Industrial Designs and Firm Performance:

Evidence from Canadian Firms

Presentation by Robert Embree – March 11, 2021

Motivation for this Research

- Industrial designs (ID) are a specialized form of intellectual property (IP) that protect unique designs
- ID has gained prominence in recent years, highlighted by the IP battle between Apple and Samsung that featured four design rights that belonged to Apple
- An internal study conducted for CIPO by the OECD indicated that designs was the IP area where Canadians lagged leading countries the most in terms of use

Positioning Study in the Literature

- There is a large literature on the effect of patents on firms, but a fairly small literature on designs
- The primary studies were conducted by or for other IP offices, including the UKIPO and European IP Office (EUIPO)
- This paper estimates the effect of holding IDs on firm revenue per employee and on net income per employee

Data

- We exploit a unique Canadian data set obtained with the assistance of Dr. Michael King from the Ivey School of Business at the University of Western Ontario
- The data set included over 500 firms, operating over a 25 year period from 1990 to 2014
- We control for firm equity, number of employees, sector, and firm-specific effects
- We also control for patents by constructing a patent index that includes international patents

Methodology

- We use two main approaches: nearest-neighbour matching and a fixed effect regression
- Nearest-neighbour matching compares each ID firm with a zero-ID firm that has similar characteristics, and calculates the average difference in revenue or profitability
- A fixed effects regression controls for firm-specific effects, and lets us consider the marginal effect of each additional ID

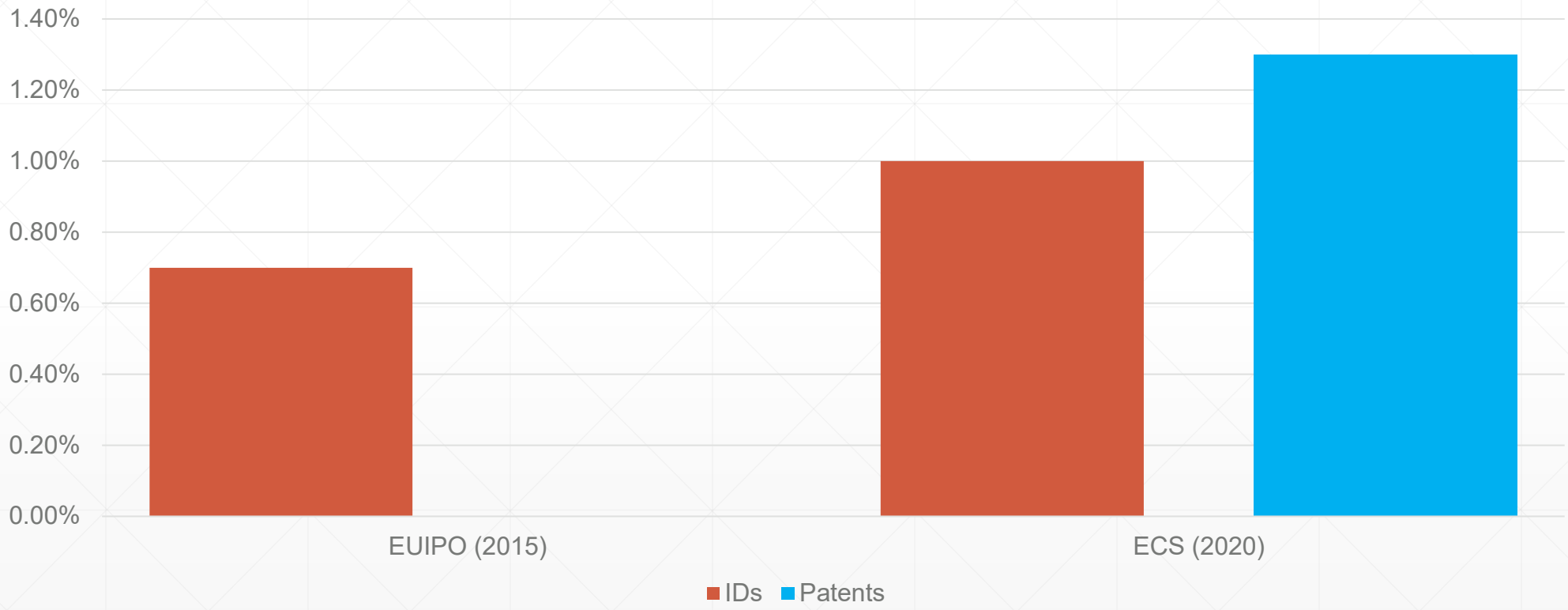
Key Questions

- What effect does holding an ID have on revenue per employee?
- What effect does holding an ID have on net income (profitability) per employee?
- What effect does having more IDs have on revenue per employee?
- Is this an ID effect or an IP effect?

Results and Comparison to Existing Literature

Study	Bascavusoglu-Moreau and Tether (UKIPO, 2011)	European IP Office (2015)	Embree, Collette, Santilli (2020)
Premium in Revenue per Employee for firms with ID	17%	15%	19%
Premium in Net Income per Employee for firms with ID	N/A	N/A	23%
Effect on Revenue per employee of 10% more ID	N/A	0.7%	1%

Effect of a 10% increase in IP stock on revenue per employee when controlling for patenting



Discussion

- One limitation to this work: not controlling for R&D, advertising or marketing expenditures
- This is partially mitigated through controlling for patenting, which is correlated with R&D
- Our main conclusion is that being “design oriented” as defined by holding, or having ever held, IDs is beneficial for firms
- This suggests that form can matter as well as function for many consumers

Thank-you for Listening!

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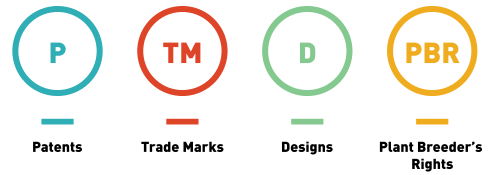
IP Rights, Business Profitability and Market Competition

Alissar Hassan
Deputy Chief Economist, IP Australia



Introduction

- The IP system: role, trade off and balance
- Evidence of IP's role promoting economic growth?

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IP owners

Descriptive statistics

P TM D PBR

Firm Characteristics

- IP rights owners doubled in the 15 year period analysed
- IP rights owners have more employees and a longer life
- IPR owners have higher profits
- Large businesses are more likely to have IP rights (mostly trade marks)
- IP rights owners are concentrated in manufacturing and whole trade industries.

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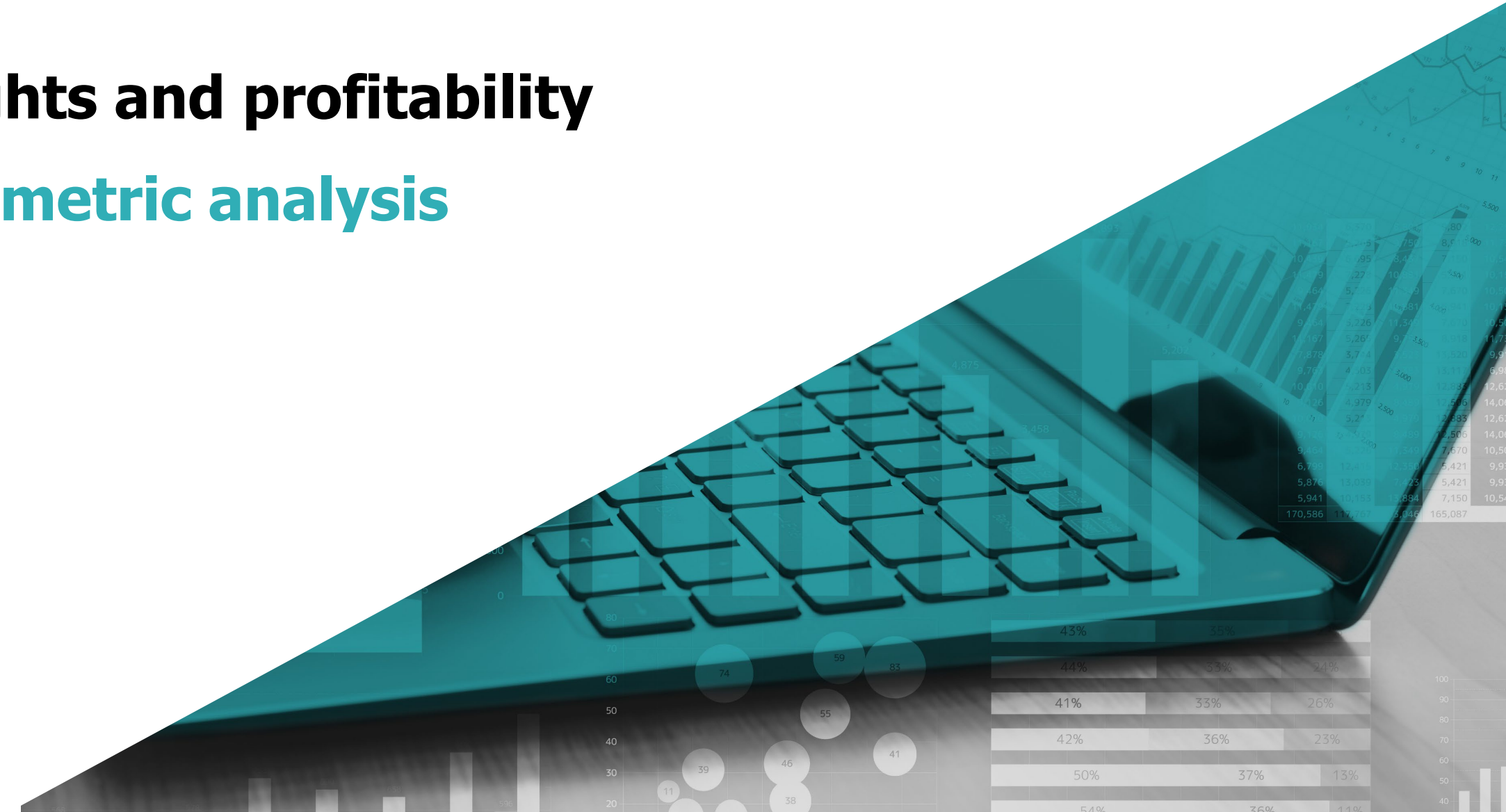
IP Rights and profitability

Econometric analysis



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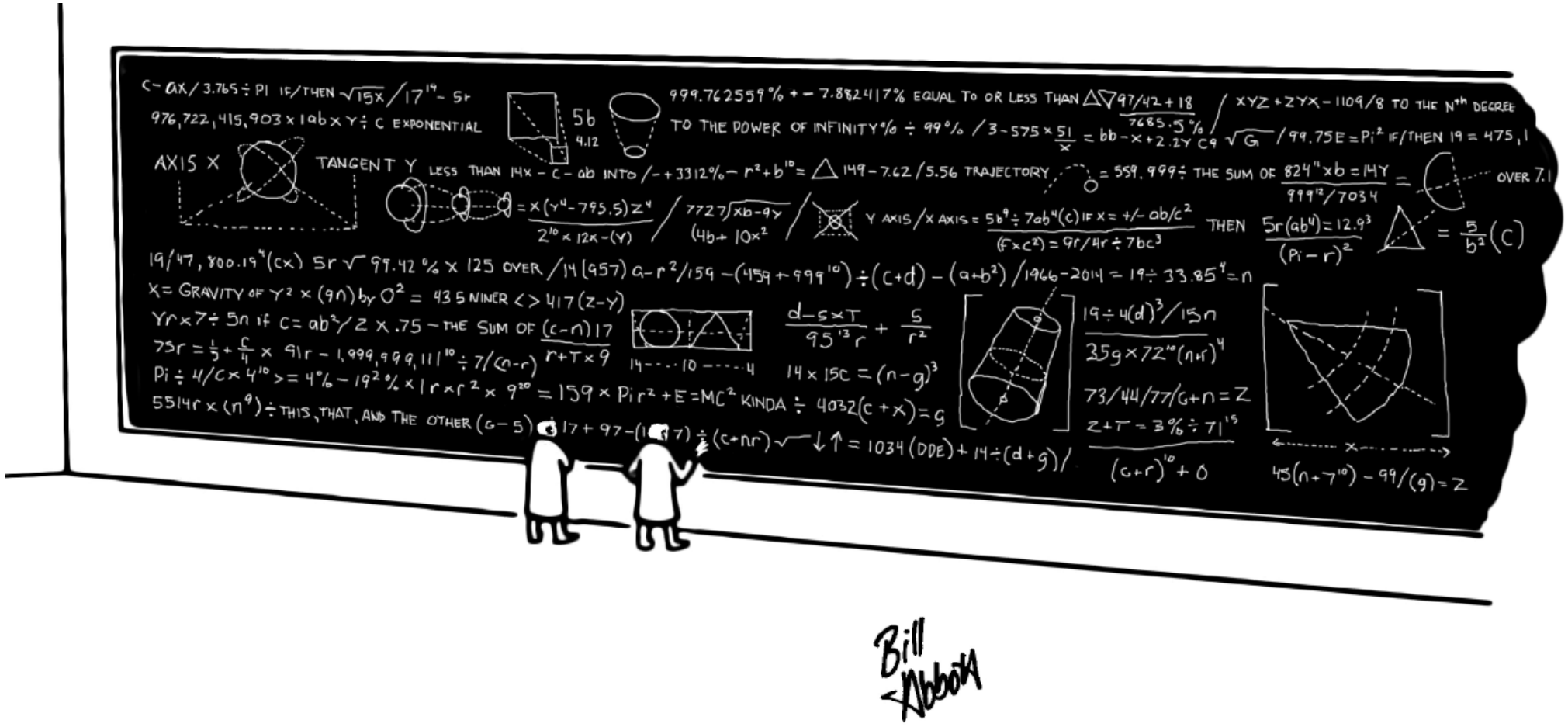

"I was just looking for a simple yes or no."

Harvard Business Review, November 2014
cartoon by Bill Abbott

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IP Rights and profitability

Key findings

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IP rights increase profits for profitable firms

- IPR ownership contributes to business average profitability
- Different types or combinations of IPRs have a positive impact on business profitability
- There is no overall significant impact of a business's number of IPRs on its profitability

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IPRs and market concentration or competition

Methodology

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High market concentration / less market competition

ANZSIC code	NACE description	HHI (avg)
J58	Telecommunications Services	0.40
J57	Internet Publishing and Broadcasting	0.39
O76	Defence	0.37
I49	Air and Space Transport	0.35
C17	Petroleum and Coal Product Manufacturing	0.34
I51	Postal and Courier Pick-up and Delivery Services	0.32

* A marketplace is generally considered to be competitive if it has a HHI of less than 0.15, while an HHI of 0.15 to 0.25 is considered to be a moderately concentrated marketplace, and an HHI of 0.25 or greater, a highly concentrated marketplace.

Do IP rights affect market concentration?

No conclusive evidence

Key findings

IPR use doubled in 15 years since 2001-02

On average, IP owners are larger and more profitable than non-owners

Manufacturing and Wholesale Trade attract most IPR usage

IP rights increase profits for profitable businesses

IP businesses holding trade marks and other IP rights contribute more to business profitability

No conclusive evidence that IP rights affect market concentration

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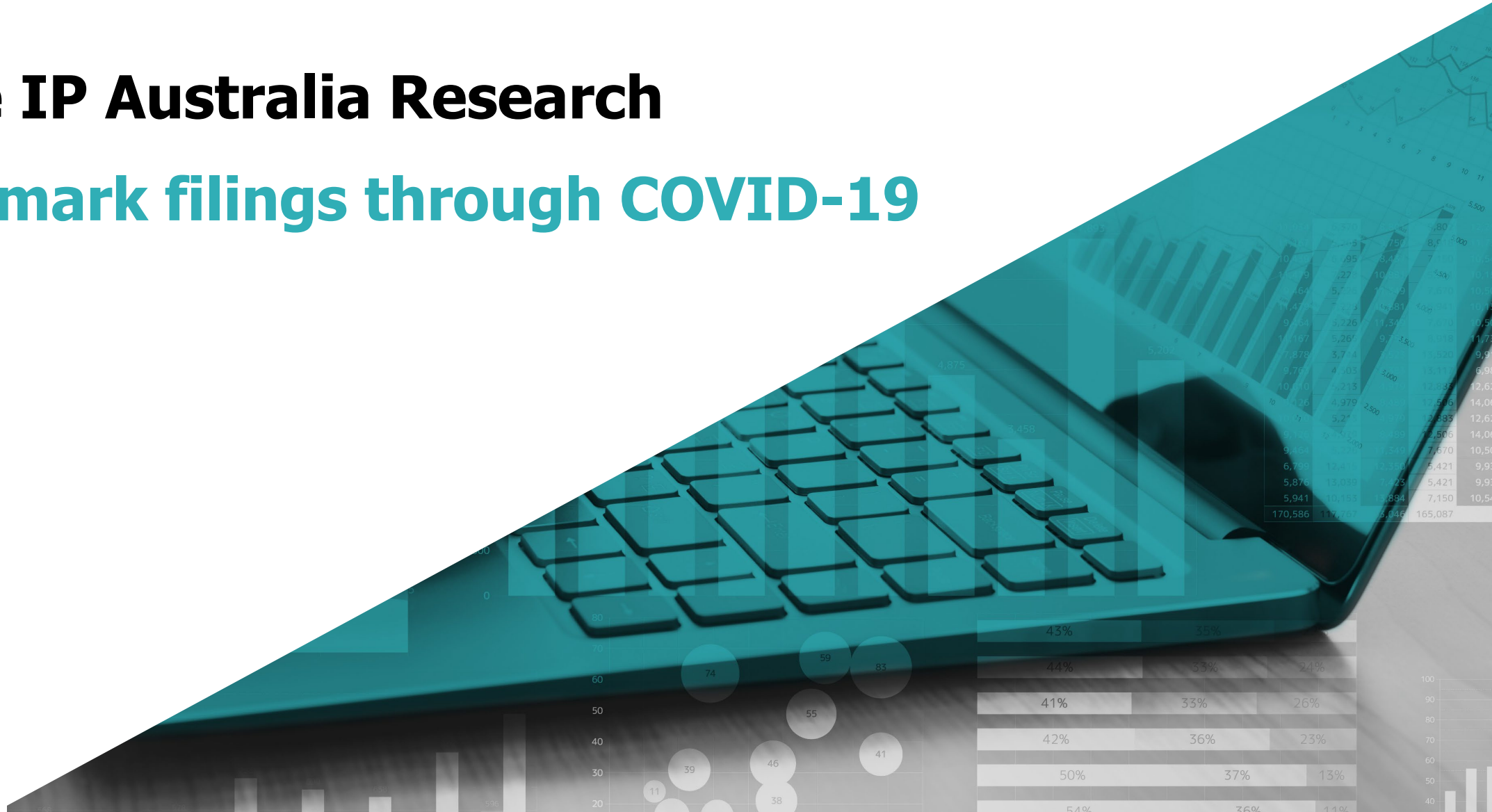
Future IP Australia Research

Trade mark filings through COVID-19



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Future IP Australia Research

Trade marks and exports

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Thank you!

https://www.ipaustralia.gov.au/about-us/research-and-data/office-chief-economist

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Canada

OFFICE OF THE CHIEF ECONOMIST

INNOVATION AND THE INTERNATIONALIZATION OF BUSINESS

4TH ANNUAL IP DATA & RESEARCH CONFERENCE

Aaron Sydor
March, 2021

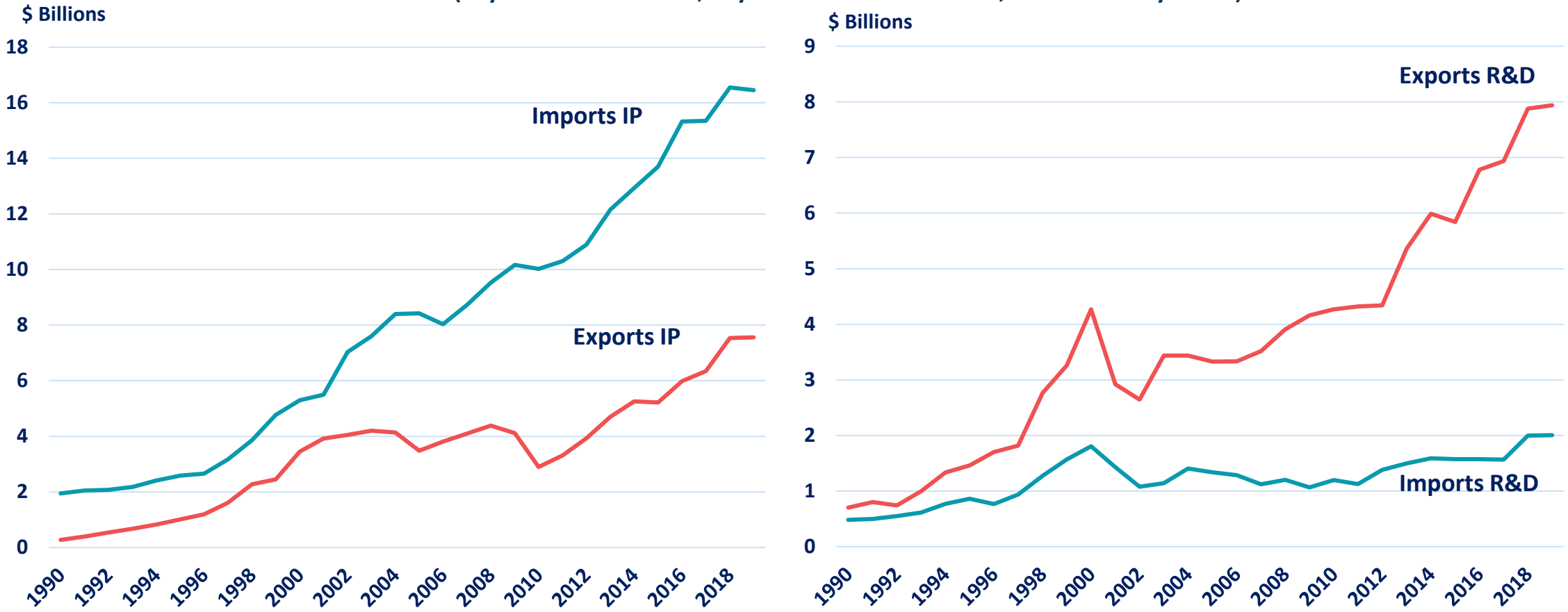
OUTLINE

- From high-level perspective of Canada as a location of choice for innovation, commercialization and trade
- To firm-level perspective of the link between innovation and the internationalization of Canadian business

CANADA IS A NET EXPORTER OF R&D AND NET IMPORTER OF IP

Canadian Trade in IP and R&D

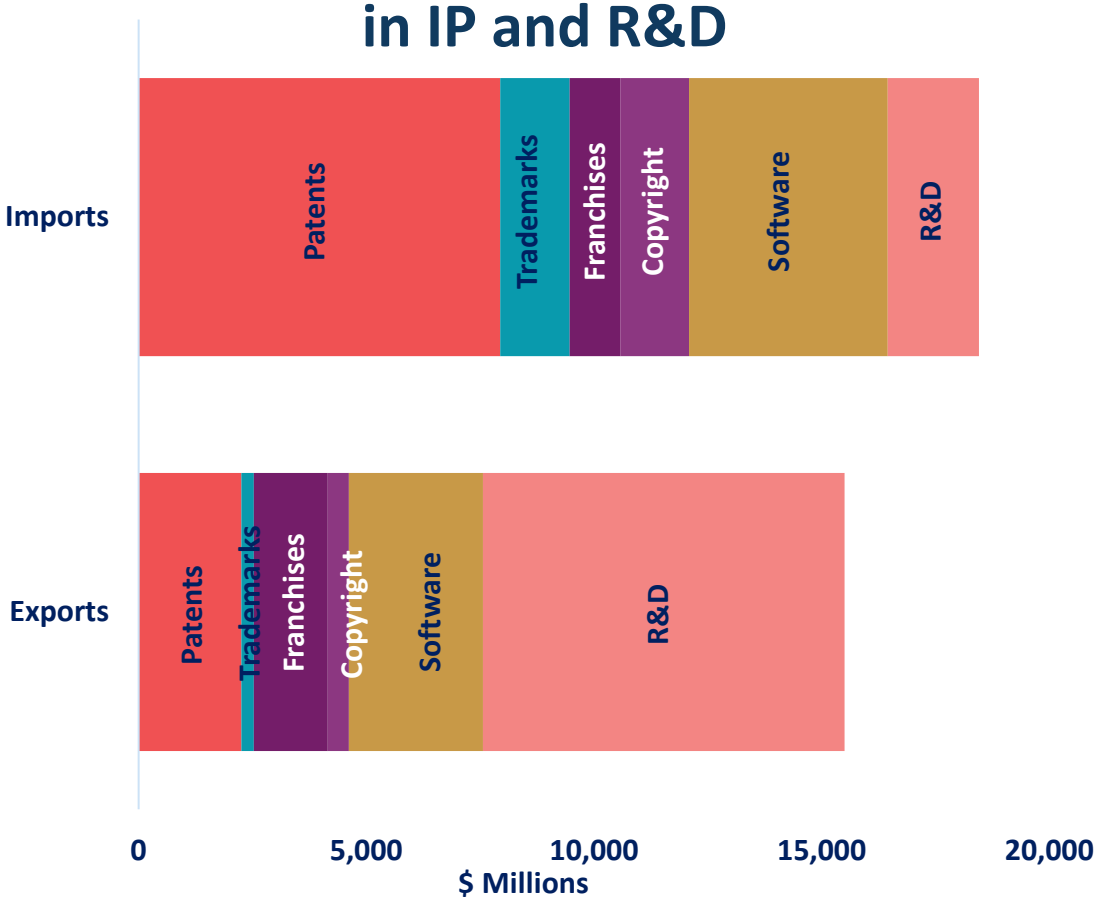
(Payments for use of IP, Payments for R&D services, Balance of Payments)



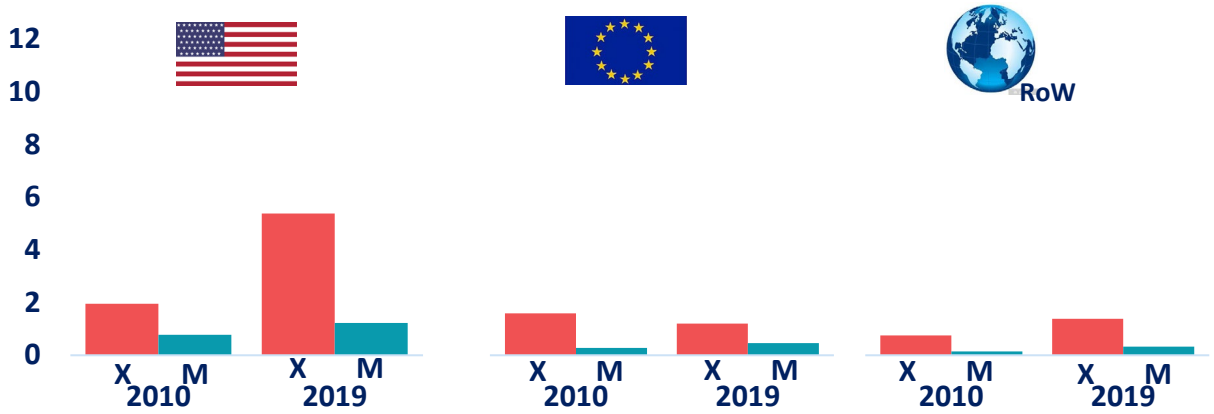
Data: Statistics Canada
Source: Office of the Chief Economist, Global Affairs Canada

MOST EXPORT GROWTH IS WITH U.S. WHILE IMPORTS INCREASINGLY COME FROM EUROPE

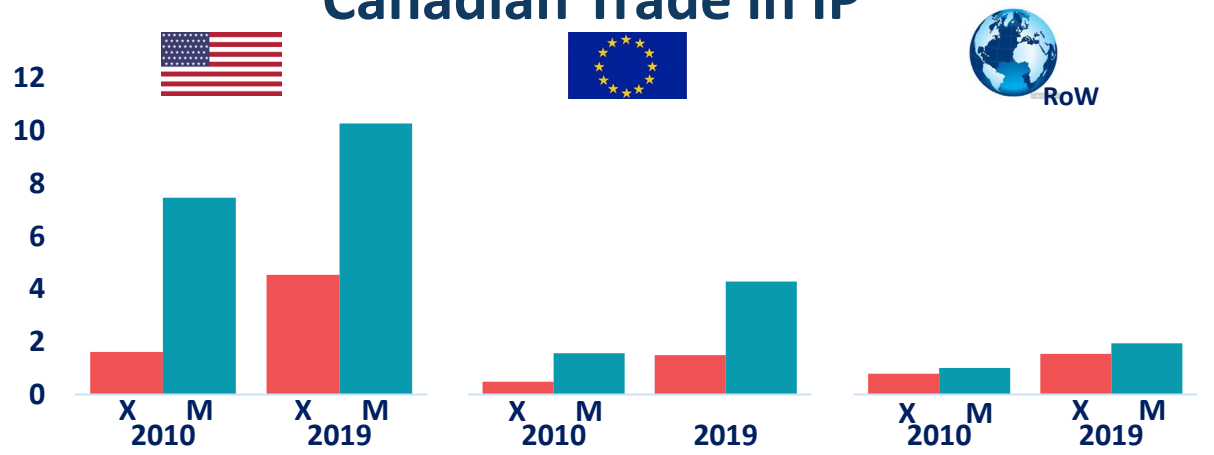
Canadian Balance of Trade in IP and R&D



Canadian Trade in R&D



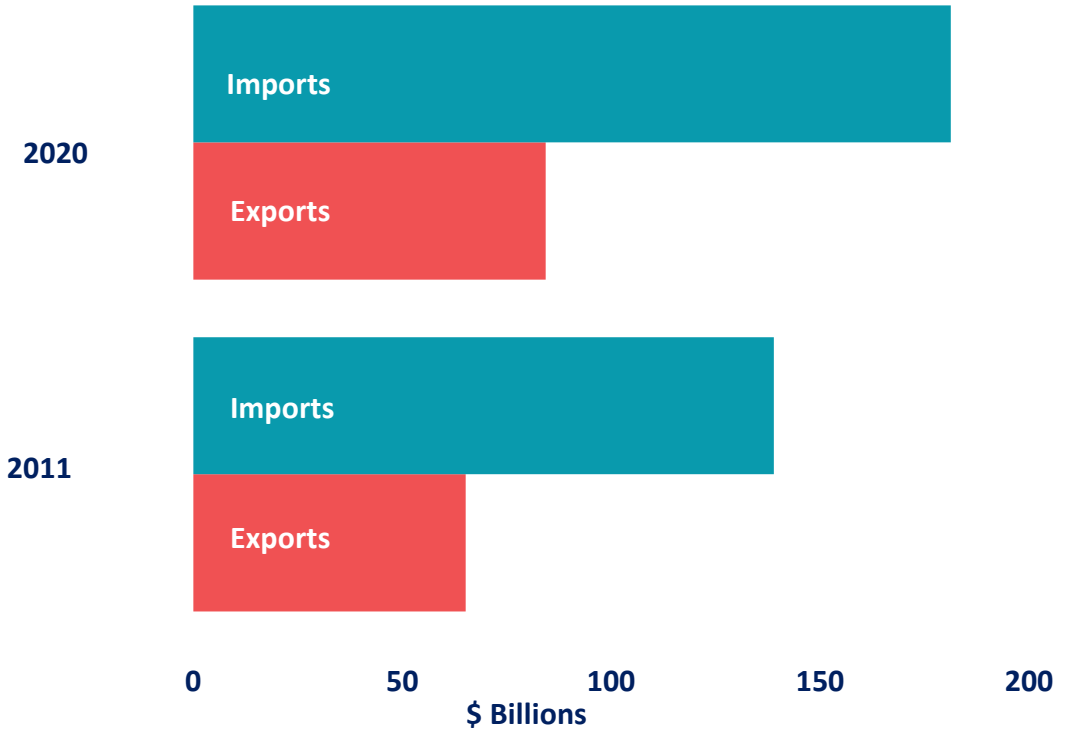
Canadian Trade in IP

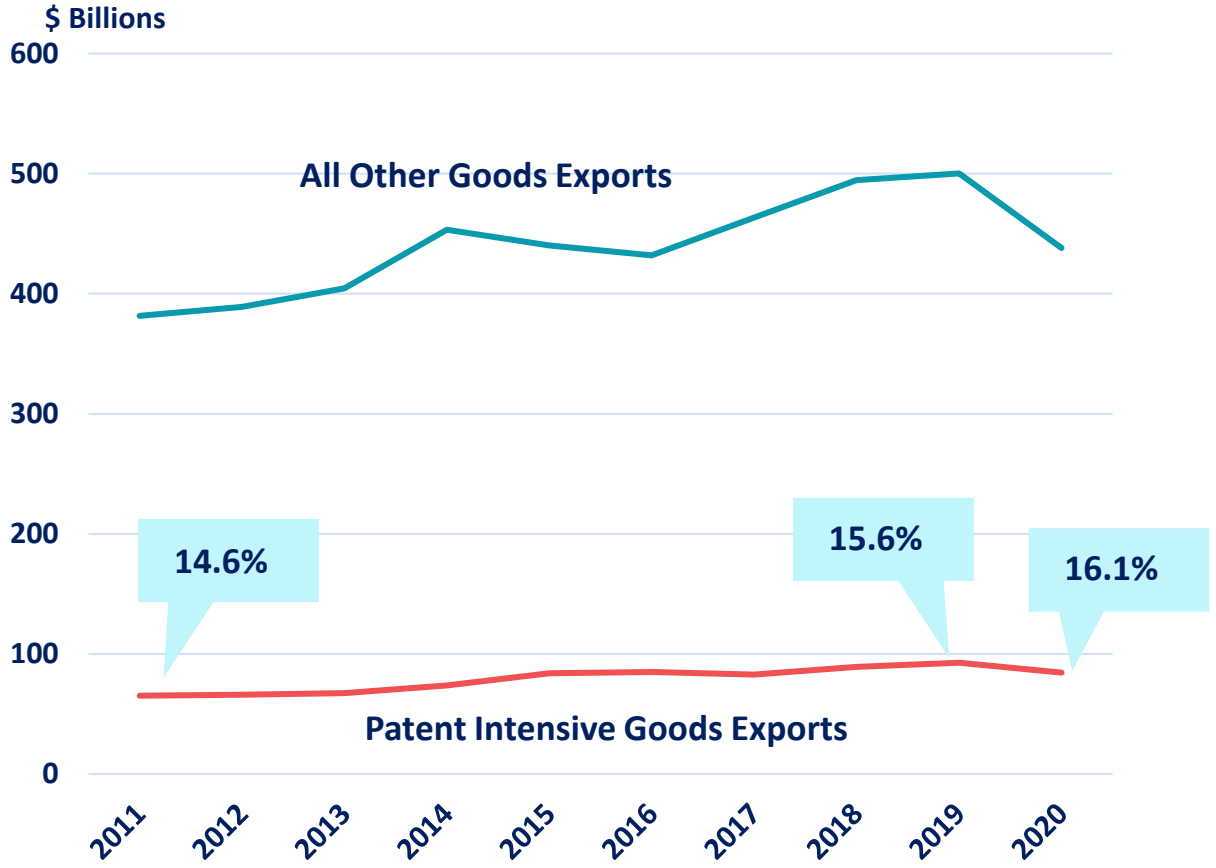


Data: Statistics Canada
Source: Office of the Chief Economist, Global Affairs Canada

ALTHOUGH GROWING FASTER THAN EXPORTS OVERALL THERE IS A LARGE DEFICIT IN IP GOODS

Patent Intensive Goods*



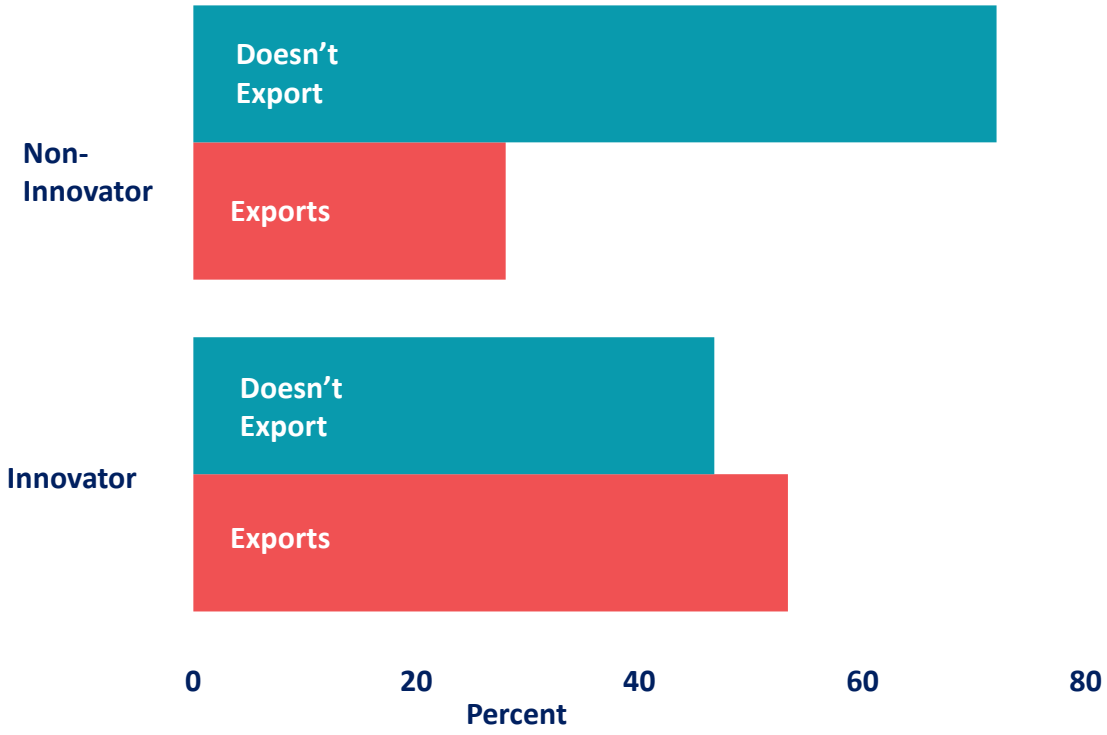


Data: Statistics Canada
Source: Office of the Chief Economist, Global Affairs Canada

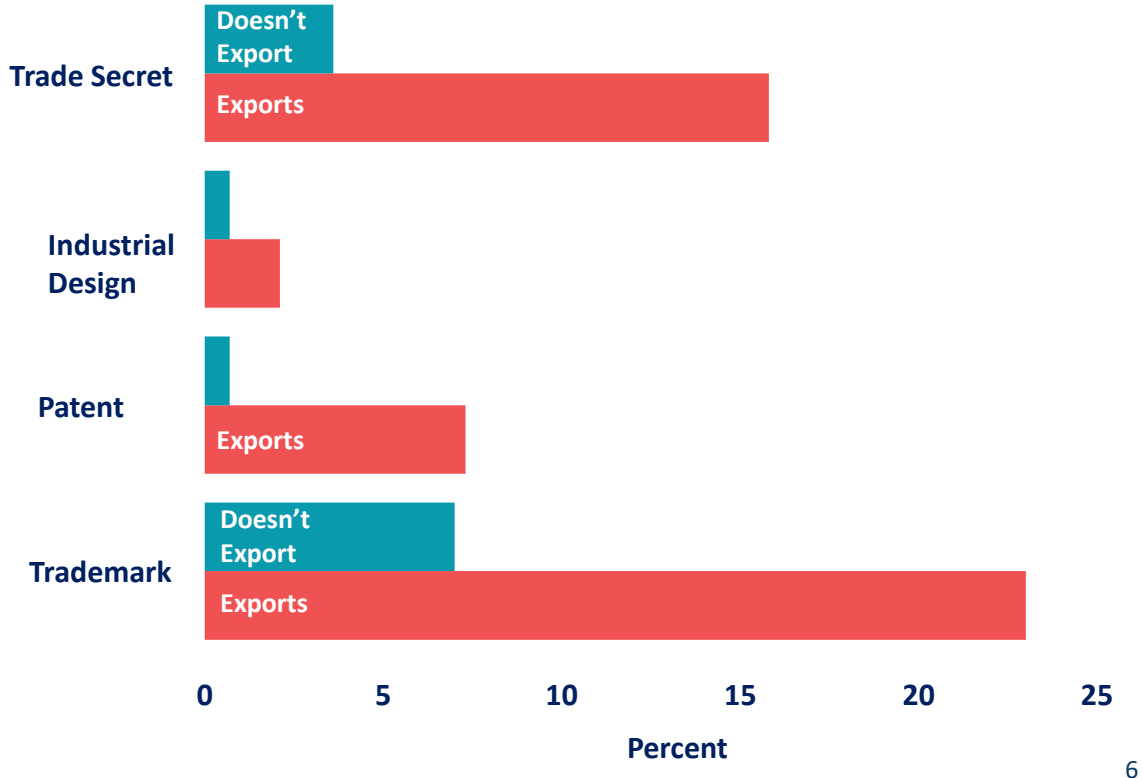
Patent intensive goods based on definition from "Intellectual Property and the U.S. Economy: Industries in Focus" U.S. Patent Office and Trademark Office 2012, excluding petro-chemicals

COMPLEX RELATIONSHIP BETWEEN EXPORTING, IP AND INNOVATION

Innovation and Exporting Among SMEs



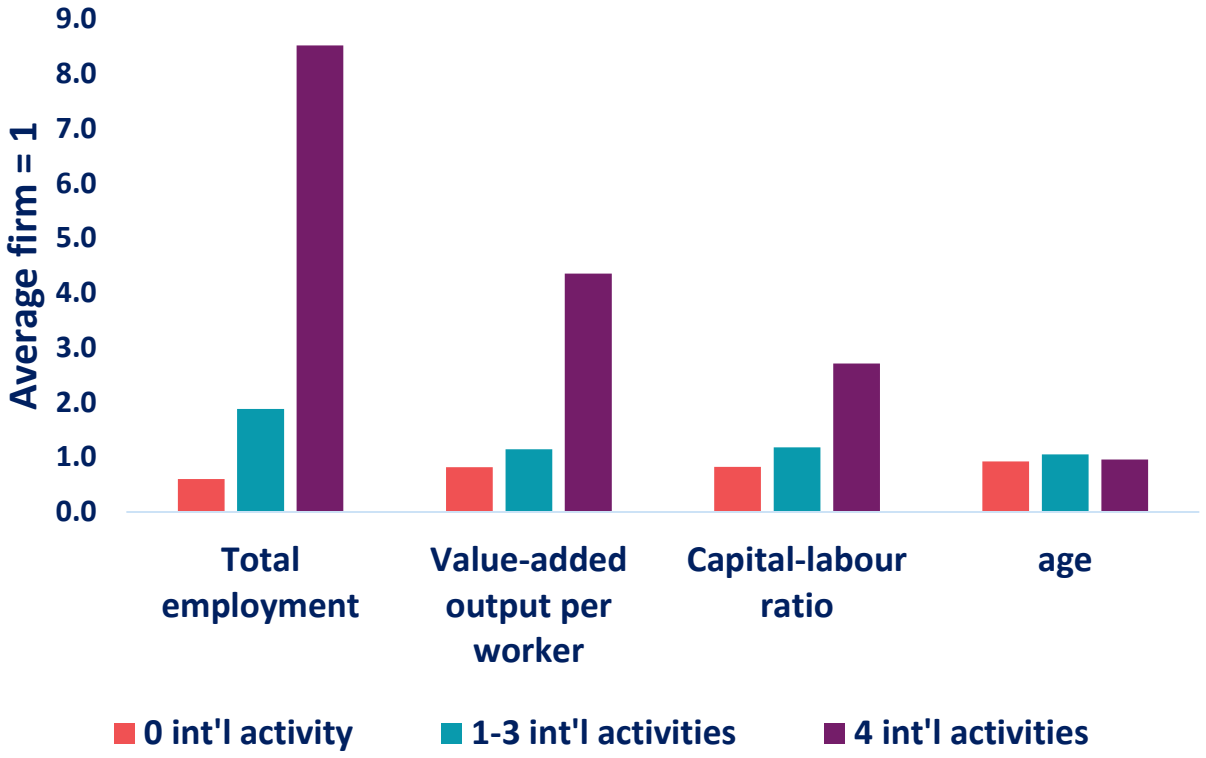
Use of IP and Exporting Among SMEs



Data: Statistics Canada
Source: Office of the Chief Economist, Global Affairs Canada

CONSTRUCT FIRM-LEVEL MEASURES OF EACH INNOVATION AND INTERNATIONAL INTENSITY

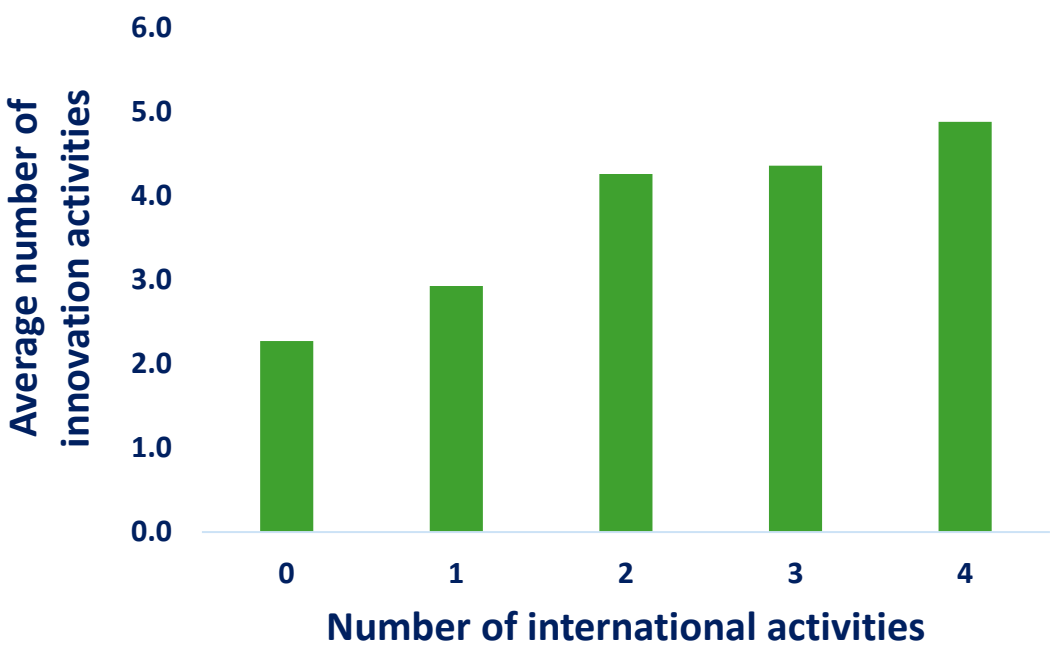
Firm attributes by internationalization intensity



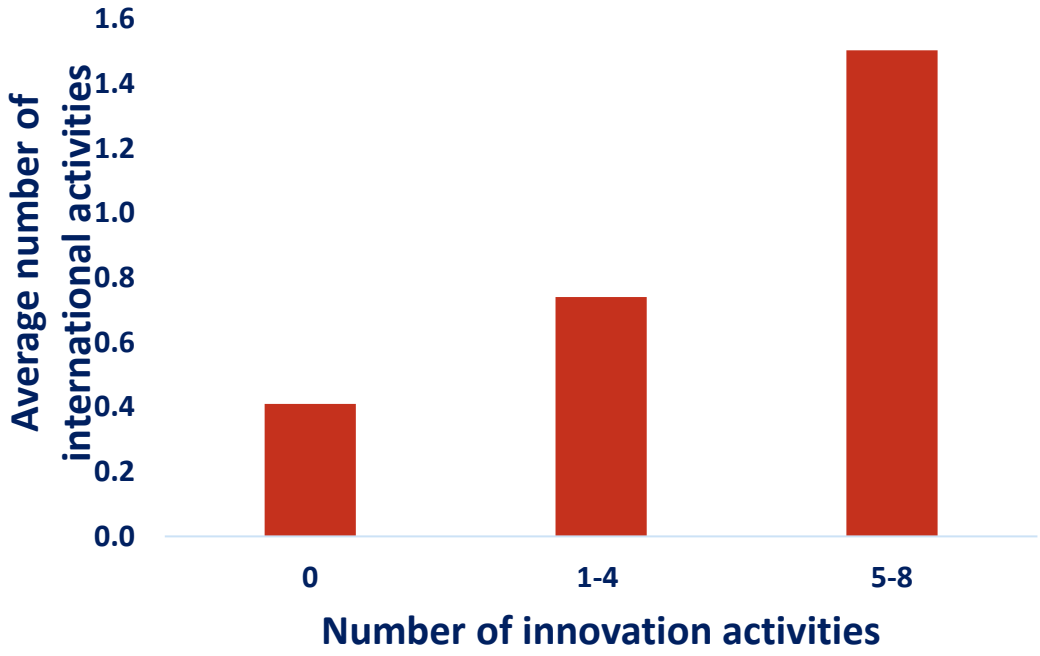
Firm attributes by innovation intensity

STRONG CORRELATION BETWEEN INNOVATION AND INTERNATIONALIZATION

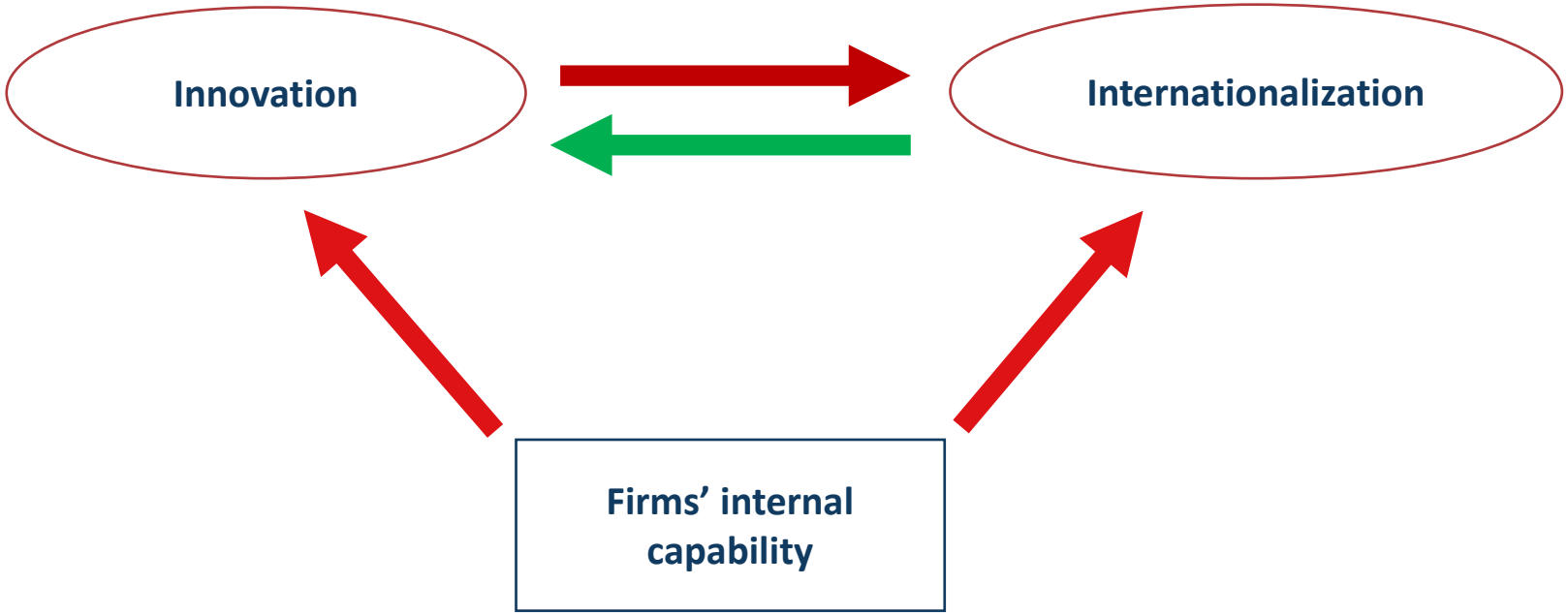
Average number of innovation activities by internationalization intensity



Average number of international activities by innovation intensity



HYPOTHESIS: AN UNSEEN "INTERNAL CAPABILITY" DRIVES BOTH INNOVATION AND INTERNATIONALIZATION



Internal Capability

Ability to overcome obstacles:

- Index 1: Measures taken to overcome obstacles to innovation (0-9)

Ability to mobilize resources:

- Index 2: Use of ten government programs at 3 levels of govermnet (0-30)

DYNAMIC CAPACITY OF FIRM AND INTERNATIONALIZATION AND INNOVATION

	Internationalizaion Intensity	Innovation Intensity
Dynamic Capacity	0.04*	0.53*
Log (Employment)	0.35*	0.35*
Log (Labour Productivity)	0.26*	0.12
Log (Cap-Lab Ratio)	0.04*	0.01
Age	-0.004	-0.01
Obs	4019	4019
R-squared	0.424	0.248
Adj/ R-Squared	0.421	0.244

CONCLUSIONS

- High-level perspective:
  - Canada is an attractive location from which to perform R&D, and increasingly commercialize
  - Patent-intensive goods play a modest role in Canadian exports
- Firm-level perspective:
  - There is a strong link between innovation and internationalization
  - In large part because these firms have the dynamic internal capability