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BUILD THE STADIUM - CREATE JOBS AND BOOST INCOMES? THE REALISED ECONOMIC IMPACTS OF SPORTS FACILITIES IN NEW ZEALAND

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BUILD THE STADIUM - CREATE JOBS AND BOOST INCOMES? THE REALISED ECONOMIC IMPACTS OF SPORTS FACILITIES IN NEW ZEALAND

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ABSTRACT

Facility construction is typically justified on the basis of ex-ante predictions of economic impact resulting from events hosted at the new or upgraded facility. Much of the independent literature, however, fails to find evidence that these impacts have materialised at an aggregate level. This paper examines the impact of facility construction on (i) employment in the construction sector and (ii) real GDP for fifteen New Zealand cities that built sports facilities between 1997 and 2009. Results indicate that while certain types of facilities have short-term impacts on construction sector employment growth, there are no long-term post-construction impacts. There is also no empirical evidence to suggest that new or upgraded facilities have any impact on local area real GDP either during or post-construction. Ex-ante claims of economic impact must, therefore, be treated with extreme caution.

Keywords: Sports facilities, economic impact analysis; local economic development

JEL Classification: L83, R58

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1. INTRODUCTION

Sports facility construction has undergone significant growth in New Zealand during the past two decades. Over NZ$1.1 billion has been spent on sports facilities in New Zealand over the past 15 years, with the public sector contributing 63% of this amount (NZ$698.7 million). The New Zealand experience is mirrored in the United States (Crompton, Howard, and Var, 2003; Noll and Zimbalist, 1997b; Quirk and Fort, 1992; Siegfried and Peterson, 2000; Zimbalist and Long, 2006), as well as countries in Europe (Jones, 2002; Newman and Tual, 2002; Rebeggiani, 2006; van Dam, 2000), and Australia (Searle, 2002), among other countries. There has been increased scrutiny of the increasing government involvement in the financing of sports facilities over time. Sports facility projects have generally not been considered financially viable (Baim, 1994). Local and national governments have consistently invested in projects that were not considered financially viable, but when society's benefits and costs were evaluated, projects could have been economically viable (Chapin, 2002).

Facility proponents have offered several arguments supporting public involvement in the construction of sports facilities, including a variety of tangible and intangible benefits (Lavoie, 2000). More recently, the "public good" argument has come into play as proponents have downplayed the economic impact dimension and accentuated the socio-economic benefits of facilities and events (Crompton, 2004). Such benefits have included the communal experiences of attending events at the stadium, and the community identity and pride generated by a local championship team (Chapin, 2002). Indeed, the measurement of consumer surplus and the value of public goods associated with sport is the latest development in this literature.

Arguably the dominant justification put forth to date for greater public sector involvement in the construction of sports facilities has been the generation of tangible economic outcomes, including job creation and income generation. Facilities and events have been said to be effective sources of new spending which, in turn, stimulate economic development and growth. These claims are typically based on the outcomes of predictive (ex-ante) studies that have accompanied either a facility or an event. Much of the scholarly literature has been sceptical of such claims, and has pointed to the fundamental differences between economic impact analysis and cost-benefit analysis to question the appropriateness of economic impact analysis for this purpose.

Coates and Humphreys (1999) identified two fundamental questions that any facility evaluation should address. Firstly, do projected impacts materialise, and secondly, is the use of public money on a sporting facility a wise choice given the available alternatives? This paper seeks to directly address the first question in the New Zealand context by examining the impacts of stadium construction on (i) employment in the construction sector and (ii) real GDP in local area economies. Results from this paper also offer insights towards an answer to the second question.

2. LITERATURE REVIEW

This literature review initially outlines the workings of the economic impact study and its role in sports facility projects. The realised benefits from sports facilities and events are then briefly summarized. These broad areas are discussed in detail in the following sub-sections.

2.1. Understanding economic impact studies and their role in facility construction

Economic impact studies are used to measure the economic return of an event or investment to a community, often as a measure of benefit alongside supplementary financial cost data provided to local councils (Crompton, Lee, and Shuster, 2001). Hefner (1990) argued that a correctly applied economic impact analysis created helpful information about sports events and facilities for policymakers. Underlying the economic impact study is the input-output (I-O) methodology. I-O analysis provides a comprehensive overview of an economy, utilising the patterns of flow of the goods and services between various sectors (Leontief, 1986). The I-O method essentially examines the impact of any increase in final demand expenditure on the level of output in each sector of the economy (Campbell and Brown, 2003). The measured impacts are the size and direction of the effect in each industry of the increase in final demand. Burgan and Mules (1992) explained, firms hire workers, purchase intermediate inputs, and produce output, which are decisions influenced by the demand for the output (Burgan and Mules, 1992). This demand expenditure, in turn, creates incomes, which provides the basis for a multiplier effect to take place.

The economic impact study is typically conducted by measuring three areas of impact: the direct, indirect, and induced impact. The direct impact is the initial, or first round, effect of visitor spending. The indirect impact is the "ripple effect" of the first round spending through the local economy. The induced impact is the impact of spending by those who have increased incomes as a result of the increased spending then generating further ripple effects (Crompton, 1995). A strength of the I-O technique is its disaggregated nature, particularly when dealing with expenditure impacts that are concentrated in certain industries (Burgan and Mules, 1992), as well as its flexibility and the policy neutral nature (Fletcher, 1989). I-O analysis has a potentially important role to play in a benefit-cost analysis, as benefits and costs would be likely to appear in an I-O analysis in some form or another as transactions within the economy (West, 1992).

Varying measurements of impacts for the same event utilising the I-O method, however, has meant that economic impact studies have been increasingly discredited in the literature, with many economists arguing that they are misleading and "little more than artful speculation" (Keating, 2001, p.3). Assumptions made in economic impact analyses are often difficult to substantiate in practice (Zaretsky, 2001). Arguably the dominant criticism of economic impact studies surrounds the use of multipliers and their associated assumptions (Matheson, 2009). In the case of full employment, the multiplier effect of an investment would be ineffective, with factor prices being pushed up as a direct result (Cowen, 1999). As a result, some have argued that ignoring resource limitations renders economic impact analysis incomplete (Dwyer, Forsyth, and Spurr, 2004). Long-term adjustments will influence the value of the multiplier over time (Coughlin and Mandelbaum, 1991). West (1992) pointed out

that the main use of the I-O analysis is in short run applications and, as such, the dynamic long-run aspects of activities would be of less significance. Indeed, the transitory and localised nature of many events meant that there was unlikely to be substantial impacts on input costs (Burgan and Mules, 1992).

Whether or not to take the multiplier effects into account is, according to Campbell and Brown (2003), dependent upon whether or not similar effects take place without the project in question. Hudson (2001) suggested taking a closer look at how a sporting facility contributes to the economy once it is constructed rather than during construction, because any number of alternative buildings or facilities could generate the same economic impact in terms of jobs and incomes. Coughlin and Mandelbaum (1991) suggested that any analysis that examined the demand effects associated with spending on a stadium alone would overstate the multiplier effects of the project if a city was funding that spending through increased taxes. If the burden of the tax on local residents is large, then there will be a large reduction in demand for local production (Coughlin and Mandelbaum, 1991). The net effect, which must include the tax burden effects that offset some (or all) of the gains associated with increased stadium construction expenditures, is what is of the most importance to policymakers.

Siegfried and Zimbalist (2000) presented perhaps the most critical summary of economic impact studies of sports facility projects and events, identifying three major methodological shortcomings. The first of these is the presence of the substitution effect. Many economic impact studies have assumed that all spending accruing as a result of an event is "new spending", which is an extremely optimistic assumption. Spending typically consists of local and visitor spending, in addition to event organisers, sponsors, and media, among others. The larger the percentage of local residents attending the event, the more inaccurate the "all spending is new spending" assumption becomes. For an accurate estimate of the economic impact, West (1992) recommended careful consideration of the appropriate regional boundaries and the extent to which the impacts occur. It is often argued that local consumers would spend money in the locality regardless of whether the event was held or not (West, 1992). To this end, the only events that are likely to generate an economic impact would either (i) have a large proportion of out-of-town visitors or (ii) induce local consumers to spend more money than they otherwise would have spent (i.e. locals draw from their savings).

The second reason is the presence of leakages out of the local economy (Siegfried and Zimbalist, 2000). Not all production in an area is produced locally, and thus not all income generated by the expenditures attributable to an event is likely to be retained locally (Siegfried and Zimbalist, 2000). A study of the economic impacts of the 1999 British Golf Open observed that the smaller the local economy, the larger the proportion of tourist expenditures was spent on imports, when compared to the national economy (Gelan, 2003).

The third reason why the economic impacts generated by economic impact studies did not materialise was the likely (negative) effect of subsidies on local government budgets (Siegfried and Zimbalist, 2000). An increase in government funding for a sports facility or event often necessitates a reduction in other areas of core government expenditures

(Alexander, Kern, and Neill, 2000). This reduction of expenditure has a balancing effect on the local economy. If the new spending on sports is a net increase in spending rather than being simply diverted from other spending in the community, then a multiplier effect will exist. Multipliers for sports tend to be low, however, and as is the case with low multipliers, job creation is minimal (Palmer, 2002). Burgan and Mules (1992) cited the study of the Adelaide Grand Prix in which it was found that employers didn't hire any additional staff during the event despite over AU$20 million in additional income being generated (Burns, Hatch, and Mules, 1986).

Economic impacts are often given as justification for government involvement (Burgan and Mules, 2001; Kesenne, 2005). Governments are, in most cases, interested in what effect public investment will have on the welfare of the local constituency (Dwyer, et al., 2004). Indeed, the definition of economic development as an increase in income or GDP has been criticised within the literature as being too narrow in focus (Chema, 1996). Some have claimed that an economic impact evaluation may merely be more convenient than an evaluation in light of the original intentions of hosting the event which may include social or cultural benefits, among others (O'Sullivan, Pickernell, and Senyard, 2009). Restricting an evaluation of an event that was financed with non-economic intentions to its economic dimension may result in the event being assessed in an inappropriate policy context (Johnson and Sack, 1996). A project that includes both economic and non-economic characteristics should be evaluated in an overall community development context rather than a narrowly defined economic evaluation (Johnson and Sack, 1996).

There are different views within the literature on what constitutes an appropriate evaluation of tangible outcomes of sports events and facilities from a public-sector funding perspective. Noll and Zimbalist (1997b) noted that a "valid" economic impact study should be a calculation of the net benefits associated with public investment that includes not only the impact on income and the associated multiplier effect, but also consumption value, the value of externalities, and the opportunity costs (Noll and Zimbalist, 1997b). An accurate economic impact analysis can provide information on the increase in tax revenues from a public investment, and thus can be considered an important evaluation tool for governments (Hefner, 1990). Indeed, if the maximisation of economic impacts is the intention of local government, then an economic impact study will be particularly informative (Burgan and Mules, 2001).

On the other hand, two comprehensive analyses have cast doubt on the reliability of these types of studies, showing that many economic impact studies adopted assumptions that inflated their economic impact (Crompton, 1995; Hudson, 2001). The inherently political nature of the stadium construction process has also been identified as a compelling explanation for the findings within the literature of over-stated benefits and under-stated costs within economic impact studies (Baade and Dye, 1988b; Noll and Zimbalist, 1997b). Kesenne (2005) has argued that even a properly conducted economic impact study does not provide justification for government involvement in such projects, advocating a cost-benefit analysis as a superior analysis.

2.2. The realised benefits of sports facilities and events

A number of economic arguments have been put forward as justification for government involvement in the financing of sports events and stadiums. Typically, approaches taken to measure the extent of such claims have been either (i) ex-ante studies, or (ii) ex-post studies (Bohanon and Peconga, 2003). Ex-ante studies are predictive studies conducted before the event, whereas ex-post studies are undertaken after the event and consider the effect of changes to the economy as a result of the event.

Much of the literature has focused on two major areas: (i) detecting the tangible impact of facilities and professional sports franchises on local economies and (ii) assessing the nature of intangible benefits associated with facilities and franchises. This branch of the literature is dominated by empirical findings of either zero or negative effects on host city incomes from facilities and franchises (Baade, 1987, 1996; Baade and Dye, 1990; Coates and Humphreys, 1999, 2001; Lertwachara and Cochran, 2007). Some studies, however, have found evidence to the contrary (Gius and Johnson, 2001; Nelson, 2001, 2002; Santo, 2005). Empirical analysis of job creation claims have tended to result in an absence of realised effects (Baade, 1996; Baade and Dye, 1988a; Baade and Sanderson, 1997a; Coates and Humphreys, 2003; Hudson, 1999; Miller, 2002), while some have attributed the possible negative impact of franchises and/or facilities to the presence of a compensating differential (Carlino and Coulson, 2004; Hamilton and Kahn, 1997).[2]

Debate within the literature has centred on the measurement of benefits such as the income and job creation effects of stadiums (Noll and Zimbalist, 1997a). Recent research, however, has suggested that stadium construction has generated a broad range of economic and non-economic benefits, ranging from the role that sports stadiums and professional franchises play in the urban revitalisation development strategy, to the numerous intangible effects associated with stadium construction and the presence of professional sports teams, including community solidarity, the "major league city" image, and civic pride.

Despite questions surrounding the legitimacy of intangible benefits and costs, many studies have found evidence suggesting that intangibles are important and more tangible than first thought (Alexander, et al., 2000; Fenn and Crooker, 2009; Groothuis, Johnson, and Whitehead, 2004; Irani, 1997; Johnson, Groothuis, and Whitehead, 2001; Johnson, Mondello, and Whitehead, 2006; Johnson and Whitehead, 2000; Owen, 2006; Santo, 2007; Schwester, 2007; Swindell and Rosentraub, 1998) although they are usually not enough to offset the subsidies provided to the facility or team in question. Such benefits are not universally accepted as genuine economic benefits, however (Meder and Leckrone, 2002). Siegfried and Zimbalist (2000) refuted such benefits, saying they were "…at a minimum hard to measure, and there are even legitimate questions as to whether they are benefits at all" (Siegfried and Zimbalist, 2000, p.99).

[2] Carlino and Coulson's 2004 findings were later re-examined and the results found to be sensitive to changes in the model and the data used (Coates, Humphreys, and Zimbalist, 2006).

3. FACILITY DEVELOPMENTS IN NEW ZEALAND

Since 1997, stadium construction activity in New Zealand has undergone a period of significant growth. New stadiums in Auckland, Wellington, Dunedin and Invercargill and several upgrades to existing stadiums have seen in excess of NZ$1.1 billion spent on sporting facilities across the country. 63%, or almost NZ$700 million, of this expenditure has come from local, regional and central government. Details of the individual facility works in the North and South Islands of New Zealand can be seen in Tables 1 and 2 respectively. Many of the new facilities were built with multiple purposes in mind.

Of the 24 construction projects, 12 were new facilities that were either completed or under construction at the end of the sample period. Three of the four facilities involving the largest outlays, Auckland's Eden Park, Christchurch's AMI Stadium (formerly Lancaster Park), and Dunedin's Forsyth Barr Stadium at University Plaza were built or upgraded in time for the 2011 Rugby World Cup. As can be seen in Tables 1 and 2, there have been a multitude of different financing arrangements for different facilities. The majority of projects, however, have involved considerable public sector contributions.

4. METHODOLOGY

Growing dissatisfaction with predictive studies that espoused sizeable benefits of sports facilities, franchises and events on host communities that rarely seemed to eventuate led several economists to conduct retrospective ex-post studies. Most of these studies are econometric analyses. The goal of these studies is typically to evaluate the realised impacts of sports and facilities on key economic variables for host economies, including income and employment, among others.

The ability of an ex-post econometric analysis to assess the realised outcome(s) of facility construction and the hosting of events is limited to those localities, cities or regions for which appropriate data is available, as well as the choice of an appropriate empirical model. To that end, several alternative models have been estimated in the literature. Case studies have utilised time-series data and associated techniques, but relatively few models have been derived from local or regional growth origins (Hudson, 1999). Perhaps the most-utilised technique has been pooling or panel-based analysis where the outcomes from multiple cities across several time periods have been considered. While panel data is often more costly to acquire, it does offer multiple advantages over time series and/or cross-section specific estimation, including greater accuracy of model parameters, and the ability to more deeply analyse and test complex behaviour, among others (Baltagi, 2007; Hsiao, 2007).

Table 1: Stadium Construction Details in the North Island, New Zealand, 1997-2009

City	Stadium	Type of Construction	Construction period	Value of construction work	Public funding details
Whangarei	Okara Park (Northland Events Centre)	Upgrade	February 2009 – June 2010	$18.5 million	Whangarei District Council: $3m; Northland Regional Council: $13m; Central Government: $2.5m (Dinsdale, 2009)
Auckland	North Harbour Stadium	Construction	January 1996 – March 1997	$42 million	$25.2m (Pegden, 1997)
	Mount Smart Stadium	Upgrade	December 2003 – March 2004	$23 million	Auckland Regional Council: 100%
	Eden Park	Stand Upgrade	June 1998 – July 1999	$38 million	Auckland City Council: $10m ("Eden Park gets nod," 1998)
	Eden Park	Upgrade	May 2008 - October 2010	$240.5 million	Central Government: $190m Auckland City Council: $20m Auckland Regional Council: $10m
	North Shore Events Centre	Upgrade	October 2000 – September 2001	$4 million	37.5% (Chapman, 2002)
	Trusts Stadium	Construction	February 2003 – August 2004	$28 million	Waitakere City Council: $12.5 million (Beston, 2004)
	Vector Arena	Construction	July 2004 – March 2007	$80 million	Auckland City Council $72.5m (Auckland City Council, 2007)
Tauranga	Western Bay Finance Stadium at Baypark	Construction	November 2000 – October 2001	$15 million	0% (100% privately funded)
Hamilton	Waikato Stadium	Upgrade	November 2000 – March 2002	$37 million	Hamilton City Council: $18m (Taylor, 2003)
Rotorua	Energy Events Centre	Construction	July 2005 – March 2007	$25 million	Rotorua District Council: $6.5m (Calkin Goeres, 2006)
Taupo	International Racing Track (Taupo Motorsport Park)	Construction	August 2005 – March 2006	$13 million	Central Government: $2m (stuff.co.nz, 2008)
Napier	McLean Park (Graeme Lowe Stand)	Upgrade	September 2008 – August 2009	$13 million	Napier City Council: $4.974m, Central Government: $3m (McCracken, 2010)
New Plymouth	Yarrow Stadium[3]	Upgrade	January 2002 – September 2002	$18 million	Taranaki Regional Council: $9.6m (Brown, 2004; Major regional asset should not become a ratepayers' liability," 2003)
Wellington	Westpac Stadium	Construction	August 1997 – December 1999	$125 million	Wellington City Council: $15m; Wellington Regional Council: $25m (Beattie, 2000)

[3] Rugby Park was renamed Yarrow Stadium in 2002 after the Yarrow family were the major benefactors in the park redevelopment.

Table 2: Stadium Construction Details in the South Island, New Zealand 1997-2009

City	Stadium	Type of Construction	Year opened/upgraded	Value of construction work	Public funding details
Nelson	Saxton Field Stadium	Construction	May 2008 – October 2009	$12.5 million	Nelson City Council: $5.4m Tasman District Council: $3.6m Central Government: $785,000 ("Government chips in for Saxton Field stadium," 2008)
	Trafalgar Park	Upgrade	November 2009 - present	$7.4 million	Nelson City Council: $5.9m Central Government: $1.5m ("Govt adds $1.5m to park upgrade," 2009)
Christchurch	Jade Stadium[4]	Upgrade	December 2000 – March 2002	$40 million	Christchurch City Council: $4m[5] (Bruce, 1999; Cheaper tickets from stadium loan - mayor," 2000)
	AMI Stadium[6] (East Stand)	Upgrade	May 2008 - January 2010	$60 million	Christchurch City Council: $20m (Pearson, 2008)
	CBS Canterbury Arena[7]	Construction	May 1996 – September 1998	$34.7 million	-
Dunedin	Forsyth Barr Stadium at University Plaza	Construction	May 2009 - August 2011	$198.3 million	Dunedin City Council: $98.5m Otago Regional Council: $37.5m Central Government: $15m (Dunedin City Council, 2010)
Invercargill	Stadium Southland	Construction	June 1999 – April 2000	$10.5 million	Invercargill City Council: $760,000 ("$760,000 loan for car parking," 1999)
	Homestead Stadium	Upgrade	February 2001 – August 2001	$7.3 million	Invercargill City Council: $1.3m (McKinlay, 2000)
	ILT Velodrome	Construction	May 2005 – May 2006	$11 million	Invercargill City Council: $150,000; Central Government: $1 million (Arnold, 2004; Burdon, 2005; New Zealand Government, 2006)

[4] Lancaster Park was renamed Jade Stadium after Aoraki Corporation bought naming rights for the park in 1998 at a cost of $4 million for 10 years (Riordan, 1998).
[5] The Christchurch City Council invested $4 million and agreed to underwrite the loan for the balance of construction costs.
[6] Lancaster Park was renamed AMI Stadium after the rights were sold to AMI in 2007 for an undisclosed sum.
[7] The Arena was known as Westpac Trust Centre from 1999-2009.

Studies that have pooled data within the literature have predominantly selected samples consisting entirely of cities that either hosted or had previously hosted professional sports franchises (Baade, 1996; Baade and Dye, 1990; Coates and Humphreys, 1999, 2001, 2002, 2003; Gius and Johnson, 2001; Lertwachara and Cochran, 2007; Nelson, 2001). An insignificant stadium or event coefficient for a pooled analysis has potentially masked quite different outcomes in individual cities. The inherently individual motivations for hosting events and building facilities are not always able to be taken into consideration in such analyses, meaning that individual city analyses may be more appropriate (Austrian and Rosentraub, 2002; Santo, 2005; Suchma, 2008). Individual analyses do not always provide generalised conclusions, however (Yin, 2003).

The initial direct impact of a new or upgraded facility is most likely to be detected in the immediate time period during which construction takes place. In the case of an event, a substantial direct injection of tourist expenditure will be evident in the local economy immediately, either in that month or quarter. The construction of a stadium may well have a series of on-going direct effects in the form of a transitory honeymoon effect (Baade and Sanderson, 1997b; Clapp and Hakes, 2005; Coates and Humphreys, 2005; Leadley and Zygmont, 2005), where people initially visit the stadium because it is an attraction in itself, and then attendance of events returns to regular pre-construction levels over time. The case for indirect effects being detectable in ex-post analyses, however, is considerably weaker than the case for direct effects. Indirect effects of either events or facilities are harder to detect as there is no known time frame within which the indirect effects filter through the local economy. As such, the longer the time frame, the less likely the effects will be detectable. One might reasonably expect the likelihood of detecting a statistically significant change in economic activity to be greater if the focus is on local area economic activity as opposed to regional or national economic activity.

The approach in this paper, therefore, is to conduct an ex-post econometric analysis. Ex-post analysis carefully conducted can be considered stronger evidence of the realised impact of a facility than ex-ante economic impact studies (Coates and Humphreys, 1999).

4.1. The models

Borrowing from the literature, separate models for territorial local authority (TLA) construction sector employment growth and TLA real GDP growth are developed. The general forms for each of these models are as shown in equations 1 and 2 below:

$$EMP\_CONST_{it} = \alpha_i x_{it} + \beta_i FCON_{it} + \delta_i + \varphi_t + e_{it} \quad (1)$$

$$GDP_{it} = \alpha_i x_{it} + \beta_i FCON_{it} + +\delta_i + \varphi_t + e_{it} \quad (2)$$

where:
EMP_CONST_{it} is the level of construction employment for TLA *i* in quarter *t*,

GDP_{it} is the level of real GDP,
x_{it} are location-specific characteristics, and
$FCON_{it}$ are facility construction-specific characteristics;
δ_i are cross-section fixed effects; and
φ_t are period-specific fixed effects.

The α's and β's are parameters to be estimated, and the e_{it} are the error terms.

The x_{it} variables include:
$SHARE\_AFF_{it}$, which is the share of TLA employment in the Agriculture, Forestry and Fisheries sector for TLA *i* in quarter *t*,
$SHARE\_MANUF_{it}$, which is the employment share of the manufacturing sector,
$SHARE\_TTS_{it}$, which is the employment share of the trade and transport services sector,
$SHARE\_SERV_{it}$, which is the employment share of the private and public service sector,
NM_{it} is the TLA's net migration,
$LQ\_EMP\_CONST_{it}$, which is the TLA's location quotient of construction employment, and
$LD\_RRET\_SALES_{it}$, which is the TLA's logged difference (percentage change) in real retail sales in quarter *t*.
Separate TLA-specific time trends ($TREND_i$) are also included as further location-specific control variables.

The $FCON_{it}$ variables used in variations of equations 1 and 2 include:
$FCON\_TOTAL_t$, which is the sum of facility construction dummy variables across TLA's in quarter *t*,
$STAD_t$, which is the sum of stadium construction dummy variables in quarter *t*,
$ARENA_t$, which is the sum of arena construction dummy variables in quarter *t*,
$MOTOR_t$, which is the sum of motorsport construction dummy variables in quarter *t*,
$VELO_t$, which is the sum of velodrome construction dummy variables in quarter *t*, and individual facility projects for TLA *i* in quarter *t* are also included as separate dummy variables.

A comprehensive list of dependent and independent variables are thus utilised in this analysis to control for a variety of TLA-specific characteristics and their influences on the local economy. The definitions and summary statistics of location-specific dependent and independent variables used in model estimation are detailed in Table 3 and 4. Variables are all taken from the Infometrics regional database, unless specified otherwise.

Table 3: Location-specific dependent and independent variables – summary statistics

Variable	Description	Infometrics Industry category	Mean	Standard Deviation	Minimum	Maximum
EMP_CONST	Quarterly level of TLA construction sector employment in quarter *t*.	E	5202.380	4701.638	877.000	23257.000
GDP	Quarterly level of TLA real gross domestic product, in millions.	-	1204.623	1414.351	176.000	6684.200
SHARE_AFF	Quarterly share of the TLA employment in the agriculture, forestry and fisheries sector.	A	3.981	4.261	0.081	19.958
SHARE_MANUF	Quarterly share of TLA employment in the manufacturing sector.	C	12.423	3.505	3.418	22.218
SHARE_TTS	Quarterly share of TLA employment in the trade and transport sectors combined.	F, G and I	23.248	3.042	13.641	30.225
SHARE_SERV	Quarterly share of employment in the combined private and public services sector.	J, K L ,M, N O P, and Q	46.300	8.510	28.876	72.834
NM	Quarterly net migration.	-	109.500	591.878	-1380.000	5163.000
LQ_EMP_CONST	Quarterly location quotient of TLA Construction sector employment (author calculation).	-	1.063	0.249	0.497	1.704
LD_RRET_SALES	Quarterly log difference (percentage change) in real TLA retail sales (nominal retail sales adjusted with CPI in each quarter).	-	0.570	11.018	-25.413	32.279

Table 4: Facility construction-specific variables ($FCON_{it}$)

Variable	Description	Mean	Standard Deviation	Minimum	Maximum
FCON_TOTAL	Sum of all facility construction dummy variables across TLAs in quarter t.	0.148	0.355	0	1
STAD	Sum of stadium construction dummy variables across TLAs in quarter t.	0.077	0.267	0	1
ARENA	Sum of arena construction dummy variables across TLAs in quarter t.	0.053	0.225	0	1
MOTOR	Sum of motorsport construction dummy variables across TLAs in quarter t.	0.011	0.103	0	1
VELO	Sum of velodrome construction dummy variables across TLAs in quarter t.	0.007	0.081	0	1

The location-specific controls in the models include TLA industry mix, which is represented by four industry employment share variables: (i) agriculture, forestry and fisheries (*SHARE_AFF*); (ii) manufacturing (*SHARE_MANUF*); (iii) trade and transport services (*SHARE_TTS*); and (iv) public and private sector services (*SHARE_SERV*), a selection that is consistent with the industry mix variables used by Hotchkiss, et al. (2003). Depending upon the relationship with the dependent variable in question, the signs on the parameter estimates are expected to vary. Net migration (*NM*) controls for changes in TLA demographic characteristics, and one would expect that greater net migration would potentially increase both employment in the construction sector and real GDP. This analysis also includes a location quotient to control for TLA construction sector (*LQ_EMP_CONST*) to control for the concentration of TLA employment in the construction sector across TLA's.[8] The sign on the location quotient coefficient is expected to be positive – the greater the concentration of employment, the greater the level of employment in the construction sector and real GDP. Finally, the percentage change in retail sales (*LD_RRET_SALES*) is included as a measure of growth in TLA market size, and the sign on this coefficient is expected to be positive – quarterly growth in the size of the market is expected to positively impact on construction sector employment and real GDP.

Like many previous studies that have measured the realised outcomes of events and facilities, the goal of this analysis is not to examine the role of key drivers of economic activity; rather, it is to control for as many theoretically important factors as possible, with the focus on whether event-specific variables impact significantly on local economic activity. To this end, the research has its limitations. Potential lack of explanatory power is possible due to omitted variables including population (even though net migration is used as a proxy), as well as local area construction information such as building permits. As Baade, Baumann and Matheson (2008) put it:
"Given the number and variety of controls found in regional growth models and the inconsistency of coefficient size and significance, any critic can claim that a particular regression suffers from omitted-variable bias. However, it is far more challenging to specify the model that remedies the problem" (Baade, Baumann, and Matheson, 2008, p. 633).

This analysis considers the impact of sports facility construction in general in the form of an aggregate variable (*FCON_TOTAL*), and then each construction type (*STADIUM*, *ARENA*, *MOTOR* and *VELO*) on employment in the construction sector and real GDP of local territorial local authorities (TLAs). If the construction of sports facilities has realised impacts on

[8] The location quotient is measured using the following formula:

$$LQ_{EMP_{CONST}} = \frac{EMP\_CONST_{i,t} / EMP\_TOTAL_{i,t}}{EMP\_CONST_{NZ,t} / EMP\_TOTAL_{NZ,t}}$$

If the location quotient equals 1, this means that TLA *i* has the same concentration of employment in the construction sector as the nation. This can be interpreted to mean that the employment in the construction sector in the TLA meets the needs for local demand. If the location quotient is less than 1, this can be interpreted to mean that employment in the construction sector for the TLA is insufficient to meet local demand. Likewise, if the location quotient is greater than 1, this suggests that local employment is more than sufficient to meet demand.

construction employment and real GDP, the coefficients on these variables are hypothesised to be positive and significant. We also examine the post construction impacts of facility construction on the two dependent variables in the form of the aggregate variable (*POST_FCON_TOTAL*), and then each construction type (*POST_STADIUM*, *POST_ARENA*, *POST_MOTOR* and *POST_VELO*). If the facilities have realised legacy effects, the post-facility coefficients are hypothesised to be positive and significant.

Levels of the dependent variables and several of the independent variables are utilised in this analysis, so all variables must be tested for the presence of unit roots that are sometimes present in levels of such variables as employment and GDP. The presence of non-stationary variables in a model can potentially lead to spurious regression results. Results of Levin-Lin-Chu (LLC) panel unit root tests for each of the variables (with trends) are reported in Table 5.

Table 5: Levin Lin Chu (LLC) Panel Unit Root Tests

Variable	Test statistic (Adjusted t*)	p-value
EMP_CONST	-1.066	0.143
GR_EMP_CONST	-16.747	0.000
GDP	-8.667	0.000
SHARE_AFF	-4.828	0.000
SHARE_MANUF	-3.179	0.001
SHARE_TTS	-3.670	0.000
SHARE_SERV	-5.285	0.000
NM	-7.523	0.000
LQ_EMP_CONST	-2.917	0.002
PCT_RRET_SALES	-34.112	0.000

There is evidence to reject the null hypothesis of non-stationarity of panels in the LLC tests for all variables except EMP_CONST. The EMP_CONST variable was re-specified as a growth rate (GR_EMP_CONST). The subsequent test result suggests that the employment growth variable, in addition to the specifications of other variables, is stationary and appropriate for use in these models. For each model, quarterly data for 15 TLAs in New Zealand is utilised between 1999:1 and 2009:2. Key economic indicators for each TLA during this period are as shown in Table 6 below.

Table 6: Quarterly Economic Indicators for Territorial Local Authorities (TLAs)

Territorial Local Authority (TLA)	Average quarterly EMP_CONST, Full Time Equivalents (FTE)	Average quarterly growth in EMP_CONST (%)	Average quarterly real GDP (1995/96 prices), $m
Whangarei	2,916.6	0.914	409.7
North Shore City	6,195.9	1.134	1,407.0
Waitakere	4,910.5	0.812	716.4
Auckland City	17,991.0	1.222	5,578.5
Hamilton City	6,463.1	1.295	981.9
Taupo	1,239.3	1.242	217.2
Tauranga City	4,497.5	2.496	600.1
Rotorua	1,995.6	2.153	429.2
Napier City	2,047.9	1.204	326.6
New Plymouth	2,992.6	1.311	729.5
Wellington City	5,466.3	0.719	2,667.9
Nelson City	1,603.6	1.447	297.0
Christchurch	12,845.0	1.014	2,418.7
Dunedin City	3,457.4	0.243	685.2
Invercargill	1,975.6	1.034	359.8

5. RESULTS AND DISCUSSION

The data used in this analysis is a balanced panel (15 cross sections across 46 quarterly time periods). Each model was initially estimated using the pooled OLS technique. Panel data diagnostic tests were conducted, including tests for autocorrelation and heteroskedasticity, as well as the Hausman test for differences between fixed and random effects to determine the appropriate model specification. The preferred specification was the fixed effects model with cross-section and period fixed effects. Wooldridge tests revealed that first order serial correlation was present in each model, and the Breusch-Pagan LM test revealed that both models also exhibited cross-sectional dependence. Each model was thus re-estimated with the Prais-Winsten panel corrected standard errors (PCSE) transformation, and serial correlation was addressed with the inclusion of a common AR(1) process across all panels. The results of this estimation procedure are reported in Tables 7 and 8 and discussed in the sub-sections that follow.

Table 7: Construction Employment Growth Results – Parameter Estimates

	Model 1: Prais-Winsten PCSE, cross-section and period fixed effects 690 observations 15 cross-sectional units Time-series length = 46 Dependent variable: GR_EMP_CONST							
	1(a) Aggregate, during construction		**1(b) Aggregate, post-construction**		**1(c) Facility types, during construction**		**1(d) Facility types, post-construction**	
Variable	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**
C	-31.913	0.733	-37.15	0.699	-39.262	0.680	-34.994	0.713
SHARE_AFF	-0.550	0.591	-0.537	0.609	-0.430	0.683	-0.549	0.600
SHARE_MANUF	-1.079	0.280	-0.919	0.371	-1.044	0.302	-0.889	0.388
SHARE_TTS	-2.138	0.070	-2.081	0.084	-2.078	0.081	-2.109	0.078
SHARE_SERV	0.191	0.846	0.279	0.780	0.264	0.791	0.240	0.808
NM	<0.001	0.868	<0.001	0.764	<0.001	0.227	<0.001	0.831
LQ_EMP_CONST	73.978	0.000	72.524	0.000	74.884	0.000	72.459	0.000
PCT_RRET_SALES	0.045	0.191	0.049	0.152	0.042	0.227	0.049	0.156
FCON_TOTAL	2.030	0.004	-	-	-	-	-	-
POST_FCON_ TOTAL	-	-	-0.571	0.504	-	-	-	-
STADIUM	-	-	-	-	2.143	0.024	-	-
ARENA	-	-	-	-	0.492	0.672	-	-
MOTOR	-	-	-	-	4.495	0.193	-	-
VELO	-	-	-	-	6.296	0.035	-	-
POST_STADIUM	-	-	-	-	-	-	0.222	0.876
POST_ARENA	-	-	-	-	-	-	-0.350	0.814
POST_MOTOR	-	-	-	-	-	-	-2.804	0.414
POST_VELO	-	-	-	-	-	-	-1.663	0.617
	R-squared	0.478	R-squared	0.471	R-squared	0.481	R-squared	0.472

5.1. Construction sector employment effects

The first stage of this analysis is to examine whether facility construction has generated changes in jobs in the local construction sector. These impacts are considered in two ways: during construction and post-construction. Parameter estimations for this model can be seen in Table 7. Firstly, model 1(a) considers the impact of the aggregate facility variable (that is, the sum total of all sports facility construction projects within each TLA). The coefficient on this variable reveals that there is a statistically significant increase in quarterly employment growth of 2.03 percentage points for each quarter during facility construction. The interpretation of this result can be illustrated with an example. Consider Wellington, which had an average quarterly growth of 0.719% during the period of analysis, for an average increase of 39.3 full-time equivalent (FTE) jobs per quarter. During a sports facility project, employment growth is 2.03% higher than usual, meaning that the average quarterly increase becomes 40.1 FTEs per quarter. The impact of the facility project during construction in Wellington is thus an increase of approximately 0.8 construction sector FTEs per quarter.

This result is further probed with the separation of construction projects into facility types in model 1(c). Of the four facility types, stadium (2.1%) and velodrome (6.9%) projects were associated with significantly higher employment growth during construction (both were statistically significant at the 5% level of significance), while arena and motorsport projects were not associated with significant effects. The stadium result relative to other projects is perhaps not surprising; they are typically larger projects than the other facilities. Care must be taken with the interpretation of the velodrome result, however, as there was only one velodrome built during the period of analysis, ILT Velodrome, built in Invercargill. These results suggest that the impact of the velodrome project during construction was an increase of approximately 1.4 construction sector FTEs per quarter. With construction lasting four quarters, this indicates that the project produced a net gain of 5.6 FTEs.

Post-construction, the results tell a different story. Model 1(b) shows the impact of the post-construction period for the combined facility projects, and there is no statistically significant impact. Separated into facility types in model 1(d), none of the project types are associated with statistically significant impacts. These results suggest that post facility construction, construction sector employment is unchanged.

Overall, these results indicate that while some facility projects generate increases in employment growth during construction, these increases are restricted to the construction period. There is no evidence to suggest that facility construction results in more jobs beyond the construction period, so it is perhaps best to refer to any employment gains as short-term in nature. Reasons why we might fail to observe a longer term effect include the limited supply of workers in the construction sector, particularly for the specialised nature of facility construction. Other construction activity could potentially be reallocated or redistributed to accommodate facility construction. Specialist large-scale facility construction work, particularly stadium projects, is often contracted to out-of-town contractors, and effectively results in regular construction

activity remaining largely unchanged. The magnitude of this effect is likely to be lower for smaller scale facilities such as arenas. Facility construction is also often signalled well in advance of actual construction dates, which may result in construction firms adjusting employment levels in anticipation of future work.

5.2. Real GDP effects

The next stage of the analysis is to determine whether facility construction is associated with realised impacts on real GDP for host TLAs. The same approach conducted in the previous sub-section is followed here. Parameter estimates are as shown in Table 8. Results for model 2(a) indicate that although the sign of the aggregated facility variable during the construction period is positive, it is not statistically significant, indicating that facility projects did not have any impact on quarterly real GDP during construction. Results from model 2(b) show that while the sign on the post-construction variable is negative, it is also statistically insignificant.

Separating the construction variable into facility types reveals similar results. Parameter estimates for model 2(c) show that none of the facility types were associated with statistically significant changes in real GDP during construction. Likewise, results for model 2(d) suggest that despite the signs on each post-construction facility type variable being negative, all of them are statistically insignificant.

These results, taken in general, suggest that the realised impacts of facility construction on real GDP are far from universally positive as is usually claimed in economic impact studies. There is no evidence to suggest that construction of a particular facility type has any impact on TLA incomes at an aggregate level. These results are generally not surprising, as many of the projects considered in this analysis were either upgrades or replacements for previously-existing facilities. As such, these results support assertions made in previously in the literature for substantially lower realised economic impacts. As Baade and Sanderson (1997b) put it:

> "Once the construction phase of the project is over, the new facility cannot contribute significantly more to community output and employment than the old facility did unless the new structure is far more successful in attracting fans from beyond the community's borders. In the case of replacement facilities, it is more accurate to promise that they will maintain current employment. To suggest or imply that a replacement facility creates new jobs, without inducing an increase in spending overall, has no theoretical foundation and almost certainly exaggerates its economic impact" (Baade and Sanderson, 1997b, p. 473).

Table 8: Real GDP Results – Parameter Estimates

	Model 2: Prais-Winsten PCSE, cross-section and period fixed effects 690 observations 15 cross-sectional units Time-series length = 46 Dependent variable: GDP							
	2(a) Aggregate, during construction		**2(b) Aggregate, post-construction**		**2(c) Facility types, during construction**		**2(d) Facility types, post-construction**	
Variable	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**
C	630.576	0.001	638.933	0.001	647.634	0.001	638.806	0.001
SHARE_AFF	-4.715	0.111	-4.850	0.105	-5.007	0.084	-4.822	0.111
SHARE_MANUF	-4.249	0.099	-4.415	0.096	-4.421	0.085	-4.408	0.099
SHARE_TTS	-6.488	0.048	-6.555	0.047	-6.675	0.041	-6.857	0.047
SHARE_SERV	-1.082	0.636	-1.147	0.608	-1.274	0.580	-1.122	0.615
NM	-0.032	0.034	-0.032	0.031	-0.033	0.026	-0.032	0.032
PCT_RRET_SALES	0.266	0.173	0.263	0.176	0.279	0.148	0.264	0.180
FCON_TOTAL	0.051	0.995	-	-	-	-	-	-
POST_FCON_ TOTAL	-	-	-2.333	0.817	-	-	-	-
STADIUM	-	-	-	-	-1.640	0.904	-	-
ARENA	-	-	-	-	11.847	0.390	-	-
MOTOR	-	-	-	-	-11.632	0.289	-	-
VELO	-	-	-	-	-1.167	0.937	-	-
POST_STADIUM	-	-	-	-	-	-	-2.119	0.920
POST_ARENA	-	-	-	-	-	-	-2.270	0.837
POST_MOTOR	-	-	-	-	-	-	-1.819	0.875
POST_VELO	-	-	-	-	-	-	-4.620	0.800
	R-squared	0.998	R-squared	0.998	R-squared	0.998	R-squared	0.998

5.3. Robustness of results

A readily-available check of the robustness of these results exists in the form of the inclusion of a lagged dependent variable in each of the models. Lagged dependent variables may capture potentially important unobserved factors that are specific to the city building the facility. As such, the exclusion of the lagged dependent variable may potentially result in parameter estimates being affected by omitted variable bias (Coates and Humphreys, 2003). As such, models 1(a)-(d) and 2(a)-(d) were re-estimated with lagged dependent variables, the results of which are as shown in Tables A1 and A2 in the appendices. Results from these tables showed a smaller increase in growth in construction employment during for aggregate facility construction (1.665% as compared to 2.030%), an effect that remains statistically significant. There are similar smaller effects for the individual facility types (the stadium and arena coefficents) which remain significant, and there are no significant post-construction effects on construction employment. The inclusion of the lagged dependent variable did not change the significance of the coefficients for the facility construction variables on real GDP. As such, these results can be considered robust given that they are largely unchanged with or without the lagged dependent variable.

6. POLICY IMPLICATIONS

The results from this analysis suggest that predictions of substantial economic impacts of sports facilities have generally not materialised. Optimistic predictions need to be tempered, with particular attention paid to the existing facility landscape. There are many reasons why economic impacts fail to materialise, many of which have been mentioned in the literature review section of this paper. A short-term increase in construction sector employment for certain facility types does appear to exist during construction, however the effect disappears post-construction. Real GDP is unaffected both during and post-construction. If the intention of local government funding in such projects is to stimulate employment or GDP, projects that generally don’t deliver anything more than short-term sector-specific impacts don’t deliver the goods.

Local politicians should also be mindful of other potential impacts of subsidising facilities, in particular the opportunity cost of subsidising facilities. It has been noted elsewhere in the literature that a change in employment composition resulting from subsidising facility projects could potentially bring about a worsening in economic development. If a facility project results in the creation of low-skill employment at the expense of high-skill employment, the host area may well experience a deterioration in economic development relative to other areas (Baade and Dye, 1990).

Results from this paper strengthens the conclusions of the majority of research throughout the scholarly literature in this field that sports facilities shouldn’t be relied upon as economic stimuli. They don’t generate increases in long-term employment, and they have no impact on local area incomes (as measured by real GDP). This is not to say that individual projects might, in the right

context, be appropriate investments for the public sector (Nelson, 2002; Rosentraub, 2010; Santo, 2005). Indeed, some city-specific case studies have found that cities that have utilised sports as a revitalisation strategy have experienced favourable outcomes (Austrian and Rosentraub, 2002; Rosentraub, 2010). If local areas that adopt this strategy grow at the expense of others within the region, however, the gains are merely redistribution rather than economic development (Coates, 2007). The desirability of such a local development strategy is problematic from a regional and central government perspective. Empirical evidence from this paper suggests that the tangible economic gains largely don't materialise for cities, rendering the strategy (at all levels) questionable at best.

7. CONCLUSION

Government funding towards sports facilities is frequently justified on the grounds of ex-ante projections of economic impact, usually in the form of employment creation and/or increases in local area GDP. Ex-post scrutiny is therefore warranted to determine whether in fact the anticipated impacts materialized in cities that have built sports facilities. This paper develops ex-post econometric models to determine the realised impact of facility construction on construction sector employment and real GDP for fifteen New Zealand cities between 1997 and 2009. Results from this paper indicate that sports facilities have resulted in only small short-term construction employment gains to host cities. Results also failed to find evidence of realised changes in real GDP.

In light of these results, which support the majority of research in this field, justification for government involvement in sports facilities should focus on other economic dimensions of sport. Public good characteristics have been quantified within the literature, and are a much more defensible rationale for government involvement. It has been suggested that aggregating the intangible economic benefits of public good creation and consumption benefits in the form of consumer surplus might justify public involvement (Coates, 2007). A future analysis should, at the very least, attempt to quantify these benefits and place them alongside the opportunity costs of facility projects.

One can only hope that policymakers at local, regional and central government levels look back to past experience for guidance on future decisions of whether to commit scarce public funds towards sports facilities. Evidence from this paper supports a growing and extremely compelling argument that facilities are generally not justified on the grounds of realised ex-ante economic impact projections. Policymakers should at the very least have realistic expectations of the likely economic impact of a new or upgraded facility on local economies, and ideally justify their involvement on other grounds.

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APPENDICES

Table A1: Construction Employment Results (including lagged dependent variable) – Parameter Estimates

	Model 1: Prais-Winsten PCSE, cross-section and period fixed effects 690 observations 15 cross-sectional units Time-series length = 46 Dependent variable: GR_EMP_CONST							
	1(a) Aggregate, during construction		**1(b) Aggregate, post-construction**		**1(c) Facility types, during construction**		**1(d) Facility types, post-construction**	
Variable	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**
C	-102.630	0.191	-110.057	0.165	-101.873	0.198	-107.109	0.180
$GR\_EMP\_CONST_{t-1}$	-0.498	0.000	-0.498	0.000	-0.498	0.000	-0.499	0.000
SHARE_AFF	0.187	0.831	0.240	0.787	0.209	0.813	0.218	0.806
SHARE_MANUF	-0.948	0.252	-0.779	0.352	-1.000	0.231	-0.779	0.356
SHARE_TTS	-1.711	0.077	-1.662	0.090	-1.720	0.078	-1.687	0.087
SHARE_SERV	0.378	0.639	0.477	0.558	0.374	0.646	0.438	0.593
NM	<0.001	0.774	<0.001	0.612	<0.001	0.760	<0.001	0.671
LQ_EMP_CONST	108.277	0.000	107.902	0.000	108.280	0.000	107.595	0.000
PCT_RRET_SALES	0.017	0.401	0.021	0.311	0.014	0.517	0.019	0.364
FCON_TOTAL	1.665	0.013	-	-	-	-	-	-
POST_FCON_ TOTAL	-	-	-0.226	0.794	-	-	-	-
STADIUM	-	-	-	-	1.869	0.032	-	-
ARENA	-	-	-	-	0.012	0.992	-	-
MOTOR	-	-	-	-	3.833	0.120	-	-
VELO	-	-	-	-	5.976	0.051	-	-
POST_STADIUM	-	-	-	-	-	-	0.347	0.797
POST_ARENA	-	-	-	-	-	-	0.491	0.724
POST_MOTOR	-	-	-	-	-	-	-3.302	0.248
POST_VELO	-	-	-	-	-	-	-1.965	0.608

	R-squared	0.806	R-squared	0.802	R-squared	0.807	R-squared	0.802

Table A2: Real GDP Results (including lagged dependent variable) – Parameter Estimates

	Model 2: Prais-Winsten PCSE, cross-section and period fixed effects 690 observations 15 cross-sectional units Time-series length = 46 Dependent variable: GDP							
	2(a) Aggregate, during construction		**2(b) Aggregate, post-construction**		**2(c) Facility types, during construction**		**2(d) Facility types, post-construction**	
Variable	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**	**Coefficient**	**p-value**
C	389.266	0.049	407.316	0.044	400.861	0.047	411.016	0.044
GDP_{t-1}	0.509	0.000	0.504	0.000	0.488	0.000	0.502	0.000
SHARE_AFF	-3.999	0.158	-4.261	0.140	-4.235	0.134	-4.313	0.141
SHARE_MANUF	-2.603	0.275	-2.951	0.251	-2.486	0.302	-2.929	0.250
SHARE_TTS	-6.482	0.036	-6.682	0.033	-6.688	0.036	-6.769	0.034
SHARE_SERV	-0.378	0.850	-0.458	0.814	-0.332	0.872	-0.466	0.810
NM	-0.010	0.496	-0.011	0.468	-0.011	0.444	-0.011	0.464
PCT_RRET_SALES	0.686	0.005	0.680	0.006	0.683	0.005	0.679	0.006
FCON_TOTAL	0.022	0.997	-	-	-	-	-	-
POST_FCON_ TOTAL	-	-	-3.212	0.609	-	-	-	-
STADIUM	-	-	-	-	-3.771	0.707	-	-
ARENA	-	-	-	-	8.615	0.386	-	-
MOTOR	-	-	-	-	-7.441	0.388	-	-
VELO	-	-	-	-	0.843	0.938	-	-
POST_STADIUM	-	-	-	-	-	-	-2.371	0.870
POST_ARENA	-	-	-	-	-	-	-4.176	0.631
POST_MOTOR	-	-	-	-	-	-	-2.497	0.739
POST_VELO	-	-	-	-	-	-	-6.160	0.635

	R-squared	0.999	R-squared	0.999	R-squared	0.999	R-squared	0.999

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