Why are Drugs Cheaper in Canada?[1]

A Revised Version of a Talk by AIMS President Brian Lee Crowley

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Let's start with the obvious question: are drugs in fact cheaper in Canada and, second, if they are cheaper, what is the cause?

We have to start by observing that the cash price paid for something is not necessarily the full cost. There can be indirect or non-obvious costs, and that is an important matter to which I will return. For the moment, let's deal with the cash cost of pharmaceuticals.

The prices for patented medicines (broadly prescription pharmaceuticals) in Canada are controlled federally by the Patented Medicine Prices Review Board (PMPRB). It uses international price benchmarking to regulate Canadian prices, in effect creating price ceilings. The Canadian price for new products cannot be more than the average price of the seven international peers the PMPRB uses as the reference group. According to Roger Martin, in 2003, Canadian prices for patented medicines were about 5% below the international median.

In addition to federally regulated prices, provincial governments, who deliver most health care services in Canada, have a number of policies that affect prices. All provinces provide drugs for a large share of their population, generally seniors and those on low-incomes. Here the control mechanism revolves around the provincial formulary, or the list of drugs approved for reimbursement by the province. Although people not covered by the provincial drug plans are free to buy outside the formulary, in practice being off the formulary means that a drug cannot really penetrate the provincial market to any significant extent. Moreover, the province will become a bulk purchaser of many of the drugs on the formulary (for e.g. hospitals, etc.), giving them extra leverage on cost. Thus, provinces negotiate hard with drug companies on the price they will reimburse before approving a medication for the formulary. This means that the negotiations on price are not really normal negotiations because the provinces hold the "hammer" of controlling access to that essential listing on the provincial formulary. In Ontario, our largest province, a price freeze has been in effect ***since 1994*** on pharmaceuticals on the formulary.

[1] This talk draws heavily on two sources. The first is an unpublished draft paper for AIMS by Professor Brian Ferguson, a health economist at the University of Guelph on Canadian pharmaceutical pricing. We hope to publish this paper early in 2005. The second is an op-ed piece in the *Financial Post* section of the *National Post* ("Bad health buys", p. FP15, Sept.15th, 2004) by Roger Martin and James Milway summarizing their work on the Toronto biopharmaceutical cluster. Naturally, however, I remain responsible for any errors of fact or interpretation.

Many people believe that these factors are the chief explanation of the price differential between Canada and the US, but these people are quite certainly wrong. These different forms of government intervention certainly play a role, but it is relatively marginal (drug companies have frequently not raised their prices as much as they were permitted to do under PMPRB rules) compared to a couple of other factors: differences in standard of living between the two countries, and legal liability issues.

While our respective standards of living used to be quite comparable, for a number of reasons, Canada's has been falling relative to the US. Today the average Canadian has an income or standard of living (depending on how you measure it) that is 20-30% lower than the average American. That has consequences for this discussion. To understand why, we have to talk about what economists call price discrimination, which marketing people refer to as pricing to market, and which the health policy literature is increasingly tending to refer to as differential pricing.

Basically, it refers to firms selling their product in different markets, and instead of charging the same price in all markets, charging different prices on the basis of local market conditions. There are a variety of reasons for this. Differing degrees of competition in different markets will lead to different prices, and a crucial issue is how easy it is to ship between markets ie to buy a product in a low price market and re-sell it in a higher price market. To the extent that goods are re-sellable, or tradeable, price differentials will tend to disappear (when calculated properly, which means including the costs of shipping the good between the markets). Housing prices differ between markets because housing is non-tradable. You can't buy a house in Portland and ship it to Boston, so housing prices will differ between Portland and Boston on the basis of things like the demand for housing (driven, for example, by population growth) and differences in income.

When a firm sells its product in two different markets, so long as those markets are separate, the firm will calculate a unique profit-maximizing price for each market. The general rule is that price will be higher in the market where consumers are less sensitive to price (i.e. the amount they buy will be less influenced by the price they pay). Low income markets tend to be more price sensitive, so prices will tend to be lower in those markets, so long as separation of the markets can be maintained. If a consumer from a high income market can simply cross the street to buy in a low income market, or if someone could buy in bulk at the lower-income market price, and then re-sell them in a high-income market at a profit after all costs, the market separation can't be maintained and the original supplier will have to charge the same price in both markets.

A great many commodities differ in price across national borders. There is a reason why Canadians in many US border communities are known as *cheeseheads*. It's because Canadian government policy makes cheese hugely more expensive than in the US, and Canadians, on discovering how cheap American cheese is, fill their boots on their way through, for reasons that must appear mysterious to many Americans. Cars tend to be less expensive in Canada. Once the price difference reached a critical level, it became

profitable for individuals to buy cars in Canada for re-sale in the US, to a degree where the auto companies began to take measures to try and prevent it, by refusing to honour warranties on cars purchased in Canada and re-sold in the US, for example. When the Canadian dollar was high against the US dollar in the mid-nineties, we had a huge trend to "cross-border shopping", where it was worthwhile for many Canadians to cross the border and do their shopping in the US, to the dismay of many Canadian retailers, who could not escape the higher costs of doing business in Canada. Had the dollar not fallen, you can be sure the government of Canada would have found new policy measures to maintain a higher degree of "market separation" because it was putting many bad government policies under increasing economic pressure.

There is no doubt that one of the major explanation of drug price differentials between our two countries is market separation to reflect the fact that Canadians cannot pay as much as Americans for their drugs. From an economic point of view, this makes perfect sense. Every separate market will have a profit maximizing price that represents that market's maximum sustainable contribution to the R&D effort of the pharmaceutical industry, as well as covering the hard costs of producing the actual medicines consumed.

Note something very important: If a company is selling at a high price in a well-off market and a lower price in a less well-off market, and separation of the markets ends so they find themselves having to charge the same price in both markets, both the company and at least one set of consumers will be made worse off as a result.

If it raises the price in the lower-priced market, because the demand is more elastic in that market (which is why the original price was lower there), even though the price will now be higher in that market it will lose enough sales to cause its profits to fall (since the original price in that market was the profit maximizing one in that market, any other price, higher or lower, must yield a lower profit than did that original price). If it cuts its price in the higher priced market, because demand was relatively inelastic there (which is why the price was higher there in the first place) it will lose revenue as a result of lowering its price, and not pick up enough in the way of sales to compensate, so its profits in that market will fall. If it adjusts both prices, settling on a common price somewhere in between the original prices, it will lose profits in both markets.

That raises the question as to whether we should care about pharma companies' profits.

Research by Scherer (2001), for example, shows that the cyclical relation between current gross profitability and R&D spending is so close — in the sense that up- and down-swings in profitability are associated with up- and down-swings in R&D spending — as to argue that current R&D spending is funded primarily out of current gross margins. (Scherer notes that the coincidence in turning points in the profit and R&D cycles is too close to be explained by causality running from R&D to profitability, especially given the very long lags between R&D spending on a particular project and profit payoff from that project. Basically, there is a very low probability that turning points in the cycle of industry profits, where the profits are the result of R&D spending done over a decade

previously, would coincide as closely as they do with turning points in the industry's cycle of current R&D spending if causality ran from lagged R&D to current profits.)

Grabowski and Vernon (2000) also investigate the factors driving pharmaceutical R&D and conclude that, while the industry does tend to invest in areas which it expects to be profitable (hardly an unexpected conclusion), current cash flow plays a significant role in determining current R&D expenditure.

The riskiness of pharmaceutical R&D programs as investments, combined with their long and uncertain time to payoff, means that any individual drug company could expect to have to pay a significant risk premium on borrowed funds, in the form of higher interest rates. If any industry was going to have to rely heavily on retained earnings as a source of investment funds, it would be the pharmaceutical industry.

The significance of this can hardly be overstated. We are on the cusp of huge potential innovation in biopharmaceuticals driven, among other things, by the mapping of the human genome. It has been estimated that that mapping has increased the number of known receptors to which bio-chemical agents can be directed from about 450 to about 4000. But if it costs (including the costs of failed drug experiments) about $800-million to bring a new drug to market, and if, as this evidence suggests, drug research and innovation is directly powered by drug company cash flow and profitability, this is hardly the time to squeeze company profits to save a few bucks on the cost of pharmaceuticals already discovered.

The second big factor that explains cross-border price differentials and that has nothing to do with Canadian government policy is the US legal system. That system has a significant, and probably ultimately harmful, impact on the US market for prescription drugs.

Drug companies are favourite targets for American trial lawyers. They are not unique in this, of course. The entire health sector in the U.S. is a feeding ground for trial lawyers. Democratic Vice Presidential candidate John Edwards made a significant part of his fortune suing obstetricians who delivered babies suffering from cerebral palsy. Edwards' argument was that the babies would not have developed CP had they been delivered by Caesarian Section. This argument was widely rejected by medical experts, who generally argue that there are too many C-Sections performed in the U.S., but Edwards managed to convince juries to find against the doctors. This is relatively easily done, through a combination of building sympathy for the afflicted child and their family and convincing the jury that, even if they don't buy the causality being argued, it won't really be the doctor who pays, it'll be his big, rich, greedy malpractice insurance company. This approach tends to work well in Southern states, where juries tend to have a populist, redistributive slant.

The upshot of Edwards' efforts, and those of his fellow trial lawyers, is that obstetricians in the US pay more in annual malpractice premiums than a great many Americans (or Canadians) earn in a year, and more and more doctors are refusing to deliver babies.

Note that jury trials are extremely rare in Canada for civil cases, and judges tend to be more demanding on evidence and less forthcoming on "redistributive" damages than US juries.[2] The US legal system in effect imposes a huge tax on pharmaceuticals that Canadians do not have to pay.

Noah (2002) looks at the effect of legal action on the supply of vaccines and other drugs in the U.S. He notes that the United States faces a critical situation with regard to availability of basic childhood vaccines as a result of past legal action. The situation remains precarious despite changes in the law intended to protect manufacturers of vaccines. This is a longstanding problem in the United States - the number of firms supplying vaccines dropped dramatically and, as Noah notes (pg. 2), quoting the California Supreme Court in 1988 "There are only two manufacturers of the [DPT] vaccine remaining in the market, and the cost of each dose rose a hundred fold from 11 cents in 1982 to $11.40 in 1986, ***$8 of which was for an insurance reserve***." Schweitzer (Schweitzer (1997) notes that the number of U.S. pharmaceutical firms engaged in contraceptives research dropped from 9 to 2 as a result of liability fears. Even though there are genuine risks associated with some vaccines, the risks associated with lack of immunization is much greater and much more severe. And as the number of children receiving basic childhood shots declines, North America's herd immunity is falling to a dangerously low level - to the point where an epidemic of one of the more serious childhood diseases, which many people erroneously believe to have been eradicated, is a real possibility.

Returning to the topic of drug pricing, Manning (1997) looked at the role played by American liability rulings on the difference in pharmaceutical prices between Canada and the United States. He concluded that: "A large part of the observed variation in the price differential is attributable to anticipated liability cost, and liability effects explain virtually all of the very big price differences observed. The best prediction of the model is that in this data set, liability risk roughly doubles the average price differential and increases the median price differential by about one-third." Proponents of re-importation of drugs from Canada to the United States might take note: John Edwards' law school classmates will have a field day with drugs which twice crossed the border of the country which Americans blame for letting Mad Cow Disease into their food supply. They are clever and inventive enough to find a way to use the US legal system to impose some of those liability costs on Canadians, with predictable effects on prices.

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[2] One lawyer I spoke to did three civil trials with jury in 30 years of trial practice and he estimated that record would probably put him in the top 10 percent of lawyers who have a record of doing jury trials in Canada. The chief difference between Canada and the USA in this area has mostly to do with the control exercised by Canadian judges over the questions put the jury, the directions given to the jurors, and the greater latitude one has in appealing jury decisions in Canada. Lawyers tend not to use jury trials for medical malpractice cases because of the risk of having to go through a second expensive trial if the jury award or decision is overturned on appeal. The Supreme Court of Canada has also effectively capped radical growth in awards. Punitive damages often make up a substantial part of a U.S. award, while such damages are very difficult to get in Canada.

So it would be my view that the evidence shows that the price differential between Canada and the US is driven chiefly by market forces (in the form of market separation) plus the US-government imposed costs of your product liability policies. Canadian government price controls explain considerably less of the differential, but the precise proportions are a matter for further research.

One of the most important things to understand about the way pharmaceuticals work in Canada vs the US is actually not how government intervention influences pricing, but how it affects the behaviour of the industry, investment and innovation. I would make the case that this is the great hidden cost of our system.

In a paper just published by Roger Martin, the Dean of the Rotman Business School at the University of Toronto, and James Milway, Executive Director of the Institute for Competitiveness and Prosperity (Martin and Milway, 2004), the authors examined the biopharmaceutical sector in Toronto, which because of the presence of many high quality factors of production in that sector, should be a North American leader in R&D and innovation in pharmaceuticals. Instead it lags well behind its peers, such as Boston.

Why? Martin and Milway are unambiguous: "On a per capita basis, Ontarians spend about three-quarters of their U.S. counterparts on drugs ($512 in Ontario v. $674 in the United States). While many applaud this, it represents a public policy choice. We have lower prices, but the lack of a sophisticated buying process means a less well developed cluster and reduced innovation and upgrading from our impressive factors conditions. The single dominant buyer in the process in Ontario differs from the process in the United States — one with multiple buyers who are both demanding and sophisticated as a result of the pressure placed upon them by the end consumer, who is more educated and has multiple choices of health care providers and a system that is less restrictive at the state level."

The outcome is that Canada produces pharmaceutical inventions at half the rate of the US industry, per capita investment in R&D is one of the lowest in the developed world, R&D investment grew 13.5% annually, vs 32.5% in the US, and average wages in Ontario's biopharma cluster are 38% lower than in the largest US states. Pretty clearly government policies in Canada (predominantly the dominant buyer ones I've described) squeeze pharmaceutical company profitability, over and above the influences of the other two factors I've referred to. R&D and production activities will, in a globalized pharmaceutical industry, be transferred to the jurisdictions where the greatest post-tax profits can be generated, and that in turn generates investment in R&D effort that, in its turn, generates new discoveries, production, R&D and so forth. The US has created a virtuous circle in this regard, Canada a vicious one.

That's not all. **Dominant buyer conditions reduce availability of new products**. Government procurement practices do not simply reduce price. To contain costs, government has implemented mechanisms to limit reimbursement of new drugs. Ontario has one of the most restrictive provincial drug formularies with only 35% of new drugs launched between 1997 and 2002 versus 59% of new drugs listed in Quebec, one of the

least restrictive provinces. This is in spite of the fact that research shows that new drugs tend to be more effective and have fewer side effects on average than the older drugs that they displace. Further, the price freeze that has been in effect since 1994, not only limits industry revenue, but further affects prices for new products brought to market. By limiting the number of new innovative treatments that are reimbursed, the government' s silo mentality is in effect raising total health care expenditures by focusing solely on the price of the drug listed at the expense of the total cost of treatment per patient.

Dominant buyer conditions slow down availability of new products. Even for new drugs that are listed, provincial ministries are slow to list them. In Canada, new drugs face a two-stage approval process. Health Canada has one of the world's longest drug approval times. In addition, it takes more than a year for new drugs to be approved for Ontario's formulary, which has an impact on all other sales in the province as other formularies and prescribing physicians often follow its lead. While other payers and prescribing physicians may have the ability to gain access to newer drugs, once approved by Health Canada, many take their lead from the Ontario formulary.

Conclusion

To wrap this all up, if you want Canadian pharmaceutical prices in the US, the steps you must follow are clear. You must cut your standard of living by 20-30%. You must reform your ludicrous product liability laws. And you must squeeze pharmaceutical industry profits through price controls and dominant purchaser policies, thus causing lower levels of pharmaceutical investment and innovation, getting cheaper prices for medicines already discovered at the cost of prolonged pain and suffering for victims of diseases we cannot yet cure or control. And you must restrict patient access to the latest and best medicines in order to keep costs low.

I leave you with this final thought: suppose the difference in prices between Canada and the US is, as I've suggested, primarily market driven. Suppose also that the US government allows reimportation of drugs from Canada, eliminating market separation. In that case, prices in Canada can be expected to rise to US levels, with the result that Canadian consumers lose out and US consumers are no better off. In addition, drug companies are worse off since any price discrimination which occurred was profit maximizing. And those in need of pharmaceutical innovation (i.e. the sick and potentially sick) are worse off because the stream of future innovations will be reduced.

Basically, everybody loses, or at the very least nobody wins.