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Getting Aligned:

How Adopting Standards Affects Canada's Productivity
and Growth

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What Is a Standard?

- Basic infrastructure of the 21st-century knowledge economy.
- Hundreds of thousands of international standards, and many thousands more at the national level, underpin the global economy.
- Cover a wide spectrum of documents, from definitions, classifications, manufacturing techniques, processes, delivery systems, and others.
- They set out requirements, specifications, guidelines or characteristics that can be consistently applied to ensure that products, materials, processes, and services perform as intended in terms of their quality, safety, and efficiency.

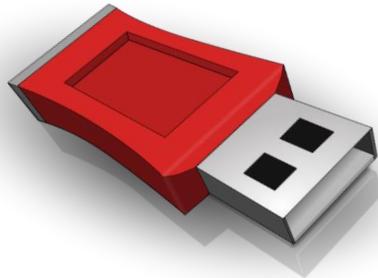
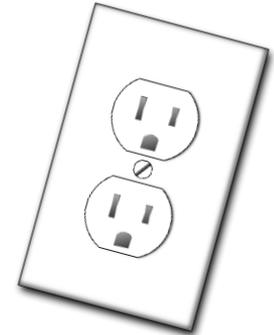
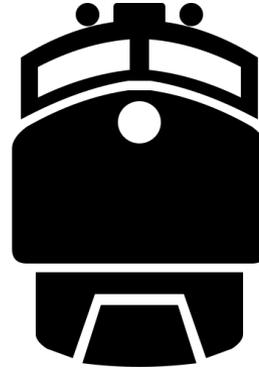
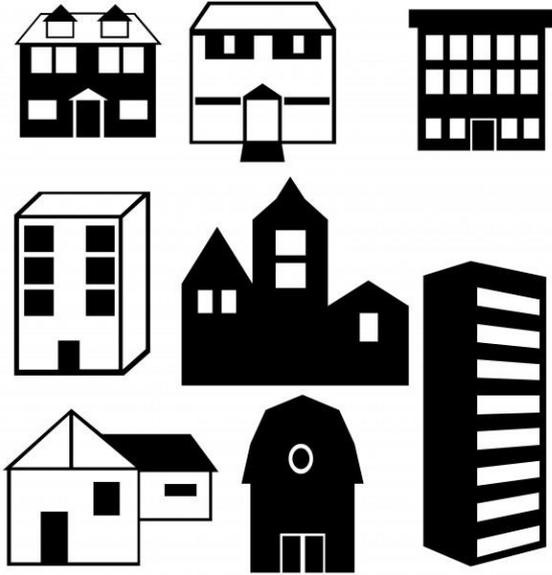


What Is a Standard? (continued)

- Developed by consensus and approved by a recognized body.
- The Standards Council of Canada (SCC) does not develop standards; rather, it accredits Standard Development Organizations (SDOs).
- SCC focuses on aligning our national standards with international and regional standards to help reduce technical barriers to trade, internally and internationally, and promote economic growth in our country.
- Put simply, they make things work, help innovations spread, and facilitate trade among provinces, countries, and economic regions.



...Standards Make Things Work



Government of Canada Standard: GCS 32.1-87 Bread, White, Enriched and Whole Wheat

The loaves shall be sweet and wholesome, well risen and well baked with even bloom. They shall be free from burned crust and be bold and uniform in shape. The crumb shall have a good, even, resilient texture, and the bread shall be free from doughy spots, lumps, and indications of mould or "rope". The bread shall be capable of being sliced without excessive crumbling.



Source: <https://www.tpsgc-pwgsc.gc.ca/ongc-cgsb/publications/catalogue/index-eng.html#tab14>



Benefits from Standards

- Promote trade
- Reduce search costs
- Increase efficiency
- Improve knowledge dissemination
- Reduce risk
- Reduce repair and maintenance costs
- Reduce transaction costs
- Improve consumer confidence
- Enhance market efficiency



Interviews and Case Studies with Canadian Organizations

Significant benefits of Standardization to:

- Facilitating trade
- Encouraging innovation, R&D and continuous improvement
- Establishing credibility and quality
- Setting a level playing field
- Improving productivity and reducing costs
- Ensuring reduced health and safety risks



Cost Savings

- Implementation of standardized work (lean manufacturing) improved productivity by 50 per cent at 3M plant.
- Standards such as ISO 9000 have resulted in reduced costs if well integrated
- Lower costs of materials
- Savings proportionately more important in high volume repetitive businesses
- Reduces cost of making and updating regulations



Timeframes

- Frustration sometimes emerges when new standards apply to old products, old facilities
- Technology and standardization process sometimes evolve slowly
- Businesses push for quick development of standards when level playing field at stake



Safety, Liability, Public Interest

- Standardization makes things less complicated; complexity drives mistakes; standardization results in fewer mistakes, fewer accidents
- Safety standards result in reduced health and safety risks to consumers; reduced burden on health care system
- Industrial safety standards can reduce accidents, for example, changes to 347 volt electrical fixtures



Unexpected benefits

- Creation of trade associations
- Increased professionalism
- Pursuit of market opportunities
- Increased communication

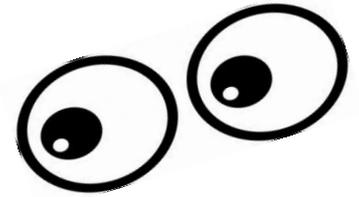


Getting Aligned: The Economic Impact of Standards in Canada

- Follow established methodology set out by international studies
- Examine the long-run relationship between the quantity of standards and productivity
- Quantify the contribution of standards to GDP and labour productivity



A Productivity Framework...



- Viewing the supply side of the economy through a production function approach
- Our productive capacity depends on:
 - the amount and type of capital,
 - the amount and quality of labour and
 - the efficiency with which capital and labour mix to produce output



A Productivity Framework...

$$GDP_t = f(L_t, K_t, TFP_t)$$

where:

GDP_t = real Gross Domestic Product

L_t = Hours worked

K_t = Capital stock

TFP_t = Total factor productivity



What is Efficiency/Productivity?

Over time is a key determinant of income levels in an economy

Contributes directly to labour productivity—output per hour worked

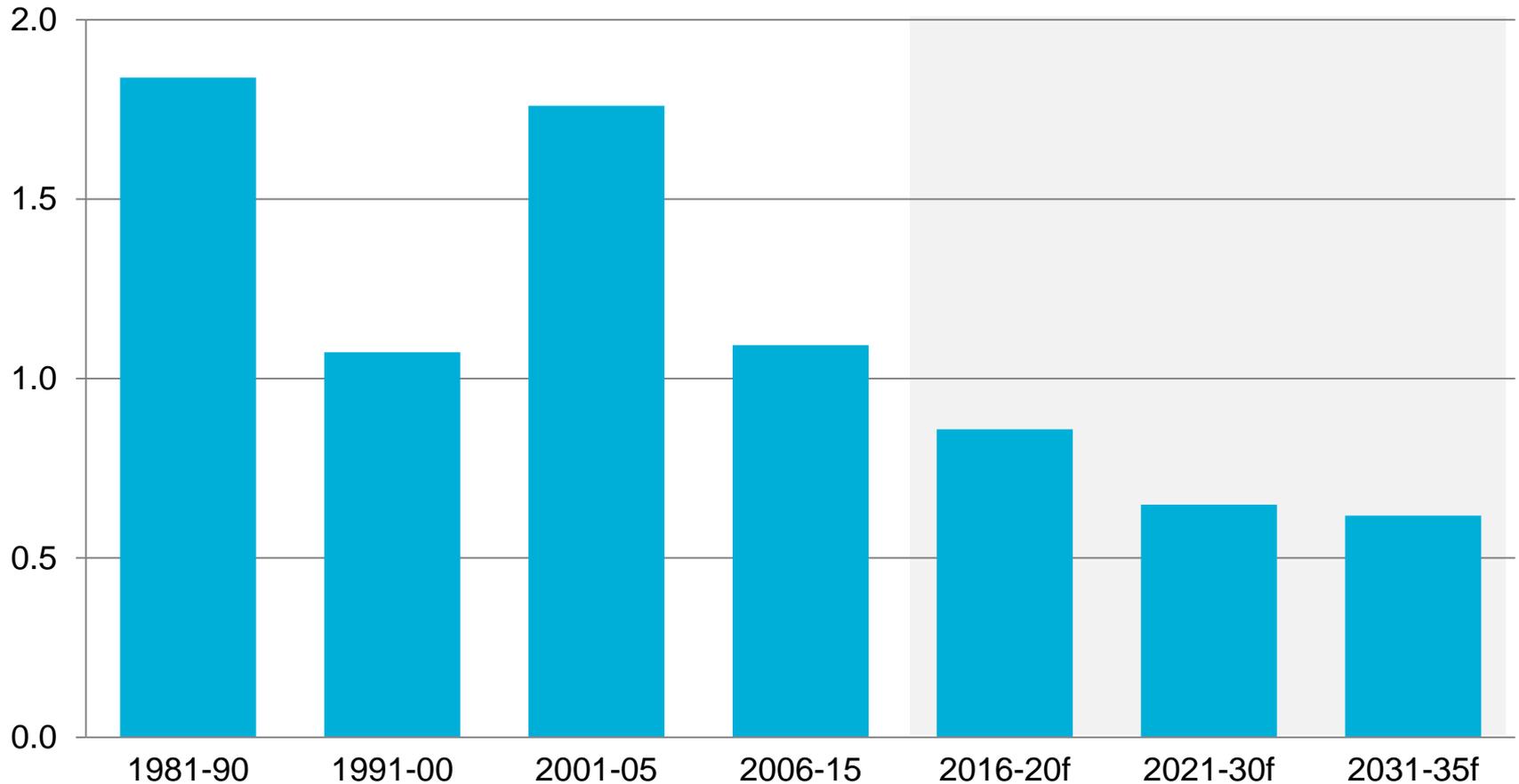
Capital stock per worker is the other defining component of labour productivity

Why are we concerned...



Labour Force Growth

average annual compound growth, per cent

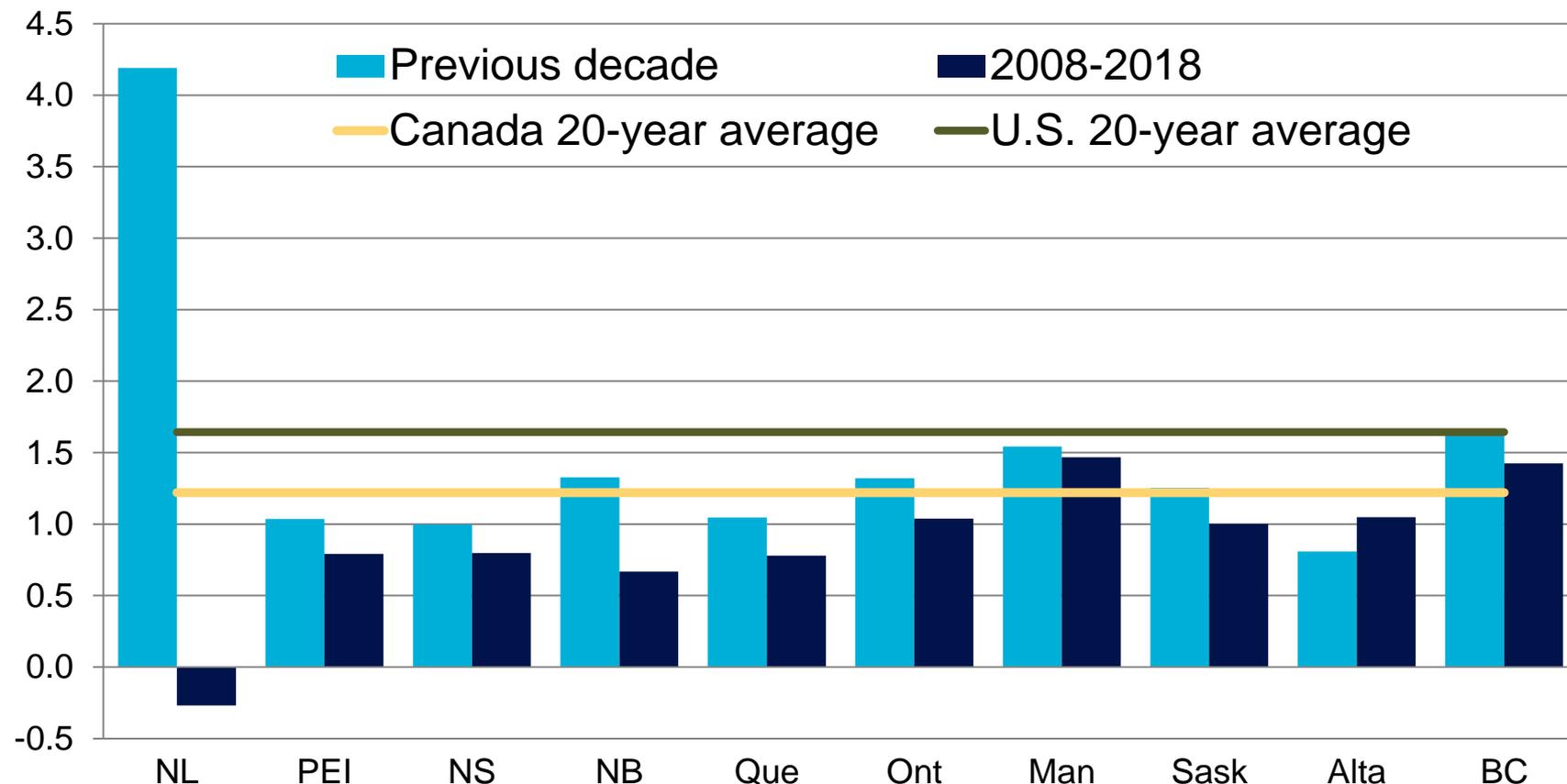


Sources: Statistics Canada; The Conference Board of Canada.



Labour Productivity Growth by Province

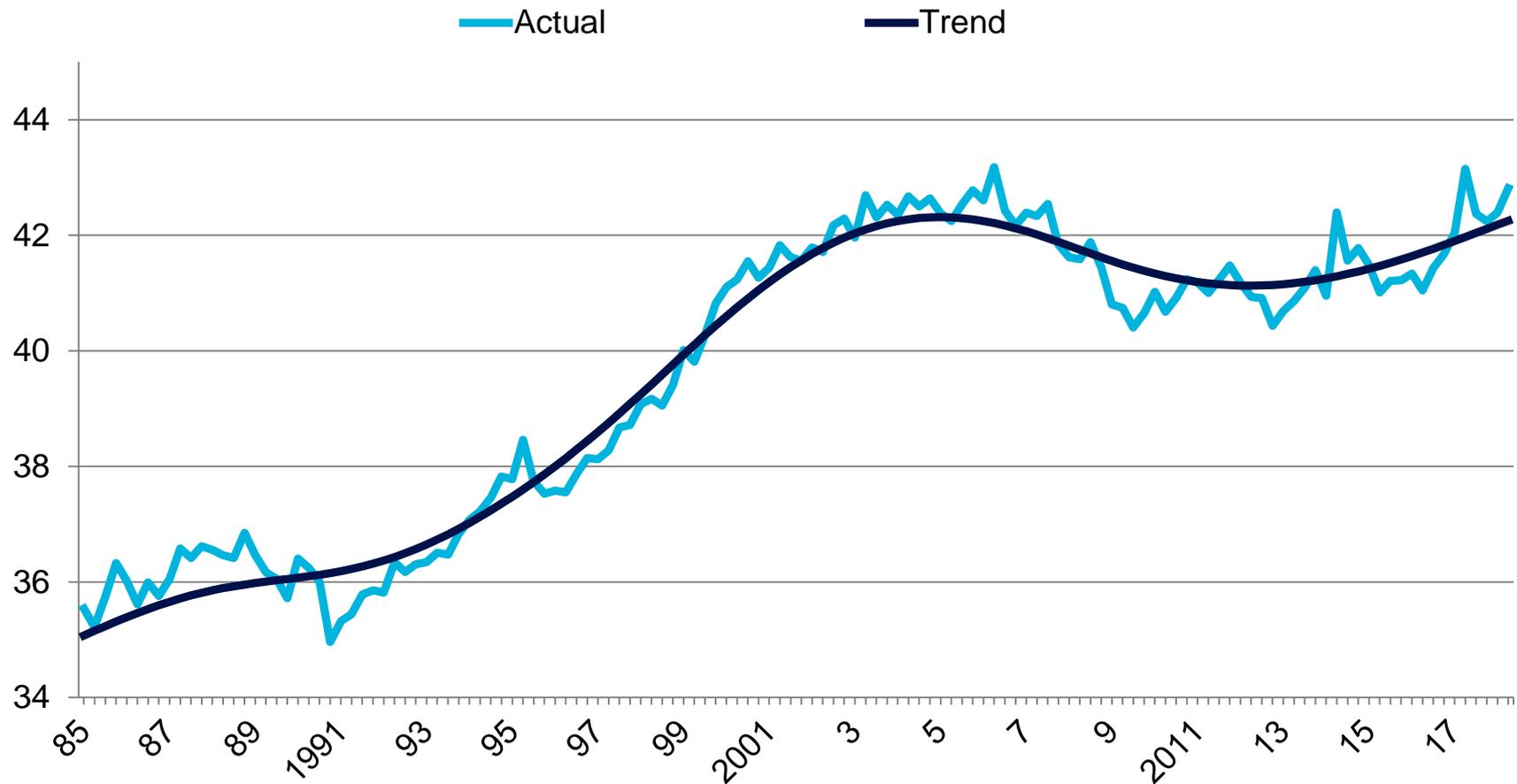
average annual compound growth, per cent



Sources: Statistics Canada; The Conference Board of Canada.



Actual and Trend Total Factor Productivity



Sources: Statistics Canada.; The Conference Board of Canada.



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Labour Productivity

$$GDP_t / L_t = f(K_t / L_t, TFP_t)$$

Contribution of capital deepening

Contribution of total factor productivity

- Technology
- Efficiency
- Other factors?



The Statistical Model

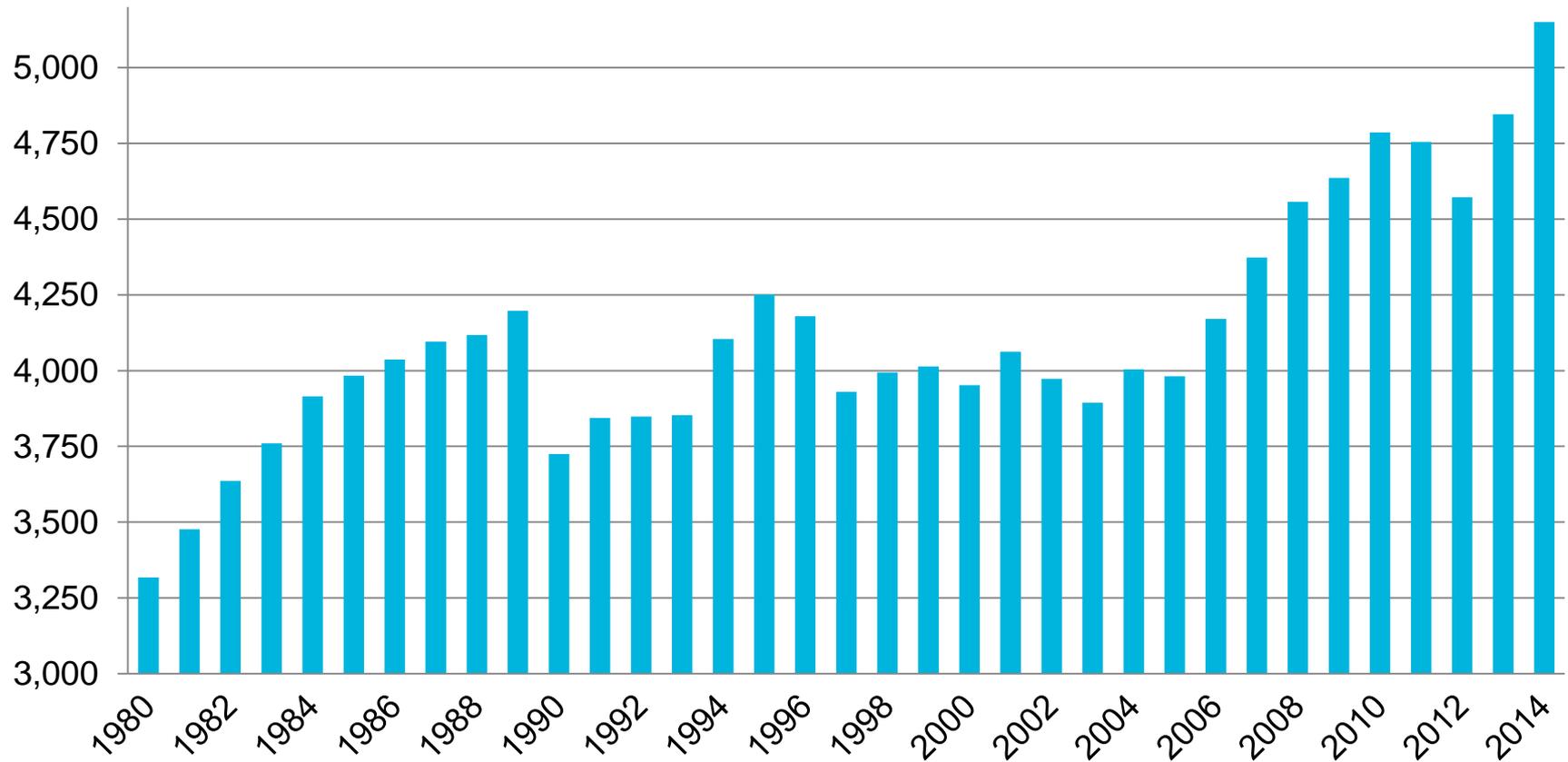
Labour productivity is modeled as a function of:

- Constant
- Capital-labour ratio
- Quantity of standards
- Time trend



Canada, Total Stock of Standards

1980-2014



Sources: Standards Council of Canada; The Conference Board of Canada.



Statistical Results

Estimated Elasticity of Labour Productivity: Economy as a Whole (All Industries), Economy Excluding Oil and Gas,

	All industries	Excluding oil and gas extraction
Elasticity with respect to Stock of Standards	0.048	0.158
Capital-to-Labour Ratio	0.163	0.212

Source: The Conference Board of Canada.

Average Contribution of Standards to Growth in Labour Productivity and Real GDP: Percentage Points Contribution

	All industries	Excluding oil and gas extraction
Average GDP and labour productivity contribution (percentage points)	0.060	0.210

Source: The Conference Board of Canada.



Standards Play a Role...

- On average, growth in the number of standards contributed 0.21 percentage points to growth in labour productivity each year
- This represents 16.1 per cent of the growth in labour productivity and 7.8 per cent of the growth in real GDP over the 1981 to 2014 period.



Conclusion

- International studies continue to provide evidence of the links among standardization, labour productivity and economic growth
- Compatibility of products, quality standards, increased networks and larger, more efficient scales of production are some of the underpinnings that link standardization with a more efficient economy
- Over 1981-2014, standardization contributed significantly to economic growth in Canada.
- For example, standardization is estimated to have contributed about \$3 billion to the \$39 billion increase in real GDP in 2014





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