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CALCULATING THE LOSS IN VALUE OF TAXI PLATES IN OTTAWA AFTER THE ARRIVAL OF THE GIG ECONOMY: AN INTRODUCTION TO THE METHOD

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FOREWORD: LIMITATIONS, CAVEATS AND QUALIFICATIONS

The comments, analyses and opinions in this report are dependent on the information provided to the authors by the plaintiff's attorneys (including the pleadings, affidavits, and any relevant non-privileged evidence), as well as court exhibits. All calculated values and the conclusions drawn from them are derived from these sources as well as from data that were obtained by the authors directly from public sources, including web pages and journal articles.

Any change in the quality of this information or any additional information could possibly, but not automatically or necessarily, change the conclusions of this expert report. The authors of this document reserve the right to modify this report if additional information comes to light.

This report has 73 pages, including appendices; all pages are numbered until Appendix 12.
There are two appended documents files in Appendix 12 and one more in Appendix 8.4.
Other referenced files can be downloaded from the provided source's URL

Martin Boyer

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1. SUMMARY AND MANDATE

1.1. The Mandate

We received a mandate from Conway Litigation[1] to offer an expert opinion on whether *"the damages sustained by the taxi plate owner class as a result of the City of Ottawa's negligence be assessed in the aggregate."* For the purposes of the analysis, we were asked by plaintiff counsel *"to assume that the proper measure of damages for the plate owner class will be loss in plate value"* … and that ... *"since the proper measure of damages is a legal issue"* there is no need for us to opine on it.

More precisely, we were asked to

a) Explain how a loss of taxi plate value would be most appropriately calculated.
b) Explain whether the loss in plate value can be reasonably assessed in the aggregate.
c) Explain the methodology for assessing plate value in the aggregate and why the methodology is fair and reasonable.

To answer this question, we were asked to:

- Review relevant documents in this matter, including the pleadings, affidavits, any relevant non-privileged documentary evidence, and any other non-privileged materials that we may request;
- Prepare a report summarizing our findings, conclusions, and opinions; and
- Attend and provide opinion evidence by way of oral examination at trial.

1.2. Expertise of Martin Boyer, Ph.D., and Christian Dorion, Ph.D.

Martin Boyer, Ph.D., and Christian Dorion, Ph.D., are both professors in the Department of Finance at HEC Montréal. Boyer is a full professor and Dorion is an associate professor. Both have done their entire academic careers at HEC Montréal.

Martin Boyer earned his Ph.D. in Managerial Science and Applied Economics from the Wharton School at the University of Pennsylvania in 1998. He also has an M.A. in Applied (Insurance) Economics from the University of Pennsylvania (1997) and an M.Sc. in Economics from the Université de Montréal (1993). He defines himself as an economist with research and teaching interests in insurance economics, financial economics and public policy & economics. He has

[1] 2025.06.23 Instructions Letter - Martin Boyer (see Appendix, Section 12).

written over 100 research papers, most of which have been published in scholarly journals after one or more peer review rounds.

Boyer has published his research findings in scholarly journals in economics, finance, insurance, information technology, and marketing. He has supervised over 150 graduate students in finance, financial economics and financial engineering. He has been an acting President of the Northern Finance Association and a past President of the American Risk and Insurance Association. He currently serves as the Editor-in-Chief of the Journal of Risk and Insurance, a scholarly journal that has been in existence for 90 years.

Martin Boyer was previously qualified as an expert witness in many court cases. He was recognized as an expert in the case involving Québec taxi plate owners (*propriétaires de permis de taxi*) against the Government of Québec when taxi plates were abolished. Boyer was also retained as the expert in the case involving the taxi industry and Uber. That case has not gone to trial yet. In both cases his services were sought by the plaintiffs.

Professor Boyer participated in the Ministère des finances du Québec technical group discussions that led to the implementation of the first $250 million program that sought to compensate taxi plate owners for the partial loss of their livelihood after the arrival of Uber in the province of Québec, and in Montréal in particular. The approach used to establish compensation for taxi plate owners is almost identical to the one he proposed to the government in May 2018 on behalf of the plate owners' attorneys.

Christian Dorion earned his Ph.D. in Finance at McGill University. He is currently an associate professor at HEC Montréal and his research is published in leading finance journals. Professor Dorion has supervised more than fifty graduate students. Between 2013 and 2025, he directed the scientific activities of the Canadian Derivatives Institute. In parallel, Professor Dorion has carried out consulting mandates in finance and derivatives and became, in 2022, the founding CEO of Delta Vega Financial, a firm providing a novel risk-scoring metric aimed at improving the transparency of Canadian markets for structured products.

Both authors affirm that they carried out their mission as experts with objectivity, impartiality and rigour.[2] They declare having no conflict of interest in the matter. They do not know any of the parties involved, and have no financial stake in any entity related to the litigation.

[2] See also the statement on our role as experts in the last pages of the appendix.

1.3. Summary of the analysis

Taxi plates are financial assets. They do not have value on their own, but they allow their owner to receive the proceeds of an economic activity. Absent a vibrant and liquid secondary resale market for taxi plates populated by atomistic traders, their value should be calculated based on the present value of the cash flows they provide to the plate's owner, using what is called **the discounted incremental cash flow approach**.

The fair market value of a taxi plate license is the price that some effective economic agent is willing to pay to own these plates. If an owner cannot generate the revenues from the plates that other individuals in society can, this owner should sell the plate (at its fair market value) to individuals who are more efficient and effective.

All taxi plates that provide the same right to cash flows have the same value, in the same way that all shares of BCE, a telecommunications enterprise, that give the same rights to cash flows (say, dividends) in the exact same circumstances all have the same value. When assets have different rights and privileges, such as common shares and preferred shares, then their values may be different. It is the same with taxi plates in the case of Ottawa, as there are operationally two categories of plates: Artisan and Industrial (our terminology).

The Artisan plates are plates owned by the driver of the plated taxi or owned by an individual who leases it to one or many drivers. An individual can own at most one Artisan plate. Industrial plate owners are either individuals who own more than one plate or corporations, who must generate revenues by leasing the plated taxis to one to three drivers. The report presents the **methodology that should be used to value the two types of plates** (Artisan and Industrial).

Our analysis will conclude that **the damages sustained by taxi plate owners because of the City of Ottawa's negligence should be assessed in the aggregate**. In our view, Artisan plates have a different value than Industrial plates, with Industrial plates being worth slightly less than Artisan plates. Accordingly, plate values should be assessed in the aggregate within each group of plates (both Artisan and Industrial). Accessible plates of each type should be worth less than standard plates of each type.

1.4. Short Answers to the Questions in the Mandate

a) Explain how a loss of taxi plate value would be most appropriately calculated.

Like any asset, taxi plate licenses have value because they allow their owner to receive cash flows (or profits) they would not have received otherwise. The appropriate technique to value taxi plates licenses is through a **"discounted cash flow model" where all incremental cash flows due to the taxi plates are identified for all the foreseeable future and discounted to today using an appropriate discount rate.**

b) Explain whether, in our opinion, the loss in plate value can be assessed in the aggregate.

The loss in plate value must be assessed in the aggregate. The reason is that all financial assets that give the same right to some cash flows must have the same value. It follows that all licenses that have the same feature should have the same value, irrespective of who owns them and the prices they sold for. A contrario, taxi license plates that have different rights should have different values.

c) Explain the methodology for assessing plate value in the aggregate and why the methodology is fair and reasonable.

If all transactions (plate transfer and fares) were reported properly, the discounted cash flow model would give, on average, a value equal to **the price at which taxi plate licenses are exchanged between unaffiliated or arms-length parties.** This is also called the taxi plates' fair market value. Knowing, however, that some taxi plate transfer prices are not truthfully reported to the authorities, the two values may not match perfectly. The loss in value for all taxi plates for single plate holder-drivers, whom we shall call the *'Artisans'*, should be estimated separately from *'Industrial'* plates. **Industrial taxi plates will be worth slightly less than Artisan plates to reflect the difference in the rights that come with both types of plates.** The same can be said of accessible plates that are worth less than standard plates. The methodology is fair and reasonable; what is important is not how one uses the license, but what the price would be if such licenses were actively traded on the open market.

1.5. Assumed Facts that Are Relevant to this Report

We were provided with a set of documents from counsel that are listed in Appendix 8.1. We were also asked[3] *"in addition to the factual findings made by the judge and the facts outlined in the statement of agreed facts, … to assume (that) the following facts are true:*

1. *Traditionally, Blueline plates have sold at a higher price than plates under other banners.*
2. *Standard taxi plates have traditionally sold at a higher price than accessible plates.*
3. *Airport plates traditionally sold at a higher price than all other plates. However, airport plates were eliminated in August 2016.*
4. *The City maintains a dataset which contains plate transfers and the price that was reported to the City. The City does not check to ensure that the sale price is accurate. There has been underreporting to the City about sale prices. However, the frequency and amount of underreporting is unknown.*
5. *We have plate transfer data from April 2006 to October 2018. The data from 2006 to 2012 is enclosed in excel format. The data from 2012 to 2018 can be found in Appendix A to the statement of agreed facts."*

We have therefore read the trial judgment, the *Amended Amended Statement of Claim* as well as the *Amended Statement of Defense* of **Court File 16-69601**. We have also read the *Statement of Agreed Facts* (SAF hereinafter). We will assume and rely on the following relevant facts in our report:

1) Standard taxi plate licenses were issued by the City of Ottawa or one of its amalgamated municipalities under the City of Ottawa By-law 2005-481 (SAF paragraph 6 of the Statement of Agreed Facts)
2) Taxi plate holders can be broken into three categories (SAF paragraph 8)
    a. Single plate license holder-drivers
    b. Multi-plate license holders
    c. Single plate license holder-leasers
3) A collective bargaining agreement is in place between fleet owners and unions representing taxi drivers (SAF paragraph 9)
4) The City of Ottawa is not involved in the collective bargaining agreement (SAF paragraphs 10 & 11)
5) Plate license holders can use their license to generate revenues as they see fit (SAF paragraph 12)
6) A single taxicab bylaw (By-law 2005-481) harmonized all bylaws in effect in pre-amalgamated cities and towns (SAF paragraph 16)

[3] Letter to the authors dates 23 June 2025 reproduced in the Appendix, Section 12.

7) The City of Ottawa enacted By-law 2012-258 pertaining to the licensing, regulating and governing of taxi cabs (SAF paragraph 17)
8) The City of Ottawa limits the number of permitted taxi plates, a number that has remained at 1,001 standard taxi plates from 2001 to 2019, or to 1,188 standard and accessible plates from 2013 to 2019 (SAF paragraphs 18, 19 & 20)
9) From 2012 to 2016, 156 taxi plate transfers occurred in the City of Ottawa (SAF paragraph 22)
10) Uber began its operations in Ottawa in September 2014 (SAF paragraph 29)
11) The City of Ottawa repealed its 2012 and 2002 By-laws regarding taxi licenses by enacting By-law 2016-272 that came into effect at the end of September 2016 (SAF paragraph 31)
12) The City of Ottawa collects from all standard and accessible taxi plates the same (SAF paragraph 47a, 47b & 47c)
    a. Application fees ($493 from 2012 to 2017)
    b. Renewal fees ($502 from 2012 to 2017)
    c. Plate transfer fees ($3,800 from 2012 to 2017)
13) The City of Ottawa collects different fees from brokers depending on the number of taxicabs and taxi drivers to whom they offer dispatching and other services (SAF paragraph 47d).

1.6. The Specificities of the Ottawa Taxi Market.

For decades, the City of Ottawa has been regulating its vehicle-for-hire industry by limiting the supply of taxicabs that could at any point in time offer ride-for-hire services. The maximum number of Standard taxi plate licenses in Ottawa was set to 1001 in 2001 and did not move thereafter except for accessible taxicabs (SAF:20). Including accessible plates, there have been between 1,174 to 1,188 licenses in the City of Ottawa since 2008 (SAF:20).[4]

The *Metro Taxi Ltd. et al. v. City of Ottawa* judgement[5] (paragraphs 22 and following) and the Statement of Agreed Facts (see Section 1.5 of this report) state that since 2001, the amalgamated City of Ottawa has been regulating its taxicab and limousine industry, following the lead of its predecessor municipalities such as Old Ottawa, Nepean, and Vanier. All taxicabs fell under the same regulation near the end of 2005. In 2012, the City of Ottawa modernized its taxicab industry

[4] In 2015, more than half (667 to be exact) of taxi plates were singly held by individuals; "Taxi Economics – Old and New" Hara Associates Inc., October 10, 2015 (trial exhibit 1, tab 281) – Hara2015 hereinafter. Of course, these numbers might have been different before and might have changed since.

[5] *Metro Taxi Ltd. et al. v. City of Ottawa,* 2024 ONSC 2725. See also the Statement of Agreed Facts (SAF: 2 through 20, and 29, 30 and 31) and the Taxi Project Team report of 2000, Section 4.3.

regulation by enacting By-law 2012-258. Section 4.1 provides more information on the structure of the Ottawa taxicab market.

The Ottawa taxi market has two components that make it unique:

1. In Montreal, Chicago, Toronto, and New York City, regular taxi plates are issued with no set maturity. The owners of such plates have, a priori, an infinitely lived asset (like a share of common stock) that allows them to transport passengers in a private automobile. In Ottawa, plates are in practice issued for a single year on an annual basis, with the right to renew the license at a pre-specified fee a plate for the following year, which comes with the right to renew the license for the year after, and so on.
2. Although only one type of standard taxi license plate is issued in Ottawa[6], the structure of the City's taxi market is such that there are effectively two types of plates, which we shall call "Artisan" and "Industrial" taxi plates in this report. "Artisan" plates are owned and operated by unique individuals. "Industrial" taxi plate owners are constrained to lease their taxi permit in accordance with the Collective bargaining agreements signed between the taxicab driver union (say UNIFOR Local 1688) and the Members of the Owners Group,[7] who any individuals or corporations that own two or more taxi plates.

Protected taxi markets like that of Ottawa, as well as the markets in Montreal, Chicago, Toronto and New York City, generate revenue streams to owners of taxi plates that are abnormally high because of the monopoly that was given to taxi plate owners to transport individuals in a private automobile for a fee. It is the ability to exploit this monopoly that induces investors (including owner-drivers) to pay high prices to obtain these revenue stream.[8] As stated by economist Dan Hara in a 2000 paper entitled "Plate Value Options" about possible compensation structures for plate owners: *"This revenue stream does not represent a more efficient system, but a monopoly situation"* (Hara2000:1-5).

> *"The term plate value refers to the money some individuals are willing to pay for the rights to use such a plate. Because cities in the region have limited the number of plates issued, an individual wishing to put a taxi vehicle on the road may not obtain a license from the city. Although the individual may have a vehicle which meets the standards set by the municipality,*

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[6] The analysis for accessible plates is similar, with the proviso that, because the actual vehicle used as an accessible taxicab will need to be adapted, which is costly. Also, picking up and dropping off passengers that require an accessible taxicab is more time consuming and demanding for the driver. If the price of fares does not adjust to these two constraints of accessible taxi plates in comparison to standard plates, both would tend to make the value of accessible taxi plate lower than standard plates.

[7] See the Collective Bargaining Agreement between Blueline and Unifor, March 1, 2018 (trial exhibit 1 tab 26) – CBA2018 hereinafter. Every other collective agreement we have seen shares the same structure.

[8] "Plate Value Options Paper", Hara Associates Inc., July 28, 2000, (trial exhibit 204) – Hara2000 hereinafter.

> *they must purchase the right to operate a taxi (the plate) from a current plate holder. When the operation of taxis becomes more profitable than other available investments of similar risk, the taxi plate will acquire a market value of its own."* (Hara2000:1-2).
>
> *"Taxi plate values reflect the excess profit derived from a share of a government created monopoly when the plates are limited in number. This creates a joint monopoly among those holding the vehicle plates. As a city continues to grow, the revenue generated per taxi starts to rise."* (Hara2000:1-2).

The City of Ottawa implemented this limit by establishing a maximum cap on issued taxi plates. Taxi plates are nothing more than legal rights that give their owner (or the owner's lessee) the privilege to charge a (regulated) fee for transporting passengers in a private automobile between two points in or out of the city. Prior to 2016, no entities other than taxi permit holders were legally allowed to offer vehicle-for hire services except limousine services (which are essentially an upscale ride-for-hire service) and the public transit authority.

Taxi permits were never abolished in Ottawa, New York City, or Chicago. From 2014 to 2016, the City of Ottawa allowed the transportation of passengers in private automobiles outside of the taxicab market, in violation of the City of Ottawa's own bylaws (SAF: 29, 37, 38 & 39).[9] The City's failure to enforce its bylaws caused damages to taxi permit holders. [10] In Montreal, the same experience occurred between 2014 and 2016 prior to the *"projet pilote du Gouvernement du Québec."*[11] By not enforcing its own bylaw (SAF: 37, 38 & 39), the City of Ottawa de facto removed the legalized monopoly that taxi permits had in transporting passengers for a fee in private automobiles. The result was a sudden increase in the supply of vehicles-for-hire, which presumably culminated with a decrease in the value of the right to earn monopoly rents, as said-rents decreased.

After failing to enforce its by-law, the City of Ottawa adopted By-law 2016-272. This bylaw, which took effect on September 30, 2016 (SAF:31), allowed non-taxi vehicle-for-hire services (such as those provided by Uber) to operate within the City of Ottawa without a taxi plate, while preserving the taxi plate system.

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[9] See also *Metro Taxi Ltd. et al. v. City of Ottawa,* 2024 ONSC 2725, paragraphs 3, 4, 5, *inter alia*.

[10] *Metro Taxi Ltd. et al. v. City of Ottawa,* 2024 ONSC 2725, paragraphs 236 through 244, *inter alia*.

[11] www.legisquebec.gouv.qc.ca/fr/document/rc/s-6.01,%20r.%202.3. The projet pilote was repealed when taxi plates were cancelled in 2020.

2. WHAT IS THE VALUE OF AN ASSET? A PRIMER

The value of a tangible or real asset represents the economic worth it holds to an owner or potential buyer. Value is best expressed as the **present value of future benefits** that an asset can generate. These benefits can be monetary—such as cash flows from a rental property—or non-monetary, such as strategic positioning. Value is not an inherent property of the asset; value comes from the interaction between its characteristics, the needs and preferences of economic agents, and the economic environment. The present value of future benefits concept is taught in the first finance class, often in the first session of the first class.

From a practical perspective, determining an asset's value involves balancing subjective assessments and objective measures. Such assessments and measures are reflected in the rate at which we discount future cash flows that an asset generates. As such, two principles guide the determination of the discount rate. They are conceptually quite simple: 1) **A dollar today is worth more than a dollar next year**, and 2) **A safe dollar next year is worth more than a risky dollar next year**. It is the combination of time and risk that give us the rate at which we should discount an asset's future cash flows. Asset value is thus sensitive to factors such as time horizon, market conditions, and risk perceptions. The variability of these factors reflects the reality that value is constantly shaped by information, scarcity, and shifting expectations about the future.

Financial assets—such as a share of common stock, a bond, or a derivative product—derive value from their ability to generate future cash flows or any right they may provide to underlying assets that generate cash flows. Taxi plates (or medallions) do not have value per se (they are only pieces of paper); they allow, however, access to future cash flows (ride-for-hire) that would not be possible otherwise. In finance, the value of a financial asset is most often formalized as the present value of expected future cash flows, discounted at a rate that reflects both the time value of money and the risk associated with those flows.

> Example. The value of a bond or a debenture is determined by discounting its coupon payments and principal repayment. The value of a stock may be estimated by discounting expected dividends or free cash flows to equity. Unlike tangible assets, financial assets have value because of ownership claims rather than physical utility.

Financial assets are a claim on cash flows generated by real activities. In that sense, **taxi permits are financial assets**.

3. HOW SHOULD WE CALCULATE ASSET (TAXI PLATE) VALUE?

The right to operate a taxi is an asset. This asset is a simple piece of paper. The right can be represented by a metal insignia, medallion or plate number depending on the city where the taxi operates. *"Because the plate generates a monthly revenue stream, it is worth something as a capital asset"* (Hara2000:1-2). What should be the value of this capital asset? How much should we pay for this piece of paper?

The arrival of Uber disrupted the taxi industry in many cities in North America. The taxi industry was heavily regulated by city, province or state governments. In the case of the Province of Québec, the government reflected on the value of assigning to a limited number of individuals the right to drive a taxicab. In a document produced by the Gouvernement du Québec titled *« Projet de loi concernant le transport rémunéré de personnes par automobile »*, which we reproduce in Appendix 8.4, the Ministère des finances du Québec *« a estimé la valeur marchande des permis selon la méthode de la valeur actuelle … (qui) reflète la valeur intrinsèque de l'actif en fonction des revenus potentiels qu'il génère à partir d'un taux d'actualisation convenu ».* We observe the same valuation approach in equation 1 of Dan Hara's 2000 report (Hara2000:3-4), even though the formula is written differently than what we present in the current report. The approach is known as the **discounted cash flow (DCF)** approach.

The basic principle of a DCF is that the value of a taxi plate should reflect all cash flows generated by the permits, in excess of those that could be generated in an open and competitive ride-for-hire taxi market (i.e., where the supply of permits is not limited), or that would not have been generated otherwise. We call these "**marginal or incremental cash flows**." The DCF principle leads to what is known as **the present value of an asset**. Mathematically, the present value is:

$$Value = \sum_{t=1}^{\infty} \frac{E(CF_t)}{(1+r)^t},$$

where $E(CF_t)$ are the expected marginal (or incremental) cash flows that will occur in t periods or years, and r is the rate at which these future cash flows are discounted. This is the first (and most important) formula that students learn in finance. We can see this as the ***Fundamental Formula for Finance***.

If cash flows are all equal and constant over the foreseeable future, say $E(FM_t) = X$ \$ for all t, then we can write the *Fundamental Formula for Finance* as

$$Value = \frac{X}{r}.$$

If cash flows are increasing at a constant rate that is known over the foreseeable future (say at rate g), so that $FM_{t+1} = FM_t(1+g)$ for all t, then the *Fundamental Formula for Finance* becomes

$$Value = \frac{X(1+g)}{r-g}.$$

If the rate of growth of cash flows is uncertain so that future expected cash flows are risky, then we must account for this uncertainty and risk by increasing the discount rate by some factor a. The *Fundamental Formula for Finance* is then

$$Value = \frac{X(1+g)}{r+a-g},$$

As discussed above, this is what we find in equation 1 of Dan Hara's 2000 report. Hara2000:3-4.

Example. Suppose a discount rate of $r = 8\%$ for some asset that generates known annual cash flows of $15,200 for all the foreseeable future. The present value of such an asset is

$$Value = \frac{X}{r} = \frac{\$15{,}200}{0.08} = \$190{,}000.$$

We can think of the $15,200 as coming from 1,085 fares per year, every year (or slightly less than 3 rides per day every day) forever, with each ride generating an average revenue net of all costs of $14 (that is, $\$15{,}200 = \$14 \times 1085$). The value of $190,000 for a taxi plate is therefore reasonable if the plate generates 3 fares per day that would not otherwise have been obtained.

A value of $\$190{,}000$ is also justified under these market conditions if the price of the monthly lease of a taxicab, net of all costs, is $\$1{,}267 = \$15{,}200/12$.

The value of the asset increases when X is large (that is, the asset generates greater cash flows), when g is large (that is, the growth rate of future cash flows is greater), when r is small (that is, the money received in the future is not worth much less today) and when a is small (that is, the risk and uncertainty associated with the asset is small).

Let us go back to the original question, which was "How much should we pay for this piece of paper that allows one to drive a taxicab in Ottawa?" The maximum one would pay for such an asset is such that the **net present value of the asset is zero**. Mathematically, we need to find the investment (or price of the asset) Y_0 such that

$$NPV = \sum_{t=1}^{\infty} \frac{E(CF_t)}{(1+r)^t} - Y_0 = 0.$$

By isolating Y_0 in this equation, we find the value of the asset.

We were asked by counsel (letter dated 23 June 2025 reproduced in the Appendix, Section 12) to assume the following as facts:

1. *Blueline plates have sold at a higher price than plates under other banners.*
2. *Standard taxi plates have traditionally sold at a higher price than accessible plates.*
3. *Airport plates sold at a higher price than all other plates. However, airport plates were eliminated in August 2016.*
4. *The City maintains a dataset which contains plate transfers and the price that was reported to the City. The City does not check to ensure that the sale price is accurate. There has been underreporting to the City about sale prices. However, the frequency and amount of underreporting is unknown.*
5. *We have plate transfer data from April 2006 to October 2018… The data from 2012 to 2018 can be found in Appendix A to the statement of agreed facts.*

In competitive markets where assets are traded between entities that are unaffiliated (at arms-length), we could simply use the price at which these assets are traded to infer what their fair market value is. Even though the City of Ottawa has collected a dataset of taxi license transfer prices, we did not use this data in our methodology because:

1. The data is not completely clean and the number of transactions per quarter is not very high; and
2. It is not clear what the transaction includes or whether the parties are affiliated.

For these reasons, the transfer price found in the city's taxi licenses database must be taken with a healthy dose of honest skepticism. The plate transfer data is therefore informative, but it is not sufficient to infer what is the true impact of the arrival of Uber and the gig economy on the value of taxi plate licenses in Ottawa.

The assumed difference in transfer value of plates associated with certain brokers (ex Blueline; Assumption #1) or arising from the contractual rights formerly associated with airport plates (Assumption #3) do not make a difference in the discounted cash flow method for valuing plates presented in this report. The calculation of the value of accessible plates (Assumption #2) is discussed below.

4. THE CONCEPTUAL PROBLEM WITH VALUING TAXI PLATES IN OTTAWA

4.1. An Overview of the Situation in Ottawa

The City of Ottawa has been limiting the supply of taxicabs for decades (Hara2000:2-1), even as early as the 1930s.[12] The maximum number of Standard taxi plate licenses was set to 1001 in 2001 and did not move thereafter except for accessible taxicabs, whose number have increased from 25 in 2003 to 187 in or around 2015 through 2019 (SAF:20). Protected markets like that of the Ottawa taxi industry generate revenue streams to owners of taxi plates that are abnormally high. This is the reason why investors (including owner-drivers) are willing to pay high prices to obtain these revenue streams.

The City of Ottawa (and its different predecessor municipalities pre-amalgamation) implemented this limit by issuing taxi plates (Hara2000:2-1), which are essentially rights to operate in a monopoly that charges a (regulated) fee charge for transporting passengers in a private automobile. Prior to the arrival of Uber, no entity other than taxi plate owners were allowed or tolerated to do so except limousine services and public transit. Limiting the number of standard taxi plates created a shortage in the supply of ride-for-hire services in Ottawa, as the demand for rides increased with the city's population.[13] The political challenge with such a system is not that it induces an increase in plate value, but rather that *"once license issues is permitted to lag behind demand, and high plate values occur, the process is difficult to reverse"* (Hara2000:1-7).

The Hara2000 report (page 2-5) shows that taxi plates outside of the collective bargaining agreement – what we call Artisan plates – were traded at prices that were 41% greater than that of taxi plate licenses governed by the collective bargaining agreement – what we call Industrial plates. With respect to leasing, Artisan (unconstrained plates) were leased at prices that were 127% greater than Industrial (constrained plates).

Between 2014 and 2016, the City of Ottawa let new ride-for-hire services (e.g. Uber and Uber-X) operate without requiring them to obtain the relevant permits from the City or from a current taxi license owner. This increased the supply of ride-for-hire services in the City of Ottawa.

In August 2016, the City of Ottawa enacted By-law 2016-272 that repealed By-law 2012-258 and By-law 2002-189 pertaining to the regulating and licensing of taxi permit licenses in the City of Ottawa (SAF:31). By-law 2016-272 formally changed the legal regime which provided taxi plate owners with a monopoly on ride-for-hire services.

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[12] *Metro Taxi Ltd. et al. v. City of Ottawa,* 2024 ONSC 2725, paragraph 1 & 24.

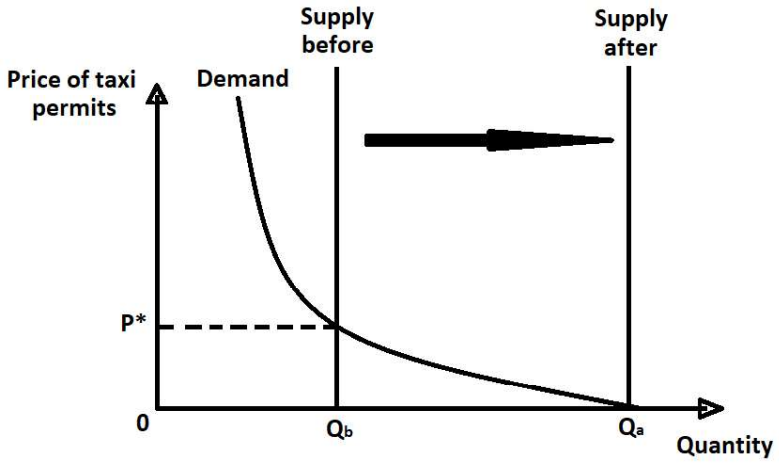
[13] The population of Ottawa increased by 20% from 2001 to 2016 according to the Canadian census.

However, it is important to reiterate that, *de facto*, the monopoly had no longer been in effect since the arrival of Uber in the City of Ottawa in 2014 and the City's failure to enforce its own bylaws (SAF: 29, 37, 38 & 39).[14]

Much before the advent of the gig-industry, Hara and Associates Inc. wrote in their 2000 report that *"suddenly expanding the number of licenses to catch up with demand will reduce the value of licenses back to zero,* ***effectively expropriating the license holders****"* (Hara2000:1-7) – our emphasis. Letting Uber and other entities operate in ride-for-hire services was, economically speaking, the equivalent of suddenly expanding the number of taxi licenses.

Ottawa taxi permits were not abolished in 2016; they are still operational as of 2025. The 2016 bylaws allowed Uber (and other private transportation companies) to operate legally on a territory that, prior to 2014, was a monopoly shared by taxi permit owners. The same approach was used in New York City and Boston, for instance. From the viewpoint of an economist, **allowing free entrance is economically equivalent to abolishing permits**, which is also the same as cancelling taxi permits after having expropriated at a price of zero the license holders.

In the following figure, an expansion of the number of licenses is equivalent to shifting the supply curve of vehicle-for-hire to the right.



- The demand for taxi permits is downward sloping (as in every classical demand model).
- The supply of taxi permits is a vertical line because it is chosen by the regulator.
- When the supply of permits is set to Q_b ('b' for before) then the equilibrium market price of taxi permits is P*.
- With a sudden increase in the supply of permits – whatever the reason – from Q_b to Q_a ('a' for after) the equilibrium price of permits falls to zero.

[14] See also *Metro Taxi Ltd. et al. v. City of Ottawa,* 2024 ONSC 2725, paragraphs 3, 4, 5 *inter alia*.

This is what was meant by an *effective expropriation* due to a sudden increase in the number of licenses (Hara2000:1-7).[15] From an economic perspective, a *de facto expropriation* can be achieved by:

1- Abolishing taxi permit licenses; this was the choice of the Government of Québec with respect to the province's taxi industry by an *"abrogation du système de la gestion de l'offre dans l'industrie du transport de personnes par automobile"* – see Appendix 8.4; or

2- Not enforcing the rights of taxi permit holder to extract the monopoly rents – this occurred in Ottawa from 2014 until the enactment of By-Law 2016-272; or

3- Allow the entry of vehicle-for-hire entities that do not need to buy permits from current taxi permit owners – this occurred in most American cities such as New York City, Chicago, Philadelphia… and in the City of Ottawa after the enactment of By-Law 2016-272; or

4- Put up for auction an abundance of new taxi permits; or

5- Split every current taxi permit into $N > 1$ new permits for free, say $N = 5$.

Whatever the mechanism used to shift the supply of taxi permits, the value of said permits would decrease. As we will see in a later section of the report, a mere increase of 10% to 20% in the supply of vehicles-for-hire could be sufficient for taxi plates licenses to be worth close to nothing.

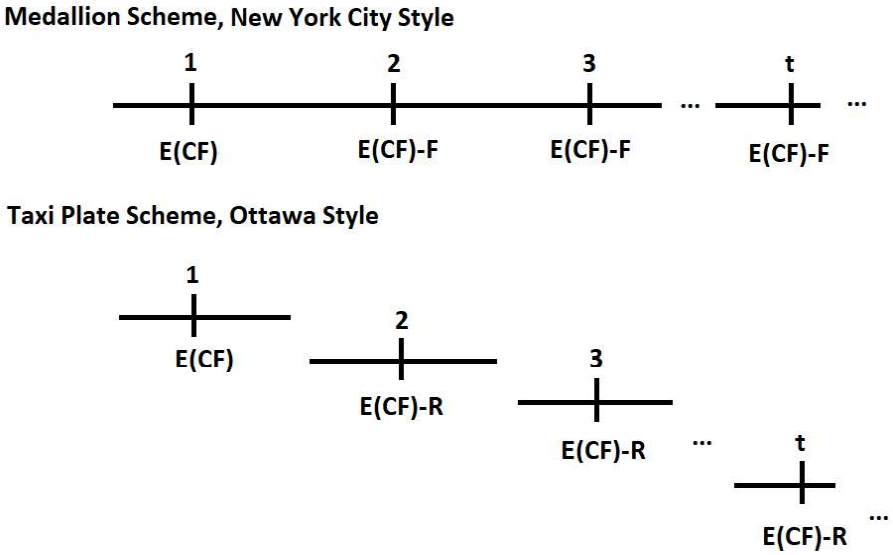
4.2. Taxi Plates in Ottawa and Medallions in New York City

In many places, such as Montreal, Chicago, Toronto and New York City, regular (i.e., not accessible) taxi plates are issued with no set maturity, provided the owner files some paperwork and pays a renewal due (which may be equal to zero). The owners of such plates have, a priori, an infinitely lived asset (like a share of common stock) that allows them to transport passengers in a private automobile for a fee.

In Ottawa, the system is slightly different, as plates are issued for a single year. Together with the plates comes the right to renew the license at a pre-specified fee for the following year, which comes with the right to renew the license for the year after, and so on. **There does not seem to be a specified number of years or maturity date at which this recursive renewal scheme would stop**. Renewal fees were $490 per plate per year from 2006 to 2012, $502 per plate per year from 2012 to 2017, and $545 per plate per year thereafter (SAF:47b).

[15] An *actual expropriation* would consist in buying back permits in existence for their fair market value… or the value to the holder, which we know must be greater than the permits' fair market value.

If expected cash flows from operations, $E(CF)$, are the same under the two systems, the two problems can be represented as follows.



New York City style medallions give its owner the ability to drives a cab to generate revenues or to lease his cab, such that the owner can expect cash flows to be equal to $E(CF)$ each year, every year, assuming that renewal dues are equal to some amount F.

In Ottawa, taxi plates allow the operation of a taxicab that generates expected cash flows of $E(CF)$ in the first year. Then, provided a renewal fee of R is paid, a new taxi plate is issued that allows the owner to operate a taxicab in the second year. With the second-year plate comes the right to pay renewal fee R to obtain a taxi permit that will allow the owner to operate a taxicab in the third year, and so on.

Using the *Fundamental Formula for Finance*, the value of New York City-style medallions with renewal dues, F, that are paid at the beginning of the second year, is

$$V_{NYC} = \sum_{t=1}^{\infty} \frac{E(CF_t)}{(1+r)^t} - \sum_{t=2}^{\infty} \frac{F}{(1+r)^t}.$$

In the case of Ottawa, taxi plate values are also given by the *Fundamental Formula for Finance*, but with a slight twist to account for the present value of the right to obtain a taxi permit for the second year ($Right_1$) if the taxi plate owner pays fee R:

$$V_{OTT} = \frac{E(CF_1)}{(1+r)} + \frac{Right_1}{(1+r)},$$

Using the *Fundamental Formula for Finance*, the value of $Right_1$ is

$$Right_1 = \frac{E(CF_2)-R}{(1+r)} + \frac{Right_2}{(1+r)},$$

where $Right_2$ is the value at period 1 of the right to obtain a taxi permit for year 3 if the taxi plate owner pays fee R in year 2. Using again the *Fundamental Formula for Finance*, the value of $Right_2$ is

$$Right_2 = \frac{E(CF_3)-R}{(1+r)} + \frac{Right_3}{(1+r)},$$

where $Right_3$ is the value at period 2 of the right to obtain a taxi permit in year 4 if the taxi plate owner pays fee R in year 3, and so on. Substituting recursively for all future periods, we find

$$V_{OTT} = \frac{E(CF_1)}{(1+r)} + \frac{E(CF_2)-R}{(1+r)^2} + \frac{E(CF_3)-R}{(1+r)^3} + \cdots + \frac{E(CF_t)-R}{(1+r)^t} \ldots$$

We can combine and rearrange the terms to find

$$V_{OTT} = \sum_{t=1}^{\infty} \frac{E(CF_t)}{(1+r)^t} - \sum_{t=2}^{\infty} \frac{R}{(1+r)^t}.$$

The mathematical approach to evaluate **the fair market value of a taxi plate in Ottawa, V_{OTT}, is the same as in New York City, V_{NYC}.** The only difference between the formulas are the values ascribed to parameters, $E(CF_t)$, r, F, and R.

4.3. Artisan and Industrial Plates

The City of Ottawa issues annually only one type of standard taxi license plates,[16] which are issued in priority to the previous year's plate owners that pay the renewal fee. Pre-2014, drivers were not allowed to charge a fee when picking up passengers in private automobile. **If there were no taxi permits in the city of Ottawa, there would still be ride-for-hire services because their need would not have disappeared.** If the supply of ride-for-hire services is not limited, then each ride-for-hire driver would most likely provide fewer rides than if it were limited.

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[16] *Accessible plates* are standard plates with additional constraints, whereas *Airport plates* were standard plates that had the additional right to pick up passengers at the Ottawa airport until late 2015 or early 2016 (Ottawa Citizen, 2015). As the Taxi Project Team report states, *"it is important to note that the Airport if not a separate zone but rather a **private concession agreement** between the Airport Authority and a taxi company"* (TPT: 15, our emphasis). Currently, there is no private concession agreement anymore, as any private transportation company can pick up and drop off passengers at the airport provided they pay a pick-up and/or drop off fee to the Airport Authority (https://www.yow.ca/business/commercial-ground-transportation).

Despite the City of Ottawa issuing only one type of license plates, **the Ottawa taxi market structure is such that there are operationally two types of plates**. We call them the "Artisan" and "Industrial" taxi plates.

- **Artisan** plates belong to those individuals who operate a taxicab themselves or who own a single plate.
- **Industrial** plates belong to individuals, who own more than one plate, or to firms that have many plates, both of which *must lease the plates* to drivers who will operate the taxicab themselves.[17]

Even if there are operationally two types of plates, their value is still calculated as the present value of the cash flows that each plate generates, $Value = \sum_{t=1}^{\infty} \frac{E(CF_t)}{(1+r)^t}$. In other words, the value of both types of plate assets is calculated using the *Fundamental Formula for Finance,* but where expected cash flow $E(CF_t)$ and the discount rate r will not necessarily be the same.

Taxi plates in Ottawa can have different values depending on whether they are Artisan or Industrial plates because $E(CF_t)$ and r may not be the same for the two types of plates. For a given plate type (Artisan or Industrial), however, **all will have the same value because they have the same $\boldsymbol{E(CF_t)}$ and $\boldsymbol{r}$.**

4.4. The Value of Artisan Plates, Standard and Accessible

The owner of a taxi plate in Ottawa is allowed to drive his own taxicab. This taxicab Artisan is allowed to pick up passengers (on the street, at stands or through a broker) because he holds that permit.

Using the previous equation, and putting some structure on the cash flows that are generated by driving a taxicab in Ottawa, we find that the value of Artisan taxi plates for owners who operate their own taxicab is

$$Value_A = \sum_{t=1}^{\infty} \frac{Revenues_t - Costs_t}{(1+r)^t} - \sum_{t=2}^{\infty} \frac{R}{(1+r)^t},$$

where $Revenues_t$ are all revenues that are generated in expectation by transporting individuals by taxicab and $Costs_t$ are all the expected costs of operating a taxicab. We can see the difference between $Revenues_t$ and $Costs_t$ as the expected cash flows from operations: $E(CF_t) = Revenues_t - Costs_t$.

[17] It should go without saying that an individual cannot drive two taxicabs at the same time, which means that any *physical person* who possesses more than one taxi plate must lease at least one out. Similarly, corporations cannot drive taxicabs; they must therefore generate cash flows only through leasing.

We can decompose the revenue component by positing that $Revenues_t = N_t \times Price_t$, where N_t is the number of annual fares and $Price_t$ is the amount collected per fare on average. We can also decompose the cost component by positing that $Costs_t = N_t \times variable_t + fixed_t$, where N_t is again the number of annual fares, $variable_t$ are all the variable costs per fare (gasoline, usage, etc), and $fixed_t$ are all the annual fixed costs of operating a taxicab. We end up with an Artisan plate value equal to

$$Value_A = \sum_{t=1}^{\infty} \frac{N_t \times Price_t - N_t \times variable_t - fixed_t}{(1+r)^t} - \sum_{t=2}^{\infty} \frac{R}{(1+r)^t}.$$

Artisans are not required to drive their own taxicab. They can also rent it to a driver. The terms of the lease will then be an agreed-upon amount, say $Lease_t$. By paying $Lease_t$ the driver is allowed to keep all income generated by transporting individuals in Ottawa. Assuming the driver is responsible for the variable costs and the plate owner, the fixed costs of operating the taxicab, then the plate owner receives an amount $Lease_t$ and must pay fixed costs $fixed_t$. If the lease is renewed every year forever, we end up with an Artisan-lessor plate value equal to

$$Value_B = \sum_{t=1}^{\infty} \frac{Lease_t - fixed_t}{(1+r)^t} - \sum_{t=2}^{\infty} \frac{R}{(1+r)^t}.$$

Assuming that the discount rates are the same in the two schemes,[18] the difference between $Value_A$ and $Value_B$ must only come with respect to how $Lease_t$ compares to $N_t \times Price_t - N_t \times variable_t$. The competition between the multitude of potential drivers in Ottawa would be such that $Lease_t = N_t \times Price_t - N_t \times variable_t$.[19]

Consequently, **the fair market value of an Artisan taxi plate should be the same whether the owner operates his own taxicab or leases it out**. In other words, in equilibrium, on average, in a competitive and free market, $Value_A = Value_B$.

In the case of accessible plates that would be owned singly by a unique individual (i.e. 'Artisan' accessible plates), their value would be

$$Value_{A'} = \sum_{t=1}^{\infty} \frac{Revenues_t - Costs_t - X_t}{(1+r)^t} - \sum_{t=2}^{\infty} \frac{R}{(1+r)^t},$$

[18] More likely, however, the discount rate applied to cash flows generated by an Artisan-operator will be greater than the discount rate applied to cash flows generated by an Artisan-lessor. The reason is that cash flows are less risky in the latter than the former.

[19] This is clearer to see if, because operating a taxicab is riskier than leasing it out, the discount rate applied to $N_t \times Price_t - N_t \times variable_t$ is greater than the discount rate applied to $Lease_t$.

Where all parameters are like in the case of standard plates (i.e., $Revenues_t$ are all revenues that are generated in expectation,[20] $Costs_t$ are all the expected costs of operating a taxicab, and R is the taxi permit renewal fee), except that there are additional costs associated with owning an accessible taxicab, X_t .[21] The additional costs include, mainly, that of making the taxicab accessible. Consequently, we have that $Value_{A'} < Value_A$.

4.5. The Value of Industrial Plates, Standard and Accessible

The analysis lies a tad differently with respect to Industrial plates in Ottawa because of the presence of the collective bargaining agreements. As such, **owners of multiple taxi plates, whether they are individuals or corporations, do not have the same right as Artisan plate owners** in collecting the lease payment they negotiated in good faith with a driver. The Ottawa taxi market is structured such that drivers as a group and Industrial taxi plateholders as a group have reached a collective bargaining agreement that delineates the rights and privileges of the members of the two groups.

The formula for calculating the value of the Industrial taxi plate is the same as when Artisans were leasing their taxi plate, that is,

$$Value_I = \sum_{t=1}^{\infty} \frac{\overline{Lease}_t - fixed_t}{(1+r)^t} - \sum_{t=2}^{\infty} \frac{R}{(1+r)^t}.$$

The lease paid to Industrial plate owners is different than the lease paid to Artisan plate owners. In other words, $\overline{Lease}_t \neq Lease_t$, so that $Value_I \neq Value_B$.

Industrial taxi plate owners will not collect the same lease as Artisan plate owners because of the collective bargaining agreement (trial exhibit 1). In that sense, for industrial plate owners, the market for taxicab leases is not a competitive and free market where the driver who is willing to pay the highest price wins the auction. Instead, the same lease price is paid by all drivers, with the drivers with the most experience having their choice of the taxi plate to lease (CBA2018). This is why the lease price of an Industrial plate, $\overline{Lease}_t$, should be lower than the lease price of an Artisan plate, $Lease_t$. We consequently have that $Value_I < Value_B = Value_A$.

Around the time of the City of Ottawa amalgamation in 2000 the market value of Artisan plates was on average 41% greater than the market value of Industrial plates.[22] With respect to leasing,

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[20] Assuming of course that the fare structure of accessible taxicab is the same as for standard taxicabs.

[21] For an estimate of this cost, see https://universalmotion.com/blog/how-much-does-a-wheelchair-van-cost/.

[22] What we call '*Artisan*' plates are called by Hara Associates '*plates free of the collective bargaining agreement*', whereas what we call '*Industrial*' plates are called '*plates under the collective agreement*' by Hara Associates (Hara:2-4).

Artisan plate leases were 127% greater than leases constrained by the collective bargaining agreement (Hara2000: 2-5). The difference in lease prices between Industrial and Artisan plates is not new, as it dates back at least to the mid-1980s (trial exhibit 1), as the appendix to the Taxi Project Team report of 2000 shows.[23] 'Artisan' plates that are leased outside of the collective bargaining agreement command a lease price that is at least twice that of 'Industrial' plates whose lease is governed by the collective bargaining agreement.

The collective bargaining agreement could allow us to calculate more precisely the fair market value of an Industrial taxi plate in Ottawa, as CBA2018 (and other bargaining agreements) gives us value to ascribe to $\overline{Lease_t}$. Calculating the fair market value of Industrial plates then only requires that we simply use $Value_I$ above and assume, as in Hara2000:3-4 (equation 1), a reasonable discount rate, r, and growth rate for $\overline{Lease_t}$.

In the case of 'Industrial' accessible plates, their value would be

$$Value_{I'} = \sum_{t=1}^{\infty} \frac{\overline{Lease}_t - fixed_t - X_t}{(1+r)^t} - \sum_{t=2}^{\infty} \frac{R}{(1+r)^t}.$$

Where all parameters are like in the case of standard plates, except for some additional costs (i.e., making the taxicab accessible) associated with owning an accessible taxicab, X_t. Consequently, we have that $Value_{I'} < Value_I$.

4.6. An Alternate Market Structure for Industrial Plates

In Ottawa, the collective agreement joins drivers who must pay a lease to taxi plate owners. An alternative market structure could have been for taxi plate owners to pay wages to their employed drivers. This system was once in place in Montreal for Teo Taxi.[24] The salaried-driver model of Teo Taxi failed when the company became insolvent in 2019, only to be reborn with drivers leasing their taxicabs from TeoTaxi.[25] Although the salaried-driver system was once in place in Montreal for Teo Taxi, our understanding is that no Industrial plate owner in Ottawa operated under such a system. It was, nonetheless, a possibility.

4.7. From Industrial to Artisan Plates (and vice versa)

[23] Taxi Project Team, Collective of authors and members, sometime in 2000 (TPT hereinafter).

[24] https://carrefourrh.org/ressources/revue-rh/volume-21-no-1/teo-taxi-du-developpement-durable-au-recrutement-d and https://www.rcinet.ca/fr/2019/01/29/teo-taxi-ferme-et-450-chauffeurs-recoivent-un-avis-de-licenciement/.

[25] https://www.journaldemontreal.com/2020/10/15/teo-taxi-reprend-du-service-sur-les-routes-du-quebec-1.

Owners of Industrial taxi plates are able, under certain circumstances, to convert them into Artisan plates. We read in the 2018 Collective Bargaining Agreement between Coventry Connections *et al.* and Unifor Canada that *"all leased plates shall remain as such and shall not be converted to rental vehicle for the duration of the Collective Agreement, provided there are persons willing to lease said plates."*[26] Moreover, the lessee has a right of first refusal when "his" plate is sold (CBA2018:24.02.(b).i).

The ability to convert an Industrial taxi plate into an Artisan plate has value. This means that the value of the Industrial plate that we calculated as

$$Value_I = \sum_{t=1}^{\infty} \frac{\overline{Lease}_t - fixed_t}{(1+r)^t} - \sum_{t=2}^{\infty} \frac{R}{(1+r)^t},$$

underestimates the actual fair market value of the plates, $Value_I^*$, by the conversion value, $C_I = Value_I^* - Value_I > 0$. This conversion value can be estimated and must be taken into consideration.

The collective agreements allow a broker to transfer up to two taxi licenses to individual drivers in any given year. Those transfer restrictions apply only for the duration of the agreement. Upon expiry, a multi-plate holder who considers the agreement's terms unfavourable may dispose of additional licenses on the open market at prevailing prices. Accordingly, **the market segmentation induced by the CBA is time-limited**: it constrains transfers while the CBA is in force but does not prevent a reallocation of plates once the agreement lapses.

Mathematically, assuming that collective agreements are renegotiated every 3 years, we have

$$Value_I^* = \sum_{t=1}^{3} \frac{\overline{Lease}_t - fixed_t}{(1+r)^t} + \frac{Value_{A,3}}{(1+r)^3}.$$

As noted above, the collective agreement also allows under certain conditions the reallocation of plates during its term. While this additional flexibility can increase $Value_I^*$, our interpretation of the agreement suggests that its effect is of second-order importance relative to the broader resale options available at expiry.

4.8. Data Needed for Applying the Proposed Method

The discounted cash flow valuation model is the more basic and the most important of all methods used to value financial assets in Finance. It can become more sophisticated as the problem becomes more complicated. Nonetheless, the principle that the value of any asset is the

[26] Collective Agreement between Coventry Connections Inc., Ziptrack Ltd., Taxitab, and Unifor Canada and its Local 1688 effective November 19th, 2017, to November 28th, 2020, paragraph 24.01(1). All other collective agreements that we read had the same clause.

sum of all discounted cash flows generated by the asset is always true in finance, whether we consider a real asset or a financial asset. Recall that we have

$$Value_A = \sum_{t=1}^{\infty} \frac{Revenues_t - Costs_t}{(1+r)^t} - \sum_{t=2}^{\infty} \frac{R}{(1+r)^t},$$

and

$$Value_I = \sum_{t=1}^{\infty} \frac{\overline{Lease}_t - fixed_t}{(1+r)^t} - \sum_{t=2}^{\infty} \frac{R}{(1+r)^t}.$$

To apply this approach to the case of Ottawa taxi plates we would need information about revenues and costs to find the value of artisan plates, $Value_A$.

1) The KPMG report[27] gives us an estimated total annual operating and capital cost of a sedan taxicab of $42,100.[28] We therefore have the cost component of the first equation: $Costs_t = N_t \times variable_t + fixed_t = \$42{,}100$;[29]
2) The renewal cost R is known from para 47 of the SAF and the City's by-law;
3) Total annual revenues (declared and undeclared) including tips, $Revenues_t$, remain unknown at this point;[30]
4) The discount rate, r, also remains unknown at this point.

The discount rate could be estimated by examining what interest rate is charged by banks and other lenders to purchasers of taxi permit licenses. We could also estimate what is the average systematic risk of taxi permit licenses to infer what the proper discount rate should be using the Capital Asset Pricing Model (CAMP), which is very well known in financial economics. To do so, we will need to assess how monthly total (or average) receipts depend on economic conditions.

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[27] "Taxi and Limousine Regulation and Service Review" by KPMG, December 31, 2015 (trial exhibit 58).

[28] We also know that each taxicab makes $8{,}418 = 365 \times 27{,}400/1{,}188$ trips per year (Mowat:7), so that the operating and capital cost per ride is on average $\$5.00 = \$42{,}100/8{,}418$.

[29] An alternative is to use our own estimation of the cost per ride as shown in the Technical Appendix (Section 9).

[30] We could also use the equation $Revenues_t = N_t \times Price_t$ to estimate total annual revenues, but we would need to have the total annual number of rides, N_t, and the average price per ride, $Price_t$. Plaintiff's Counsel gave us a list of monthly credit card transactions from February 2008 to July 2019 that is promising in terms of finding what is the average revenue per fare paid by credit (and debit) cards (see the letter dated 25 September 2025 in the Appendix, Section 12), as well as the total daily reported fares. If we believe that credit and debit transactions are a representative sample of all transactions (including transactions paid by cash), then we have a very good estimate of the average gross revenue per fare for the entire taxicab industry. Unreported cash fares remain unreported.

In the case of Industrial plates, it seems, based on the set of documents that were made available to us, that we already have all the components to find their fair market value, $Value_I$… except for the discount rate, r.

1) We have the annual lease collected by the Industrial taxi plate owners;
2) We have an idea of the fixed and capital costs they incur;
3) We know from the different court documents what the renewal fees (R) are; and
4) The only unknown that remains is which discount rate, r, to use.

The discount rate to use remains unknown despite the large number of documents to which we had access in this case. There are indirect ways to infer what the appropriate discount rate must be for Artisan and Industrial plates (see the previous footnote).

5. THE SITUATION IN NEW YORK CITY AND OTHER NORTH AMERICAN CITIES

Apart from the existence of a union agreement between plate renters and plate owners, the market structure for Ottawa taxis is very similar to what exists in other big cities where city or state governments have implemented a permit system (or a medallion system) which artificially and intentionally limits the number of available taxis. Historically, the number of permits and medallions increased at a much slower pace than the demand for taxis.

Taxi permit owners can be artisans (one car and one driver) or companies that can own hundreds of cars and have several hundred drivers. Drivers generally rent a taxi for a work shift. Taxi cabs can also subscribe to a dispatch service for which the driver or owner pays a commission or a fee, or they can work in parallel to these services (sometimes referred to as "ghosts" in taxi driver vernacular). Large city centres like Toronto, Montréal, Paris, New York, Chicago, London, Berlin and Munich (among others) limit the number of taxi cabs on their territory.

5.1. New York City's "Yellow Cabs"

The birth of the controlled taxi medallion market dates to the 1937 Haas Law,[31] which froze the New York City government's ability to deliver taxi permits, when there were 13,500 taxi medallions in New York. The number of taxi medallions went from 21,000 in 1931 to 11,414 in 1947, when there was a stark increase in demand for this type of service, as we can see in Schaller and Gilbert (1996). Road congestion and air and noise pollution were the two main factors that limited any significant increase in the number of medallions. As of August 2025, there were 13,587 medallions,[32] which is essentially the same number as in 1937.

One of the most comprehensive data sources taxi permit values come from the city of New York (public data is also available for Chicago). As in Ottawa pre-2014, whoever wanted to transport people in exchange for payment in New York City had to have (own or rent) a "Yellow Cab" or "Green Cab" permit.[33] There were a limited number of these permits. When examining in Figure 5.1 the evolution of the average daily gross income for all taxi drivers, we see that before 2013 the average daily income for the industry was increasing. Starting in 2014, however, average daily incomes for the industry started to decrease.

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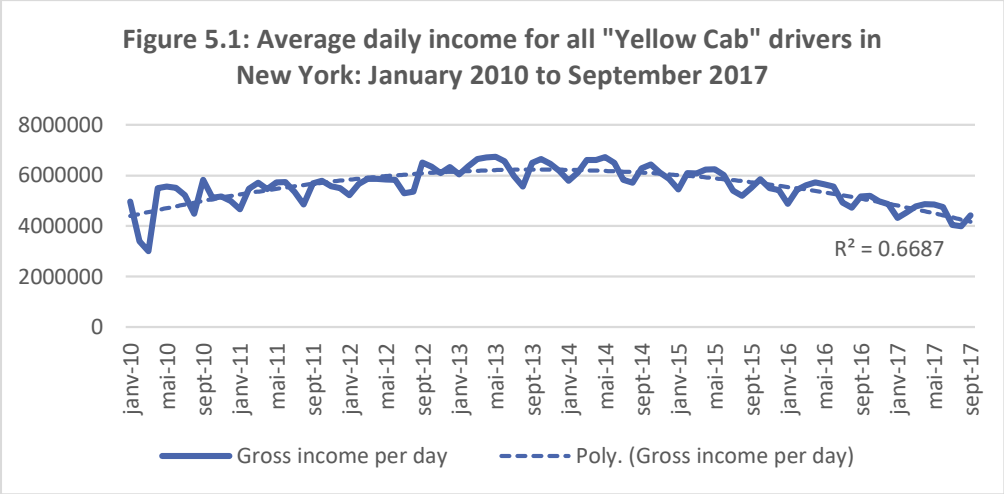
[31] "History", nyc.gov/html/media/totweb/taxioftomorrow_history_regulationandprosperity.html (page viewed on January 25, 2023)

[32] "Yellow Cab", nyc.gov/site/tlc/businesses/yellow-cab.page (page last viewed on August 11, 2025)

[33] "Green cab" permits came with restricted rights compared to "Yellow cab" permits.



Although Uber began its activities in New York in 2011, it's only during the fall of 2014 that nearly a million New Yorkers were using Uber's services each week.[34] The "Yellow Cab" drivers' incomes started suffering from the competition, especially since the number of potential Uber drivers was double the number of existing "Yellow Cab" medallions, maybe even quadruple that number![35]

Since the "Yellow Cab" drivers' incomes depends on them owning or renting a medallion, a change (or an increase) in the anticipated average long-term income must be reflected in the value of these permits. Figure 5.2 illustrates the evolution of the value of New York taxi medallions[36] starting at the second quarter of 2009 and up until the end of 2020 — the continuous line, to be read on the left axis. The value is calculated as the average price at which the medallions are exchanged after eliminating transactions between initiates (such as family members) and transactions at a price of zero.

The average value of permits reached a peak of over a million dollars at the end of 2013 and beginning of 2014, which corresponds to the moment when the average income for the taxi industry was at its historic peak (see Figure 5.1). By 2016, New York City taxi medallions were worth half their 2014 value. In 2018, medallions were worth less than $250,000. At the end of 2020, it was possible to purchase a "Yellow Cab" medallion for less than $100,000.[37]

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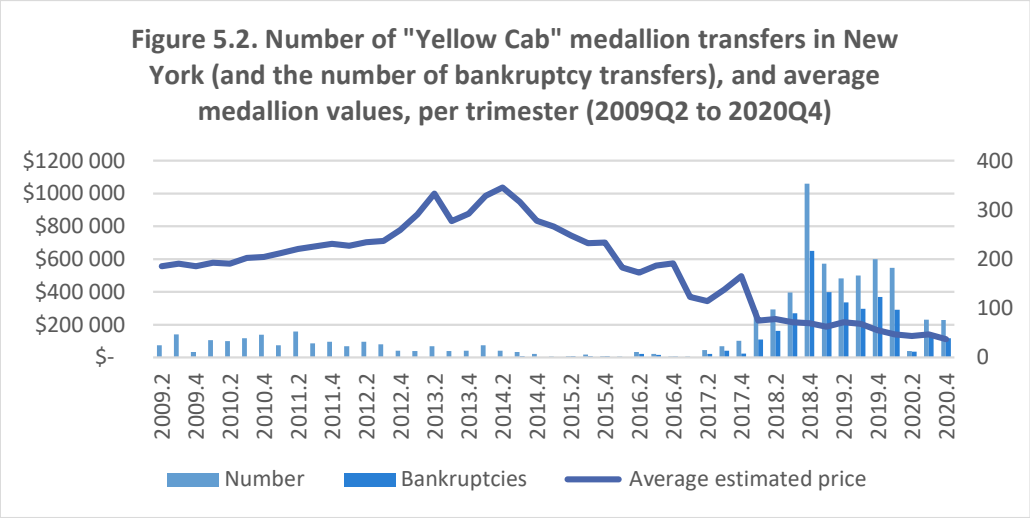
[34] "Uber Won New York", by Alison Griswold, November 18, 2015, slate.com/business/2015/11/uber-won-new-york-city-it-only-took-five-years.html

[35] "Yellow Cab, Long a Fixture of City Life, Is for Many a Thing of the Past" January 15, 2017, nytimes.com/2017/01/15/nyregion/yellow-cab-long-a-fixture-of-city-life-is-for-many-a-thing-of-the-past.html

[36] "Medallion Transfers", www1.nyc.gov/site/tlc/businesses/medallion-transfers.page

[37] The New York City Taxi and Limousine Commission prohibited all transactions in April and May 2020 due to the COVID-19 pandemic.



The decrease in the value of the New York medallion starting in 2014 was accompanied by an increase in the number of transactions — the blue columns, which can be read on the right axis.

- Whereas there were only thirty or so normal transactions per trimester before 2014, that amount has tripled since 2018. It is important to note that not all transactions are equal.
- Whereas only one of the 534 regular transactions from 2009 to 2013 was due to a bank foreclosure or bankruptcy — in red using the right axis — over half of the 1,842 "Yellow Cab" permits that were exchanged between 2016 and 2020 were the result of a bank foreclosure or bankruptcy.

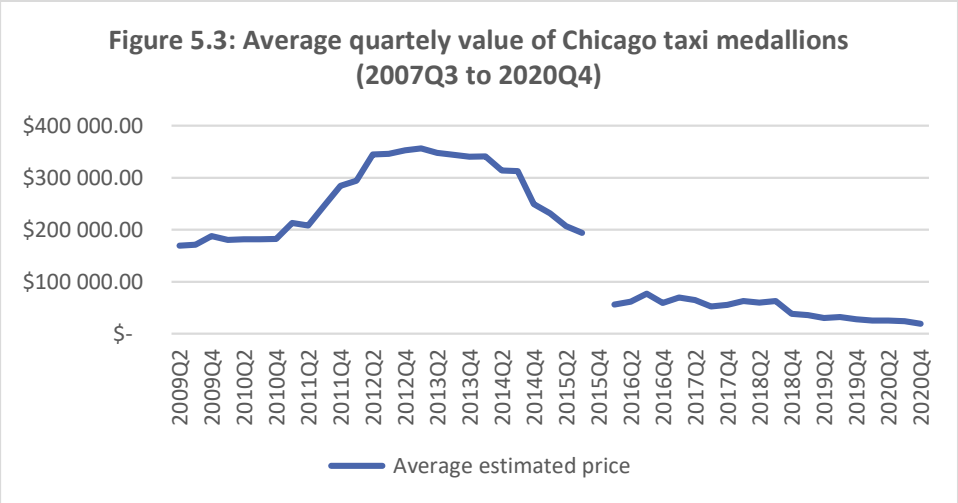
Assuming a medallion owner's average debt of $600,000, we understand why some owners preferred to declare bankruptcy rather than to continue paying back a loan on an asset whose value was greatly inferior to the face value of the debt. The same phenomenon occurred in Boston.[38]

5.2. The Value of Medallions Elsewhere in North America

Let's examine now how the value of medallions evolved in certain large North American cities, such as Boston, Philadelphia, Chicago, Miami, San Francisco, and Toronto.

[38] "They stole from us': the New York taxi drivers mired in debt over medallions," by Erum Salam, October 2, 2021, theguardian.com/us-news/2021/oct/02/new-york-city-taxi-medallion-drivers-debt and "Cabbies defaulting on loans", by Jack Sullivan, October 15, 2015, commonwealthmagazine.org/economy/cabbies-defaulting-on-loans/

Figure 5.3 shows the evolution of the average value of a medallion in **Chicago**.[39] In the same way that Figure 5.2 eloquently presented the very quick decrease in medallion value in New York City, Figure 5.3 illustrates how medallion value in Chicago dropped decreased drastically. after eliminating transactions between family members and artificially priced transactions we find that Chicago medallions were worth USD 340,000 at the end of 2013 and the beginning of 2014, but only USD 60,000 in 2016.



In **Boston**,[40] where taxis are regulated by the municipal police's "*Hackney Carriage Unit,*"[41] the 1,835 "Hackney" medallions had an average value of $685,000 in 2014. [42] Four years later, in 2018, these medallions were only worth $58,668. According to documents from the Court of Massachusetts, [43] the average price for a Boston taxi medallion as of June 2014 was $637,500 and it was up to $700,000 in 2014.

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[39] "Business Affairs And Consumer Protection Medallion Transfers 8/22/2007 to Present", June 1, 2022, chicago.gov/content/dam/city/depts/bacp/publicvehicleinfo/medallionowners/medalliontransfers08222007to06012022.pdf

[40] Aside from Chicago and New York City, which are cities that make data on taxi medallions publicly and easily available, other cities do not have, it seems, a central depository from which we can access taxi medallion and plate transfer prices that is easily accessible. To gather this information for other cities, we must settle for secondary sources, such as news or specialized press articles, or evidence presented in U.S. courts (as was the case with Philadelphia, for example) and used in their legal decisions.

[41] "Hackney Carriage Unit" bpdnews.com/hackney-carriage-unit (page viewed on November 3, 2021) & "Taxi consultant report", October 11, 2013, cityofboston.gov/news/uploads/6033_4_24_27.pdf

[42] "Competition hacks taxi business", by Jordan Graham, October 21, 2021, bostonherald.com/2018/10/21/competition-hacks-taxi-business/

[43] United States District Court District of Massachusetts, September 6, 2019, courthousenews.com/wp-content/uploads/2019/09/Uber.pdf

To participate in the new medallion auction in **Philadelphia** in 2016,[44] a $10,000 minimum bid had to be made. All medallions were not sold. And yet, in October 2014, the unit value of the 1,610 taxi medallions was $545,000,[45] and it was only slightly over $80,000 in November 2016, when 15% of medallions had been seized due to non-payment by their owners.

In **Miami** in 2014, the average price for a taxi medallion was $340,000. [46] The 2,121 medallions in service in Miami-Dade County were emitted via a lottery. The average value of these medallions was only $35,000 in 2017-2018.[47] In **San Francisco**, a medallion was worth $250,000 between 2010 and 2014. [48] There have been no medallions sold since 2016 and over half of all medallions bought via a loan are now managed by a financial institution.[49] With its 1,967 medallions for 1.1 million people,[50] San Francisco has a little less than 1.8 medallions per 1,000 residents.

The last city which can illustrate and quantify the impact of Uber's arrival on a market is **Toronto**, which had 2.6 million residents in 2014.A taxi plate cost $360,000 in 2012,[51] but sold for $65,000 in 2016. At the end of 2022 Toronto taxi medallions were up for sale for $12,000,[52] even though the city no longer allowed for new or newly joined Uber drivers since the end of 2021.[53]

In all these examples **there is only one type of standard taxi medallion, permit or plate**.

5.3. The Presence of Uber Driver Elsewhere in North America

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[44] "Taxi medallion values hit new low as PPA sets minimum bid for upcoming auction", by Jim Saksa, June 28, 2016, whyy.org/articles/taxi-medallion-values-hit-new-low-as-ppa-sets-minimum-bid-for-upcoming-auction/ & "Taxi owners hang on to one coveted medallions, hoping for a rebound", by Lauren Ferner, August 20, 2016, inquirer.com/philly/business/transportation/20160821_Taxi_owners_hang_on_to_once-coveted_medallions__hoping_for_a_rebound.html

[45] United States Court of Appeals for the Third Circuit, March 27, 2018, www2.ca3.uscourts.gov/opinarch/171871p.pdf

[46] wlrn.org/news/2014-07-02/how-the-taxi-industry-became-legit-in-miami

[47] forbes.com/sites/nicksibilla/2018/08/08/miami-taxis-arent-entitled-to-a-market-stranglehold-must-compete-with-uber-federal-court-rules/?sh=2dc10380e5ca

[48] nytimes.com/2019/10/04/nyregion/taxi-medallions-chicago.html & 48hills.org/2021/12/taxi-drivers-protest-demand-relief-from-sfs-failed-permit-program/

[49] marketplace.org/2021/10/27/san-francisco-taxi-drivers-still-struggle-with-medallion-debt/

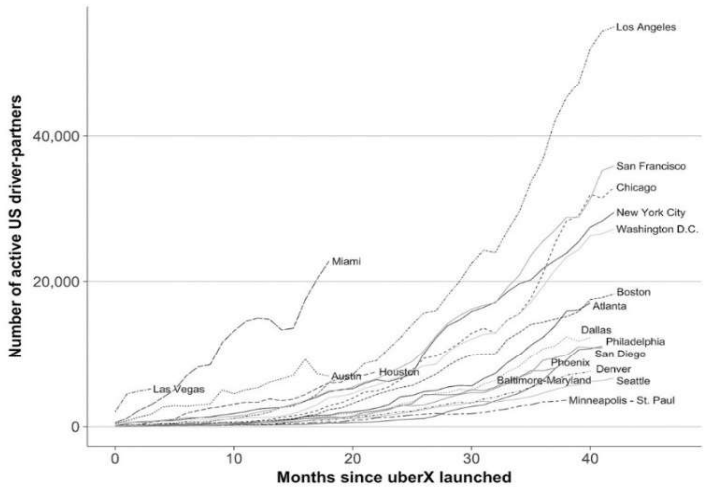
[50] sfmta.com/sites/default/files/reports/2016/2015%20SFMTA%20Transportation%20Factsheet.pdf

[51] theglobeandmail.com/news/toronto/why-uber-is-the-best-thing-to-happen-to-torontos-taxi-industry/article29825194/

[52] The page was last accessed on 20 Decembre 2022; it is reproduced in Appendix 8.5.

[53] cbc.ca/news/canada/toronto/city-council-ride-hailing-service-driver-training-decision-1.6244937

One of the most fascinating questions associated with the presence of Uber in North American taxi markets is the speed at which non-taxi drivers (and, perhaps, taxi drivers too) became Uber drivers. The following figure taken from Hall and Krueger (2017) shows the number of Uber drivers in a subset of U.S. cities up to 40 months after Uber became available in early 2012.



Active US Driver-Partners over Time, by City

These are all larger cities than Ottawa. When Uber was launched, Ottawa counted slightly less than one million residents. Around the same time, the populations of Philadelphia and of San Diego were 1.5 million for 10,000 Uber drivers each 40 months after the launch of Uber.

6. ESTIMATING TAXI PERMIT VALUE LOSS IN OTTAWA

We know that the number of taxi permit licenses in the City of Ottawa is limited, thus creating some monopoly-like situation for the individuals and companies that own the permits. The question we seek to answer in this section is how we would go about quantifying the value of taxi licenses in Ottawa if the experience of the Ottawa taxi industry followed that of other places where Uber (and other ride-share services) decided to offer their services. Recall that *"suddenly expanding the number of licenses to catch up with demand will reduce the value of licenses back to zero,* ***effectively expropriating the license holders****"* (Hara2000: 1-7) – our emphasis. [54]

6.1. Loss of Value between 2014 and 2022 in other North American cities

Based on the experience of other North American cities, Tables 6.1a and 6.1b summarize the value loss of taxi permits in dollars (Table 6.1a) as a percentage (Table 6.1b) from 2014 to 2016, 2018 and 2022. The loss of value in percentage is quite uniform from one market to another, at least when comparing the value in 2018 and 2022 to that of 2014.

Table 6.1a: Number and value of permits[55] in 2014, 2016, 2018 and 2022 in certain large North American cities where the taxi industry was managed by a medallion system (or its equivalent)

	Medallions		Medallion value			
	Number	per 1000	2014	2016	2018	2022
New York	12,779	1.6	$1,000,000	$500,000	$200,000	$150,000
Chicago	6,904	2.6	$340,000	$60,000	$40,000	$12,500
Philadelphia	1,610	1.1	$545,000	$80,000	$10,000	
Boston	1,835	3.3	$685,000	$250,000	$60,000	
San Francisco	1,967	1.8	$250,000			
Miami	2,121	1.3	$340,000		$35,000	
Toronto	5,000	1.9	$360,000	$65,000		$12,000
Average		**1.94**				

[54] In addition, we read in *Metro Taxi Ltd. et al. v. City of Ottawa,* 2024 ONSC 2725, that "any loss incurred and proven by the Plaintiffs is directly caused by the City's inaction or ineffective action in the enforcement of its taxi by-laws" (paragraph 241), so that "any reasonable person would foresee that the failure to enforce taxi regulations against Uber would have a devastating economic impact on the Plaintiffs" (paragraph 243). In the end, the Court is "satisfied that the City caused the Plaintiffs damages" (paragraph 244).

[55] When the data was found for the specified years.

Table 6.1b: Loss of medallion value, in dollars and in percentages (or the equivalent) between 2014 and 2016, 2018 and 2022

	Loss of …					
	2014 to 2016		2014 to 2018		2014 to 2022	
	Value	%	Value	%	Value	%
New York	$500,000	50%	$800,000	80%	$850,000	85%
Chicago	$280,000	82%	$300,000	88%	$327,500	96%
Philadelphia	$465,000	85%	$535,000	98%		98%
Boston	$435,000	64%	$625,000	91%		91%
San Francisco						
Miami			$305,000	90%		90%
Toronto	$295,000	82%			$348,000	96%
Average		**73%**		**89%**		**93%**

On average, taxi permits lost, from 2014 to 2018, approximately 89% of their value. The great majority of the loss in value occurred between 2014 and 2016, as illustrated in Figure 6.1 for the six cities for which we have data beyond 2014 (a value of 1 was assigned to taxi medallions in 2014).

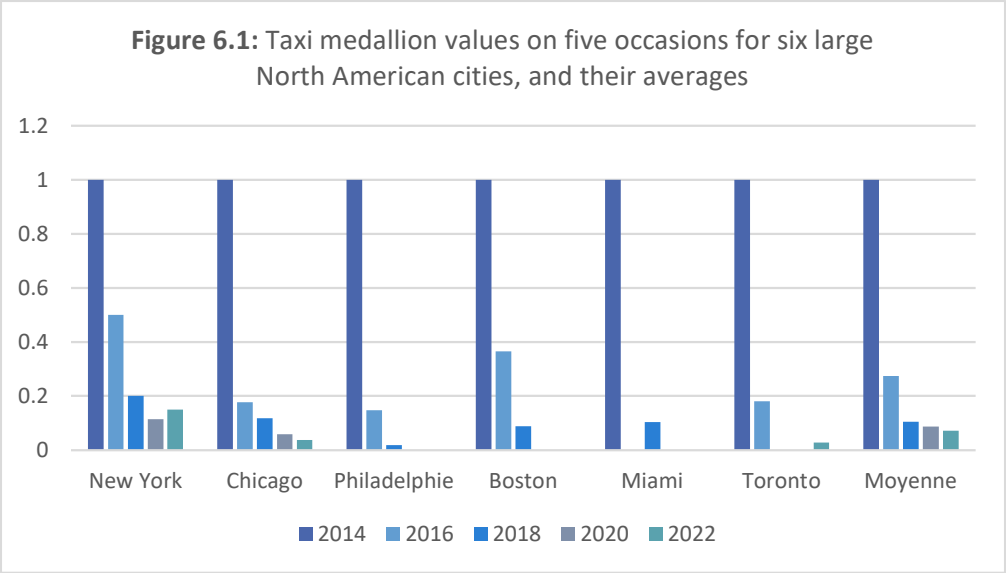


Figure 6.1: Taxi medallion values on five occasions for six large North American cities, and their averages

6.2. Value Based on Income Stemming from the Use of a Permit

According to the basic discounted cash flow principle, the price of a cab owner's permit today should reflect all the cash flows associated with the permit, in addition to the cash flows that would be available without a permit system (or if the number of permits were infinite). Based on

this principle,[56] we can assess the value of the permits according to one of the principles of finance, that of discounting cash flows generated by the asset. According to this principle, [57] an asset's value is calculated as the present value of the cash flows generated by the asset over its lifetime, which would not have been generated otherwise; these are called **marginal** or incremental **cash flows**.

The present value of an asset is given as:

$$Value = \sum_{t=1}^{\infty} \frac{E(CF_t)}{(1+r)^t},$$

where $E(CF_t)$ is the expectation of marginal or incremental cash flows that will occur in t years, and r is the discount rate for these cash flows. If the marginal cash flows are all equal and constant over time (and equal to any sum of $E(CF_t) = X$ \$ for all of t), we can therefore rewrite the previous equation as: $Value = \frac{X}{r}$.

Let us examine a fictional example using parameter values that are sensible for the case of taxi permits in the city of Ottawa. **THESE ARE NOT ACTUAL NUMBERS**.

Let us suppose an asset (i.e., taxi permit) value of $Value = \$190{,}000$. Using a discount rate of $r = 8\%$,[58] a $\$190{,}000$ asset value is only reasonable if it generates an annual cash flow net of expenses of $X = \$15{,}200 = 190{,}000 \times 8\%$ for all future periods.

In the case of taxi permits, a long-term **average net income of $14 per trip** is sufficient to support taxi plate values of $\$190{,}000$. To see why, let us assume total annual operating and capital cost of a sedan taxicab of $42,100. If each taxicab makes $23 = 27{,}400/1{,}188$ trips per day every day, or $8{,}418 = 365 \times 27{,}400/1{,}188$ trips per year, the operating and capital cost per ride is on average $5.00. An average net profit per ride of $14.00 would then require an average revenue per ride of $19.00. A taxi plate value of $190,000 is therefore reasonable if

[56] As a case in point of the usefulness of this principle to estimate taxi plate velue, we read in the Analysis column of document titled *"Projet de loi concernant le transport rémunéré de personnes par automobile"* (see Appendix 8.4) that, in 2016, the Ministère des finances du Québec "*a estimé la valeur marchande des permis selon la méthode de la **valeur actuelle nette… (qui) reflète la valeur intrinsèque de l'actif**, en fonction des revenus potentiels qu'il génère à partir d'un taux d'actualisation convenu*" (our emphasis). Using the discounted cash flow method with a discount rate of 3.75% per annum, the Ministère des finances du Québec estimates a total value for taxi permits of 740 million dollars in 2016.

[57] See the aforementioned HARA2000 document, as well as the document entitled "Projet de loi concernant le transport rémunéré de personnes par automobile" reproduced in Appendix 8.4.

[58] We should note that in the document entitled "Projet de loi concernant le transport rémunéré de personnes par automobile" reproduced in Appendix 8.4, a discount rate of 3.75% is suggested.

it generates 1,085 trips per year (or 90 trips/month or 3.02 trips/day) **that would not have been made otherwise**.

Table 6.2 illustrates the number of daily trips needed to justify a price of $190,000 for taxi licenses for a set of discount rates and average net revenue per trip. If permits generate a net profit of $12 (rather than $14), the taxi license would have had to allow 3.52 more trips per day to justify a permit price of $190,000. At a discount rate of $r = 6\%$ (rather than $r = 8\%$), the $190,000 permit would have had to generate an additional 2.25 trips per day for its purchase to be economically sensible.

Table 6.2: Number of additional daily trips required to render profitable the purchase of a taxi permit for $190,000, based on the discount rate and the average net income per trip.

Discount rate	Average net income of a trip					
	$11	$12	$13	$14	$15	$16
3%	1.44	1.32	1.22	1.13	1.06	0.99
3.75%	1.80	1.65	1.52	1.41	**1.32**	1.24
4%	1.92	1.76	1.62	1.51	1.41	1.32
5%	2.40	2.20	2.03	1.88	1.76	1.65
6%	2.88	2.64	2.44	*2.26*	2.11	1.98
7%	3.36	3.08	2.84	2.64	2.46	2.31
8%	3.84	*3.52*	3.25	**3.02**	2.81	2.64
9%	4.32	3.96	3.65	3.39	3.17	2.97
10%	4.80	4.40	4.06	3.77	3.52	3.30

What percentage decrease in the number of trips which would justify a $\$190{,}000$ loss of value? Assuming one taxicab makes 23 trips per day or 8,400 trips per year, then a simple decrease in the number of trips of 13.1% (from 23 to 20) would decrease the value of the taxi permits by $\$190{,}000$, as illustrated in Table 6.3.

Table 6.3: Clientele loss, in percentage, that would justify a taxi permit's value to go to lose $190,000, if each taxi generated 23 trips per day, and considering the discount rate and the average net trip income.

Discount rate	Net average trip income					
	$11	$12	$13	$14	$15	$16
3%	6.2%	5.7%	5.3%	4.9%	4.6%	4.3%
3.75%	7.8%	7.2%	6.6%	6.1%	**5.7%**	5.4%
4%	8.3%	7.6%	7.0%	6.5%	6.1%	5.7%
5%	10.4%	9.5%	8.8%	8.2%	7.6%	7.2%
6%	12.5%	11.5%	10.6%	*9.8%*	9.2%	8.6%
7%	14.6%	13.4%	12.3%	11.5%	10.7%	10.0%

8%	16.7%	*15.3%*	14.1%	**13.1%**	12.2%	11.5%
9%	18.7%	17.2%	15.9%	14.7%	13.7%	12.9%
10%	20.8%	19.1%	17.6%	16.4%	15.3%	14.3%

7. FINAL REMARKS AND CONCLUSION

We offer the following concluding remarks that summarize our analysis.

1- Taxi permits in Ottawa are financial assets that combine the right to operate a taxicab for one year and the option to purchase the right to operate a taxicab in the following year, forever. As a result, the mechanism is not different from the issuance of taxi medallions that have no maturity.
2- For all taxi permits that have the same rights and privileges, as is the case for Ottawa taxi permits (Amended Statement of Defense, paragraph 28), there is one and only one fair market value. In other words, for any given type of permit, they can be valued in the aggregate.
3- Although the city of Ottawa only issues one type of open taxi permit in addition to accessible permits, operationally, taxi permits belong to two categories that differ with respect to the rights and privileges of operating a taxicab. We called these two categories of plates: the Artisan Plates and the Industrial Plates.
4- In all cases, plate value should be equal to the discounted sum of all cash flows generated by owning the plates in excess of the cash flows that would have been generated without a plate system.
5- All Artisan Standard Plates have the same rights and thus the same value.
6- All Industrial Standard Plates have the same rights and thus the same value, but that value is lower than the value of Artisan Plates, because they do not have the same rights are Artisan Standard Plates.
7- Accessible Plates are worth less than Standard Plates because they do not have the same rights as Standard Plates.

_____

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8. APPENDIX: REFERENCES AND DOCUMENTS IN SUPPORT OF THE ANALYSIS

8.1. Ottawa Taxi Lawsuit Documents

- Trial Judgment: *Metro Taxi Ltd. et al. v. City of Ottawa*, 2024 ONSC 2725
- Amended Amended Statement of Claim; Ontario Superior Court of Justice File 16-69601.
- Amended Statement of Defence; Ontario Superior Court of Justice File 16-69601.
- Statement of Agreed Facts; Ontario Superior Court of Justice Court File 16-69601.
- "Emerging Issues in the Taxi and Limousine Industry" by Sunil Johal, Sata Ditta & Noah Zon, Mowat Center, University of Toronto, circa 2016. (Trial exhibit 1, Tab 279)
- Final Report on Taxi Industry Reform, Taxi Project Team of Ottawa Transition Board, dated December 5, 2000. (Trial exhibit 1, Tab 246)
- Plate Transfer List, 2006-2012 (Trial Exhibit 32)
- Spreadsheet entitled "POS Chart July 2019".xlsx (disclosed to the City as an attachment to the September 5, 2019 letter from Benjamin Grant to Benoit Duchesne)
- Plate Value Options Paper, Taxi Project Team Ottawa Transition Board, by Hara Associates Inc. July 28, 2000. (Trial 204)
- "Taxi Economics – Old and New", Hara Associates Inc., dated October 10, 2015. (Trial exhibit 1, Tab 281)
- "City of Ottawa Taxi and Limousine Regulation and Service Review", KPMG, December 31, 2015. (Trial exhibit 58)
- Collective Agreement between Coventry Connections Inc., Ziptrack Ltd., Taxitab, and Unifor Canada and its Local 1688 effective November 19th, 2017, to November 28th, 2020.

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- NYC Taxi & Limousine Commission (www.nyc.gov/html/tlc/html/technology/aggregated_data.shtml and www1.nyc.gov/site/tlc/businesses/medallion-transfers.page)
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8.4. Appended Documents

Projet de loi concernant le transport rémunéré de personnes par automobile

2019-03-07
Napperon décisionn

The document is reproduced hereinafter at the end of the document.

8.5. Other Documents Directly Used in the Analysis and Openly Accessible

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cbc.ca/news/canada/toronto/city-council-ride-hailing-service-driver-training-decision-1.6244937

https://universalmotion.com/blog/how-much-does-a-wheelchair-van-cost/.

"Taxi company deals with labour dispute by allowing anyone to be an airport cab" https://ottawacitizen.com/news/local-news/taxi-company-solves-labour-dispute-by-allowing-anyone-to-be-an-airport-cab

9. TECHNICAL APPENDIX: ESTIMATION OF THE NET INCOME PER TAXICAB RIDE

Suppose that a taxi plate owner has purchased a Toyota Prius hybrid vehicle as his taxicab. According to Toyota Canada[59], « the 1.8L four-cylinder engine, the powerful electric motor, the newly designed power storage batteries and powertrain management systems all add up to one thing: the most efficient Prius yet, delivering fuel efficiency of just 4.5L / 100 km city/highway combined. »

Suppose a gasoline price of 1.165 $.

For a Toyota Prius, this translates into a fuel cost of $5.244 per 100km. As for maintenance costs, it is estimated[60] at $500 per year for a normal driving of 18,000 km, which corresponds to about 20¢ per trip. If we add up the cost of fuel and the cost of maintenance, we arrive at a total marginal cost per trip of 55¢.

> If the taxicab is a 4-cylinder Toyota Camry, the consumption per 100 km would be 8.1 litres[61]. Assuming the same maintenance cost as the Toyota Prius, we arrive at a marginal cost per ride of about 84¢.

We therefore consider our use of a marginal cost of $1 per trip for the period prior to the arrival of Uber in Ottawa.

The purchase of a Toyota Prius at a cost of $36,000 (including taxes)[62] that is kept for 4 years and is resold for $9,000 at the end of the fourth year.[63] The amortized cost per year is then $6,750. Assuming taxicabs provide 70 trips per week and is on the road 25 days a month (the equivalent of 43.5 weeks a year), we arrive at an operating cost of the new Toyota Prius of about $2.225 per trip. If all other operating costs are of the same order and combining all the costs associated with operating a taxicab ($0.55 per trip for gas and maintenance, $2.25 per trip for the car and $2.225 per trip for other costs), **we arrive at an operating cost of less than $5 per trip**.

Using an average gross revenue per ride of $19, it seems reasonable to use an average long-term net income of $14 per ride.

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59 https://www.toyota.ca/en/connect/2017/canadian-green-car-of-the-year-2017-toyota-prius/

60 www.yourmechanic.com/article/the-most-and-least-expensive-cars-to-maintain-by-maddy-martin

61 www.toyota.ca/toyota/fr/vehicles/camry/features-benefits

62 www.toyota.ca

63 www.canadianblackbook.com

10. SHORT BIOGRAPHIES OF THE EXPERTS

10.1. Synopsis of the Expertise of Martin Boyer, Ph.D.

Martin Boyer (M.A. and Ph.D. *Managerial Science and Applied Economics*, Wharton School of the University of Pennsylvania; M.Sc. and B.Sc. in *Economics*, Université de Montréal) has been Professor of Finance at HEC Montréal since June 2017. He was president of HEC Montréal's Faculty senate in 2024-2025.

He is also a Fellow of CIRANO and the ERPsim Research Consortium of HEC Montréal. He has served as President of the American Risk and Insurance Association, Secretary General of the Northern Finance Association, and as a board member of the Canadian Society for Economic Science.

Martin Boyer was a visiting professor at the University of British Columbia (Sauder) and the University of New South Wales, as well as an associate professor at the University of Toronto's Rotman School, where he taught in the Master of Financial Risk Management program, at Cornell University, where he taught in the Master of Public Finance program, and at the University of St. Gallen, where he taught in the doctoral program in administration.

He has served on the Board of Directors of the HEC Montréal Pension Plan, the Board of Directors of the Montreal Institute of Structured Finance and Derivatives, and the Boards of Directors of the Northern Finance Association and the American Risk and Insurance Association. He is currently the Editor-in-Chief of the Journal of Risk and Insurance.

Martin Boyer is the author or co-author of a hundred scientific and professional articles (published or not), and the author of several public and private reports. His research focuses on investment valuation, corporate governance, risk management of financial and non-financial companies, and informational issues in insurance and other contracts.

He was qualified as an "Expert" for an administrative court proceeding in Québec, as well as an "Expert" in the Québec Superior Court of Justice. He has written several expert reports with respect to business valuation and damage valuation.

10.2. Synopsis of the Expertise of Christian Dorion, Ph.D.

Christian Dorion earned his Ph.D. in Finance from McGill University in 2010, after completing a master's degree in machine learning at Université de Montréal and working for more than three years as a quantitative analyst in a fintech consulting firm. His research, published in leading finance journals, focuses on derivatives, structured products, and the role of systematic risk in asset pricing.

Dorion teaches investments and derivatives at the undergraduate, master's, and doctoral levels, and has supervised more than fifty graduate students. Between 2013 and 2025, he directed the scientific activities of the Canadian Derivatives Institute, where he led the Institute's academic and industry outreach, including its international conference and its network of senior fellows.

In parallel, Dorion has carried out consulting mandates in finance and derivatives since 2019, working on a handful of expert cases, though without testifying in court. Building on this experience, he became the founding CEO of Delta Vega Financial in 2022, a firm created to commercialize a risk-scoring methodology for structured products developed in collaboration with Canadian market participants.

11. CURRICULUM VITAE OF THE EXPERTS

11.1. CV of Martin Boyer, Ph.D.

CURRENT POSITIONS

EMBEC Inc., Economic consultant since 2004 and President since 2020

HEC Montréal, Université de Montréal
- Professor, Department of Finance, since 2006.
- Member of the LACFAS/LACED, since 2001.
- CIRANO Fellow, since 2000.

Risk Theory Society Member, 2005-2008 & since 2011.

PREVIOUS AND TEMPORARY POSITIONS

HEC Montréal, Université de Montréal
- President, HEC Montréal Faculty Senate, 2024-2025.
- CEFA Professor of Finance & Power Corporation of Canada Chair, 2004-2017-2022.
- Chairman, Department of Finance, 2007-2010.
- Assistant, Associate Professor, Department of Finance, 1997-2001-2006.
- Director, Groupe de recherche en gestion des risques des régimes de retraite $(GR)^2R^2P^2$, 2013-2016.

Visiting Professor / Scholar
- Université de Montréal, Département de sciences économiques, 2022-2024.
- Universität St. Gallen, Dpt of Insurance and Risk Management, winter 2021.
- University of Toronto, Department of Finance, Rotman School, 2015-2019.
- Florida State University, Catastrophic Storm Risk Management Center, 2010-2017.
- Ludwig-Maximilians-Universität, Munich Risk and Insurance Center, autumn 2016.
- Cornell University, College of Human Ecology, winter 2015.
- University of New South Wales, CEPAR, autumn 2014.
- University of British Columbia, Department of Finance, 2003-2004.

EDUCATION

Wharton School of Business and Finance, University of Pennsylvania
- Managerial Sciences and Applied Economics. Ph.D. in 1998.
- Risk Management and Insurance. M.A. in 1997.

Université de Montréal
- Economics. M.Sc. in 1992.
- Economics. B.Sc. in 1991. Incomplete Minor in Russian Studies.

PROFESSIONAL EXPERIENCE: EXPERT AND EXPERT WITNESS

- **Expert witness** on the value of a business partner in a family firm, 2020-2025.
- **Expert witness** in a class action lawsuit, Regroupement des propriétaires de taxi, 2018-2024 (Taxis v. PGQ).
- Lawsuit expert on the cost of an operational glitch, 2020- (BCE).
- Class action lawsuit expert, BCP, 2019- (Dupuis).
- Class action lawsuit expert, BCP, 2019- (Asselin).
- Class action lawsuit expert, TAXI, 2018- (Taxis).
- Class action lawsuit expert, HELOC, 2017-2019 (Masalla).
- **Expert witness** in the valuation of an asset, 2016-2019 (AMP)
- **Expert witness** for the city of St-Hyacinthe (Police), 1999-2000.
- **Expert witness** for the Société de transport de Montréal (Police), 1999.

PROFESSIONAL EXPERIENCE: CONSULTING

- Groupe Jean-Coutu, 2014-2015. Valuation of a brand.
- National Bank of Canada, Strategic Retirement program panel member, 2008-2012.
- Concentric, 2008. Didactic Coordinator.
- DGIA, 2006. A Pricing Model for REITs.
- Industry Canada, 2006. Firm financing when approaching insolvency.
- Vinci Concessions, 2004. Non-linear pricing schemes for toll highway.
- Caisse Centrale Desjardins, 2004. Valuing Collateralized Debt Obligations.
- Industry Canada, 2004. Corporate governance and returns to shareholders in the Canadian small business manufacturing sector.
- Le vérificateur général du Québec, 2003. Financial responsibility of government investors.
- TransÉnergie HydroQuébec (TEHQ), 2003. Risk management of electricity projects.
- Bombardier International, 1999-2000. The value of multinational conglomerates.
- CIGNA, 1996. Market study on high end insurance products (over 500 million $ in damages).

EDITORIAL RESPONSIBILITIES

Editor-in-Chief, Journal of Risk and Insurance, since 2025
Associate Editor, Geneva Papers on Risk and Insurance: Issues and Practice, since 2023
Guest Editor, Geneva Papers on Risk and Insurance: Issues and Practice, 2020, 2022.
Associate Editor, Journal of Risk and Insurance, 2007-2018.
Associate Editor, Risks, 2012-2016.
Associate Editor, Canadian Journal of Administrative Science, 2012-2016.
Associate Editor, Gestion, 2009-2015.
Associate Editor, *Assurance et gestion des risques*, 2011-2013.
Editor, *Assurance et gestion des risques*, 2004-2011.
Special Editor, *Assurance et gestion des risques*, 2003-2004.
Editorial Board of *Assurance et gestion des risques*, 2001-2013.
Program Committee Chair & President, Northern Finance Association, 2006.

Program Committee Chair, American Risk and Insurance Association, 2017.

FELLOWSHIPD AND AWARDS

- President's Award, American Risk and Insurance Association, 2025.
- Brocket-Shapiro Best Paper Award in Actuarial Economics, 2015.
- Best Paper Award, Quarterly Journal of Finance, 2015.
- Casualty Actuarial Society, Theory of Risk Best Paper Award, 2013.
- Bank of Canada NFA Prize for the Best Paper on the Canadian Financial System, 2010
- Early Career Scholarly Achievement Award, American Risk and Insurance Association, 2007
- Outstanding Assistant Professor Award, HEC Montréal, 2001.
- Young Researcher Grant (best research project), HEC, 1998.
- American Compensation Association Award, 1998-99.
- S. S. Huebner Fellow, University of Pennsylvania, 1992-97.
- Boursier du Fonds FCAR-Québec, 1993-1997.
- Social Science and Humanities Research Council (Canada) Fellow, 1993-1997.

MAIN ACADEMIC PUBLICATIONS

1. "The Litigation Cost of Cross-listing in the United States" *Corporate Governance: An International Review*, 33:436-461. (2025).
2. "Corporate social responsibility and directors' and officers' liability: The moderating effect of the risk environment and growth potential" *Business and Society* 63(3): 668–711 (2024); with Anne Kleffner and Hao (Leo) Lu.
3. "Tax Compliance and Firm Response to Electronic Sales Monitoring" *Canadian Journal of Economics 56(4): 1430-1468 (2023)*; with Philippe d'Astous.
4. "New Advances on Cyber Risk and Cyber Insurance" *Geneva Paper on Risk and Insurance – Issues and Practice 48(2): 267-274 (2023)*; with Martin Eling.
5. "Tax-Preferred Savings Vehicles: Can Financial Education Improve Asset Location Decisions?" *Review of Economic and Statistics 104:541–556 (2022)*; with Philippe d'Astous and Pierre-Carl Michaud.
6. "Ineffective Implementation of Corporate Governance? A Call for Greater Transparency to Reduce Agency Cost" *Managerial and Decision Economics 43(5): 1528-1547 (2022)*; with Samya Tahir, Mian Sajid Nazir, and Muhammad Ali Jibran Qamar.
7. "Pensions, annuities, and long-term care insurance: On the impact of risk screening" *Geneva Risk and Insurance Review 46:133-174 (2021)*; with Franca Glenzer (HEC Montréal).
8. "Demand for Annuities: Price Sensitivity, Risk Perceptions, and Knowledge." *Journal of Economic Behavior and Organisations 180:883-902 (2020);* with Sébastien Box-Couillard and Pierre-Carl Michaud.
9. "Cyber insurance demand, supply, contracts, and cases" *Geneva Papers on Risk and Insurance - Issues and Practice 45:559-563 (2020).*
10. "Long-Term Care Insurance: Information Frictions and Selection." *American Economic Journal: Economic Policy 12(3): 134-169 (2020)*; with Philippe De Donder, Claude Fluet, Marie-

Louise Leroux, and Pierre-Carl Michaud.

11. "Operational Risk Management and Regulatory Investment Constraints on Portfolio Allocation: Evidence from Property and Casualty Insurers." *Journal of Regulatory Economics 57(1): 20-52 (2020)*; with Willie D. Reddic and Elicia P. Cowins.
12. "Insurance Fraud in a Rothschild-Stiglitz World.*" Journal of Risk and Insurance 87(1): 117-142 (2020)*.
13. "A Canadian *Parlor Room-Type* Approach to the Long-Term Care Insurance Market." *Canadian Public Policy* 45(2), pp. 262–282 (2019); with Philippe De Donder, Claude Fluet, Marie-Louise Leroux, and Pierre-Carl Michaud.
14. "Portfolio Rebalancing Behavior under Operating Losses and Investment Limitations." *International Review of Economics and Finance* 63:313-328 (2019); with Willie D. Reddic and Elicia P. Cowins.
15. "Long-Term Care Risk Misperceptions." *Geneva Papers Issues and Practice 44(2): 183-215 (2019);* with Philippe De Donder, Claude Fluet, Marie-Louise Leroux, and Pierre-Carl Michaud. **Lead Article**.
16. "Directors' and Officers' Liability Insurance, Corporate Risk and Risk Taking: New Panel Data Evidence on the Role of Directors' and Officers' Liability Insurance." *Journal of Risk and Insurance* 82(4): 753–791 (2015)*;* with Sharon Tennyson. **Lead Article**.
17. "The Structure of Reinsurance Contracts" *Geneva Papers on Risk and Insurance: Issues and Practice 40:474-492 (2015*); with Théodora Dupont-Courtade.
18. "D&O Insurance and IPO Performance: what can we learn from insurers?" *Journal of Financial Intermediation 23(4):504-540 (2014)*; with Léa Stern.
19. "Underwriting Apophenia and Cryptids: Are Cycles Statistical Figments of our Imagination?" *Geneva Papers on Risk and Insurance: Issues and Practice 40:232-255 (2014*); with Iqbal Owadally.
20. "Confirmation biases in the financial analysis of IT investments" *Journal of the Association for Information Systems 15(1):1 (2014)*; with Renaud Legoux, Pierre-Majorique Léger and Jacques Robert.
21. "Insuring Catastrophes and the Role of Governments" *Natural Hazards and Earth Science Systems 13:2053-2063* (2013); with Charles Nyce.
22. "If we can simulate it, we can insure it: An application to longevity risk management" *Insurance: Mathematics and Economics* 52:35-45 (2013); with Lars Stentoft.
23. "Are Underwriting Cycles Real and Forecastable?" *Journal of Risk and Insurance* 79: 995–1015 (2012); with Éric Jacquier and Simon van Norden.

    Winner of the **2012 Casualty Actuarial Society** best paper award on the Theory of Risk
24. "Is Corporate Governance Risk Valued? Evidence from Directors' and Officers' Insurance" *Journal of Corporate Finance* 18:349-372 (2012); with Léa Stern.

    Winner of the **2010 Bank of Canada** best paper award on the Canadian Financial System
25. "Claims-Made and Reported Policies and Insurer Profitability in Medical Malpractice" *Journal of Risk and Insurance* 78(1): 139-162 (2011); Patricia Born.
26. "The Impact of Switching Costs on Vendor Financing" *Finance Research Letters,* 6:236-241 (2009); with Karine Gobert.
27. "Career Concerns of Top Executives, Managerial Ownership and CEO Succession" *Corporate Governance: An International Review*; 16:178-193 (2008); with Hernan Ortiz Molina.

28. "Dynamic Prevention in Short Term Insurance Contracts" *Journal of Risk and Insurance*, 75:289-312 (2008); with Karine Gobert.
29. "Resistance (to Fraud) is Futile" *Journal of Risk and Insurance*, 74:461-492 (2007).
30. "Common and Fundamental Factors in Stock Returns of Canadian Oil and Gas Companies" *Energy Economics*, 29:428-453 (2007); with Didier Filion.
31. "Exchange Rates and Order Flow in the Long Run" *Finance Research Letters*, 3(4): 235-243 (2006); with Simon van Norden. **Lead Article**.
32. "The Impact of Media Attention: Evidence from the Automobile Insurance Industry" *Journal of Media Economics*, 19:193-220 (2006).
33. "Overcompensation as a Partial Solution to Commitment and Renegotiation Problems: The Case of Ex-post Moral Hazard" *Journal of Risk and Insurance*, 71:559-582 (2004). **Lead Article**.
34. "Optimal Audit Policies with Correlated Types" *Economic Theory*, 24(2): 325-334 (2004); with Patrick Gonzalez.
35. "Contracting under Ex post Moral Hazard, Costly Auditing and Principal Non-Commitment" *Review of Economic Design*, 8(1): 1-38 (2003). **Lead Article**.
36. "Mitigating Insurance Fraud: Lump-Sum Awards, Premium Subsidies, and Indemnity Taxes" *Journal of Risk and Insurance*, 68(3): 403-436 (2001).
37. "Centralizing Insurance Fraud Investigation" *Geneva Papers on Risk and Insurance Theory*, 25(2): 159-178 (2000).
38. "Media Attention, Insurance Regulation and Liability Insurance Pricing" *Journal of Risk and Insurance*, 67(1): 39-74 (2000).
39. "Insurance Taxation and Insurance Fraud" *Journal of Public Economic Theory*, 2(1): 101-134 (2000).
40. "Assessing the Impact of Televised Debates: The Case of the 1988 Canadian Election" *British Journal of Political Science*, 26:143-164 (1996); with André Blais.

OTHER REFEREED PUBLICATIONS

41. « La mauvaise perception des risques de longévité et de dépendance ne suffit pas à expliquer la faiblesse du marché de l'assurance dépendance (au Canada) » *Revue d'économie financière 152: 185-201*; with Philippe De Donder, Claude Fluet, Marie-Louise Leroux, and Pierre-Carl Michaud.

    Winner of the **2025 Prix Louise-Dandurand**, Fonds de recherche du Québec
42. "Why Overconfident Traders Generate a Lower Performance? Insights from an Experimental Study." *International Review of Financial Consumers 5:33-46 (2020)*; with Jérôme Martin, Laurence Dumont, and Pierre-Majorique Léger.
43. "Insurers Complexity and Managerial Discretion" *Quarterly Journal of Finance 9(3):4 (2019)*; with Willie D. Reddic and Elijah Brewer III.
44. "Yes, we can (price derivatives on survivor indices)!" *Risk Management and Insurance Review 20(1): 37-62 (2017)*; with Lars Stentoft.
45. "Les modèles factoriels et la gestion du risque de longévité" *Actualité Économique 91(4): 531-566 (2015);* with Christian Dorion and Lars Stentoft.
46. "Measuring Longevity Risk for a Canadian Public Pension Fund" *Risk Management and Insurance Review, 17(1): 37-59 (2014)*; with Lars Stentoft and Joanna Mezja.

47. "Directors' and Officers' Insurance and Shareholders' Protection" *Journal of Financial Perspective, 2(1): 107-128 (2014).*
48. "An Industrial Organization Theory of Risk Sharing" *North American Actuarial Journal 17(4): 283-296 (2013)*; with Charles Nyce.
    Winner of the **2014 Brockett-Shapiro Best Paper Award**
49. "Alleviating Managerial Disagreement through Financial Risk Management" *Quarterly Journal of Finance 3(2):9 (2013);* with Marcel Boyer and René Garcia.
    Winner of the **2013 QJF Best Paper Award**
50. "Financial Distress Risk and the Managing of Foreign Currency Exposure" *Quarterly Journal of Finance 3(1):2 (2013)*; with Monica Marin.
51. "Pricing Survivor Forwards and Swaps in Incomplete Markets Using Simulation Techniques" In *Longevity Risk Management for Institutional Investors* (2012), Institutional Investors Journal (Fall 2012) pp. 69-87; with Lars Stentoft and Amélie Favaro.
52. "Northeastern Gas: Treasury Management Using an Enterprise System" *Journal of Corporate Treasury Management, 4(4): 370-382 (2012);* with Gilbert Babin, Pierre-M. Léger, and Jacques Robert.
53. "Le marché des transporteurs aériens canadiens : une étude de cas en organisation industrielle" *Actualité Économique* 87(3): 1-35 (2011); with Kodjovi Assoé.
54. "Professional Liability Insurance Contracts: Claims-made versus Occurrence Policies" *Insurance and Risk Management* 79(3):251-278 (2011); with Karine Gobert.
55. "Market Growth and Barriers to Entry: Evidence from the Title Insurance Industry" *Insurance and Risk Management* 78(3): 283-316 *(2010);* with Charles Nyce.
56. "Protecting directors and officers from liability arising from aggressive earnings management" *Insurance and Risk Management*, 77(1): 33-58 (2009); with Amandine Hanon.
57. "A Note on the Valuation of a CDO and of an n^{th}-to-Default CDS without Monte Carlo Simulation" *Insurance and Risk Management* 77(3): 265-272 *(2009)* with Olivier Marquis.
58. "Risk Retention Groups in Medical Malpractice Insurance: A Test of the National Chartering Option" *Journal of Insurance Regulation, 27(4): 3-34 (2009);* with Patricia Born and Michael Barth. **Lead Article**.
59. "Three Insights from the Canadian D&O Insurance Market: Inertia, Information and Insiders" *Connecticut Insurance Law Journal*, 14:75-106 (2008).
60. "Directors' and Officers' Insurance in Canada" *Corporate Ownership and Control*, 4(4): 141-145 (2007).
61. "Assessing the Demand for Directors' and Officers' Insurance Using Public Information" *Journal of Forensic Accounting*, 6:389-410 (2005).
62. "The Impact of Health Care Cost on Fraud and Economic Waste" *Insurance and Risk Management*, 73:4-24 (2005); with Pierre-Thomas Léger.
63. "Merging Automobile Insurance Regulatory Bodies: The Case of Atlantic Canada" *Insurance and Risk Management*, 72(1): 129-159 (2004); with Jörg Schiller.
64. "Les clauses de valeur-à-neuf sont-elles optimales?" *L'Actualité économique*, 77(1): 53-74 (2001).
65. "An Analysis of the Title Insurance Industry" *Journal of Insurance Regulation*, 17:213-255 (1998); with Charles M. Nyce.

BOOK CHAPTERS

66. "Designing insurance against extreme weather risk: The case of HuRLOs." In *Ecological, Societal, and Technological Risks and the Financial Sector,* T. Walker, D. Gramlich, M. Bitar & P. Fardnia (Eds.)*, 2020, pp. 91-122,* Palgrave MacMillan; with Michèle Breton and Pascal François.
67. "Cognitive Fit and Visual Pattern Recognition in Financial Information System: An Experimental Study." In *Information Systems and Neuroscience* , F. Davis, R. Riedl, J. vom Brocke, P.-M. Léger & A. Randolph. (Eds.), 2019; with Jérôme Martin, Pierre-Majorique Léger and Laurence Dumont.
68. "How Risk Management Adds Value." In *Investment Risk Management*, H.K. Baker and G. Filbeck (Eds), 2014, Oxford University Press; with Monica Marin.
69. "Behavioral Risk." In *Investment Risk Management*, H.K. Baker and G. Filbeck (Eds), 2014, Oxford University Press; with Samuel Ouzan and Franca Glenzer.
70. "Income Trusts Governance and Performance: Time for a Post-mortem." In *Stock Returns: Cyclicity, Prediction and Economic Consequences*, George I. Ellison (Ed.), 2009, Nova Science Publishers; with Claude Francoeur, Réal Labelle and Stéphane Rousseau.
71. "Insurance Mechanisms." American Institute for Chartered Property and Casualty Underwriters, 2006.
72. "Pooling Equilibrium in Insurance." In B. Sundt and J. Teugels (Eds.), *The Encyclopedia of Actuarial Science*, 2004, Wiley publishers, pages 1304-1308; with Marcel Boyer.
73. "The Impossibility to Separate an Honest Man from a Criminal in a Fraud Context." In *Automobile Insurance: Road Safety, New Drivers, Risks, Insurance Fraud and Regulation*, Georges Dionne and Claire Laberge-Nadeau eds., Kluwer Academic Publishers, Boston, 1999.

NON-REFEREED PUBLICATIONS

74. "Les effets de l'assurance médicaments sur la demande des soins de santé" *Assurances et gestion des risques*, 78(3): (2010); with Pierre-Thomas Léger.
75. "Le risque de longévité: une application au régime de retraite de la Gendarmerie royale du Canada" *Assurances et gestion des risques*, 78(1): (2010); with Patrice Boucher.
76. "Le risque de longévité: valorisation et outils de gestion" *Assurances et gestion des risques*, 77(3): 273-300 (2009); with Patrice Boucher.
77. "Le risque de longévité: importance, mesure et implications" *Assurances et gestion des risques*, 77(1): 85-106 (2009); with Patrice Boucher.
78. "L'état de la finance au Québec et au Canada" *Assurances et gestion des risques*, 76(4): 5-30 (2009).
79. "L'après fusion des bourses canadiennes : Et si le Québec s'inspirait de la Suisse?" *Gestion, 33(4)*: 10-13 (2009).
80. "Une brève histoire des assurances au moyen-âge" *Assurances et gestion des risques*, 76(3): 83-98 (2008).
81. "Les titres adossés à des créances hypothécaires : Le marché américain et le marché canadien" *Assurances et gestion des risques*, 76(1): 55-72 (2008); with François Girard.
82. "Les titres adossés à des créances hypothécaires : Caractéristiques et propriétés" *Assurances et gestion des risques*, 75(4): 521-542 (2008); with François Girard.
83. "Les 100 ans de la Finance" *Gestion*, 32(2): 42-51 (2007); with Kodjovi Assoé and Étienne

Favreau.

84. "Notre avenir en quatre D : la démographie" *Gestion*, 32(3): 60-71 (2007).
85. "An overview of the market for credit risk transfer" *Assurances et gestion des risques*, 73(2): 199-217 (2005); with Nicolas Papageorgiou.
86. "Passing the buck! Le risque de crédit et le risque réglementaire" *Assurances et gestion des risques*, 72(3): 589-601 (2004); with Nicolas Papageorgiou.
87. "Les petites et moyennes entreprises face aux risques financiers et réels" *Assurances et gestion des risques*, 72(2): 391-402 (2004); with Kodjovi Assoé.
88. "J'ai la foi! Croyances et bénéfices de la gestion des risques" *Assurances et gestion des risques*, 72(1): 169-179 (2004).

PUBLICATIONS IN NEWSPAPERS (OP.ED.)

"La réponse du Québec n'est-elle pas à la hauteur?" *La Presse*, 11 May 2022.
"Priorité aux régimes de retraite : Un pensez-y bien" *La Presse*, 19 June 2021.
"Qui veut payer pour les soins de longue durée " *La Presse*, 23 May 2020.
"Retraite: le nouveau régime fédéral sera un échec" *La Presse*, 24 November 2011.
"Myopie et gaspillage de temps" *La Presse*, 30 March 2009.
"Les solutions financières à la longévité" *La Presse*, 3 March 2008.
"L'État contre les bonnes œuvres" *La Presse*, 3 January 2008.
"Le développement énergétique du Québec : pour une véritable création de richesse" *La Presse*, 7 April 2007.
"Les quatre chevaliers de l'Apocalypse" *La Presse*, 26 February 2007.
"La mondialisation et les droits d'auteur" *La Presse*, 18 December 2006.
"La mondémocratilisation" *La Presse,* 20 November 2006.
"Manque de courage politique" *La Presse*, 18 February 2006.
"Gare à l'interventionnisme!" *Les Affaires*, 11 March 2006.
"L'assurance maladie privée au Québec" *La Presse*, 18 June 2005.

RESEARCH GRANTS

- Boyer*, M. Martin « Insurance », Social Sciences and Humanities Research Council of Canada (SSHRC), 2026-2031; $131,000 (projected).
- Boyer, M. Martin, Philippe d'Astous*, Irina Gemmo, Jimmy Martinez Correa. « Planning for Retirement: Integrating Savings Goals, Predictable Income Streams, and ESG Principles to Cultivate Financial Well-Being », Social Sciences and Humanities Research Council of Canada (SSHRC), 2024-2029, $117,000.
- Boyer, M. Martin, Philippe d'Astous, and Pierre-Carl Michaud*. « Analyses en économie comportementale reposant sur du calcul à haute efficacité appliqué à de grands ensembles de microdonnées confidentielles », Fondation canadienne pour l'innovation (FCI), 2020, $182,000.
- Boyer, M. Martin, Philippe d'Astous*, and Barry Scholnik. « Peer Effects and Program Take-Up: Evidence from employer-employee linked administrative data », Social Sciences and Humanities Research Council of Canada (SSHRC), 2020-2022, $61,700.

- Achou, Bertrand, M. Martin Boyer, Franca Glenzer, Marie-Louise Leroux, and Pierre-Carl Michaud*. « Income security in retirement: perceptions, incentives and behaviours », Social Sciences and Humanities Research Council of Canada (SSHRC), 2020-2024; $194,630.
- Boyer*, M. Martin, Willie Reddic, Lars Stentoft, and Simon van Norden « Asset allocation of insurance companies: systemic, regulatory and solvency risk and solvency issues », Social Sciences and Humanities Research Council of Canada (SSHRC), 2018-2024; $141,600.
- Boyer*, M. Martin, Willie Reddic, and Elicia Cowins. « Executive compensation and hedge accounting: an investigation of reporting and risk incentives associated with the corporate use of derivatives », IFSID, 2016-2018; $30,000.
- Boyer, M. Martin, Philippe de Donder, Marie-Louise Leroux, Claude Fluet, and Pierre-Carl Michaud*. « Protection contre les risques financiers à la retraite: analyse économique du risque de dépendance », Social Sciences and Humanities Research Council of Canada (SSHRC), 2016-2019; $194,000.
- Boyer*, M. Martin. « L'assurance de soins longue durée, épargne de retraite, et solvabilité des assureurs » Ministère des finances du Québec, 2016; 25,000$.
- Boyer*, M. Martin, Christian Dorion, and Lars P. Stentoft. « Pricing and Using Longevity Risk Instruments », IFSID, 2012-2014; $40,000.
- Boyer*, M. Martin and Lars Stentoft. « Valuation and Hedging of Longevity Risk for Pension Plans », Institut de finance mathématique de Montréal (IFM2), 2012-2015; $30,000.
- Boyer*, M. Martin, Monica Marin, J.-François Outreville and Lars Stentoft. « Longevity Risk Management », Social Sciences and Humanities Research Council of Canada (SSHRC), 2011-2014; $71,500.
- Boyer*, M. Martin « Professional Liability Insurance: Medical Malpractice Insurance, Directors' and Officers' Insurance, and Contract Structure », Social Sciences and Humanities Research Council of Canada (SSHRC), 05/08-05/11; $154,000.
- Boyer*, M. Martin « La fusion des Bourses canadiennes », Subvention stratégique interne, HEC Montréal, 07/07-07/08; $10,000.
- Boyer, M. Martin, Claude Francoeur, Réal Labelle* and Stéphane Rousseau « Income Trusts: A Post-Mortem », Institut sur la gouvernance des organisations privées et publiques, 04/07-04/08; $30,000.
- Boyer*, M. Martin and Karine Gobert. « Short Term Contracts and Long-Term Relationships: The Impact on Insurance Contracts and on the Financing of Research and Development Investment Projects », Social Sciences and Humanities Research Council of Canada (SSHRC), 04/04-04/07; $50,000.
- Boyer, M. Martin « Organizational Structure and Its Implication for the Firm's Financial Structure », HEC Montréal, Office of Strategic Planning, 06/03-06/04; 8 500 $.
- Benoit Aubert, Jacques Robert*, et al. « E-Commerce Prototypes: Taking Theoretical Concepts to Market », Valorisation-Recherche Québec, 05/01-05/05; $1,900,000.
- Benoit A. Aubert*, et al. « Integrated Risk Management Methods and Systems », Valorisation-Recherche Québec, 05/01-05/05; $1,600,000.
- Boyer*, M. Martin, Karine Gobert, and Patrick Gonzalez. « Agency Problems with Correlated Information », Fonds pour la Formation de Chercheurs et d'Aide à la Recherche (FCAR-Québec), Team of Young Researchers Grant, 05/00-05/03; $135,000.

- Boyer*, M. Martin. « Directors and Officers Liability Insurance », Fonds pour la Formation de Chercheurs et d'Aide à la Recherche (FCAR-Québec), Young Researcher Grant, 05/00-05/03; $45,000.
- Paul André, Georges Dionne* et al. « Finance and Insurance Laboratory », Canadian Foundation for Innovation (CFI), Ministère de l'Éducation, SUN Microsystems and Cisco Systems, 03/00-06/01; 3 294 056 $.
- Boyer*, M. Martin. « Agency Problems with Correlated Information », Fonds pour la Formation de Chercheurs et d'Aide à la Recherche (FCAR-Québec), Equipment Grant, 07/00-06/01; $15,000.
- Gagné*, Robert, Paul André, M. Martin Boyer, and Jean-François L'Her « Firm Performance, Corporate Control and Agency Problems: The Canadian Experience », Social Sciences and Humanities Research Council of Canada (SSHRC), 04/99-04/02; $93,000.
- Boyer*, M. Martin and Paul André « Performance des entreprises, contrôle corporatif et problèmes d'agence: l'expérience canadienne », Assistant Professor Grant, Direction de la recherche (HEC), 09/98-09/00; $7,500.
- Boyer*, M. Martin and Jean-François L'Her « Firm Performance, Corporate Control and Agency Problems in Canada », Direction de la recherche (HEC), 06/98-05/00; $5,000.
- Boyer, M. Martin, Robert Gagné*, and Jean-François L'Her « Corporate Ownership Structure and Compensation in Closely Held Firms », CIRANO, 06/99-05/01; $45,000.
- Boyer*, M. Martin « Économie de l'assurance et fraude », Risk Management Chair (HEC), 06/97-05/99; $10,000.
- Boyer*, M. Martin « An Analysis of the Title Insurance Industry », Direction de la recherche (HEC) 11/97-11/99; $5,000.

*: Team leader and/or Lead researcher

11.2. CV of Christian Dorion, Ph.D.

EDUCATION

Ph.D. in Management (Finance), 2010, McGill University *Pricing financial derivatives: The impact of business conditions and systematic risk*.

M.Sc. in Computer Science (Machine Learning), 2004, Université de Montréal *Kernel methods applied to portfolio management*, under the supervision Yoshua Bengio.

CURRENT POSITION

Delta Vega Financial, President & Founding CEO, since 2022.

HEC Montréal, Finance Department, Montréal, Qc Associate Professor, since 2015 Assistant Professor, 2010–2015.

- Publishing in the very top finance journals.
- Teaching classes on investments (B.Com.) and derivatives (B.Com., M.Sc. and Ph.D.).
- Supervising more than 50 master's and doctorate students. For the nearly 2/3 of them in the supervised project stream (M.Sc.), helping them balance their employer's concrete, short-term objectives with the M.Sc. program requirements.
- Serving on several administrative committees, some of strategic importance for the department
- Recruiting committee: Hiring new finance faculty, maximizing the alignment with the department's culture while accounting for our short and medium-term teaching needs.
- Finance Ph.D. Program: Leading (1 year) and assisting (several years) the recruitment of our Ph.D. students, which involves pre-screening & interviews.
- Research Council: Representing the department at a council chaired by the school's Research Director; briefing the department on the relevant issues.

OTHER ACADEMIC POSITIONS

Queen's University. 2024/9—2025/5
University of California, Los Angeles. Winter 2022.
Queen's University. Winter 2021.
University of Maryland. 2016/9—2017/5

OTHER SELECTED WORK EXPERIENCE

Delta Vega Financial, President & Founding CEO, since 2022

- Leading a 5-year initiative to develop a risk metric for structured products, in collaboration with a major Canadian issuer. The resulting IP is now powering Delta Vega's API.
- As the designated CEO starting in 2022, conducting the 2-year negotiations, involving multiple stakeholders, that led to the incorporation.
  - Securing the R&D grant necessary to launch our operations.
  - Negotiating the unconventional transfer of the intellectual property developed by the Canadian Derivatives Institute leaders and some of HEC Montreal's students and employees.
  - Steering the iterative process of finalizing the shareholders' agreement, effectively managing differing stakeholder perspectives.

- Aligning the activities of the Chief Financial, Operating, and Scientific Officers to achieve the company's strategic goals.

Canadian Derivatives Institute; Scientific Coordinator & Director, 2013–202.

- Organizing the 14 editions of CDI's conference since its foundation in 2011. The conference has an international reach, its keynote speakers having been the most celebrated names in derivatives, and it is arguably the best conference on the topic.
- Organizing several other conferences and workshops, increasing the visibility of the Institute locally and globally.
  - Reviewing the technical reports submitted in compliance of the grants we awarded.
  - Creating, growing and fostering the network of CDI Research Fellows. Our senior fellows include some of the foremost references in our field. We currently have 10 fellows who actively promote the Institute in their network.

Virtual Derivatives Workshop (virtualderivatives.org) Co-organizer, since 2020

- Organizing more than 80 online seminars, with a live audience varying between 30 and 70 people depending on the specific topic; more than 500 different audience participants through time.
- Promoting the seminars through our YouTube channel, counting more than 1,240 subscribers and 42,000 views.

ApStat Technologies Inc., Quantitative Analyst, 2004/6–2008/1

- Operationalizing a machine-learning model developed during my master's: The model was used by a Montreal-based CTA as the main input in the daily rebalancing of one of their funds.
- Liaising with the traders and refining the model according to their input.

12. LETTERS OF COUNSEL TO THE EXPERTS

2025.06.23
Instructions Letter -M

2025.09.25. Ltr.
Martin Boyer.pdf

Both letters are reproduced hereinafter at the end of the document.

CONWAY

Thomas G. Conway
Direct Line: 613.780.2011
Email: tconway@conwaylitigation.ca

Assistant: Doreen Navarro
Direct Line: 613.691.0375
Email: dnavarro@conwaylitigation.ca

June 23, 2025

VIA EMAIL martin.boyer@hec.ca

M. Martin Boyer, Ph.D.
EMBEC Inc.
4765A, boul. Édouard-Montpetit
Montréal, QC H3W1P6

Dear Mr. Boyer:

RE: EXPERT EVIDENCE FOR METRO TAXI LTD. V CITY OF OTTAWA
COURT FILE NO.: CV-16-69601
OUR MATTER ID: 5056-002

On May 13, 2024, the Ontario Superior Court released a judgment on three common issues in the above referenced class action.[1] The Court held that the City of Ottawa was negligent in enforcing the taxi by-law when Uber illegally operated in Ottawa. The only remaining certified common issue to be decided is whether the damages of the plate owner class can reasonably be determined in the aggregate. The taxi plate owner class is comprised of all persons who on September 1, 2014 held a standard taxicab plate holder license or an accessible taxicab plate holder license pursautn to the City of Ottawa taxi-bylaw, or who were issued a standard taxicab plate holder license or an accessible taxicab plate holder license pursuant to the City of Ottawa taxiby-law between September 2, 2014 and September 30, 2016.

You have been retained to provide expert evidence on the aggregate damages issue. We are writing to: (1) confirm the scope of the opinion evidence that we are asking you to provide; and (2) provide you documents that we think will assist you in formulating your opinion and expert report.

Scope of opinion

At this stage of the proceeding, your opinion will be limited to opining on whether, as a matter of methodology, the damages of the plate owner class can reasonably be assessed in the aggregate. We are not asking you, at this stage, to quantify the damages. The Court has ordered

[1] *Metro Taxi Ltd. et al. v. City of Ottawa*, 2024 ONSC 2725.

that the quantification of damages will occur at a later stage in the proceeding, after all appeals from the trial decision are exhausted.

For the purposes of your analysis, we are asking you to assume that the proper measure of damages for the plate owner class will be loss in plate value. We expect that the City will take the position that the proper measure of damages is loss of income for two years, namely 2014 to 2016, and that this measure of damages can only be calculated individually. Since the proper measure of damages is a legal issue, you need not and should not opine on it.

Your report should:

1. Explain how, in the taxi plate context, a loss of plate value would be most appropriately calculated.

2. Explain whether, in your opinion, the loss in plate value can be reasonably be assessed in the aggregate.

3. If your anwers to point #2 above is in the affirmative, explain the methodology for assessing plate value in the aggregate and why you think the methodology is fair and reasonable.

Factual matrix underpinning opinion and report

In formulating your opinion and conducting your analysis, you will have to take into account the factual matrix of this case. You can obtain the factual matrix from three sources: (1) the trial judge's decision on liability; (2) the statement of agreed facts that the parties have jointly drafted; and (3) facts that we tell you can be assumed to be true. If, while formulating your opinion and drafting your report, you have questions regarding whether you can assume certain facts to be true, please let us know and we will inform you of whether you can assume the facts to be true or not.

At this stage, in addition to the factual findings made by the judge and the facts outlined in the statement of agreed facts, we will ask you to assume the following facts are true:

1. Traditionally, Blueline plates have sold at a higher price than plates under other banners.

2. Standard taxi plates have traditionally sold at a higher price than accessible plates.

3. Airport plates traditionally sold at a higher price than all other plates. However, airport plates were eliminated in August 2016.

4. The City maintains a dataset which contains plate transfers and the price that was reported to the City. The City does not check to ensure that the sale price is accurate.

There has been underreporting to the City about sale prices. However, the frequency and amount of underreporting is unknown.

5. We have plate transfer data from April 2006 to October 2018. The data from 2006 to 2012 is enclosed in excel format. The data from 2012 to 2018 can be found in Appendix A to the statement of agreed facts. You will see in the dataset that each plate is assigned a plate numbers. Plates numbered 3000 to 5000 are accessible plates.

List of documents

Below is the list of documents that we are enclosing with this letter. You can access and download these documents through this link. Please do not treat this list of documents as closed. If you need additional documents, please let us know and, if we are able to provide them to you, we will do so.

	Document Name	Notes
	Pleadings	
1.	Amended amended statement of claim	
2.	Amended statement of defence	
	Certification of Class Proceeding	
3.	Certification order	
	Statement of Agreed Facts	
4.	Statement of agreed facts	
	Trial Decision on Liability	
5.	Trial decision	
	Submissions on Aggregate Damages	
6.	Plaintiffs' submissions re aggregate damages	
7.	City's submissions re aggregate damages	
	By-laws	
8.	2012 Taxi By-law	This was the by-law that was in effect until 2016, when Private Transportation Companies (e.g. Uber) were legalized.
9.	2016 Taxi By-law	This is the by-law that legalized Private Transportation Companies. It also contains a regulatory scheme for taxis.
	Class member and plate transfer data	
10.	Dataset outlining plate transfers from 2006 to 2012 (trial exhibit 32)	
11.	List of plate owner class by name (trial exhibit 95)	
	City Documents and Staff Reports	
12.	Report from Ottawa Taxi Project Team to Ottawa Transition Board, dated December 5, 2000 (trial exhibit 246)	This contains recommendations regarding removal of plate limits, and making taxi plates

		non transferrable upon amalgamation
13.	Staff Report dated June 11, 2001 (trial exhibit 7)	Pages F2234 to F2239 contains considerations by the City regarding the closed plate system.
City Consulting Reports		
14.	Plate Value Options Paper, July 28, 2000 (trial exhibit 204)	Prepared by the Hara Associates for the Ottawa Transition Board to assess compensation scenarios at amalgamation
15.	Working Paper – Scenario E – Compensation at Purchase Price Plus CPI August 21, 2000 (trial exhibit 205)	Prepared by the Hara Associates for the Ottawa Transition Board to assess a specific compensation scenario at amalgamation
16.	Taxi Economics – Old and New, Hara & Associates report, dated October 10, 2015 (trial exhibit 1, tab 281)	This is a report considered by City Staff in recommending the legalization of Private Transportation Companies
17.	Emerging Issues in the Taxi and Limousine Industry, Mowat Centre report, October 2015 (trial exhibit 1, tab 279)	This is a report considered by City Staff in recommending the legalization of Private Transportation Companies
18.	KPMG Report, December 31, 2015 (trial exhibit 58)	This is a report considered by City Staff in recommending the legalization of Private Transportation Companies
Collective Bargaining Agreements		
19.	Collective Agreement - Airport Taxi 1980-1982 (trial exhibit 1, tab 12)	
20.	Collective Agreement - Airport Taxi 1983-1986 (trial exhibit 1, tab 13)	
21.	Collective Agreement - Airport Taxi 1986-1987 (trial exhibit 1, tab 14)	
22.	Collective Agreement - Airport Taxi 1993-1995 (trial exhibit 1, tab 15)	
23.	Collective Agreement - Airport Taxi 1996-1997 (trial exhibit 1, tab 16)	
24.	Collective Agreement - Blueline 1982-1984 (trial exhibit 1, tab 17)	
25.	Collective Agreement - Blueline 1985-1986 (trial exhibit 1, tab 18)	
26.	Collective Agreement - Blueline 1986-1989 (trial exhibit 1, tab 19)	

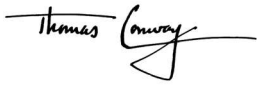
27.	Collective Agreement - Blueline 1990-1993 (trial exhibit 1, tab 20)	
28.	Collective Agreement - Blueline 1994-1997 (trial exhibit 1, tab 21)	
29.	Collective Agreement - Blueline 1999-2002 (trial exhibit 1, tab 22)	
30.	Collective Agreement - Blueline 2008-2011 (trial exhibit 1, tab 23)	
31.	Collective Agreement - Blueline 2003-2005 scanned book (trial exhibit 1, tab 24)	
32.	Collective Agreement - Blueline 2005-2008 (trial exhibit 1, tab 25)	
33.	Collective Agreement - Blueline 2017-2020 (trial exhibit 1, tab 26)	
34.	Collective Agreement - Capital Taxi 2006-2010 (trial exhibit 1, tab 27)	
35.	Collective Agreement - Diamond Taxi 1987 (trial exhibit 1, tab 28)	
36.	Collective Agreement - DJs Taxi 1991-1994 Signed (trial exhibit 1, tab 29)	
37.	Collective Agreement - DJs Taxi 1995-1998 (trial exhibit 1, tab 30)	
38.	Collective Agreement - DJs Taxi 2001-2004 (trial exhibit 1, tab 31)	
39.	Collective Agreement - DJs Taxi 2007-2010 (trial exhibit 1, tab 32)	
40.	Collective Agreement - Gloucester 1983-1986 (trial exhibit 1, tab 33)	
41.	Collective Agreement - Gloucester 1989-1992 (trial exhibit 1, tab 34)	
42.	Collective Agreement - Gloucester 1993-1995 (trial exhibit 1, tab 35)	
43.	Collective Agreement - Gloucester 2001-2003 (trial exhibit 1, tab 36)	
44.	Collective Agreement - West-Way 2006-2009 (trial exhibit 1, tab 37)	
45.	Collective Agreement - West -Way 2009-2012 (trial exhibit 1, tab 38)	
46.	Collective Agreement - West-Way Airport Taxi 2005-2008 (trial exhibit 1, tab 39)	
47.	Collective Agreement - Ziptrack 2011-2014 (trial exhibit 1, tab 40)	
48.	Collective Agreement - Ziptrack 2013-2016 (trial exhibit 1, tab 41)	

Please list all documents provided in an Appendix to your expert report.

You are also free to consult and rely on any sources, for example, any academic documents or other documents in the public domain. For any such sources, please list these in an Appendix to your expert report.

We look forward to working with you.

Yours very truly,



Thomas G. Conway

cc. Marion Sandilands
Joseph Rucci

CONWAY

Joseph Rucci
Direct Line: 613.780.2014
Email: jrucci@conwaylitigation.ca

Assistant: Doreen Navarro
Direct Line: 613.691.0375
Email: dnavarro@conwaylitigation.ca

September 25, 2025

VIA EMAIL martin.boyer@hec.ca

Martin Boyer, Ph.D.
EMBEC Inc.
4765A, boul. Édouard-Montpetit
Montréal, QC H3W1P6

Dear Mr. Boyer:

RE: METRO TAXI LTD. V CITY OF OTTAWA | COURT FILE NO.: CV-16-69601
OUR MATTER ID: 5056-002

Please fine enclosed additional documents for your review that have been previously disclosed to the City. You can access and download these documents through this link. If you need additional documents, please let us know. If we are able to provide them to you, we will do so. Please advise if you have difficulty accessing the link or documents.

	Document Name	Notes	Date of Disclosure
1.	POS Chart July 2019	Data for the number of credit card and debit transactions for the period of February 2008 to July 2019	September 5, 2019 (letter from Benjamin Grant to Benoit Duchesne)
2.	List of rates under collective agreements, 2013-2016		Answer to Undertaking of Marc Andre Way and Metro Taxi Ltd. #3
3.	Total Fares from Courtney July 31,2019 corrected for Feb 2017 figures	Data for the total volumes of fares and temperatures from October 2011 to July 2019	September 5, 2019 (letter from Benjamin Grant to Benoit Duchesne)

Yours very truly,

Joseph Rucci

cc. Marion Sandilands
Thomas G. Conway

Projet de loi concernant le transport rémunéré de personnes par automobile

Montant	Description	Analyse	Commentaires et recommandations
Estimations de la valeur marchande des permis de propriétaire de permis de taxi			
1 460 millions $	Valeur maximale	Cette valeur est le résultat d'une bulle spéculative de la valeur des permis à Montréal. Ce sommet fut atteint autour de 2008. La valeur des permis renouvelables qui changent de main (valeur de transaction) n'est plus en phase avec les revenus tirés de l'exploitation d'un permis.	Cette valeur des permis en 2008 ne peut être prise en considération dans le calcul des compensations à venir.
1 272 millions $	Valeur marchande des permis de propriétaire de taxi selon la valeur des transactions en 2013-2014.	La valeur reflète une tendance à la baisse de la valeur des permis qui a fait suite à la récession de 2009 et la très lente reprise qui a suivi.	
1 192 millions $	Valeur de référence en 2015, selon la valeur des transactions, utilisée pour le calcul de la compensation versée en 2018.	La différence de la valeur marchande des permis établie à partir des transactions réalisées en 2015 et en 2018 (446 M$) ne fut utilisée que pour établir la ventilation du montant total de compensation versée aux propriétaires de permis, en fonction de l'agglomération dans laquelle le permis était exploité, en septembre 2018.	La perte de valeur entre 2015 et 2018, estimée à 446 M$, fut compensée en 2018. Cette perte de valeur ne doit pas être compensée une deuxième fois.
746 millions $	Valeur de référence utilisée pour le calcul de la compensation versée en 2018 en vertu du Programme d'aide financière à la modernisation de l'industrie du transport par taxi.	En 2016 et 2018, la juste valeur marchande fut estimée selon deux méthodes différentes • En 2016, le MFQ a estimé la valeur marchande des permis selon la méthode de la valeur actuelle nette (VAN). La VAN reflète la valeur intrinsèque de l'actif, en fonction des revenus potentiels qu'il génère, à partir d'un taux d'actualisation convenu. Au taux d'actualisation de 3,75 %, cette valeur marchande égale 740 M$ • En 2018, le groupe de travail conjoint, mis en place pour proposer des mesures d'accompagnement de l'industrie du taxi, a utilisé la valeur des transactions réalisées durant l'exercice financier 2017-2018. Le résultat est 746 M$. La proximité des deux résultats démontre que la valeur des permis sur le marché secondaire est revenue à l'équilibre avec les revenus attendus de l'exploitation d'un tel permis de propriétaire de permis de taxi.	Cette valeur (746 M$) semble le meilleur point de départ pour le calcul de la perte réelle découlant de l'abrogation du système de gestion de l'offre dans l'industrie du transport des personnes par automobile.
715 millions $	Juste valeur marchande de l'ensemble des permis transférables au moment du dépôt du projet de loi (mars 2019).	L'estimation préliminaire sur la base de la valeur des transactions réalisées depuis le 1er avril 2018 semble démontrer que le marché est toujours en baisse. Cette baisse de la valeur des permis serait de l'ordre de 4 % (environ 30 M$).	**Recommandation :** Utiliser la valeur marchande déjà utilisée en septembre 2018, sans tenir compte de la baisse de la valeur observée depuis mars 2018, baisse qui résulte autant de l'effet Uber que de l'incertitude découlant des travaux entourant la refonte de la loi.
Compensations déjà versées pour la perte de valeur découlant du projet-pilote Uber			
250 millions $	Montant versé en soutien à l'industrie du taxi.	Le montant de compensation versé, 250 millions $, correspond à 56 % de la perte estimée sur la base des valeurs de transactions de 2015-2018 (446 M$).	
Compensation à prévoir à la suite à la terminaison de la gestion de l'offre			
715 millions $	Valeur totale des permis au moment du dépôt de la loi en mars 2019 susceptible à compensation	Pour arriver à un autre montant de compensation, il suffit d'introduire un taux d'compensation accordé aux propriétaires de permis de taxi.	
• 250 millions $	Montant de compensation qui serait versé au moment du dépôt du projet de loi, d'ici le 31 mars 2019.	Scénario discuté avec le ministère des Finances	L'annonce du versement d'une somme de 250 M$ de compensation au moment du dépôt du projet de loi annoncerait une somme de compensation additionnelle et finale à celle versée en 2018-2019.
• 465 millions $	Valeur résiduelle e	Ce montant ne fera pas l'objet d'une compensation.	Ce scénario n'est pas envisagé.

Montant	Description	Analyse	Commentaires et recommandations
Revenus perçus en vertu du projet-pilote Uber			
26 millions $	Redevance versée par Uber depuis le début du projet-pilote en octobre 2016.	Le montant versé par Uber en vertu du projet-pilote correspond à environ 1,25 $ par course. Ce montant est utilisé pour financer le Programme de soutien à la modernisation de l'industrie du transport par taxi qui comporte trois volets : efficacité énergétique, modernisation technologique et image de marque.	Le versement de cette redevance prendra fin avec la mise en application de la nouvelle loi.
Revenus estimés à partir d'une redevance perçue en vertu de la nouvelle loi sur le service rémunéré de personnes par automobile			
63 millions $	Montant annuel de redevance permettant de rembourser en 15 ans la compensation de 715 M$ versé en vertu de la nouvelle loi.	Le taux de redevance requis pour financer ce montant est de 1,20 $ / course soit approximativement le même taux que celui que paient présentement les usagers d'Uber. • Le nombre de courses annuel est estimé à 52.3 millions. Le remboursement des compensations reflète mieux l'équité entre les générations puisqu'il ne revient pas aux générations de futurs clients de compenser pour des décisions prises il y a plusieurs décennies et dont les usagers passés ont profité.	
22 millions $	Montant annuel de redevance permettant de rembourser la compensation de 250 M$ versé en vertu de la nouvelle loi en 15 ans.	Le taux de redevance requis pour financer ce montant est de 0,42 $ / course	
10 millions $	Montant annuel de redevance perçu pour financer le soutien à la modernisation de l'industrie du transport rémunéré de personnes par automobile.	Le financement de ce montant établi arbitrairement correspond à une redevance d'un peu moins de 0,20 $ / course Ce montant permettrait de soutenir l'industrie dans son évolution technologique et dans l'évolution des pratiques d'affaires en matière de mobilité durable par automobile. Il pourrait éventuellement être affecté au soutien de l'industrie face à l'arrivée du transport des personnes par véhicule autonome, sans chauffeur.	
32 millions $	Montant annuel de redevance perçu pour financer à la fois le remboursement des indemnités et le soutien à la modernisation de l'industrie du transport rémunéré de personnes par automobile.	Toutes combinaisons ou tous autres montants cibles peuvent être établis pour fixer le montant perçu de redevance auprès des usagers du transport rémunéré de personnes par automobile avec un chauffeur. • Le montant de la redevance observable ailleurs dans le monde varie de 0,10 $ à 1.25 $ par course.	Recommandation : Fixer le montant de la redevance à 0,60 $ / course Cette redevance permettra de rembourser les 250 millions $ de compensation versés ainsi que le programme de modernisation annuel.

Court File No. 16-69601

ONTARIO
SUPERIOR COURT OF JUSTICE

B E T W E E N:

METRO TAXI LTD., MARC ANDRÉ WAY and ISKHAK MAIL

Plaintiffs

and

CITY OF OTTAWA

Defendant

Proceeding under the *Class Proceedings Act, 1992*

ATTESTATION DE L'OBLIGATION DE L'EXPERT

1. Je m'appelle Martin Boyer, Ph.D. J'habite à Montréal, dans la province de Québec.

2. J'ai été engagé(e) par Conway Associates pour témoigner dans le cadre de l'instance judiciaire susmentionnée.

3. Je reconnais qu'il m'incombe de témoigner dans le cadre de la présente instance comme suit :

    a) en rendant un témoignage d'opinion qui soit équitable, objectif et impartial;

    b) en rendant un témoignage d'opinion qui ne porte que sur des questions qui relèvent de mon domaine de compétence;

    c) en fournissant l'aide supplémentaire que le tribunal peut raisonnablement exiger pour décider une question en litige.

4. Je reconnais que l'obligation visée ci-dessus l'emporte sur toute obligation que je peux avoir envers toute partie qui m'a engagé(e) ou au nom de laquelle j'ai été engagé(e).

5. Je certifie être convaincu(e) de l'authenticité de toutes les sources savantes et de tous les autres documents ou dossiers que j'ai cités dans le rapport d'expert accompagnant la présente formule:

   a. les documents et dossiers qui m'ont été remis par la partie qui a l'intention de m'appeler comme témoin, ou en son nom, et constituant des preuves ou des preuves potentielles au cours de la procédure judiciaire, que j'ai analysés ou interprétés dans mon rapport;

   b. les sources savantes et les divers documents et dossiers que j'ai mentionnés dans mon rapport seulement dans le but de traiter leur utilisation par un autre témoin expert dans son rapport à l'occasion de la même procédure judiciaire;

      La liste des sources savantes, des documents et des dossiers se trouve à l'Annexe du rapport d'expert à la Section 8.

14 octobre 2025

date .....

signature

REMARQUE : La présente formule doit être jointe à tout rapport d'expert visé au paragraphe 53.03 (1) ou (2) et à tout témoignage d'opinion rendu par un expert dans le cadre d'une motion ou d'une requête.

Court File No. 16-69601

ONTARIO
SUPERIOR COURT OF JUSTICE

B E T W E E N:

METRO TAXI LTD., MARC ANDRÉ WAY and ISKHAK MAIL

Plaintiffs

and

CITY OF OTTAWA

Defendant

Proceeding under the *Class Proceedings Act, 1992*

ATTESTATION DE L'OBLIGATION DE L'EXPERT

1. Je m'appelle Christian Dorion, Ph.D. J'habite à Montréal, dans la province de Québec.

2. J'ai été engagé(e) par Conway Associates pour témoigner dans le cadre de l'instance judiciaire susmentionnée.

3. Je reconnais qu'il m'incombe de témoigner dans le cadre de la présente instance comme suit :

    d) en rendant un témoignage d'opinion qui soit équitable, objectif et impartial;

    e) en rendant un témoignage d'opinion qui ne porte que sur des questions qui relèvent de mon domaine de compétence;

    f) en fournissant l'aide supplémentaire que le tribunal peut raisonnablement exiger pour décider une question en litige.

4. Je reconnais que l'obligation visée ci-dessus l'emporte sur toute obligation que je peux avoir envers toute partie qui m'a engagé(e) ou au nom de laquelle j'ai été engagé(e).

5. Je certifie être convaincu(e) de l'authenticité de toutes les sources savantes et de tous les autres documents ou dossiers que j'ai cités dans le rapport d'expert accompagnant la présente formule:

c. les documents et dossiers qui m'ont été remis par la partie qui a l'intention de m'appeler comme témoin, ou en son nom, et constituant des preuves ou des preuves potentielles au cours de la procédure judiciaire, que j'ai analysés ou interprétés dans mon rapport;

d. les sources savantes et les divers documents et dossiers que j'ai mentionnés dans mon rapport seulement dans le but de traiter leur utilisation par un autre témoin expert dans son rapport à l'occasion de la même procédure judiciaire;

La liste des sources savantes, des documents et des dossiers se trouve à l'Annexe du rapport d'expert à la Section 8.

date 13 octobre, 2025

signature

REMARQUE : La présente formule doit être jointe à tout rapport d'expert visé au paragraphe 53.03 (1) ou (2) et à tout témoignage d'opinion rendu par un expert dans le cadre d'une motion ou d'une requête.

CONFIDENTIAL / LITIGATION PRIVILEGE

METRO TAXI LTD. et al. Plaintiffs	and	CITY OF OTTAWA Defendant	Court File No. 16-69601

ONTARIO
SUPERIOR COURT OF JUSTICE

Proceeding commenced at OTTAWA

ATTESTATION DE L'OBLIGATION DE L'EXPERT

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