

# CASH FOR KIDNEYS? THE CASE FOR COMPENSATED ORGAN DONATION





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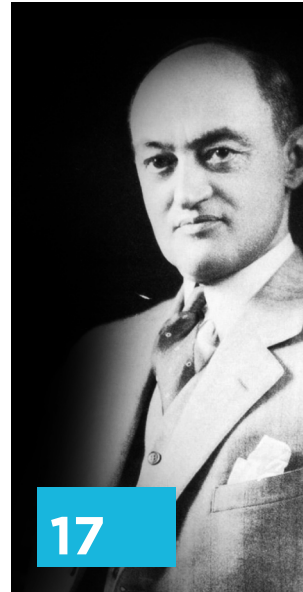
*Our mission is to improve the quality of life for Canadians, their families and future generations by studying, measuring and broadly communicating the effects of government policies, entrepreneurship and choice on their well-being.*

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Ryan Hill

# WELCOME

Dear Readers:

Welcome!

After a very long winter, the snow is finally melting in most of the country and we are headed into the warmer months.

This edition of the *Canadian Student Review* highlights two fascinating articles from our student contributors. William Dunstan outlines the potential benefits of a human organ market and Brennan Sorge explains CANZUK, a free trade opportunity for Canada. Meanwhile, senior fellow Vincent Geloso reflects on the great work of the late economist Harold Demsetz, and the Fraser Institute's own Ashley Stedman and Elmira Aliakbari discuss why electric cars may not be as clean as they seem.

We are also excited to highlight a video from the Foundation for Economic Education, *Made in Mékhé*, which showcases the compelling Magatte Wade – a past *Explore Public Policy Issues* speaker!

We wish you all the best as you begin to wrap up your school year and encourage you to stay connected with us in the months ahead by liking our Education Programs Facebook page ([www.facebook.com/EducationPrograms](http://www.facebook.com/EducationPrograms)).

Best,

Ryan

# The Essential and Importance of ADAM SMITH

JAMES OTTESON

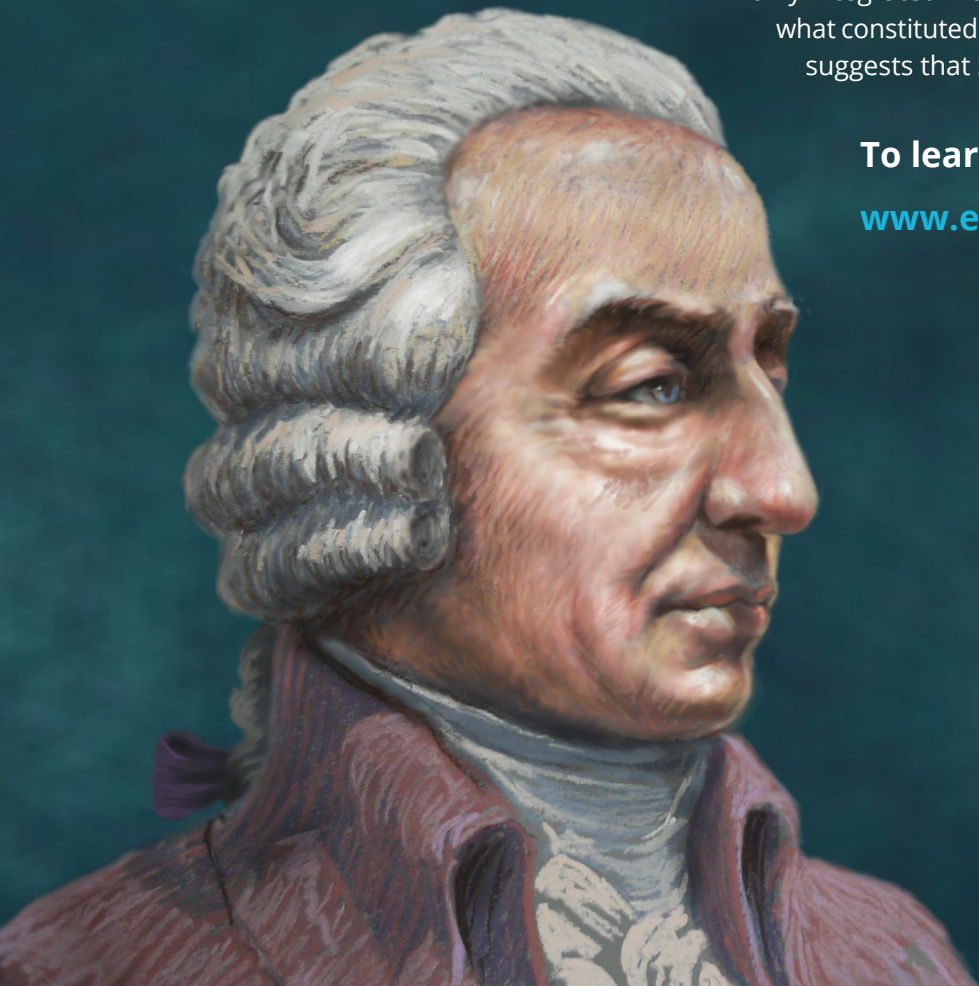
Adam Smith (1723 – 1790) is widely hailed as the founding father of economics. He wrote only two books, but the number of topics and ideas covered is vast. This book introduces Smith's most important ideas and gives readers some appreciation of both the depth and the breadth of his thought, which are as applicable today as they were in the late 1700s when he originally wrote them.

Can we engage in economic transactions while maintaining our morality? Must we give up on our morality in order to become rich? As our world becomes increasingly integrated by trade, finance, and commerce, these questions become all the more pressing. As current as such questions are, they were already explored by Adam Smith in the eighteenth century.

Smith offered a framework for understanding morality that not only integrated market transactions but set parameters for what constituted acceptable transactions. Modern research suggests that Smith was astonishingly accurate.

**To learn more, visit**

[www.essentialadamsmith.org](http://www.essentialadamsmith.org)



# ESSAY CONTEST INFORMATION

Showcase your ideas on public policy and the role of markets by entering our essay competition. \$9,000 in cash prizes will be awarded, \$3,000 of which is designated just for high school students! Winning essays may be published in Fraser Institute journals and authors will have the opportunity to experience the peer review process.

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### **2019 Essay Contest – What in the world would Adam Smith say?**

Drawing on Smith's 1776 book, *An Inquiry into the Nature and Causes of the Wealth of Nations*, construct an essay that takes Smith's thoughts and extrapolates them to a current or recent episode in history, OR a current Canadian policy issue.

While constructing your essay, you may choose to consider one or more of the following:

- What would Adam Smith say about the state of markets today? What would he change?
- Would Smith agree or disagree with the recent rise of protectionism?
- What would Adam Smith think about trade tariffs?
- How would Smith explain why some nations are poor while others are rich?
- What would Smith say about the future of automation in the workplace?
- Consider a current Canadian policy issue (e.g. minimum wage, consumer regulations, etc.) and discuss what Smith would think about it. Would he agree or disagree with this policy?

**EXTENDED DEADLINE: June 1, 2019**

To learn more, visit [www.studentessaycontest.org](http://www.studentessaycontest.org)

# CASH FOR KIDNEYS? THE CASE FOR COMPENSATED ORGAN DONATION

WILLIAM DUNSTAN

In 2016, 4,029 Canadians were unable to get a desperately needed kidney or liver transplant; 175 died as a result (CIHI, 2017). In Canada, and in most other places in the world, organ donation rates are too low to meet demand for transplants. There has been modest success in appealing to potential donors' altruism, but a larger supply of transplant organs could be secured by appealing to people's self-interest. Paying people to donate their organs—i.e., establishing a system of so called compensated donation for organs donated by a living patient—would provide a substantial benefit in both Canada and other countries should they pursue such policies.

The precise system of compensated organ donation (COD) that I am advocating for is one where governments pay each donor a certain amount of money and the recipient or a third party can offer donors additional payment as a further inducement. Though this idea may seem radical, such a system has been practiced in Iran for over 30 years, albeit really only with kidneys. Iranian COD has been immensely successful. Within two years of introducing COD, living donation rates tripled and have grown further since (Ghods, 2002). Rouchi et al. (2014) found that there are

**5-YEAR SURVIVAL RATES FOR RECIPIENTS OF CADAVERIC KIDNEYS DONATIONS ARE AROUND 80%, THOSE FOR RECIPIENTS OF LIVING DONATIONS APPROACH 90%**

around 20 living kidney donations per million people (pmp) each year in Iran – most of which presumably come from paid donors, compared to just 15 pmp in Canada (CIHI, 2017). These

living donations account for 66 percent of Iranian kidney transplants, compared to just 42 percent of Canadian transplants (Rouchi et al., 2014; CIHI, 2017). This proportional reliance on living donations is another benefit of COD. While 5-year survival rates for recipients of cadaveric kidney donations are around 80 percent, those for recipients of living donations approach 90 percent (Dominguez-Gil and Pascual, 2008).

Iran's success is simple to understand: more people will donate kidneys if they have a financial incentive to do so. The power of incentives is why incorporating private payments into COD systems is necessary. Wealthier patients can obtain timelier transplants by offering prices matching the demands of potential donors who would not donate for the base amount set by the government. This increases the quantity of organs supplied and reduces wait times for patients who cannot afford private payments by shrinking waiting lists for transplants supplied at the government price. In Shiraz, a province where private payments are effectively banned, fewer transplants are completed each year and a greater proportion of these kidneys come from lower-quality cadaveric donors than elsewhere in Iran (Fry-Revere, 2014).

The idea that offering money for organs will increase living donations is virtually uncontested. However, much debate over COD focuses not on efficiency but on issues like outcomes for donors, impacts on equality of access to health care, and the viability of alternative means of increasing donation rates.

COD promises people opportunities to improve their lives by providing money they can use to, say, pay off debt or fund their education. But some worry that paid donors will not see these benefits and that COD will



only exploit donors' desperation. Evidence from Iran suggests these fears are overblown. Seventy-three percent of paid donors claim that selling their kidney helped them resolve financial difficulties (Jahromi et al., 2015). One donor, for example, claims his life is "a thousand times better" after he used the payment for his kidney to pay off a loan and become financially stable (Fry-Revere, 2014: 182). Inevitably, some paid donors will have negative experiences. But it is hardly fair to remove an opportunity, much less one that saves others' lives, just because the potential benefits fail to materialize for a select few.

Further, contrary to many people's initial assumptions, COD does not drastically reduce equality of access

to transplants relative to altruism-only systems like Canada's. In Iran, 50.4 percent of kidney recipients from paid donors are poor and a third are middle-class (Ghods and Savaj, 2006). Wealthier Iranian patients have an easier time procuring transplants, but this is the case in Canada too. Even though provincial governments cover health care costs, the average organ donor in Canada loses \$3,268 through travel costs, lost wages, and other expenses, with some donors facing costs exceeding \$10,000 (Klarenbach et al., 2014). As wealthier Canadians are more likely to have friends or family who can bear these costs, they are better able to find a donor notwithstanding the ban on payment. In Canada and other countries with altruism-only donation, wealthier patients are



still more likely to get transplants from living donors (Klarenbach et al., 2006; Grace et al., 2012). So, COD and altruism-only systems are in fact quite equal in regards to equality of access to transplants.

Another common argument is that COD is unnecessary because we could ensure an adequate supply of transplant organs by adopting presumed consent so that people have to opt-out of being a donor rather than opt-in. Adopting presumed consent may be worthwhile, but evidence from Spain—often considered to have the world’s premier organ transplant system—shows that it does not eliminate the need for COD. Despite having the world’s highest cadaveric donation rates, more than 4,000 Spaniards remain on a waiting list for a kidney while fewer than 3,000 transplants are completed each year (Matesanz et al., 2017). Presumed consent also lowers living

donation rates as people feel less of an obligation to donate. In Spain, roughly 90 percent of kidney transplant recipients get lower-quality cadaveric organs (Matesanz et al., 2017), compared to about a third of Iranian recipients (Rouchi et al., 2013).

Paying people to donate their organs is sensible policy. The Iranian experience shows that COD creates a larger supply of higher-quality transplant organs, provides economic opportunities, and creates little additional inequality of access to transplants. It may be unfortunate that we need to pay donors to ensure an adequate supply of transplant organs or that there are people in situations where their decision to sell an organ is a rational one, but we must recognize that all that banning compensated organ donation achieves is denying economic opportunity and condemning people to unnecessary deaths. ♦

*William Dunstan is a recent graduate of St. Matthew High School. He is currently a first year Public Affairs and Policy Management student at Carleton University.*



#### REFERENCES

- Canadian Institute for Health Information [CIHI] (2017). *Annual Statistics on Organ Replacement in Canada: Dialysis, Transplantation and Donation, 2007 to 2016*. CIHI. <[www.cihi.ca/sites/default/files/document/corr\\_ar-snapshot-en.pdf](http://www.cihi.ca/sites/default/files/document/corr_ar-snapshot-en.pdf)>, as of January 2, 2019.
- Dominguez-Gil, Beatriz, and Julio Pascual (2008). Living Donor Renal Transplant in Spain: A Great Opportunity. *Nefrologica* 28, 2 (April): 123-238.
- Fry-Revere, Sigrid (2014). *The Kidney Sellers: A Journey of Discovery in Iran*. Carolina Academic Press.
- Ghods, Ahad J. (2002). Renal Transplantation in Iran. *Nephrology Dialysis Transplantation* 17, 2 (February): 222-228.
- Ghods, Ahad J., and Shekoufeh Savaj (2006). Iranian Model of Paid and Regulated Living-Unrelated Kidney Donation. *Clinical Journal of the American Society of Nephrology* 1, 6 (November): 1136-1145.
- Grace, Blair S., Alan Cass, Philip A. Clayton, and Stephen P. McDonald (2012). Transplantation Rates for Living—but not Deceased—Donor Kidneys Vary with Socioeconomic Status in Australia. *Kidney International*, 83: 138-145.
- Jahromi, Alireza Hamidian, Bahar Bastani, and Sigrid Fry-Revere (2015). A Revised Iranian Model of Organ Donation as an Answer to the Current Organ Shortage Crisis. *Iranian Journal of Kidney Diseases* 9, 5 (September): 354-360.
- Klarenbach, Scott, Amit X. Garg, Sorina Vlaicu (2006). Living Organ Donors face Financial Barriers: A National Reimbursement Policy is Needed. *Canadian Medical Association Journal* 174, 6 (March): 797-798.
- Klarenbach, Scott, John Arnold, Neil Boudville, Timothy Caulfield, Meaghan Cuerden, Amit Garg, John Gill, Philip Jacobs, Martin Karpinski, Gregory Knoll, G.V. Ramesh Prasad, Leroy Storsley, Darin Treleavan (2014). Economic Consequences Incurred by Living Kidney Donors: A Canadian Multi-Center Prospective Study. *American Journal of Transplantation* 14, 4 (April): 916-922.
- Matesanz, Rafael, Elisabeth Coll, Beatriz Dominguez-Gil, Beatriz Mahillo, R. Marazuela (2017). How Spain Reached 40 Deceased Organ Donors per Million Population. *American Journal of Transplantation* 17, 6 (June): 1447-1454.
- Rouchi, Alireza Heidary, Mohammad Aghighi, and Fatemeh Ghaemi (2014). Outlook of Organ Transplantation in Iran: Time for Quality Assessment. *Iranian Journal of Kidney Diseases* 8, 3 (May): 185-188.

# MADE IN MÉKHÉ

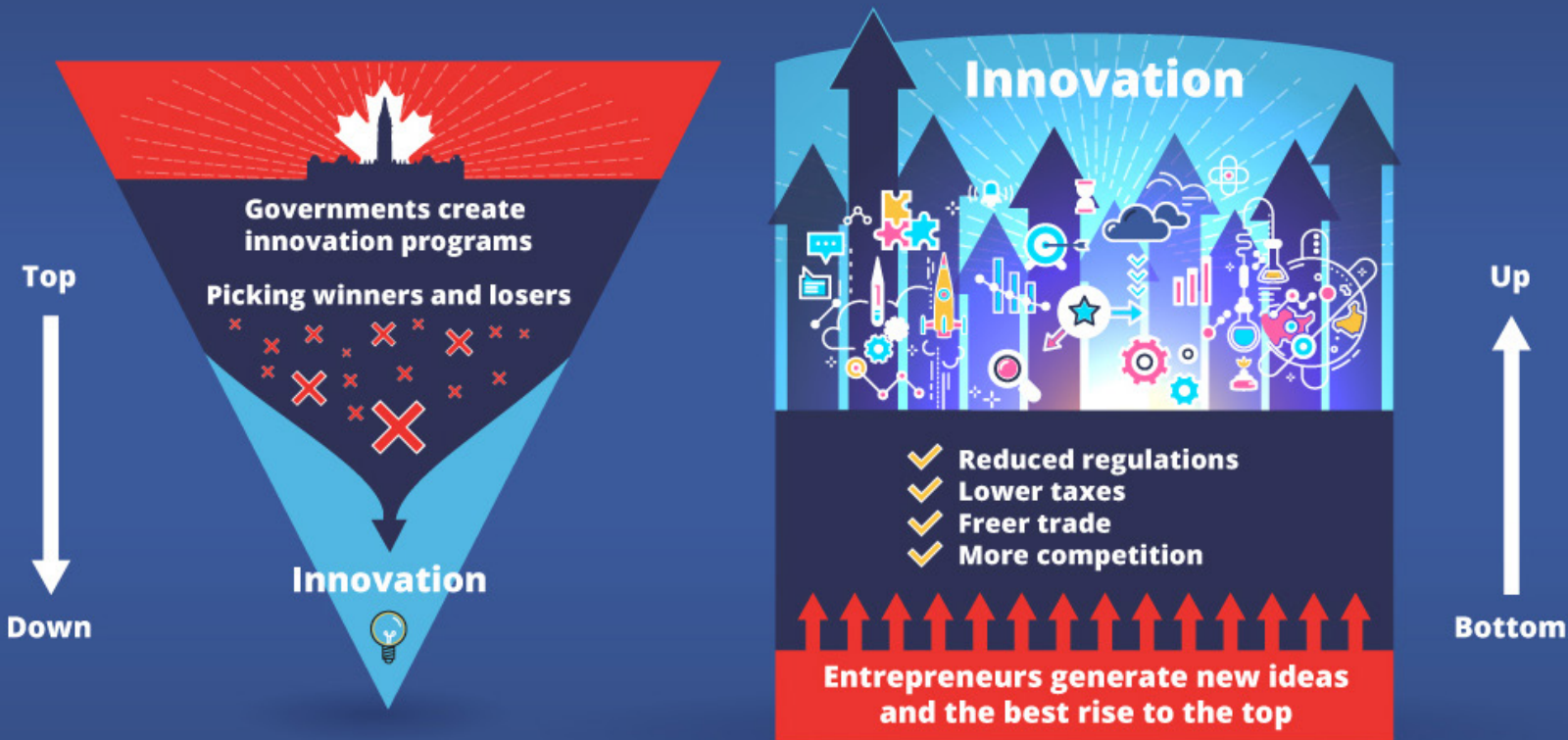


Magatte employs a Senegalese company, CAWAAN, to sew the bags for her products. The Gueye Family are fifth-generation makers of handmade leather goods.

# INNOVATION IN CANADA: AN ASSESSMENT OF RECENT EXPERIENCE

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## Government top-down innovation programs don't work



**To spur innovation, governments need to establish the right economic environment for entrepreneurs and businesses**

# CANZUK: An Opportunity for Canada?

**BRENNAN SORGE**

There is an old proverb that says you shouldn't put all your eggs in one basket. In 2018, Canada was confronted with a substantial risk to its economic wellbeing. That risk came in the form of the NAFTA (North American Free Trade Agreement) negotiations, where it became abundantly clear that NAFTA was not as secure as Canada had anticipated. With the United States being the source of just over 60 percent of Canada's imports and the destination of 70 percent of its exports, the recent instability in NAFTA could

**IN 2018, CANADA WAS CONFRONTED WITH A SUBSTANTIAL RISK TO ITS ECONOMIC WELLBEING**

easily have been damaging for Canada (Statistics Canada, 2019a). This situation has highlighted the dangers of our reliance on the US, and exposed the need for Canada to have diverse trading partners.

The questions surrounding the future of NAFTA (now called the United States-Mexico-Canada Agreement, or USMCA) are concerning, and should drive Canadians to ask an important question: how can Canada diversify its trade and economic ties beyond the United States? Additional trade agreements are certainly one important step toward answering this question, and one that Canada has already acted on with the launch of the Trans Pacific Partnership (TPP). However, the US has held a powerful economic lever in its relationship with Canada not just because of our joint trading relationship, but also because our two economies are much more integrated with each other than they are with other nations. Both workers and companies can move or expand across our shared border in either

direction. For instance, more Canadians work in the United States than they do anywhere else in the world (Statistics Canada, 2019b).

Agreements like the TPP are important, but they do not allow Canada to economically integrate with other nations in the same way that Canada does with the United States. If trade agreements are not the correct vehicle for facilitating integration, would it be advantageous for Canada find alternative ways to integrate with other nations, and if so, which ones? One answer comes in the form of a proposal called "CANZUK." This agreement between Canada, Australia, New Zealand, and the United Kingdom, would allow for free trade, recognize free movement for citizens, and give citizens the ability to work in all signatory nations without a visa. This proposal is substantially more comprehensive than a trade deal and because of the increased ease of movement it would create, especially in terms of labour mobility, CANZUK could enable Canada—and the other signatory nations—to become more strongly tied to each other and so reduce their reliance on the United States.

There are some compelling reasons to favour CANZUK. The involved nations already share many commonalities, which would allow for relatively seamless economic integration. In purely economic terms, all four nations have relatively similar average incomes and standards of living (Statista, 2019). Economic freedom is similar between the four nations, with Canada and Australia being tied for the tenth freest economy, the United Kingdom being only slightly better off at ninth, and New Zealand ahead at third (Fraser Institute, 2018). As a multilateral treaty, CANZUK would also reduce the regulatory confusion that would result from multiple bilateral trade treaties. Furthermore, all four nations share

the same language, a similar legal and government system, and a shared history.

Undoubtedly, an agreement like CANZUK does not come without challenges. An obvious challenge is geography. The four nations are scattered across the world, and developing robust trade with each other would be far more difficult and costly than it was for Canada with the United States. Another challenge could be the difficulty in negotiating a deal that all four nations would accept, although some limited polling done by Canzuk International, a non-profit advocating for the implementation of this policy, indicates that there would be significant public support in all four countries if this policy were proposed (Canzuk International, 2018). Managing public expectations

and addressing the concerns of those opposed would also require considerable political capital and policy development.

Overall, as the troubles with the NAFTA renegotiations over the past months have demonstrated, it is in Canada's best interest to expand its trading relationships and improve its integration into the larger world economy. An agreement like CANZUK would go a long way toward achieving this goal. Even though challenges remain, CANZUK is worth further investigation, and certainly demands more public discussion. Canada's eggs have all been left in one trade basket for far too long. ♦

*Brennan Sorge is currently an economics and business student at Thompson Rivers University. His interests centre on the effects of law and policy on the economy, and he hopes to act on these interests in further study of both economics and law.*



#### REFERENCES

- Canzuk International (2018). *National and Regional Polling Results* – April 2018. Canzuk International. <<https://www.canzukinternational.com/wp-content/uploads/2018/04/CANZUK-International-National-Regional-Polling-2018.pdf>>, as of January 4, 2019.
- Fraser Institute (2018). *Economic Freedom of the World: 2018 Annual Report*. The Fraser Institute. <<https://www.fraserinstitute.org/economic-freedom/map?geozone=world&page=map&year=2016#country-info>>, as of January 3, 2019.
- Statista (2019). *Ranking of Countries by Median Self-reported Household Income between 2006 and 2012*. Statista. <<https://www.statista.com/statistics/318120/ranking-of-countries-by-median-household-income/>>, as of January 2, 2019.
- Statistics Canada (2019a). *Table 12-10-0011-01: International Merchandise Trade for All Countries and by Principal Trading Partners*. Government of Canada. <<https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1210001101>>, as of March 19, 2019.
- Statistics Canada (2019b). *Migratory Exchanges between Canada and Other Countries. Canadians Abroad*. Government of Canada. <<https://www150.statcan.gc.ca/n1/pub/11-008-x/2008001/article/10517-eng.htm#3>>, as of January 2, 2019.

# THE LATE GREAT ECONOMIST EVERYONE SHOULD KNOW

VINCENT GELOSO

As 2019 dawned, US economist Harold Demsetz passed away. He was one of the most cited economists of the 20th century. One of his early articles tops the list of the most important articles in the *American Economic Review* (the highest-ranking economic journal). This article is more often cited than the top articles of better-known economists such as Joseph Stiglitz and Paul Krugman who, unlike him, went on to win the Nobel prize in economics. Demsetz's reach also went beyond economics and deeply affected the legal profession.

Most Canadians have probably never heard of Harold Demsetz. The same is likely true of Americans. In fact, it's possible that most economists under age 45 would be unable to name him. Yet he's well worth knowing.

Demsetz is so important because his way of conceiving of markets differed from that of his contemporaries. Back in the mid-twentieth century, economists started from the textbook notions of "perfect competition" and believed that anything that did not conform to this was inefficient and that consumers were being gouged. To rectify cases of gouging, many economists advocated using government intervention. The best example is in the field of competition policy. If a firm was seen as having a large share of a particular market, it was deemed to be a monopoly. As a result, the economists claimed, there was an inefficiency that hurt consumers. The state would have to intervene and break up the large firm.

Demsetz contested that view in a very subtle way. He pointed out that firms are lured by the expectation of large profits when they decide to innovate and create new products and increase their efficiency (firms don't typically pursue large market shares per se). After all, why go through a long process of research and

development to improve a firm's efficiency only to gain one or two percent of the market?

By asking this question, Demsetz was flipping conventional logic on its head. Until then, economists had tended to assert that high concentration allowed firms to be monopolists and earn high profits. Demsetz argued that efficient firms were able to secure large market shares and high profits. The lure of large market shares was the incentive to innovate and become quite efficient. Thus, high concentration could be synonymous with improvement in consumer welfare.

Demsetz argued that barriers to entry could hurt consumers most. As long as a single large firm could reasonably fear competitors from within the industry or from outside of it (e.g., a new product that made that firm's product obsolete), it would keep acting in a competitive manner. If potential competitors were kept out, then consumers were adversely affected.

A Canadian example illustrates this point.

In 2008, the Canadian firm that produced the famed BlackBerry phones, Research in Motion, represented 60 percent of the market for smartphones. Research in Motion achieved that market share by creating a revolutionary new product that satisfied consumers at a relatively low price given the quality (e.g., security features, ease of typing, multitasking abilities, complementary applications). It secured a large market share and large profit. And then, as other firms entered the market for smartphones and improved their products in other dimensions, Research in Motion started losing market share. The company is now only a shadow of what it used to be.

Likewise, current market leaders such as Amazon, Netflix, and Google will also fall by the wayside if they are unable to keep innovating and satisfying consumers. If they fail to do so, minor competitors (who are sometimes just a free computer mouse click away) will easily pick up where they dropped the ball and the established firms will face a fate similar to that of Research in Motion.

Demsetz's insight is crucially relevant to modern policymaking. First, it suggests that it's easy, based only on market share, to confuse efficiency with monopoly. Ideally, this understanding leads all policymakers to be more humble about their ability to diagnose problems, let alone solve them.

Second, and more important, Demsetz's insight suggests that the best course of action for policymakers is to follow a "first, do no harm" approach. Rather than ask what governments can do to rectify a situation, the relevant question becomes "What has the government done to create the problem?" For example, is the government creating barriers to entry in a certain field? Is it limiting competition by subsidizing incumbent players? Is it increasing the cost of entry by imposing burdensome regulations?

This is a far humbler policy course that, prior to Demsetz's work, did not hold much sway. Today, it commands more respect. For that reason alone, it's worth considering Demsetz to be one of the greatest economists worth knowing. ♦

*Vincent Geloso, Fraser Institute Senior Fellow, is a visiting professor of economics at Bates College (Lewiston, ME) and earned his PhD from the London School of Economics. Previously, he was postdoctoral fellow at Texas Tech University and earned his undergraduate degree from the University of Montreal.*

*Professor Geloso specializes in the measurement of living standards today and in the distant past. He combines his specialization in economic history with a specialization in political economy in order to explain differences in living standards over time and space. His articles have been published in Economics and Human Biology, Canadian Journal of Economics, Social Science Quarterly, Journal of Economic History, Health Policy and Planning, and Historical Methods and many provincial and national newspapers.*



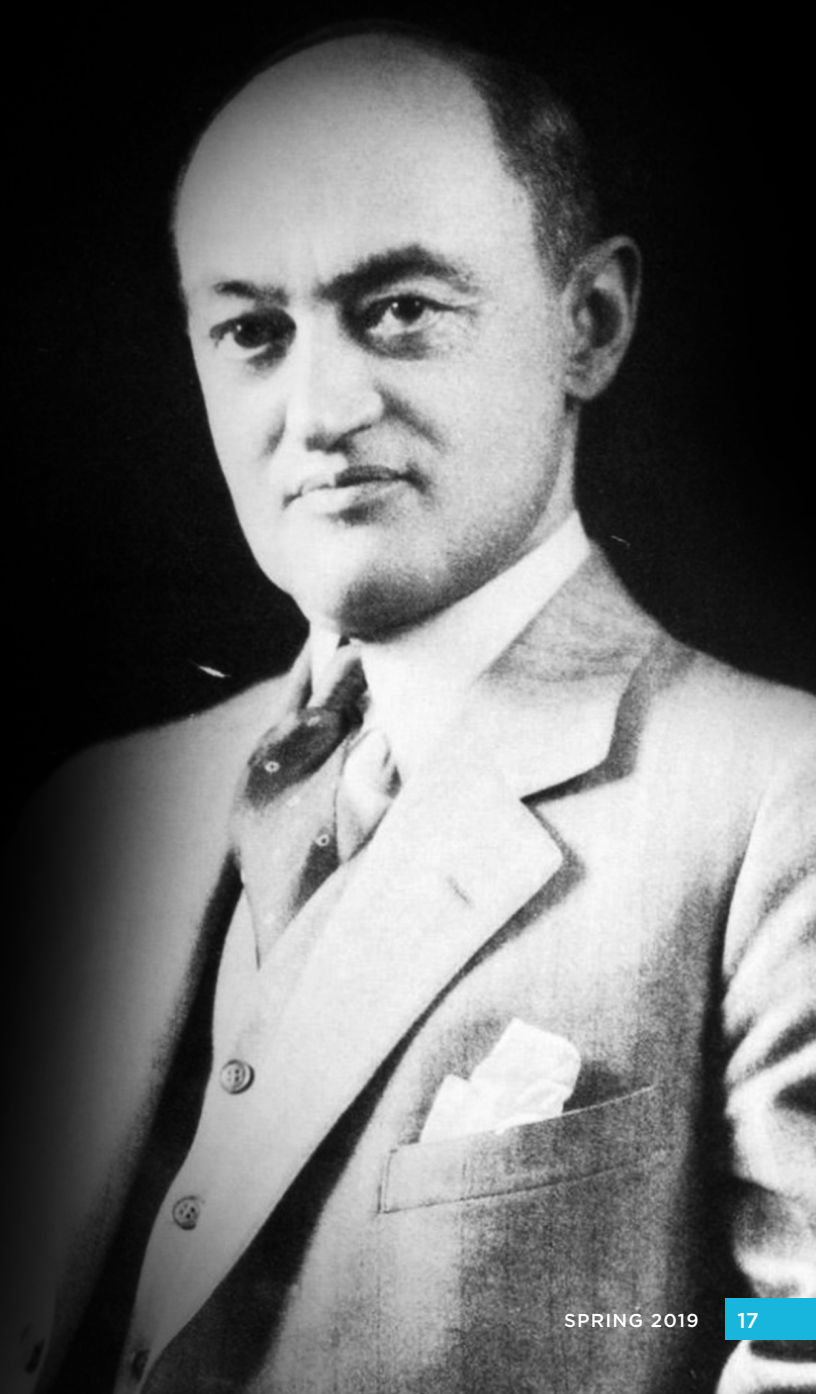
Photo Credit: Reed Hutchinson/UCLA



**SITUATIONS EMERGE IN THE PROCESS OF CREATIVE DESTRUCTION IN WHICH MANY FIRMS MAY HAVE TO PERISH THAT NEVERTHELESS WOULD BE ABLE TO LIVE ON VIGOROUSLY AND USEFULLY IF THEY COULD WEATHER A PARTICULAR STORM.**

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— JOSEPH SCHUMPETER



# ELECTRIC CARS MAY NOT BE AS CLEAN AS THEY SEEM

ELMIRA ALIAKBARI AND ASHLEY STEDMAN

There has been growing support for electric vehicles in many countries including Canada. Many governments have given sizeable subsidies to electric car buyers to help lower the price of electric vehicles and therefore increase the demand for them.

One of the major justifications for government subsidies is that electric vehicles will reduce greenhouse gas emissions. However, according to new research published by Bloomberg, emissions may actually increase depending on the source of energy used in battery manufacturing.

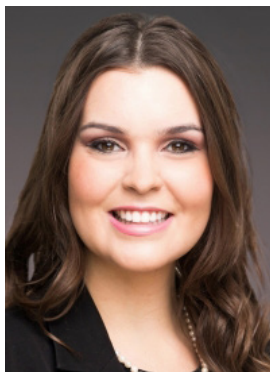
What's often misunderstood about electric cars is that the lithium-ion batteries need for these cars are manufactured in some of the world's worst-polluting countries. More specifically, by 2021, most of the battery components for electric vehicles will come from countries such as China, Thailand, Germany, and Poland, each of which relies on non-renewable energy sources such as coal for electricity. As a result, while electric cars are emission-free on the road, the process of building the batteries may discharge a significant amount of carbon dioxide.

According to the sources presented in the research, building a car battery for a sport-utility vehicle (1,100 pounds) could emit up to 74 percent more CO<sub>2</sub> than producing an efficient conventional gas-powered car, assuming the battery is manufactured in a factory powered by fossil fuels such as coal. The specific amount of additional CO<sub>2</sub> from electric vehicles is dependent on where the battery is made, how it's made, and the sources of electricity.

Simply put, drivers in countries heavily dependent on non-renewable powered electricity generation might release more CO<sub>2</sub> emissions with electric cars compared to an efficient diesel engine. For instance, in Germany, an electric vehicle would take more than 10 years to break even with respect to its CO<sub>2</sub> emissions with a vehicle with an efficient combustion engine.

In reality, the environmental benefits of electric vehicles may not be realized if the electricity used to build the vehicle's battery comes primarily from non-renewable sources. ♦

*Ashley Stedman is a senior policy analyst working in the Centre for Natural Resources. She holds a BA (Honours) from Carleton University and a Master of Public Policy from the University of Calgary. Ms. Stedman is the co-author of a number of Fraser Institute studies, including the annual Global Petroleum Survey and Survey of Mining Companies.*

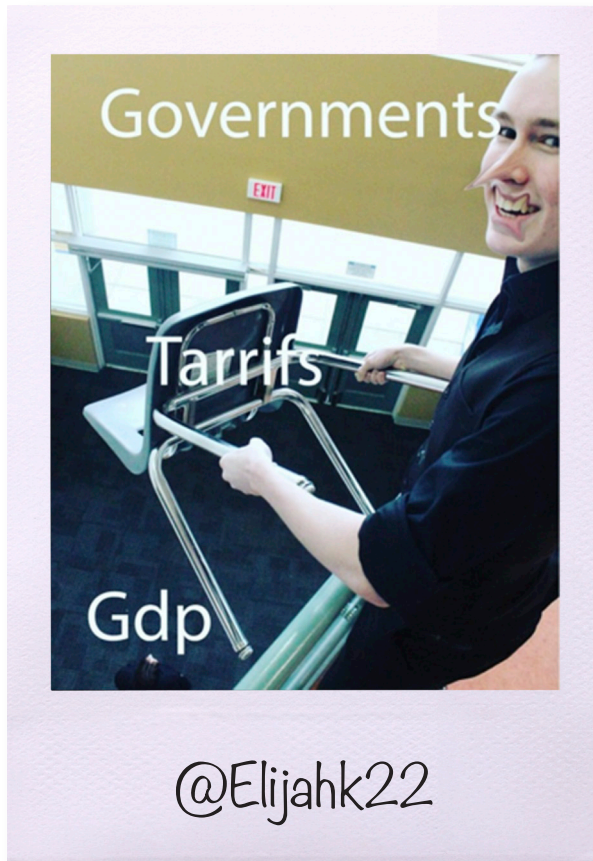


*Elmira Aliakbari is Associate Director of Natural Resource Studies at the Fraser Institute. She received a PhD in Economics from the University of Guelph, and MA and BS degrees in Economics, both from the University of Tehran in Iran. She has studied public policy involving energy and the environment for nearly eight years.*



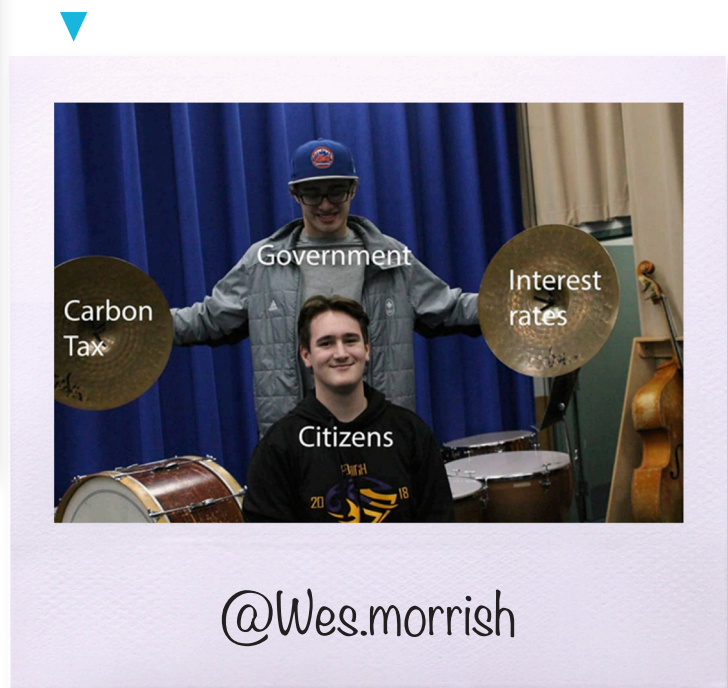
## MEME CONTEST WINNERS

WE ARE PLEASED TO SHOWCASE TWO WINNERS FROM OUR FALL MEME CONTEST!



- ◀ Elijah Kliever is a grade 11 student at Penticton Secondary school and is deeply enjoying his grade 12 economics course. He hopes to pursue some economic study when he graduates high school.

Wes Morrish is a student at Penticton Secondary School in Grade 11.



For more information and to enter a meme into our spring contest, visit [www.memecontest.org](http://www.memecontest.org)

# PHARMACEUTICAL REGULATION, INNOVATION, AND ACCESS TO NEW DRUGS: AN INTERNATIONAL PERSPECTIVE

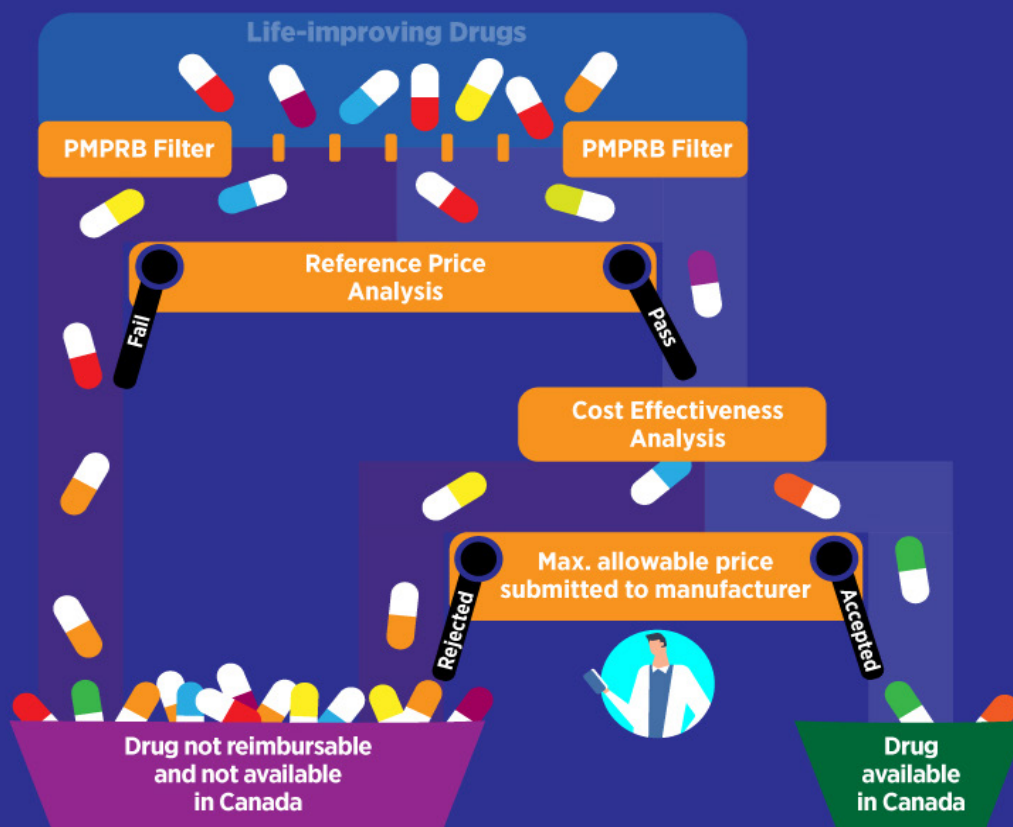
BACCHUS BARUA AND STEVEN GLOBERMAN

*Pharmaceutical Regulation, Innovation, and Access to New Drugs: An International Perspective* finds that the federal government's plan to lower prescription drug prices through changes to the Patented Medicine

Prices Review Board could impede access to new life-saving drugs for Canadian patients and even discourage innovation in the pharmaceutical sector. ♦

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# EFFECTIVE TAX AND ROYALTY RATES ON NEW INVESTMENT IN OIL AND GAS AFTER CANADIAN AND AMERICAN TAX REFORM

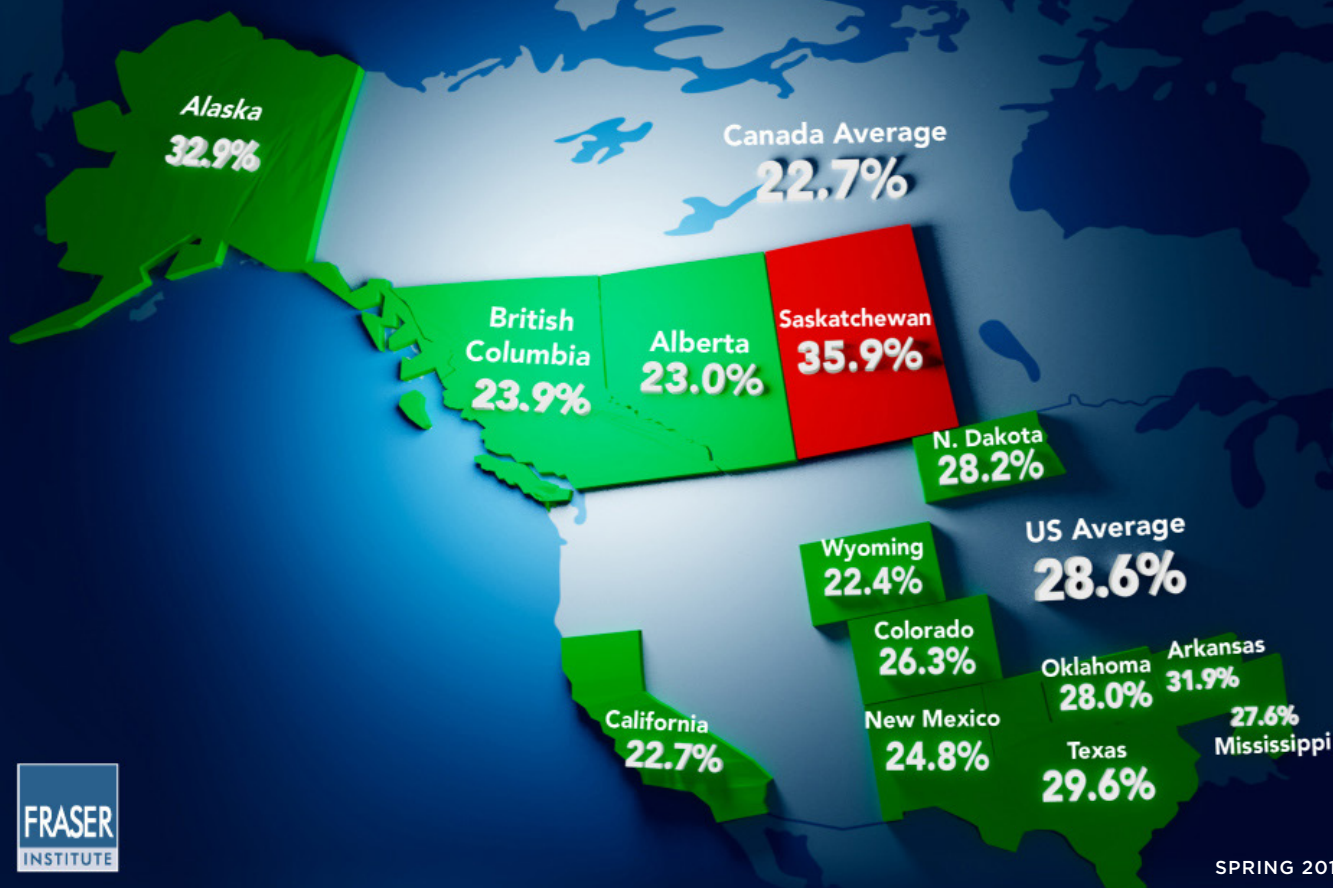
PHILIP BAZEL AND JACK M. MINTZ

*Effective Tax and Royalty Rates on New Investment in Oil and Gas after Canadian and American Tax Reform* finds that, despite the federal government's recent (albeit temporary) investment incentive measures, the effective tax rate on new investment in the oil and gas sectors are uncompetitive in two of Canada's major

energy-producing provinces: Saskatchewan and BC. In fact, Saskatchewan has the highest taxes on new investment in both oil and gas among all major energy-producing jurisdictions in North America, and BC has the second-highest tax rate on new gas investments in Canada. ♦

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## Effective Tax Rate on New Oil Investment



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