Economic Impacts of Early Learning and Care

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Overview

1. Effects of Early Learning and Care (ELC) on Children
2. Effects of ELC on parents
3. Short-term economic effects of ELC
   - Short-term multiplier
   - Mothers' labour supply effect
2. Long-term economic benefits of ELC
   - Children's Human Capital & Parents income
   - Long-term Benefits/Costs
5. Implications of Dr. Pascal's proposals

Effects Of ELC On Children

Effects on social outcomes generally found to be positive, particularly for disadvantaged

Effects on cognitive abilities generally found to be positive, particularly for disadvantaged

Mixed results for effects on socio-emotional development

- **Quebec**
- **Quality**
- **Barnett (2008) suggests on balance quality ELC positive for children**

Positive Effects on Children in Short Run

Barnett (2008) reports that meta-analyses found preschool education to produce an average immediate improvement of about half a standard deviation (SD) on cognitive development.

This is equivalent to 7 or 8 points on an IQ test, or a move from the 30th to the 50th percentile for achievement test scores.

For the social and emotional domains estimated effects average about 0.33 SD.

Positive Effects on Children in Long Run

Barnett (2008) also reported the estimated effects decline as students move from immediate experience to elementary school, to adolescence, and to adulthood follow-up.

Long-term effect are smaller than short-term effects.

Long-term effects are roughly 0.10 to 0.20 SD for cognitive abilities, 0.15 for school progress, and 0.15 to 0.20 on social behaviour including delinquency and crime.

Different attributes have been studied.

Different Aspects of ELC

Full day vs. half day kindergarten improves cognitive learning, +0.93 SD in literacy and +0.75 SD in arithmetic (Lee et al. 2005)

Effective after school programs improve children's academic achievement by 0.3 SD (Durlak & Weissberg, 2007), larger gains for disadvantaged

Summer school programs improves academic achievement by 0.14-0.25 SD (Cooper et al., 2000)

Different Aspects Give Different Effects

- Early identification and intervention of special needs children improves cogitative development by 0.5-0.75 SD (Guralnick, 1991)
- Increased parental involvement improves educational outcomes by 0.5-0.6 SD (Jeynes, 2005)
- Effects via children lead to gains in human capital & lower government costs. Long-term economic effects
- Provision of ELC have short-term economic effects via spending multiplier

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Effects Of ELC On Parents

- Labour supply of mothers
  - Participation rates
  - Average hours worked
  - Access to quality ELC can be more important than price
- Labour supply effects impact economy in short run and can provide long-term effects because of more workplace experience, productivity and income

Short-term Multiplier - Definition

Multiplier: Number of extra units of output per unit increase in input

If there is a direct $100 increase in spending on cars

The car industry will need to increase production by $100

There will be an indirect increase in production by all the suppliers to the car industry (eg. Tires) by $20

Their suppliers will need to increase production, etc. eg. $2

Multiplier = $122/$100 (or 1.22)

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Short-Run Multipliers - Types

Direct Multiplier—industry directly having the increase in spending / production

Indirect Multiplier—sum of the supplying industries that have an increase in output

Gross Output (GO) or Revenue multiplier

Gross Domestic Product or Value Added multiplier (smaller than GO multiplier)

GDP multiplier shows impact of sector on GDP, GO multiplier shows how sales increase

Employment multiplier—number of jobs for each million dollars spent

Type I—direct & indirect short-term effects

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Type I Short-term Multipliers

Direct & Indirect Industry Multipliers				
Industry	GDP	Gross Output	GO Rank	GDP Rank
Finance, Insurance, Real Estate and Rental and Leasing	0.95	1.37	21	1
Education	0.94	1.39	20	2
Retail trade	0.92	1.53	13	3
Non-profit institutions	0.92	1.42	17	4
Child Care Outside the Home	**0.90**	**1.35**	**22**	**5**
Government	0.90	1.48	14	5
Recreation	0.87	1.67	4	14
Accommodation & Food Services	0.85	1.78	2	16
Construction	0.78	1.76	3	19
Agriculture	0.77	1.97	1	21
Manufacturing	0.61	1.67	5	23

Source: Cross & Ghanem (2006) & Stats Canada Input-Output Impact Assessment (2008)

ELC Direct & Indirect Multipliers

Direct ELC GDP multiplier is large because import leakages very small

Indirect ELC GDP effect is small because most expenditures are related to labour costs

Combined direct and indirect GDP multiplier one of the largest of the major sectors

Employment multiplier is large per $million

- **High labour share of total costs**
- **Low wages of ELC workers means more workers per $ increase in labour costs**

Employment Multipliers

Employment Multipliers (Jobs per $Million)				
Industry	Rank	Direct Jobs	Indirect	Both
Child Care Outside the Home	**1**	**36.9**	**2.6**	**39.5**
Other Services (Except Public Administration)	2	20.4	7.2	27.6
Educational Services	3	24.6	2.9	27.5
Accommodation & Food Services	4	19.8	5.2	25.0
Government Sector	12	8.9	4.4	13.3
Construction	16	5.7	4.3	10.0
Manufacturing	20	3.1	3.7	6.7
Finance, Insurance, Real Estate and Rental and Leasing	21	3.1	2.0	5.1

Source: Statistics Canada Input-Output Impact Assessment & "S Level" Employment Multipliers for 2005

Induced GDP Multiplier

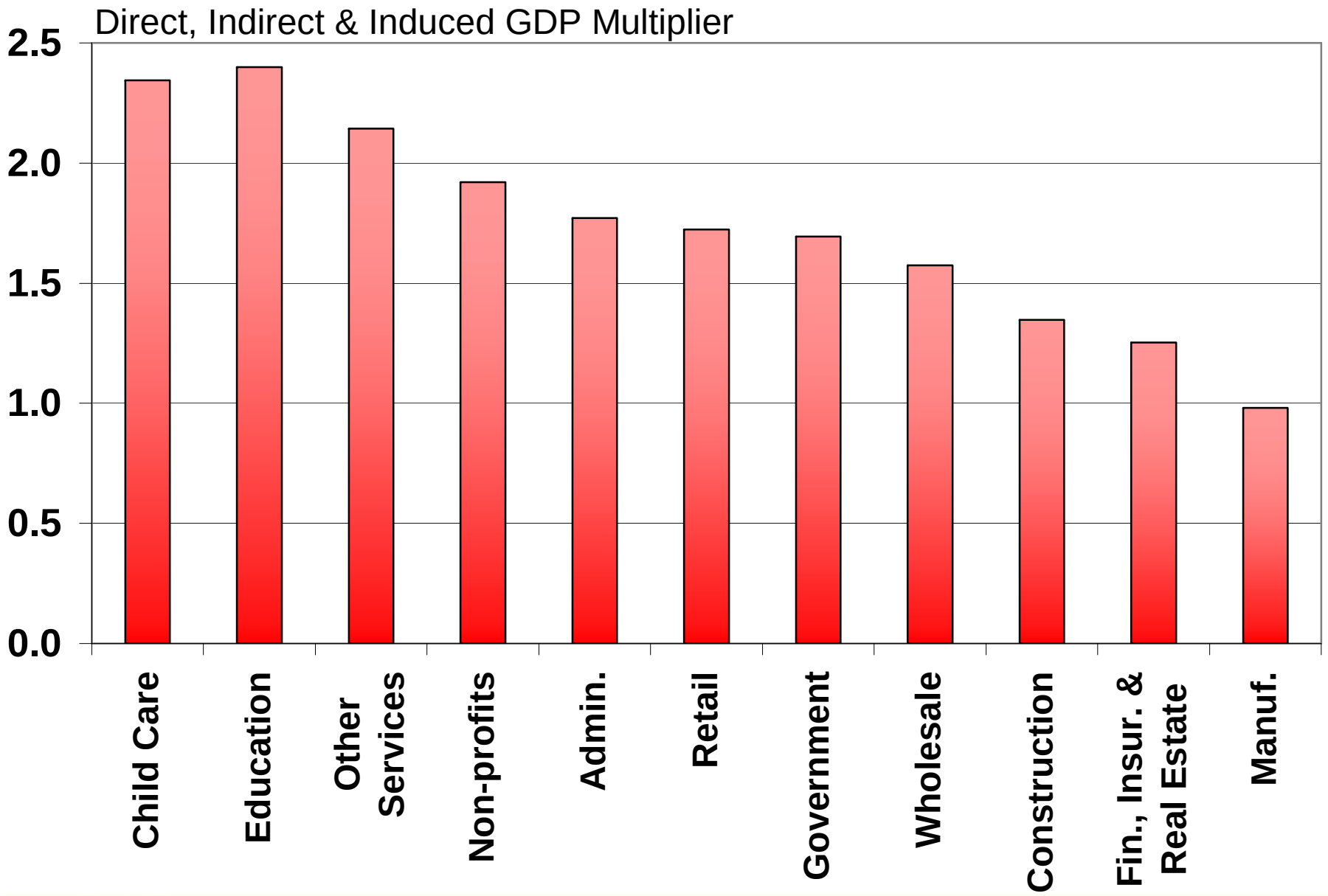
Induced effect captures the impact on the economy from increased labour income and household spending

Induced GDP effect for ELC is large because

- **Labour costs are large share of total costs**
- **Wages of ELC workers are low**
  - **Low tax rate (increases multiplier)**
  - **Low saving (high spending) per dollar increase in wages (increases multiplier)**

Type II Multiplier—includes direct, indirect & induced effects

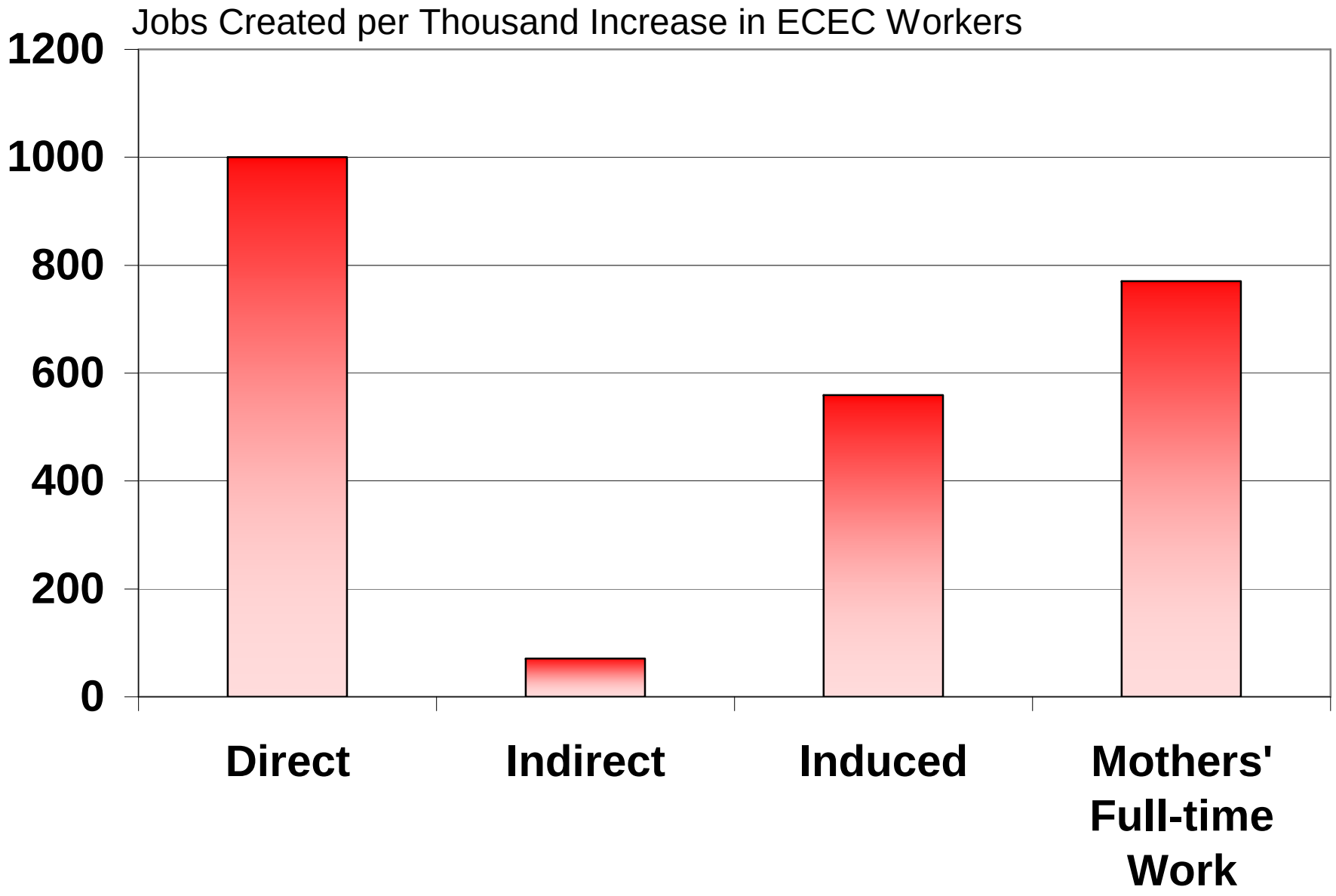
Type II GDP Multipliers



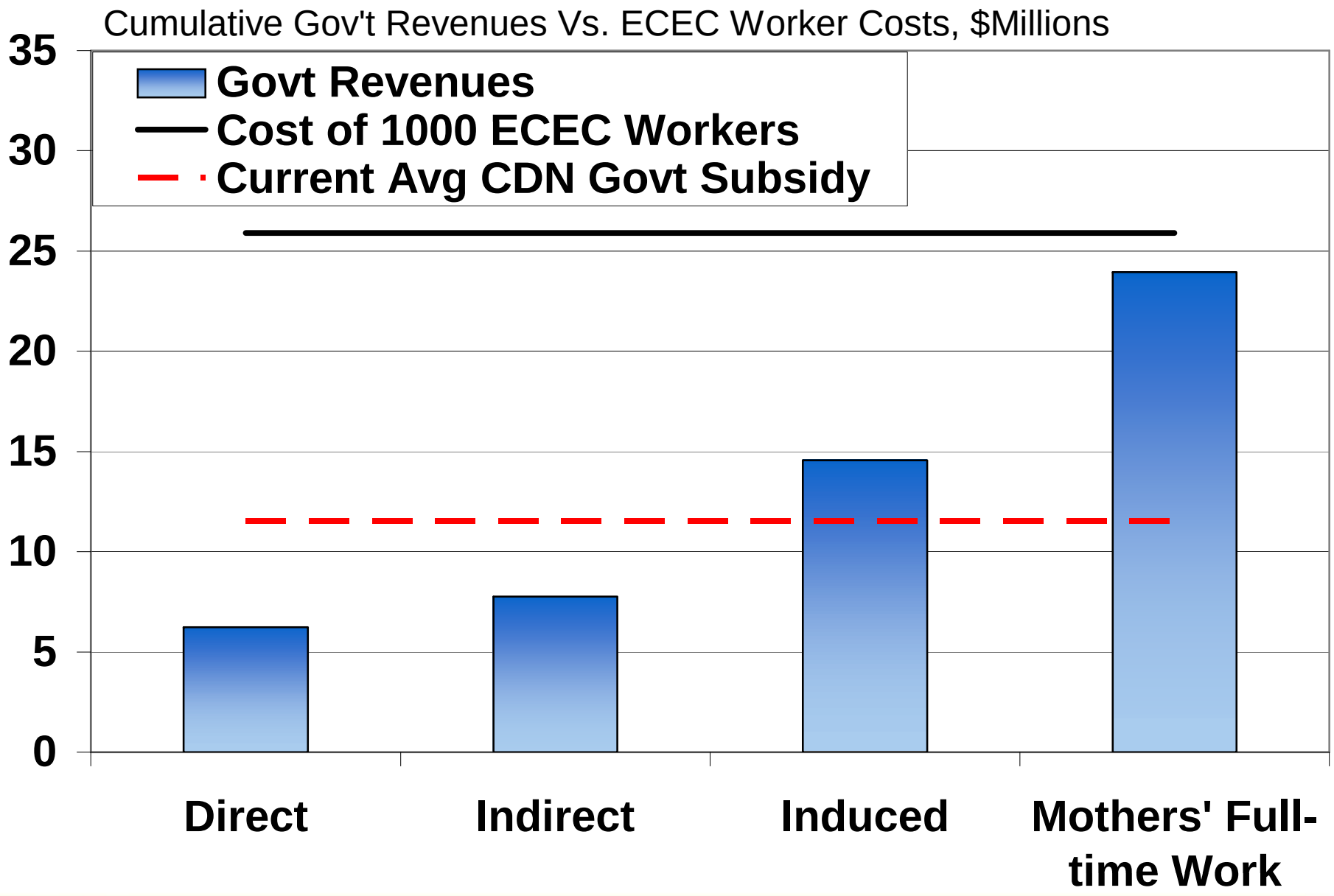
Comparison of Type II ELC Multipliers

Early Learning and Care Multipliers In Various Regions		
Reference	**Location**	**Multiplier**
Warner *et al.* (2003)	Tompkins County, NY	1.60 (GO, Type II)
Liu *et al.* (2004)	US state average	1.91 (GO, Type II)
Ribeiro and Warner (2004)	New York state	2.04 (GO, Type II)
Insight Center (2006)	LA County	2.05 (GO, Type II)
Liu *et al.* (2004)	US	3.25 (GO, Type II)
Prentice (2008)	Local Area in Manitoba	1.58 (GO, Type II)
Fairholm (2011)	Nova Scotia	2.23 (GDP, Type II)
Fairholm (2010)	Ontario	2.27 (GDP, Type II)
Fairholm (2009)	Canada	2.34 (GDP, Type II)

ELC Affects Jobs Via Mothers Too



Government Revenue Affected by ELC



Long-Run Effects

Benefits

- **Children**
- **Mothers**
- **Includes cost savings to government**

Costs

- **Cost of providing quality ELC**
- **Cost savings for informal child care**

Benefit cost ratio per hour =
(benefits / hours) / (costs / hours)

Estimating Effects on Children

A few studies use randomized experimental approach that is the gold standard of research. Used Abecedarian program because it examines full-day ELC. For disadvantaged.

Translated the results from disadvantaged to average child using estimates from Loeb et al. (2007) on test score gain from ELC for all children vs. disadvantaged.

Apply adjustment factor to the percentage achievement difference between Abecedarian participants and controls. Adjust for education of ELC worker and staff ratio differences and apply to average Canadian child.

Adjustments to Average Child

Adjustments to Reflect Average Vs. Disadvantaged Cohorts				
	Participants	Control	Diff.	Adjusted Diff.
Grade retention rate	31%	55%	-44%	-24%
Years in special ed.	1.0	1.5	-33%	-18%
Smoking rates	39%	55%	-29%	-16%
HS Dropout rate	33%	49%	-33%	-18%
Math Score (Woodcock Johnson)	93	82	13%	7%

Canadian Adjustment

Canadian Benefits Based on Adjusting Estimated Abecedarian Benefits (Five Year Olds, 2005)				
	All children	Participants	Values	Benefits
Grade retention rate (grades 1-8)	34%	26%	9,700	797
% funding for special education	12%	10%	9,700	1,762
Smoking rates	20%	17%	170,789	5,436
Canadian high school dropout rate	13%	10%	9,700	-219

Benefits To Children - Results

- Higher future earnings
  - Detailed human capital growth model (Dickens, Sawhill, and Tebbs, 2006)
- Benefits from decreased smoking
- Savings on primary education
  - Grade retention
  - Special education
- Does not include
  - Effects on future generations
  - Delinquency effects
  - Other Health effects

Benefits To Parents

- Immediate wage gains
  - Working more (employment & hours)
- Future wage gains
  - More experience
- Does not include
  - Future wages gains via further education

Benefit-Cost Results

Summary of Costs & Benefits of Current Canadian Child Care	
	Net Present Values (NPV)
NPV hourly costs of formal child care	$5.08
NPV hourly cost savings on informal child care	-$2.31
NPV hourly net costs of formal child care	$2.77
NPV hourly net benefits mothers	$5.42
NPV hourly net benefits children	$1.62
NPV hourly net benefits from formal child care	$7.04
Benefit-cost ratio of formal child care	2.54
Note: Using 3% real discount rate, for 2005	

Impacts of Dr. Pascal's Proposals

Atkinson Foundation asked C4SE to do an economic analysis of the introduction of the early learning and care (ELC) system proposed by Dr. Pascal as of 2012-13

The analysis highlights the short and long-term effects on Ontario

Included effect of higher ELC wages and more education for some mothers

The report also showed the impact on Toronto using a methodology that can be replicated for other municipalities

Impacts of Proposals on Ontario

ELC Ratios and Multipliers For Ontario		
	ELC Operations	Capital
GDP (per dollar of expenditure)		
Direct GDP	0.89	0.52
Direct and indirect GDP	0.96	0.76
Total GDP multiplier	2.02	1.47
Ratio of total to direct GDP	2.27	2.83
Employment (per million dollars of expenditure)		
Direct Employment	13.59	7.86
Direct and indirect Employment	14.7	10.95
Total Employment multiplier	29.26	20.13
Ratio of total to direct Employment	2.15	2.56

Benefit-Cost Ontario

Long-term Costs and Benefits for Ontario	
NPV hourly costs of early learning	$5.52
NPV hourly costs savings on informal child care	-$1.57
NPV hourly net cost of early learning	$3.95
NPV hourly net benefits mothers/parents	$7.69
NPV hourly net benefits children	$1.88
NPV hourly net benefits from early learning	$9.56
Benefit-cost ratio of early learning	2.42

Long-term Benefit/Cost Ratios

Results of Fairholm (2009) and Fairholm and Davis (2010) of 2.4-2.5 similar to those found by others for universal programs.

Cleveland and Krashinsky (1998) estimated high quality child care in Canada would return over $2 for every dollar invested.

For the US, Karoly and Bigelow (2005) estimated that a universal child care program in California would yield benefits of $2-$4 for every dollar invested. Belfield (2005) estimated that every dollar invested provides future benefits worth $2.25 for the Louisiana child care system.

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Summary of Economic Impact of ELC

ELC GDP and job multipliers are large.

A dollar invested in the ELC sector has a larger impact on Canadian economy than:

- **a dollar used to support most of the other major sectors**
- **most government programs**
- **short-term impact from taxes via stimulus effects**

Large share of spending is recouped via higher govt revenues, but split fed / prov

Long-term societal benefits exceed costs by more than 2 to 1

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