



## Assessing the stock of regulation

## A tool for regulatory stewards

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Each year NZIER devotes resources to undertake and make freely available economic research and thinking aimed at promoting a better understanding of New Zealand's important economic challenges. This paper was funded as part of this public good research programme. The paper draws upon material originally developed for the Ministry of Transport (NZIER 2015). This view expressed in this paper are the sole responsibility of the authors and do not reflect the views of the NZ Government.

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## Key points

- Traditionally New Zealand's system of regulatory management focussed on the flow of new laws and regulations through tools such as Regulatory Impact Assessment.
- Until recently responsibility for keeping the stock of regulation up to date was not assigned. This was a significant gap as the stock of regulation is increasing significantly over time and changes in technology, business and social practices means the statue book continually needs to be revised and modernised.
- Over the last few years however more emphasis has being placed on managing the stock of regulation with departmental chief executives now having statutory responsibility for the 'stewardship' of the stock of existing regulations.
- Detailed guidance has been developed by the Treasury to help clarify what the responsibilities of regulatory stewardship are.
- However the development of the tools to meet those responsibilities has lagged behind.
- To fill this gap, this paper presents a new approach for systematically scanning the existing stock of regulation and identifying regulations that have a high likelihood of creating, rather than mitigating, market inefficiencies.
- We find that modern research techniques are available to help departmental chief executives meet their new statutory responsibilities. The approach we used was mixed method that combined quantitative techniques such as Computational General Equilibrium (CGE) modelling analysis, with qualitative text analysis to assess the overall approach to regulation. These analytic techniques were augmented by expert judgement from practitioners.
- Our approach focussed on identifying the dominant styles of regulation and hence the greatest potential for market inefficiencies. By style of regulation we mean the use of prescriptive command and control regulation, more flexible performance based regulation or the use of market instruments such as tradeable permits.
- We identified the areas for greatest scope for efficiency gains based on a weighting of three factors: 1) the materiality based on the value of the economic outputs, 2) the nature of the regulatory environment (the dominant style and reach) and 3) the potential for efficiency gains over time (identified by previous studies).
- The output from the weighting was a quantitative ranking of the present value in dollar terms of the potential performance gains over the next 15 years.
- In short where the style, reach, level and duration of regulation suggest a high potential for market inefficiencies, there was significant potential efficiency gains and the domain was economically significant, then it was placed in the priority list for detailed review.
- The approach is illustrated for the transport sector. However, the broad approach could be tailored to a particular situation facing a department and practitioner input is essential for interpreting the analysis.

## Contents

1.	Introdu	Introduction				
	1.1.	What we mean by 'regulations'	5			
	1.2.	The focus of this paper	5			
	1.3.	Assessing regulatory performance	6			
	1.4.	Globalisation and local particularism	7			
2.	Our or	Our organising framework				
	2.1	Contrasting regulatory styles	8			
3.	Our fra	Our framework				
	3.1.	Nature of regulation	10			
	3.2.	Materiality assessment	15			
	3.3.	Identifying the potential for gain from reform				
	3.4.	Using SCP to check for undesirable impacts	17			
	3.5.	Triangulating the results	19			
	3.6.	Narrowing down to specific regulations for review	19			
4.	Conclu	sions	21			

#### Appendices

Appendix A Regulatory stock assessment tools	. 22
Appendix B References	. 24

### Figures

Figure 1 Types of regulatory costs	4
Figure 2 Regulatory cause and effect	6
Figure 3 Assessment framework	10
Figure 4 Transport value added	16
Figure 5 Trends in transport sector productivity	
Figure 6 Structure conduct performance framework	19

#### Tables

Table 1 Characteristics of regulations as inefficiency indicator	11
Table 2 Regulatory style by transport mode	12
Table 3 Level of transport interventions	12
Table 4 Regulatory reach – 'Rules'	14
Table 5 Regulatory stock reviews in New Zealand	22

## 1. Introduction

New Zealand, like other OECD countries, has been active in developing a regulatory management system since the mid-1980s but the prime focus has been posing 'big policy' questions to review the *flow* of new laws and regulations through tools such as Regulatory Impact Assessment. Until recently responsibility for keeping the *stock* of regulation up to date was not assigned. New Zealand regulatory policy has gone through four overlapping phases (Gill 2016):

- 1. Sector-based reform with extensive regulatory reform in 1984 and the early 1990s and ongoing changes thereafter
- 2. Compliance cost reduction an episodic series of initiatives introduced from the early 1990s until the mid-2000s
- Regulatory flow management the flow of new regulations has been focussed through Regulatory Impact Analysis (RIA) and a Code of Good Regulatory Practice commencing in 1998
- 4. Regulatory stock management increased emphasis on stock management, starting in 2009, in addition to flow management.

New Zealand prides itself on the clarity of responsibility in the formal public management system introduced in the 1980s. However, the Cabinet Office Manual – the constitutional bible in a Westminster system – is virtually silent on the Minister's role in regulation, beyond a short reference to the introduction of new primary legislation. Similarly, statute was essentially silent on the responsibilities of departmental chief executives until the changes to State Sector Act in 2013 (in phase 4 above), assigned responsibility for the stock of regulation.

By convention, every statute specifies one or more administering departments. However, there is no statute which specifies what the role of the administering department is for primary or any secondary or tertiary legislation and until recently the current State Sector Act 1988 made no mention of this role.<sup>1</sup>

The amendment to the State Sector Act (section 32(1)(d)(ii)) clarified the responsibility of departmental chief executives for "the stewardship of...the legislation administered by the department". The new legislative provision was backed up with Cabinet approved regulatory stewardship expectations published in April 2013, which provided administrative guidance on the duties and responsibilities of an administering department.

There were two imperatives for more clearly assigning responsibility for the stewardship of stock of regulation: the steady growth in the stock of regulation and the size of the prize (the cost of regulation). The stock of regulation continues to growth rapidly over time (NZ Productivity Commission 2014 p275). Changes in technology, business and social practices means the statute book dates and needs to be revised and modernised. Others linger beyond usefulness, and unknowingly stifle innovation at a significant social cost.

While regulations impose costs on businesses and individual taxpayers these are generally hidden. Surprisingly little is known about the full cost of regulation but the empirical evidence that is available suggests that the costs imposed by regulation are significant. NZIER estimates suggest the administrative cost of regulation in New Zealand averages around \$5 billion (2.9% of GDP). These estimates are in line with comparable estimates in other jurisdictions (NZIER 2016). The \$5 billion only includes the value of the effort of businesses and citizens to comply with regulation. These compliance costs do not include the distortionary cost of regulation resulting in undesirable and unanticipated changes of behaviour shown in Figure 1.

<sup>&</sup>lt;sup>1</sup> See Gill and Frankel (2014) for a longer description of the formal roles and responsibilities of the different players including Parliamentary Counsel Office and Select Committees.

#### **Figure 1 Types of regulatory costs**



Source: NZIER adapted from Victorian Productivity Commission

The relative sizes of the boxes in Figure 1 are drawn from the international tax literature as no authoritative estimates are available for the total distortionary cost of regulation. Surprisingly little is known about the distortionary costs of regulations, how they relate to administrative and compliance costs, and how these in turn compare with the costs of taxation.<sup>2</sup> Figure 1 illustrates that if taxation is a guide then the 'distortionary costs' of regulations can be larger by orders of magnitude than the more visible administrative and compliance costs.<sup>3</sup>

While the regulatory stewardship responsibilities of chief executives have been clarified, the development of the tools to meet those responsibilities has lagged behind. Almost no guidance is provided on how to review the existing stock. There is a range of tools (and these are outlined in Appendix A). But none of the tools in Appendix A focus on the total cost of regulation.

This paper fills this gap by presenting a new approach for systematically scanning the existing stock of regulation and identifying regulations that have a high likelihood of creating, rather than mitigating, distortions.

The approach includes a range of methods – combining quantitative techniques such as CGE modelling analysis, with qualitative text analysis to assess the overall approach to regulation. These analytic techniques are then augmented by expert judgement.

For illustrative purposes, we draw on our recent application of this approach to the transport sector in New Zealand.<sup>4</sup> The transport sector's impact on society in New Zealand is much larger than its simple 2.4% share of GDP implies. As the engine-room of New Zealand it's very important that the transport sector functions well and is efficient. However, the focus of this paper is not with transport regulation

<sup>&</sup>lt;sup>2</sup> Gill and Frankel op cit.

<sup>&</sup>lt;sup>3</sup> A typical study (for Canada) found administration costs of taxation as 0.4% of GDP (1.2% of tax revenue) and compliance costs of between 1.1% and 1.4% of GDP (3.4 - 4.3%. of tax revenue) https://www.fraserinstitute.org/sites/default/files/compliance-and-administrative-costs-of-taxation-incanada-2013.pdf. Distortion costs are more difficult to quantify but are generally an order of magnitude larger. Because the dead-weight cost of distortion from taxation is proportional to the square of the tax rate, it is possible for the dead-weight cost to be well in excess of a dollar for each dollar raised. The NZ Treasury (2009) concluded that the distortion cost ranged from 10c to nearly \$2 for each dollar of revenue raised.

<sup>&</sup>lt;sup>4</sup> NZIER. 2015. Transport Regulation Identifying opportunities for improving the regulatory environment.

per se. Rather it concerns an approach for assessing a stock of regulations. The transport sector is an instructive example as there are distinctive regulatory regimes applying to the different modes of transport: land transport, rail, aviation and maritime.

### 1.1. What we mean by 'regulations'

There is no agreed definition of regulation in the literature. Some widely accepted definitions such as 'legal rules which seek to steer the behaviour of mainly private citizens and companies'<sup>5</sup> are excessively permissive as they include interventions such as taxes and subsidies. For example, while subsidies require a statutory basis they do not rely on regulatory coercion to have their desired impact. In this paper we use a legal definition of regulation. When we refer to regulations we mean Acts of the New Zealand Parliament (primary legislation) and Legislative Instruments (secondary legislation). "Most regulations and rules, and many notices, orders, determinations, and warrants are Legislative Instruments".<sup>6</sup>

This includes Acts as well as Legislative Instruments such as regulations and rules that are made under the authority of an empowering Act. We exclude subordinated legislation, e.g., standards, codes and guidance (sometimes referred to as tertiary legislation).

We focus on the direct effects on product markets of the specific regulatory interventions. In addition to transport sector specific regulations there are generic legislation such as the Sale and Supply of Alcohol Act 2012 or the legal framework around Occupational Health and Safety that applies to multiple sectors. The approach we have developed could be applied to these generic regulations but that was not the focus of our work so far.

## 1.2. The focus of this paper

Evaluating the stock of regulations requires an assessment of both the cause (that is the regulations themselves) and the effect (the impacts or outcomes which stem from behaviour changes that are induced or directed by the regulations). Figure 2 illustrates these causal linkages.

There has been academic research and development in the practises of practitioners on each of the elements of these linkages. For example, practitioners in a number of jurisdictions have applied the standard cost model (SCM)<sup>7</sup> to assess regulatory performance from a compliance viewpoint. Data on direct government administration costs for regulators are readily available in government agencies' annual reports (although this information has not yet been pulled together). While there is a growing body of literature on the measurement of outcomes from regulatory interventions,<sup>8</sup> overall the evidence base about 'what works' with regulatory interventions is thin.<sup>9</sup> We are however aware of little previous work on assessing the causal link between the regulations themselves, how regulations are applied and the resultant impacts on the efficiency of product markets.

The challenge for us was to develop a methodology that would make these connections in a structured and measurable way and from this structure be able to credibly estimate the nature and magnitude of the potential impacts on product markets. The focus of this paper is to describe both the approach and the consequences that flow from the analysis. The aim of the approach is to identify potential for improvements in the regulatory regime. In the case of the transport sector, the study resulted in the

<sup>&</sup>lt;sup>5</sup> Black (2014). See the regulatory toolkit for a range of thematic and functional definitions of regulation http://www.regulatorytoolkit.ac.nz/about-regulation/definitions

<sup>&</sup>lt;sup>6</sup> http://www.pco.parliament.govt.nz/about-legislation/

<sup>&</sup>lt;sup>7</sup> Standard Cost Model Network (2005.

<sup>&</sup>lt;sup>8</sup> See Allio (2015) for a survey.

<sup>&</sup>lt;sup>9</sup> In a recent survey the OECD observed "Overall, however, very few OECD countries have actually deployed the ex post evaluation systematically and no dedicated governance structure is usually at hand to support the ex post evaluation function" (OECD 2015 p129).

identification of several case studies of potential market efficiency gains that warranted further investigation.





Source: NZIER from Coglianese (2012)

## 1.3. Assessing regulatory performance

Traditional measures of regulatory performance such as the standard cost model focus on the direct compliance costs rather than the wider indirect cost of regulations. Figure 2 shows that regulatory performance comprises three elements – the *regulations* themselves; the *behaviour* of both the regulator and the 'regulated' target and the *outcomes* from the process. Evaluating each of these involves somewhat different approaches and measures.

The regulations are administered by regulators with varying degrees of compliance by regulatees. Compliance costs from regulation can be measured through surveys of compliance effort and audits which provide assessments of the degree of compliance with the rules.

In the end however it is the measurement of the impact on the outcome that matters for the living standards of New Zealanders – behaviour changes and implementation effectiveness only matter in so far as they deliver the desired outcomes. We therefore suggest that from a regulatory stewardship perspective the focus should be on measures of impact and the relationship between regulatory outcomes and the regulations that sit behind them.

## 1.4. Globalisation and local particularism

There are global forces that shape regulation in New Zealand including the internationalisation of policy, technology developments, and globalisation of value chains. New Zealand cannot affect these global forces of change in any significant way although it can choose how to respond.

That is not to deny that there are a number of drivers of regulation that are unique to New Zealand's heritage and geography. For example, New Zealand's relatively small population has a number of consequences for regulatory quality, some positive and some negative. New Zealand's smallness, along with a history of openness, has meant that the public has ready access to select committees and there is a well-established and credible submission process. Unlike comparable jurisdictions we make extensive use of primary legislation (rather than relying on secondary or tertiary regulations) and under Standing Order 280, all legislation (other than Bills under urgency) goes to a select committee for review.<sup>10</sup>

An example here from the transport sector sees New Zealand with a seat at the international table, but with limited ability to shape the regulation of international aviation and shipping. Once promulgated, New Zealand has little choice but to adopt regulations for international services. However, we can choose whether to apply these rules to domestic aviation and shipping.<sup>11</sup> The continuous process of change in international transport management in the last 10 years, from a segmented modal approach towards a much more integrated transport concept, is resulting in increasing pressure on all modes of transport to adapt their role and function to this more demanding operational environment. This adaption is especially important for a small remote island nation like New Zealand where transport is a critical to being competitive domestically and internationally. Despite extensive reforms over the last 25 years, transport firms still operate in a regulated environment. However, the focus of regulation has shifted from economic regulation to regulation driven off safety and security concerns.<sup>12</sup> As we will illustrate the different modes have developed distinctive regulatory styles which allows for interesting comparisons across modes.

Product market efficiency is important for overall economic performance. The efficiency of markets, like transport is important as they provide services to other industries that compete internationally. International competitive forces require continued focus on the potential for reforms in the regulatory environment to enable transport firms to operate more efficiently, while addressing any safety or security concerns. The next section sets out the framework we developed to assess regulatory performance.

<sup>&</sup>lt;sup>10</sup> See Gill 2013 at page 568 for a longer discussion of how New Zealand's unique features affect regulation.

<sup>&</sup>lt;sup>11</sup> By contrast road and rail transport are land based and while technology and technical standards may be developed overseas, we have more degrees of freedom in what we adopt domestically. Even this freedom is constrained however by the fact that we are an importers of all vehicles and rolling stock.

<sup>&</sup>lt;sup>12</sup> Prior to the economic reforms of the 1980s in New Zealand all transport modes had extensive economic regulation including price control (international aviation) quantitative restrictions (the 150 kilometre road transport limit) and entry barriers (buses and taxi licensing). These economic barriers were swept away on the regulatory reforms of the late 1980s and early 1990s as transport regulation was refocussed on safety objectives.

## 2. Our organising framework

The question is how to go about assessing regulatory performance and in particular whether regulation is generating product market inefficiencies? A "whole of regulatory intervention" perspective needs to be included because it is likely that the effects of regulatory interventions extend beyond just administrative and compliance costs to include the effects on behaviour in product markets. The wider costs of regulation are what matters when thinking about product market regulation.

Most regulated sectors involve multiple regulatory interventions. Because of this, we use a mixedmethod approach combining quantitative and qualitative approaches to create an integrated highlevel assessment framework. Our approach involves analysis of the detailed legal provisions and economic analysis of national accounts data in order to identify initial priorities; and then the use of regulatory analysis to conduct a priority assessment based on assessments of causal relationships between regulations and the markets. We tested these assessments with regulatory experts.

Our approach is based on the distinction between 'heavy handed' command and control regulation from 'light handed' market informing disclosure regulation, and both from an intermediate case of 'market harnessing' regulation which emphasises the use of economic incentives while eschewing prescriptive approaches to standards and compliance.

## 2.1. Contrasting regulatory styles

Within the transport sector, the different transport modes have developed distinctive regulatory styles. By 'style' of regulation we mean the dominant way regulation is conducted. There are three main styles – command and control, light handed and market harnessing (performance based and market instrument based). These styles differ on two dimensions – how prescription occurs and how sanctions are applied.

Command and control is the direct prescription of what is permitted and what is illegal (command) while the control refers to the use of negative sanctions for non-compliance including criminal prosecution. Light handed regulation by contrast involves greater use of disclosure and relying on the parties themselves to enforce the regime through civil actions. Market harnessing has emerged as an alternative to light handed and prescriptive command and control. In this case the overall standard or target is specified but regulated firms and individuals are free to choose any technology that complies. Another strand is the greater use of markets (creating tradable permits in fisheries, atmospheric emissions, and radio spectrum etc.) and non-regulatory instruments (taxes such as Road User Charges, subsidies for passenger transport and the like).

These regulatory strategies or styles are ideal types. In practice statutes will contain a mix of styles. For example, enforcement can involve a mix of criminal (a continuum from restoration orders to fines and imprisonment), administrative actions (a continuum from warnings improvement notices through to injunctions and banning) and civil penalties. Indeed, recent law has created a new category of civil penalties which involves mixing civil and criminal.<sup>13</sup>

A key style difference between command and control and other styles is in how control is exercised. While command and control emphasises criminal sanctions, responsive regulation and risk-based regulation both emphasise that enforcement should aim to get voluntary compliance by the regulated. Criminal prosecution was seen as the last resort once the menu of other options – civil actions by

<sup>&</sup>lt;sup>13</sup> A number of alternatives to command and control have been proposed although there is no convergence in the literature on what the alternatives are. For a more detailed typology on which this paper is based see Arie Freiberg, The Tools of Regulation.

customers and a range of administrative actions including publicity campaigns, information provision, assistance with compliance etc. have been exhausted.

Our approach to the review of regulations makes a judgment regarding the dominant mode of control by reading the law that applies to the sector under review as it stands. We compare approaches by evaluating the:

- Style does the approach focus on means (process or inputs for example) or ends (performance standards)? is the focus at macro or micro level? and is the focus external (enforcing international standards) or domestic (creating local standards)?
- Level what is the nature of the regulatory instruments used (primary legislation, secondary regulations or more tertiary detailed rules)?
- Reach what is regulated, top-down regulation (process and operator defined safety solutions)? or bottom-up (detailed standards for individual inputs)?
- Duration are the interventions adaptive over time (as technology and international standards progress, for example)?

Our core objective questions can be broken down into a series of sub-questions:

Core	questions
Q1	<ul> <li>What styles of regulation suggest the greatest potential for market inefficiencies?</li> <li>Answering this question involves a process of legal screening.</li> <li>What is the dominant style of regulation for each product market?</li> <li>How do the said regulations fit within the formal regulatory economic structure?</li> </ul>
Q2	<ul> <li>Which regulated product markets matter with respect to the New Zealand economy? Answering this question involves a process of materiality screening.</li> <li>What are the economic linkages between the product markets and the rest of the economy?</li> <li>In which market is command and control regulation dominant and the economic linkages the largest?</li> </ul>
Q3	<ul> <li>Where are the potential impacts to economic efficiency from regulation greatest in the market(s)?</li> <li>Bring the output from the answers to Q1 and Q2 together in a quantitative and qualitative manner.</li> <li>Identify potential efficiency improvements from screening evidence and moderating [sense making] with regulatory/industry expertise.</li> </ul>

Our methodology was developed in response to these questions.

## 3. Our framework

We use a four step mixed-method framework that combines quantitative and qualitative approaches to create an integrated high-level assessment framework.

Our framework (summarised in Figure 3) involves:

- assessing the nature of the regulations by screening the detailed legal provisions to identify regulations at high risk of creating or sustaining inefficiency
- assessing the economic materiality of regulations, given the size of a sector and its connectedness to other parts of the economy
- identifying the potential for gain from reform, based on international literature on the orders of magnitudes of efficiency gains from reform
- testing findings with regulatory experts
- undertaking a high-level structure conduct performance (SCP) analysis of the markets affected by the regulations to check for evidence of undesirable impacts
- using these steps to narrow down to an initial list of priority areas and regulations for review
- quality assurance from internal QA and an External Reference Group.



#### Figure 3 Assessment framework

#### Source: NZIER

We discuss each element of our framework below.

## 3.1. The dominant characteristics of regulation

When we screen regulations, we start by looking for their dominant characteristics. We do this because economic theory points to different regulatory approaches having **different risks of adverse effects on the** *efficiency* **of the sector**. The regulatory approach will affect the:

- freedom of market operators to choose delivery methods or to innovate
- reliance of the regulator on its, and the sector's expertise or capability
- ease by which the regulator can keep rules current and relevant.

#### Ideal approach is informed by the nature of the risk

The choice of regulatory approach can be matched to the nature of problem or risk being addressed.

For example, when assessing the ability to prevent or address any harm, consideration needs to be given to the incentives on actors, and the information available to consumers and regulators. These factors should inform the choice of instrument – making rules, applying incentives, and/or disclosing information.

Accordingly, we cannot have a predetermined view of what the regulatory approach *should* be. However, this analysis is an important part of the assessment of the impact of the specific regulations, and especially to identify the regulatory alternatives that may be available.

This is the reason why we screen regulations to look for the dominant regulatory mode (see Table 1 Characteristics of regulations as inefficiency indicator below) as one of the indicators of the likelihood of inefficiency.

Characteristic	Focus (spectrum)	Why an indicator of potential inefficiency?
Style	Means vs ends	Input focus or limited discretion gives certainty, but inhibits choice and innovation if regulation locks in technology, processes, or providers.
Level	Act vs rule	Acts tend to be more difficult to change than rules and so inhibit beneficial change.
Reach	Operator defined solutions vs input standards	Regulation of sector inputs requires regulator to understand impacts of rules governing inputs (usually technology orientated) on markets over time.
Duration	Static vs adaptive requirements	Do regulations allow providers to adapt their services or processes to changes in market requirements, technology etc.?

#### Table 1 Characteristics of regulations as inefficiency indicator

Source: NZIER

### 3.1.1. Legal scanning process – a transport example

The objective of the legal screening was to identify elements of legislation or regulations that could be constraining or distorting product market activity so that the materiality of the impact could then be assessed.

For transport, identifying these elements posed two distinct challenges:

- 1. how to search the very large and varied stock of existing regulation consistently and comprehensively to find structures or components that were of interest
- 2. how to identify the elements of regulatory interventions that have the potential for an economic impact. Examples of economic impact include whether the elements restrict entry to the market or whether they impact operating processes or the equipment used by participants in the market.

To identify the dominant style of regulatory intervention, and to define the characteristics of each style, our initial legal scanning used a thesaurus of keywords to search the individual clauses applying to each transport mode (road, rail, air and maritime). This allowed us to assess how each group of regulation intersects with the relevant product markets. Our initial screen showed that there were almost no pure economic regulatory interventions but rather there was a complex mix of safety, security, and technology regulations.<sup>14</sup>

To illustrate our approach, we draw on data from a study of the impact of the stock of transport regulation in New Zealand. We found that the results of the analysis of regulatory style for transport modes was somewhat counter-intuitive to our naive hypothesis (See Table 2 Regulatory style by transport mode).

Mode split	Land	Aviation	Maritime	Rail
Command & control	65%	48%	57%	48%
Market informing	25%	25%	28%	28%
Market harnessing	10%	26%	15%	24%

#### Table 2 Regulatory style by transport mode

#### Source: NZIER

Regulatory and economic theory suggests that command and control style regulations are more prone to cause inefficiency and limit innovation where the services being regulated are complex and subject to rapid technological change and/or there is a wide variety of methods of delivering the service. Accordingly, our hypothesis was that the transport modes with an emphasis on command and control styles would be more likely to have rules that were causing inefficiencies. Land transport is therefore the main candidate, at this point, of being at risk of having inefficiency-causing regulations.

Land, air and maritime all followed similar models with a high reliance on rules and almost no use of regulations. Rail was the exception with an almost complete reliance on legislation and virtually no use of rules (see Table 3). As a result, most insight regarding reach came from our investigations of the use of and detail in the rules used for transport regulation.

#### **Table 3 Level of transport interventions**

Instrument type	Land	Aviation	Maritime	Rail
Acts	28%	24%	23%	93%
Regulations	7%	2%	2%	6%
Rules	65%	74%	74%	1%

#### Source: NZIER

From this legal screening, the limited use of Acts and heavy reliance on rules by land, air and sea modes, suggests to us that the Acts could be focussed on setting the general framework for rules and delegating the detailed decisions on what, and how, to regulate to specialist regulators for each of the modes. Arguably, the reliance on rules creates an opportunity for a more flexible and responsive regime than would be the case with a reliance on Acts.

<sup>&</sup>lt;sup>14</sup> These findings required various 'running' modifications to our analytical framework.

### 3.1.2. Legal screening

The second stage of our screening of transport regulations (box 2 in Figure 3) involved a clause by clause examination of particular interventions.

We used Statistics New Zealand's System of National Accounts (SNA) value chain to identify the dominant target or focus of the interventions for each mode. We looked in detail at the focus or 'target' of the regulatory intervention (labour inputs, intermediate inputs, processes and outputs, for example), as well as the reach of the regulatory coverage (that is, is it targeted at selected inputs or at all inputs). One of the outputs of the stage 2 legal screening was a series of frequency tables – the counts of how often different words from our thesaurus appeared in each set of regulatory interventions. An important headline finding here was that the same regulatory style does not result in the same focus:

- land transport focussed on equipment by vehicle and components across vehicle to control what vehicles are used under what conditions to deliver transport services
- aviation systems focussed particularly with respect to ensuring operators have the capability to meet operating standards with checks to ensure they continue to meet them
- maritime combined focus including both the requirements the equipment has to be designed to meet and the how that equipment should be operated
- rail safety systems focus.

### 3.1.3. Screening process

This screening was not a simple task for transport as there are many hundreds of rules and regulations. To make the task of reviewing the legislation tractable and systematic, the legislation, regulations and rules were loaded into searchable databases. In total there were seven databases:

- for each of air, land transport and maritime modes, we had one for the legislation and regulations and one for the rules
- one database for rail legislation and regulations (rail is not covered by any rules).

We used these databases to search the instruments for words that we could use to classify the 'type definitions' and from there to develop a thesaurus to develop a high level map of the focus and coverage of the instruments. The iterative process to develop, refine and apply the thesaurus is outlined below:

- develop a list of keywords associated with different styles of regulation, based on review of the literature and expert advice
- search the database tables by clause for these words, to count how often they occurred (that is, are they relevant within the instrument) and whether they appeared separately or together in instruments or clauses (that is, are they a good discriminator of different styles)
- search the database tables, word by word, to identify and count which root words appeared in each instrument to provide a bottom-up check of the coverage and discriminatory power of the thesaurus based on the words actually used in the instruments
- discuss the results of this database analysis with the expert advisor, then the words in the thesaurus were amended and the process steps described above were completed again until we "got it right".

Once the thesaurus enhancements were complete, the thesaurus and the database were used to 'count' the keywords associated with particular regulatory styles and focus. We also analysed the timing of changes to the legislation and regulations to compare the durability of legal instruments across mode.

### Transport Rules as an example

This scanning of regulatory instruments highlighted that some legislation and regulations prescribe conditions for 'use and operations' in particular transport modes. However, for the transport sector, most of the legislation and regulations seemed to have a focus on enabling the transport mode regulators to make rules. Because of this finding we also classified the rules for each mode and sub-mode by what the rule was regulating (that is, was the target equipment, operations, certification or licensing).

Using the word count of the rules as an indicator of the coverage and focus of the rules we carefully examined the 'reach' of these rules in the different modes.

Rule focus	Explanation	Land	Aviation	Maritime	Rail
General	General regulations by mode	16%	8%	0%	N/A
Equipment	Rules for specific equipment	57%	5%	51%	N/A
Operating	Defines operating conditions	15%	41%	38%	N/A
Operator	Directs operators behaviour	0%	2%	0%	N/A
Certification	Controls operator entry to markets	0%	21%	5%	N/A
Related services	Rules relating to support services	0%	10%	0%	N/A
Certification - operation	Controls operations of service organisations	0%	2%	0%	N/A
Licensing individuals	Rules for licensing people to participate in markets	7%	11%	6%	N/A
Licensing operators	Rules for licensing organisations to participate in markets	5%	0%	0%	N/A

#### Table 4 Regulatory reach – 'Rules'

#### Source: NZIER

The focus of rules by mode in Table 4 above indicates that:

- aviation rules are focussed on how equipment is operated and also on those allowed to
  operate air transport services and the processes they use to meet the standards set by
  the regulator
- maritime rules focus on designing equipment so that it can be operated safely and ensure that the operators have the processes and capability to operate ships safely
- land transport rules focus on prescribing standards that vehicles and components of vehicles need to meet using a mixture of manufacturer and bespoke standards.

This suggests that different regulatory approaches were selected to achieve the regulators' objectives. These differences materially affect the freedom given to the market to innovate, impact on the reliance of the regulator on the expertise and capability of participants in the market, and influence the type of problems the regulator faces in keeping the rules current and relevant.

### 3.2. Materiality assessment

The materiality assessment focussed on assessing whether the product market effects are important in an economic sense (box 2 in Figure 3). Statistics New Zealand's System of National Accounts (SNA) and input /output data was analysed to identify whether a particular transport market was significant or material in an economic sense. We used the NZIER CGE model to identify the linkages across other industrial sectors and the potential accumulated performance improvements across the whole economy.<sup>15</sup>

#### Why does materiality matter - a transport illustration

Transport is a service industry that is transaction based such that each mode moves people or goods from one place to another. It follows that the efficiency of how transport transactions take place will have a direct impact on the performance of the markets that the particular transport modes serve. Each transport mode intersects at different stages and in different places in the New Zealand economy:

- intermediate use, by the manufacturing sector for example, where transport is used to
  obtain input materials that are essential to production, to undertake production or to move
  outputs from production to intermediate or end consumer markets for consumption. An
  example here is Dairy Transportation Limited (DTL) that manages the end to end (milk from
  the farm dairy products to retail outlets) logistics chain for Fonterra using all four transport
  modes within New Zealand and internationally
- end *consumption* by either private individuals and households or businesses and government. Aviation and land transport passenger services are good examples of transport modes that directly provide consumer services
- a wide range of goods are *imported* to New Zealand from overseas which involve a range of international and domestic transport services. Some goods are taken into domestic production as intermediate inputs or are taken into the wholesale/retail chain as trade goods. Significant here is the importation of oil for refining and the distribution of refined petroleum products for intermediate or end consumption
- a wide range of primary, secondary and manufactured goods are sent to *export*, requiring domestic and international transport along the way. All four transport modes can be seen in action across a range of industry sectors that produce for export.

<sup>&</sup>lt;sup>15</sup> CGE models provide a rich and realistic representation of how changes in one part of an economy flow through or spill over to other parts. CGE modelling is widely recognised as a more robust and rigorous method for economic impact analysis than alternatives such as the common, but simplistic, input-output multiplier analysis. CGE models recognise that resources are not infinitely available and that growth in one part of the economy inevitably draws resources from other areas. They also take into account the effects of this growth on the price of inputs such as labour and capital.

#### Figure 4 Transport value added

2011; \$m; basic prices



#### Source: Statistics New Zealand, NZIER

Our research complemented recent work of the New Zealand Productivity Commission which focussed on the following aspects of transportation; the importance of transport in the economy with separate investigations into the performance of ports and shipping within the economy,<sup>16</sup> and an extensive review of the performance of the services sector.<sup>17</sup> They also investigated the efficiency and effectiveness of the regulatory environment.<sup>18</sup>

### 3.3. Identifying the potential for gain from reform

This phase involved identifying where the areas of focus should be to get best product market performance improvements. This stage of the framework required pulling together the output of our legal screening of regulations, and the economic materiality analysis, with the objective of prioritising the transport modes and sub-modes for market inefficiency potential. This process needed to be conducted in a deterministic manner, driven by the weight of evidence rather than just qualitative assessments. It was also important that it be "triangulated" by more than one method and/or other data. We had also identified that at this point we would need to reference other empirical research on market impacts from regulatory interventions as part of the research process.

#### How did this work?

If we had identified a mode or sub-mode where the style, reach, level and duration of its regulatory interventions suggested a high potential for market inefficiencies, <u>AND</u> the mode or sub-mode was significant in an economic materiality or interconnectedness sense, <u>THEN</u> it was placed in a priority list for further evidence and consideration as a case study.

<sup>&</sup>lt;sup>16</sup>New Zealand Productivity Commission. 2012. International freight services sector. <u>http://www.productivity.govt.nz/inquiry-content/1508?stage=4</u>

<sup>&</sup>lt;sup>17</sup> New Zealand Productivity Commission. 2014. Boosting service sector productivity. <u>http://www.productivity.govt.nz/inquiry-content/1624?stage=4</u>

<sup>&</sup>lt;sup>18</sup> New Zealand Productivity Commission. 2014. Regulatory institutions and practice. <u>http://www.productivity.govt.nz/inquiry-content/1788?stage=4</u>

This assessment was designed to produce a combination of top-down macro results (such as a discord between the style of regulatory interventions in each transport mode) and more micro, bottom-up results (for example, how component rules are applied to cars and heavy vehicles in land transport). Both are capable of impacting on the efficient performance of transport markets.

The objective here is to rank transport markets at the mode or sub-mode level for market inefficiency potential from regulatory interventions. The tool we used to merge the evidence together in a quantitative, deterministic manner was a matrix that used weightings of:

- economic output by sub-mode in absolute \$\$
- regulatory reach and style (each mode and sub-mode was ranked relative to the other modes with respect of potential for market inefficiencies)
- potential efficiency gain over time at the sub-mode level.

We undertook a literature review to identify plausible values for the potential efficiency gains. We were looking to identify, where has the regulation of transport been reformed or restructured and what impact was experienced in product market performance on both a one-off basis and dynamic gains over time.

The output from the matrix was quantitative ranking at the sub-mode level, in \$ terms, of the present value of the potential performance gains over the next 15 years. This was not intended to be a guide as to the real performance gains that could be achieved from a specific market. Rather it answered a hypothetical question – if we are right about our assessment of the linkages between regulatory interventions, the materiality and sector relationships in an economic sense and we can achieve the sorts of performance gains that have been sustained in our reference markets, *then what is the priority order of the markets or modes for the next stage of the research and our analysis*?

## 3.4. Using SCP to check for undesirable impacts

To 'triangulate' these findings from our screening we looked at real-world performance metrics in transport product markets using the structure conduct performance framework. This framework (shown in Figure 5) is used in competition analysis to assess the heath of markets. The main metrics of interest are the trends in the structure of the industry (such as the number and size of the firms) and the performance of productivity over time.

Research from the OECD indicates the linkages between regulatory quality and economic performance<sup>19</sup> and the significant positive effect of competition on long term productivity trends by product market performance closer to the international technology frontier.<sup>20</sup> The OECD looks at particular aspects of government involvement on product markets:

- overall trend in government involvement over time
- entry regulation
- ownership controls
- price controls
- use of command and control regulation.

The reason SCP is of interest is because of the link between regulation, completion and economic performance. Economic regulation such as licensing generally precludes new entrants and restricts competition in the market. As a result, removal of economic regulation is often associated with

<sup>&</sup>lt;sup>19</sup> Jacobzone, S., F. Steiner, E. Ponton and E. Job (2010) Assessing the impact of regulatory management systems. OECD Working papers on Public Governance No7.

<sup>&</sup>lt;sup>20</sup> OECD (2014) Factsheet on how competition policy affects macroeconomic outcomes.

significant productivity gains<sup>21</sup>. By contrast regulation that focuses on safety allows entry more readily but can result in the reduction in competition as entry is deterred and 'unsafe' operators are weeded out.



#### Figure 5 Trends in transport sector productivity

#### Source: NZIER

Figure 5 shows the trend in overall transport sector productivity. What is striking is the correlation between the removal of economic regulation of the transport sector in the 1990s with a one-off increase in productivity but then a decline thereafter to below pre-reform rates of productivity increase. Of course correlation does not equal causation. We used the SCP framework to examine for evidence of potential distortions at the sub-mode level. If the SCP analysis did not provide evidence of poor market performance, then this would call into question whether the regulations we identified are actually constraining the market in some way.

If we do see evidence of poor market performance then further analysis is needed to check whether this performance is caused by regulations, or whether it reflects other influences (such as cyclical factors, broader secular trends or temporary disruptions from major technological adjustments).

So the final step in the screening and testing process was to consider trends in structure and performance within the specific sub-mode 'markets' such as passenger aviation or freight aviation – the segments one level below modes (aviation, land transport, etc.).

We started from the standpoint that inefficiency could stem from regulations becoming out of date, as technology and other circumstances change, or from the regulations inadvertently creating market power (for example, by putting in place entry barriers). This means that, in addition to the specifics of the regulation, we also needed to look at whether and how regulations impact on the structure of the market, the conduct of market participants, and ultimately the performance of the market. Figure 6 summarises the well-established SCP framework we used to do this.

<sup>&</sup>lt;sup>21</sup> Our literature review for regulatory reform of the transport sectors in other jurisdictions identified significant productivity gains following deregulation. (NZIER 2015 Table 10 p33).

#### Figure 6 Structure conduct performance framework



Source: NZIER based on Bain (1959) Industrial Organization

## 3.5. Triangulating the results

We are not aware of any previous primary research into assessing the impacts of an existing stock of regulatory interventions. It is thus important that the results be 'triangulated'. We tested our findings with transport regulators – not industry within the context of this project – to ensure findings were consistent with the New Zealand transport environment.

We presented output data at a workshop where participants reacted to our initial findings and contributed to explaining why these findings occurred. We conducted a second expert workshop to present additional findings and to gather feedback on our choice of focus areas and the candidate case studies, for consideration and inclusion.

To provide feedback on the overall research design and to test the emerging research findings, the Ministry of Transport organised a reference group of senior Ministry personnel and two outside 'peer review' experts. We also used our own in-house QA processes to review the method and findings as the research progressed.

## 3.6. Narrowing down to specific regulations for review

The approach we adopted was analogous to geological prospecting in that the aim was to identify where to the most attractive prospects are to investigate further. Prospecting identifies targets but does not but does not guarantee what will be found when the target site is drilled. In applying the full methodology we identified potential 'case-studies' where we saw immediate potential for material

inefficiencies because of prescriptive command and control, technology orientated regulations that had their focus on market operations. These case studies<sup>22</sup> need not concern us here as the methodology for undertaking case studies is fairly standard.

Subsequent work would require greater disaggregation of the type of analysis we undertook at the product market level, in order to identify the detailed evidence of inefficient outcomes from regulation at regional and firm level. Our analysis suggested the following indicators of inefficiency at the micro level of the firm or specific regulatory interventions:

- prescriptive regulations regarding technology, inputs, processes
- long lived prescriptive rules
- the use of local rather than international transportation standards
- high levels of administrative effort by firms to comply with regulation
- high compliance costs that require real resources and frequent regulatory activity
- entry and exit controls
- a regulatory framework that lacks integration and has incompatible elements
- the absence of (or limited) horizontal integration of regulatory regimes across a sector.

This research has made detailed assessments of the constraints that regulations impose. It was a topdown assessment with a scope that 'started at 30,000 feet and descended to 5,000 feet'. The results should be used as a starting point for more detailed review work in in specific product markets. Our review of product market performance indicators illustrates the potential for efficiency impacts in particular transport product markets and identify where to target the next stages of review.

 $<sup>^{\</sup>rm 22}$  A case study on truck mass and dimension rules is set out in NZIER (2015).

## 4. Conclusions

This paper presents a new approach for systematically scanning the existing stock of a regulatory regime and identifying regulations that have a high likelihood of creating, rather than mitigating, market inefficiencies. This is an important development. New Zealand departmental chief executives now have a statutory responsibility for the 'stewardship' of the stock of existing regulations. While those responsibilities are clearly articulated the development of the tools to meet those responsibilities has lagged behind. In particular, there are no tools that focus on reducing the total cost of regulations.

To fill this gap, we developed a framework, using a range of methods, to assess the stock of existing regulatory interventions. It involved:

- systematic scanning of every existing regulation for regulatory style that is at high risk of creating or sustaining inefficiency
- assessing the economic materiality of regulations, given the size of a sector and its connectedness to other parts of the economy
- identifying potential gains from reform, based on international literature on the orders of magnitudes of efficiency gains from reform
- undertaking a high-level structure conduct performance check by transport sub-mode to check for evidence of undesirable impacts of regulations
- using these results to narrow down to an initial list of priority areas and regulations for review
- testing findings with regulatory experts and a Reference Group.

The approach focussed on identifying the greatest potential for market inefficiencies based on the dominant styles (command and control regulation, more flexible performance based regulation or the use of market instruments such as tradeable permits). We identified the areas for greatest scope for efficiency gains based on a weighting of three factors: 1) the materiality based on the value of the economic outputs, 2) the nature of the regulatory environment (the dominant style and reach) and 3) the potential for efficiency gains over time (identified by previous studies).

In short where the style, reach, level and duration of the regulatory interventions suggested a high potential for market inefficiencies, AND the mode or sub-mode was significant in an economic materiality sense, AND there is evidence of significant potential gains from reform THEN it was placed in a priority list for detailed review. The output from the weighting was a quantitative ranking of the present value in dollar terms of the potential performance gains over the next 15 years.

Like any framework this analysis is subject to limitations. Like any form of prospecting the analysis points to where to the most attractive prospects are to investigate further but does not guarantee what will be found. Drilling down at the level of an individual regulation or cluster of regulations will still be required through more conventional policy and legal analysis. Put another way the focus is on identifying the potential 'size of the prize' (based on correlation) but establishing causation required more focussed detailed investigation.

Overall we find that modern research techniques are available to help departmental chief executives meet their new statutory responsibilities. The methodology was developed for the transport sector to provide a mechanism to identify where to focus their review efforts and the potential 'size of the prize'. We are confident that this approach, with minor modifications, could also be used in other sectors.

# Appendix A Regulatory stock assessment tools

This Appendix<sup>23</sup> explores the tools for assessing regulatory regimes in New Zealand. The Australian Productivity Commission, in its survey of Australian state and federal regulatory practices, suggests that there are three types of reviews of regulatory regimes:

- Stock management RIA, red tape reduction, Regulatory Budgets, in/outs
- Ad hoc stock-takes, principle-based, benchmarking, in-depth reviews
- Programmed reviews sun-setting, embedded in statute, post implementation reviews.<sup>24</sup>

Table 5 compares the different mechanisms and compares and contrast their focus, locus and applications in New Zealand.

Two things are striking about New Zealand:

- the lack of tools that aim to assess the total cost of regulation
- the limited range of tools that are applied.

	Case reviews	Management	Programmed
Examples	Agency mechanisms	Red tape reduction	Sunset clauses
	Specialist tribunals and	In/out rules	Post Implementation Reviews
	investigators	Regulatory budget	Statutory reviews
	Courts, ADR, Ombudsman		
Timing	Ad hoc	Ongoing	Planned
Focus	Dispute resolution/ process application	Compliance costs	Effectiveness implementation
Locus	Individual cases	Individual regulations	Individual regulation or parts of regulations
Used in New Zealand	√, √, √	х, х, х	X, some, few

#### Table 5 Regulatory stock reviews in New Zealand

Source: NZIER based on APC (2011)

#### Only a limited range of tools are applied

Relatively few of the tools in columns 2 and 3 in Table 5 are required by law in New Zealand, are included in the regulatory management guidance or used in practice. By contrast case review mechanisms (column 1 in Table 5) are used extensively.

On the management devices shown in column 2, New Zealand has been an early adaptor and leader on regulatory impact assessment (RIA) but has declined to adopt regulatory budgets, in-out requirements or red tape reduction targets.

<sup>&</sup>lt;sup>23</sup> This is an amended version of 'Learning the way forward? The role of monitoring, evaluation and review' (Derek Gill and Susy Frankel).

<sup>&</sup>lt;sup>24</sup> Australian Productivity Commission. 2011. Identifying and Evaluating Regulatory Reform.

On ad hoc reviews, the main focus is on in-depth reviews, as stock takes of burdens on business, and principle based and benchmarking reviews are rare.

On programmed reviews there is no requirement for sun-setting, post implementation reviews are only required where a RIS was inadequate or not supplied and embedded reviews are relatively rare.

Gill and Frankel (2014, p91-93) report the results of a keyword search of all 1,872 statutes in force in August 2012. They found 1.2% (22) statutes with 'embedded' reviews while follow up searches found another 0.6% (11 Acts) that had review provisions that applied to the operation of specific sections of the Act. Subsequent searches did not identify any further other statutory review provisions. A similar search of regulations found no cases of embedded reviews. "As a result we can safely conclude that the number of statutes or secondary regulation with embedded review provisions in New Zealand is very low."

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