delta Q_f^i) > 0$; $(\delta C / \delta Q_b^i) > 0$; $(\delta C / \delta N^i) > 0$

Note that $(\delta C / \delta Q_f^i)$ is non-zero since, as N rises for a given Q , W falls thus adding to output *quality*. In this way, (r) rises since R remains fixed. The total differentials in r_f^i , r_b^i and N^i , respectively, are:

$$d\pi^i = [r_f^i (\delta Q_f^i / \delta r_f^i) + Q_f^i] + [r_b^i (\delta Q_b^i / \delta Q_f^i) (\delta Q_f^i / \delta r_f^i)] \\ - [(\delta C / \delta Q_f^i) + (\delta C / \delta Q_b^i) (\delta Q_b^i / \delta Q_f^i)] (\delta Q_f^i / \delta r_f^i) = 0 \quad (2.25)$$

$$d\pi^i = [r_b^i(\delta Q_b^i/\delta r_b^i) + Q_b^i] - [(\delta C/\delta Q_b^i)(\delta Q_b^i/\delta r_b^i)] = 0 \quad (2.26)$$

$$\begin{aligned} d\pi^i &= [r_f^i + r_b^i(\delta Q_b^i/\delta Q_f^i)](\delta Q_f^i/\delta N^i) \\ &\quad - [(\delta C/\delta Q_f^i) + (\delta C/\delta Q_b^i)(\delta Q_b^i/\delta Q_f^i)](\delta Q_f^i/\delta N^i) \\ &\quad - (\delta C/\delta N^i) = 0 \end{aligned} \quad (2.27)$$

The equilibrium values, r_f^{i*} and r_b^{i*} , and $(\delta C/\delta N^i)$ are obtained by solving equations (2.25), (2.26), and (2.27) using equations (2.15), (2.16), (2.17), and (2.18).

Solving for r_b^{i*} , using (2.17) gives:

$$\begin{aligned} r_b^{i*} &= \frac{(\delta C/\delta Q_b^i)(\delta Q_b^i/\delta r_b^i) - Q_b^i}{(\delta Q_b^i/\delta r_b^i)} = (\delta C/\delta Q_b^i) - Q_b^i/(\delta Q_b^i/\delta r_b^i) \\ &= (\delta C/\delta Q_b^i) + n_b(\delta W_b/\delta Q_b^i)Q_b^i \end{aligned} \quad (2.28)$$

Thus, the equilibrium backhaul transport rate equals the marginal cost of haulage plus a congestion toll. The congestion toll is the arrival rate or number of trips (Q_b^i) multiplied by the marginal cost of elapsed waiting time of an additional truck [$n_b(\delta W_b/\delta Q_b^i)$] at point B. If a portion of the B to A backhaul is a regulated cabotage move there would be two expected effects for all firms: (1) n_b would be higher under incidental or return trip, outward (U.S.) cabotage since the domestic good must be ready for pick-up when the truck arrives and the foreign driver must be laid over or transferred while the extra cost of a domestic driver is incurred; and (2) $(\delta W_b/\delta Q_b^i)$ must also be higher since the arrival time at A from B is necessarily slowed due to route deviations as part of the cabotage move as well as unloading at the intermediate point and customs/immigration checks upon exit. Of course, cabotage reform would diminish these effects due to lesser administrative costs and the extra move itself would be looked upon as its own market transaction that is no longer dependent on the existence of international freight at point B.

Solving for r_f^{i*} gives:

$$r_f^{j*} = \frac{-r_b^i(\delta Q_b^i/\delta Q_f^j)(\delta Q_f^j/\delta r_f^j)}{(\delta Q_f^j/\delta r_f^j)} + \frac{[(\delta C/\delta Q_f^j) + (\delta C/\delta Q_b^i)(\delta Q_b^i/\delta Q_f^j)](\delta Q_f^j/\delta r_f^j)}{(\delta Q_f^j/\delta r_f^j)}$$

$$- \frac{Q_f^j}{(\delta Q_f^j/\delta r_f^j)}$$

$$= -r_b^i(\delta Q_b^i/\delta Q_f^j) + (\delta C/\delta Q_f^j) + (\delta C/\delta Q_b^i)(\delta Q_b^i/\delta Q_f^j) - Q_f^j/(\delta Q_f^j/\delta r_f^j) .$$

Plugging in equation (2.28) to the above gives:

$$r_f^{j*} = -[(\delta C/\delta Q_b^i) + n_b(\delta W_b/\delta Q_b^i)Q_b^i](\delta Q_b^i/\delta Q_f^j) + (\delta C/\delta Q_f^j) + (\delta C/\delta Q_b^i)(\delta Q_b^i/\delta Q_f^j) - Q_f^j/(\delta Q_f^j/\delta r_f^j)$$

then replacing $(\delta Q_f^j/\delta r_f^j)$ in the above with equation (2.15) gives:

$$r_f^{j*} = (\delta C/\delta Q_f^j) + Q_f^j n_f (\delta W_f/\delta Q_f^j) - [n_b(\delta W_b/\delta Q_b^i)Q_b^i](\delta Q_b^i/\delta Q_f^j)$$

and, finally, replacing with equation (2.18):

$$r_f^{j*} = (\delta C/\delta Q_f^j) + Q_f^j n_f (\delta W_f/\delta Q_f^j) + n_b(\delta W_b/\delta Q_b^i)Q_b^i \quad (2.29)$$

where $(\delta W_b/\delta Q_b^i) < 0$.²⁰ The second term in equation (2.29) is a congestion toll on the fronthaul equal to the cost of increased waiting time for each marginal truck unit at point A commencing the fronthaul. The third term is the cost of decreased waiting time at point B resulting from an increase in traffic flow from point A. Even with empty backhauls, $Q_b^i < Q_f^j$ and $r_f^{j*} > r_b^{i*}$ will always obtain if the cost and wait times at the fronthaul are greater:

$$\text{i.e., } (\delta W_f/\delta Q_f^j) > (\delta W_b/\delta Q_b^i); (\delta C/\delta Q_f^j) > (\delta C/\delta Q_b^i); n_f > n_b .$$

But with no empty backhauls, as a greater possibility under cabotage reform, $Q_f^i = Q_b^i$ so that r_f^{i*} becomes:

$$r_f^{i*} = (\delta C / \delta Q_f^i) + Q_f^i [n_f (\delta W_f / \delta Q_f^i) + n_b (\delta W_b / \delta Q_f^i)] \quad (2.30)$$

which is essentially MC_{f+bl} in figure 2.6 in that it is the expected full-price equivalent of the loaded fronthaul minus the empty backhaul cost plus the loaded backhaul cost. Recall that $R_b > MC_{bl}$ and $R_f < R_f$ is implied by equation (2.29). With Q_b rising to, and passing Q_f as MC_{bl} falls, $(\delta W_b / \delta Q_f^i)$ must be getting smaller.

Finally, solving for $(\delta C / \delta N^i)$ gives:

$$(\delta C / \delta N^i) = [r_f^i + r_b^i (\delta Q_b^i / \delta Q_f^i)] (\delta Q_f^i / \delta N^i) - [(\delta C / \delta Q_f^i) + (\delta C / \delta Q_b^i) (\delta Q_b^i / \delta Q_f^i)] (\delta Q_f^i / \delta N^i)$$

and after plugging in equations (2.28) and (2.29):

$$\begin{aligned} (\delta C / \delta N^i) = & [(\delta C / \delta Q_f^i) + Q_f^i n_f (\delta W_f / \delta Q_f^i) + Q_b^i n_b (\delta W_b / \delta Q_f^i)] (\delta Q_f^i / \delta N^i) \\ & + [(\delta C / \delta Q_b^i) + Q_b^i n_b (\delta W_b / \delta Q_b^i)] (\delta Q_b^i / \delta Q_f^i) (\delta Q_f^i / \delta N^i) \\ & - [(\delta C / \delta Q_f^i) + (\delta C / \delta Q_b^i) (\delta Q_b^i / \delta Q_f^i)] (\delta Q_f^i / \delta N^i) \end{aligned}$$

and replacing $(\delta Q_f^i / \delta N^i)$ and $(\delta Q_b^i / \delta Q_f^i)$ with equations (2.16) and (2.18), respectively:

$$\begin{aligned} (\delta C / \delta N^i) = & [(\delta C / \delta Q_f^i) + Q_f^i n_f (\delta W_f / \delta Q_f^i) + Q_b^i n_b (\delta W_b / \delta Q_f^i)] \\ & \cdot [-(\delta W_f / \delta N^i) / (\delta W_f / \delta Q_f^i)] + [(\delta C / \delta Q_b^i) + Q_b^i n_b (\delta W_b / \delta Q_b^i)] \\ & \cdot [-(\delta W_b / \delta Q_f^i) / (\delta W_b / \delta Q_b^i)] [-(\delta W_f / \delta N^i) / (\delta W_f / \delta Q_f^i)] \\ & - \{(\delta C / \delta Q_f^i) + (\delta C / \delta Q_b^i) [-(\delta W_b / \delta Q_f^i) / (\delta W_b / \delta Q_b^i)]\} \\ & \cdot [-(\delta W_f / \delta N^i) / (\delta W_f / \delta Q_f^i)] \end{aligned}$$

which after expansion and cancellation gives:

$$(\delta C / \delta N^i) = -Q_f^i n_f (\delta W_f / \delta N^i) > 0 \quad (2.31)$$

where $(\delta W_f/\delta N^i) < 0$. Equation (2.31) indicates that capacity is determined exclusively in the fronthaul market. The marginal expected cost per extra unit of capacity equals the effect on waiting time at point A as brought about by a change in capacity.

It is also useful to specify r_f^{i*} and r_b^{i*} in terms of price elasticities. Substituting equations (2.15), (2.16) and (2.17) into (2.29) gives:

$$r_f^{i*} = (\delta C/\delta Q_f^i) + Q_f^i[-1/(\delta Q_f^i/\delta r_f^i)] + Q_b^i\{-1/(\delta Q_b^i/\delta r_b^i)\}(\delta Q_b^i/\delta Q_f^i)$$

and multiplying the second and third terms of the above by (r_f^i/r_f^i) and (r_b^i/r_b^i) , respectively:

$$\begin{aligned} r_f^{i*} &= (\delta C/\delta Q_f^i) + [-(Q_f^i/\delta Q_f^i)(\delta r_f^i/r_f^i)r_f^i] + [-(Q_b^i/\delta Q_b^i)(\delta r_b^i/r_b^i)r_b^i(\delta Q_b^i/\delta Q_f^i)] \\ &= (\delta C/\delta Q_f^i) - (r_f^i/\eta_f^i) - (r_b^i/\eta_b^i)(\delta Q_b^i/\delta Q_f^i) \end{aligned}$$

where η_f^i and η_b^i are the price elasticities of demand which are, for non-Giffen goods, less than zero. Thus,

$$r_f^{i*} = [(\delta C/\delta Q_f^i) - (r_b^i/\eta_b^i)(\delta Q_b^i/\delta Q_f^i)][1 + (1/\eta_f^i)]^{-1} \quad (2.32)$$

Substituting equation (2.17) into (2.28) gives:

$$r_b^{i*} = (\delta C/\delta Q_b^i) + Q_b^i[-1/(\delta Q_b^i/\delta r_b^i)]$$

and multiplying the second term by (r_b^i/r_b^i) :

$$\begin{aligned} r_b^{i*} &= (\delta C/\delta Q_b^i) + Q_b^i[-(r_b^i/r_b^i)/(\delta Q_b^i/\delta r_b^i)] \\ &= (\delta C/\delta Q_b^i) - (r_b^i/\eta_b^i) \end{aligned}$$

or

$$r_b^{i*} = (\delta C/\delta Q_b^i)[1 + (1/\eta_b^i)]^{-1} \quad (2.33)$$

While it may seem that equations (2.32) and (2.33) imply that if, in equilibrium, the price elasticities equaled -1, r_b^{i*} and r_f^{i*} would be infinity, these equations are in fact variations on the familiar relationship: $MR=P[1+(1/\eta)]$. While R is fixed, (r) functions like a downward sloping demand and is counteracted by W until R is unchanged. In other words,

$$r_b^{i*} = (\delta C/\delta Q_b^i)[1 + (1/\eta_b^i)]^{-1} \sim P=MR[1 + (1/\eta_b^i)]^{-1} \text{ or} \\ MR=P[1 + (1/\eta_b^i)]$$

which, in equilibrium under perfect competition, requires $MC=MR$ where MC is rising. Thus, with (r) acting as a downward sloping demand, $MR=0$ when $\eta=-1$ meaning that only price-elastic values apply to equations (2.32) and (2.33).

Finally, a partial derivative of interest is:

$$(\delta r_f^{i*}/\delta \eta_b^i) = r_b^i(\delta Q_b^i/\delta Q_f^i)(\eta_b^i)^{-2}[1 + (1/\eta_f^i)]^{-1} \quad (2.34)$$

$$> 0 \text{ iff } |\eta_f^i| > 1 \text{ and } (\delta Q_b^i/\delta Q_f^i) > 0 .$$

Equation (2.34) implies that Q_b and Q_f fall in the face of the backhaul demand shifting leftward. Note that $(\delta r_f^{i*}/\delta \eta_f^i)$ and $(\delta r_b^{i*}/\delta \eta_b^i)$ were found by Talley (1989) to both be positively signed, which indicated value-of-service pricing.

Regulation

The industry demand curve is the *effective* demand curve since empty backhauls are always assumed to be present. The firm will take that demand as the basis on which to product differentiate. In this regard a national shipper (k) has a utility maximization problem over (m) choices of trucking firms desirable out of N_1 . These N_1 firms are the total operating ones out of a total of N possible firms. Contestability is accounted for since $(N-N_1)$ firms are potential entrants. The problem is specified as such:

$$\begin{aligned} \max. & U(Q_{k1}, Q_{k2}, \dots, Q_{km}, q; v) \\ \text{s.t.} & \sum_{b=1}^m R_{kb} Q_{kb} + q \leq 1 \end{aligned} \quad (2.35)$$

where q is a *numeraire* good and v is the finite dimensional vector indicating the shipper's valuation of the product types. The *numeraire* price is normalized to equal 1 and each firm may charge different prices. Following Hart (1985), the prices of all goods (j) not being produced are taken to be infinite. Thus,

$$p_j = \infty \text{ for every } j > (N_1 + 1). \quad (2.36)$$

A firm ($N_1 + 1$) is the representative firm that product differentiates relative to the N_1 firms (that will not react).

A simple and convenient case is the quasi-linear utility function:

$$U = U[\sum_{i=1}^m f(Q_{ki})] + q \quad (2.37)$$

where $f(Q_{ki})$ indicates that Q_{ki} is a function of the firm's choice of product differentiation. The first-order condition for equation (2.37) is:

$$U'[\sum_{i=1}^m f(Q_{ki})] f'(Q_{ki}) = R_i \text{ for every } i=1, \dots, m. \quad (2.38)$$

Without reaction from other firms, firm ($N_1 + 1$) takes the index of total output of the (m) types as a constant. Thus,

$$Q_k^c = \sum_{i=1}^m f(Q_{ki})$$

where Q_k^c indicates a constant Q_k . In this way, the firm's demand function may be written:

$$Q_i^p(R_i, Q_k^c) = d[R_i / U'(Q_k^c)] \quad (2.39)$$

Thus, $d(\cdot) = f'(Q_{kj})^{-1}$. Equation (2.39) is a proportional demand (Q_i^p) by which the (N+1) firm's product differentiation leads to a more price-elastic demand:

$$Q_i^* = Q_i^*[R_i(Q_k^c)]$$

that is, the firm's actual demand is based on a shipper's reaction to price or freight rate changes under conditions of a constant index of total output quality (Q_k^c) available elsewhere.

In equilibrium,

$$Q_i^*[R_i(Q_k^c)] = Q_i^p(R_i, Q_k^c) \quad (2.40)$$

that is, Q_i^* is tangent to ATC but the proportional demand (Q_i^p) runs through that point.

(2.40) Equilibrium and Cabotage Reform

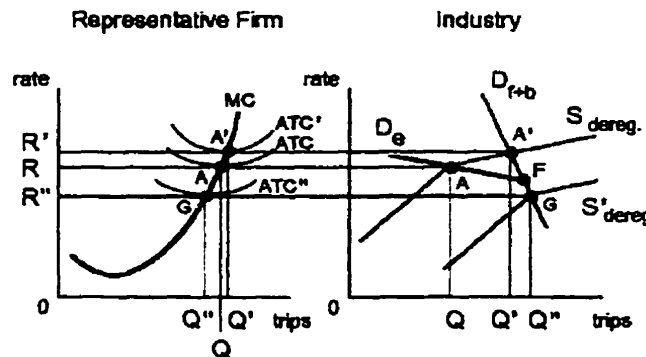
The equilibria given by points B and C in figure 2.1 were temporary in nature and dependent upon the regime in place at the time of adjustment. The permanent equilibrium highlighted by point A in those figures was the steady state, based upon the location of the non-cyclical demand and the freight rate indicative of an industry that has, in the long run, fully adjusted to the regime in place. This section will discuss how a permanent change in industry demand through cabotage reform will lead to a change in the steady state equilibrium.

Successful reform of incidental move cabotage may be characterized by a fall in marginal loaded backhaul costs to the extent that empty backhauls are completely eliminated. When this occurs the effective demand curve becomes irrelevant and the joint demand curve is the one faced by the industry. If the marginal loaded backhaul costs fall as shown in figure 2.6 it should then be noticed that the fronthaul rate is lower as well. With the summed freight rates thus lower, the relevant equilibrium

quantity must have increased as well. This point is made by comparing point F with point G on the joint demand curve of figure 2.7. In order put the point in its proper context, for cabotage reform to be of the magnitude necessary to bring about the appropriate fall in marginal costs, it must take place in a deregulatory regime. In this way the deregulatory kinked supply curve is the locus that is needed in this context. This assumption is reasonable since it would seem that domestic deregulation is a necessary precursor to transborder deregulation.

With a permanent increase in demand along the deregulatory kinked supply curve, the industry can maintain a permanently larger number of firms. In figure 2.8 it can be seen that the long run equilibrium will move from point F to point G. In effect, cabotage reform works like a permanent demand expansion in the industry causing a permanently lower expected freight rate since loaded backhaul costs permanently decline. Again, society gains on net because any welfare loss triangle applicable to backhaul shippers, due to the rate being set above marginal cost, will be outweighed by: (1) a portion of consumer surplus remaining due to the fall in marginal cost; and (2) the net gain accruing to fronthaul shippers.

Figure 2.8: Industry Supply and the Cabotage Effect



In the framework for figure 2.8, ATC contains the appropriate average costs of the fronthaul and empty backhaul at Q_f plus the average cost of the backhaul at $Q_b < Q_f$ while ATC' contains the effect of the typical assumption of increasing costs due to firm entry. The MC curve is drawn given the assumption that total industry costs increase equiproportionally meaning that MC in effect shifts up onto itself over the pre- and post-cabotage reform cases. In other words, cabotage reform is assumed for simplicity to affect only the fixed costs of a firm's operation rather than its marginal (i.e. line-haul) cost.

In comparing the set of figures 2.5 through 2.7 with figure 2.8, it will be noticed that the marginal cost curves for the former were drawn horizontally for simplicity of analysis but can, in the present context, be considered to be the long run marginal costs for an industry indicative of passive supply. The marginal cost curve for the firm in figure 2.8 is short run in nature and drawn in the familiar fashion and, with each trucking firm approximated to have nearly constant returns to scale in the long run, their long run marginal costs would be relatively flat, as depicted at the industry-level.

The process of cabotage reform takes the firm and the industry from point A to A' and then finally to point G (by-passing point F as shown in figure 2.7). Note that the quantity difference between points A and F indicates the quantity of empty backhauls. Each firm at point G is producing less but there are more firms in the industry and the expected permanent freight rate is now lower after cabotage reform. The movement from point A to A' highlights the effect of a permanent increase in demand in the post-reform environment. Referring to figure 2.7, the effect is that the joint demand becomes operational instead of the lower effective demand indicative of empty backhauls. At point A', the increas-

ing cost nature of the industry as given by the supply curve leads to an increase in the freight rate when firms enter the industry attempting to capture the positive economic profits being earned by the incumbents. Point A', being on the joint demand curve, can also be considered to be the steady state point where loaded backhauls have just increased to the level of loaded fronthauls. But, as mentioned above, there is no *a priori* reason to assume that loaded backhaul cost after cabotage reform might not decrease further. The move from A' to G highlights the effect that occurs when loaded backhaul costs become permanently lower. Using figure 2.6 as a reference, industry output increases further but under the condition of backhaul shippers paying a premium above their marginal loaded backhaul costs and fronthaul shippers paying less than their fronthaul (plus empty backhaul) costs. The *sum* of these two rates is lower after the fall in backhaul costs and this is reflected in point G as compared to A'.²¹ The supply curve (S) was drawn on the assumption of domestic market deregulation only while the new supply curve (S') reflects the permanently lower costs that come about due to transborder market rationalization. Finally, at the firm level this rationalization is reflected by the fall in ATC' to ATC''. Since the supply curve has shifted rightward the long run structure of the industry has been positively affected.

(2.50) Chapter conclusions

This chapter has developed a model of the trucking sector that establishes the operational responses that a firm makes within regimes of either regulation or deregulation. The structure of the industry was taken to be an approximation of perfect competition or monopolistic competition under the regulation or deregulation regimes, respectively. The cyclical nature of trucking demand was

discussed through the effects of temporary demand expansion and contraction around the steady-state equilibrium. The effect of incidental move/return trip, outward cabotage reform was also built into the model to highlight the gains to be had from a reform process along those lines. A regime change of this type had the obvious supply-side effects but there were demand-side effects as well since the change was not merely cyclical in nature. The model served to show that the deregulatory processes undertaken in Canada and the United States were not capable of capturing all possible welfare gains since the context of those changes were only domestic in scope. The ability to efficiently deal with an empty backhaul problem that exists due to international freight transport puts the cabotage problem into proper focus. Cabotage reform is, therefore, international deregulation that is a source of further welfare gains. There was no attempt to sort out the distribution of these gains between Canada and the United States. Backhaul shippers receive the largest welfare gain. Of course, given the longer run into the United States by Canadian trucks, it is U.S.-based backhaul shippers that outnumber Canadian-based ones in a ton-mile sense, at least. No predictions can be made regarding which nation's carriers and shippers might gain more.

Chapter 2 Endnotes

¹ Since jointness of supply is involved here, the marginal cost functions contain both the marginal costs of the fronthaul and the backhaul. The demand side, explored in greater detail in section 2.30, will elaborate further.

² An assumption of strictly collusive behavior under regulation on the part of incumbents may be too strong. A new entrant's burden is to prove its PCN for its target market while contending with: (1) the power of rate bureaus to set freight rates; and (2) the rebuttal power of any *one* of the incumbents in the licensing process. There is no need for a great degree of coordination of incumbents to deter entry and, in this regard, it will be argued below that monopolistic competition is a better approximation to the regulated industry than would be an oligopolistic model.

³ While the industry demand curve will be fully developed in sections 2.30-2.31, suffice it to say here that it is what will be labeled the "effective" demand curve for fronthaul and backhaul movements that obtains in the model at this point.

⁴ Technically, the welfare measurement is accurate only when the demand curve is an income-compensated (i.e., Hicksian) demand. This is required because the goal is to examine the removal of the regulatory distortion in the context of the effect of a change in the freight rate while demanders, individually, remain at constant utility levels; that is, only the substitution effect induced by the regulatory change is to be captured. The demand curves in figure 2.1 would necessarily become steeper, as long as trucking services are a normal good. There is no concern required for the supply curves since they would retain their relative slopes under income-compensation. Furthermore, the effect of income compensation on product supply is ambiguous given that it derives from both factor demand and factor supply of which both may be income-compensated.

⁵ Since the "shift" in supply brought about by deregulation is institutional, as opposed to technological, the total regulatory gains to the incumbents of $BD \times Q$ are indeed rents that are merely returned to society upon deregulation. However, it is important to note that if rent seeking activity takes place within the regulatory regime then some, or perhaps all, of these rents indicate a waste of resources, implying that the welfare gain under deregulation may be even larger than indicated in figure 2.1. Rent seeking will be incorporated into the model in chapter 3.

⁶ The seminal work on the monopolistically competitive model is Chamberlin (1933) while a more modern approach is to be found in Hart (1985). The nature of the generic model is: (1) there is a large, non-fixed, number of firms that are able to differentiate their output under the same cost conditions; (2) each firm is able to ignore its impact on, and thus the reactions from, the other firms; (3) freedom of entry and exit leads to zero economic profit in the long run; (4) firms have perfect information about prices and qualities; and (5) each firm faces a downward sloping demand curve. In the model of regulation em-

ployed here, product differentiation is license-induced and entry is restricted.

⁷ Of course, neither does a perfectly competitive long run equilibrium conform to the historical record but it does serve as a better benchmark for an industry that does exhibit some of the characteristics of a competitive market. Furthermore, even if the steady state were characterized by a permanent regulatory regime of the type discussed in chapter 1 it is unlikely that a large degree of excess capacity would prevail. Regulation would merely slow the adjustment process; it would not stop it. Under the assumption of efficient markets, a long run adjustment process would entail licenses whose values characterized the long run marginal cost of production of a unit of trucking services. And if a PCN case could be made by a new entrant, in the long run all such entry would be granted. However, the implications of market bias through long run rent seeking will be explored in chapter 3 so that this assumption may be relaxed somewhat.

⁸ As mentioned above this implicit cooperation should not be taken to be oligopolistic. There are N firms that may produce any one of N types of differentiated products for a large set of shippers that are only interested in the finite number of firms (m) that are able in various degrees, due to regulatory restrictions, to satisfy their demands. What is required, however, is to assume that any m -combination taken out of the N product set is equi-probable for a given shipper. As Hart (1985; p. 530) points out, such an assumption rules out the "neighbouring" of firms such that a change in the action of one firm will now be evenly spread over all firms making any one firm's actions negligible when the number of firms is large. Thus point (2), *supra*-note 6 is satisfied. National shippers are thus equally likely to make use of any jurisdiction so long as their delivery range is large enough. This distinctly relieves this model of the need to assume duopoly or oligopoly based upon a jurisdiction in isolation from others as was suggested in Prentice (1994). A more competitive, and yet governmentally-influenced, process of operations fits in more effectively with the rent seeking approach and indeed with the empirical evidence of regulatory decisions (Boucher, 1991). The idling of a truck is independently rational, non-price competition and all firms will do this in response to a fall in demand that affects all N firms.

⁹ Of course, wages may be characterized as either variable in terms of payment per completed trip or fixed in terms of contractual agreements. The effect on labour, if it were indeed characterized as a variable cost, would not be too large if the fall in total variable cost were such that it was able to maintain its approximate graphical shape in the relevant production range; that is, it would be the case that its marginal cost derivative would be affected only in a minor way. This is reasonable since layoffs of labour would not be too pronounced because the fall in demand is taken to be temporary.

¹⁰ At point B in both panels, the two D' demand curves will not possess the same price elasticities. It is the case, following Chamberlin's original specifications, that the firm's demand would be more price elastic than the industry demand. Without "neighboring", the firm's pricing actions will not provoke a reaction from competitors meaning that if, for example, it lowered its price it

would capture a larger share of the market than it would without differentiation. The industry demand curve is the total demand for the general class of the good that is an *ex ante* benchmark used by all firms in their differentiation processes.

¹¹ The assumption of equal falls in ATC across regimes is also reasonable given the effect of market capitalization that may occur under regulation. If one wishes to depart from an assumption of competitive factor markets under regulation then one might assume that, given the greater flexibility of large firms to adjust under regulation, ATC might fall more than is indicated. But the effect of market capitalization, through unionized labour for example, would serve to mitigate the fall in ATC beyond that expected by a fall in the fixed costs of fleet operation. A more interesting question would revolve around the dynamic adjustment of ATC across regimes so as to determine which regime is more susceptible to a longer period of losses while ATC falls to meet the fall in demand. This institutional question cannot be *a priori* addressed with this model.

¹² Zero economic profit occurring in a rent seeking environment is known as "efficient" rent seeking and is the type most often employed in the literature since it is the most straight forward. A bidding for licenses among incumbents in an efficient auction process would be expected to lead to such a rationing when mergers or acquisitions are taking place. Another important reason for ATC rising, as mentioned in Prentice (1994), is the greater prevalence of the backhaul problem in an expanding, though regulated, industry. Indeed, the backhaul problem will figure largely in the discussion of the demand side as well as in the building of the cabotage reform effect into the complete model.

¹³ This conclusion for the regulated firm's output relative to the deregulated firm's output is not an *a priori* one. As can be seen in the firm panel of figure 2.4, the degree of point B being to the right of point C is based upon: (1) the shape of the marginal cost curve beyond point C; and (2) the price elasticity of demand. A more price inelastic demand and/or a greater degree of diminishing returns, through a steeper marginal cost beyond point C, could lead to $Q_B < Q_C$ at the firm level. On inspection of figure 2.4, point B would lie to the left of point C if, for the given marginal cost, $MR' = MC$ at a point below R_C . Of course, it will always be the case that $Q_B = Q_C$ so long as $MR'(Q_B) = R_C$.

¹⁴ Mishan (1971) notes that a shifting consumer demand curve along with a shifting cost or supply curve provides no real insight into the welfare measurement problem. In fact, the concepts of consumer and producer surpluses cannot be accurately measured when both demand and supply are moving in a comparative static sense.

¹⁵ The seminal mathematical work on modeling the allocation of joint costs is found in Samuelson (1969). An earlier debate by Taussig and Pigou over this problem as applied to railways is provided in Taussig (1913) and Pigou and Taussig (1913). Taussig correctly argued that it was joint cost that explained the readily observed phenomenon of carriers charging rates in inverse relation to the absolute value of the price elasticity of demand (so-called value-of-service pricing) while Pigou felt that the result stemmed exclusively from the existence of

monopoly. **Talley (1989)** demonstrates that joint costs alone are a sufficient condition for value-of-service pricing, meaning that such pricing may exist in competitive, unregulated markets.

¹⁶ This simple diagram may also be used to make the following point regarding the "equal rates for equal miles" style of regulation practiced by the ICC. To the extent that the regulated rate set the price line above all points on the backhaul demand curve, a potential backhaul market is closed off. In this regard, the entire consumer surplus obtained by backhaul shippers, if an efficient rate were set equal to MC_{bl} , would be lost. This is a definite welfare cost of regulation. International trade theory is beginning to recognize the existence of welfare losses due to closed markets resulting from barriers to trade. **Romer (1994)** sets up a model economy that has a 10% tariff on capital inputs reducing national income by 1% using a fixed list of capital inputs. If this list is changeable due to markets being closed off, the resulting loss in national income rises to 20%.

¹⁷ Strictly speaking, a portion of the gain in consumer surplus to backhaul shippers is appropriated by fronthaul shippers leaving the former with a freight rate above marginal loaded backhaul costs creating a quasi-economic rent for the trucking firms obtaining backhauls.

¹⁸ This effective demand curve is taken to be the sum of the marginal willingnesses to pay over the various potential backhaul points on D_b and the *stationary* fronthaul quantity demanded, Q_f . By construction, D_e will always be parallel to D_b .

¹⁹ When MC_{f+be} falls it causes a demand effect by way of a fall in D_e due to a fall in R_f and a rise in Q_f . With a change in both cost (i.e. supply) and demand, the steady state equilibrium will be expected to change as will be made clear in section 2.40.

²⁰ **De Vany and Saving (1977)** listed the third term in equation (2.29) as negative contrary to the above. That difference was also noted by **Talley (1989; *supra*-note 2)**.

²¹ To verify this, one need only examine figure 2.6 where it may be found that: $MC_{f+bl} < [MC_{f+be} + MC_{bl}]$. The marginal cost with no empty backhauls is always less than the summed marginal costs with empty backhauls present.

Chapter (3): Applications and extensions of the transborder trucking model.

(3.10) General

This chapter will use the model of chapter 2 as a base for further analysis of regulation, deregulation and cabotage reform. Section 3.20 will further discuss the regulatory rents that accrue to the firms in a regulated industry, using rent seeking theory. Section 3.30 will more explicitly discuss the cabotage reform process by way of the precision afforded through marginal welfare changes. Finally, section 3.40 offers chapter conclusions.

(3.20) Regulatory rents and rent seeking behavior

This section lays out the nature of rent seeking firms which operate under regulatory protection. In general, rent seeking theory has sought to combine public choice theory with the neoclassical theory of the firm. The government is endogenized in that it too possesses an objective function characterized by the maximization of the revenue to be extracted through the rents it makes competitively available to firms entering or already within regulated industries. It is from this theoretical base that a connection between the rents created in a regulated trucking industry and the welfare loss of regulation may be further substantiated. How is rent seeking applicable to the trucking industry? It is a rational response by trucking firms to a regulatory game whereby the regulator sells benefits (i.e. operating licenses) in exchange for money while, importantly, refusing to refund the expenditures of firms unsuccessful at this game.¹

(3.21) Rent Seeking: Definition

The concept of rent seeking was first developed by **Tullock (1967)** and showed, contrary to studies indicating small social costs of monopoly, that such costs could in fact be quite large. The term rent seeking itself was first coined by **Krueger (1974)** and used to analyze the nature of quotas as developed in international trade theory. A reappraisal of the seminal welfare cost of monopoly study undertaken by **Harberger (1954)** was completed by **Posner (1975)** using the new rent seeking perspective. Harberger's estimate of the welfare loss of monopoly was calculated utilizing statistics for the rate of return to capital for 73 manufacturing industries in the United States over the years 1924 through 1928. The loss of consumer welfare based on the industrial structure in question represented a value equal to a surprisingly low, 0.1% of national income.² In this context it would be reasonable to conclude that monopolization was not a source of great inefficiency in the U.S. economy. In contrast, Posner asserted that all rent would be exactly dissipated at the social level meaning that \$1 would be collectively spent in order to capture \$1 and that the rents in Harberger's analysis would then represent a further loss in consumer welfare. Posner's estimates are industry-specific but, to provide some contrast, in his reformulation of the Harberger analysis for the airline industry, under Civil Aeronautics Board regulation, he calculated a total social cost of airline monopoly equal to 92% of total revenue of the industry at the monopoly price.

Rent seeking is an activity involving the pursuit of economic rents that are usually granted by government. The process is a competitive one since firms will attach a value to the rent to be granted and would compete for the privilege of receiving such rent over other firms because monopoly profits could then be realized. The process is also a wasteful one in that, while the rent itself is

merely a transfer from one agent to another, a departure from a competitive industrial structure has a welfare loss accompanying it (i.e., the Harberger Triangle). Furthermore, the receiver of the rent, and indeed the unfortunate firms that competed for it and lost, all spent resources for the purpose of winning. These expenditures are labeled rent seeking waste and must be added to the traditional Harberger Triangle measure of the cost of monopoly. To the extent that the rent seeking waste is equal to the rent itself, the economic rent will precisely highlight this further rent seeking waste--- and it may be labeled the Tullock Rectangle--- giving, in effect, a welfare loss trapezoid.

It is important to be precise in the use of the term rent seeking. The devotion of resources for the sole purpose of achieving rents need not in itself be rent seeking. Rent seeking has come to be used in the context of the pursuit of rents that do not offer Pareto improvements to welfare. Tullock has been careful to note, for example, that rent creation through patents and their pursuit is not, in general, an example of rent seeking activity. Consider that patent protection for a cancer drug surely creates a rent for the possessor but is likely Pareto improving while, on the other hand, a tariff erected under pressure by domestic drug firms to bar the importation of such a drug is not (Tullock, 1993). The tariff case, showing a clear distinction between winners and losers, is the true thrust of the rent seeking literature. It is also useful to think of rent seeking games as negative sum from society's point of view (Tullock 1980a). From the individual firm's point of view the game can be positive, zero, or negative in sum but it is generally assumed that the expenditures of the losers far outweigh those of the winner(s). More specific means to calculate rent seeking expenditure are shown in section 3.22. If a firm does play the game, it is an efficient response from its point of view but wasteful from a societal view.

The theory of public choice— the economics of politics or of political decision makers— becomes useful in the rent seeking environment and over all forms of disposition of rent. It is through the political process that rents are created; it is to the political agents that rent seeking payments are made; and it is to the political agents that rent maintenance payments or tributes might be made by recipients in order to maintain a privileged position. A theory of the firm in a rent seeking environment cannot be complete without the inclusion of public choice theory. Public choice serves to model governmental activity and it is precisely for that reason that such models are important in the rent seeking literature since the government is a player along with the agents that are competing for rents. Government is endogenous in this framework. A government knows that a rent created will encourage a certain amount of rent seeking for it. To the extent that the government relies on funds from such sources, one can say that the rent creation itself is a function of the rent seeking expenditure it is thought to bring about. Governments treat these market inefficiencies as a source of revenue. Regulation of industries not only stabilizes their size but also the revenue to be acquired by the government; in other words, there exists a stability—efficiency trade-off as part of the economics of regulation (Prentice 1994).

Within the theory of the firm is the idea that, in the absence of barriers to entry, a firm making positive economic rent will have its position eroded in the long run as firm entry drives such rents down to zero. This familiar set of firms one can label as profit seekers (Buchanan 1980) which serves the purpose of showing the benefits of competition. But with government involvement in rent creation— in effect, institutionalizing barriers to entry— competition can serve to create social waste. Firms are now competing for rents— in other words rent seeking— which at the societal level creates a welfare loss and negative sum for society as indicated above. The transformation of firms from profit seekers to

rent seekers is conditioned by a change in the institutional setting brought about by government. And it is important to note that whether a firm is a profit seeker or rent seeker, it is still acting efficiently from its own point of view; but it is the societal effect which differs.

Another term that Tullock introduces is rent avoidance (Tullock 1980a) which essentially means activity undertaken by an individual or firm so as to minimize rent seeking costs to itself. Basically, this involves working around laws or regulations through governmental connections or, if necessary, through bribery of officials to achieve illegal exemptions. While this may minimize rent seeking outlays for a firm, rent avoidance does not come without cost. Firms may have to retain lawyers, lobbyists or insiders in order to effectively deal with the government for such purposes. In fact, any lobbying so as to influence the shape of government regulations is rent avoidance since one must assume that the firm is acting out of self-interest. Such activity will have a time cost and perhaps the cost of hiring the required specialists. An example of rent avoidance here would be situations where a trucking firm avoids routes that put it in contact with customs officials that are more "by the book" than others. Rent avoidance will provide a return to this trucking firm but it would be a small one if the firm finds it necessary to hire staff for the sole purpose of engaging in rent avoidance activities. The institutional environment would still be wasteful because one can assume that rent avoidance cannot be so successful as to mean that regulations become ineffective everywhere. Distortions will likely still exist.

One can see that such a rent seeking process is a cousin of the Stigler--Peltzman view of regulation whereby the very firms that are regulated have the biggest stake in the regulatory environment in which they conduct business. The

regulator will attempt to maximize his own wealth function subject to competing special interests with the result being that regulated firms will be prevented from achieving competitive revenue (or profit) maximization since the regulated price is inversely related to the wealth of the regulator. Following Paul and Schoening (1991) the regulator wishes to maximize his wealth (W) with respect to the size of the political majority (M) he can gather through his actions.

$$W = W(M) ; W_M > 0 \quad (3.1)$$

This majority is a function of the regulated price (P), which is the regulator's choice variable, and the firm's revenue (Y). Therefore,

$$M = M(P, Y) ; M_P < 0 \text{ and } M_Y > 0 \quad (3.2)$$

The sign of M_P shows that a higher price reduces consumer support but the opposite is true for the producer given that:

$$Y = Y(P) ; Y_P > 0 \quad (3.3)$$

The first-order condition for Y_P is:

$$[W_M(-M_P)/W_M M_Y] > 0 \quad (3.4)$$

For $Y_P > 0$ to hold in equation (3.4) the wealth-maximizing price chosen by the regulator will be one *less than* the revenue-maximizing one (where $Y_P = 0$ would be the case). For $Y_P = 0$, $M_P = 0$ must hold which means passive consumers. But

it is the political pressure of consumers, through $M_p < 0$, that is responsible for the above result. The same result was obtained by Peltzman (1976) except that he used profit as an argument instead of revenue. Paul and Schoening have argued that revenue is better suited where firms are susceptible to rent extraction by resource suppliers. It is the case that unionized labour was a source of profit capitalization for many regulated trucking firms (Rose 1987). Compensatory freight rates were, however, combined with entry restrictions and was part of the regulator's response to conflicting consumer (shipper) and firm pressures.

There is a demand for regulation which, through the political process, can affect the forthcoming supply of regulation. Firms wish to see entry to their industry controlled through the set up of regulations. A government will respond in the way that best serves its self-interest, just as would any other agent. The international trade literature developed the closely related theory of directly unproductive profit seeking (DUP) to show that tariffs and quotas are not welfare equivalents when the output effect is the same since the latter can produce rent dissipation through rent seeking for licenses (Bhagwati, *et al.* 1984). This is similar to the notion of the foreign discovery of a cancer drug. Domestic drug firms would ideally rather see a blockade on the cure rather than compete with it through the setting up of a tariff. In general, the Stiglerian view of regulation coupled with the theory of rent seeking also serves to explain why rents are not simply sold off by governments to the highest bidder at an auction. An auction mechanism is an easy and less wasteful infrastructure to maintain relative to a regulatory bureaucracy. An auction might put the class of winners in a state of flux while a regulatory bureaucracy, with all of its rules and standards, creates a class of "insiders" and incumbents that can serve to entrench the class of winners through lobbying from a position of asymmetric information. As will be seen in section 3.22, that point has not been modelled; rather, it is assumed that

incumbent firms can engage in collusion or pre-emptive rent seeking bids.³ The idea of "insiders" is relevant to the real world since governments rely on expert advice from the very groups they desire to regulate; to wit, the associations for: physicians, teachers, lawyers, accountants, etc. (Dean and Prokop, 1996).

It should be noted that some have criticized the way the concept of rent seeking has been formalized, particularly those in the institutional–methodological school of economic thought. Samuels and Mercurio (1984) claim that rent seeking can be either negative sum or positive sum for society depending upon the sorts of legal-economic settings involved. Of course, their differing conclusions arise from the different underlying assumptions, an example of which would be the objection Samuels and Mercurio have to the concept of the non-coercive marketplace and the coercive polity which, however, is a popular assumption employed by many (e.g., Buchanan, 1964). As noted above, Tullock stresses that rent seeking always involves the generation of waste. Samuels and Mercurio feel that defining waste in terms of a welfare loss triangle generated in a price-output diagram is too simplistic because the physical commodity itself is only a part of the true output. They wish to define an effective commodity as being the physical commodity plus the property rights associated with its use; and any exchange of the latter is not accounted for in neo-classical methodology. The thrust seems to be that, since there can be no unique set of rights applicable to a particular physical commodity, there are no constant effective commodities when laws change due to rent seeking because these items are a function of current law. Since rent seeking endeavors to change the law, it alters the effective commodity and thus the concept of waste cannot apply to effective commodities. The initial set up of property rights by the government has been taken by rent seeking theorists to be constant. Certainly, this is a requirement in a Coasian world in which Pareto-improving rights trade can take place.

This of course is foreign to the distributional issues that Samuels and Mercurio wish to raise using their particular methodology. It would be a waste-producing enterprise for private agents to attempt to change the law. It is true, as a result of the Coasian methodology, that economists have been more concerned with the exchange of legal rights and not the legal *change* of legal rights so that it might seem, as Samuels and Mercurio would argue, that constitutional change simply cropping up as a solution to perceived rent seeking activities appears out of place because the process of legal change, itself, is not modeled.

These points are useful when one is at the stage of proposing constitutional change so as to alter the foundation block of all laws. But one can argue that the legal change of legal rights, so as to get a handle on the ever-changing nature of effective commodities, is fraught with waste of its own in terms of logrolling and agenda-setting on the part of political agents, thereby bringing about lobbying efforts through interest group formation. Samuels and Mercurio would say that this is an activity that is simply changing the nature of the effective commodities. But in the political market, through such things as logrolling and agenda setting on the supply side and multidimensionality of issues on the demand side, one can expect uncertainty in political decision making. Uncertainty raises costs. Private agents would spend resources so as to minimize such uncertainty but competition in the marketplace means the political decisions that are purchased are very likely not Pareto-improving. The losers in the process must have wasted resources in that their resources were devoted for naught. The institutional-methodological framework as a critique of rent seeking seems to address only the nature of what a commodity is but not the fundamental change in the social consequences of the actions of private agents in order to influence political decision-making. A firm would only make use of a lobbyist if the government allowed itself to be lobbied, and would only attempt to influence regu-

latory decisions if the regulator were willing to be influenced.

The application of rent seeking below will take place using the neoclassical framework as its base since, one can argue, it is still the more powerful means to analyze market behavior. One can simply build the legal-economic aspects of the market into the strategic behavior of the firms that undertake rent seeking activities. As will be seen, there are a variety of refinements to rent seeking games.

(3.22) Rent seeking in regulated for-hire trucking: evidence

The trucking industry as characterized by rate and entry regulation operated using a licensing system. Regulatory boards, during the years before deregulation, controlled provincial and state for-hire trucking operations on an inter- and intra-jurisdictional basis. Operating rights acquired through a license conferred rents upon the recipient based on the geographic and/or carriage restrictions applied to others. A system of rent seeking on the part of would-be entrants and rent maintenance and defense of the part of incumbent firms over licensing procedures has been comprehensively documented by **Boucher (1991)**. Furthermore, in the discussion of figure 2.1 it was mentioned that the regulatory rents, if subject to efficient rent seeking expenditure, would be a further source of welfare gain from deregulation. Thus, a discussion of rent seeking is important in order to establish the complete welfare effects of institutional change. This section provides a review of Boucher's findings as evidence of rent seeking behavior.

Boucher's model builds upon other studies of the regulated trucking industry that have shown the main beneficiaries of regulation to have been the owners of

the operating licenses and the unionized workers (see, for example, Moore (1978) and Rose (1987)). As was discussed in chapter 1, the decisions of the regulatory boards were made in a quasi-judicial manner whereby both *pro* and *con* evidence relating to entry viability were presented. Since there cannot be systematic bias in these proceedings there will never be a zero probability of success attached to the next marginal dollar spent in the rent seeking process. Still, as will be seen below, there is an optimal amount to be spent by any rent seeking firm. The choice of variables in Boucher's model are instructive in that they indicate the active and reactive arguments that occur at board hearings.

The sample used by Boucher consisted of 776 applications to the Quebec Transport Commission for general and specialty operations gathered over the years 1976-1980. These were codified on the basis of: (1) content of the request; (2) characteristics of the applicant; and (3) the reactions of the incumbents and the board. Each point will be elaborated upon in turn.

The content of a request could range from a mere application to loosen restrictions within a given jurisdiction all the way to an expansion into a new jurisdiction. This latter request was more likely to elicit challenges by incumbents leading to a lower probability of Commission approval. That hypothesis was accepted through statistically significant evidence.⁴ Furthermore, the hypothesis that applications for specialty freight carriage would be less likely to be denied relative to an application for general freight carriage was also found to be statistically significant.⁵ Certainly, specialty freight carriage is a more difficult business notwithstanding the entry process. A major factor is the backhaul problem that in and of itself acts as a deterrent to entry. Finally, the hypothesis that an applicant that showed evidence of a shipper contract allowing for agreed-to freight rates, as opposed to general rates set through the Quebec Tariff Bureau,

was more likely to receive approval was also found to be statistically significant. It may be inferred that certain shipper groups are third party players in the rent seeking process. Though this was not part of Boucher's study, evidence of shipper strength in the regulatory decision making process over backhaul markets could serve to explain some of the reasons for the current reforms of the cabotage regulations. Now unencumbered by geographic or commodity restrictions, trucking firms would be less effective in this lobbying process than would be the shippers themselves in making the case to their government that their transport costs would fall with greater competition in backhaul markets.

Regarding the characteristics of the applicant, two variables were specified. A proxy for the "importance" of the firm was established by way of the number of tractors and trailers owned.⁶ Size is also some indication of the resources that the firm might bring to bear in the rent seeking process. Boucher notes that ambiguity exists as to the expected sign of this variable with respect to the probability of acceptance. It is not clear because the importance of a new entrant or expansive firm has to be weighed against the importance of the collective set of incumbents. Nonetheless, the model indicated positive and significant coefficients for two of the three classes of size used. Boucher notes that the largest fleet size class was significantly different from the other two meaning that the board discriminated in favor of those firms with seemingly more political clout and rent seeking resources. The second variable was the location of the applicant's head office in the jurisdiction of expansion or simply the willingness to be located there as part of the case for entry. In a sense, this is a proxy for "visibility" and a definite source of further tax revenue to the jurisdiction. This variable was found to be positive and statistically significant.

The reactions of incumbents and the board highlight the rent maintenance

process which seeks to prevent further competition from eroding the value of the operating rights. Five dummy variables are proposed. (1) a dummy variable is set to equal one when a protest is laid. Its expected sign is negative but a positive sign was found to be statistically significant. (2) a dummy variable is set equal to one when an applicant introduces an amendment to its application in order to placate opposition. It was found to be statistically significant and have the expected sign. (3) with respect to the reaction of the board to a request, a dummy variable representing price competition is employed and is set equal to one if the application makes any mention of the entrant proposing rates below those set by the Tariff Board. The expected sign is negative because the board will likely react in favor of the financial viability of the incumbents and of the jurisdiction in general. However, this variable was statistically significant with a positive sign. (4) a dummy variable representing an increase in traffic to the jurisdiction is set equal to one when an entrant makes that argument. The idea is that an entrant is able to increase for-hire trucking's market share at the expense of other modes which is a Pareto-improvement to the jurisdiction in that the incumbents maintain their share and the board has more activity upon which to oversee. The variable was found to have the expected positive sign but was not statistically significant. Finally, (5) a dummy variable is set equal to one if the board grants operating rights for reasons beyond those made by the entrant. The Quebec board is expected to follow this strategy when a new territory or market opportunity for for-hire trucking presents itself. Thus, the board acts as a third party in the rent seeking process by expanding its own wealth and authority and acting over and above its simple role of enforcer and adjudicator of government policy. The variable's positive sign was not found to be statistically significant, suggesting that the board was not independent of its political masters.⁷

It should be noted that Boucher's findings lend empirical support to the for-

mulation of the kinked regulation supply curve of chapter 2 in that regulators act as a discriminating monopoly which serves to bias opportunities in favor of large firms. It is this combination of large fleets coupled with piecemeal changes in operating authorities— with hardly ever an expansion of a firm's general freight carriage authority— that is at the heart of the regulation-induced product differentiation process occurring among the regulated firms within a jurisdiction. To the extent that Boucher did not find evidence to support the view that regulators themselves could rent seek, the rents obtained in the regulated for-hire trucking industry will be shared among the large firms and certain shipper groups. Of course, with a board less likely to possess an agenda of its own, it is certainly easier for a deregulatory process to take place when the politicians deem it advantageous.

(3.23) Rent seeking games and the transborder trucking model

As is often pointed out in the rent seeking literature, the presence of regulators with the power to grant market share to firms will serve to make the rent seeking process on the part of these firms a perfectly rational one. In this way, a firm's rent seeking behavior may be precisely formulated with the foundation model in Tullock (1980b). This section discusses: the nature of rent seeking games; the conditions required for efficient rent seeking to occur; and the implications of these games for the transborder trucking model of chapter 2.

The typical scenario for a rent seeking model is to specify a number of firms competing for a rent of a fixed present value with all perceiving to have the same chance of winning. Along with this comes the usual assumption of risk neutrality and thus a spending of the expected value of the rent on rent seeking activities. The analogy is that of a lottery with a fixed prize so that the total

amount spent by all players will not alter the amount of the prize. Underdissipation of rent would arise from risk aversion and/or decreasing returns to scale while the opposite of the two would be necessary for overdissipation. As to underdissipation, risk aversion would mean that if a person had a chance to win a large number of lotteries, he would not buy a ticket for all of them if it meant that all of his income would be exhausted. In a similar vein, decreasing returns or diseconomies would mean that, with a large set of tiny firms rent seeking, a small firm would face a lower limit in terms of the cost of the cheapest forms of rent seeking since phone calls beget phone bills, sending letters involves the cost of stamps so that if these costs are too large for the tiny firm, the limit will not be reached which brings about underdissipation. It will be seen below that entry due to such costs might be deterred at some point in the long run leaving the remaining firms with positive economic profits.

The most basic rent seeking game is to have two people (A and B) involved in a lottery for a fixed prize of \$100. Each ticket costs \$1 and the players can buy as many tickets as they want. It is assumed that each player is rational in the sense that when one player enacts his optimal strategy, the other player will recognize it and act accordingly as in the usual Cournot model.⁸ The probability of person A winning is:

$$P_A = A/(A+B) \quad (3.5)$$

where A and B are taken to be the respective expenditures of the two players.

The optimal strategy for the players of this game is not for each to spend \$50 which would thus mean a total expenditure of \$100 leading to complete prize (rent) dissipation. The optimal strategy is for each player to spend \$25 which

thus implies underdissipation. To see why, let person A buy \$25 worth of tickets and B buy \$50 worth. We have:

$$P_A = 25/75 = 1/3 ; P_B = 50/75 = 2/3 .$$

The expected values of A and B's investment are $\$100(1/3) = \33.33 and $\$100(2/3) = \66.66 , respectively. But if B reduced his investment to, say, \$40 then his probability becomes:

$$P_B = 40/65 = 0.6154 .$$

The expected value of B's investment becomes \$61.54 meaning that with a \$10 reduction in his investment his expected gain falls by only $\$66.66 - \$61.54 = \$5.13$ leaving him better off by $\$10 - \$5.13 = \$4.87$. Of course, in this context, A gains as well because of B's action:

$$P_A = 25/65 = 0.3846$$

implying an expected gain of \$38.46 instead of \$33.33 for the same investment. The savings for B, however, will continue to rise until his investment falls to \$25. It can be shown that if B stuck with a \$50 investment, A's optimal investment is then \$17 but the problem is that B would still gain by lowering his investment and, of course, A would gain by increasing his. In an intuitive sense, the reason why a \$50 investment per player is not optimal is because it only ensures that total expected return equals total cost rather than marginal return equaling marginal cost which is a fundamental tenant of neoclassical microeconomics.⁹ From Tullock (1980b) the optimal response is derived based on the

following probability calculation:

$$P_i = (n-1)/n^2 \quad (3.6)$$

where (n) is the number of players.

Thus, the equilibrium investment for each player in the two-person game here is $\$100(P_i)$ or \$25. Of course, with a \$50 total expenditure, each player has a 50% chance of winning. Again, what is crucial here is that each player can figure out the correct strategy, and that the other players know that strategy as well.

A common variation of the previous game often employed in the literature is to make the odds a nonlinear function of the investments in the following manner:

$$P_A = A^R / (A^R + B^R) \quad (3.7)$$

which also possesses an equilibrium investment of the form:

$$P_i = R[(n-1)/n^2] \quad (3.8)$$

where $R > 0$.

One interpretation of the R exponent in equation (3.7) is as an index denoting the different marginal cost structures of the firms playing the game; specifically the steepness of the supply curve built into the game. Another interpretation of R is as the negative of the marginal cost of influencing the probability of winning the game (Corcoran 1984). As R rises the marginal cost is decreasing and its curve is getting flatter which is akin to economies of scale becoming more

pronounced. In general, total expenditures can be less, equal, or greater than the prize depending upon the number of players and the value of R. It is from this point that the nature of the long run behavior of the rent seeking firm can be analyzed.

Corcoran contends that Tullock's model, as presented above, represents a short run analysis of the firm in a rent seeking environment in that the number of firms in question has been taken as fixed when calculating rent seeking costs. Of course, the concept of efficient rent seeking--- the special case when total expenditures in the industry equal the rent available through competition (i.e. exact dissipation)--- is a long run concept akin to zero economic profits in the neo-classical perfectly competitive model. The difference between the short run and the long run is, as usual, the length of time it takes for: a rent seeking opportunity to become known; and firms to adjust so as to enter or exit the industry. In other words, a trucking firm wishing to expand the scope of its existing license within a jurisdiction would be engaged in short run rent seeking while a new entrant to a jurisdiction would be engaging in long run rent seeking. The revelation of a rent seeking opportunity, in this context, would arise if: (1) a firm believes it can now show PCN; or (2) the regulator will indeed act as a third party rent seeker thereby signaling firms regarding jurisdictional expansion. Using the analysis above, the long run can be defined as the length of time it takes the long run equilibrium number of rent seeking firms to become informed and make an entry or exit decision.¹⁰ A comparison of short run and long run behavior can be achieved through the following game-theoretic model where players, again in a Cournot sense, anticipate the actions of their rivals, and firm entry is modeled for the industry. Consider the two player case:

$$V_A = [A^R / (A^R + B^R)] P e^{-qt} - A \quad (3.9)$$

where: V_A is the net present value of A's expenditure; P is the payoff which occurs at time t ; and q is the discount rate.

Each firm wishes to maximize its V . In this formulation the prize is interpreted as (P/e^{qt}) or the present discounted value of a prize whose future value is P . Differentiating equation (3.9) with respect to A , setting the result equal to zero, and solving for A gives the expenditure of firm A (and that of firm B, by symmetry) which is:

$$A = [(n-1)RPe^{-qt}]/n^2 \quad (3.10)^{11}$$

Note that equation (3.10) is comparable to (3.6) and (3.8) when they are multiplied by the discounted value of the payoff. Since each player spends an equal amount because of the assumption of symmetry, the probability of any firm winning is obviously $(1/n)$. The total collective expenditure on rent seeking in the short run is equation (3.10) multiplied by n , or:

$$T = [(n-1)RPe^{-qt}]/n \quad (3.11)$$

From equation (3.11) one can see that total rent seeking expenditures (T) would fall if the number of firms in the competition were reduced so that $(n-1)/n$ would fall which leads to some of the counter-intuitive points involved in the dealing with the rent seeking society. For example, competition biased to one player from the start and overt nepotism are two ways in which societal waste can be curbed as the playing field is not only unlevel but is observed by all to be unlevel. With $n=1$, it is the case that $T=0$ and, as n approaches infinity, $(n-1)/n$ will approach 1 making (RPe^{-qt}) the total rent seeking expenditure in an

industry with infinite firms. T also falls if R falls which means that the marginal cost of affecting the probability of winning would have to be rising in that context. Again, R falling implies diseconomies thus making it harder for other firms at the margin to enter the industry. While the interplay of large trucking firms wishing to enter a jurisdiction may certainly be opposed by other large incumbent firms, there can be no doubt that the rent seeking environment leads to a jurisdiction made up of primarily large firms. Finally, T would also fall if the discount rate or opportunity cost (q) were to rise which could happen for such reasons as uncertainty or delay in receipt of P when due. This makes sense if P is considered to be a rent in the future to be created by proposed regulations still pending approval. Obviously, greater rent seeking occurs in the context of current regulations and not those that might or might not be instituted because the disposition of P would be uncertain.

To build a long run perspective into the model, one has to allow for the entry and exit of rent seeking firms. A firm enters (or stays in) the industry when the rate of return to the rent seeking game is higher than those of the alternative uses of time and funds; if not, it does not enter (or stay). Here an expected rate of return (m) is distinguished from the discount rate (q); the former being a function of the ratio of the expected payoff per firm and the firm's expenditure which thus gives the following discount factor:

$$e^{mq} = \frac{[P/n]}{[(n-1)RPe^{-qT}]/n^2} \quad (3.12)$$

The numerator of equation (3.12) is $P(1/n)$ which is the product of the payoff and the probability of winning and is thus the expected payoff per firm while the denominator is the equilibrium expenditure of a firm with (n) competitors

(equation 3.10). By taking the natural logarithm of both sides of (3.12), the expected rate of return may also be written as:

$$m = q + (1/t) \ln \frac{n}{(n-1)R} \quad (3.13)$$

Firms will continue to enter the rent seeking industry until the expected rate of return to all firms (which is sensitive to n) is equal to the firms' discount rate. Thus, entry stops when $m=q$ which will occur when:

$$\ln \frac{n}{(n-1)R} = 0 \quad (3.14)$$

Thus, from equation (3.14) it follows that $n/[(n-1)R] = 1$ from which one can obtain the number of entrants necessary to achieve long run equilibrium:

$$n = R/(R-1) \quad (3.15)^{12}$$

If it is assumed that the payoff occurred as soon as the expenditures by the winning firms were made then $t=0$ in equations (3.10) and (3.11) and the expected rate of return or profit rate would be infinite as given in equation (3.13). In this context Corcoran focuses on the level of profits such that entry occurs in the $t=0$ case only so long as the level of profits is non-negative which implies:

$$(P/n) - A = (P/n) - [(n-1)RPe^{-qt}]/n^2 \quad (3.16)$$

which, when noting $t=0$, can be transformed into:

$$(P/n)-A = P(n+R-nR)/n^2 \quad (3.17)$$

Note that equations (3.16) and (3.17) calculate the expected payoff to the firm minus its expenditure in order to achieve it; that is, a net expected payoff in contrast to the ratio of expected payoff to expenditure (i.e. $[P/n]/A$ given in equation (3.12)). From equation (3.17), entry occurs until profits fall to zero which occurs at the same number of firms as that given by equation (3.15). For simplicity, many of the other games discussed below will also employ $t=0$ so as to avoid the unilluminating complication of discounting. Finally, substituting equation (3.15) into (3.11) gives the total rent seeking expenditures in the long run:

$$T = Pe^{-\alpha} \quad (3.18)$$

Thus, (3.18) states that in long run equilibrium the total expenditures of firms in the industry will equal the present discounted value of the payoff, as is expected under the efficient rent seeking result, irrespective of the number of firms in the industry.¹³ An important result of equation (3.18) is that it is not sensitive to R in contrast to the short run level of expenditure found in (3.11). In the long run, if R fell then each firm's expenditure (A) falls based on equation (3.10); the expected rate of return (m) to each firm would rise based on (3.13); and profits would rise for each firm based on (3.17). This last effect comes from the fact that the partial derivative of profits in equation (3.17) with respect to R gives: $[P(1-n)/n^2] < 0$. Thus, an individual firm's expenditure falls but, in an offsetting fashion, entry occurs because of the profits such that total expenditure will remain constant in the long run.

In summary, the long run behavior of the rent seeking firm is such that the industry achieves an equilibrium whereby each firm's expected rate of return equals the discount rate or, in the $t=0$ case, expected profits are zero and the total amount of rent seeking expenditure equals the present discounted value of the rent. As far as the curbing of total rent seeking expenditure is concerned, lowering the number of players through suitable barriers works only to preclude the short run result through free entry because (n) is an argument only in equation (3.11) and not (3.18). Of course, so long as $n > 1$, (3.11) indicates that there will still be rent seeking expenditure in the short run. Stating equations (3.11) and (3.18) again:

$$T = [(n-1)RPe^{-qt}]/n \quad (\text{short run; Tullock})$$

$$T = Pe^{-qt} \quad (\text{long run; Corcoran})$$

(3.11) and (3.18)

Since $(n-1)/n$ is bounded by zero and one, it is possible that short run rent seeking expenditure can exceed long run seeking only if R is sufficiently large and $n > 1$. Again, a larger R reflects greater ease in affecting the probability of winning. In Boucher (1991), new firm entry was very much the exception in Quebec and the bias was in favor of large firms. It would seem that Boucher's findings corroborate a short run rent seeking process. The interesting policy result would be: if R were large enough, it would be better for society to encourage free entry into the industry so that the smaller long run equilibrium rent seeking expenditure were achieved quickly. Such a quick outcome needs the spreading of prior knowledge before expenditures are made and such expenditures must be made with minimal delay by the firms. This seems like a reasonable outcome in industries that are newly regulated in that no firms are "insiders" to the regulatory process and yet all firms would wish to jockey for position quickly; all

firms have equal information and do not wish to delay expenditures. With some degree of economies in trucking existing at the terminal level and over the transport network, and rent seeking expenditures taking place in the presence of regulation, the short run equilibrium is less efficient than would be the long run equilibrium.

From equation (3.15), if R were less than or equal to one, the equilibrium number of firms in the long run would be unbounded since there would be a continuous incentive for firm entry. Minimum long run average total cost (LRAC) would not be achievable over positive output levels meaning that LRAC would be an increasing function over positive output levels which implies that decreasing returns to scale would exist over the firms in the industry. Of course, it is still true that total rent seeking expenditure in the long run is not sensitive to R . With $R=1$ comes a large (n) meaning that $(n-1)/n$ approaches one which also indicates that long run expenditure may now be more than that in the short run. In this case, a barrier to entry would lower total expenditures. Thus, a policy to lower total rent seeking expenditures has to be based on the long run cost structure of the industry concerned. Finally, from equation (3.18) total rent seeking expenditure could be curbed if the discount rate (q) could be increased through such measures as increasing the lag between expenditure and payoff, or reducing taxes on investment income.

It should be noted that **Tullock (1984)** states that equation (3.15), while mathematically correct, is not very helpful in his view over the entire set of rent seeking problems originally posed in **Tullock (1980b)**. To be fair, Corcoran has laid out the nature of long run rent seeking equilibrium only when, as he stresses, it can actually be reached. Tullock's point seems to be that his own complete short run analysis has parameters that, at times, would not allow the

long run results to obtain. In effect, the long run result seems to be applicable to a narrow range of marginal costs such that $R:[1,2]$; that is, a range in which marginal cost is neither very low nor very high.

Consider Corcoran's proposition above that, with R less than or equal to one, entry is unbounded in the long run. Calculating the short run total expenditure of all firms using equation (3.11) with, say, $R=0.5$, $P=\$100$, and $t=0$ (again, for simplicity) we see that T is only $\$50$ when the number of firms in the industry is infinite (meaning $(n-1)/n$ would be 1 in equation (3.11)). All regulatory rent is not exhausted. Corcoran's long run framework would suggest, in contrast, a long run equilibrium of (-1) firms based on equation (3.15) and a total expenditure of $\$100$ based on equation (3.18). Technically, when $R=1$ and with (n) thus approaching infinity based on equation (3.15), both short run and long run equations would indicate exact dissipation. This implies that the infinity of firms in the industry in the short run would never leave in the long run. In the context of $R < 1$, Corcoran's long run framework seems unhelpful, as Tullock has said, since it would seem difficult to envision a short run to long run progression toward complete dissipation that involves entry up to an infinity of firms and then somehow arriving at (-1) firms. If this progression were true, then a large unexplained gap in microeconomic theory would indeed exist. However, it will be shown below that exact dissipation can occur in the $R < 1$ case in contrast to Tullock's criticism, if firms are allowed to engage in bid-splitting.

With $R > 2$, and again $t=0$, the short run result indicates $T > P$ for (n) greater than or equal to 2 meaning that total expenditure exceeds the rent (i.e. overdissipation). Yet, the long run result would have $T=P$ and $n:[1,2)$ where $n=1$ occurs as R approaches infinity. To avoid non-integer solutions, the num-

ber of firms in the long run has to be 1 thus giving a long run monopoly situation. But here, again, there is a problem in progressing from a short run to a long run that can involve from two to an infinity of firms collectively overdissipating the rent and then ending up, in the long run, with only one firm that exactly dissipates it on its own thus denying itself monopoly profits while remaining alone in the industry. However, while the short run game is negative sum for the two firms as well as for society, the long run result of one firm remaining and the other backing off is related to the precommitment part of the game to be discussed below. Incidentally, with $R=2$, both the short run and the long run result indicate exact dissipation at $n=2$; the two firms in the short run would not want to leave in the long run. In this case, the Tullock and Corcoran equations seem consistent. Of course, if $n > 2$ in the short run there would be overdissipation which would reach a limit of double the rent as (n) approached infinity.

When $1 < R < 2$, Tullock and Corcoran seem to find agreement. With, say, $R=1.5$ and thus $n=3$ resulting from equation (3.15), the short run result also gives $P=T$ when $n=3$. It is likely that entry would occur up to $n=3$ if it were not at that level in the short run. Of course, if $R=1.6$ then the long run number of firms would be 2.67. Since only integers are realistic, the result would be 2 firms as a 3rd would result in losses for all. Of course, the 2 firms here would have to be making positive economic profits in the long run because of that fact. But, as will be seen below, in the precommitment stage there might be reasons for that third firm to enter.

The matrix of possible values of R and (n) set up in **Tullock (1980b)** have three regions: (1) under- and exact dissipation by the set of players; (2) overdissipation by the players as a set; and (3) overdissipation by each player individu-

ally. These last two regions represent a game that is definitely negative sum as far as both the group of players and society is concerned. Of course, even the first region is likely negative sum from a societal point of view, as **Tullock (1980a)** has argued, if we note that there may be other costs to society omitted from a game played at the industry level. For example, there may have been resources used to lobby against the enactment of the regulations that are now in place and which are now making the current rent seeking game possible. Those resources have clearly been wasted. Furthermore, in a earlier game it could even be possible that the resources spent for the pro-regulation effort overdispersed the present value of the rent awarded to the winners of those regulations. In short, it does not seem unreasonable to hypothesize that pre- and post-regulation rent seeking is *always* a negative sum game from a societal point of view. Again, one can note that the framework here is different from the one **Samuels and Mercurio (1984)** discuss. Still, the question is, why would firms play a game characterized by the last two regions of the Tullock matrix if it is a negative sum even at the industry or firm levels? Because the opting out firm(s) would leave large profits to the firm that continues to rent seek. To understand this behavior, Tullock discusses a sub-game known as the precommitment stage where each player attempts an opening move that shows a commitment that would act as a deterrent to entry for the others. But what is troublesome here is that the "paradox of the liar" (**Tullock, 1980b**) may crop up. Essentially, there may not be a solution to the precommitment game for, if there were one, all players could figure it out. If the proper precommitment is to have a deterrent effect, the other players may consider it to be a device to capture rent and thus enter to prevent that, or if the proper precommitment is to not raise a visible deterrent then entry is obviously not deterred. All firms in the industry, as if off to a war that no one intended, will feel compelled to play a game that could be negative sum at the industry and even firm level.

It should be noted that even precommitment games that actually have solutions may not be easily played out. Suppose that a short run rent seeking game is occurring with a marginal cost structure (through R) such that each player spends more than the expected value of the rent. For example, with $R=3$, $n=2$, $t=0$, and $P=100$ each player would spend \$75 in the attempt to win \$100. Total expenditure is \$150 and, from equation (3.9), the expected gain for both players is -\$25. If both players had bid \$50, it would be marginally profitable for one to increase his bid to \$51 which likewise leads to marginal profitability if the other follows suit. In this manner, the short run equilibrium is \$75. Tullock notes that if the first player spends his \$75 up front it would seem sensible for the other player not to play which thus leaves a \$25 profit for the former. If this deterrent worked one would have to analyze the parameters of that particular game. The first player had made a large investment on *minimal* information in that he had moved before every one else had. Plus the first player's decision to bid first may have involved resources spent to test the waters, so to speak, and determine that a deterrent bid was useful. Although one cannot say exactly, it might be the case that some or all of the \$25 profit could have been dissipated by precommitment expenditures. One can appreciate the complications involved in a rent seeking industry if one wishes to eliminate societal wastes due to rent seeking. Short of engineering biases or simply putting up rents to auction, there is little that can be done.

Corcoran and Karels (1985) attempt to address Tullock's criticisms of Corcoran's original long run framework. In the true sense of long run behavior it should be expected that all firms in a rent seeking environment would avoid entering a game that produces negative expected gains since such firms could consider the alternative of entry to be a zero loss through no bid; however, in the

context of "hardball competition" discussed below, even that need not be the case. If all firms employed a strategy of no-negative-expected-gains-allowed, then there would never be overdissipation of rents. But it does not seem that this result can be stable. It was not profitable, in a total sense, in the last game above to end up bidding \$75 but it was profitable in a marginal sense for every \$1 incremental bid past the first \$50. This, then, takes the firms back to using a precommitment bid that would only create an expected loss if the deterrent did not work and another firm had entered the game. It would seem that Corcoran and Karels are arguing that, in the long run at least, firms would never overbid because they would play a strategy of avoid-the-winner's-curse. What can be said is that the type of competition going on in the rent seeking industry is based upon the types of strategies the firms are using for the playing of the game and for deciding upon entry and exit.

Corcoran and Karels have made some suggestions along these lines. Consider $R=0.5$, $n=2$, $t=0$, and $P=\$100$. The optimal bid is \$12.50 for each player leading to expected profits of \$37.50 based on equations (3.10) and (3.9), respectively. Now let one of the two players (player X) submit two bids at once. The effect is as if $n=3$ with the optimal bid now becoming \$11.11 for each player and the expected profit per player now becoming \$22.22. Of course, the double bidding player's profits are really \$44.44 which, it is noted, exceeds his profits under the two-bid scheme. What is the response of the other player who made only one bid (player Y) in this context? He would follow suit thus giving, in effect, $n=4$ giving an optimal bid of \$9.38 for each of the two and an expected profit for both of $\$15.62 \times 2 = \31.24 . This sort of splitting can be carried on until there is an infinite amount of splittings and the expected profits for both will continue increasing while the optimal bid size at each split becomes infinitesimal. This splitting device shows that as (n) approaches infin-

ity, the optimal bid becomes zero while the expected profit of each bid given is still positive. For example, with (n) split to 1000, the optimal bid is \$0.0004995 and the expected profits are \$0.0995005. One can notice that the product of (n) and the expected profits per player is close to the \$100 value of the rent. Thus, in contrast to Tullock's criticism of the $R < 1$ case above, the results here show that rents are exactly dissipated since an infinite number of firms can enter just so long as infinite bid splitting is allowed every step of the way with each new entrant. It may be unrealistic to say that the long run equilibrium consists of an infinity of firms making infinitesimal bids and earning at least zero profits but the example mentioned does show that the short run Tullock result— a \$50 total expenditure over all firms as (n) becomes infinity— will not be the case in the long run. Instead of only half of the rent being dissipated, all of it will be at the limit in the long run. The long run adjustment always results in a small firm size because equation (3.7) can be shown to be strictly concave when R is less than or equal to one and the probability of winning is a function of (A) that is increasing at a decreasing rate. So the largest marginal change in the win occurs close to $A=0$.

Of course, the way to prevent the game from proceeding to infinite players and microscopic bids is to institute minimum-value bids (or, alternatively, recognize that rent seeking involves transactions costs such as the price of a stamp or a phone call). It turns out that the optimal bid would be the minimum allowable bid if and only if it were greater in value than the unconstrained bid. For example, in the case of $R=0.5$, $P=\$100$ and $t=0$, if the minimum bid is institutionally set at \$1, the unconstrained (A) reaches that minimum amount at exactly 49 firms based on equation (3.10). From 49 firms up to 100 the optimal bid is \$1 and the expected profit to all of the firms falls from \$1 to \$0 at which point the rent is dissipated (100 firms @ \$1 bids) and no entry will follow.

Technically, it will be the case that a small positive profit will exist for the remaining firms at the point of dissipation (when further entry would create negative profits for all) if the payoff is not integer-divisible by the minimum bid. Note as well that bid-splitting, if allowed, would simply artificially increase (n) faster and the result would be fewer firms in the end. It should be noted that another transaction cost applicable to the trucking industry would be a license payment to a regulator. Thus, it seems, one way to curtail the number of firms rent seeking for a regulatory license is to put a lump-sum cost on that license as a form of minimum bid.

Following Tullock's suggestion of pre-emptive bidding, Corcoran and Karels show that a range of bids for certain values of R and (n) exist but acknowledge that $R > 1$ must be the case in the long run result. The pre-emptive bid works such that the incumbent firms in the industry will bid so as to maintain non-negative expected profits and ensure that only negative profits accrue to any entrant. The scenario is that all firms currently in the industry are placing equal bids, because they are following the same strategy, and receiving non-negative expected profits so that entry is possible if minimum bidding or transactions costs are not allowed. Corcoran and Karels suggest the following way for calculating the range of pre-emptory bids. Since each incumbent firm requires non-negative expected profits, (P/n) , with (n) now taken to be the number of incumbent firms, would represent the upper bound of any such bid. Again, this is similar to the long run equilibrium proposed in Corcoran (1985) in that long run total expenditures (T) and the pre-emptory bid are here both independent of R . If all incumbent firms had bid (P/n) then $T=P$ and exact dissipation would be the long run result which, of course, would have also obtained if entry had been occurring. In the latter case, the result would be that all firms would be guaranteed only zero expected profits as opposed to the possibility that

a positive level of expected profit to the incumbent firms could result if they engaged in successful pre-emption bidding. The lower bound of the pre-emption bid is that particular bid small enough to just ensure a zero expected profit to an entrant.

Taking the parameters from the short run pre-commitment game examined above, the range of pre-emptive bids can be calculated. With $R=3$, $n=2$, $t=0$, and $P=\$100$, the upper bound is \$50 while the lower bound is \$42. The minimum bid that firm B would make so as to ensure that firm A has zero expected profits is:

$$B = \frac{(R-1)P/R}{[n(R-1)]^{1/R}} \quad (3.19)$$

But the range of such bids is sensitive to the number of incumbent firms. To see this, Corcoran and Karels give an example with $R=1.4$, $n=2$, $t=0$, and $P=\$100$. The pre-emptive bid range is \$33.51 to \$50. If there were eight incumbent firms then the range would have been \$12.45 to \$12.50. But at nine firms the range is \$11.44 to \$11.11; that is, the upper bound of \$11.11 dissipates the rent while \$11.44 is the *minimum* bid necessary to ensure negative expected profits for an entrant. So the \$11.44 bid would deter entry but leave the nine firms with negative profits because of overdissipation. Since that would not be reasonable, the pre-emptive bid strategy would only work when the industry contains up to eight firms.

However, if the number of incumbent firms in the industry is enough, through the bids they make, to achieve a normal Cournot-Nash equilibrium as given by equation (3.10) and, furthermore, that value is within their pre-

emptive range, then those bids at that equilibrium would be where the incumbent firms would settle under normal circumstances. If the Cournot-Nash solution were above the upper bound, exiting would occur since the number of existing firms could not be maintained in the industry. As firms exit, the bid range increases until it envelopes the Cournot-Nash solution. Technically, the bid given in equation (3.10) is increasing which also means that the range has to be expanding faster than the normal bid is rising. If the Cournot-Nash solution were below the lower bound, entry would ensue. The bid in (3.10) falls and so does the bid range; however, it can be shown that the bounds of the range are falling as well so that the Cournot-Nash solution will still be enveloped. In general as the number of firms increase (decrease) the pre-emption range narrows (widens) with the upper bound falling (rising) faster than the lower bound.

An example of a sort of non-normal circumstance would be collusion whereby the incumbent firms would agree to opt for the lower bound of the pre-emptive bid range where entry is deterred. Another example of a non-normal circumstance, which happens to also work against the collusive solution, is what **Corcoran and Karels (1985)** call "hardball competition" whereby an entrant will deliberately cause negative profits for itself and the other firms. Presumably, these losses will be short run until it achieves incumbent status. Of course, a burden of PCN set on all potential entrants to the regulated trucking industry would seem to over-ride this possibility. But the larger are the expected profits of the incumbents, the smaller is the expected loss to the entrant meaning such a move by an entrant may afford it leverage over the others in a precommitment game. It may be possible that a regulatory board would look upon "hardball competition" as merely a signal of the entrant's faith that necessitates a negotiated solution at the hearing stage. The long run equilibrium in the presence of hardball competition occurs when the upper and lower bounds of

the pre-emptive bids are equal to each other. Of course, transactions costs facing new entrants such as application costs *etc.* can serve to hold down entry and reduce dissipation. Finally, another interesting result is that the minimum pre-emptive bid at first decreases as R increases, and then increases afterward.

The recent theoretical literature on rent seeking still embraces the model of efficient rent seeking first set out in **Tullock (1980b)** and further refined by **Corcoran (1984)** and **Corcoran and Karels (1985)**. **Perez-Castrillo and Verdier (1992)** confirm some of Corcoran's long run analysis and further discuss rent seeking activity in an industry with Stackelberg leader behavior. If it were the case that one firm in the game possessed superior knowledge before the rent seeking bids took place then it would be useful to consider a leader-follower framework for the incumbent firms. Things such as better connections with political agents, or systematically better lobbying efforts introduce a degree of bias into the game. It turns out that a Stackelberg leader has an interest in entering a pre-emption bid and thereby attempting to deter the entry of other firms that would compete with the incumbents. In line with equation (3.19), the leader makes the minimum pre-emptive bid which the followers will match thus deterring entry. Of course, this model did not consider the possibility of hardball competition discussed above. Again, such preclusion of entry, short of minimum value bidding or other barriers to entry, only occurs in the $R > 1$ case as seen by equation (3.19). Of course, **Tullock (1980b)** also introduced bias into his lottery model in that one player would receive a multiple of tickets over his opponent with the same \$1 spent. In that case, the region of underdissipation increased thus showing that bias reduces rent seeking cost. But the fact that the unfavored player still engaged in the game shows that only perfect knowledge of the futility of playing is the only true deterrent; that is, blatant biases such as nepotism, or political patronage are the only good deterrents in the rent seeking

society.

Rent seeking is a natural phenomenon of competitive market behavior and is overseen to various degrees by government. To acknowledge the rationality of firms that engage in such behavior, along with its negative sum societal consequences, is to begin to give a fresh look to the theory of the firm in the presence of active government. The societal waste accruing from rent seeking entrants and rent defending incumbents serves to add to the view that rate and entry regulation in the for-hire trucking industry in Canada and the United States was a source of welfare loss. In effect, these rent seeking games show that a lot of activity occurs "behind" the simple supply and demand curves of the model presented in chapter 2. Of course, deregulation served to overcome most of these problems but there still remains the problem of achieving international deregulation of for-hire trucking services. The next section will examine the welfare effects of cabotage reform in the context of marginal welfare analysis.

(3.30) Cabotage reform and marginal welfare analysis

Cabotage regulations are essentially a non-tariff barrier (NTB) to trade. In comparison to the literature on tariffs, quotas and voluntary export restraints (VERs), the development of theory and applications regarding NTBs has been sparse.¹⁴ This section will examine the cabotage reform effect introduced in chapter 2 in more detail so that some further conclusions with respect to the nature of NTBs may be drawn.

A useful discussion of the welfare effects of NTBs is provided by **Herberg (1990)**. Consider a two-country, two-commodity model in which a NTB is im-

posed unilaterally by the domestic government or, alternatively, a VER is instituted with the agreement of the foreign exporters. Since the licenses or privilege under regulation to import or export, as the case may be, are to be shared in some way between the two countries the question to be asked concerns the effect of regulation on the economic welfare of each country. To simplify the analysis, assume that: rent generation is not dissipated due to any rent seeking activity; all markets are perfectly competitive; no international factor movements are induced; and finally, a country's share of the rent is distributed in a lump-sum (i.e., non-distortionary) fashion to its consumers.

If the domestic share of rent created is unity then rents from quota licenses accrue only to domestic importers. If the domestic share is zero, or very small, then the foreign country has instituted a VER and its now-limited exporters capture all rent. Finally, if the domestic share is between zero and unity then quota licenses are effectively auctioned off to both domestic importers and foreign exporters. The interesting conclusion of this analysis will be that a NTB set against domestic imports is more likely to lower the welfare of the domestic country and raise that of the foreign country if the domestic rent-share gets smaller. Of course, one can note that this welfare loss would be larger if rent seeking were allowed because the resources spent on competing for scarce licenses by those that did not ultimately achieve them are a further welfare loss. The reason for the above conclusion is that a country cannot gain in welfare unless its terms of trade improve and this cannot happen unless its share of the rent is close to unity. To see this, let:

$$S = (p - p^*)m \quad (3.20)$$

$$T = p^* + (1 - a)(p - p^*) \quad (3.21)$$

where m is domestic imports, S is the scarcity rent, T is the effective price of an import, (a) is the domestic rental share with $a:[0,1]$, and the domestic and foreign prices are p and p^* , respectively.

Thus the effective price of an import equals the foreign price plus the product of the foreign rent share and the price differential, with $(1-a)(p-p^*)$ being the foreign rent per unit of a domestic import that accrues to a foreigner. Herberg takes T and $(1/T)$ to also represent the domestic and foreign terms of trade, respectively. From equation (3.21) we get:

$$dT = (1-a)dp + (a)dp^* \quad (3.22)$$

For an improvement in the domestic terms of trade (T), the domestic country needs $dT < 0$. With the imposition of a NTB one expects $dT < 0$ to hold with (a) close to unity and to be violated with (a) close to zero. With (a) close to unity and thus $(1-a) < (a)$, a fall in the foreign price in equation (3.22) overpowers the effect of a rise in the domestic price such that $dT < 0$. The effect of the imposition of a quota is to make the domestic price rise and the foreign price fall when the supply function is made vertical at the desired quantity under the quota. In the case of a VER imposed by a foreign country, $a=0$ so that any foreign price change will not affect the domestic country's terms of trade and thus likely not to provoke any retaliation which explains the popularity of VERs.

The domestic country's expenditure (or disposable income) is the sum of its revenue function (or factor income at factor market equilibrium) plus the scarcity rent.

$$E(p, U) = R(p) + aS \quad (3.23)$$

If we consider 2 commodities and 2 countries, we have:

$$E(p_1, p_2, U) = R(p_1, p_2) + aS \quad (3.24)$$

$$E^*(p_1^*, p_2^*, U^*) = R^*(p_1^*, p_2^*) + (1-a)S \quad (3.25)$$

Using the dual approach, with commodity 2 as the good imported by the domestic country we can assume, from Walras' Law, that world demand equals world supply:

$$(\delta E / \delta p_2) - (\delta R / \delta p_2) + (\delta E^* / \delta p_2^*) - (\delta R^* / \delta p_2^*) = 0 \quad (3.26)$$

The importation of commodity 2 is subject to a NTB that raises the domestic price higher *vis a vis* the foreign price. The import function and scarcity rent function, respectively, for commodity 2 become:

$$m_2 = (\delta E / \delta p_2) - (\delta R / \delta p_2) > 0 \quad (3.27)$$

$$S = (p_2 - p_2^*) m_2 \quad (3.28)$$

With commodity 1 taken as a numeraire (i.e. $p_1 = p_1^* = 1$), it can be shown that:

$$dU = (1/E_U) [(\delta E / \delta p_2) dp_2 - (1-a)m_2 dp_2 - a m_2 dp_2^* + a(p_2 - p_2^*) dm_2] \quad (3.29)$$

A NTB will: lead to a fall in imports ($dm_2 < 0$); raise the domestic price ($dp_2 > 0$); reduce, if the country is "large", the foreign price ($dp_2^* < 0$); and cause the domestic terms of trade to improve (deteriorate) when the domestic share of the scarcity rent is large (small). It is also true, given equations (3.22) and (3.29), that:

$$dU = (1/E_U) [(\delta E / \delta p_2) dp_2 - m_2 dT + a(p_2 - p_2^*) dm_2] \quad (3.30)$$

and for the foreign country:

$$dU^* = (1/E_{U^*}) [(\delta E^* / \delta p_2^*) dp_2^* + m_2 dT + (1-a)(p_2 - p_2^*) dm_2] \quad (3.31)$$

which shows that an improvement in the domestic terms of trade ($dT < 0$) leads to an improvement in domestic welfare. The condition required is that the rent share be close enough to unity and that initial trade protection is low or close to zero. As long as markets clear, some further propositions come out of the analysis. First, if the domestic terms of trade deteriorate, foreign welfare is raised with a small rent share going to the domestic country with low initial trade protection. Thus, a NTB can never benefit both countries at the same time and yet, importantly, if the initial trade restrictions were severe, *both* countries would have received lower welfare. This latter point can be seen by noting from equations (3.30) and (3.31) that:

$$(dU/dm_2) = a(p_2 - p_2^*) > 0 \quad (3.32)$$

$$(dU^*/dm_2) = (1-a)(p_2 - p_2^*) > 0 \quad (3.33)$$

$$(dU/dT) = -m_2 < 0 \quad (3.34)$$

$$(dU^*/dT) = m_2 > 0 \quad (3.35)$$

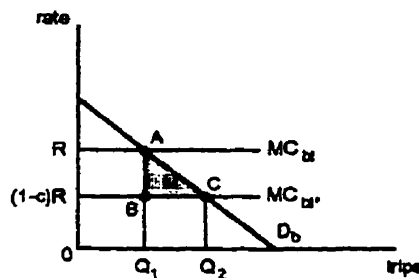
With $dm_2 < 0$, the effect on welfare of $dT < 0$ is such that: (1) welfare for the domestic country falls when $(p_2 - p_2^*)$ is large enough so that the lower-import effect overpowers the improved domestic terms of trade effect making equation (3.30) fall on net; and (2) welfare for the foreign country definitely falls irrespective of the size of $(p_2 - p_2^*)$ as the import and domestic terms of trade effects reinforce each other such that equation (3.31) falls.

In summary, NTB imposition is either a zero-sum game or a negative-sum game. What complicates cabotage reform in North America is that the design of the regulations are somewhat reciprocal between Canada and the United States leading to an ambiguous net effect according to Herberg's model. In addition to

the layout of the different Customs and Immigration Acts on each side of the border, there remains the possibility of different degrees of enforcement and of compliance. Still, the fact that partial reform has been recently concluded would seem to indicate that a positive result was, and is, expected from this and further reform measures. The demand-side model of chapter 2 may now be expanded by way of the specific marginal welfare equations so as to examine the incremental effects of cabotage reform.

There are some differences to consider between marginal welfare analysis and total welfare analysis as originally used by Harberger (1964).¹⁵ Consider again figure 2.5 in which the marginal loaded backhaul costs decrease due to cabotage reform as relating to incidental/return trip movements. Ignoring the rectangle portion of the welfare gain allows for a re-examination of the Harberger triangle portion of the total gain. It should be borne in mind that the literature has primarily focused on tax rates as the item subject to marginal changes; in the present case one must assume that there is a marginal cost of regulation applicable to a trucking firm's marginal cost of production.¹⁶ Consider a fall in the implied marginal cost of cabotage regulation contained within the backhaul freight rate as shown in figure 3.1.

Figure 3.1: Harberger Triangle and the Cabotage Effect



The Harberger triangle portion of the welfare gain in the backhaul market is represented by area ABC. This welfare gain may be written as:

$$W = ABC = (1/2) dQ [R-(1-c)R] = (1/2) dQ (cR) \quad (3.36)^{17}$$

where c = the marginal cost of cabotage regulation.

For a "small" reform to the regulations, it is the case that $dR=cR$ which gives:

$$W = (1/2) [(dQ/dR) cR] cR \quad (3.37)$$

Multiplying equation (3.37) by $[Q_2(1-c)/Q_2(1-c)]=1$ and manipulating gives:

$$W = (1/2) [(dQ/dR) R(1-c)/Q_2] [c^2/(1-c)] RQ_2 \quad \text{or}$$

$$W = (1/2) N [c^2/(1-c)] RQ_2 \quad (3.38)^{18}$$

where N =the compensated price elasticity of backhaul demand.

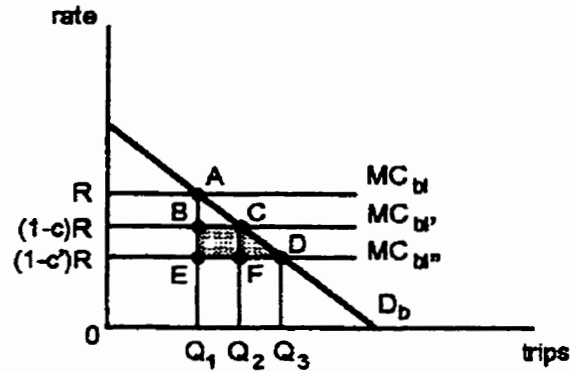
The Harberger (1964) measure would be paraphrased as:

$$W = (1/2) N c^2 RQ_1 \quad (3.39)$$

Because the regime change is one where (c) falls due to cabotage reform, the Harberger equation is not applicable *post*-reform since it measures the gain from the unobservable point A in figure 3.1 as opposed to the observable point C.

The marginal gain in welfare is measured by the trapezoidal addition to the Harberger triangle when (c) falls by a "small" amount. This is shown in figure 3.2 by the area BCDE.

Figure 3.2: A Marginal Change in Cabotage Regulations



Equation (3.39) may be reworked into the following total differential.

$$\begin{aligned}
 dW &= CDF + BCEF = (1/2) [(1-c)R - (1-c')R] dQ_2 + \\
 &dQ_2 [(1-c)R - (1-c')R] \quad \text{or} \\
 dW &= (3/2) dQ_2 [(1-c)R - (1-c')R] \tag{3.40}
 \end{aligned}$$

Noting that $c' = c + dc$ and $dQ_2 = [NQ_2 / (1-c)] dc$ allows equation (3.36) to be re-written as:

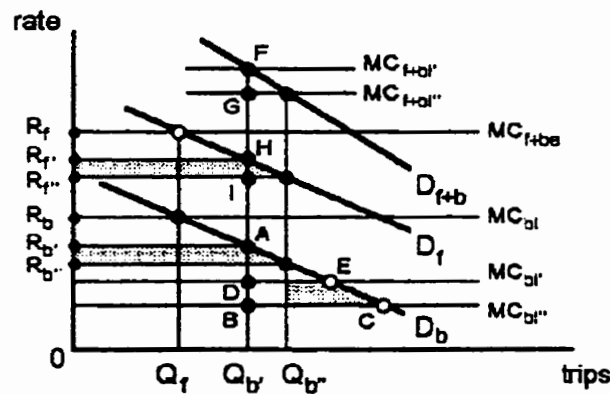
$$dW = (3/2) [Rdc / (1-c)] NQ_2 dc \tag{3.41}$$

Equation (3.41) shows the marginal welfare gain in the backhaul market net of the rectangle gain. Since there are no transfer rents earned under cabotage regulation the welfare gain is really a trapezoid as was shown in figure 2.5. That fact allows the analysis to stop at this point since there is no regulatory rent

upon which to differentiate equation (3.41).¹⁹ The rectangle portion of the trapezoid is neither a transfer to backhaul shippers from rent earned by firms able to find loaded backhauls nor is it government revenue from a customs levy or tariff. The marginal cost of cabotage regulation is in the form of a NTB cost of compliance applied to both sides of the border which reciprocally affects the trucking industry and shippers on both sides. Nor is rent seeking a phenomenon likely to occur in the cabotage market since: (1) the negotiating firm would be a foreign entity to the government with the power to grant license; and (2) cabotage regulations do not work like a quota system which is necessary for the bargaining over licenses.

The above analysis may also be applied to the fronthaul market when the joint demand curve becomes operative as was shown in figure 2.6. The discussion as related to that diagram showed a welfare gain accruing to fronthaul shippers as well as a quasi-economic rent accruing to the firms able to secure backhauls. Figure 3.3 indicates the trapezoidal marginal changes in welfare applicable to both fronthaul and backhaul markets.

Figure 3.3: Joint Demand and a Marginal Change in Cabotage Regulations



This figure is a compact version of figure 2.6 used so that the small changes in welfare may be easily seen. An incremental drop in MC_{bl} leads to trapezoidal welfare gain to fronthaul shippers. Measuring this between the original fronthaul quantity before the joint demand became operational— that is, Q_{f--} and the observed joint quantity of $Q_{b'}$, equation (3.40) may be rewritten as:

$$dW_f = (3/2) dQ_{b'} [R_{f--} - R_{f'--}] \quad (3.42)$$

Of course, the difference in fronthaul rates in equation (3.42) is measured by HI in figure 3.3 and is related to the fall in the marginal cost of regulation (FG) in the terms of $HI = (\text{slope of } D_f / \text{slope of } D_{f+b}) FG$. Finally, for the backhaul marginal welfare change, figure 3.3 shows (1) a trapezoidal gain, which would be of the same format as equation (3.40), as well as (2) a trapezoidal loss measured from the hollowed-out point C. The measurement of this area is not adaptable to Browning's equations since neither $Q_{b'}$ nor the hollowed-out point that represented desired backhaul quantities are observable. Of course, it is always the case that the net result is still a gain in welfare to the backhaul shippers as confirmed by the shaded areas.

(3.40) Chapter conclusions

This chapter served to extend the model presented in chapter 2. Indeed, the analysis of rent seeking behavior was crucial in order to explain the process of welfare loss under regulation. As well, the possibility of shippers and regulators as third party players helped to explain why regulatory regimes evolve. In this light the effect of cabotage reform as a marginal fall in the cost of regulation

was examined. The gain in welfare was shown to be bilateral since the regulations themselves were reciprocally set. In terms of a continental transportation framework the model does not mitigate welfare gains from unilateral reform either. As was made clear in Herberg's model of NTBs it is possible that unilateral imposition of a NTB may lead to a negative sum result for society. The results of this chapter should serve as a theoretical base upon which further cabotage reform may take place.

Cabotage reform is an activity that naturally lags behind free trade agreements. Tariff barriers are being removed continentally as well as globally. However, non-tariff barriers tend to remain in place longer since they are more lucrative for the imposing government as compared to their tariff-equivalents. Thus, rent seeking theory and DUP theory have both shown NTBs and quotas to be harder to remove once they are put in place. It would seem that cabotage reform will eventually occur in a reciprocal fashion, much in the same way as free trade in goods and services are negotiated. This has clearly been the case with Canada and the United States. The process will be complicated by the fact that trucking services are both a means to trade in exports and imports as well as being a potential source of competition for freight transport in domestic markets. The model presented here showed that efficiency gains occur over a continental fleet. Trucking services would have to be recognized as such once cabotage reform is completed.

Chapter 3 Endnotes

¹ In order to keep this chapter in its proper perspective it should be noted that the rent seeking analysis developed here serves to show that the welfare gains from deregulation are likely to be larger than those shown in figure 2.1 (*q. v.* chapter 2, *supra*-note 5). It is not applicable, however, to the specific case of cabotage reform since regulatory rents do not accrue to firms able to engage in cabotage. For example, while figure 2.5 shows a shaded trapezoidal gain due to reform, there was no pre-reform regulatory rent because MC_{bl} cannot be considered to be the applicable cost of backhaul provision. *All* firms, in the pre-reform state, must operate under cabotage regulations and thus face costs given by MC_{bl} . There is no inter-firm competition for the right to engage in cabotage.

² It should be noted that Harberger employed the simplifying assumptions that: (1) all monopolies operated with constant marginal costs; and (2) they all faced a price elasticity of demand equal to unity. The first assumption removes the need to consider producers' surplus while the second violates the common practice whereby monopolies set price along the price-elastic portions of the demand curves they face. Alternative studies using different demand and cost assumptions provided estimates in a range from 0.5% to over 5% of national income (see, for example, Kamerschen (1966) and Worcester (1973)).

³ Collusion is the typical form co-ordination used in the literature. However, it will be recalled from the discussion of the model in chapter 2 that the trucking firms operating under regulation needed not to act in so covert a manner. The contraction phase in the model is marked by the observance among the firms of vehicle idling and in the expansion phase the barrier to entry is re-enforced through rent maintenance by any one incumbent wishing to argue PCN thus attempting to mitigate any rent seeking among the potential entrants.

⁴ Significance of the t-statistics is at the 0.05 level. Boucher's model is essentially the estimation of a linear conditional logit function over the distribution of the probabilities for a favourable entry decision. This is formed based upon a proposed random utility function for the regulator in which its error term follows an extreme-value distribution. Both a bi-polar decision model and a more disaggregated decision model were estimated. Since the latter incorporated the more realistic regulator choice variables of accept, reject, and partial acceptance, it is the results of this model that will be discussed. Note that the partial acceptance choice variable accounts for outcomes of any logrolling processes among the players that may take place.

⁵ Boucher notes that the Quebec Transport Commission had never granted a license to carry general freight in any narrow geographic region to any firm in the last fifteen years prior to the interprovincial deregulation of 1988.

⁶ Fleet size was found to give better statistical results than gross annual operating revenue.

⁷ Except for the last variable, the other four reaction variables were found to possess the expected sign and were statistically significant in the simple accept--reject model.

⁸ It should be clear given the material of chapter 1 and the review of Boucher (1991) in section 3.22 that the process for obtaining or expanding a license can now be viewed as a rent seeking process occurring prior to an entrant's production of trucking services. The terms under which regulation--induced product differentiation will take place are worked out at this stage so that the monopolistically competitive set of incumbents will form according to the regulator's desired structure of the jurisdiction. A Cournot set of reactions is both simplifying and practical since it should not be too hard for an entrant to figure out that an incumbent's optimal strategy is to oppose entry (*q. v.* chapter 1, *supra*-note 13) and that, in consequence, an entrant will attempt to appease the regulator in some fashion. While it is true that a Cournot model does not provide for an adequate "story" as to how equilibrium among reaction functions is achieved the bulk of the rent seeking literature makes use of this formulation. For exceptions see Perez-Castrillo and Verdier (1992) and Linster (1993).

⁹ Of course, under cooperation, and with no further entry, the optimal strategy would be for each firm to buy merely 1 ticket thus still giving each a 50-50 chance. Consider this action in the context of the rent seeking trucking firm. Unless the class of shippers in the jurisdiction is found to switch often their loyalty among particular firms, or the regulator is open to new appeals for competitive pricing on the part of an entrant, the application for, or expansion of, a given license must be seen as close to a one-shot game on the part of the applicant. As such, a one-shot prisoners' dilemma game mitigates the opportunity for cooperation. Recall that Boucher merely found evidence pointing to a positive effect of a shipper contract on board acceptance but this does not allow one to infer that such contracts shift often within a jurisdiction leading to a frequent need to apply to amend a firm's operating rights.

¹⁰ Note that in the context of the supply side model of chapter 2, firm entry under regulation was taken to be zero as part of a simplifying assumption of the incumbent firms' power. This can be considered to be an *ex post* result of regulation. If so, there is no barrier to a firm's attempt at entry as part of a rent seeking environment. This point is made in terms of the rise in ATC experienced by the firms (*i.e.*, incumbents) during the expansionary phase in demand. As discussed in chapter 2, rent seeking payments to regulators are occurring which may now be better classified as rent defense payments to regulators in the midst of the attempts of new firm entry during the expansion. Of course, if the time frame for the demand expansion is short then some short run rent seeking in terms of license enhancement on the part of incumbents is to be expected. In terms of rent seeking theory, there are close parallels between rent seeking and rent defense (*q. v.* *supra*-note 11 below).

¹¹ Paul and Wilhite (1991) show that this equation would also hold in the context of rent maintenance or defense. In equation (3.9), Pe^{-qt} would have a negative sign attached signifying the present discounted value of the rent to be

lost to a new entrant by a rent-defending incumbent. The expected value (V_A) to this firm, if now an incumbent, is surely negative because it is spending resources in order to prevent a loss. But equation (3.10) will still hold for a rent defender as well as a rent seeker.

¹² Equation (3.15) provides insight into the expected size of the regulated for-hire trucking industry. In the long run, all of these entrants defined through (3.15) will become the pool of incumbents upon which the short run rent seeking and rent defense process takes place in the midst of any temporary demand expansion. In the light of the model of chapter 2 it is reasonable to assume that long run rent seeking occurs on the basis of the given permanent and non-cyclical demand curve. In this way, the long run regulatory equilibrium obviously defines the number of firms that will exist when the industry is at the *kinked* point on the regulatory supply curve.

¹³ The kinks along both the regulation and deregulation supply curves occur, it will be recalled, at the same point along the permanent demand curve. In this regard, such a result can be taken as a matter of convenience since it very much depends on an assumption of the initial state of the world. If long run rent seeking expenditure is initially to take place, (T) will only be positive so long as (P) exists. As was done in chapter 2, if one allows $P=0$ and no regulation to be the initial state of the world as part of the model then the firms' rent seeking response to regulation in the next phase may serve to raise the kink point of the regulation supply above that for deregulation. While that would serve to complicate the welfare analysis of that chapter it would, however, increase the expected size of the welfare gain from deregulation.

¹⁴ A theoretical treatment of NTBs may be found in Herberg (1990) while quantitative overviews are to be found in Coughlin and Wood (1989) and Winters and Brenton (1991).

¹⁵ While it will be argued in this section that marginal welfare analysis is appropriate for an examination of the cabotage reform effect there do remain some differences of opinion as to how to measure marginal welfare changes. A review and appraisal of three of these measures may be found in Fullerton (1991).

¹⁶ The assumption of constant marginal costs of production under cabotage regulation allows for a simple parallel, downward shift in those costs after reform. While increasing marginal costs of production and regulation are an unnecessary complication to the discussion of marginal welfare changes, they do allow for other styles of regulation. One might wish, for example, to specify more "progressive" costs of regulation in that the marginal cost of regulation could rise as more loaded international backhauls take place. In this way, the differential between MC_{bl} and MC_{bl}' would be seen to increase in figure 2.5 as the number of trips increased. Such costs of compliance may arise due to more detailed border checks or a graduated system of license costs for international trips.

¹⁷ Note that the area of the triangle as measured by the product of one-half the base and the height is correct only so long as the compensated demand curve is assumed to be linear.

¹⁸ This measure of total welfare change, as contrasted by **Harberger (1964)**, is discussed in **Browning (1987)**.

¹⁹ For example, **Browning (1987)** calculates the change in marginal welfare brought about by tax revenue rising by an extra \$1.

Chapter (4): Conclusions

This dissertation has attempted to make the theoretical case that deregulation of the trucking industry is a source of efficiency gains. However, deregulation was not fully completed because transborder trucking has remained very much regulated through restrictions on cabotage activity. Such further deregulation would be a source of continued efficiency gains in a marketplace that is increasingly continental in nature.

The historical overview showed that the trucking industry in Canada and the United States experienced a fall in freight rates as a result of deregulation. Furthermore, the over-capacity of formerly protected firms, along with the entry of owner-operators, served to create a more competitive marketplace. This conforms to the rightward (i.e., downward) shifts seen in the industry supply curve after deregulation. It was shown how the ICC in the United States entrenched empty backhauls as a permanent feature of regulated interstate trucking because of its non-market based approach to calculating appropriate backhaul rates.

Canada and the United States deregulated their trucking industries for domestic reasons and moved down parallel roads without much interaction. This brought the reciprocity issue to the fore with respect to cabotage activity once transborder trucking greatly increased as a result of CUSTA and NAFTA. Transportation was not addressed in either of these trade agreements leaving truck weights and dimension restrictions, as well as cabotage regulations, as a detriment to the spirit of free trade that was achieved with respect to goods and some services.

Reciprocity with respect to repositioning move cabotage does not exist since, in the U.S., the move must be made in a northward direction. As well, different degrees of enforcement by Customs and Immigration officials served to further blur the issue. Compliance with respect to cabotage was also a problem given the specific restrictions involved in incidental moves. What was the same on both sides of the border, however, was that drivers faced stronger restrictions than did their equipment.

A re-interpretation rather than reform to cabotage regulations is what essentially has occurred due to Canada's unwillingness to exempt the market value of U.S. tractor-trailers from the Goods and Services' Tax levy. While the re-interpretation allows for some efficiency gains, they are but a small step forward. Through the bill of lading, international freight will be considered as such until the final destination is reached. In this way, foreign equipment and drivers may move such freight point-to-point domestically. Since the freight is international it is not a cabotage operation by definition. Still, *bona fide* incidental and repositioning move restrictions on domestic freight still apply, thus serving to leave a gap in potential backhaul transport opportunities. Of course, the issue of trailer spotting has been clarified and such operations are made easier and the subjective term of "regularly scheduled" in the U.S. regulations is to be ignored by officials. Furthermore, U.S. goods destined for Mexico, as international traffic, would now be fair game for Canadian trucking firms. However, while it is fairly easy to discuss equipment reforms, immigration will likely remain an issue preventing meaningful cabotage reform with respect to drivers.

It is also interesting to note the level of misunderstanding relating to cabotage regulations as provided in the survey of Canadian carriers. However, these firms have indicated a willingness to compete with their U.S. counterparts in an

environment allowing for freedom of cabotage. An expectation of efficiency gains, even with reciprocity of reform, indicates potential welfare gains in the transborder trucking industry due to a fall in compliance costs.

From the institutional framework presented, a set of industry supply functions was established along with their relationship to a representative trucking firm or owner-operator, as applicable. Temporary demand shocks, as part of the cyclical nature of the trucking industry, were used to elaborate upon these relationships. The welfare gain to the trucking industry from deregulation occurs independently of the sign of the demand shock. Furthermore, sticky freight rates, over and above entry regulation, were shown to be a source of even greater welfare gain when removed.

The effect of cabotage reform was introduced into the model through development of the demand side. In order to keep the analysis manageable the fall in marginal costs alone, in the midst of cabotage reform, indicated only greater ease in undertaking incidental move or return trip, outward cabotage. Repositioning moves would require a general equilibrium analysis in order to capture the opening up of other markets beyond the initial transborder move. However, the partial equilibrium framework alone is enough to establish welfare gains accruing from lower operating costs and increased competition on the given transborder route. Since the model is designed on a continental basis, it is not possible to sort out the distribution of the gains expected from cabotage reform on a national basis; but net gains accrue even under the circumstance of unilateral reform.

The cabotage effect was characterized in terms of a permanent increase in demand; specifically a change from the effective demand to the joint demand in-

dicative of zero empty backhauls. As well, the fall in costs led to a supply-side effect in which a new and more efficient steady state equilibrium was achieved.

A theory of regulation of the trucking industry was developed through the use of rent seeking theory. To this end, a careful review of the literature was provided in order to differentiate between societally efficient profit seekers and their transformation, through government action, into societally inefficient rent seekers. Evidence of rent seeking activity in the for-hire trucking industry in Quebec was presented showing that a bias occurred in favor of large firms in regulatory consideration of their license applications. This lent empirical support to the theory behind the supply curve of regulation.

Rent seeking games were explored as part of both short run and long run activity. These served to show the strategic behavior of firms that wished to maximize their payoff from rent seeking activities. Insight was also provided as to the number of firms expected to engage in long run rent seeking. With exact dissipation of the rent, this also becomes the expected number of incumbents.

The theory between short run and long run rent seeking games is not always compatible. Devices such as minimum value bidding allow for a smoother progression of short run to long run results. Nonetheless, the literature on long run games does provide insight into the behavior of firms during a license hearing. If the number of incumbents is large enough, pre-emptive bids on their part may lead to an entrant's departure from the game. On the other hand, the entrant may engage in so-called hardball competition and either successfully enter or at least be taken by the regulator to be engaging in a serious pre-commitment posture. The rules of the game will always be defined by the regulator. And it was likely that the well-known bias introduced by the PCN requirement limited

greatly the ability of a new entrant to achieve unconditional entry.

Finally, non-tariff barriers were shown to be either a zero-sum or negative--sum game over two countries. In terms of cabotage regulations, the net effect in either Canada or the United States is ambiguous because of the somewhat reciprocal overall application of this protection. Using the cabotage model, marginal welfare analysis was applied in order to show the effects of an incremental fall in backhaul shipping costs arising from cabotage reform. Welfare equations were developed in order to quantify some of these gains. The overall result was that all or a portion of the net gains to the industry would accrue to the backhaul shippers.

Trucking cabotage reform is an exercise in removing uncertainty and lowering operational costs. As such, the welfare gains from such reform have been highlighted. If a country is able to deregulate its domestic trucking industry, there seems to be no reason why such effort cannot be extended to the transborder market; especially given the establishment of free trade agreements with respect to goods. In this vein, negotiations leading to free *modes* of trade agreements are necessary to strengthen general trade agreements.

Bibliography

- Anderson, D. and R. Huttzell. (1989). "Trucking Regulation, 1935-1980." in J. Felton and D. Anderson eds. *Regulation and Deregulation of the Motor Carrier Industry*. Ames: University of Iowa Press. pp. 14-41.
- Annual Review of the National Transportation Agency of Canada*. (1993). Ottawa: National Transportation Agency.
- Bhagwati, J., R. Brecher, and T. Srinivasan. (1984). "DUP Activities and Economic Theory." in D. Colander (ed.) *Neoclassical Political Economy: The Analysis of Rent-Seeking and DUP Activities*. Cambridge: Ballinger Publishing Co.
- Boucher, M. (1991). "Rent-Seeking and the Behavior of Regulators: An Empirical Analysis." *Public Choice*. vol. 69. pp. 51-67.
- Browning, E. (1987). "On the Marginal Welfare Cost of Taxation." *American Economic Review*. vol. 77. no. 1. pp. 11-23.
- Buchanan, J. (1964). "What Should Economists Do?" *Southern Economic Journal*. vol. 30. pp. 213-22.
- . (1980). "Rent Seeking and Profit Seeking." in J. Buchanan, R. Tollison, and G. Tullock (eds.) *Toward a Theory of the Rent-Seeking Society*. College Station: Texas A&M University Press. pp. 3-15.
- Chamberlin, E. (1933). *The Theory of Monopolistic Competition*. Cambridge: Harvard University Press.
- Chow, G. (1995). "North American Trucking Policy." in T. Oum *et al.* (eds.) *Transport Economics: Selected Readings*. Transportation Series 103. Korea Research Foundation for the 21st Century.
- . and J. McRae (1989). "Non-Tariff Barriers and the Structure of the U.S.-Canadian (Transborder) Trucking Industry." *Transportation Journal*. vol. 30. no. 2. pp. 4-21.
- Collins, F. and J. Bowland. (1989). "The Early Results of Transportation Regulatory Reform in Canada— Revisited." *Canadian Transportation Research Forum: Proceedings*. pp. 21-8.
- Corcoran, W. (1984). "Long-Run Equilibrium and Total Expenditures in Rent-Seeking." *Public Choice*. vol. 43. pp. 89-94.
- . and G. Karels. (1985). "Rent-Seeking Behavior in the Long-Run." *Public Choice*. vol. 46. pp. 227-46.

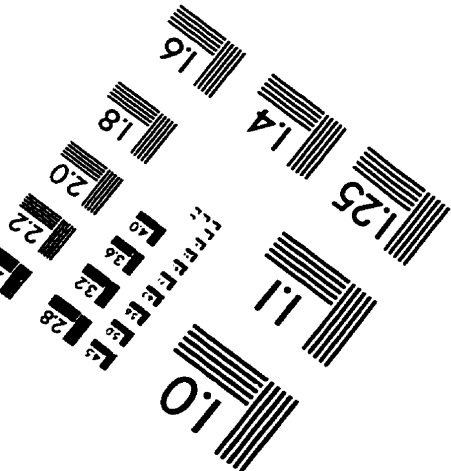
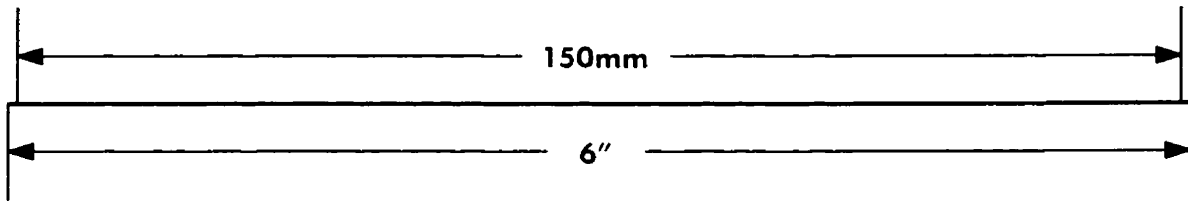
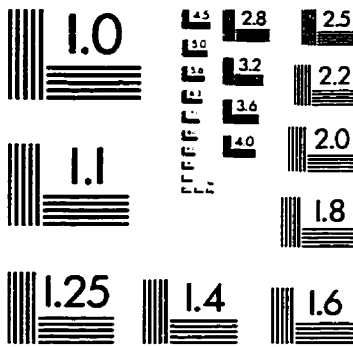
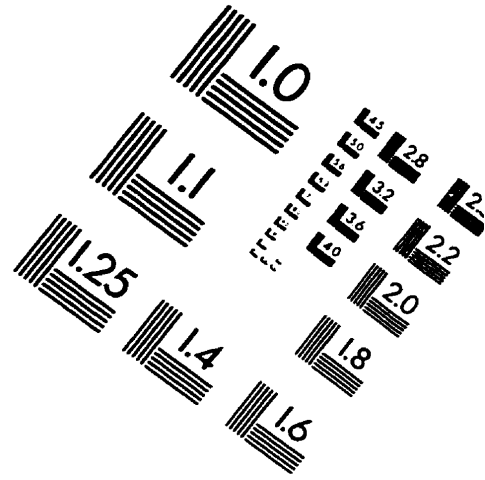
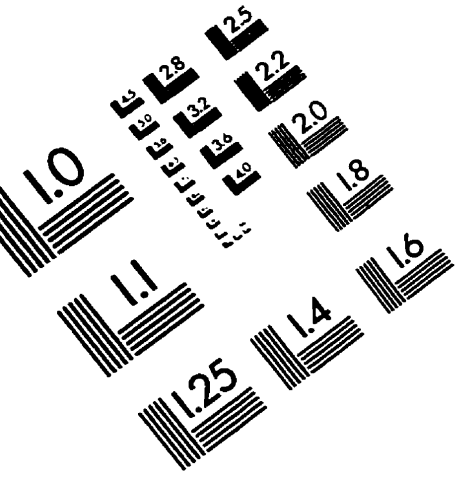
- Coughlin, C. and G. Wood. (1989). "An Introduction to Non-Tariff Barriers to Trade." *Review: The Federal Reserve Bank of St. Louis*. Jan./Feb. pp. 32-46.
- Dean, J. and D. Prokop. (1996). "Internal Threats to the University: Special Interest Groups and Rent-Seeking Behavior." *The Canadian University in the Twenty-First Century*. Centre for Higher Education Research and Development. Research Monograph no. 3. The University of Manitoba Press. pp. 67-82.
- De Vany, A. and T. Saving. (1977). "Product Quality, Uncertainty, and Regulation: The Trucking Industry." *American Economic Review*. vol. 67. no. 4. pp. 583-94.
- Felton, J. (1981). "Impact of ICC Rate Regulation upon Truck Back Hauls." *Journal of Transport Economics and Policy*. vol. 15. no. 3. pp. 253-67. Also printed in Felton and Anderson (1989). *op. cit.* pp. 66-81.
- . (1989). "Background of the Motor Carrier Act of 1935." in J. Felton and D. Anderson eds. *op. cit.* pp. 3-13.
- Francois, J. et al. (1996). "Commercial Policy and the Domestic Carrying Trade." *Canadian Journal of Economics*. vol. 29. no. 1. pp. 181-98.
- Fullerton, D. (1991). "Reconciling Recent Estimates of the Marginal Welfare Cost of Taxation." *American Economic Review*. vol. 81. no. 1. pp. 302-08.
- Harberger, A. (1954). "Monopoly and Resource Allocation." *American Economic Review*. vol. 44. pp. 77-87.
- . (1964). "Taxation, Resource Allocation and Welfare." in J. Due (ed.) *The Role of Direct and Indirect Taxes in the Federal Reserve System*. Princeton: Princeton University Press.
- Hart, O. (1985). "Monopolistic Competition in the Spirit of Chamberlin: A General Model." *Review of Economic Studies*. vol. 52. pp. 529-46.
- Heads, J., B. Prentice, and M. Harvey. (1991). *The Transborder Competitiveness of Canadian Trucking*. Economic Research Branch. Transport Canada.
- Herberg, H. (1990). "Welfare Effects of Non-Tariff Barriers: A General Equilibrium Analysis." *Weltwirtschaftliches Archiv*. vol. 126. no. 3. pp. 511-22.
- House, M. (1993). *A Canada-U.S.A. Cabotage Perspective*. Motor Carrier Branch. Policy and Coordination Group. Transport Canada
- Joyce, D. (1996). "Little Changes in Store under Proposed Cabotage Rule." *Truck West*. vol. 7. no. 1. (Jan.) p. 28.

- . (1997a). "Thorny Questions Haunt Cabotage Changes." *Truck West*. vol. 8. no. 9. (Sept.) p. 28.
- . (1997b). "Cabotage Crackdown Hits Tour Bus Operator." *Truck West*. vol. 8. no. 12. (Dec.) p. 11.
- Kamerschen, D. (1966). "An Estimation of the 'Welfare Losses' from Monopoly in the American Economy." *Western Economic Journal*. vol. 4. pp. 221-36.
- Kaplan, H. (1989). *Policy and Rationality: The Regulation of Canadian Trucking*. Toronto: The University of Toronto Press.
- Kingham, I. (1996). "NAFTA Trade Corridors- The 'Unlevel Playing Field' for International Carriers." *Canadian Transportation Research Forum: Proceedings*. pp. 677-89.
- Krueger, A. (1974). "The Political Economy of the Rent-Seeking Society." *American Economic Review*. vol. 64. pp. 291-303.
- Linster, B. (1993). "Stackelberg Rent-Seeking." *Public Choice*. vol. 77. pp. 307-21.
- Mathieson, A. (1994). "Owner Operators in Canada: Who are These Guys?" *Canadian Transportation Research Forum: Proceedings*. pp. 479-93.
- Mishan, E. (1971). *Cost-Benefit Analysis: An Introduction*. New York: Praeger Publishers Inc.
- Montufar, J. and A. Clayton. (1997). "Manitoba-Related Trucking in the Mid-Country Corridor." *Canadian Transportation Research Forum: Proceedings*. pp. 510- 24.
- Moore, T. (1978). "The Beneficiaries of Trucking Regulation." *Journal of Law and Economics*. pp. 327-43.
- Paul, C. and N. Schoening. (1991). "Regulation and Rent-Seeking: Prices, Profits, and Third-Party Transfers." *Public Choice*. vol. 68. pp. 185-94.
- . and A. Wilhite. (1991). "Rent-Seeking, Rent-Defending, and Rent Dissipation." *Public Choice*. vol. 71. pp. 61-70.
- Peat Marwick Thorne. (1991). *The Effects of Taxation on Canada-U.S. Trucking Competitiveness*.
- Peltzman, S. (1976). "Towards a More General Theory of Regulation?" *Journal of Law and Economics*. vol. 19. pp. 211-40.

- Perez-Castrillo, J. and T. Verdier. (1992). "A General Analysis of Rent-Seeking Games." *Public Choice*. vol. 73. pp. 335-50.
- Pigou, A. and F. Taussig (1913). "Railway Rates and Joint Cost." *Quarterly Journal of Economics*. vol. 27. May pp. 535-38.
- Plehwe, D. (1997). "Deregulation and Integration of Transport Industries: The Emergence of Transnational Transportation Systems." Abstract only. *Transportation Research Forum: Proceedings*. pp. 31-3.
- Posner, R. (1975). "The Social Cost of Monopoly and Regulation." *Journal of Political Economy*. vol. 83. pp. 807-27.
- Prentice, B. (1994). "The Stability/Efficiency Regulatory Trade-Off: Policy Implications for For-Hire Trucking." *Canadian Transportation Research Forum: Proceedings*. pp. 494-507.
- _____, and H. Guzman. (1992). "Implications of NAFTA for Canada-Mexico Trucking." *Asociacion Mexicana de Ingeniera de Transporte*.
- Robyn, D. (1987). *Braking the Special Interests: Trucking Deregulation and the Politics of Policy Reform*. Chicago: University of Chicago Press.
- Romer, P. (1994). "New Goods, Old Theory, and the Welfare Costs of Trade Restrictions." *Journal of Development Economics*. vol. 43. pp. 5-38.
- Rose, N. (1987). "Labor Rent Sharing and Regulation: Evidence from the Trucking Industry." *Journal of Political Economy*. vol. 95. pp. 1146-78.
- Samuels, W. and N. Mercuro. (1984). "A Critique of Rent-Seeking Theory." in D. Colander (ed.) *Neoclassical Political Economy: The Analysis of Rent-Seeking and DUP Activities*. Cambridge: Ballinger Publishing Co.
- Samuelson, P. (1969). "Contrast between Welfare Conditions for Joint Supply and for Public Goods." *Review of Economics and Statistics*. vol. 51. Feb. pp. 26-30.
- _____. (1983). *Foundations of Economic Analysis: Enlarged Edition*. Cambridge: Harvard University Press.
- Schultz, R. (1980). *Federalism, Bureaucracy, and Public Policy: The Politics of Highway Transport Regulation*. Montreal: McGill-Queen's University Press.
- Skorochod, P. and R. Bergervin. (1984). "Issues in Transportation/Distribution for the Small/New Exporter." *Canadian Transportation Research Forum: Proceedings*. pp. 831-53.
- Stigler, G. (1971). "The Theory of Economic Regulation." *Bell Journal of Economics and Management Science*. vol. 2. pp. 137-46.

- Talley, W. (1989). "Joint Cost and Competitive Value-of-Service Pricing." *International Journal of Transport Economics*. vol. 16. no. 2. pp. 119-30.
- Taussig, F. (1913). "Railway Rates and Joint Cost Once More." *Quarterly Journal of Economics*. vol. 27. Feb. pp. 378-84.
- Toll, E. (1994). "Mexican Transport Needs Work." *Journal of Commerce*. March 10. p. 7A.
- Transmode Consultants Inc. (1991). *Implications of Alternative Cabotage Rules*.
- Trimac Consulting Services. (1991). *Owner Operator Costs and Earnings Comparison in Canada/U.S. Transborder Trucking*.
- Trucking in Canada*. Ottawa: Statistics Canada. cat. no. 53-222.
- Truck West*. (1997). vol. 8. no. 4. (April) p. 30.
- Tullock, G. (1967). "The Welfare Costs Tariffs, Monopolies, and Theft." *Western Economic Journal*. vol. 5. pp. 224-32.
- . (1980a). "Rent Seeking as a Negative-Sum Game." in J. Buchanan *et al.* (eds.) *op. cit.* pp. 16-36.
- . (1980b). "Efficient Rent Seeking." in J. Buchanan *et al.* (eds.) *op. cit.* pp. 97-112.
- . (1984). "Long-Run Equilibrium and Total Expenditures in Rent-Seeking: A Comment." *Public Choice*. vol. 43. pp. 95-7.
- . (1993). *Rent Seeking*. Brookfield: Edward Elgar.
- Winters, L. and P. Brenton. (1991). "Quantifying the Economic Effects of Non-Tariff Barriers: The Case of UK Footwear." *Kyklos*. vol. 44. fasc. 1. pp. 71-91.
- Worcester, D. (1973). "New Estimates of the Welfare Loss to Monopoly, United States: 1956-1969." *Southern Economic Journal*. vol. 40. pp. 234-45.

IMAGE EVALUATION TEST TARGET (QA-3)



APPLIED IMAGE, Inc
1653 East Main Street
Rochester, NY 14609 USA
Phone: 716/482-0300
Fax: 716/288-5989

© 1993, Applied Image, Inc., All Rights Reserved

