

InterVISTAS

Film and Television Industry Review



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Table of Contents

Executive Summary	iii
List of Terms and Abbreviations	xii
1.0 Introduction	1
2.0 Overview of British Columbia Film and Television Industry	2
2.1 Size and Scope of the Film Industry	2
2.2 Tax Credits Available for Productions Filming in BC	5
2.2.1 Federal Tax Credits	5
2.2.2 British Columbia Tax Credits	5
2.2.3 Impact on Effective Wages	7
2.3 Review of Existing Film Industry Data	8
3.0 Economic Impact of the Film and Television Industry in British Columbia	12
3.1 What is Economic Impact?	12
3.2 Economic Impact Methodology	13
3.2.1 Analysis of the Payroll Data	14
3.2.2 Employment Survey	16
3.3 Direct Employment Generated by the BC Film and Television Production Industry	18
3.3.1 Economic Impact Estimates Based on 2004 Data	18
3.3.2 Economic Impact Estimates Adjusting for Production Levels	19
3.4 Multiplier Impacts	20
3.5 Tax Revenue Impacts	22
3.5.1 Personal Income Taxes	22
3.5.2 Consumption Taxes Paid by Individuals	23
3.5.3 Consumption Taxes Paid on Production Spending	23
3.5.4 Corporate Income Taxes	23
3.5.5 Total Provincial Tax Revenues Generated	24
4.0 Factors Affecting the Film and Television Production Industry – Overview	25
4.1 Literature Review	25
4.2 Interviews with Industry Stakeholders	27
4.3 Comparison of British Columbia with Other Jurisdictions	29
5.0 Statistical Analysis of Film and Television Industry Production Levels	36
5.1 Data	36
5.2 Preliminary Data Analysis	38
5.2.1 Visual Examination of the Correlation Between Production Spending and Tax Credits ..	38
5.2.2 General Trends in Production Spending – Pre and Post Tax Credit Implementation	42
5.2.3 Rank-Order Analysis	44
5.3 Econometric Analysis	55
5.3.1 Introduction to Regression Analysis	55
5.3.2 Econometric Analysis of Film/TV Industry Data	57
5.3.3 Summary of Additional Regression Analysis	62
5.4 Assessment of the Econometric Analysis	63

6.0	Costs, Benefits and Opportunity Costs of Tax Credits Offered to the Film and Television Industry in British Columbia	65
6.1	Fiscal Costs and Benefits: Taxes Paid and Tax Credits Received by the Film/TV Production Industry	65
6.2	Assessing the Opportunity Cost of the Tax Credit Program	67
6.2.1	Opportunity Cost Assessment Based on the Econometric Analysis	69
6.2.2	Limitations to the Opportunity Cost Assessment	71
6.2.3	Sensitivity Analysis	72
6.3	Multiple Account Evaluation: Consideration of Other Costs and Benefits	76
7.0	Summary and Conclusions	80
	Appendix A: Employment Survey	81
	Appendix B: Economic Impact Multipliers	84
	Appendix C: Details of the Tax Revenue Calculations.....	85
	Appendix D: Full Regression Results	89
	Appendix E: Summary Literature Review.....	94

Executive Summary

The Province of British Columbia commissioned Inter VISTAS Consulting Inc. to undertake a comprehensive economic study of the British Columbia film and television industry. Major components of the study included:

- Verification of data from the film/TV industry in British Columbia.
- Estimation of the economic impact of the film/TV industry in British Columbia.
- Examination of the factors affecting the film and television industry production spending.
- Cost benefit analysis of the film/TV production tax credit program.
- Assessment of the opportunity cost associated with the tax credits.

Details of the study analysis and findings are provided in the main report. The key findings are summarised below.

Assessment of Film Industry Data

Inter VISTAS examined the methodology behind two key statistics widely quoted by the film industry – film production expenditures and industry employment. One of the most widely quoted reports on the economic contribution of the film industry is the annual *Profile* report produced by Nordicity Group Ltd. on behalf of the Canadian Film and Television Production Association (CFTPA), Association des Producteurs de Films et de Télévision du Québec (APFTQ) and Canadian Heritage. The most recent version of the report is called *Profile 2005: An Economic Report on the Canadian Film and Television Industry*.

The data on production expenditures appears to be an accurate reflection of the spending and film production activity in BC and other parts of Canada. Figures on the employment supported by the film/TV industry in BC typically range from 30,000 to 42,000 depending on the level of production in each year. We note that roughly 62% of the quoted employment is indirect employment in industries supplying and servicing the film and television production industry rather than employment in the film/TV industry itself. The BC employment figures provided in the *Profile* report represent employment of BC residents only. It does not include employment associated with BC productions but located elsewhere (e.g., post-production work conducted in the U.S.), nor does it include temporarily “imported” labour (e.g., U.S. crews working in BC for the term of the production).

Economic Impact Estimates

An independent estimate of the economic impact of the film and television production industry was developed using a methodology that quantified the employment related to the film/TV production industry. The employment estimate was based on a combination of production payroll data, containing hours worked on individual productions, and an employment survey of film and television industry businesses.

The estimated employment, wage and GDP estimates are provided in **Table ES-1**, including multiplier impacts (indirect and induced).

Table ES-1: Economic Impact of the Film and Television Production Industry in British Columbia

Impact	Employment (FTEs)	Wages (\$ Million)	GDP (\$ Million)
Direct	13,200	\$841	\$1,274
Indirect	7,600	\$272	\$301
Induced	3,100	\$111	\$139
Total	23,900	\$1,224	\$1,714

Figures based on average production levels over the last five years.

Over 13,000 FTE jobs are generated within the film/TV industry itself. In addition, the film/TV industry is estimated to generate a further 10,700 FTEs of employment in other industries supplying goods and services to the film/TV industry, and through general spending in the economy by employees (known as indirect and induced impacts, respectively). The film/TV industry is relatively high wage, with an average full-time wage of \$63,740 per annum, nearly double the BC average.

The total employment estimate of 23,900 FTE jobs is considerably below those quoted elsewhere, which typically range from 30,000 to 42,000. The primary reason for this difference appears to be the application of different multipliers to estimate the multiplier impacts. The multipliers used in this study were supplied by BC Stats and are based on the most recent data available from Statistics Canada.

Factors Affecting Film/TV Production Spending: Econometric Analysis

As a basis for the development of the econometric analysis, an extensive literature review and data collection exercise was undertaken. In addition, interviews were conducted with film and television stakeholders in British Columbia and the United States. Findings from the literature review and stakeholder interviews can be found in Chapter 4.

The econometric analysis used data relating to film/TV production from nine provinces and 11 U.S. states over a period from 1992 to 2004 (a total of 201 observations). The findings from the econometric analysis were:

- Econometric evidence generally supports the hypothesis that tax credits do have an impact on production spending decisions. The results from our analysis finds a weak but positive relationship between tax credits and production spending levels.
- Likewise, we find a significant relationship between production spending and effective labour costs (labour rates after adjusting for exchange rate and tax credits), such that, all else being equal, productions will move to jurisdictions with lower effective wages.
- The analysis also indicated that there was a high sensitivity to effective labour costs, such that a 1% increase in effective labour costs reduces overall production by 1.2% (equally, a 1% reduction in labour costs increases overall production by 1.2%). The analysis would appear to

support the argument that film/TV production is mobile and will shift from one location to another on the basis of small differences in production costs.

- Our analysis was unable to conclusively determine whether tax credits have any impact above and beyond the dollar savings they provide (In other words, whether tax credits act as a marketing tool, which can signal that a jurisdiction is film industry friendly, as some stakeholders indicated).
- The econometric analysis did not reveal any statistically significant impact on overall production levels resulting from the digital animation or regional tax credits.
- We did find statistical evidence that production in BC and Canada is significantly impacted by exchange rate movements and that the recent appreciation in the Canadian dollar did negatively impact on production in Canada, including BC.

Using the findings from the econometric analysis, InterVISTAS estimated the impact on production spending levels of eliminating the BC tax credits. Removing the provincial tax credits increases the effective wage rate by 36% on domestic productions and by 12% on foreign (service) productions.¹ On the basis that BC labour costs account for approximately 50% of production spending in BC, this is equivalent to a 9% increase in BC production costs, on average. Based on the econometric analysis, this increase in production costs could result in a 17% decline in production spending in BC, worth \$192 million.²

Fiscal Costs and Benefits

The primary focus of the cost benefit analysis of the film/TV production tax credits was on tax revenues to the provincial government. This analysis made use of the economic impact and econometric analysis described above, as well as other relevant sources.

The fiscal cost benefit analysis examined the taxes generated by film/TV productions in BC (the benefit) versus the tax credits provided to film/TV productions by the provincial government (the cost). The taxes generated by the film/TV industry are summarised in **Table ES-2**. In total, the film/TV industry generates \$121 million in tax revenues for the provincial government

Table ES-2: Total Provincial Tax Revenues Generated by the BC Film/Television Industry

Tax Component	Amount Per Annum (\$ Million)
Personal income taxes	\$53.5 million
Consumption taxes on personal spending	\$22.5 million
Consumption taxes on production spending	\$36.3 million
Corporate income tax	\$8.7 million
Total tax revenues	\$121.0 million

¹ These figures are based on the tax credits prior to the January 2005 increase.

² Based on a five year average of production spending of \$1,150.9 million.

The cost benefit analysis based on provincial tax revenues is summarised in **Table ES-3**. The film/TV industry in BC receives a total of \$65.7 million in tax credits and generates a total of \$121.0 million in tax revenues for the provincial government, resulting in a net tax revenue benefit for the government of \$55.3 million. Both domestic and foreign productions are estimated to generate tax revenues in excess of tax credits received.

Table ES-3: Cost Benefit Assessment of Film/TV Industry Provincial Tax Revenues

Production Type	Total Tax Credits Provided*	Total Production Spending*	Taxes Generated	Net Tax Revenue Benefit
Domestic	\$24.4 million	\$257.4 million	\$30.4 million	+\$6.0 million
Foreign	\$41.3 million	\$893.5 million	\$90.6 million	+\$49.3 million
Total	\$65.7 million	1,150.9 million	\$121.0 million	+\$55.3 million

* Five year average

Opportunity Cost Assessment

To assess whether there is an opportunity cost to providing tax credits to the film and television production industry, the study examined the extent to which tax credits are necessary to attract film/TV production to BC. Consider, for example, the extreme situation where film/TV production is completely insensitive to the tax credits, so that removing the tax credits has no impact on the level of production. In this situation, there is an opportunity cost of \$65.7 million associated with the tax credits: the provincial government is spending \$65.7 million in tax credits to attract \$121.0 million in tax revenues that it would have received even without the tax credit. In this hypothetical case, this \$65.7 million could have been utilised by the provincial government for other purposes.

It is also worth considering the alternative extreme where, by removing the tax credits, all film/TV production ceases in BC. In this situation, our analysis indicates that there is a net revenue loss to the provincial government of \$55.3 million: by removing tax credits costing \$65.7 million, the government forgoes \$121.0 million in tax revenues. In this hypothetical case, eliminating the tax credits would be detrimental to total tax revenues.³

The reality is likely to lie somewhere between these two extremes. The issue of assessing opportunity cost then becomes: how much film/TV production and tax revenues would be lost by removing the tax credits?

The econometric analysis indicated that approximately \$192 million in production spending could be lost by eliminating the tax credits. With this lost production spending, an estimated \$20.8 million

³ The overall loss of tax revenue may be smaller than \$121.0 million, as some of those employed in the film/TV industry may find employment in other sectors of economy and so continue to pay taxes (albeit at a different rate than if employed in the film/TV industry). However, to fully assess the extent to which this would occur is beyond the scope of this study. Therefore, in this analysis we have assumed that there would be no displacement of employment to other sectors. In effect, the analysis represents the maximum potential tax revenue loss associated with the elimination of the tax credits.

in provincial tax revenues would also be lost. However, by removing the tax credits, the provincial government would save \$65.7 million currently provided in tax credits, resulting in a net tax revenue gain of \$65.7 million - \$20.8 million = \$44.9 million. Therefore, there is an opportunity cost associated with the tax credits of approximately \$45 million: by providing the tax credits, the provincial government forgoes \$45 million in net tax revenues.

Furthermore, our analysis indicates that, so long as total film/TV production spending in BC does not decline by more than 53%, the provincial government will achieve a net tax revenue gain from eliminating the tax credits. However, if the decline in production exceeds 53%, there will be a net loss of tax revenues resulting from eliminating the tax credit.

Summary and Conclusions

The conclusions from this economic review of the BC film and television industry and the associated provincial tax credits are:

- The film/TV industry is estimated to generate employment of over 13,000 FTE jobs. Including spin-off effects into other industries and the general economy, the industry generates nearly 24,000 FTEs of employment. The industry is relatively high wage, with an average full-time income of \$63,740 per annum, nearly double the BC average.
- Econometric analysis supports the argument that film/TV production is highly sensitive to labour costs (including the tax credit). Broadly speaking, each 1% increase in effective BC labour costs reduces production spending by 1.2%.
- Based on the econometric analysis, eliminating the tax credit would result in an estimated 15% decline in production spending, worth \$192 million.
- The film/TV industry in BC is estimated to generate provincial tax revenues in excess of the tax credits provided by the provincial government by approximately \$55 million.
- However, there is an estimate opportunity cost associated with the tax credits of \$45 million. In other words, based on the econometric analysis, there would be a net tax revenue gain of \$45 million in eliminating the tax credits. Our analysis also indicated that, so long as total film/TV production spending in BC does not decline by more than 53%, the provincial government will achieve a net tax revenue gain from eliminating the tax credits. However, if the decline in production exceeds 53%, there will be a net loss of tax revenues resulting from eliminating the tax credit.
- It should be kept in mind that our analysis assumes that the response to tax credit elimination would be a rational, economic response similar to past behaviour. However, the data used in this analysis did not contain an instance of a jurisdiction lowering or eliminating its film/TV production tax credit. It is important to consider the possibility that there may be a strategic retaliatory response to the elimination of the tax credits by the BC government. The industry response from decision centres in Los Angeles, New York and elsewhere may be to drastically cut production in BC in order to “punish” the province. This action would serve as a warning to other jurisdictions about the implications of removing film/TV production tax credits.

- The focus of our analysis has been on the quantifiable economic and fiscal aspects of the film/TV industry. This does not necessarily represent the full range of costs and benefits associated with the film/TV industry that should be considered when assessing the tax credits. Many of these costs and benefits cannot be expressed in monetary terms; therefore we have conducted a Multiple Account Evaluation of the industry and the tax credits, which is summarised in **Table ES-4** on the following pages.

Table ES-4: Multiple Accounts Evaluation of Film/TV Production Industry and the Tax Credits in British Columbia

Account	Benefits	Costs
Impact of the Tax Credit on Production Levels	Based on the econometric analysis, the tax credits attract an additional \$192 million in film/TV production.	-
Provincial Tax Revenues	<p>The film and television industry generates an estimated \$121 million in tax revenues for the provincial government (based on average production levels over the last five years).</p> <p>Our analysis indicates that the film industry is a net tax contributor to the provincial government, contributing over \$55 million after tax credits.</p>	Prior to the January 2005 increase, the tax credits payments cost an average of \$66 million per annum to the provincial government.
Tax Revenue Opportunity Cost	-	Based on the econometric analysis, there is an estimated opportunity cost in providing the tax credits of \$45 million. This suggests that the provincial government could gain an additional \$45 million in net revenues by eliminating the tax credits.
Role of Tax Credits in Developing the Film/TV Industry	Tax credits are often used by government as a temporary measure to enable industries (or specific businesses) to expand and develop, generally with the expectation that once the industry has developed, it will generate tax revenues that match or exceed the tax credits provided.	<p>Tax credits have been provided by the BC government for approximately seven years, during which time the industry has grown considerably (we note that the industry exhibited strong growth before the introduction of the credits). At issue is whether the industry is now mature and has outgrown the need for tax credits to continue developing.</p> <p>If tax credits are indeed necessary for the BC film/TV industry's continued long-term survival, this brings into question whether the industry is truly sustainable.</p>

Account	Benefits	Costs
Tax Credit Competition	<p>The tax credits may enable BC to better compete for film/TV production work with an increasing number of U.S. states now offering tax credits, as well as jurisdictions which can offer lower labour costs (e.g., Romania, Czech Republic).</p> <p>The tax credits can buffer the adjustment to a stronger Canadian dollar.</p>	<p>The effectiveness of the BC tax credit program appears to be vulnerable to changes enacted in other jurisdictions.</p> <p>In addition, the impact of tax credits can be offset by outside factors, most notably exchange rates.</p>
Economic Impact	<p>The BC film/TV industry is estimated to generate approximately 13,200 direct FTE jobs. Including multiplier impacts (indirect and induced), the industry generates 23,900 FTE jobs.</p>	-
Economic Diversification	<p>The film/TV production contributes to the economic diversification of the BC economy. The industry is relatively high-tech and high-skilled, and is one that has demonstrated strong growth, not just in BC but globally.</p>	<p>The majority of the production work is sourced from the United States, a country that BC is already heavily dependent on for the export of BC goods and services.</p>
Employment Opportunities	<p>The film/TV production industry involves high skilled, high wage employment. The average annual salary earned in a full-time position is \$63,740, nearly double the BC average wage.</p>	-
Industry Synergies and Cluster Development	<p>The film/TV production industry is increasingly making use of digital and computer technologies, some of which have developed in BC. There may be synergies with related industries, such as computer gaming and internet/e-commerce, which support development of a cluster of highly skilled and highly creative technology-driven industries</p>	-

Account	Benefits	Costs
Tourism Impacts	The film/TV industry is a highly visible industry that attracts considerable media attention. BC's participation in this industry may enable it to increase its visibility and desirability in the global market, with benefits for business and tourism development.	In considering the role of tax credits in exploiting this benefit, it is unclear whether this impact is more or less effective than direct tourism marketing.
Cultural Benefits	The presence of a major film/TV production industry in the province may enable and support the development and retention of local creative talent.	-

List of Terms and Abbreviations

Above the Line	Portion of a production's budget spent on major creative elements and personnel – film rights, script development, writers, producers, directors, principle members of cast, etc.
APFTQ	Association de Producteurs de Films et de Télévision du Québec.
BC	British Columbia.
BCCFU	British Columbia and Yukon Council of Film Unions.
BC Stats	Central statistical agency of the Province of British Columbia.
Below the line	Portion of a production's budget spent on technical items and labour – crew, extras, sets, cameras, electrical, transportation, film stock, etc.
CAVCO	Canadian Audio-Visual Certification Office.
CBA	Cost-Benefit Analysis, also known as Benefit-Cost Analysis (BCA).
CFTPA	Canadian Film and Television Production Association.
CFVPTC	Canadian Film or Video Production Tax Credit.
CPP	Canada Pension Plan.
CRTC	Canadian Radio-television and Telecommunications Commission.
DAVE	Digital Animation and Visual Effects (DAVE) tax credit, provided by the BC provincial government.
Direct employment	Employment that can be directly attributed to a particular business, activity or industry.
EI	Employment Insurance.
FTE	Full-Time Equivalent (in reference to jobs), also known as a Person Year.
FIBC	Film Incentive British Columbia. Labour based tax credit provided by the BC government to BC owned and controlled production companies.
GDP	Gross Domestic Product.
GST	Goods and Services Tax.
IATSE	International Alliance of Theatrical Stage Employees, Moving Picture Technicians, Artists and Allied Crafts of the United States, its Territories and Canada.
Indirect Employment	Employment in down-stream industries that result from the presence of a particular business, activity or industry. Indirect employment is generally generated in industries that supply or provide services the direct business, activity or industry.

Induced Employment	Employment generated by personal expenditures made by individuals employed directly or indirectly by the particular business, activity or industry.
MPPIA (BC)	Motion Picture Production Industry Association of British Columbia.
<i>Profile</i> report	Annual economic report on the Canadian film and television production industry in Canada produced by Nordicity Group Ltd. on behalf of the Canadian Film and Television Production Association (CFTPA), Association des Producteurs de Films et de Télévision du Québec (APFTQ) and Canadian Heritage.
PST	Provincial Sales Tax.
PSTC	Production Service Tax Credit. Labour based tax credit provided to foreign and out-of-province film/TV productions.
SAG	Screen Actors Guild.
UBCP	The Union of BC Performers.

1.0 Introduction

The Province of British Columbia has commissioned Inter VISTAS Consulting Inc. to undertake a comprehensive economic study of the BC film and television industry. This study involved the following major components:

- **Review of Existing Data and Methodology.** An examination of the methodology behind two key figures widely quoted by the film/TV industry: film/TV production expenditures and industry employment. This review is provided in Chapter 2, along with an overview of the BC film and television industry and the tax credits available to the industry in BC.
- **Estimating the Economic Impact of the BC Film/TV Industry.** An independent estimate of the economic impact of the film and television production industry was developed, using a methodology that quantified the employment related to the industry. The employment estimate was based on a combination of production payroll data, containing hours worked on individual productions, and an employment survey of film and television industry businesses. The methodology and findings are provided in Chapter 3.
- **Examination of the Factors Affecting the Film and Television Industry.** The aim of this component of the study was to develop an understanding and quantitative assessment of the factors affecting the film and television industry, including tax credits. This component involved a number of elements:
 1. A literature review and general data collection.
 2. Interviews with industry stakeholders in BC and the United States.
 3. Statistical and econometric analysis of the data to assess the sensitivity of film production to various factors identified in the literature review and stakeholder interviews.

The findings from the literature review and stakeholder interviews are provided in Chapter 4, along with a comparison of the factors affecting the BC film/TV industry with those in other jurisdictions in North America. The statistical and econometric analysis is summarised in Chapter 5.

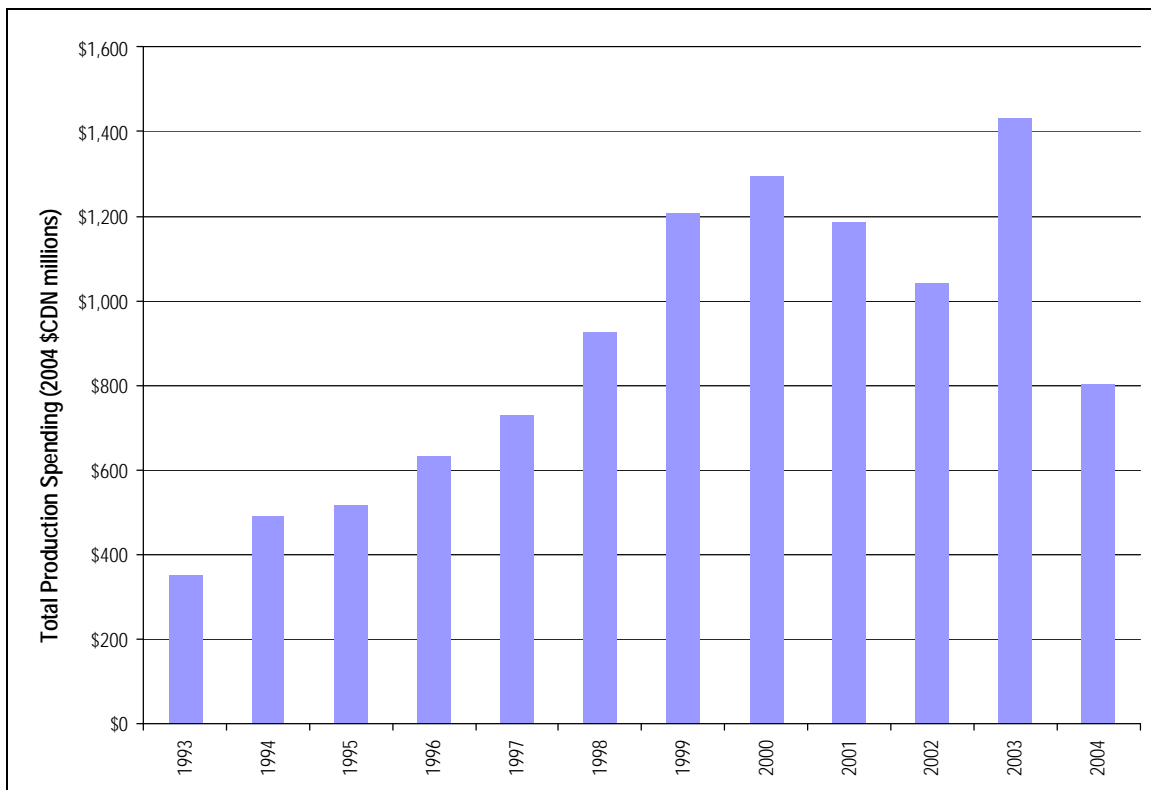
- **Cost Benefit Analysis of the Tax Credit Program.** Building on the analysis summarised in Chapters 3-5, a cost benefit analysis of the industry was conducted, which is summarised in Chapter 6. As not all of the costs and benefits associated with the film/TV industry can be expressed in monetary terms, a Multiple Account Evaluation was also conducted, also provided in Chapter 6.
- **Assessment of the Opportunity Cost Associated with the Tax Credits.** To assess whether there is an opportunity cost to providing tax credits to the film and television production industry, we have analysed the extent to which tax credits are necessary to attract film/TV production to BC. This analysis is summarised in Chapter 6, along with various sensitivity tests to determine the sensitivity of the findings to changes in various key parameters.

2.0 Overview of British Columbia Film and Television Industry

2.1 Size and Scope of the Film Industry

The current BC film and television industry is large in scope, and has exhibited tremendous growth over the past decade. **Figure 2-1** below displays total production spending in the province from 1993 to 2004. Over this period, total production spending in the province increased 129%, or 12% per annum. More recently, from 2000 to 2004, average annual production spending in the province has averaged approximately \$1.15 billion per annum (in 2004 dollars).

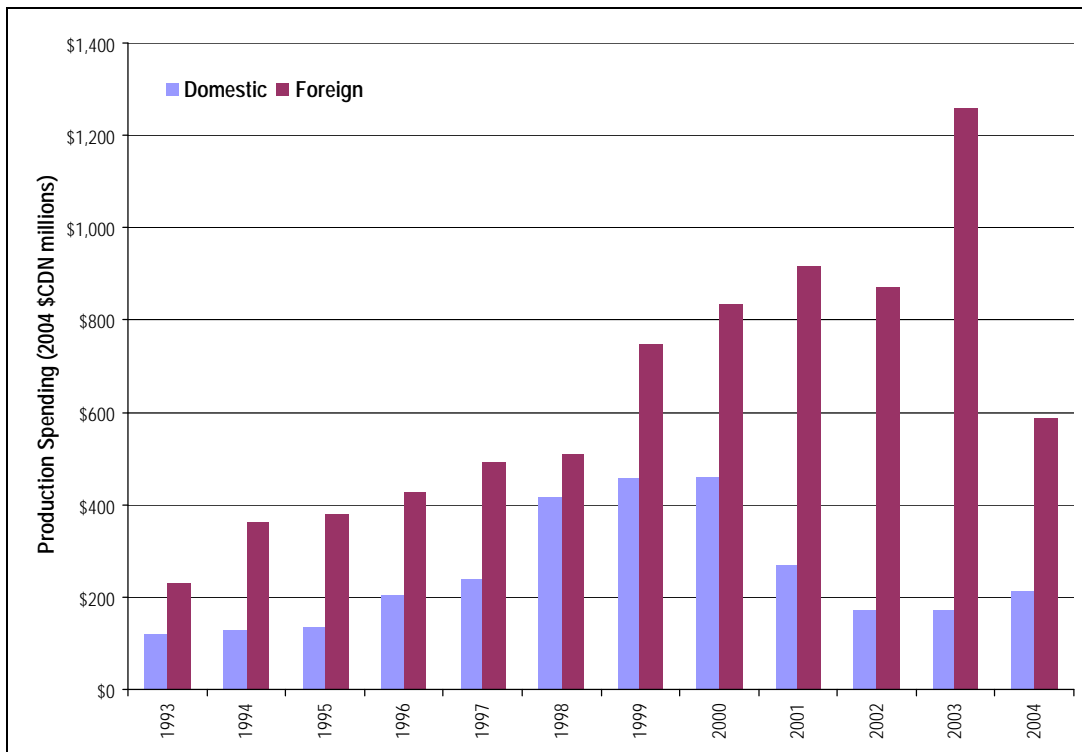
Figure 2-1: BC Film Production Spending, 1993-2004 (2004 \$CDN)



Source: BC Film Commission

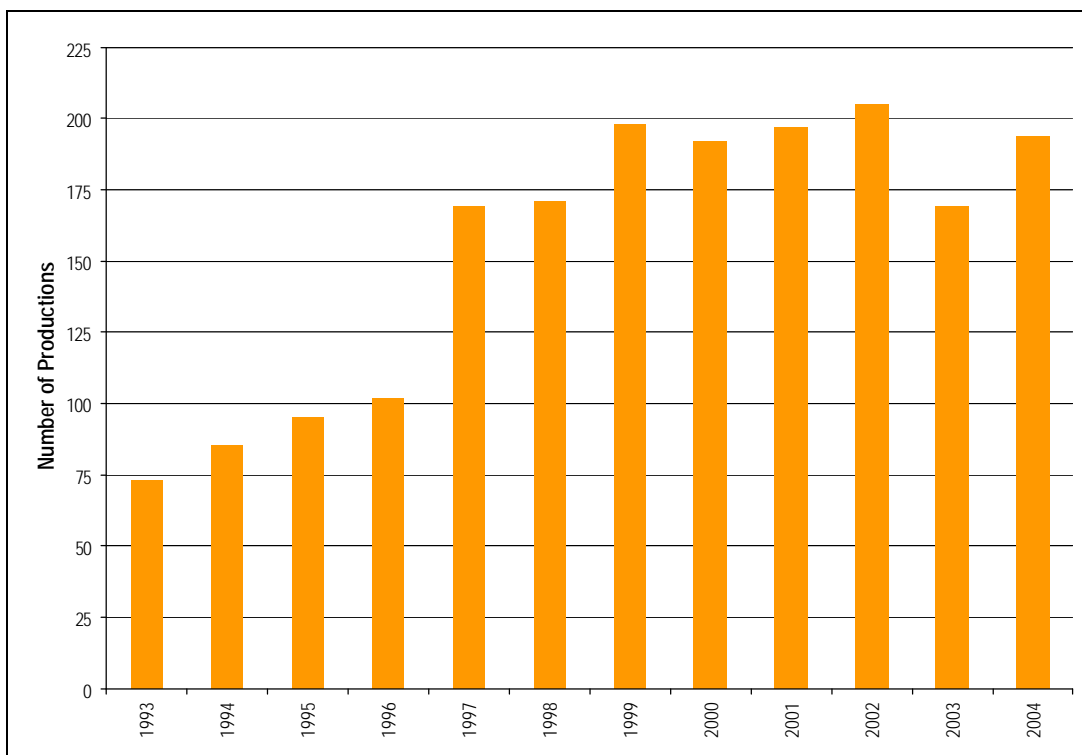
Figure 2-2 breaks down total BC production spending into the domestic (i.e., Canadian) and foreign components for the period of 1993 to 2004. Over the past five years, foreign (service) spending has accounted for, on average, 78% of total production spending in the province. **Figure 2-3** displays the number of productions shot in BC each year from 1993 to 2004. Over this period, there has been a 166% increase in the annual number of productions filmed in the province.

Figure 2-2: BC Film Production Spending Breakdown, 1993-2004



Source: BC Film Commission

Figure 2-3: Number of Productions Shot in BC, 1993-2004



Source: BC Film Commission

A wide range of productions are shot in BC, including feature films, television series, television movies, mini-series, pilots, documentaries, and animation. **Figure 2-4** below breaks down the total number of 2004 productions into the production type and domestic/foreign. In 2004, television series accounted for 42% of total production spending in the province, while feature films accounted for 30%.

Figure 2-4: BC Productions by Type in 2004

Production Type	Domestic		Foreign		Total	
	Number	Spending (\$ millions)	Number	Spending (\$ millions)	Number	Spending (\$ millions)
<i>Feature films</i>	30	\$ 49.8	16	\$ 191.6	46	\$ 241.3
<i>Television Series</i>	15	\$ 100.3	21	\$ 235.8	36	\$ 336.1
<i>TV movies, miniseries, pilots, documentary</i>	65	\$ 48.8	31	\$ 137.5	96	\$ 186.4
<i>Animation</i>	6	\$ 15.0	10	\$ 22.5	16	\$ 137.4
Total	116	\$ 213.9	78	\$ 587.3	194	\$ 801.2

Source: BC Film Commission. Figures may not sum to totals due to rounding.

Year to date figures provided by the BC Film Commission indicate that production levels in 2005 are significantly higher than in 2004. Production statistics up to September 30, 2005 show that the number of productions was 41% higher than the same period in 2004 (from 97 productions YTD 2004 to 137 productions YTD 2005). The number of feature films in production was up 28% over the same period in 2004, while the number of TV productions was up 20%.⁴ At the time of writing, figures on production spending in 2005 were not available.

⁴ The number of documentaries and animations also increased considerably, bringing the overall increase to 41%.

2.2 Tax Credits Available for Productions Filming in BC

Productions filming in the province of BC can apply to receive both federal and provincial film production tax credits. These are discussed in the following sections.

2.2.1 Federal Tax Credits

Labour-based tax credits are provided by the federal government to nearly all film/TV productions shot in Canada. Different tax credits are provided for domestic (i.e., Canadian) and foreign productions.⁵ These are summarised below.

Domestic Productions

The federal government offers the Canadian Federal Film or Video Production Tax Credit (CFVPTC), which is available to Canadian-owned and controlled productions. This tax credit can be applied to 25% of specified labour expenditures capped at 60% of total production expenditures.

Foreign (Service) Productions

The federal government provides the federal Production Service Tax Credit (PSTC) to foreign productions.⁶ The tax credit can be applied to 16% of “qualified Canadian labour expenditures” (the credit was increased from 11% to 16% in 2003).

2.2.2 British Columbia Tax Credits

The BC government provides tax credits for film/TV production in BC, which are in addition to those provided by the federal government. The BC tax credits are described below.

Film Incentive BC (FIBC) Tax Credit

In April 1998, the Film Incentive BC (FIBC) program was introduced in BC. This program is for production corporations that are BC-owned and controlled and that have qualifying levels of Canadian content. FIBC is a refundable corporate income tax credit that allows a certain percentage of labour costs incurred during production to be claimed. The credits reduce the firm's tax payable, and any surplus is paid out to the firm. If the firm receives an eligibility certificate from BC Film, they are eligible for the tax credits summarised in **Figure 2-5**.

⁵ Foreign productions are generally referred to as service productions. Most of this foreign production is sourced from the U.S., although there are significant volumes of production sourced from the U.K., Germany and elsewhere.

⁶ This credit is available to Canadian productions that do not meet all the requirements for the domestic tax credit.

Figure 2-5: Film Incentive BC (FIBC) Summary

Tax Credit	Pre-Jan 2005	Post-Jan 2005	Description
<i>Basic</i>	20%	30%	Qualified BC labour expenditures capped at 48% of total production expenditures.
<i>Regional</i>	12.5%	12.5%	This credit is in addition to the basic credit and is paid on qualified BC labour expenditures prorated by the number of days of principal shooting in BC outside of the Vancouver area.
<i>Training</i>	30%	30%	Amount paid to BC-based residents registered in approved training programs (capped at 3% of qualified BC labour expenditures).
<i>Digital animation or visual effects (DAVE)</i>	15%	15%	This credit is in addition to the basic credit and is paid on BC labour expenditures directly related to digital animation or visual effects.

The FIBC is available only to BC-owned and controlled production corporations. However, there are very few Canadian productions shot in BC not using this tax credit. The vast majority (around 90%) of Canadian productions shot in BC access the FIBC rather than the PSTC tax credit.⁷

British Columbia Production Services Tax Credit (PSTC)

Shortly after the FIBC was introduced, the province started offering the Production Services Tax Credit (PSTC) to non-BC productions shot in BC (introduced in June 1998). Like the FIBC, the PSTC is a refundable corporate income tax credit, which can be claimed on a certain percentage of labour expenditures. The corporation must meet several general eligibility requirements in order to access the credit, including:

- minimum budget levels on production spending;
- the corporation must have a permanent establishment in the province of BC;
- the corporation must meet certain copyright requirements.

Figure 2-6 outlines the tax credits available through the PSTC.

⁷ Based on a conversation with Robert Wong, Manager, Tax Credit Program at BC Film. One way the FIBC can be accessed by Canadian productions is through inter-provincial co-production status.

Figure 2-6: BC Production Services Tax Credit (PSTC) Summary

Tax Credit	Pre-Jan 2005	Post-Jan 2005	Description
<i>Basic</i>	11%	18%	Qualified BC labour expenditures.
<i>Regional</i>	6%	6%	This credit is in addition to the basic credit and is paid on qualified BC labour expenditures prorated by the number of days of principal shooting in BC outside of the Vancouver area to the total days.
<i>Digital animation or visual effects (DAVE)</i>	15%	15%	This credit is in addition to the basic credit and is paid on BC labour expenditures directly related to digital animation or visual effects.

2.2.3 Impact on Effective Wages

Firms producing film/television in BC have the opportunity to take advantage of both the federal and provincial tax credits simultaneously. These tax credits have the effect of decreasing the effective wages paid out by production companies.

For example, combined with the federal tax credits, the pre-2005 provincial tax credits discount the wage rates as follows:

- Domestic: $\text{WageRate} \times (1 - \underset{\text{Fed. Credit}}{25\%} - \underset{\text{Prov. Credit}}{20\%}) = \text{Wage Rate} \times 55\%$
- Foreign: $\text{WageRate} \times (1 - \underset{\text{Fed. Credit}}{16\%}) \times (1 - \underset{\text{Prov. Credit}}{11\%}) = \text{Wage Rate} \times 75\%$

The application of the federal and provincial tax credits differs for domestic and foreign productions. The credits on domestic productions are additive, with both credits applying to the full wage rate, while the tax credits on foreign productions are multiplicative so that the federal tax credit is applied to wage rate net of the provincial tax credit. Prior to the 2005 increase, the combined federal and provincial tax credits reduced the effective wage rate by 45% on domestic productions and 25% on foreign (service) productions.⁸

The effective wage is even lower when the January 2005 tax credit increases are accounted for:

- Domestic: $\text{WageRate} \times (1 - \underset{\text{Fed. Credit}}{25\%} - \underset{\text{Prov. Credit}}{30\%}) = \text{Wage Rate} \times 45\%$
- Foreign: $\text{WageRate} \times (1 - \underset{\text{Fed. Credit}}{16\%}) \times (1 - \underset{\text{Prov. Credit}}{18\%}) = \text{Wage Rate} \times 69\%$

⁸ This does not include the impact of the regional and DAVE tax credits which may discount wage rates even further for certain applicable productions. In addition, the tax credits on domestic productions (CFVPTC and FIBC) are subject to a cap such that labour expenses exceeding certain percentage of total production costs are not eligible for the tax credit. This may lower the effective discount on wage costs for productions exceeding the cap.

Therefore, the current tax credits reduce the effective wage rate by 55% on domestic productions and 31% on foreign (service) productions.

2.3 Review of Existing Film Industry Data

One of the most widely quoted reports on the economic contribution of the film industry is the annual *Profile* report produced by Nordicity Group Ltd. on behalf of the Canadian Film and Television Production Association (CFTPA), Association des Producteurs de Films et de Télévision du Québec (APFTQ) and Canadian Heritage.⁹ This report provides estimates of the total value of film and television production in Canada and the number of jobs generated, with breakdowns by province.

We have investigated the methodology used to estimate the numbers produced in the *Profile* report:

- **Film expenditures.** The expenditure figures are based on data from CAVCO, CRTC, CBC, Department of Canadian Heritage and provincial film commissions. The expenditure figures are broken down by province and production type – CAVCO, non-CAVCO, foreign-sourced, broadcaster in-house.¹⁰ For British Columbia, foreign-sourced productions made up 80% of total film and television production in 2003/04, as shown in **Figure 2-7**, reproduced from *Profile 2005*. By comparison, foreign production accounts for 16% and 19% of total production in Québec and Ontario respectively. CFTPA has confirmed to us that the production volume figures for foreign-sourced productions only include dollars spent in British Columbia, and does not include spending elsewhere (i.e., the U.S.) on the production. Figures include both above and below-the-line spending, but generally exclude items such as the incomes of U.S. stars, producers, directors, etc. on location in BC (the BC Film Commission also provides figures on the total spending associated with productions in BC as well the proportion spent in BC).

⁹ At the time of writing, the most recent version of the report was *Profile 2005: An Economic Report on the Canadian Film and Television Industry*.

¹⁰ CAVCO, the Canadian Audio-Visual Certification Office, co-administers the Canadian Film or Video Production Tax Credit (CFVPTC) with the Canada Revenue Agency. The objective of the CFVPTC is to encourage Canadian programming and to develop an active domestic production sector. The credit is valued at 25% of qualified labour expenditures of an eligible production. CAVCO-excluded productions (i.e., non-CAVCO productions) include: news and current events programming, talk shows, game shows, sporting events, awards shows, reality TV, pornography, advertising and documentaries.

Figure 2-7: Source of Film Production and Total Value of Production in 2003/04

Province	CAVCO	Non-CAVCO	Foreign-Sourced	Broadcaster In-house	Total (\$ million)
British Columbia	12%	2%	80%	6%	\$ 1542
Ontario	42%	6%	19%	33%	\$ 1758
Québec	55%	8%	16%	20%	\$ 1206
Nova Scotia	40%	6%	38%	17%	\$ 135
Manitoba	11%	2%	73%	15%	\$ 109
Alberta	33%	5%	0%	62%	\$ 99
Saskatchewan	61%	9%	0%	30%	\$ 42
New Brunswick	45%	7%	0%	49%	\$ 17
Newfoundland	31%	5%	0%	65%	\$ 8
PEI	32%	5%	38%	26%	\$ 5

Source: Profile 2005: An Economic Report on the Canadian Film and Television Industry.

- Employment.** The 2005 *Profile* estimates that Film and Television production generated 51,800 full-time equivalent (FTE) direct jobs in Canada in 2003/04. In addition, an estimated 82,900 indirect FTE jobs were generated for a total of 134,700 direct and indirect FTE jobs in Canada.¹¹ In British Columbia, the *Profile* reports that 42,200 direct and indirect FTE jobs were generated in 2003/04. In previous years, this estimate has ranged from 30,000-35,000 FTE jobs.

Although the *Profile* does not provide an estimate of direct jobs in BC, by applying the national multiplier we can estimate that 16,200 direct FTE jobs were generated by film and television production in BC in 2003/04. Applying the same approach, the direct job figure for previous years is estimated to be in the range of 11,500 to 13,500 FTEs.

Discussions with CFTPA's Vice President of Business Affairs, as well as the limited methodology information provided in the *Profile*, indicate that direct employment was estimated by dividing total film/TV labour expenditures by average industry income. Indirect employment was then estimated by applying a Statistics Canada multiplier to the direct employment estimates.

Direct Employment. Although the *Profile* provides limited information on the methodology, a very similar approach was used by the Nordicity Group (authors of the *Profile* report) in a study for the Nova Scotia Film Industry Taskforce.¹² This study provided figures on the total value of film and television production in Nova Scotia based on data from the Nova Scotia Film

¹¹ Induced impacts are not estimated.

¹² *Nova Scotia Film, Television and New Media Industry: Impact Analysis and Long-Term Strategy*, Nordicity Group Ltd. In association with Duopoly Inc., July 2004.

Development Corporation (NSFDC) and the CFTPA. To estimate employment, the authors first estimated the proportion of production costs spent on Nova Scotia-based labour (as opposed to equipment or labour brought in from other parts of the continent). As hard data was not available, this proportion was based on broad information provided by the NSFDC. For example, 40% of production costs in domestic productions were assumed to be spent on Nova Scotia based labour; 20% of production costs in foreign-sourced productions were assumed to be spent on Nova Scotia based labour.

Direct employment was then estimated by dividing the estimated total spending on Nova Scotia labour by average industry wages. The average industry wage was based on full-time employment income for workers in the *Motion Picture and Sound Recording Industries* reported by Statistics Canada. This average wage figure was adjusted to remove the effect of sound recording workers (who generally had higher incomes than the average) and also to include employee health and union benefits, CPP and EI.

In summary, the estimation of direct employment is inferred through the application of spend rates (some of which are estimated rather than observed) and average wage information. The BC employment figures provided in the *Profile* report represents employment of BC residents only. It does not include employment associated with BC productions but located elsewhere (e.g., post-production work conducted in the U.S.), nor does it include temporarily "imported" labour (e.g., U.S. crews working in BC for the term of the production).

Indirect Employment. Approximately 62% of the employment reported as generated by the film and television production industry in the *Profile* is indirect employment. This is employment in businesses and industries outside the film/TV industry that supply and service the film/TV industry. For example, a firm that provides cleaning services to a production may be considered part of the indirect impact. For the *Profile*, the indirect impact was estimated using Statistics Canada Input-Output multipliers which indicate that each direct full-time job generates 1.6 indirect full time jobs. While the multipliers have been correctly applied, we note they have not been updated since the *Profile* report was initiated. More recent multipliers are available from Statistics Canada and indicate that indirect impacts may be lower than was the case with older multipliers.¹³ In addition, we note that there are a number of general issues associated with the application of multipliers. These are particularly pertinent when so much of the reported employment is based on indirect effects:

- **Misapplication of multipliers.** Failure to correctly differentiate between direct and indirect impacts can result in overestimation of the economic impact. For example, a firm providing catering services to film productions may be included in the direct impact by the consultant conducting the study. However, the Input-Output model from which the indirect multipliers are taken may categorise this employment as indirect. In this situation, application of the indirect multiplier results in a double counting of the employment.

¹³ The same multipliers have been used for employment estimates going back to 1994/95. However, multipliers provided by BC Stats and Statistics Canada indicate that the multiplier impacts associated with the industry have declined, due to changes in classification, improved data collection and analysis, and the maturing of the industry.

- **Assumes linear effects or constant returns to scale.** The Input-Output model upon which the multipliers are based does not allow for economies (or diseconomies) of scale, so inputs are always consumed in the same proportion regardless of the scale of production. This may be unrealistic considering economies of scale are a factor in many industries. These models also assume there are no productivity gains in the economy. Likewise, increases and decreases in expenditure show the same proportional impacts which may not be the case in reality.
- **Supply is assumed to be perfectly elastic.** Any increase in demand for goods and services leads to the producing industries increasing their output by an equal amount to satisfy that demand. It is assumed that the industries have no difficulty in obtaining intermediate inputs such as raw materials, labour and imports. If a shortage of resources did occur, this could lead to inflationary pressures, substitution effects or changes in imports, which would reduce the overall economic impact.

In short, the indirect impacts are the outcome of the Statistics Canada Input-Output model (albeit a very detailed and well-established model) which is based on a range of assumptions that may not apply in every instance. If some of these assumptions do not apply, then the indirect impacts could be quite different from those estimated by the Input-Output model.

3.0 Economic Impact of the Film and Television Industry in British Columbia

One of the requirements of this study was to assess the economic contribution of the film and television industry to the province of British Columbia. In order to fulfil this requirement, an economic impact study of the film and television industry in BC was conducted. Section 2.2 reviewed previous estimates of the economic impact (specifically employment). This economic impact study provides verification of these estimates using an alternative methodology.

This chapter outlines the methodology and findings of the economic impact study conducted by InterVISTAS.

3.1 What is Economic Impact?

Economic impact is a measure of the spending and employment associated with a business, a sector of the economy, a specific project (such as the construction of a new facility), or a change in government policy or regulation. Economic impact can be measured in various ways. Two of the most popular ways to assess economic impact are in terms of employment generated and in terms of the dollar value of output produced. These measures attempt to assess the gross level of activity or expenditure. As such, they are not “net” measures that weigh benefits against costs, but nevertheless these measures can be useful in developing an appreciation of businesses, projects, investments and economic sectors.

This study measures the economic impact of the BC film and television industry in the following ways:

- Employment;
- Wages;
- Gross Domestic Product (Value-Added);
- Taxes.

In addition, three types of economic impact are estimated – direct, indirect and induced:

Direct economic impact is employment or value-added that can be directly attributed to the production of films and television projects in British Columbia. This includes the creative, technical and managerial aspects of film/TV production.

Indirect economic impact is employment or value-added created in industries that supply goods and services to the film/TV industry. For example, this would include firms providing cleaning services, accounting services, transportation services, accommodation, or supplying lumber for set construction, etc.

Induced economic impact is employment or value-added generated by general consumption by individuals employed directly or indirectly by the film/TV industry. For example, the spending of a production manager on groceries, housing, transportation, consumables, etc.

Total economic impact is the sum of direct, indirect and induced effects. The multiplier (indirect and induced) economic impacts represent the maximum potential stimulus to the economy resulting from activity in the film and television production industry.

3.2 Economic Impact Methodology

The economic impact methodology was based around a detailed and comprehensive measurement of the direct employment observed in the film and television production industry. Measuring the employment generated by the film/TV industry has many challenges, as much of the employment is made up of individuals working on an intermittent and adhoc basis for fairly short-lived productions. Therefore, tracking the number of individuals involved in film/TV productions and the number of hours they worked is not straightforward. For example, a camera operator may work on a fairly large number of productions in one year, each requiring him/her to work different hours and interspersed with periods of rest. Some actors and extras may work for a fairly small number of hours in film and television production in any given year, and may supplement their income with work in other unrelated industries, work which should not be included in the employment measurement.

The methodology developed in order to address these issues, and enable a comprehensive estimate of direct employment, made use of two primary data sources:

- **Payroll Data.** Most of the payroll associated with film and television production is contracted to payroll companies. We were able to obtain fairly detailed data on the hours and wages earned by BC residents on film and television productions in BC in 2004 from the three major payroll companies operating in BC - Entertainment Partners Canada, Cast & Crew Entertainment Services Inc. and Axiom International.¹⁴ Between them, these companies handle virtually the entire film/TV production payroll in BC. The data provided by these companies enabled breakdowns of hours and wages by job category, name of production, type of production (features, TV service, Movie of the Week, etc.) and Canadian vs. service (i.e., foreign) productions. The data included both union and non-union labour, as well as above-the-line and below-the-line employment.
- **Employment Survey.** The payroll data was primarily made up of "on-set" employment, which is not a full representation of the employment associated with the film and television production. For example, employment in film studio administration, post-production, digital effects, etc., was generally not included in the payroll data. Therefore, an employment survey was sent to various film and television industry businesses to quantify this additional employment.

¹⁴ The data was provided without names or other information that could identify the individuals or businesses paid through the payroll companies.

Further details on the analysis of the two data sources are provided below. Having estimated the direct employment impact of the film/TV industry, the indirect and induced impacts were estimated using multipliers produced by BC Stats. These multipliers were applied to the direct employment estimates to estimate the indirect and induced employment impacts. GDP is also estimated using BC Stats multipliers applied to the direct employment estimates.

The multipliers are derived from an economic/statistical model of the general economy, specifically the Input-Output model of the BC economy maintained by BC Stats.¹⁵ As already discussed in Section 2.2, the accuracy of multiplier analysis is limited by a number of factors, including:

- the accuracy of the underlying model;
- the level of unemployment in the economy;
- the assumption of constant returns to scale;
- the assumption that the economy's structure is static over time; and
- the assumption that there are no displacement effects.

The multiplier impacts present the potential indirect and induced impacts that can be achieved under a given set of economic conditions. In reality, these conditions may not all apply, and the multiplier impacts may be somewhat different. That said, the multipliers used are based on the best model and data available, which are maintained by the government and widely used and quoted for industries in BC. While multiplier impacts certainly do occur, and it is reasonable to attempt to represent them, it is also important to be mindful of their limitations.

3.2.1 Analysis of the Payroll Data

The data provided by the payroll companies was incorporated into one dataset. While the data was largely made up of hours worked in 2004, it did contain a few instances of payments for worked carried out on productions in earlier years (due to late submission of the pay claim or corrections to payments). These data items were screened out by comparing the production names in the payroll data with the list of productions shot in BC in 2004 published by the BC Film Commission.¹⁶ This screening process removed relatively few observations, reducing the total hours by less than 0.1%.

The combined dataset represented 11.1 million hours of film/TV production employment in 2004. A breakdown of hours by production type is provided in **Figure 3-1**. For ease of reference, the total hours have been converted in full-time equivalent (FTE) jobs by dividing by 1,800 (roughly equivalent to the hours worked in one year in a full-time position, after allowing for vacation, statutory holidays and sick leave).¹⁷ In total, the payroll data contains hours worked representing 6,188 FTE jobs.

¹⁵ The multiplier impacts are based on multipliers contained in *British Columbia Provincial Economic Multipliers and How to Use Them*, published in April 2004 by BC Stats.

¹⁶ This list can be found at <http://www.bcfilmcommission.com/filminfo/list2004.php>.

¹⁷ Full-time Equivalents (FTEs) are also sometimes referred to as Person Years.

Figure 3-1: Total Hours in the Raw Payroll Data

Production Type	Hours	Full-Time Equivalent Jobs
Feature Film	3,310,001	1839
TV (series, pilots, MOW, mini-series)	7,432,346	4129
Documentaries	3,132	2
Commercials	391,662	218
Total	11,137,141	6,188

Discussion with the payroll companies indicated two significant areas where the payroll data may under-represent on-set employment hours:

- Productions that were too small in size to require the use of a payroll company and productions by certain production companies that handle their payroll in-house. Documentaries in particular appear to be under-represented in the payroll data.
- Productions for commercials, which often do not use payroll companies.¹⁸

To address the missed smaller productions, the payroll data totals were factored up by comparing the number of productions covered in the payroll data with the list of productions maintained by the BC Film Commission. The payroll data covered 156 productions shot in BC in 2004, while the BC Film Commission reports that 194 productions were shot in BC in 2004, a difference of 38 (the payroll data covered 80% of all productions in BC). As most of the missed productions were likely to be Canadian (virtually all foreign productions make use of the payroll companies), this factoring up was based on the average hours worked on a Canadian production – estimated from the payroll data to be 27,514 hours per production (approximately 15 FTEs). Therefore, an additional $38 \times 27,514 = 1,045,500$ hours (582 FTEs) were added to the payroll totals.

The hours associated with the missing commercial productions were estimated using information provided by the Commercial Production Association of Western Canada (CPAWC). This information indicated that approximately 635 on-set FTEs are generated annually by the commercial production. As 218 FTEs of employment are already represented in the payroll data, an additional 417 FTEs (635 minus 218) were added to the payroll totals.

Including the adjustments described above, the total on-set employment generated by the film and television production industry was estimated to be **7,186 FTEs**.

This estimate should not be construed as the number of individuals employed on productions, as it appears that the average number of hours worked is considerably lower than 1,800 hours. Although it is not possible to provide an accurate estimate of the average hours worked, data provided by one of the three payroll companies indicates that the average hours worked could be in the range of 1200-1600 hours per year. This would suggest that the number of individuals

¹⁸ Although commercial productions do not benefit from tax credits or other incentives, they do represent a significant portion of the employment base and contribute to the size and critical mass of the industry.

represented by the payroll data could be in the region of 8,000 to 11,000, with many of these individuals working a small number of hours on-set each year and others working a full year.

However, in this report we have used FTEs as the standard measure of employment in order to allow aggregation with the employment survey data and comparison with other estimates of film and television industry employment.

Analysis of the wage information contained in the payroll data indicated that this on-set labour earned an average of approximately \$38.25 per hour. This is equivalent to \$68,850 per FTE job, nearly double the average wage in BC in 2004.¹⁹ However, if the average hours worked is in the region of 1200-1600 hours per year, then the average annual salary earned per individual is in the region of \$45,000 to \$61,800, 26-73% higher than the overall BC average.

3.2.2 Employment Survey

An employment survey was sent to firms whose employment would not appear in the payroll data. A short questionnaire was sent by email to over 400 businesses listed in *Reelwest Digest 2005*, a comprehensive directory of the film and video industry in Western Canada. A copy of the questionnaire can be found in **Appendix A**. The information requested in the questionnaire included:

- Proportion of the firm's business that is film and television related.
- Proportion of the firm's business that is related to Canadian production and the proportion that is related to service (foreign) production.
- Proportion of the firm's business that is related to the following categories of production: feature films, television (TV services, pilots, mini-series, MOW), documentaries, commercials, other.
- Total employees broken down into full-time, part-time and seasonal employment.
- Total annual payroll.

Follow-up telephone calls were conducted to increase the response rate of the survey. This follow-up process focussed on ensuring that all of the larger employers responded to the survey (e.g., the major studios, post-production and animation firms) as well as obtaining a representative sample of the smaller businesses.

In total, 216 firms responded to the survey. A small number of firms were excluded from the analysis on the basis that they were not part of the direct impact of the film/TV production business, e.g., accounting firms, lawyers, car rental companies (the film/TV related activities of these firms would be picked up in the indirect impacts, estimated using BC Stats multipliers). In addition, any firm reporting that less than 75% of its business was film and television related was excluded from the analysis on the basis that they were not part of the direct impact and would be picked up as part of the indirect impact. After these exclusions, a sample of 201 businesses remained.

¹⁹ Source: BC Stats. The average weekly wage in BC in 2004 was \$686.61. Multiplying by 52, the average annual wage in BC was \$35,704.

In cases where firms did not respond to the survey, their employment was inferred using survey results for firms of similar types. For example, if 20 post-production firms were sent questionnaires but only 15 responded, even after follow-up telephone calls, the following approach was used to estimate the employment of the five non-responding firms. A mean number of employees was calculated from the 15 post production firms that responded, with outlier firms removed (i.e., very large and very small firms).²⁰ This average employment estimate was then applied to the non-responding firms to infer their employment level. Due to the focus on obtaining responses from the large firms, about 68% of the final estimated employment was based on actual responses and 32% was inferred.

Including inferred employment, the total employment estimated from the employment surveys is provided in **Figure 3-2**, with a breakdown into full-time, part-time and seasonal employment.

Figure 3-2: Employment Estimated from the Employment Surveys

	Number of Jobs	Percentage
Full-time	2,458	76%
Part-time	642	20%
Seasonal	124	4%
Total	3,224	100%

The surveyed film/TV related firms were estimated to provide 3,224 jobs. Applying a weight of 0.5 to the part-time and seasonal jobs, it is estimated that these firms generated 2,841 FTE jobs per annum. Based on the annual payroll information provided in the survey, the average annual wage was \$45,941 per FTE job, 29% higher than the average BC wage.

²⁰ Defined as those firms whose employment total was more than two standard deviations away from the raw mean.

3.3 Direct Employment Generated by the BC Film and Television Production Industry

3.3.1 Economic Impact Estimates Based on 2004 Data

The total direct employment generated by the film/TV production industry in BC was estimated by combining the results from the analysis of the payroll data and the employment survey, as shown in **Figure 3-3**.

In total, it is estimated that the film and television production industry generated 10,027 FTEs of employment in 2004, earning a total of \$625 million in wages.

Figure 3-3: Total Direct Employment Generated by the BC Film and Television Production Industry in 2004

	Full-Time Equivalent Jobs	Total Wages (\$ Million)
Payroll Data	7,186	\$494.7
Employment Survey	2,841	\$130.5
Total	10,027	\$625.2

Estimated direct employment broken down type of production is provided in **Figure 3-4**. Over half (57%) of direct employment is generated by television production, with another 27% generated by feature film production. The employment breakdown is broadly in line with production spending.²¹ In addition, approximately 70% of employment relates to service (foreign) production and 30% to domestic (Canadian) production. Again, this is broadly in line with production spending figures.²²

²¹ The BC Film Commission reports that 62% of production spending in BC in 2004 is related to television and 30% to feature films. However, these percentages do not include commercials.
Source: <http://www.bcfilmcommission.com/filminfo/break2004.php>.

²² The BC Film Commission reports that in 2004, 73% of production spending in BC related to foreign productions, and 27% to Canadian productions.
Source: <http://www.bcfilmcommission.com/filminfo/break2004.php>.

Figure 3-4: Direct Employment by Type of Production

	Full-Time Equivalent Jobs	Percentage
Type of Production		
Feature Film	2,717	27%
TV (series, pilots, MOW, mini-series)	5,735	57%
Documentary	127	1%
Commercials	775	8%
Other	673	7%
Total	10,027	100%
Canadian/Foreign Productions		
Canadian	2,976	30%
Foreign (service)	7,051	70%
Total	10,027	100%

3.3.2 Economic Impact Estimates Adjusting for Production Levels

The estimation of direct employment is largely based on 2004 payroll data. In 2004, film/TV production in BC experienced a significant downturn. The total value of film/TV production in 2004 declined 43% from 2003 and was at its lowest level since 1997. It is reasonable to expect that much of the employment estimated in our economic impact analysis would vary in direct relation with the total value of production in BC, particularly the employment captured in the payroll data.

So that the employment estimates are not overly impacted by selection of any particular year, we have estimated the employment impact based on a five year average of total production spending. The production spending in BC over the last five years is provided in **Figure 3-5**. The five year average of total production spending is \$1,150.9 million, 44% higher than the production level in 2004.

To adjust the direct employment estimate for production, it has been assumed that the employment captured by the payroll data varies in direct proportion with production, while the employment captured by the employment survey is largely fixed. Therefore, the direct employment was estimated as follows:

$$2,841 + 7,186 \times (1,150.9 / 801.0) = 13,200 \text{ FTE jobs}$$

Based average production levels over the last five years, the film/TV industry generates 13,200 direct FTEs of employment (this is 32% higher than employment in 2004). Adjusting wages by the same process, the total direct wages are estimated to be \$841.4 million, an average wage of \$63,740 per FTE job.

Figure 3-5: Film and Television Production Spending in British Columbia in 2004 Dollars

Year	Domestic Productions	Foreign Productions	Total
2000	\$460.4 million	\$835.0 million	\$1,295.4 million
2001	\$269.4 million	\$916.7 million	\$1,186.1 million
2002	\$171.3 million	\$869.5 million	\$1,040.8 million
2003	\$172.0 million	\$1,259.5 million	\$1,431.4 million
2004	\$213.9 million	\$587.1 million	\$801.0 million
<i>Average (in 2004 \$)</i>	<i>\$257.4 million</i>	<i>\$893.6 million</i>	<i>\$1,150.9 million</i>

Source: BC Film Commission

3.4 Multiplier Impacts

The indirect and induced impacts, as well as the GDP and Economic Output impact, were estimated using multipliers provided by BC Stats. In estimating the multiplier impacts, we have used the direct employment estimate based on the five year average of production levels, rather than the 2004 employment estimate. The multipliers for *Motion Picture and Video Production, Distribution and Post-Production* (large aggregation) have been used as they closest match the industry of interest. The multiplier impacts, along with the direct impacts, are presented in **Figure 3-6**. The multipliers used for this analysis are provided in **Appendix B**.

Figure 3-6: Employment and Economic Impacts of the Film and Television Production Industry in British Columbia

Impact	Employment (FTEs)	Wages (\$ Million)	GDP (\$ Million)
Direct	13,200	\$841	\$1,274
Indirect	7,600	\$272	\$301
Induced	3,100	\$111	\$139
Total	23,900	\$1,224	\$1,714

* Wage multipliers are not provided by BC Stats. To estimate indirect and induced wages, we have applied the average BC wage in 2004 (\$35,704) to the number of estimated indirect and induced FTE jobs.

The film/TV industry in BC generates 13,200 direct FTE jobs. Including multiplier effects (indirect and induced), an additional 10,700 FTE jobs are generated, for a total of 23,900 FTE jobs. This total employment earns over \$1.2 billion in wages.

As well as employment, the economic contribution of the film/TV industry can be measured in terms of GDP. As such, the film/TV industry generates nearly \$1.3 billion in direct GDP. With multiplier effects (i.e., direct + indirect + induced), film/TV is estimated to generate a potential \$1.7 billion in GDP for the British Columbia economy.

The total of 20,800 direct and indirect FTE jobs is considerably lower than those quoted elsewhere, as discussed in Section 2.3, which range from 30,000 to 42,000 FTEs.²³ The main reason for this difference appears to be the application of different multipliers to estimate the indirect impacts.²⁴

The multipliers used in this analysis, supplied by BC Stats and based on the Year 2000 input/output model, indicate that 0.57 indirect FTEs are generated for every 1 direct FTE of employment in the BC film/TV industry.²⁵ This is slightly more than a third of the 1.6 indirect multiplier used in the *Profile* report; a multiplier obtained from Statistics Canada. Discussions with BC Stats suggest that the Statistics Canada multipliers used in the *Profile* report may be out of date. The same multipliers have been used in the *Profile* report since 1999. More recent multipliers developed by Statistics Canada are similar to those produced by BC Stats, and indicate a much lower indirect impact. The reasons for the change in the multipliers include:

- Industry reclassification related to the change over to the North American Industry Classification System (NAICS).
- Improvements in data collection and analysis.
- Structural change in the film and television industry since the earlier multipliers were estimated, indicating that as the industry has grown, it has required proportional less resources from other industries.

BC Stats stands by its new (lower) multipliers. This suggests that industry economic impact analysis, such as that provided in the *Profile* report, use outdated multipliers that are overstating the total employment impact of the film/TV industry.

²³ The *Profile* report provides only direct and indirect impacts, not induced.

²⁴ The direct employment estimates produced in the *Profile* report range from 11,500 to 16,200 FTEs, depending on the year. This range is line with the direct employment estimate in Figure 3-6 of 13,200. Therefore, the primary reason for the difference in the estimates is the application of different multipliers.

²⁵ Including induced impacts, 0.81 indirect and induced FTE jobs are generated for each direct FTE.

3.5 Tax Revenue Impacts

The estimation of tax revenue impacts includes the following taxes generated by film/TV production:

- Personal income tax paid by the 13,200 FTEs of *direct* employment generated by film/TV production.
- Consumption taxes (such as PST) paid on the spending of individuals employed in the film/TV industry in BC, as well as net expenditures on games of chance.²⁶
- Consumption taxes (such as PST) paid on non-labour components of film/TV production budgets – materials, equipment, rentals, services, etc.
- Corporate income taxes paid by businesses involved in the film and television production industry.

Given the study's focus on provincial film tax credits, the tax impacts include only taxes received by the provincial government and does not include any taxes that may be received by the federal and municipal governments. Also, the tax analysis considers only those taxes paid by *direct* employment and spending only, and does not consider taxes generated by indirect and induced impacts. The methodology employed and findings for each tax component are described in the following sections. Further details of the methodology can be found in **Appendix C**.

3.5.1 Personal Income Taxes

In British Columbia, provincial income tax is paid on taxable income at a rate that increases with taxable income. Because the tax rate is progressive, the tax paid by a group of employees depends on the distribution of income among those employees. An approximate determination of the income distribution was derived from the payroll data and additional data provided by the BC Council of Film Unions.

Applying the appropriate provincial tax rates to this income distribution, and allowing for standard deductions for EI, CPP, RSP, dependants, charitable donations, etc.,²⁷ the total provincial income tax paid is estimated to be \$53.5 million.

²⁶ Includes spending by BC residents only. This may under-represent this component of the tax impact as it does not include consumption taxes paid by non-residents on personal spending while they are filming in BC (e.g., taxes spending by U.S. actors, directors, producers, etc.).

²⁷ The deductions are based on data available from the Canada Revenue Agency.

3.5.2 Consumption Taxes Paid by Individuals

Household expenditure data provided by Statistics Canada indicates that approximately 37% of average household expenditure in BC is subject to provincial sales taxes or provides revenues to the provincial government through gaming. Applying the relevant tax rate to these expenditures (see Appendix C for more details), approximately 2.7% of household expenditure goes to provincial government revenues.

Applying this percentage to total direct income of \$841 million, it is estimated that the total amount of revenue generated by personal spending of people employed in the film/TV industry is \$22.5 million.²⁸

3.5.3 Consumption Taxes Paid on Production Spending

Sample budget breakdowns provided to InterVISTAS by various BC producers indicates that approximately 35-50% of production spending in BC is spent on items that may be subject to provincial sales tax. This includes travel, accommodation, purchases, equipment rentals, studio rentals and post-production. Based on an average of 45% of BC production spending, and assuming that this spending is subject to PST of 7%, the total tax revenues was estimated to be:

$$45\% \times 7\% \times \$1,150.9 \text{ million} = \$36.5 \text{ million}$$

3.5.4 Corporate Income Taxes

To calculate corporate income tax liability is extremely complex. It requires knowledge of the total tax base, and the proportion of the tax base subject to corporate income tax. Therefore, an approximate method has been used, based on the average corporate tax paid per employee estimated from Statistics Canada data. In British Columbia, the provincial corporate income tax collected per employee was \$649.52 (based on 2004 figures). Assuming the BC film/TV industry pays corporate income tax at the average rate per employee, the 2004 corporation income tax liability of the BC film/TV industry is estimated to be \$8.7 million.

²⁸ This assumes a zero savings rate (i.e., household expenditure = household income). Statistics Canada reports that the average personal savings rate in Canada in 2004 was 0.4%. This savings rate declined to -0.6% in the first quarter of 2005.

3.5.5 Total Provincial Tax Revenues Generated

The estimated total provincial tax revenues generated by the BC film/TV industry is provided in **Figure 3-7**. The direct employment and spending by the BC film/TV industry generates a total of \$121 million in tax revenues for the BC government.

Figure 3-7: Total Provincial Tax Revenues Generated by the BC Film/Television Industry Based on a Five Year Average of Production Levels

Tax Component	Amount Per Annum (\$ Million)
Personal income taxes	\$53.5 million
Consumption taxes on personal spending	\$22.5 million
Consumption taxes on production spending	\$36.3 million
Corporate income tax	\$8.7 million
Total tax revenues	\$121.0 million

4.0 Factors Affecting the Film and Television Production Industry – Overview

In order to understand the factors affecting the film and television industry, an extensive literature review and data collection exercise was undertaken. In addition, interviews were conducted with film and television stakeholders in British Columbia and the United States. The findings from the literature review and stakeholder interviews are summarised below.

In addition, Section 4.3 provides a comparison of the factors affecting the BC film/TV industry with those in other jurisdictions in North America, including a listing of all current tax credit programs in North America.

4.1 Literature Review

The list of documents reviewed include:

- *The Economic Impact of Foreign Film Production in Québec: An analysis of the economic consequences of \$10 million spent in Québec on foreign film production*, Forum Metropolitain De L'Industrie Cinematographique, November 2004.
- *What is the Cost of Runaway Production?*, Los Angeles County Economic Development Corporation, August 2005.
- *U.S. Runaway Film and Television Production Study Report*, The Monitor Company, June 1999.
- *The Migration of U.S. Film and Television Production*, U.S. Department of Commerce, January 2001.
- *Hollywood North: The Impact of Costs and Demarcation Rules on the Runaway Film Industry*, Driesch, Audrey, 2002.
- *Foreign Film and Television Drama Production in Australia: A Research Report*, Australian Film Commission, 2002.
- *The Impact of an Entertainment Industry Strike on the Los Angeles Economy*, Milken Institute, June 2001.
- *Review of State Tax Credits Administered by the Department of Economic Development*, Office of the State Auditor of Missouri, 2001.
- *Profile 2005 – An Economic Report on the Canadian Film and Television Production Industry*, Canadian Heritage, CFTPA and APFTQ.
- *Nova Scotia Film, Television and New Media Industry: Impact Analysis and Long-Term Strategy*, Nordicity Group Ltd, 2004.
- *The Economic Impacts of Film & Video Productions in Washington State*, ECONorthwest, 2003.

- *The Impact of the Film Industry on Colorado*, University of Colorado, Leeds School of Business, Business Research Division, 2003.
- *Analysis of the Film and Video Industry in Arizona*, Arizona Department of Commerce, 2004.
- *Entertainment Industry Economics*, H. Vogel, Cambridge University Press, 2001.

Appendix E contains summaries of some major documents reviewed as part of this study. Our literature review revealed little “hard” analysis to date of the factors affecting film production location. Many of the reports focussed on the economic impact of the film/TV production industry. However, there were two studies of particular interest:

- **U.S. Runaway Film and Television Production Study Report, The Monitor Company, June 1999.** Estimated that productions that “runaway” from Hollywood to Canada could save up to 25% in production costs (based on 1999 exchange rates). The study postulates that exchange rates, generally lower production costs and government incentives play a part in runaway productions. However, no econometric (or similar) analysis was conducted on causality. Based on interviews with industry players, the quality of production facilities and crew were also found to be important. The report notes that Canadian, U.K. and Australian crews have become highly skilled as more runaway production is handled, which increases their ability to handle larger productions. In other words, a critical mass of production is reached which supports increased investment and skills development, and so attracting more runaway production and developing domestic production. The report suggests that Canada is quite far along this path, and has a capability not far behind California and New York.
- **Hollywood North: The Impact of Costs and Demarcation Rules on the Runaway Film Industry, Audrey Droesch, Stanford University, 2002.** This study used regression analysis of runaway production from California to BC to examine the causes of runaway production. The analysis focused on two “pull” factors – exchange rates and tax credits – and one “push” factor – labour demarcation rules in California (generally, work rules in BC were more flexible than in California). The dependent variable was the ratio of runaway films (to BC) to films produced in L.A. county. The analysis found that demarcation rules were a major driving force behind runaway production, an effect which was accentuated by tax incentives and favourable exchange rates. The author included additional analysis incorporating star actor’s salaries to determine whether big star wage demands were forcing producers to reduce costs in other areas. The author found some evidence that star salaries did lead to more runaway production but the evidence was statistically weak.

4.2 Interviews with Industry Stakeholders

Interviews were conducted with a range of film and television industry stakeholders in British Columbia and the U.S. The primary purpose of these interviews was to obtain information that would guide the empirical research, rather than canvas the industry on its view of tax credits and the performance of the BC tax regime. The interviews were used to identify key factors affecting production location decisions, and the role of tax credits in this decision making process. The list of organisations contacted included:

- Director's Guild of Canada;
- BC Film;
- BC Film Commission;
- CFTPA, BC Producer's branch;
- MPPIA;
- Lion's Gate Film Studios;
- BC Council of Film Unions;
- Various BC producers involved in domestic and service productions in film and television;
- Payroll companies;
- Disney/ABC;
- New Line (part of Warners);
- Alliance of Motion Picture Television Producers.

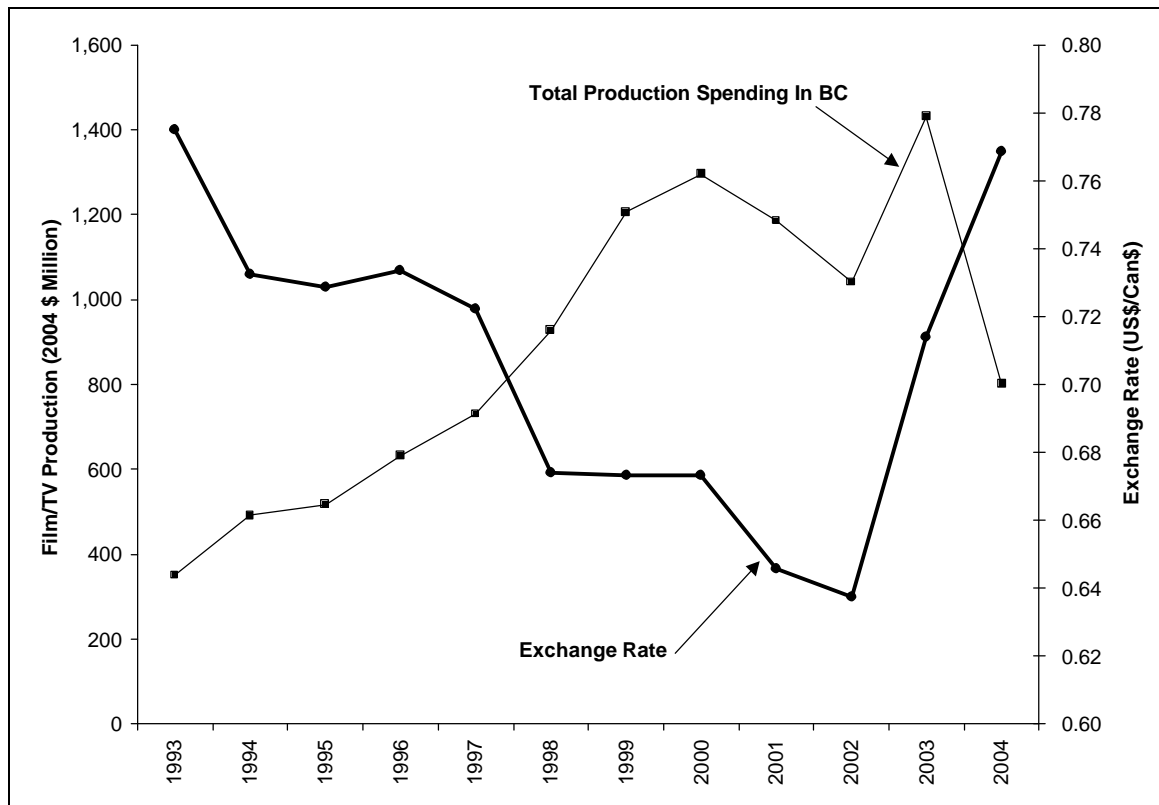
The following summarises the key points that were made by a number of the stakeholders we talked to. These points represent the views and opinions put forward during the interviews; we have not determined their accuracy or veracity.

Key points made during the interviews:

- Film and television production is heavily bottom-line driven and exhibits great mobility. Production location decision-making is almost entirely determined by budget and which location offers the best value-for-money. Typically, producers will decide between a number of locations (a shortlist of between two and six) which meet the creative needs of the production (e.g., scenery) based purely on which is the cheapest to film in. A number of stakeholders emphasised that this cost focus was not simply a matter of profit maximisation but was related to improving the production value. For example, money saved on location can be put towards better post-production and digital effects.
- When costing out locations, detailed budgeting is often conducted which includes the full range of cost elements including labour, equipment, location and facility costs, transportation costs, tax credits and other incentives, financing costs, and exchange rates.

- While all location costs can have an impact on the final location decision, tax credits do get particular attention and can affect the short list of locations to be more fully costed out. As one executive put it: “An effective tax credit is all the marketing a region needs”.
- The cost difference between locations can be very small but have a big impact on final location decisions. One executive stated that the cost difference in locations can be in the range of 4-10%. One BC producer gave an example where the location of an \$8 million production was based on a \$25,000 cost difference. We note that these cost differences are in the range where a tax credit can make a difference to the location decision.
- The intense focus on cost considerations ranges across all types of production. In the case of smaller and/or independent productions, the tax credits can make the difference as to whether the production obtains financing or is “green-lighted” by the studio. Even with “blockbuster” productions, small differences in cost can affect location decisions. One stakeholder indicated that the decision to film *X-Men 2* in BC rather than Ontario, where the first *X-Men* film was shot, was primarily a financial decision.
- The BC film industry benefited from the weakening Canadian dollar, relative to the U.S. dollar, during the 1990s, making BC (as well as the rest of Canada) a lower cost region in which to film. Conversely, the rapid appreciation of the Canadian dollar from 2002 to 2004 did impact on the volume of service film production in British Columbia, as it did in many other provinces (see **Figure 4-1**). As a result, the BC industry has been forced to find greater efficiencies. Prices for items such as production equipment and studio space have dropped or remained static (i.e., falling behind inflation) in many cases resulting in the closure of some businesses. There has also been a softening in labour rates, for example, the IATSE Local 891 offered discounted labour rates in late 2004 and early 2005.
- While most stakeholders did feel that the recent increase in the BC PSTC tax credit had offset the exchange rate change to some extent, the primary benefit of the tax credit change had been to avoid a large-scale shift in production to Ontario following its tax credit increase in late 2004. The most common reasons given for Ontario’s tax credit increase was to offset the exchange rate change and to counteract tax credits introduced by New York state.
- For the labour unions, the tax credits have a direct impact on wages. Any reduction in the tax credits would likely result in lower wages in order for the film/TV industry to make up the difference. This could eventually lead to recruitment and retainment difficulties.
- The one-year time limit on the recent tax credit increase has created some uncertainty in the industry and may have negatively impacted on BC’s attractiveness on some longer-term production decisions.²⁹
- The general consensus from the stakeholders was that it looked as though total production in BC in 2005 would be considerably higher than in 2004. While some of this improvement was attributed to the recent tax credit increase, it was felt that there had been a upturn in the industry generally, with the industry trending away from reality programming and back to scripted series.

²⁹ The increase in the BC PSTC is effective from January 1st, 2005 to March 31st, 2006. The recent increase in the Ontario PSTC is subject to review by the end of 2005.

Figure 4-1: Film/TV Production in BC Versus the U.S./Canadian Dollar Exchange Rate

Source: BC Film Commission and Pacific Exchange Rate Service, Sauder School of Business, <http://fx.sauder.ubc.ca/>.

4.3 Comparison of British Columbia with Other Jurisdictions

The province of BC is one of the major film/television production centres in North America. In terms of production volume, it ranks 4th in North America, behind California, New York and Québec. **Figure 4-2** lists the top-five film/television production centres in North America, based on average production spending over the past five years.

Figure 4-2: Average Annual Production Spending, 2000-2004

Rank	Province/State	Average Production Spending (2004 CDN\$)
1	California	\$ 33.15 billion
2	New York	\$ 7.39 billion
3	Québec	\$ 1.40 billion
4	British Columbia	\$ 1.15 billion
5	Ontario	\$ 1.00 billion

Source: Various provincial and state film commissions and the 2005 *Profile* report. In terms of foreign (service) productions, BC ranks 3rd, behind California and New York.

The following provides an overview of the film and television industry in British Columbia relative to other jurisdictions. This assessment is based on data collected during the study, a literature and media review, and interviews with industry stakeholders.

- The vast majority of production in BC is sourced from elsewhere, primarily Los Angeles but also New York and Toronto. As a result, BC directly competes with these regions for certain types of production.
- Within Canada, BC's main competitors for both domestic and service productions are Ontario, and to a somewhat lesser extent, Québec. Ontario offers similar tax credits, production infrastructure and skilled labour pool as BC. Québec is generally less attractive than Ontario and BC for U.S. producers. This is reflected in the fact that Québec generally has a lower volume of foreign service production than Ontario and BC despite having a similar sized industry.
- BC's proximity to Los Angeles (and lack of time-zone difference) does provide it with a competitive advantage over other regions in North America, such as Ontario. However, the bottom-line focus of the industry means that this advantage is not sufficient to overcome significant cost differences. In other words, BC does not command a premium due to its proximity to Los Angeles. It should also be noted that considerable service production is sourced out of New York, where Ontario and Québec have a proximity advantage.
- Nova Scotia, Manitoba, Saskatchewan, New Brunswick, Newfoundland, PEI, Yukon have more generous tax credits than BC, in the range of 30-45% of labour costs. However, these provinces are not currently viewed by the stakeholders consulted as major competitors to BC, as they do not have the depth of skilled labour nor the infrastructure to handle large numbers of productions or to handle large-scale productions. However, over time, the tax credits may enable some of these provinces to achieve the same sort of critical mass that BC, Ontario and Québec have achieved, and ultimately become a significant competitor to BC. Manitoba was highlighted by some stakeholders as having a particularly attractive tax credit regime – not only was the rate recently increased from 35% to 45% of labour costs (in March 2005) but some of the tax credit can be applied to out-of-province labour. For example, a production company can obtain a tax credit for using labour from BC on a production filmed in Manitoba (subject to certain restrictions). Alberta does not offer tax credits but has no sales tax which was identified by some stakeholders as a significant benefit.
- Until fairly recently, few U.S. states had meaningful film/TV production tax credits.³⁰ However, many states recently have put in to place production expenditure or labour based tax credits similar in nature to those provided by BC and other provinces. Louisiana and New Mexico were among the first to introduce such tax credits in 2002. Louisiana provides a 10-20% credit on labour as well as a 10-15% investment tax credit on total production spending. New Mexico provides a 15% tax credit on all in-state spending with 80% of the refund paid up front, as well as interest free loans of up to US\$15 million for productions meeting certain state labour requirements. In 2004 and 2005, a number of other U.S. states put into place labour and expenditure based tax credit schemes, notably Illinois, Georgia, Maryland, Pennsylvania,

³⁰ Over 30 U.S. States provide sales or hotel tax credits to film/TV productions, which have been in place for some time, but most are so restrictive that they were little used and have had minimal impact on production location decisions.

Hawaii, North and South Carolina, Arizona, Florida, Kansas, Texas, Rhode Island and New York.

- The major centres for film production are now starting to introduce tax credit themselves. New York State introduced the “Empire State Film Production Credit” in August 2004, which provides a 10% tax credit on qualified in-state expenditures. In addition, the City of New York recently introduced a 5% tax credit on expenditures. At the time of writing, it was being reported that California is also considering a tax credit of 12% on in-state expenditures, up to a cap of US\$3 million.
- The view from the stakeholder interviews was that overall labour costs in BC (incorporating both rates and demarcation rules) were lower than in Los Angeles and New York and comparable with Ontario and Québec. Many of the smaller production locations (e.g., Manitoba, Louisiana, Nova Scotia) offered lower labour rates but this had to be set against the availability of labour. For example, while Louisiana labour rates may be lower, it may not be possible to completely crew a production with Louisiana labour, so additional labour would need to be transported from other parts of North America, at considerable cost.
- BC offers fairly competitive rates for equipment, studio and location rentals and other production supply items relative to other locations in North America. In general, these costs do not vary considerably across North America.
- While BC has the infrastructure and depth of labour to compete for major “blockbuster” productions, there is substantial competition worldwide for these types of productions. Regions such as Australia, the UK, South Africa, Romania, Czech Republic and other parts of Eastern Europe are often considered for certain larger productions, as well as the more “traditional” locations within North America. Many of these regions offer considerably lower labour costs than BC (and the rest of North America) and some, such as the UK and Australia, also offer tax incentives.
- BC has developed a fairly large and mature post-production, animation and digital special-effects capability, aided by the Digital Animation and Visual Effects (DAVE) tax credit. That said, for foreign service productions, most of this post-production work is still conducted in Los Angeles for reasons of control and accessibility.
- Many stakeholders commented that BC ranked very highly in North America in terms of tax credit administration and support.

Figure 4-3 outlines the numerous tax credits that are currently offered in Canada, while **Figure 4-4** displays those offered in the United States.

Figure 4-3: Canadian Film Tax Credits

Jurisdiction	Tax Credit Description
Canada – Federal	Canadian federal film or video production tax credit: available to Canadian-owned and controlled productions. This tax credit can be applied to 25% of specified labour expenditures.
	PSTC: primarily for foreign (service) production, and applies 16% of labour expenditures.
Alberta	Alberta currently does not offer a provincial film tax credit.
British Columbia	FIBC: this tax credit is applicable to 30% (effective January 2005) of eligible labour expenditures. There is also a 12.5% regional bonus and 30% training credit that are also available.
	BC PSTC: this tax credit is applicable to 18% (effective January 2005) of eligible labour expenditures. There is also a 6% regional bonus that is available.
	DAVE: this is a bonus 15% tax credit on eligible labour expenditures that are directly attributable to digital animation or visual effects activities.
Manitoba	Manitoba offers up to 45% in tax credits on approved labour expenditures – 35% base, 5% added on for frequent filming, and 5% added on for rural/northern incentive.
New Brunswick	New Brunswick Film Tax Credit (introduced in 1997): applies to 40% of eligible salaries, and is capped at 50% of total production costs.
Newfoundland	Newfoundland and Labrador Film and Video Industry Tax Credit (introduced in 1999): applies to 40% of eligible labour expenses.
Nova Scotia	Nova Scotia Film Industry Tax Credit: applies to 35% of eligible labour costs, capped at 15% of the production budget. An additional 5% is added for frequent-filming companies, and for filming outside the metro Halifax region.
Ontario	Ontario Film and Television Tax Credit (OFTTC): applies to 30% of eligible Ontario labour costs (domestic), with a potential regional bonus of 10% for productions outside the Greater Toronto Area.
	Ontario Production Services Tax Credit (OPSTC): applies to 18% of eligible Ontario labour costs.
	Ontario Computer Animation and Special Effects (OCASE) Tax Credit: applies to 20% of eligible Ontario labour costs in respect of eligible activities.

Jurisdiction	Tax Credit Description
Prince Edward Island	PEI Film and Television Labour Rebate Program: applies to 30% of the eligible PEI labour expenditures OR 15% of eligible total production costs.
Québec	Québec Film and Television Production Tax Credit: base rate of 33.3% of eligible labour spending, not exceeding 50% of eligible total production costs.
	Québec Production Services Tax Credit: based rate of 20% of eligible labour expenditures.
	Québec Dubbing Tax Credit: base rate of 33.3% of the consideration paid by the corporation for services, to a maximum of 40.5% of the consideration paid for the execution of the dubbing contract.
Saskatchewan	Saskatchewan Film Employment Tax Credit (SFETC): applies to 35% of total salaries, not exceeding 50% of total eligible production costs. There is also an additional 5% bonus for filming 40km outside Regina and Saskatoon.

Figure 4-4: U.S. Film Tax Credits

Jurisdiction	Tax Credit Description
United States - Federal	<p>The American Jobs Creation Act was signed into law in 2004 and includes tax provisions that encourage domestic film production.</p> <ul style="list-style-type: none"> ▪ Section 181 of IRS tax code allows a tax write-off of productions expenditures for domestic productions with aggregate costs under \$15 million. ▪ Section 191 of IRS tax code provides for a 9% deduction for income from domestic production activities (actual credit is limited to the lesser of 9% of net income or 50% of wages).
Georgia	<p>Georgia Production Partnership Incentive Program (introduced in 2005): The foundation of the Act is a 9% investment tax credit. Production companies that spend a minimum of \$500,000 in the state on qualified production and post production expenditures in a single year are eligible for this credit. This includes most materials, services and labour. The 9% credit applies to both residential and out-of-town hires with a salary cap of \$500,000 per person per production.</p> <p>The Act will award additional tax credits of 3% for all Georgia residents hired by the production. In effect, producers receive a tax credit equal to 12% for all qualified Georgia labour - the base tax credit of 9% plus a bonus of 3% for Georgia hires.</p>
Illinois	<p>The Illinois Film Production Tax Credit (introduced Jan 2004): provides a 25% tax credit on Illinois Income Tax for wages paid by a production company to each employee who is an Illinois resident.</p>
Louisiana	<p>Labour Tax Credit (introduced in 2002): The credit is equal to 10-20% of the total aggregate payroll (10% if production spending is between \$300,000 and \$1million, and 20% if spending is greater than \$1 million).</p> <p>Investor Tax Credit (introduced in 2002): If the total base investment is greater than \$300,000 and less or equal to \$8 million dollars, each taxpayer shall be allowed a tax credit of 10% of the actual investment made by that taxpayer.</p>
Mississippi	<p>Mississippi has offered a 10% film tax credit (non-transferable and non-refundable) on labour expenditures to Mississippi residents since July 2004.</p>
Missouri	<p>Qualified film production companies can receive a state income tax credit of up to 50% of the company's expenditures necessary for the making of a film in Missouri, not to exceed \$500,000 in tax credits per project.</p>

Jurisdiction	Tax Credit Description
New Mexico	New Mexico offers a 20% tax rebate on production expenditures that are subject to taxation by the State of New Mexico. This is a refund, with no brokering required and no cap – the more that is spent, the more return.
	New Mexico offers a 0% loan, up to \$15 million per project (which can represent 100% of budget) for qualifying feature or television projects. Terms are negotiated.
	Production companies filming in New Mexico can qualify for a 50 percent wage reimbursement for each qualified New Mexico film and media trainee hired on their production.
New York	As of 20 August 2004, the Empire State Film Production Credit has been available, providing a fully-refundable tax credit equal to 10% of qualified expenditures to qualifying film and TV productions.
North Carolina	Recently, new legislation was passed providing a 15% tax credit on goods, services, and labour for film and television production spent in-state, once spending reaches a \$250,000 threshold. The tax credit is valid for expenditures made between 1 January 2005 and 2010.
Pennsylvania	Pennsylvania's film production tax credit provides a 20% tax credit for production expenses incurred in-state, provided that 60% of production expenses are incurred in-state.
South Carolina	South Carolina recently (late 2004 and July 2005) passed legislation which will provide production companies with a 15% tax rebate on labour and goods and services expenditures. The rebates are contingent on production costs exceeding \$1 million in the tax year.
Utah	In July 2005, Utah's Motion Picture Incentive Fund was introduced offering a 10% refund on every dollar spent on production in Utah.

In addition to the states listed above, a number of other states are currently in the process of developing or passing legislation that introduce film industry tax credits, most notably California.

5.0 Statistical Analysis of Film and Television Industry Production Levels

A key element of this study was to examine the relationship that exists between the level of production spending in a specific region and key variables that might be expected to impact this level of production, including tax credits. This process involved three key steps:

- **Step 1:** Data collection. Crucial to the quantitative analysis is the collection of reliable data from various locations.
- **Step 2:** Preliminary data analysis. Before conducting any econometric analysis, some simple plots and non-parametric analysis were conducted of the data.
- **Step 3:** Econometric regression analysis. To examine the data in more detail, various regression models were developed and estimated.

5.1 Data

Data was collected comes from two main regions – Canada and the United States.³¹ A comprehensive and compatible dataset was developed for the each of the provinces and States listed in **Figure 5-1**. In terms of the Canadian data, the data set was very complete, comprising the nine largest provinces. With respect to the U.S., data was collected from states that had a significant volume of film/TV production, as well as states that had recently introduced tax credit programmes. Partial data was collected for many other states but was not sufficient to be included in this analysis.³²

With respect to specific variables, a wide range of predetermined variables that were postulated to be important in explaining production spending and location decisions were both collected and developed. The following list outlines the key variables collected and the various sources:

- **Production spending:** Canadian provincial spending data was obtained from various provincial film commissions/offices and the Canadian Film and Television Production Association (CFTPA), while U.S. state spending data was obtained from various state and city film offices. Canadian spending is also broken down into domestic and foreign production.
- **Tax credits:** Tax credit information was obtained from various film commissions and related government departments included their date of introduction and any subsequent changes. Information was collected for federal, provincial, domestic, foreign, digital animation and visual effects, and regional tax credits and incentives.
- **Exchange rate:** The source of our historical exchange rate data was the University of British Columbia's Sauder School of Business' Pacific Exchange Rate Service.³³

³¹ We also attempted to collected data from Australia and New Zealand, but were unable to obtain data that was compatible with this study.

³² Many states do not actively collected data related to film and television production.

³³ <http://fx.sauder.ubc.ca/>

- **Average wage:** Wage data for the film/TV industry was obtained from Statistics Canada and the Bureau of Labour Statistics (BLS) for the U.S. The Canadian wage data is North American Industry Classification System (NAICS) based, and ranges from 1991 to 2004. The NAICS industry for which data was obtained is classified as “motion picture and video industries”.
- **Consumer Price Index (CPI):** The consumer price index is a measure of the average change in consumer prices over time in a fixed market basket of goods and services. This index was used to deflate/inflate data into 2004 terms, and was also utilised as a proxy for the cost of certain goods and service consumed by the film/TV production industry. Like the wage data, Canadian data comes from Statistics Canada, while the corresponding U.S. data is from the BLS.
- **Gross Domestic Product (GDP):** GDP for the various regions was collected as an alternate measure of production spending. This data was obtained from Statistics Canada and the U.S. Bureau of Economic Analysis (BEA).
- **Population:** The Canadian data was obtained from Statistics Canada, while the corresponding U.S. data was obtained from the Bureau of Economic Analysis (BEA).
- **Employment/Unemployment:** Data on employment and unemployment rates was obtained from Statistics Canada and the U.S. Bureau of Labour Statistics.

Figure 5-1: Provinces and States – Data Collected

Canada	United States
<ul style="list-style-type: none"> ▪ British Columbia ▪ Alberta ▪ Saskatchewan ▪ Manitoba ▪ Ontario ▪ Québec ▪ New Brunswick ▪ Nova Scotia ▪ Newfoundland 	<ul style="list-style-type: none"> ▪ California ▪ New York ▪ North Carolina ▪ Texas ▪ New Mexico ▪ Louisiana ▪ Illinois ▪ Hawaii ▪ Montana ▪ Idaho ▪ South Carolina ▪ Virginia ▪ Washington ▪ New Jersey

5.2 Preliminary Data Analysis

The preliminary data analysis involved examining the data and relationships amongst different variables through basic plots, summary statistics (e.g. average annual growth), and rank-order tables.

5.2.1 Visual Examination of the Correlation Between Production Spending and Tax Credits

Figure 5-2 plots total film/TV production spending before and after the implementation of a tax credit programme for a number of states and provinces, where data was available before and after the tax credit introduction.

British Columbia. BC experienced consistent growth in production spending during the early 1990s. There appears to be an increase in the production growth rate following the introduction of the tax credit for two years, before production growth slows then declines in 2001.

Ontario. Much like B.C., Ontario has also experienced consistent production spending growth since the early 1990s. Spending increased immediately after their tax credits were introduced, but levels off two years after the implementation.

Québec. A production service tax credit was introduced in 1997 (the domestic tax credit was introduced in 1991). For the two years following the production service tax credit implementation, production spending increased significantly before slowing in 2000.

Newfoundland. Newfoundland introduced its 40% labour tax credit in 1999. Production spending has been fairly varied in the years following, with little discernible upward trend.

New Mexico. New Mexico's peak in production spending occurred in 1994. Since 1994, production spending has fallen significantly. 2002 marks New Mexico's lowest year of production spending and was also the year when the state implemented its tax credit.

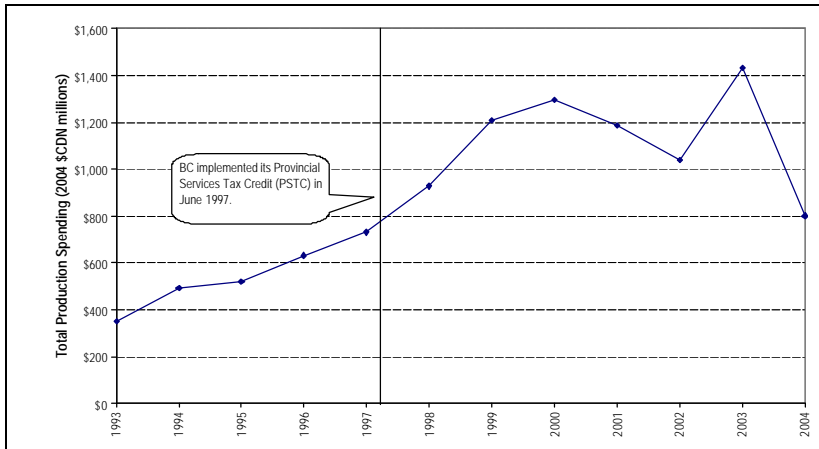
Hawaii. Hawaii production spending initially increased in 1998 after a 4% tax rebate was introduced in 1997. However, since 1998 annual production spending has been volatile and has decreased in alternate years.

Illinois. Illinois introduced its film tax credit at the beginning of 2004. After a sub-par 2003, the industry recovered in 2004.

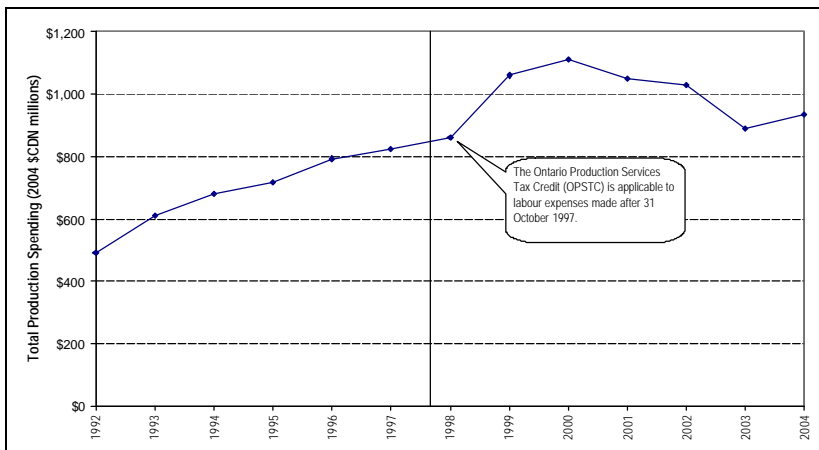
Louisiana. Film industry spending in Louisiana increased significantly after it introduced various tax credits. In the mid-to-late 1990s, the industry hovered around CDN\$30 million. However, since the tax credit was implemented in 2002 production jumped to approximately CDN\$250 million and CDN\$400 million in 2003 and 2005, respectively.

Figure 5-2: Production Spending in Provinces/States that have Implemented Tax Credits

British Columbia



Ontario



Québec

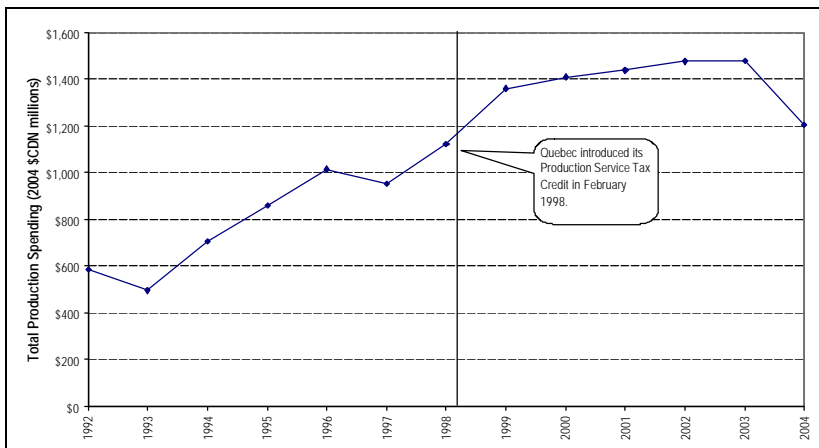
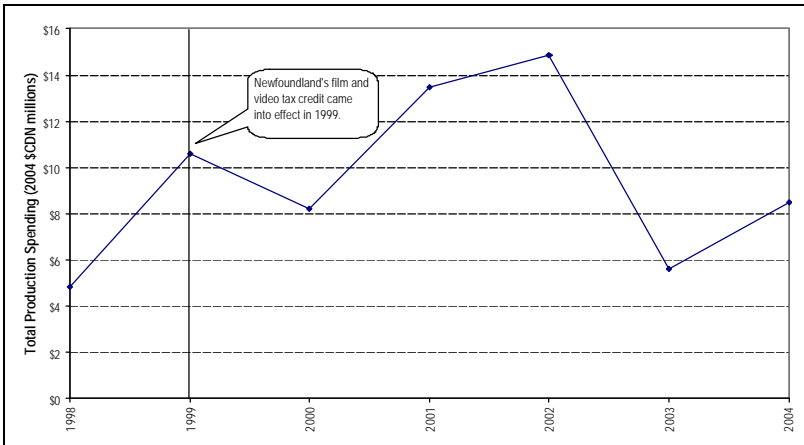
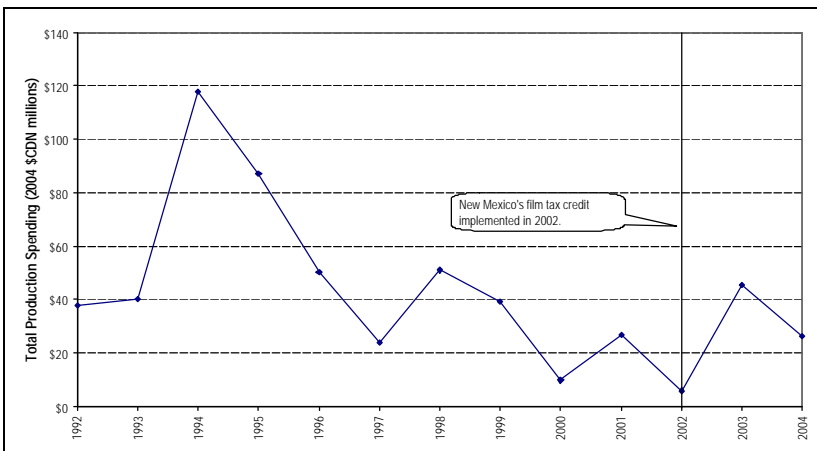


Figure 5-1 (continued)
Newfoundland



New Mexico



Hawaii

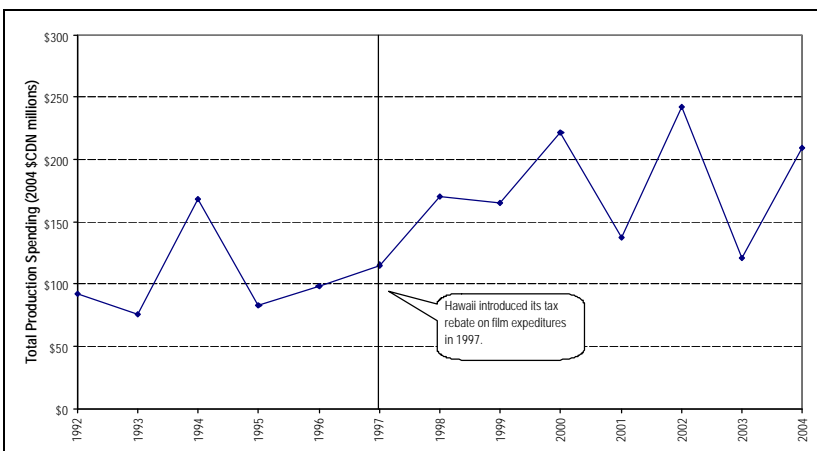
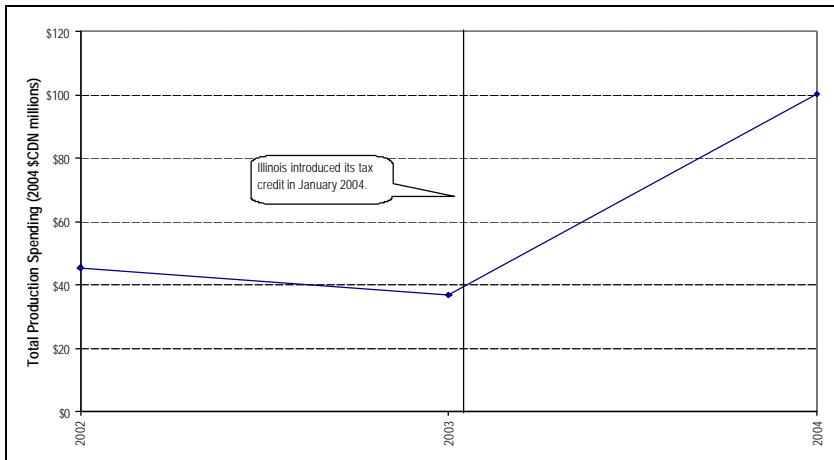
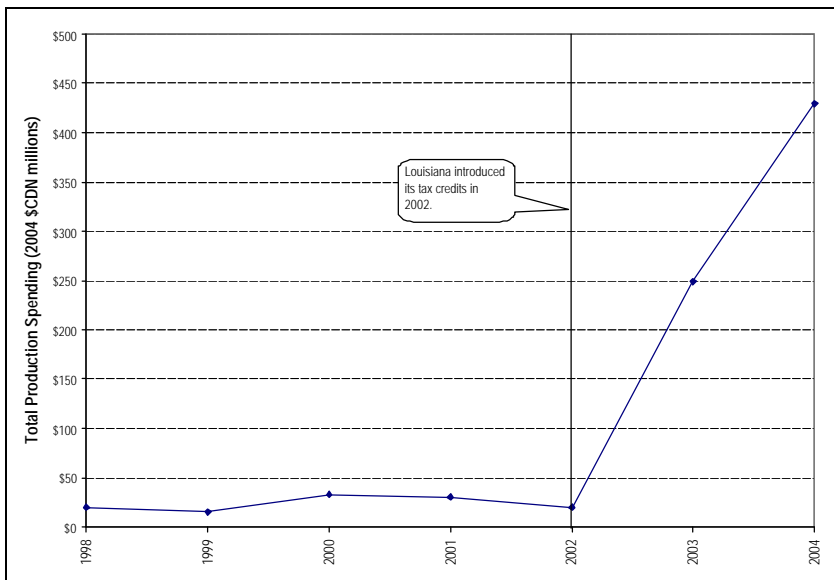


Figure 5-1 (continued)

Illinois



Louisiana



5.2.2 General Trends in Production Spending – Pre and Post Tax Credit Implementation

Figure 5-3 incorporates the information displayed in the plots from the previous section. For the specified sample period, the average annual growth in total film and television production spending is listed for the period before and after the provincial/state tax credit commenced.

It appears as though for Canada, growth in production spending has not been impacted by the tax credit. In the years following the implementation of the tax credit, the average growth is no greater than 1% for the Canadian provinces listed in the table (Ontario, Québec, B.C. and Newfoundland). In the U.S., for the states where data was available (Louisiana, New Mexico, Illinois and Hawaii), it appears as though production spending growth did increase following the introduction of the tax credit.

Figure 5-3: Average Annual Production Spending Growth, Before and After Tax Credit Implementation³⁴

Province/State	Average Annual Production Spending Growth	
	Pre-Tax Credit	Post- Tax Credit
Louisiana	-0%	601%
New Mexico	- 8%	176%
Illinois	- 19%	172%
Hawaii	5%	12%
Ontario	14%	1%
Québec	15%	1%
British Columbia	27%	-2%
Newfoundland	120%	-4%
Average (unweighted)	19%	120%

³⁴ All available data was utilised in these calculations. The data ranges from 1992 to 2004.

Figure 5-4 displays average growth rates in production spending following introduction of the tax credit in provinces and states that have implemented a tax credit. For comparison purposes, the table also presents the average growth rates for provinces and states where no tax credits have been implemented for the period of 1998 to 2004. The data indicates that the states exhibiting the highest growth rates were those that had implemented a tax credit.

Figure 5-4: Average Annual Production Spending Growth, 1998-2003

Province/State	Average Annual Production Spending Growth
Regions with tax credits (growth post tax credit)	
<i>Louisiana (2002-2004)</i>	601%
<i>New Mexico (2002-2004)</i>	176%
<i>Illinois (2003-2004)</i>	172%
<i>Manitoba (1998-2004)</i>	28%
<i>New Brunswick (1998-2004)</i>	6%
<i>Hawaii (1998-2004)</i>	4%
<i>Ontario (1998-2004)</i>	1%
<i>Québec (1998-2004)</i>	1%
<i>Saskatchewan (1998-2004)</i>	1%
<i>British Columbia (1998-2004)</i>	-2%
<i>Nova Scotia (1998-2003)</i>	-3%
<i>Newfoundland (1999-2004)</i>	-4%
<i>Alberta (1998-2004)</i>	-2%
Average	75%
Regions without tax credits	
<i>California (1998-2004)</i>	4%
<i>North Carolina (1998-2004)</i>	1%
<i>New York (1998-2004)</i>	0%
<i>Texas (1998-2004)</i>	-3%
<i>Utah (1998-2004)</i>	-8%
<i>Virginia (1998-2003)</i>	-17%
Average	-4%

5.2.3 Rank-Order Analysis

In addition to analysing the data based on simple averages and plots, several rank-order analyses were conducted.

5.2.3.1 Rank-Order Analysis: Introduction

Rank-order analysis is one of the most commonly used methods of computing a correlation coefficient between the ranks of scores on two variables. In this type of analysis, variables are ranked on an ordinal scale. The ranks of two different variables are compared for all observations (in this case provinces and states) in an attempt to determine if a relationship exists between the ranking of the two variables.

For example, one could examine the relationship between educational attainment and income. **Figure 5-5** contains some hypothetical data relating several individuals' income levels with the number of years of post-secondary education achieved.

Figure 5-5: Data - Income vs. Education

Name	Income	Number of years of post-secondary education
Jim	\$ 50,000	4
Fred	\$30,000	0
Kim	\$ 100,000	8
Peter	\$ 35,000	2
Danielle	\$ 60,000	6
Tom	\$ 100,000	10
Chris	\$ 25,000	0
Lisa	\$ 45,000	5
Tyler	\$ 80,000	7

Based on the data in the table above, ranks can be assigned for each variable and then the observations can be placed in order based on one of the variables. In **Figure 5-6**, the various individuals are ranked, and then ordered based on income.³⁵ From this rank-order table, it appears as though there is a positive relationship between income and education; the more years of education, the higher the income.

³⁵ An income rank of 1 refers to the individual(s) with the highest income, and a education rank of 1 refers to the individual(s) with the most years of post-secondary education.

Figure 5-6: Rank-Order Table – Income vs. Education

Name	Income	Education (# of years of post-secondary education)
Kim	1	2
Tom	1	1
Tyler	3	3
Danielle	4	4
Jim	5	6
Lisa	6	5
Peter	7	7
Fred	8	8
Chris	9	8

The culmination of a rank-order analysis involves calculating a correlation coefficient. The most common correlation coefficient used when examining ordinal data is the Spearman rank-order correlation coefficient (R_s):

$$R_s = 1 - (6 \cdot SD^2 / N(N^2 - 1));$$

Where N= number of observations and D= the difference between the two ranks

For this example, the Spearman correlation coefficient is equal to 0.975 and is statistically significant. This suggests a robust positive relationship exists between education and income with this hypothetical data.

5.2.3.2 Rank-Order Analysis: Production Spending vs. Tax Credit

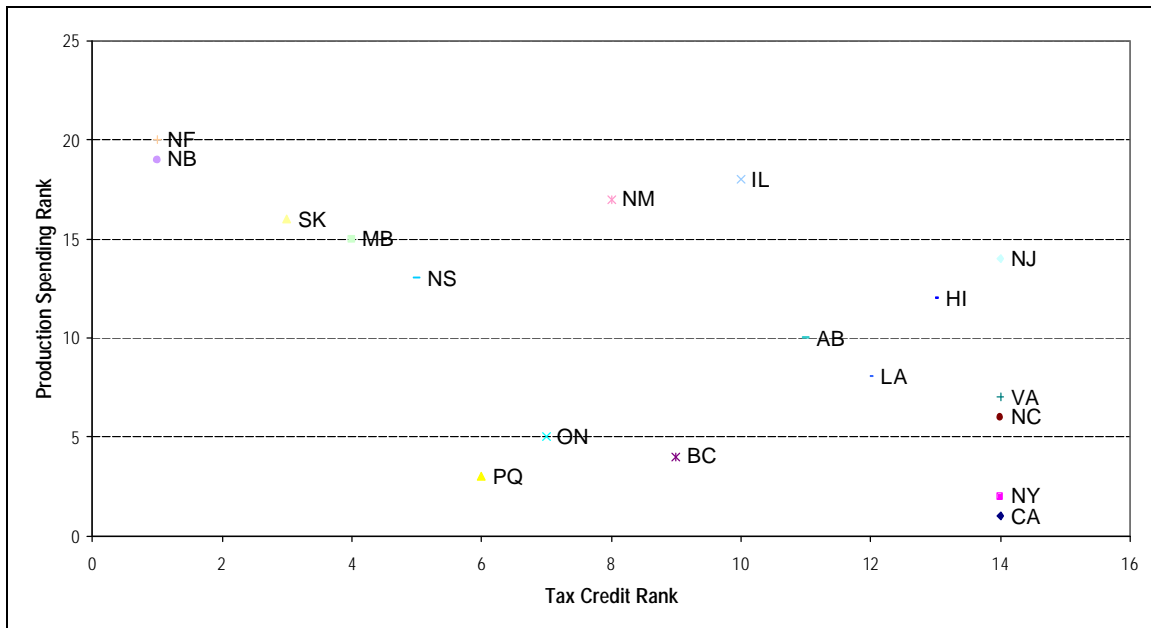
To further examine the relationship between production spending and the level of tax credit offered, two separate rank-order analyses were performed for the same group of provinces and states listed above. The first compares the province/state's 2003 total production spending rank with their 2003 tax credit rank, and the second compares the 1998-2003 average annual production spending growth rank with the tax credit rank.

Average Production Spending vs. Tax Credit Offered, 2003

In **Figure 5-7**, the production rank and corresponding tax credit rank of each region is listed; these rankings are also plotted in **Figure 5-8**.

Figure 5-7: Rank-Order, Total Production Spending vs. Tax Credit - 2003

Province/State	Total Production Spending Rank	Tax Credit Rank
California	1	14
New York	2	14
Québec	3	6
British Columbia	4	9
Ontario	5	7
North Carolina	6	14
Virginia	7	14
Louisiana	8	12
Texas	9	14
Alberta	10	11
Utah	11	14
Hawaii	12	13
Nova Scotia	13	5
New Jersey	14	14
Manitoba	15	4
Saskatchewan	16	3
New Mexico	17	8
Illinois	18	10
New Brunswick	19	1
Newfoundland	20	1

Figure 5-8: Rank-Order, Total Production Spending vs. Tax Credit Offered, 2003

From the rank-order table and corresponding plot displayed above, it appears as though total production spending is not directly correlated with the level of tax credit offered. If a relationship did exist, it would be expected that the data points in the above plot would lie on the diagonal through the origin. The Spearman correlation coefficient associated with these two variables' ranks is equal to -0.548 and statistically significant. However, the negative coefficient indicates that regions with lower production generally have higher tax credits. The relationship appears to reflect the fact that regions with low levels of film/TV production often provide more attractive tax credits in order to attract more productions.

After examining the relationship between total production spending and the level of tax credit offered through the rank-order analysis, the data in this form provides little evidence to support the idea that higher tax credits lead to higher production spending. However, the total spending figure limits the analysis due to the fact that certain provinces and states have historically higher or lower production spending than others. A more appropriate analysis involves comparing production spending *growth* with the level of tax credit offered, as described below.

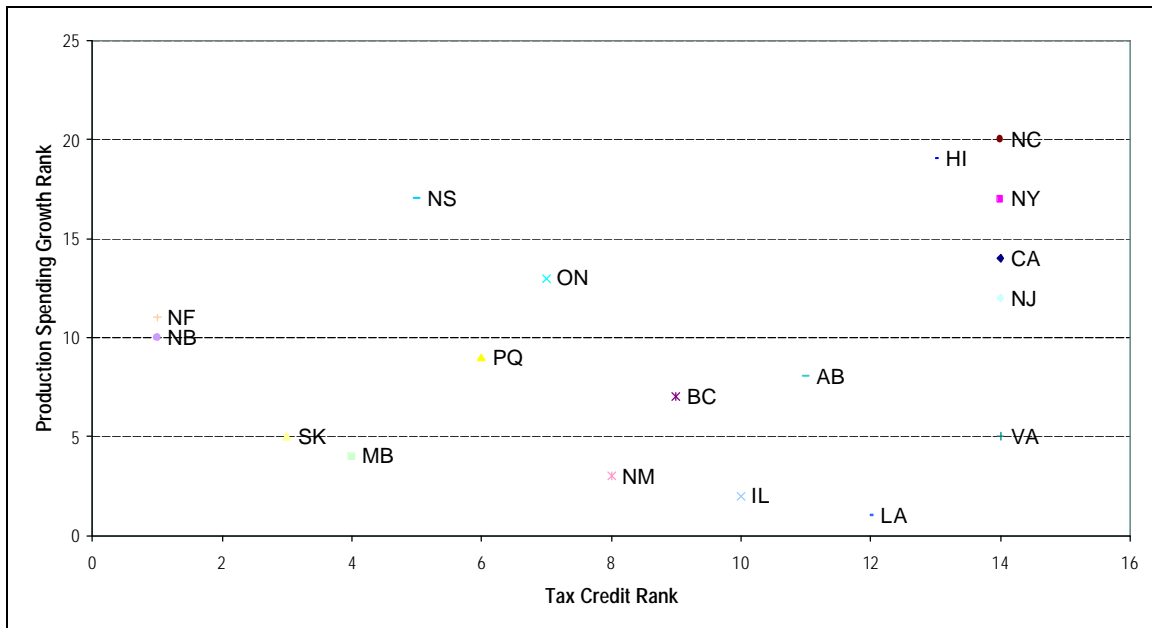
Average Production Spending Growth (1998-2003) vs. Tax Credit Offered (2003)

Figure 5-9 presents each region's 1998-2003 production spending growth rank and corresponding 2003 tax credit rank. This data is also plotted in Figure 5-10.

Figure 5-9: Rank-Order, Total Production Spending Growth vs. Tax Credit, 2003

Province/State	Total Production Spending Growth Rate Rank	Tax Credit Rank
Louisiana	1	12
Illinois	2	10
New Mexico	3	8
Manitoba	4	4
Saskatchewan	5	3
Virginia	5	14
British Columbia	7	9
Alberta	8	11
Québec	9	6
New Brunswick	10	1
Newfoundland	11	1
New Jersey	12	14
Ontario	13	7
California	14	14
Texas	15	14
Utah	16	14
New York	17	14
Nova Scotia	17	5
Hawaii	19	13
North Carolina	20	14

Figure 5-10: Rank-Order, Total Production Spending Growth vs. Tax Credit, 2003



A regression analysis relating the tax credit ranking to the production spending growth rank was estimated to determine if a trend could be identified. The results of this regression are displayed in **Figure 5-11**.

Figure 5-11: Regression of Production Growth Rank on Tax Credit Rank

Variable (Dependent Variable = Production Growth Rank)	Coefficient (Standard error)
<i>Constant</i>	6.674 (2.931)
<i>Tax Credit Rank</i>	0.396 (0.280)

The coefficient on the tax credit rank variable is positive, which suggests a positive relationship between the level of tax credit offered and production spending growth. However, the t-statistic for this coefficient is low, suggesting the result is statistically weak. The Spearman correlation coefficient reinforces the results of the regression, providing a positive (0.378) but insignificant estimate.

In this form, the data does provide some indication, albeit weak, that a relationship between production spending growth and the level of tax credit exists.

5.2.3.3 Rank-Order Analysis: Production Spending vs. Average Effective Wage

When discussing the various variables that are likely to have an impact on the level of production spending, the average industry wage must be taken into consideration. It is expected that productions are more likely to set up in provinces and states that offer lower wages. Below-the-line wages are a significant component of a production's cost structure, thus merit significant attention when making location decisions.

Thus, in addition to the relationship between production spending and the tax credit, we also examined the relationship between production spending and average industry wage. More specifically, we examine the average effective wage, which incorporates the average industry wage with the exchange rate and the level of labour tax credit offered. Using the average effective wage allows comparisons of the actual labour costs across different provinces and states:

$$\text{Average Effective Wage} = \text{Average Wage (in local currency)} * \text{exchange rate} * (1 - \text{labour tax credit});$$

The following table provides some summary statistics linking production spending with the average effective wage. For the period of 1998 to 2003, the average level of production spending, the average annual growth in production spending, the average effective wage, and the average annual growth in the effective wage are displayed for three separate groupings. The three groups are:

- California and New York;
- Provinces and states that have implemented a tax credit pre-2004; and
- Provinces and states that have yet to implement a tax credit.

Figure 5-12: Summary Statistics – Production Spending and Average Effective Wages, 1998-2003

Grouping	Average Production Spending (2004 \$CDN millions)	Average Annual Production Spending Growth	Average Effective Wage	Average Annual Effective Wage Growth
<i>California & New York</i>	\$ 16,822	-2%	\$ 70,292	2%
<i>Tax Credits</i>	\$ 366	74%	\$ 22,380	-3%
<i>No Tax Credits</i>	\$ 219	2%	\$ 50,515	-1%

It is apparent from **Figure 5-12** that regions that have introduced tax credits have experienced the lowest average annual wage growth and highest average annual production spending growth over the period.

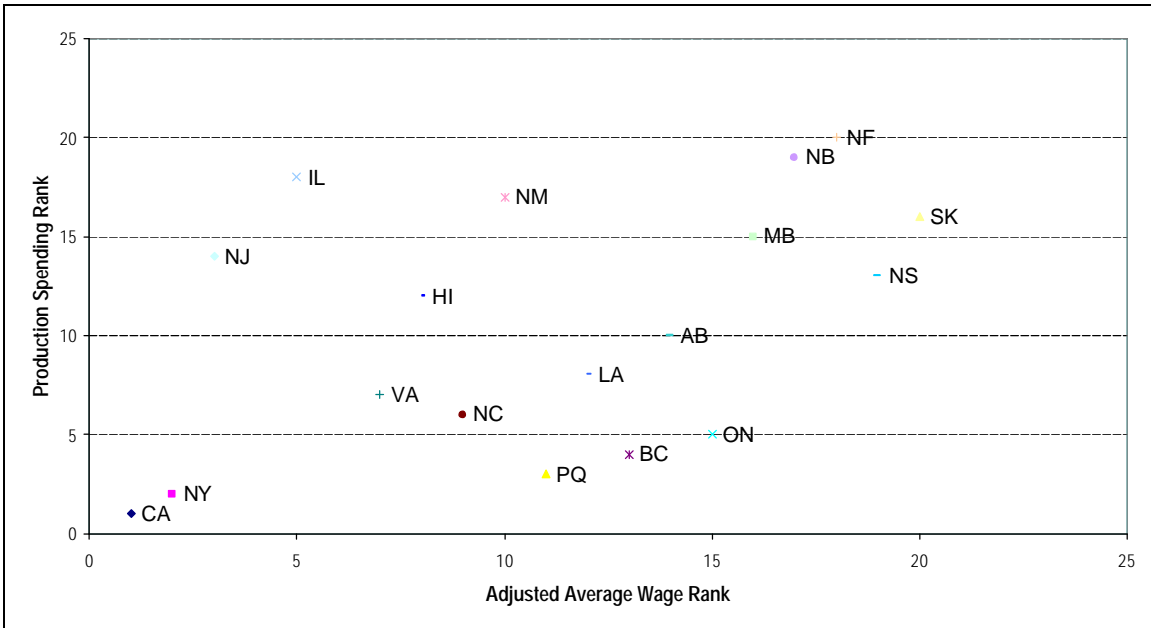
Total Production Spending vs. Average Effective Wage, 2003

In the following rank-order analysis, we examine the relationship between the average effective wage and production spending. **Figure 5-13** displays the production spending rank and corresponding average effective wage rank. A scatter-plot displaying each province/state's ranks is presented directly below the table, in **Figure 5-14**.

Figure 5-13: Rank-Order, Total Production Spending vs. Average Effective Wage, 2003

Province/State	Total Production Spending Rank	Average Effective Wage Rank
California	1	1
New York	2	2
Québec	3	11
British Columbia	4	13
Ontario	5	15
North Carolina	6	9
Virginia	7	7
Louisiana	8	12
Texas	9	6
Alberta	10	14
Utah	11	4
Hawaii	12	8
Nova Scotia	13	19
New Jersey	14	3
Manitoba	15	16
Saskatchewan	16	20
New Mexico	17	10
Illinois	18	5
New Brunswick	19	17
Newfoundland	20	18

Figure 5-14: Rank-Order, Total Production Spending vs. Average Effective Wage, 2003



From the scatter-plot above, it is difficult to identify if a relationship exists between the average effective wage and production spending. To examine this further, a regression was run, and results are displayed in **Figure 5-15**.

Figure 5-15: Regression of Production Spending Rank on Average Effective Wage Rank, 2003

Variable (Dependent variable = Production Spending Rank)	Coefficient (Standard error)
<i>Constant</i>	6.000 (2.551)
<i>Average Effective Wage Rank</i>	0.429 (0.213)

The results of this rank-order analysis, comparing the production spending rank with the average effective wage rank, indicate that the average effective wage is positively correlated with the production spending rank – there is more production in higher wage regions than lower wage regions. The Spearman correlation coefficient is also positive, suggesting a positive relationship. Again, this result may reflect the fact that the highest production regions have the lower (or no) tax credits and sometimes have the highest wages.

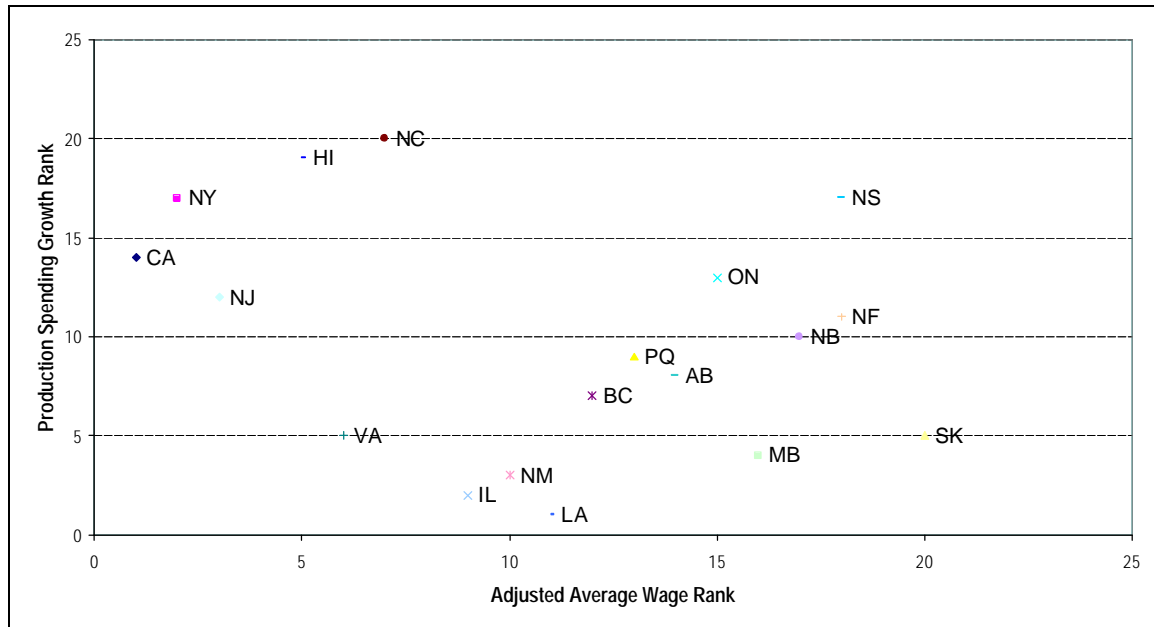
Total Production Spending Growth (1998-2003) vs. Average Effective Wage (2003)

This rank-order analysis examines the relationship between the average effective wage and production spending growth. **Figure 5-16** displays the production spending growth rank and corresponding average effective wage rank. A scatter-plot displaying each province/state's ranks is presented in **Figure 5-17**.

Figure 5-16: Rank-Order, Total Production Spending Growth (1998-2003) vs. Average Effective Wage (2003)

Province / State	Total Production Spending Growth Rank	Average Effective Wage Rank
Louisiana	1	11
Illinois	2	9
New Mexico	3	10
Manitoba	4	16
Saskatchewan	6	20
Virginia	5	6
British Columbia	7	12
Alberta	8	14
Québec	9	13
New Brunswick	10	17
Newfoundland	11	18
New Jersey	12	3
Ontario	13	15
California	14	1
Texas	15	8
Utah	16	4
New York	17	2
Nova Scotia	18	18
Hawaii	19	5
North Carolina	20	7

Figure 5-17: Rank-Order, Total Production Spending Growth (1998-2003) vs. Average Effective Wage (2003)



The scatter-plot does not reveal any obvious relationship between production spending growth and average effective wage. To further investigate this relationship, the Spearman correlation coefficient was calculated. The coefficient is equal to -0.323 , signalling a negative relationship which is logically correct, however the efficient is statistically weak.

Therefore, the results of our four rank-order analyses provide inconclusive evidence on the relationship between production spending and the level of tax credit offered and the average effective wage. To further analyse the relationships examined in the rank-order analyses several detailed regression models were estimated.

5.3 Econometric Analysis

5.3.1 Introduction to Regression Analysis

Regression analysis is used to investigate relationships between certain variables of interest. It is a statistical tool that researchers use to examine the causal effect of one or more variables on another.

Suppose one wishes to investigate the relationship between income and education. Specifically, they would test whether income increases with educational attainment. The regression equation would be written as follows:

$$\text{Income} = a + \beta \cdot \text{Educ} + e$$

Where:

Income = income earned (this variable on the left hand side of the equation is also referred to as the 'dependent' or 'endogenous' variable);

Educ= the number of years of schooling attained (this variable on the right hand side of the equation is also referred to as the 'independent' or 'exogenous' variable);

a = a constant level of income (what an individual would earn without any education);

β = the effect (in dollars) of an additional year of schooling on income;

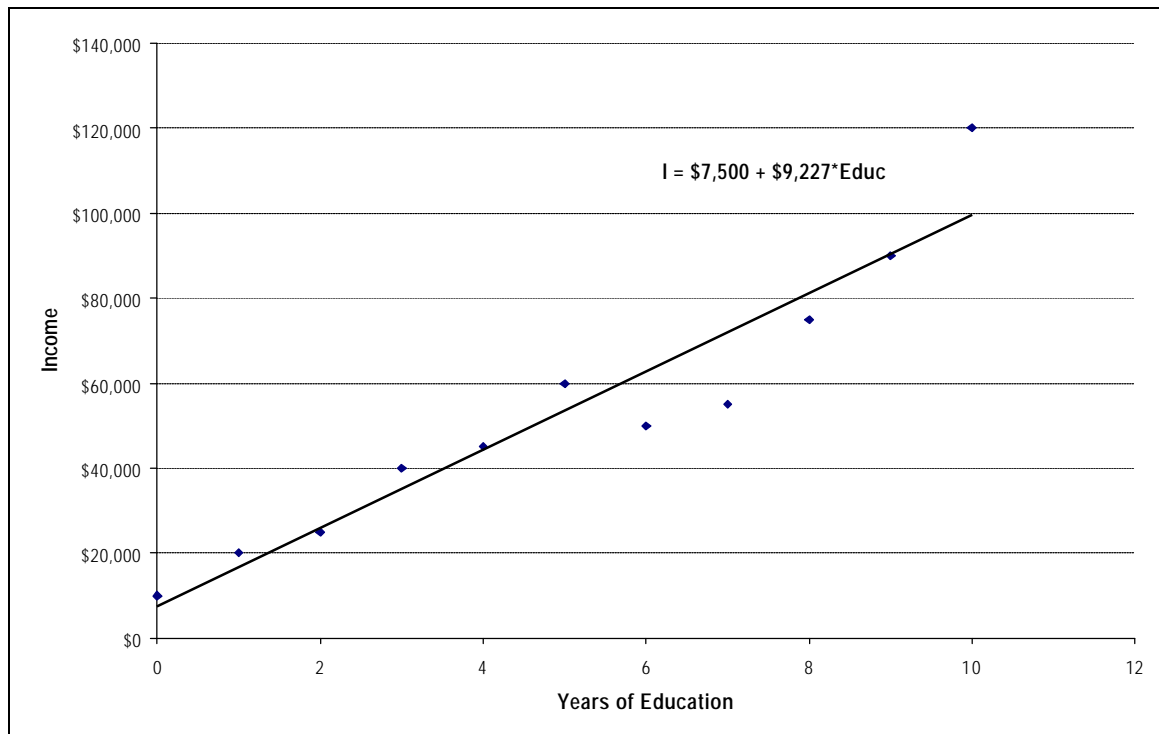
e = error term;

Regression analysis uses information on the relationship between Income and Educ, and assumptions about the error term, to produce estimates of the parameters a and β . The equation above relating earnings and education reflects a line, where the constant is the y-axis intercept and β represents the slope of the line. The task of estimating the two parameters involves fitting this line based on the observations of income and education. The plot in **Figure 5-18** displays various data points which reflect the various income-education observations.

Based on the fitted line in Figure 5-18, the estimated regression equation is:

$$\text{Income} = \$7,500 + \$9,227 \cdot \text{Educ}$$

The \$7,500 estimate of the constant suggests that an individual without education earns on average, \$7,500. The positive estimate of β reflects the positive relationship between education and income (i.e. income increases with additional educational attainment). The specific coefficient suggests that for every additional year of education, the individual earns an additional \$9,227.

Figure 5-18: Basic Regression, Income vs. Education

Based on hypothetical data.

In addition to the coefficient estimates, there are a number of statistical indicators used to assess the performance of the regression analysis:

- *Adjusted R-Squared.* Provides an indicator as to how well the estimated regression equation explained the variation in the dependent variable (sometimes referred to as the statistical fit). A value of 1 would indicate that the regression equation perfectly explained the variation in the dependent variable, while a value close to zero would indicate that the regression equation was a poor fit.
- *T-Statistic.* A t-statistic is calculated for each coefficient estimate (e.g., α and β) based on its standard error. This statistic gives an indication of whether the estimated coefficient is significantly different from zero or, in other words, whether the variable to which coefficient applies had any measurable impact on the dependent variable. Broadly speaking, absolute t-statistics above two (2) indicate that the estimated coefficient is significantly different from zero.

This is a basic example of linear regression, with hypothetical data, but it provides a brief overview of how regression analysis can be utilised. Regression models can be considerably more complex and are employed to examine multiple relationships (i.e. there are several independent variables), and may employ alternative functional forms (e.g. logarithmic).

5.3.2 Econometric Analysis of Film/TV Industry Data

This section describes the results from several regression analyses of film/TV industry data that was collected. The models used data from nine provinces (BC, AB, SK, MB, ON, PQ, NB, NS and NF) and 11 U.S. states (CA, NY, NC, TX, LA, NM, IL, NJ, HI, VA and UT), representing the larger film production jurisdictions. In total, the model is made up of 201 observations from the various provinces and states. The dependent variable in each case was the log of total production dollars in each state/province adjusted for inflation (converted in 2004 dollars). All models were estimated using logged linear formulation,³⁶ via the two-stage least squares (2SLS) estimation method.³⁷

All the models included the following explanatory variables:

- Constant.
- A dummy for each year from 1993 to 2004 (dummies were relative to 1992). These dummies picked up the general trends affecting the industry as a whole (e.g., economic cycle, trends towards different types of production, etc).
- A dummy for each state or province (dummies were relative to BC). These picked up the historical and structural reasons for production levels in each region that were not explained by other variables. For example, California has the highest production level because it has long been the centre for motion picture production in the U.S., a fact not related to its labour rates, tax regime or any other quantifiable factor. This dummy would also pick up materials/supplies cost differences that we were unable to capture using a CPI variable.

Wage Rates, Exchange Rates and Tax Credits

This first model incorporated the following explanatory variables in addition to the dummies and constant described above and related them to production spending:

- Average film industry wage in 2004 dollars in local currency;
- The U.S.\$ / Can\$ exchange rate – this was set to unity for the U.S. states and to the average annual exchange rate value for the Canadian provinces.
- Tax credit included as percentage of labour costs. BC, Québec and Ontario have different tax credit rates for domestic and international productions. For these provinces a weighted average of the two tax credit rates was used, weighted by domestic and international production.

The results of this regression are provided in **Figure 5-19**. The table provides the coefficient estimates for the three variables of interest, as well as the constant and all dummy variables

³⁶ Models were also estimated using straight levels (i.e., unlogged) and change in levels but found to have poorer fits.

³⁷ Two stage least squares is used when a specified model has an endogeneity problem (when an independent variable is endogenous). In our models, industry wages are included as independent variables and are also endogenous. It is true that wages impact production spending, but production spending also influences wages. This circular relationship requires that wages be instrumented for in the models. The two-stage least squares estimation process takes this endogeneity into account and instruments for adjusted wages with population, income per capita and unemployment.

included in the regression model. The adjusted R-square for this model was 0.949, indicating that model represented a fairly good fit for the data.

The results of this model provide some support to the hypothesis that tax credits lead to increased levels of film/TV production. The coefficient on the tax credit variable (0.401) is positive, indicating that jurisdictions with higher tax credits attract more production, all else being equal. However, the t-statistic is 0.5, indicating that the evidence is weak at best.

While the coefficient on the tax credit is statistically weak, part of the problem may be the lack of variation in the tax credit data. British Columbia, Ontario and Québec all introduced their tax credits around the same time and, in effect, may have cancelled each other out. For example, if Québec had introduced a tax credit and BC and Ontario had not responded, we might have seen a shift in production to Québec – an outcome the regression analysis may have picked more strongly. Instead, all three provinces moved together and maintained their market share. For the smaller provinces we were unable to obtain much before-and-after data (most of the data is for the period after the tax credit was introduced) and the U.S. states have only recently introduced tax credits in most cases, and so there may be insufficient data to determine the impact of the tax credits. Therefore, most of the tax credit effect seems to be captured by the difference between regions with tax credits and those without, and the analysis suggest there is evidence, albeit weak, that jurisdictions with tax credits attract more film/TV production than jurisdictions without tax credits.

In this regression estimation, the exchange rate coefficient is negative (-3.677) and statistically significant (the t-statistic is greater than two), indicating that the recent appreciation in the Canadian dollar has negatively impacted on the Canadian film/TV industry even accounting for background industry trends. The wage rate coefficient is negative, suggesting that, all else being equal, regions with higher labour rates are less attractive locations to film in.

With respect to the dummy variables, all year and state/province dummy variable coefficients appear logical. The year dummies are relative to 1992. The dummies are positive and increase in size from 1993 to 2001 indicating that overall production levels increased over the 1990s. The province dummies are relative to BC. The dummies for California and New York are positive and fairly large reflecting the historically larger volumes of production conducted in these states relative to BC. The coefficient estimates for jurisdictions such as Newfoundland and New Brunswick are negative, reflecting that these are smaller production centres than BC. The dummy for Ontario is fairly small and statistically weak suggesting that, after allowing for tax credit and wage rate differences, BC and Ontario attract similar volumes of production.

Figure 5-19: Regression Results for Production Spending with Wage Rates, Exchange Rates and Tax Credits (2SLS Estimation)

Independent Variable	Coefficient	Standard Error	t-statistic
<i>Constant</i>	42.961	12.382	3.470
<i>Log average wage (\$ local currency)</i>	-1.993	1.219	-1.635
<i>Exchange rate (US\$/CDN\$)</i>	-3.677	1.662	-2.212
<i>Tax credit -labour (%)</i>	0.401	0.715	0.500
<i>1993 dummy</i>	0.043	0.239	0.181
<i>1994 dummy</i>	0.258	0.236	1.091
<i>1995 dummy</i>	0.276	0.233	1.185
<i>1996 dummy</i>	0.295	0.230	1.283
<i>1997 dummy</i>	0.281	0.228	1.235
<i>1998 dummy</i>	0.386	0.241	1.603
<i>1999 dummy</i>	0.516	0.240	2.152
<i>2000 dummy</i>	0.404	0.241	1.674
<i>2001 dummy</i>	0.511	0.246	2.075
<i>2002 dummy</i>	0.406	0.261	1.558
<i>2003 dummy</i>	0.656	0.245	2.673
<i>2004 dummy</i>	0.749	0.259	2.894
<i>Alberta dummy</i>	-2.054	0.276	-7.452
<i>Saskatchewan dummy</i>	-3.437	0.329	-10.453
<i>Manitoba dummy</i>	-2.719	0.277	-9.823
<i>Ontario dummy</i>	0.118	0.185	0.637
<i>Québec dummy</i>	0.859	0.471	1.825
<i>New Brunswick dummy</i>	-4.083	0.305	-13.401
<i>Nova Scotia dummy</i>	-2.456	0.309	-7.949
<i>Newfoundland dummy</i>	-4.083	0.286	-17.170
<i>California dummy</i>	5.631	0.781	7.209
<i>Hawaii dummy</i>	-0.079	0.578	-0.137
<i>Louisiana dummy</i>	-1.591	0.495	-3.214
<i>Illinois dummy</i>	-1.080	0.639	-1.692
<i>New Jersey dummy</i>	-0.411	0.621	-0.661
<i>New Mexico dummy</i>	-1.481	0.587	-2.521
<i>New York dummy</i>	4.289	0.719	5.966
<i>North Carolina dummy</i>	0.983	0.507	1.937
<i>Texas dummy</i>	-0.008	0.500	-0.017
<i>Utah dummy</i>	-0.041	0.545	-0.075
<i>Virginia dummy</i>	-0.081	0.537	-0.151

Average Effective Wage

In an attempt to develop a more robust model, an alternative formulation was attempted. All three variables – exchange rate, wage rates and tax credits – are components of the cost of film/TV production. This suggests that they should have a similar impact on production location decisions. Therefore, they were combined into a single variable – the average effective wage, already described in Section 5.2.3, the average wage in 2004 Canadian dollars after applying the tax credit. Logged production was regressed against this variable along with the dummies and constant already discussed. The key results of the regression estimations are provided in **Figure 5-20**. Full estimation results for this and the other remaining regressions can be found in **Appendix C**.

Figure 5-20: Regression Results with the Average Effective Wage (2SLS Estimation)

Model/Variable	Coefficient	Standard Error	t-statistic
<i>Constant</i>	31.642	4.424	7.152
<i>Log average effective wage</i>	-1.170	0.448	-2.610

For this model specification, the coefficient on the average effective wage is negative, as would be expected: locations with higher wage rates after adjusting for exchange rate and tax credits, are less attractive, all else being equal. The coefficient estimate is statistically significant in this model (the t-statistic is above 2). Thus, net labour costs (after tax credits and exchange rates), represented by the average effective wage, do appear to have an observable impact on production location decisions.

This model suggests that the elasticity of production with respect to effective wages is -1.17. So a 1% increase in the effective wage rate in a jurisdiction, after adjusting for exchange rate and tax credits, reduces the total dollars spent on film/TV production by 1.17%.

Average Effective Wage and the Tax Credit

Additional regression analysis was conducted incorporating the average effective wage and the tax credit in the explanatory variables. The aim of this analysis was to determine whether the tax credits had any impact above and beyond the dollar savings it provides. In other words, do tax credits act as a marketing tool, which can signal that a jurisdiction is film industry friendly? The results of this regression are provided in **Figure 5-21**.

With this model, the coefficients associated with the average effective wage and the tax credit are of the expected sign: increases in the effective wage lower production levels while increases in the tax credit increase production. However, the t-statistic on the tax credit dummy is low indicating that there is only weak evidence that tax credits have an impact beyond the labour cost savings provided. Again, this may be due to the lack of variation in the timing of the tax credits between Canadian provinces.

Figure 5-21: Regression Results with the Average Effective Wage and the Tax Credit (2SLS Estimation)

Model/Variable	Coefficient	Standard Error	t-statistic
<i>Constant</i>	30.354	8.061	3.766
<i>Log average effective wage</i>	-1.045	0.802	-1.304
<i>Tax credit dummy</i>	0.099	0.319	0.309

**Average Effective Wage and Additional Tax Credits:
Digital Animation/Visual Effects and Regional Tax Credits**

In addition to the basic labour tax credit offered in most jurisdictions, several Canadian provinces offer additional digital animation/visual effects and regional tax credits. **Figure 5-22** presents the results from a regression analysis that includes the average effective wage and dummy variables for both digital animation and regional tax credits. The results from this analysis are inconclusive. The sign on the digital animation coefficient is opposite to that which might be expected (it would be expected that the coefficient would be positive: the additional credit results in higher levels of production), and the coefficient efficient is statistically weak. The coefficient for the regional tax credit is positive, as might be expected, but is statistically weak.

Thus, the analysis does not provide any conclusive evidence that these tax credits result in additional production spending at the aggregate level.

Figure 5-22: Regression Results with the Average Effective Wage, Digital Animation Tax Credit and Regional Tax Credit (2SLS Estimation)

Model/Variable	Coefficient	Standard Error	t-statistic
<i>Constant</i>	31.235	6.222	5.020
<i>Log average effective wage</i>	-1.136	0.622	-1.827
<i>Digital animation tax credit dummy</i>	-0.191	0.253	-0.753
<i>Regional tax credit dummy</i>	0.161	0.318	0.506

5.3.3 Summary of Additional Regression Analysis

In addition to the core regression analysis described above, various other formulations were estimated incorporating other explanatory variables. A summary of the results of these formulations are provided below.

- **Separate Canadian model.** The regression analysis of the average effective wage and tax credit was also conducted using only the Canadian data (i.e., data from the nine Canadian provinces). The model was estimated using domestic spending, service spending, and total spending as the dependent variable, all yielding inconclusive results. In most cases, the relevant coefficients were of a counter-intuitive sign and statistically weak. Thus, little conclusive evidence is provided by this analysis of just the Canadian data. This confirms the earlier assessment that most of the information on the impact of the tax credit is provided by the difference between regions with tax credits (i.e., Canadian provinces) and those without (i.e., the U.S. states, until recently).
- **Time trend.** A time trend variable is used to account for annual structural shifts. However, when incorporating a time trend variable, it is implicitly assumed that the change year-over-year is linear. The time trend variable was inserted in the model, but proved to be not as effective as incorporating specific year dummy variables.
- **SARS dummy variable.** The SARS outbreak of 2003, which occurred in Ontario, was reported to have had an impact on production in the province in that year. For this reason a dummy variable for this one year was included for the province of Ontario. The variable was included in numerous models, but proved statistically insignificant.
- **Dubbing tax credit dummy variable.** The province of Québec offers a dubbing tax credit to productions. This is a unique credit, so a specific dummy variable was included in an attempt to isolate the credit's impact. The coefficient on this dummy variable was not found to be statistically significant.
- **Cost of living (CPI used as a proxy).** In addition to labour costs, the exchange rate, and the level of tax credits, another factor that comes into play when production location decisions are made is the cost of general goods and services in the region that may be purchased by the production company. To proxy this cost, we used the consumer price index. However, implementing CPI into the model resulted in a statistically insignificant coefficient.
- **Sales tax exemption dummy variable.** Certain U.S. states offer sales tax and hotel tax exemptions for film productions. In addition, Alberta has no sales tax. To account for these factors, a dummy variable was included for these states and provinces, but did not prove to be statistically significant.
- **U.S. critical mass dummy variable (set to 1 for CA and NY).** Certain states have reached critical mass in the film industry. Critical mass is the scale or volume at which processes become self-perpetuating. With respect to the U.S., California and New York can be viewed as having reached a critical mass. Including a U.S. critical mass dummy results in the coefficient being insignificant, likely having to do with the state dummies already accounting for these specific impacts.

- **Canada critical mass dummy variable (set to 1 for BC, ON and PQ).** For Canada, the same logic regarding critical mass was applicable to BC, Ontario and Québec (albeit on a smaller scale than New York and California). However, the dummy was found to be statistically insignificant.

5.4 Assessment of the Econometric Analysis

The econometric analysis summarised in Table 5-14 revealed a production elasticity with regards to effective labour costs of -1.17 .³⁸ Each 1% increase in the effective cost of BC labour, after adjusting for the exchange rate and tax credit, reduces total production by approximately 1.17%.³⁹ This result indicates a high degree of sensitivity to production costs, especially given that BC-based labour costs typically account for between 40% and 60% of the total production spending in BC.⁴⁰ Based on an approximate average proportion of 50%, the elasticity of production with regards to all production costs can be calculated as follows:

$$-1.17 / 0.5 = -2.34$$
⁴¹

This suggests that a 1% increase in the overall cost of production of filming in BC would lead to a 2.3% decline in overall production spending in the province. This is indicative of a very high degree of sensitivity to costs and may reflect the substitutability of production locations. This would appear to support the anecdotal information provided in the stakeholder interviews that the industry exhibits great mobility in terms of production location.

Our conclusions, based on the econometric analysis, are:

- Econometric evidence generally supports the idea that tax credits do have an impact on production spending decisions. The results from our analysis finds a weak but positive relationship between tax credits and production spending levels.
- Likewise, we find a significant relationship between production spending and effective labour costs (after adjusting for exchange rate and tax credits), such that, all else being equal, productions will move to jurisdictions with lower effective wages.
- The analysis also indicated that there was a high sensitivity to labour costs, such that a 1% increase in effective labour costs reduces overall production by 1.17% (equally, a 1% reduction in labour costs increases overall production by 1.17%). The analysis would appear to support

³⁸ This elasticity can be seen as akin to a demand price elasticity, where demand is represented by production spending and price is represented by the effective labour rate.

³⁹ This is an approximation of the elasticity response. The econometric analysis uses a logarithmic formulation, so the relationship between the percentage change in effective wages and the percentage change in production is non-linear.

⁴⁰ Based on a review of sample budgets provided by BC producers and anecdotal information provided during the stakeholder interviews.

⁴¹ If labour costs are 50% of total production costs, then a 1% increase in BC labour costs represents a 0.50% increase in total production costs. If this 1% increase in labour costs results in a 1.17% decline in production, the production elasticity with regards to overall production costs can be approximately estimated as: $-1.17\% / 0.5\% = -2.34$.

the argument that film/TV production is highly mobile and will shift from one location to another on the basis of small differences in production costs.

- Our analysis was unable to conclusively determine whether tax credits have any impact above and beyond the dollar savings they provide (in other words, whether tax credits act as a marketing tool, which can signal that a jurisdiction is film industry friendly, as some stakeholders indicated).
- The econometric analysis did not reveal any statistical significant impact on overall production levels resulting from the digital animation or regional tax credits.
- We did find statistically significant evidence that production in BC and Canada is significantly impacted by exchange rate movements and that the recent appreciation in the Canadian dollar did negatively impact on production in Canada, including BC.

6.0 Costs, Benefits and Opportunity Costs of Tax Credits Offered to the Film and Television Industry in British Columbia

The econometric analysis described in Chapter 5 provided quantitative information on the sensitivity of the film/TV industry to tax credits, as well as other labour cost components such as exchange rates and wage rates. This analysis indicated that production location decisions are fairly sensitive to changes in the tax credit (and other labour costs), such that a one (1) percent reduction in labour costs in BC leads to a 1.17% increase in total film/TV production spending in the province. In other words, econometric analysis indicates that tax credits can increase the level of film/TV production spending in a jurisdiction.

However, to more fully evaluate the tax credits, it is necessary to undertake a broader assessment of the benefits, costs and opportunity costs associated with these tax credits. The primary focus of our analysis has been on the tax revenue implications for the provincial government. This analysis of tax revenues makes use of the economic impact and econometric analysis described previously, as well as other relevant sources.

In addition, at the end of this chapter consideration is given to costs and benefits associated with the film/TV production tax credits, beyond just the tax revenue implications. This analysis has been conducted using the Multiple Accounts Evaluation framework.

Most of the analysis and discussion provided below is based on the tax credits prior to the January 2005 increase, as there is currently limited data on production levels following the tax credit increase. So that the results are not overly impacted by selection of any particular year, the analysis of production spending and tax credit payments is based on five year averages (2000-2004 inclusive) *effective* to 2004 dollars (in line with the economic impact analysis in Section 3.2).

6.1 Fiscal Costs and Benefits: Taxes Paid and Tax Credits Received by the Film/TV Production Industry

The fiscal cost benefit analysis examined the taxes generated by film/TV productions in BC (the benefit) versus the tax credits provided to film/TV productions by the provincial government (the cost). The taxes generated by the film/TV industry are outlined in Section 3.5. In total, it is estimated that the film/TV industry generates \$121.0 million in tax revenues for the provincial government, as summarised in **Figure 6-1**.

Figure 6-1: Total Provincial Tax Revenues Generated by the BC Film/Television Industry

Tax Component	Amount Per Annum (\$ Million)
Personal income taxes	\$53.5 million
Consumption taxes on personal spending	\$22.5 million
Consumption taxes on production spending	\$36.3 million
Corporate income tax	\$8.7 million
Total tax revenues	\$121.0 million

The amounts provided by the provincial government in the form of tax credits to the film/TV production industry over the last five years are summarised in **Figure 6-2**.

Figure 6-2: Total Tax Credits Provided by the BC Government

Year	Film Incentive BC (Domestic)	Production Service Tax Credit (Foreign)	Total
2000/01	\$30.9 million	\$31.4 million	\$62.3 million
2001/02	\$11.8 million	\$47.0 million	\$58.8 million
2002/03	\$22.5 million	\$46.3 million	\$68.8 million
2003/04	\$23.9 million	\$28.9 million	\$52.8 million
2004/05*	\$27.0 million	\$43.0 million	\$70.0 million
<i>Average (in 2004 \$)</i>	<i>\$24.4 million</i>	<i>\$41.3 million</i>	<i>\$65.7 million</i>

Source: BC Film Annual Report and 2004/05 BC Government Budget. Totals include DAVE and regional tax credits, but not direct funding to BC Film.

* Budgeted amounts based on tax credit before the January 2005 increase.

The tax credit program, prior to recent tax credit increase, cost the BC government in the region of \$60-\$70 million per annum.⁴² It is clear from the tables above, that the film/TV industry generates provincial tax revenues in excess of the total tax credits provided. Based on five year averages of production and tax credit payment levels, the industry generates \$55.3 million more in tax revenues than it receives in tax credits. Therefore, there is a net benefit, in terms of tax revenues, to the BC government.

A similar cost benefit analysis was conducted for the domestic and service tax credits individually, which is provided in **Figure 6-3**.

⁴² With the recent tax credit increases, this total is expected to increase to at least \$100 million.

Figure 6-3: Cost Benefit Assessment of Film/TV Industry Provincial Tax Revenues

Production Type	Total Tax Credits Provided	Total Production Spending*	Taxes Generated	Net Tax Revenue Benefit
Domestic	\$24.4 million	\$257.4 million	\$30.4 million	+\$6.0 million
Foreign	\$41.3 million	\$893.5 million	\$90.6 million	+\$49.3 million
Total	\$65.7 million	1,150.9 million	\$121.0 million	+\$55.3 million

* Five year average

Both types of production generate tax revenues in excess of the tax credits paid. The production service tax credit provides the greatest net benefit, both in terms of total dollars received as well as return on credits provided (119% compared with 25% for the domestic credits).

6.2 Assessing the Opportunity Cost of the Tax Credit Program

The analysis in the previous section demonstrates that the film/TV industry is a net contributor to provincial tax revenues. However, this analysis does not address the issue of whether there is an opportunity cost associated with providing tax credits to the film and television production industry. Opportunity cost reflects what is sacrificed or forgone by undertaking a particular project or policy. By providing tax credits to the film/TV industry, the province may be forgoing tax revenues that could be used to undertake other projects or provide priority social services.

To assess whether there is an opportunity cost to providing tax credits to the film and television production industry, we have analysed the extent to which tax credits are necessary to attract film/TV production to BC. Consider, for example, the extreme situation where film/TV production is completely insensitive to the tax credits, so that removing the tax credits has no impact on the level of production. In this situation, there is an opportunity cost of \$65.7 million associated with the tax credits: the provincial government is spending \$65.7 million in tax credits to attract \$121.0 million in tax revenues that it would have received even without the tax credit. In this hypothetical case, this \$65.7 million could have been utilised by the provincial government for other purposes.

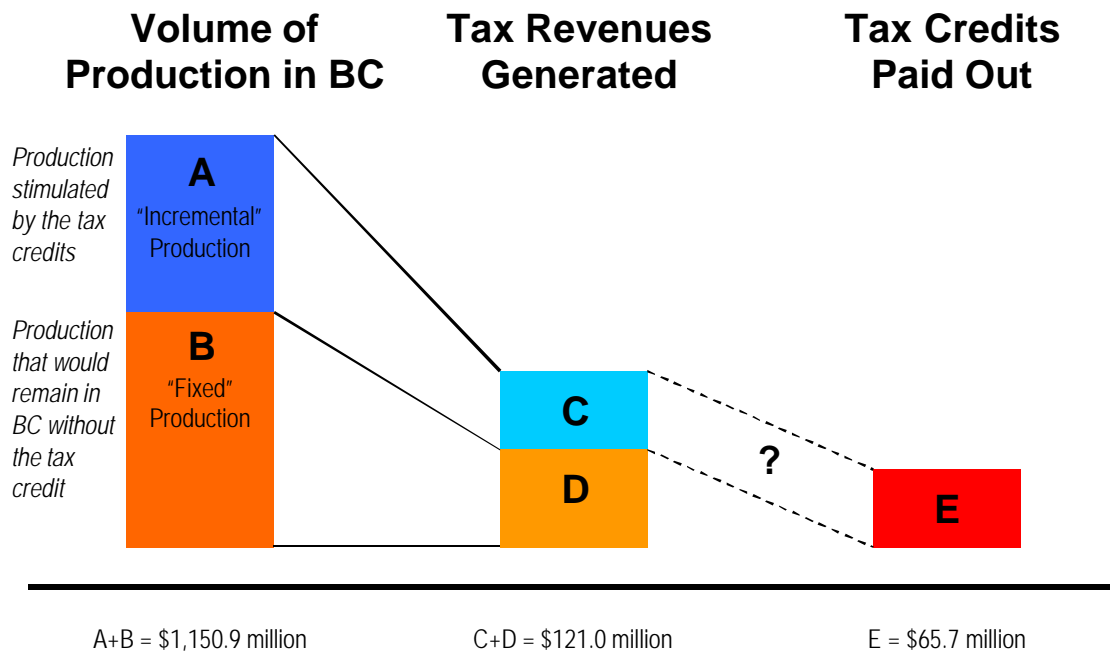
It is also worth considering the alternative extreme where, by removing the tax credits, all film/TV production ceases in BC. In this situation, our analysis indicates that there is a net revenue loss to the provincial government of \$55.3 million: by removing tax credits costing \$65.7 million, the government forgoes \$121.0 million in tax revenues. In this hypothetical case, eliminating the tax credits would be detrimental to total tax revenues.

The issue of assessing opportunity cost then becomes: how much film/TV production would be lost by removing the tax credits? (or, alternatively, how much additional film/TV production is attracted to BC as a result of the tax credits?). This is illustrated in **Figure 6-4**. A certain proportion of film/TV production would remain in BC even without the tax credit, represented by Area B – the “fixed” production. The remaining proportion of production is stimulated by the tax credits, represented by Area A – the “incremental” production. In the first example given above, where production levels are unaffected by the tax credits, Area A would be zero. In the second example,

where all film/TV production is lost by removing the tax credits, Area B would be zero. The reality is likely to lie somewhere between these two extremes.

The film/TV production generates tax revenues for the provincial government, represented by Areas C and D in Figure 6-4 (the tax revenues generated by the incremental and fixed productions, respectively). The assessment of opportunity cost considers whether the tax generated by the incremental film/TV production (Area C) is greater than the total sum of tax credits paid out by the provincial government, Area E. If Area C is greater than Area E, then there is a net benefit to the tax credit program, as the incremental production contributes more tax revenues than the provincial government pays out in total tax credits to attract that production. If Area E is greater than Area C then there is opportunity cost to providing the tax credit: the government receives less tax revenues from the incremental production that it is paying out in total for the tax credits.⁴³

Figure 6-4: Film and Television Production Tax Credit Opportunity Cost Assessment



It should be noted that this opportunity cost assessment assumes that the incremental production employs resources and labour that would otherwise be unemployed or underemployed and hence would not be contributing to provincial tax revenues. However, it is possible that some of the employment generated by the incremental production would be drawn from other industries, e.g., an electrician leaving the construction industry to work in the film industry. This displacement effect could have the impact of reducing the incremental tax revenues (Area C) as this displaced

⁴³ Even though not all of the tax credits are paid to the incremental productions, the tax credit payments to the fixed productions are unnecessary to attract this production, and therefore must be offset against the tax revenues generated by the incremental production. Ideally, the tax credit would be targeted at only the incremental productions, however, in reality this is nearly impossible to determine. We note that the tax credit program offered by Illinois requires production companies to demonstrate that the production would not film in Illinois without the tax credit (i.e., the tax credit alone makes filming in Illinois cheaper than filming in other jurisdictions). It is unclear to what extent this is accurately represented by the production companies.

employment was already contributing taxes (possibly at a different rate depending on relative wage rates). For example, the electrician was already paying provincial taxes on his/her work in the construction industry, so his/her move into the film industry does not generate additional tax revenues, except to the extent that his/her wage rate changes.

This displacement effect is most likely to occur when the provincial economy is at or close to full employment and net in-migration is low. To fully assess whether this is currently the case, and its impact on film/TV industry employment, would require a detailed and complex analysis of the BC economy, which is beyond the scope of this study. However, in this analysis we have assumed that the displacement effect from incremental production is negligible.

In this opportunity cost assessment, the relative size of Area A and Area B has been estimated by making use of the findings from the econometric analysis, summarised in the following section.

6.2.1 Opportunity Cost Assessment Based on the Econometric Analysis

As already discussed in Chapter 2, combined with the federal tax credits, the provincial tax credits discount the wage rates as follows (based on the tax credits prior to January 2005):

- Domestic: $\text{WageRate} \times (1 - 25\% - 20\%) = \text{Wage Rate} \times 55\%$
Fed. Credit Prov. Credit
- Foreign: $\text{WageRate} \times (1-16\%) \times (1-11\%) = \text{Wage Rate} \times 75\%$
Fed. Credit Prov. Credit

So the combined federal and provincial tax credits reduce the effective wage rate by 45% on domestic productions and 25% on foreign (service) productions. Removing the provincial tax credits impacts the effective wage rate as follows:

- Domestic: $\text{WageRate} \times (1-25\%) = \text{Wage Rate} \times 75\%$
Fed. Credit
- Foreign: $\text{WageRate} \times (1-16\%) = \text{Wage Rate} \times 84\%$
Fed. Credit

Therefore, removing the provincial tax credits increases the effective wage rate by 36% on domestic productions (75 / 55) and by 12% on foreign productions (84 / 75). Weighted by production, eliminating the tax credit increases BC labour costs by 18%. On the basis that BC labour costs account for approximately 50% of production spending in BC, this is equivalent to a 8.9% increase in overall production costs.

This is a considerably smaller increase than that which resulted from the increase in the value of the Canadian dollar between 2002 and 2004.⁴⁴ However, it is in the range that could impact on production location decisions, as indicated in the stakeholder interviews. In addition, the appreciation of the Canadian dollar also impacted on two of BC's main competitors, Ontario and Québec.

⁴⁴ The Canadian dollar appreciated by over 30% between January 2002 and December 2004. Source: Pacific Exchange Rate Service, Sauder School of Business, <http://fx.sauder.ubc.ca/>.

Applying the elasticity of -1.17 estimated in Section 5.3, we can estimate the loss of production resulting from the elimination of the provincial tax credits, summarised below:

Production Type	Effective Wage Increase	Elasticity	% Reduction in Production ⁴⁵	Dollar Reduction in Production ⁴⁶
Domestic	+36.4%	-1.17	-30.4%	\$78.3 million
Foreign (service)	+12.4%	-1.17	-12.7%	\$113.9 million
Total	+17.7%	-	-16.7%	\$192.2 million

Elimination of the tax credits is estimated to reduce overall production spending by \$192.2 million or 17% (equivalent to Area A). This suggests that 83% of film/TV production (\$958.7 million) would still remain in BC even without the tax credit (equivalent to Area B). Domestic production is estimated to lose the greatest proportion of productions (30%), largely because the tax credit offered to domestic production is higher (20% compared with 11% for service productions).

Assuming that tax revenues generated by the film industry decline by a similar proportion, remaining tax revenues (Area D) are estimated to be \$100.2 million, the result of a loss of \$20.8 million (16.7%) in tax revenues (Area C). The opportunity cost of the tax credits can therefore be assessed as follows:

Area C Taxes generated by incremental production	\$20.8 million
Area D Taxes generated by fixed production	\$100.2 million
Sub-total (C+D)	\$121.0 million
Area E Tax credits paid out	\$65.7 million
Opportunity Cost (E-C)	\$44.9 million

Based on the analysis above, the provincial government spends \$65.7 million on tax credits in order to attract incremental film/TV production generating \$20.8 million in tax revenues. Therefore, by providing the tax credits, the provincial government is forgoing \$44.9 million in net tax revenues. Based purely on tax revenues, there is an opportunity cost associated with providing the tax credits in the region of \$44.9 million.

⁴⁵ Estimated as follows: $(1 + \% \text{Wage Increase})^{\text{Elasticity}} - 1$. This produces a non-linear response to wage changes.

⁴⁶ Production spending \times % Reduction in Production. Production spending based on the five year average of \$1,150.9 million.

6.2.2 Limitations to the Opportunity Cost Assessment

The outcome of the assessment described above depends heavily on the sensitivity of film/TV production to changes in tax credits, represented by the elasticity estimated in Section 5.3. As discussed in that section, the estimated elasticity is largely based on the difference between production levels in Canadian provinces with tax credits and U.S. states without tax credits. The data does not contain an instance where a jurisdiction has lowered or removed its film/TV production tax credit.⁴⁷ Therefore, while based on the best data and model formulation available, the econometric analysis may not fully capture the impact of a jurisdiction unilaterally eliminating its tax credit.⁴⁸ There are number of reasons why film/TV production may exhibit greater sensitivity to the elimination of the BC tax credits than indicated by the estimated elasticity:

- Increasing numbers of U.S. states are offering substantial tax credits to film/TV production. Therefore, there is a greater selection of alternative locations where production companies can access tax credits if BC is no longer offering credits.
- Although the econometric analysis did not indicate that tax credits have any observable marketing effect, eliminating the tax credits may be interpreted by film/TV producers as an indicator that the BC government is no longer favourable to the industry.
- BC offers a greater pool of skilled labour and more developed infrastructure than many of the smaller provinces and states, such as Manitoba, Nova Scotia, Louisiana and New Mexico, which may enable BC to still compete with these regions even without a tax credit. However, New York has recently introduced tax credits and California appears to be in the process of enacting tax credits, both regions which have far larger and more mature industries than BC. Likewise, Ontario and Québec offer similar labour and infrastructure levels to BC.
- The film/TV production industry exhibits great mobility and the decision makers in Los Angeles and New York have very few sunk costs in BC (most of the film/TV infrastructure developed in BC is locally owned).
- While eliminating the tax credit may have a modest impact on production levels in the short-term, this loss may erode the industry's ability to maintain the critical mass of production necessary to support the current level of infrastructure and skilled labour. Over the long term, there may be a gradual decline in production levels resulting in a significantly smaller industry.
- Our analysis assumes that the response to the elimination of the tax credits would be a rational, economic response, similar to past behaviour. However, it is important to consider the possibility that there may be a strategic retaliatory response to the elimination of the tax credits by the BC government. The industry response from decision centres in Los Angeles, New York and elsewhere may be to drastically cut production in BC in order to "punish" the province. This action would serve as a warning to other jurisdictions about the implications of removing film/TV production tax credits. The industry certainly has the organisation and

⁴⁷ Going back 15 years, there does not appear to be an instance anywhere in North America where a jurisdiction has lowered or reduced a tax credit offered to the film/TV industry.

⁴⁸ As noted in Section 5.4, the elasticity derived from the econometric analysis is indicative of an industry that is highly sensitive to production costs. However, we have examined the impact on the opportunity cost analysis if the industry is indeed more sensitive than our analysis suggests.

strength to make such an action, as well as the ability to ensure that it received considerable media attention.

To attempt to address these issues, a number of sensitivity tests were conducted on the opportunity cost analysis, described in the following section.

6.2.3 Sensitivity Analysis

The sensitivity tests conducted included:

- Opportunity cost assessment using an elasticity of -2.34 , double the estimated elasticity.
- Estimation of the elasticity necessary in order for there to be no opportunity cost associated with the tax credit, and the estimated impact on production levels.
- Separate opportunity cost analysis of the domestic and the foreign (service) tax credits.
- Provisional analysis of the increased tax credits enacted in January 2005.

Doubling the Elasticity

Based on an elasticity of -2.34 , elimination of the tax credit is estimated to reduce production by 30.1%, or \$346.1 million. Tax revenues generated by the film/TV production industry are estimated to decline by \$37.3 million. The opportunity cost of the tax credits can therefore be assessed as follows:

Area C Taxes generated by incremental production	\$37.3 million
Area D Taxes generated by fixed production	\$83.7 million
Sub-total (C+D)	\$121.0 million
Area E Tax credits paid out	\$65.7 million
Opportunity Cost (E-C)	\$28.4 million

With the elasticity doubled, the opportunity cost associated with the tax credit is reduced from \$44.9 million to \$28.4 million. However, even in this scenario, the provincial government is forgoing tax revenues by providing the tax credits.

Zero Opportunity Cost Estimation

This analysis examined the elasticity that would be required in order for the opportunity cost associated with tax credits to be zero, i.e., the taxes generated by incremental production is equal to the tax credits paid out:

Area C Taxes generated by incremental production	\$65.7 million
Area D Taxes generated by fixed production	\$55.3 million
Sub-total (C+D)	\$121.0 million
Area E Tax credits paid out	\$65.7 million
Opportunity Cost (E-C)	Nil

The elasticity required in order to reduce the opportunity cost of the tax credits to zero is -5.2 , over four times the size of the estimated elasticity of -1.17 . In this scenario, the elimination of the tax credits results in a 53% decline in production, or \$613.6 million. This analysis suggests that, so long as production does not decline by more than 53% (from the five year average level of \$1,150.9 million), the provincial government will achieve a net tax revenue gain from eliminating the tax credits. However, if the decline in production exceeds 53%, there will be a net loss of tax revenues resulting from eliminating the tax credit.

Opportunity Cost Analysis of the Domestic and Foreign (Service) Tax Credits

Opportunity cost analysis was conducted on the domestic and foreign (service) tax credits separately, i.e., the impact of eliminating either the domestic or foreign credit rather than eliminating both, and the opportunity cost associated with each tax credit. The results of this analysis are summarised in **Figure 6-5**.

Eliminating the domestic tax credit is estimated to reduce domestic production by 30% or \$78.3 million. This represents a 6.8% decline in total production (from a base of \$1,150.9 million). The opportunity cost associated with the domestic tax credit is \$15.1 million: the provincial government pays out \$24.4 million in domestic tax credits and receives \$9.3 million in tax revenues from the incremental domestic production.

Eliminating the foreign (service) tax credit is estimated to reduce foreign production by 12.7% or \$113.9 million, a 9.9% decline in overall production in BC. The opportunity cost associated with the foreign tax credit is \$29.8 million: the provincial government pays out \$41.3 million in foreign tax credits and receives \$11.5 million in tax revenues from the incremental foreign production.

Figure 6-5: Individual Analysis of the Domestic and Foreign (Service) Tax Credits

	Domestic	Foreign (service)
% Reduction in Sub-sector (Domestic/Foreign)	-30.4%	-12.7%
Value of Production Lost	\$78.3 million	\$113.9 million
% Decline in Overall Production	-6.8%	-9.9%
Area C Taxes generated by incremental production	\$9.3 million	\$11.5 million
Area D Taxes generated by fixed production	\$21.1 million	\$79.1 million
Sub-total (C+D)	\$30.4 million	\$90.6 million
Area E Tax credits paid out	\$24.4 million	\$41.3 million
Opportunity Cost (E-C)	\$15.1 million	\$29.8 million

Provisional Analysis of the Increased Tax Credits Enacted in January 2005

The analysis provided in the previous sections is based on the tax credits prior to the January 2005, due to the lack of data available on 2005 production levels at the time of writing. However, some provisional analysis of the new tax credits was conducted, using a similar approach to the previous analysis. This analysis should not be considered a forecast of production levels in 2005, as it does not address other important factors, such as exchange rates and general industry trends, which also impact on production levels.

As described earlier, in January 2005 the provincial tax credit on domestic productions was increased from 20% to 30%, and the tax credit on foreign (service) productions was increased from 11% to 18%. This amounts to 18% reduction in the effective wage rate on domestic productions and an 8% reduction in the effective wage rate on foreign productions, relative to the pre-January 2005 tax credits. Applying the elasticity of -1.17, the percentage increase in production can be estimated as follows:

Production Type	Effective Wage Decrease	Elasticity	% Increase in Production
Domestic	-18.2%	-1.17	+26.5%
Foreign (service)	-7.9%	-1.17	+10.1%
Total*	-10.2%	-	+13.7%

* Calculated as a weighted average of domestic and foreign production, weighted by average production levels over the last five year.

Therefore, all else being equal, the increased tax credits are postulated to increase domestic production by 27% and foreign production by 10%, an overall increase of 14%.

To assess the impact on tax revenues and tax credit payments, these percentages have been applied to the tax revenue and tax credit payments estimated in Section 6.1 (i.e., the estimates based on a five year average of production levels), as shown below:

Production Type	% Increase in Production	Increase in Tax Revenues ⁴⁹	Total Tax Revenues	Increase in Tax Credits Provided	Total Tax Credits Provided ⁵⁰
Domestic	+26.5%	\$8.0 million	\$38.5 million	\$21.9 million	\$46.3 million
Foreign (service)	+10.1%	\$9.1 million	\$99.7 million	\$33.1 million	\$74.4 million
Overall	+13.7%	\$17.2 million	\$138.2 million	\$55.0 million	\$120.7 million

Based on a five year average of production levels, the 14% increase in production induced by the increased tax credits is estimated to increase tax revenues to the provincial government by \$17.2 million. However, the increased tax credits require additional funding by the provincial government in the amount of \$55.0 million, due to the increased tax credit rates and the incremental production stimulated (requiring additional tax credit payments). Therefore, there is an opportunity cost of \$37.8 million (\$55.0 million-\$17.2 million) associated with providing the increased tax credit rates. This is in addition to the opportunity cost associated with the original tax credits, previously estimated at \$44.9 million.

Further analysis of the new tax credit rates examined the impact of removing the tax credits entirely and the impact of returning the tax credit to their previous levels, as summarised in **Figure 6-6**. The table provides the estimated percentage decline in production levels resulting from these changes. Estimates of the dollar decline in production levels were not possible due to the lack of data on 2005 production levels at the time of writing.

Based on the estimated production elasticity of -1.17, removing the tax credits entirely is estimated to reduce overall production levels by 26%. Reverting the tax credits to their previous levels (20% for domestic productions and 11% for foreign productions), is estimated to reduce overall production spending by approximately 12%.

⁴⁹ Previous Tax Revenues x % Increase in Production.
E.g., for domestic production, \$30.4 million x 26.5% = \$8.0 million;
for foreign (service) production, \$90.6 million x 10.1% = \$9.1 million.

⁵⁰ Previous Tax Credit Payment x (1 + % Increase in Tax Credit Rate) x (1 + % Increase in Production).
E.g., for domestic production, \$24.4 million x (30/20) x (1 + 26.5%) = \$46.3 million;
for foreign (service) production, \$41.3 million x (18/11) x (1 + 10.1%) = \$74.4 million.

Figure 6-6: Estimated Reduction in Production Levels as a Result of Lowering the New Tax Credit Rates

Production Type	Impact of Removing the New Tax Credits Entirely	Impact of Returning the Tax Credits to Pre-January 2005 Levels
Domestic	-45.0%	-20.9%
Foreign (service)	-20.7%	-9.1%
Overall*	-26.1%	-11.8%

* Calculated as a weighted average of domestic and foreign production, weighted by average production levels over the last five year.

6.3 Multiple Account Evaluation: Consideration of Other Costs and Benefits

The analysis thus far has focussed on only the tax revenue implications of the film/TV production tax credits. While the tax revenue implications are important in understanding the economic implications of the tax credits, this does not necessarily represent the full range of costs and benefits associated with the film/TV industry that should be considered when assessing the tax credits. Many of these costs and benefits cannot be expressed in monetary terms, as would be required in a social cost benefit analysis. For this reason, we have used a Multiple Account Evaluation (MAE) framework. This approach lists, analyses and, where possible, quantifies the impacts and issues relevant to the study. The MAE approach involves examining different accounts, representing different aspects of the analysis, typically presented in a matrix format.

The MAE matrix developed to assess the costs and benefits related to the film/TV production tax credits is provided in **Figure 6-7**.

Figure 6-7: Multiple Accounts Evaluation of Film/TV Production Industry and the Tax Credits in British Columbia

Account	Benefits	Costs
Impact of the Tax Credit on Production Levels	Based on the econometric analysis, the tax credits attract an additional \$192 million in film/TV production.	-
Provincial Tax Revenues	<p>The film and television industry generates an estimated \$121 million in tax revenues for the provincial government (based on average production levels over the last five years).</p> <p>Our analysis indicates that the film industry is a net tax contributor to the provincial government, contributing over \$55 million after tax credits.</p>	Prior to the January 2005 increase, the tax credits payments cost an average of \$66 million per annum to the provincial government.
Tax Revenue Opportunity Cost	-	Based on the econometric analysis, there is an estimated opportunity cost in providing the tax credits of \$45 million. This suggests that the provincial government could gain an additional \$45 million in net revenues by eliminating the tax credits.
Role of Tax Credits in Developing the Film/TV Industry	Tax credits are often used by government as a temporary measure to enable industries (or specific businesses) to expand and develop, generally with the expectation that once the industry has developed, it will generate tax revenues that match or exceed the tax credits provided.	<p>Tax credits have been provided by the BC government for approximately seven years, during which time the industry has grown considerably (we note that the industry exhibited strong growth before the introduction of the credits). At issue is whether the industry is now mature and has outgrown the need for tax credits to continue developing.</p> <p>If tax credits are indeed necessary for the BC film/TV industry's continued long-term survival, this brings into question whether the industry is truly sustainable.</p>

Account	Benefits	Costs
Tax Credit Competition	<p>The tax credits may enable BC to better compete for film/TV production work with an increasing number of U.S. states now offering tax credits, as well as jurisdictions which can offer lower labour costs (e.g., Romania, Czech Republic).</p> <p>The tax credits can buffer the adjustment to a stronger Canadian dollar.</p>	<p>The effectiveness of the BC tax credit program appears to be vulnerable to changes enacted in other jurisdictions.</p> <p>In addition, the impact of tax credits can be offset by outside factors, most notably exchange rates.</p>
Economic Impact	<p>The BC film/TV industry is estimated to generate approximately 13,200 direct FTE jobs. Including multiplier impacts (indirect and induced), the industry generates 23,900 FTE jobs.</p>	-
Economic Diversification	<p>The film/TV production contributes to the economic diversification of the BC economy. The industry is relatively high-tech and high-skilled, and is one that has demonstrated strong growth, not just in BC but globally.</p>	<p>The majority of the production work is sourced from the United States, a country that BC is already heavily dependent on for the export of BC goods and services.</p>
Employment Opportunities	<p>The film/TV production industry involves high skilled, high wage employment. The average annual salary earned in a full-time position is \$63,740, nearly double the BC average wage.</p>	-
Industry Synergies and Cluster Development	<p>The film/TV production industry is increasingly making use of digital and computer technologies, some of which have developed in BC. There may be synergies with related industries, such as computer gaming and internet/e-commerce, which support development of a cluster of highly skilled and highly creative technology-driven industries</p>	-

Account	Benefits	Costs
Tourism Impacts	The film/TV industry is a highly visible industry that attracts considerable media attention. BC's participation in this industry may enable it to increase its visibility and desirability in the global market, with benefits for business and tourism development.	In considering the role of tax credits in exploiting this benefit, it is unclear whether this impact is more or less effective than direct tourism marketing.
Cultural Benefits	The presence of a major film/TV production industry in the province may enable and support the development and retention of local creative talent.	-

7.0 Summary and Conclusions

The conclusions from this economic review of the BC film and television industry and the associated provincial tax credits are:

- The film/TV industry is estimated to generate employment of over 13,000 FTE jobs. Including spin-off effects into other industries and the general economy, the industry generates nearly 24,000 FTEs of employment. The industry is relatively high wage, with an average full-time income of \$63,740 per annum, nearly double the BC average.
- Econometric analysis supports the argument that film/TV production is highly sensitive to labour costs (including the tax credit). Broadly speaking, each 1% increase in effective BC labour costs reduces production spending by 1.2%.
- Based on the econometric analysis, eliminating the tax credit would result in an estimated 15% decline in production spending, worth \$192 million.
- The film/TV industry in BC is estimated to generate provincial tax revenues in excess of the tax credits provided by the provincial government by approximately \$55 million.
- However, there is an estimated opportunity cost associated with the tax credits of \$45 million. In other words, based on the econometric analysis, there would be a net tax revenue gain of \$45 million in eliminating the tax credits. Our analysis also indicated that, so long as total film/TV production spending in BC does not decline by more than 53%, the provincial government will achieve a net tax revenue gain from eliminating the tax credits. However, if the decline in production exceeds 53%, there will be a net loss of tax revenues resulting from eliminating the tax credit.
- It should be kept in mind that our analysis assumes that the response to tax credit elimination would be a rational, economic response similar to past behaviour. However, the data used in this analysis did not contain an instance of a jurisdiction lowering or eliminating its film/TV production tax credit. It is important to consider the possibility that there may be a strategic retaliatory response to the elimination of the tax credits by the BC government. The industry response from decision centres in Los Angeles, New York and elsewhere may be to drastically cut production in BC in order to “punish” the province. This action would serve as a warning to other jurisdictions about the implications of removing film/TV production tax credits.

Appendix A: Employment Survey

The employment survey is provided on the following page. The survey was sent by email to film and television related firms in BC by *Reel West*, publishers of the *Reelwest Digest 2005*, a comprehensive directory of the film and video industry in Western Canada. The survey was sent to all the businesses listed in Reel West's directory that had provided email addresses. The responses were then sent back by email to *Reel West* and automatically forwarded on to InterVISTAS Consulting. In order to improve the response rate, the questionnaire was sent with a message from Peter Leitch, Chair of the Motion Picture Production Industry Association (MPPIA) encouraging respondents to complete the questionnaire.

Employment Survey

As Chair of the Motion Picture Production Industry Association (MPPIA), I am writing to you to ask for your assistance on an important study. The British Columbia Ministry of Small Business and Economic Development has commissioned consulting firm InterVISTAS Consulting Inc. to undertake an economic impact study of BC's Film and Television Production sector. MPPIA recognizes that this is an important study that will enable the BC government to better understand our industry.

As part of this study, InterVISTAS is conducting a survey of employment in the sector. Reel West are kindly assisting us in distributing this survey. I would be grateful if you could complete the short questionnaire at the bottom of this email. In order to meet the tight timeline of this study, we request that you complete this survey as soon as possible.

I appreciate that some of the information requested in the survey may be of a sensitive nature to your firm. Please be assured that InterVISTAS Consulting will maintain the confidentiality of your survey response, and that the completed surveys will not be viewed by anyone other than InterVISTAS Consulting. Only the aggregated survey totals will be provided in the final report. The final document will not reveal employment figures or other data for any individual firms.

The economic impact study is under the supervision of Ian Kincaid, Manager, Economic Analysis at InterVISTAS Consulting Inc. Should you have any questions regarding the study, or completing the survey, please contact him at 604-717-1845.

Thank you for your co-operation in this important study.

Peter Leitch
Chair, MPPIA

QUESTIONNAIRE

To respond, click [Reply] and type in your answers under each of the questions below, then click [Send].

If you are unable to answer all of these questions, please answer as many as you can.

Q1. Please state the name of your firm/organisation and describe the type of business you conduct (e.g., equipment supply, catering, post-production).

Name of firm/organisation: _____ Type of business: _____

Q2. Approximately what proportion of your annual business is related to film and television production? For example, some businesses will derive all their business from film and television production, while others will do business in still photography, theatre, etc.

_____ %

Q3. Please estimate, approximately, the proportion of your film and television business that is related to Canadian production and the proportion that is related to foreign (i.e., service) production? (base these percentages on approximate dollars of production, rather number of productions)

Canadian: _____ % Foreign: _____ %
(these two percentages should sum to 100%)

Q4. Please estimate, approximately, the proportion of your film and television business that is related to the following types of production:

(base these percentages on approximate dollars of production, rather number of productions)

Feature Film Production: _____ %

TV Series/Pilots/Mini-series: _____ %

Documentaries: _____ %

Commercials: _____ %

Other: _____ % (these percentages should sum to 100%)

Q5. Please state the total number of employees you have at present located in British Columbia, including full-time, part-time and seasonal workers.

Total employees: _____ (BC employment only)

Of the total employment, how many are:

Full-time: _____

Part-time: _____

Seasonal: _____

(Full-time, part-time and seasonal should sum to **Total employees**)

Q6. How many of your employees in Q4 are in managerial or administrative positions (i.e., back-office positions as opposed to skilled labour/technician)?

Back-office staff: _____

Q7. Approximately, what is the total annual payroll for your total employment in Q4?

Total annual payroll: _____

Appendix B: Economic Impact Multipliers

The multipliers used to estimate indirect and induced impacts, as well as GDP and Economic Output impacts were provided by BC Stats. The multipliers for *Motion Picture and Video Production, Distribution and Post-Production* (large aggregation) have been used as they closest match the industry of interest. The multipliers provided below are in 2003 dollars. The multipliers were inflated to 2004 dollars in this study.

Economic Output and GDP per \$1 of Direct Economic Output (2003 \$)

Industry	Output			GDP/Output			
	Own Indirect	Total Indirect	Total Induced	Total Direct	Own Indirect	Total Indirect	Total Induced
228 Motion Picture and Video Production, Distribution and Post-Production	0.28	0.58	0.11	0.43	0.12	0.25	0.06

Employment per \$1 million of Direct Economic Output (2003 \$)

Industry	Employment (PY / \$M)			
	Total Direct	Own Indirect	Total Indirect	Total Induced
228 Motion Picture and Video Production, Distribution and Post-Production	4.56	1.28	3.91	2.58

Appendix C: Details of the Tax Revenue Calculations

Calculation of Personal Income Taxes Generated

In British Columbia, provincial income tax is paid on taxable income at a rate that increases with taxable income. Because the tax rate is progressive, the tax paid by a group of employees depends on the distribution of income among those employees. An approximate determination of the income distribution was derived from the payroll data and additional data provided by the BC Council of Film Unions (BCCFU). This was used to estimate the provincial income tax paid by the employment represented in the payroll data. The income tax paid by the employment captured by the employment survey (see Chapter 3 for more details) was based on the average wage report in the survey.

Estimated Personal Income Taxes for the Payroll Data Employment

The combined BCCFU and payroll data was split into quartiles based on the number of hours worked in 2004. The average number of hours worked in each quartile was calculated and the average wage rate applied to estimate the income earned. The averages are provided in the table below. The income tax paid to the provincial government was based on the rate that would apply to the average income levels, allowing for standard deductions for EI, CPP, RSP, dependants, charitable donations, etc.⁵¹ For the first quartile income tax estimates, it was assumed that the income derived from film/TV production work was not the sole income for these individuals and that they would also be employed in other sectors so that their total income was in line with the provincial average of \$35,704. Therefore, the rate that applied to the film/TV related income was the rate that would apply to an income of \$35,704.⁵² For the other three quartiles, it was assumed that the income earned in the film/TV industry was the sole income of the individuals involved.

Average Hours Worked and Income Tax Paid by Quartile

Quartile	Average Hours in 2004	Income	Taxes Paid
1 st Quartile	240	\$9,186	\$419
2 nd Quartile	1,200	\$47,600	\$2,506
3 rd Quartile	1,906	\$74,700	\$4,640
4 th Quartile	2,814	\$111,400	\$10,056

⁵¹ The deductions are based on data available from the Canada Revenue Agency.

⁵² This has the effect of increasing the estimated personal income tax paid relative to assuming that the income of \$9,186 is the sole income of these individuals.

Taking an average across the four quartiles, the average income taxes paid the provincial government was \$4,407 per person. The total personal income tax paid by the employment represent by the payroll data was estimated to be:

$$\$4,407 \times 10,359^{53} = \$45,652,113$$

Estimated Personal Income Taxes for the Employment Survey Taxes

As reported in Section 3.2.2, a total of 2,841 FTE jobs are represented by the employment survey, earning an average of \$45,941 per annum. Allowing for standard deductions for EI, CPP, RSP, dependants, charitable donations, etc., the provincial income tax payable on this average income is estimated to be \$2,756. The total income tax paid by this employment was calculated as:

$$\$2,756 \times 2,841 = \$7,831,103$$

Estimated Total Personal Income Taxes Paid by the Film and Television Industry

The total personal income tax paid to the provincial government was estimated to be:

$$\$45,652,113 + \$7,831,103 = \$53,483,216 \text{ (approximated to } \$53.5 \text{ million in the main report)}$$

Calculation of Consumption Taxes Paid by Individuals

The estimation of consumption taxes paid by individuals employed in the film/TV industry was based on 2003 average BC household expenditure data provided by Statistics Canada, reproduced in the table below. As can be seen in the table, for each expenditure category the consumption tax payable was assessed and the amount taxes paid estimated.

An estimated \$1,607 of household expenditures is paid in taxes or other revenues to the provincial government, approximately 2.7% of total expenditures. Applying this percentage to total direct income of \$841 million (see Section 3.4), it is estimated that the total amount of revenue generated by personal spending of people employed in the film/TV industry is \$22.5 million.⁵⁴

⁵³ Payroll employment after adjusting for production levels. See Section 3.3.2 for more details.

⁵⁴ This assumes a zero savings rate (i.e., household expenditure = household income). Statistics Canada reports that the average personal savings rate in Canada in 2004 was 0.4%. This savings rate declined to -0.6% in the first quarter of 2005.

BC Average Household Expenditures (2003) and Consumption Taxes

Item	Amount	Comment	Estimated Tax
Personal Income Taxes	\$10,490	N/A	\$0
Personal insurance payments & pension contributions	\$3,134	N/A	\$0
Gifts of money and contributions	\$1,847	N/A	\$0
Food	\$6,784	Assume PST not applicable.	\$0
Shelter	\$12,314	Assume PST not applicable.	\$0
Household operation	\$2,908	PST may apply to some costs. Assume 2/3 of expenditures subject to 7% PST	\$136
Household furnishings & equipment	\$1,644	Assume PST applies to all expenditures	\$115
Clothing	\$2,264	PST not applicable to children's clothing. Assume 2/3 of expenditures subject to 7% PST	\$106
Transportation	\$8,245	Assume 3/4 of expenditures subject to 7% PST	\$433
Health care	\$1,921	Assume PST not applicable.	\$0
Personal care	\$775	Assume PST applies to all expenditures.	\$54
Recreation	\$3,856	Assume PST applies to all expenditures.	\$270
Reading materials & other printed matter	\$260	Assume PST not applicable.	\$0
Education	\$1,091	Assume PST not applicable.	\$0
Tobacco products & alcoholic beverages	\$1,377	Tobacco subject to high tax rates. Alcohol subject to 10% tax. Assume that average tax rate of 20% applies.	\$275
Games of chance (net expenditures after winnings)	\$255	BC Lottery Corporation data indicates that approximately 60% of net revenues (i.e., after winnings) are distributed to the BC government (the other 40% goes towards operating costs, fees and payments to the federal government).	\$153
Miscellaneous	\$924	Assume PST applies to all expenditures	\$65
Total	\$60,089		\$1,607

Source: Statistics Canada, CANSIM table 203-0001

Calculation of Consumption Taxes Paid on Production Spending

Sample budget breakdowns provided to InterVISTAS by various BC producers indicates that approximately 35-50% of production spending in BC is spent on items that may be subject to provincial sales tax. This includes travel, accommodation, purchases, equipment rentals, studio rentals and post-production. Based on an average of 45% of BC production spending, and assuming that this spending is subject to PST of 7%, the total tax revenues was estimated to be:

$$45\% \times 7\% \times \$1,150.9 \text{ million} = \$36.5 \text{ million}$$

Calculation of Corporate Income Taxes

To calculate corporate income tax liability is extremely complex. It requires knowledge of the total tax base, and the proportion of the tax base subject to corporate income tax. Therefore, an approximate method has been used, based on the average corporate tax paid per employee estimated from Statistics Canada data. In British Columbia, the provincial corporate income tax collected per employee was \$649.52 (based on 2004 figures). Assuming the BC film/TV industry pays corporate income tax at the average rate per employee, the 2004 corporation income tax liability of the BC film/TV industry is estimated to be \$8.7 million.

Appendix D: Full Regression Results

The following tables provide the complete results from the four regression models discussed in Chapter 5. In addition to the variables displayed in the tables in Chapter 5, the province, state and year dummy variables are included.

Regression Results with Wage Rates, Exchange Rates and Tax Credits
(Adjusted R-square: 0.949)

Independent Variable	Coefficient	Standard Error	t-statistic
<i>Constant</i>	42.961	12.382	3.470
<i>Log average wage (\$ local currency)</i>	-1.993	1.219	-1.635
<i>Exchange rate (US\$/CDN\$)</i>	-3.677	1.662	-2.212
<i>Tax credit -labour (%)</i>	0.004	0.715	0.005
<i>1993 dummy</i>	0.043	0.239	0.181
<i>1994 dummy</i>	0.258	0.236	1.091
<i>1995 dummy</i>	0.276	0.233	1.185
<i>1996 dummy</i>	0.295	0.230	1.283
<i>1997 dummy</i>	0.281	0.228	1.235
<i>1998 dummy</i>	0.386	0.241	1.603
<i>1999 dummy</i>	0.516	0.240	2.152
<i>2000 dummy</i>	0.404	0.241	1.674
<i>2001 dummy</i>	0.511	0.246	2.075
<i>2002 dummy</i>	0.406	0.261	1.558
<i>2003 dummy</i>	0.656	0.245	2.673
<i>2004 dummy</i>	0.749	0.259	2.894
<i>Alberta dummy</i>	-2.054	0.276	-7.452
<i>Saskatchewan dummy</i>	-3.437	0.329	-10.453
<i>Manitoba dummy</i>	-2.719	0.277	-9.823
<i>Ontario dummy</i>	0.118	0.185	0.637
<i>Québec dummy</i>	0.859	0.471	1.825
<i>New Brunswick dummy</i>	-4.083	0.305	-13.401
<i>Nova Scotia dummy</i>	-2.456	0.309	-7.949
<i>Newfoundland dummy</i>	-4.083	0.286	-17.170
<i>California dummy</i>	5.631	0.781	7.209
<i>Hawaii dummy</i>	-0.079	0.578	-0.137
<i>Louisiana dummy</i>	-1.591	0.495	-3.214
<i>Illinois dummy</i>	-1.080	0.639	-1.692
<i>New Jersey dummy</i>	-0.411	0.621	-0.661
<i>New Mexico dummy</i>	-1.481	0.587	-2.521
<i>New York dummy</i>	4.289	0.719	5.966
<i>North Carolina dummy</i>	0.983	0.507	1.937
<i>Texas dummy</i>	-0.008	0.500	-0.017
<i>Utah dummy</i>	-0.041	0.545	-0.075
<i>Virginia dummy</i>	-0.081	0.537	-0.151

**Regression Results with Average Effective Wage
(Adjusted R Square = 0.952)**

Independent Variable	Coefficient	Standard Error	t-statistic
<i>Constant</i>	31.642	4.424	7.152
<i>Log average effective wage</i>	-1.170	0.448	-2.610
<i>1993 dummy</i>	0.159	0.226	0.701
<i>1994 dummy</i>	0.427	0.231	1.846
<i>1995 dummy</i>	0.443	0.224	1.976
<i>1996 dummy</i>	0.425	0.223	1.908
<i>1997 dummy</i>	0.411	0.220	1.870
<i>1998 dummy</i>	0.570	0.220	2.589
<i>1999 dummy</i>	0.687	0.217	3.169
<i>2000 dummy</i>	0.566	0.216	2.618
<i>2001 dummy</i>	0.734	0.220	3.333
<i>2002 dummy</i>	0.622	0.223	2.791
<i>2003 dummy</i>	0.678	0.210	3.224
<i>2004 dummy</i>	0.598	0.210	2.847
<i>Alberta dummy</i>	-1.905	0.223	-8.560
<i>Saskatchewan dummy</i>	-3.771	0.380	-9.913
<i>Manitoba dummy</i>	-3.127	0.310	-10.079
<i>Ontario dummy</i>	0.045	0.174	0.259
<i>Québec dummy</i>	0.258	0.207	1.244
<i>New Brunswick dummy</i>	-4.642	0.356	-13.030
<i>Nova Scotia dummy</i>	-2.713	0.341	-7.961
<i>Newfoundland dummy</i>	-5.331	0.345	-15.458
<i>California dummy</i>	4.734	0.532	8.902
<i>Hawaii dummy</i>	-0.814	0.400	-2.036
<i>Louisiana dummy</i>	-2.113	0.321	-6.588
<i>Illinois dummy</i>	-1.828	0.471	-3.880
<i>New Jersey dummy</i>	-1.158	0.450	-2.570
<i>New Mexico dummy</i>	-2.261	0.386	-5.864
<i>New York dummy</i>	3.448	0.503	6.850
<i>North Carolina dummy</i>	0.403	0.368	1.095
<i>Texas dummy</i>	-0.520	0.357	-1.458
<i>Utah dummy</i>	-0.691	0.402	-1.718
<i>Virginia dummy</i>	-0.666	0.404	-1.649

**Regression Results with Average Effective Wage and Tax Credit
(Adjusted R Square= 0.953)**

Independent Variable	Coefficient	Standard Error	t-statistic
<i>Constant</i>	30.354	8.061	3.766
<i>Log average effective wage</i>	-1.045	0.802	-1.304
<i>Tax credit dummy</i>	0.099	0.319	0.309
<i>1993 dummy</i>	0.155	0.226	0.689
<i>1994 dummy</i>	0.412	0.242	1.705
<i>1995 dummy</i>	0.414	0.250	1.657
<i>1996 dummy</i>	0.392	0.255	1.541
<i>1997 dummy</i>	0.374	0.262	1.430
<i>1998 dummy</i>	0.517	0.308	1.679
<i>1999 dummy</i>	0.637	0.293	2.173
<i>2000 dummy</i>	0.517	0.291	1.778
<i>2001 dummy</i>	0.681	0.308	2.211
<i>2002 dummy</i>	0.563	0.329	1.710
<i>2003 dummy</i>	0.627	0.281	2.227
<i>2004 dummy</i>	0.547	0.270	2.027
<i>Alberta dummy</i>	-1.890	0.239	-7.908
<i>Saskatchewan dummy</i>	-3.690	0.587	-6.291
<i>Manitoba dummy</i>	-3.070	0.442	-6.944
<i>Ontario dummy</i>	0.050	0.174	0.287
<i>Québec dummy</i>	0.264	0.212	1.247
<i>New Brunswick dummy</i>	-4.568	0.538	-8.496
<i>Nova Scotia dummy</i>	-2.647	0.501	-5.283
<i>Newfoundland dummy</i>	-5.261	0.514	-10.228
<i>California dummy</i>	4.676	0.693	6.747
<i>Hawaii dummy</i>	-0.887	0.592	-1.497
<i>Louisiana dummy</i>	-2.122	0.352	-6.036
<i>Illinois dummy</i>	-1.869	0.570	-3.276
<i>New Jersey dummy</i>	-1.194	0.553	-2.159
<i>New Mexico dummy</i>	-2.299	0.489	-4.701
<i>New York dummy</i>	3.399	0.642	5.296
<i>North Carolina dummy</i>	0.393	0.407	0.966
<i>Texas dummy</i>	-0.517	0.368	-1.405
<i>Utah dummy</i>	-0.712	0.467	-1.525
<i>Virginia dummy</i>	-0.675	0.439	-1.537

Regression Results with Average Effective Wage, Digital Animation & Visual Effects Tax Credit, and Regional Tax Credit
(Adjusted R Square = 0.952)

Independent Variable	Coefficient	Standard Error	t-statistic
<i>Constant</i>	31.235	6.222	5.020
<i>Log average effective wage</i>	-1.136	0.622	-1.827
<i>Digital animation/visual effects tax credit dummy</i>	-0.191	0.253	-0.753
<i>Regional Tax credit dummy</i>	0.161	0.318	0.506
<i>1993 dummy</i>	0.166	0.227	0.730
<i>1994 dummy</i>	0.431	0.236	1.827
<i>1995 dummy</i>	0.448	0.227	1.979
<i>1996 dummy</i>	0.429	0.226	1.894
<i>1997 dummy</i>	0.403	0.231	1.744
<i>1998 dummy</i>	0.564	0.252	2.241
<i>1999 dummy</i>	0.682	0.243	2.802
<i>2000 dummy</i>	0.561	0.242	2.320
<i>2001 dummy</i>	0.728	0.252	2.893
<i>2002 dummy</i>	0.615	0.258	2.382
<i>2003 dummy</i>	0.684	0.228	2.998
<i>2004 dummy</i>	0.607	0.220	2.754
<i>Alberta dummy</i>	-1.836	0.344	-5.342
<i>Saskatchewan dummy</i>	-3.844	0.450	-8.545
<i>Manitoba dummy</i>	-3.046	0.512	-5.948
<i>Ontario dummy</i>	0.126	0.206	0.610
<i>Québec dummy</i>	0.332	0.239	1.386
<i>New Brunswick dummy</i>	-4.556	0.585	-7.779
<i>Nova Scotia dummy</i>	-2.788	0.393	-7.093
<i>Newfoundland dummy</i>	-5.246	0.567	-9.248
<i>California dummy</i>	4.757	0.619	7.685
<i>Hawaii dummy</i>	-0.779	0.440	-1.769
<i>Louisiana dummy</i>	-2.072	0.335	-6.183
<i>Illinois dummy</i>	-1.798	0.502	-3.580
<i>New Jersey dummy</i>	-1.128	0.509	-2.213
<i>New Mexico dummy</i>	-2.225	0.422	-5.278
<i>New York dummy</i>	3.474	0.580	5.991
<i>North Carolina dummy</i>	0.440	0.398	1.106
<i>Texas dummy</i>	-0.481	0.377	-1.275
<i>Utah dummy</i>	-0.657	0.444	-1.479
<i>Virginia dummy</i>	-0.628	0.432	-1.453

Appendix E: Summary Literature Review

Title	U.S. Runaway Film and Television Production Study Report
Author(s)	The Monitor Company
Date	June 1999
Publication	A Report for SAG and DGA
Pages	1-29
Summary of discussion	<p>This study has two primary objectives: (1) to quantify the extent to which runaway production has been occurring since 1990, and (2) to identify the major causes. No regression analysis is performed to determine the causes of runaway production.</p> <p>This study has four key components: (1) development of a database of all U.S. film and TV productions since 1990, (2) 70 interviews with industry participants, (3) calculation of total U.S. impact, and (4) derivation of total FTE positions.</p> <p><i>Definition:</i> A runaway production is one that is developed and intended for initial broadcast in the U.S., but is actually filmed in another country. The two types of runaway productions are (1) creative (story takes place in a different setting), and (2) economic (departs because of production costs). This study focuses on economic runaways.</p> <p><i>Database of production:</i> A database of all U.S.-developed production was developed using sources such as industry publications, Internet Movie Database. Information collected included companies/individuals involved, type of production and, where possible, production value, with breakdowns of how much was runaway.</p> <p><i>Interviews:</i> Interviews were conducted with 70 producers, Guild members, executives, film commissioners to discuss the runaway production situation.</p> <p><i>Economic Impact:</i> In 1998, of the 1,075 U.S. developed productions studied by the author, 285 (or 27% of the total) were economic runaways. This represented a 185% increase from the 100 (or 14% of total) in 1990. By moving production abroad, this represented a loss of \$10.3 billion in the U.S. in 1998 alone (five times the loss in 1990). In terms of labour, 20,000 FTEs were lost in 1998. The economic impact figures were based on the value of production with the application of BEA multipliers. Employment figures were estimated using the average number of jobs/positions employed in a production multiplied by the number of productions lost to runaway.</p>

Title	U.S. Runaway Film and Television Production Study Report
	<p><i>Where Does Production Go?</i> The report estimated 81% of runaways end up in Canada, and 10% in Australia and the U.K.</p> <p><i>Causes of Runaways (based on the interviews rather than quantitative analysis):</i> When location decisions are made, expected revenues with the cost of production, as well as the quality of talent and crews are taken into account. The combined result of exchange rates, lower production costs, and government incentives allows the producers of a typical TV movie to reduce production costs by 25% or more by choosing to film in Canada.</p> <p>The report also notes that Canadian, U.K. and Australian crews are getting higher skilled as more production is handled, which increases their ability to handle larger productions. In other words, critical mass of production is reached which supports increased investment and skills development, and so attracting more runaway production. The report suggests that Canada is quite far along this path, and has a capability not far behind California and NY.</p>

Title	The Migration of U.S. Film and Television Production
Author(s)	U.S. Department of Commerce
Date	January 2001
Pages	1-90
Summary of discussion	<p>This report stems from a request to the Department of Commerce to examine the flight of U.S. TV and film production to foreign shores. Without the use of regression analysis, this study examines:</p> <ul style="list-style-type: none"> ▪ the impacts of the film industry on the U.S. economy, ▪ the economic losses from runaway productions (it incorporates much of the same information as the Monitor Company's 1999 report on runaway production), ▪ the effects of globalisation and technology, and ▪ incentive programs in other countries. <p>When examining the effects of globalisation, the study examines the cost competitiveness of the U.S. They claim that many people in the industry link runaways with the dollar's purchasing power abroad, ignoring other factors like prices. Without the use of regression analysis, they have examined whether there's evidence that costs in other competitor countries (Canada, UK, Ireland, Australia) declined relative to costs in the U.S. The following formula was used to calculate R, a rough measure of the change in the total cost of production in the foreign country in question relative to the change in the total cost of production in the U.S.:</p> $R = (1 + \%FCPI) * (1 + \%e) / (1 + USCPI).$ <p>For the period of 1990-2000, R=0.74 for Canada, meaning Canadian costs of production decreased considerably relative to the U.S.</p> <p>In conclusion, the study finds that runaways are a significant problem that could threaten to disrupt important segments of the industry and the thousands of workers who depend on it. They could also have an adverse impact on American pop culture.</p>

Title	Hollywood North: The Impact of Costs and Demarcation Rules on the Runaway Film Industry
Author(s)	Droesch, Audrey
Date	2002
Publication	Stanford University
Pages	1-37
Summary of discussion	<p>This study looks at the causes of runaway production, and uses regression analysis to examine the impacts of the causes.</p> <p>This study looked at not only exogenous factors for why American producers are lured away (e.g. exchange rates, tax incentives, production costs), but also the factors that may be pushing them away (i.e., both pull and push factors). This study used regression analysis to examine the effects of exogenous factors (exchange rate and tax credits) in addition to labour demarcation rules in the U.S. (causes increased below-the-line worker wages relative to average service sector worker). The analysis focused on runaway production to B.C. from California.</p> <p>The first regression run includes:</p> <ul style="list-style-type: none"> ▪ RUNAWAY as the dependent variable. This is a ratio of runaway films (to B.C.) to films produced in L.A. county (based on number of productions rather than value). ▪ EXCH as an independent variable. This is exchange rate, measured by the number of Canadian dollars to U.S. dollars. ▪ REBATE as an independent variable. This is the fraction of labour costs in B.C. rebated by the Canadian government. ▪ RATIO as an independent variable which proxies the cost of demarcation rules. This is a ratio of total labour costs of below-the-line labour in B.C. to total labour costs of below-the-line labour in L.A. <p>A log-log OLS regression was run, which provided all negative coefficients, and a r-squared value of 0.52. However, it should be noted that the EXCH variable is insignificant. The regression results suggest that while the exchange rate and rebates (tax incentives) contribute to increasing runaway production, the make-work rules (rules which cause Hollywood below-the-line wages to exceed those in B.C.) are just as important.</p> <p>The author remarks that all three of the independent variables reflect the relative cost of producing in B.C. versus L.A. For this reason, the three variables are combined into one independent variable – RELCOST:</p>

Title	Hollywood North: The Impact of Costs and Demarcation Rules on the Runaway Film Industry
	REL COST = (1 – REBATE)*RATIO*EXCH The second regression involves regressing lnREL COST on lnRUNAWAY. The results suggest the REL COST variable is significant, and the r-squared value is 0.5. The results suggest an elasticity of runaways with respect to relative costs equal to –1.25, which suggests a strong negative effect.

Title	Foreign Film and Television Drama Production in Australia: A Research Report
Author(s)	Australian Film Commission
Date	2002
Pages	1-63
Summary of discussion	<p>This AFC report has three objectives: (i) to examine the reasons why foreign producers select Australia, (ii) to examine the Australian crew capacity and foreign requirements, and (iii) to examine Australian production crew experience. A literature search, survey, and data analysis were performed. However, it should be noted that no regression analysis was performed by the authors.</p> <p>The key influences on location decisions can be broken down into economic factors and production requirements.</p> <p><i>Economic factors:</i> production costs, government incentives, and exchange rates.</p> <p><i>Production requirements:</i> infrastructure, crew quality, crew depth, crew relations and location issues.</p>

Title	The Impact of an Entertainment Industry Strike on the Los Angeles Economy
Author(s)	Milken Institute
Date	June 2001
Publication	Commissioned by the Office of Mayor R.J. Riordan, City of Los Angeles
Pages	1-72
Summary of discussion	<p>This is an independent analysis of the impact of potential movie and television industry strikes on the LA economy. The report examines the impact of a strike by the WGA, SAG, and AFTRA under 3 scenarios – short, intermediate and prolonged strikes. It also looks at the impact of only a SAG and AFTRA strike under two scenarios – one-month and three-month strikes.</p> <p>The Milken Institute uses econometric models of the LA and Californian economies to evaluate the potential impact of the strikes. The models incorporate structural linkages between export sectors (e.g. movie and TV production in LA – produce goods and services that are primarily consumed outside of LA and California) and dependent supplier industries through an embedded input-output framework. The export industries serve national markets, but the income they generate provides one of the major stimuli to the local economy.</p> <p>The findings of this study suggest that a strike by writers and actors could decrease employment in LA by as many as 81,900 jobs, and reduce output by \$4.4 billion in Q3 2001. With respect to tax revenues, a strike could result in LA losing as much as \$54.4 million in tax revenue.</p>

Title	Review of State Tax Credits Administered by the Department of Economic Development
Author(s)	Office of the State Auditor of Missouri
Date	2001
Pages	1-66
Summary of discussion	<p>This report reviews the impacts of 33 state tax credit programs in Missouri so policymakers can evaluate their effectiveness. One of the credits examined is the state of Missouri's film production tax credit, which became effective in 1999.</p> <p>The state film tax credit is worth up to 50% of the amount of investment in production or production-related activities in a qualified film project. A qualified production must not have selected Missouri as the location site prior to pre-applying for the tax credit.</p> <p>The direct impact of the tax credit is evaluated by comparing the tax credits claimed with the direct production spending. Applying the direct impacts to a macroeconomic model of the Missouri economy then derives the total impact. The model compares a baseline forecast of the Missouri economy with an alternative forecast that takes into account the film production tax credit. The alternative model includes changes to two of the thousands of variables included in the model:</p> <ul style="list-style-type: none"> ▪ <i>Film production costs:</i> The productions cost variable was decreased by \$80,000 (benefit the producers obtained from the tax credits in 1999), multiplied by the average 10-year growth rate for the industry over a 10-year period. ▪ <i>Government spending:</i> Government spending was reduced by the amount of tax credits redeemed by the producers in 1999 (\$4,540), not the entire amount that can be redeemed in the future (\$80,000). <p>Applying the changes mentioned above and the assumptions below:</p> <ul style="list-style-type: none"> ▪ usage of the tax credit will increase at the same rate as motion picture industry growth, and ▪ the tax credit program will end after ten years. <p>The following total economic impact results were derived from the model:</p> <p><i>Employment:</i> Total Missouri employment would increase annually by 3 to 5 jobs from 1998 to 2008. After the sunset year (termination year) of the tax credit, the number of jobs created declines, but remains positive.</p>

Title	Review of State Tax Credits Administered by the Department of Economic Development
	<p><i>Gross state product:</i> Missouri gross state product would increase by approximately \$100,000 in 1999 to a peak annual increase of \$214,000 in 2006 and 2007.</p> <p><i>Personal income:</i> The annual growth in personal income mirrors that of gross state product, peaking at \$214,000 in 2007.</p> <p><i>Wages:</i> The film production tax credit does not have much impact on wages, because no new permanent jobs are created. The model predicts a small wage increase in the first year of the tax credit, no impact from 2000 to 2003, and a negative impact from 2004 to 2008.</p>

Title	Profile 2005 – An Economic Report on the Canadian Film and Television Production Industry
Author(s)	Canadian Heritage, CFTPA and APFTO
Date	2005
Pages	1-38
Summary of discussion	<p>This is an economic report on the Canadian film and television production industry. The report gives an overview of the Canadian film and television industry, and then analyses production industry data.</p> <p>The industry statistics are first provided at a national aggregate level and then broken down by production type (e.g. foreign, domestic, CAVCO, non-CAVCO, etc.) and province. The report includes data from several sources, including Statistics Canada, Nordicity Group, Canadian Heritage foreign production surveys, and CRTC.</p> <p>The key statistics reported include:</p> <ul style="list-style-type: none"> ▪ <i>Total volume of film and television production</i> (total, in-house production, foreign production, CAVCO production, non-CAVCO production): The volume of production figures were estimated by Nordicity Group, based on data from CAVCO, CRTC, CBC and the Department of Canadian Heritage. It should be noted that the foreign production spending estimates represent spending in Canada by foreign-based producers (i.e. no spending that occurs in the foreign country is taken into account). The spending figures include both above and below-the-line labour spending. ▪ <i>Export value of Canadian production</i> ▪ <i>Direct, indirect, and total FTE jobs</i>: Through contact with the CFTPA's VP of Business Affairs, it is known that the direct employment statistics are based on production expenditure data, research of employment spending and average industry wages. The direct jobs reflect employment in production and post-production. ▪ <i>Real GDP growth</i>: The real GDP growth data was obtained from Statistics Canada and includes production, post-production, and distribution.

Title	Nova Scotia Film, Television and New Media Industry: Impact Analysis and Long-Term Strategy
Author(s)	Nordicity Group Ltd.
Date	2004
Publication	Prepared for the Nova Scotia Film Industry Taskforce
Pages	1-212
Summary of discussion	<p>The purpose of this report is two-fold: (1) to perform an economic impact analysis of the film and television industry in Nova Scotia, and (2) to come up with long-term strategies for the industry.</p> <p>Economic impact analysis: The economic impact analysis involved four distinct stages:</p> <ol style="list-style-type: none"> (I) Estimating the direct impact of the film and television industry in NS, (II) Deriving total impacts (direct impacts + spin-off impacts) by applying the direct impacts to an I/O model, (III) A cost-benefit analysis of the NS film incentive tax credit (FITC) was undertaken by comparing government tax revenues associated with film and TV production with the cost of the tax credits, and (IV) Examining the socioeconomic and cultural impacts of the industry. <p><u>Stage 1:</u> In calculating the direct economic impacts (these include operating and capital expenditures, household income, employment and provincial government revenue), the first step involved estimating the overall expenditures of the NS film and TV production industry. Total expenditures include operating expenditures which reflect the production budgets of film and TV productions (included: NSFDC-supported domestic and guest productions, CBC productions, private and pay TV productions, and commercials), and capital expenditures. Several sources (NSFDC, the CRTC, Statistics Canada, and information obtained through interviews with producers) were used to derive estimates of operating expenditures, while capital expenditure estimates were derived from online surveys.</p> <p>After estimating total expenditures, they were then distributed amongst four specific spending categories:</p> <ul style="list-style-type: none"> ▪ <i>NS Labour:</i> This represents the household income of NS residents working in the industry. ▪ <i>NS Equipment & Services:</i> This reflects equipment and services

Title	Nova Scotia Film, Television and New Media Industry: Impact Analysis and Long-Term Strategy
	<p>expenditures made by a typical production (after calculating total NS equipment and services spending, it was allocated amongst 42 SIC categories before it could be applied to the I/O model).</p> <ul style="list-style-type: none"> ▪ <i>Non-NS Labour</i>: This represents income earned by non-residents of NS while working on productions in NS. ▪ <i>Non-NS Equipment & Services</i>: This form of spending was excluded from the input-output analysis. <p>Domestic Production</p> <ul style="list-style-type: none"> ▪ Based on 2003/04 NSFDC statistics, total NS spending (NS labour + equip & services) was equal to 75% of total domestic production budgets. The 2003/04 estimate was then applied to the domestic production budgets for all five years of the analysis to obtain total NS spending. ▪ Based on 2002/03 and 2003/04 NSFDC statistics, NS labour spending was equal to 40% of total domestic production budgets. The 40% was applied to the domestic production budgets for all five years of the analysis to obtain NS labour spending. ▪ Knowing the percentages allocated to total NS spending and NS labour, we know that NS equipment and services are allocated 35% of domestic production budgets (75% - 40% = 35%). <p>Foreign Production</p> <ul style="list-style-type: none"> ▪ Based on 2003/04 NSFDC production statistics, total NS spending (NS labour + equip & services) was equal to 40% of total foreign production budgets. Therefore, 40% is applied to all five years of the analysis. ▪ Based on the same statistics, NS labour spending is equal to 20% of total foreign production budgets. ▪ NS equipment and services therefore account for the remaining 20% (40% - 20% = 20%). <p>For both domestic and foreign productions, the non-NS labour spending was derived by subtracting the NS labour figures (40% and 20% respectively) from the total labour spend estimate (NS and non-NS) of 55% (based on NSFDC statistics). Of the total non-NS labour spending, the authors have assumed that 50% is spent in NS, while the other 50% is spent elsewhere. This is the same assumption made by the NS Department of Finance's 2000 tax credit analysis.</p> <p>In addition to direct expenditures, employment data was also required to derive total impacts from the I/O model. Dividing total labour spending by the average annual employee cost (average employment income plus fringe</p>

Title	Nova Scotia Film, Television and New Media Industry: Impact Analysis and Long-Term Strategy
	<p>benefits and payroll taxes paid by employees) derives the estimated number of direct FTEs.</p> <p>The average annual salary was based on the 2001 Census of Canada (Statistics Canada) average employment income for full-time motion picture and sound recording industry workers. This wage includes below-the-line and above-the-line workers, in addition to sound recording workers.</p> <p>It is worth noting that the authors included an additional step to account for the fact that sound recording industries were included in the annual average employment income statistic obtained from Statistics Canada. With Statistics Canada's SEPH data, the average weekly earnings in the sound recording industry can be differentiated from those in the motion picture and sound recording industry. On average, between 1999 and 2003, average weekly earnings in the motion picture industry were 98% of the average motion picture and sound recording industries. This ratio was applied to the average annual employment income of the motion picture and sound recording industry to derive the average annual employment income earned in the motion picture and video industry.</p> <p><u>Stage 2:</u> The second stage of the impact analysis involved applying Nordicity's cost information (operating and capital expenditures) to the provincial I/O model. The I/O model derives spin-off employment, household income (sum of labour spending, other employment compensation, and household income induced by capital expenditures) and provincial government revenue from the cost data provided by Nordicity. The study also provides provincial government revenue. Below are some key points worth noting:</p> <p>Non-NS labour income is excluded from the determination of direct employment, household income and provincial government revenue, but included in the estimated spending of the income in the province.</p> <p>The direct impact to provincial government revenue (comprised of personal income, sales taxes, and indirect taxes) is estimated from wages and salaries estimated by the I/O model.</p> <p><u>Stage 3:</u> The third stage involves a cost-benefit analysis to evaluate the NS FITC. This is done by comparing total provincial government revenues (direct + spin-off), with the value of Nova Scotia film industry tax credits over the 5-year period of 1999/00 to 2003/04. The study finds that tax credits are virtually revenue neutral when total economic impacts are considered (as opposed to direct impacts), and have a negative impact when direct impacts are considered.</p>

Title	Nova Scotia Film, Television and New Media Industry: Impact Analysis and Long-Term Strategy
	<p><u>Stage 4</u>: Socio-cultural impacts were identified through interviews and a literature review. Many of these impacts are very difficult to quantify, thus cannot be incorporated into the I/O model. However, the authors do state that because the province of NS earns as much as it spends on the sector (FITC is revenue neutral), the overall impact is overwhelmingly positive because of the socio-cultural benefits.</p> <p>Long-term strategies: The authors' strategy sets out two major goals for Nova Scotia's film industry (five year strategy):</p> <ul style="list-style-type: none"> ▪ To maintain Nova Scotia's leadership position in Canada as the 4th largest production centre in the country; and ▪ To stimulate a new period of growth for Nova Scotia's film industry with a target increase of \$50-75 million in annual new activity by the year 2010.

Title	The Economic Impacts of Film & Video Productions in Washington State
Author(s)	ECONorthwest
Date	2003
Publication	A Report for the Washington State Film Office
Pages	1-17
Summary of discussion	<p>This is an economic impact study of the Washington State film and video production industry done by a major Pacific Northwest economic research firm for the Washington State Film Office.</p> <p>The authors' definition of the industry involves the inclusion of three NAICS codes: 51211, 51219, and 541922 (production, post-production and distribution) with data for employment and economic output. The authors used these measurements of film and video production to drive an input-output model that calculates the indirect and induced impact of these industries on the State economy in 2001.</p> <p>The study is based on 2001 data obtained from the U.S. Economic Census, the Washington State Employment Security Department, the Washington Film Office, and the U.S. BLS. Due to the fact that there is a large portion of self employed film industry workers (1,800) that otherwise would not be picked up as members of the industry, the authors measure industry expenses. This is done to account for the income of self-employed workers as part of indirect industry output (the exact methodology is unclear as no appendix is provided).</p> <p>The total economic impact of the film and video production industry in Washington State was estimated at: 8,033 jobs, \$656 million in economic output, \$261 million in labour income, and \$18.4 million in taxes.</p>

Title	The Impact of the Film Industry on Colorado
Author(s)	University of Colorado, Leeds School of Business
Date	June 2003
Publication	Prepared for the Colorado Film Commission
Pages	1-130
Summary of discussion	<p>An analysis of the Colorado film industry was performed to determine its economic impacts, examine its structure, and understand the intangible benefits. No regression analysis was performed, and no estimates of economic output were provided.</p> <p>The authors first analyse employment and wage data from the Colorado Department of Labour and Employment (ES202 data) for the period of 1993 to 2000. Because of the large number of small companies and sole proprietorships, the authors review non-employer businesses for NAICS code 5121 (motion picture and video industry).</p> <p>In addition to the data analysis, the authors also conduct a survey to determine the impact of businesses in the industry. The survey responses from production and supplier companies were used to determine costs and revenue projections for the industry.</p> <p>The authors provide the following conclusions from their study:</p> <ul style="list-style-type: none"> ▪ This industry pays higher than average wages compared to the state as a whole. ▪ It grew faster in the past ten years than the Colorado economy. ▪ The basic infrastructure is stronger than anticipated. <p>The report suggests that the entertainment industry presents several distinct advantages to the state:</p> <ul style="list-style-type: none"> ▪ It is a tool for economic development throughout Colorado. Filming took place in at least 40 of the state's 64 counties in 2002. ▪ It attracts new dollars to the state's economy. In 2001, 75% of receipts for production companies came from out of state. ▪ It is not necessarily tied to normal economic patterns. When the economy falters or is flat, this segment continues to grow. ▪ It encourages tourism. It's a clean industry that increases exposure of the state. ▪ It culturally enriches the state.

Title	Analysis of the Film and Video Industry in Arizona
Author(s)	Arizona Department of Commerce
Date	2004
Pages	1-56
Summary of discussion	<p>This study by the Arizona Department of Commerce examines various aspects of the state's film and video industry. The following sections are included in the study:</p> <p><i>Economic analysis:</i> The Arizona Dept of Commerce obtains their employment and wage data from the Arizona Department of Economic Security (DES). Data is collected for three specific NAICS codes (the three codes make up the: 51211 (production), 51219 (post-production) and 51212 (distribution). The DES employment data was used in conjunction with IMPLAN's input-output model, to derive the indirect and induced economic impact of Arizona's film industry.</p> <p>In 2003, the Arizona film industry generated over \$201 million in economic activity and nearly \$57 million in wages.</p> <p><i>Industry structure:</i> A set of surveys was distributed to obtain information on the structure of the state's film industry. The surveyed groups include: film festivals, high schools, universities, production companies, in-house production, local film commissions, and suppliers.</p> <p><i>Best practice / Benchmarks:</i> The study examines the economic impact of several competitor states and the financial incentives offered (Texas, Utah, Nevada, New Mexico, Colorado, Florida).</p> <p><i>Competitive advantages and disadvantages:</i> The authors contacted 95 producers and asked them about their perceptions and experience in the film industry (23 completed interviews).</p>