

# **A Sustainable Economy for New Zealand**



*Discussion Paper  
for Conference on  
A Sustainable Economy for New Zealand*

*Legislative Council Chamber  
Parliament Buildings  
Wellington  
12 November 2010*

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## EXECUTIVE SUMMARY

A sustainable economy for New Zealand can no longer be achieved purely within the confines of national monetary and fiscal policy. National sustainability for every country today has to take into account the broader context of the global economy.

The impact of human activity on the planet has transformed in the past two centuries. The global population explosion and increases in *per capita* production and consumption have generated a sixty-fold increase in the size of the global economy. Many aspects of the global ecosystem are facing serious strain as a result, and this is being exacerbated now by climate change (and perhaps 'peak oil'). Authoritative studies conclude that human activity is colliding with certain global ecological limits and causing a decline in Earth's biodiversity. Unless redressed, these problems will substantially diminish the benefits which future generations can obtain from the natural resource base. Reversing the degradation of the global ecosystem while meeting increasing demands for ecological services will involve significant change in policies, institutions and practices.

Since the Rio Earth Summit in 1992, the goal of international policy has been 'sustainable development'. With a serious ecological overshoot of the planet's natural resource base today yet extreme human poverty and wealth, the international community faces difficult decisions over the question of continued economic growth for the richer economies.

Much depends on reaching agreement on the underlying economic models that drive policy-making. Two alternative economic models are currently juxtaposed in what is an emerging 21<sup>st</sup> century debate: the conventional neo-classical model and the new, trans-disciplinary ecological model.

- The neo-classical economic model, building on the principles of private property, market competition and free trade, promotes economic growth as the central goal, achievable through micro-economic concepts of market equilibrium, marginal utility, and optimal resource efficiency. The neo-classical response to the ecological crisis is to encourage the market to self-correct through pricing of externalities, thereby ensuring a 'genuine savings' in national capital at the macro-level.
- The ecological economic model, in contrast, stresses 'throughput' of matter and energy in the productive process. It sees the economy as a sub-set of the environment whose limits cannot be breached. Rather than optimal efficiency, it postulates optimal scale as the criterion of economic success. Rather than indefinite growth, it proposes a steady-state global economy, within which sustainable development of a qualitative kind can occur, broadening the measure of economic success from Gross Domestic Product to Quality of Life. 'Prosperity without growth' is an option, and may become an imperative. And it advocates broader instruments for measuring economic success than simply using GDP, such as the Genuine Progress Indicator and the Ecological Footprint.

New Zealand's economic challenges are modest in comparison to elsewhere. The population density is low, the national ecosystem services abundant, the technological level advanced, and the people relatively prosperous. Ours is one of the few countries to run a national ecological surplus. There is, as a consequence, limited national appreciation of the magnitude of the global challenge.

Yet the national economy is small, open and vulnerable, and the country's debt is mounting to alarming levels. The challenge to fiscal and monetary policy – achieving national sustainability while regenerating post-recession progress towards the conventional goals of employment security, price stability and commodity availability – is immense.

Indeed, the close inter-dependence among all national economies today through trade, currency and investment transactions makes the goal of 'national sustainability' almost prohibitively complex. Because the ecosystem, rather than the nation-state, is the natural entity, it is easier to identify, and probably to attain, global sustainability than national sustainability.

The distinction between 'strong' and 'weak' sustainability will have a critical effect on future governmental decisions. Each nation will need to decide whether to maintain its capital stock of all natural resources at existing levels or whether it is free to substitute resource inputs for greater national output.

There is a need for political parties in the NZ Parliament to generate a serious dialogue, removed from the usual daily competitive exchange, and search for common ground in future macro-economic policy for a sustainable future, irrespective of philosophical persuasion. A series of questions designed to generate discussion along these lines is set out in Part IV.

## Introduction

This paper explores the prospects for developing a sustainable economy for New Zealand. The purpose of the paper is to generate discussion on the subject among analysts and policy-makers across all philosophical persuasions. It is designed to construct a framework for discussion at the conference, and after.

The paper is comprised of four parts:

- Part I addresses the global economy, and the challenge of sustainability;
- Part II explores the theoretical economic models behind the contemporary debate;
- Part III addresses the national economy, and the challenge of national sustainability for New Zealand;
- Part IV identifies policies of the three largest political parties and poses questions for each to consider.

### Part I. The Challenge of Global Sustainability

The impact of human activity on the planet has transformed in the two centuries since the Industrial Revolution. For tens of millennia, the number of humans remained low, their economic activity rudimentary, and their impact on the environment modest.

In the past two centuries the human population has burgeoned (from 1 billion in 1800 CE to 6.7 bn. in 2010). It is projected to reach 9.2 bn. by 2050 (Table I). The average global population density on land has increased correspondingly, from 6 persons per sq. km. to 45.

In addition, within the past century and especially half-century, material production and consumption *per capita* have sharply increased. The global economy has grown by a factor of seven in the past 50 years. In terms of bio-evolutionary time-scale, humankind has suddenly begun to manipulate the natural resource base at a planetary level.<sup>1</sup>

#### Global Impact

The impact of modern economic activity on Earth has been far-reaching. Today all terrestrial domains – the lithosphere, pedosphere, atmosphere, hydrosphere and biosphere – face stress. The most comprehensive survey of the ecological state of the planet has reported the following findings:<sup>2</sup>

1. Over the past 50 years, humans have changed ecosystems more rapidly and extensively than in any comparable period of time in human history, largely to meet rapidly growing demands for food, fresh water, timber, fibre and fuel. This has resulted in a substantial and largely irreversible loss in the diversity of life on Earth.
2. The net gain in human well-being from economic activity has been achieved at growing cost through degradation of many ecosystem services, increased risk of non-linear change, and the exacerbation of regional poverty. These problems, unless addressed, will considerably diminish the benefits that future generations obtain from Earth's ecosystem.
3. The degradation of ecosystem services could grow significantly worse during the first half of the 21<sup>st</sup> century.
4. The challenge of reversing the degradation of the global ecosystem while meeting increasing demands for ecological services will involve significant change in policies, institutions and practices which are not currently under way.

Human activity, the survey concluded, is depleting Earth's natural capital, putting such strain on the environment that the ability of the planet's ecosystems to sustain future generations can no longer be taken for granted. The impact has intensified in the past half-century in five interlocking ways:

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<sup>1</sup> See economic historian J.R. McNeil's four propositions: "First, that the 20<sup>th</sup> century was unusual for intensity of change and the centrality of human effort in provoking it. Second, that this ecological peculiarity is the unintended consequence of social, political, economic and intellectual preferences and patterns. Third, that our patterns of thought, behaviour, production and consumption are adapted to our current circumstances – that is, to the current climate (and global bio-geochemistry), to the 20<sup>th</sup> century's abundance of cheap energy and cheap fresh water, to rapid population growth, and to yet more rapid economic growth. Fourth, that these preferences and patterns are not easily adaptable, should our circumstances change." McNeil (2001), xxii.

<sup>2</sup> UN's Millennium Ecosystem Report 2005, <http://www.millenniumassessment.org/en/index.aspx>

- *Land degradation:*  
In the ten millennia since the inception of settled agriculture, the planet's forest cover has been reduced from 80% of the land surface to 30% (4 billion ha.).<sup>3</sup> This has resulted in serious land erosion and decline in soil quality.<sup>4</sup> On current rates of deforestation (12.4 m. ha. *per annum*), there will be only 10% of global forest cover remaining by 2030. In addition, over-grazing along with excessive river and artesian water drawdown has resulted in extensive and rapid desertification (assessed, annually, at 6 million ha. to desert, and 21 m. ha reduced to zero economic productivity).<sup>5</sup>
- *Fresh water scarcity:*  
By 2025, one-fifth of humanity will live in areas with absolute water scarcity and two-thirds could be living under water-stress conditions.<sup>6</sup>
- *Ocean degradation:*  
Acidification, thermal expansion, dead zones, coral reef decline, and fishery collapse. Global fisheries are breaching the sustainable limit of 100 bn. tonnes; with regional collapses in specific areas.
- *Biodiversity loss:*  
Historically-unprecedented species extinction, 1,000 times above natural extinction rates.
- *Atmospheric pollution:*  
Emission into the atmosphere of some 500 Gt. of CO<sub>2</sub> equivalent, with a 'global carbon budget' of 250 Gt. possibly remaining.<sup>7</sup> Associated climate change is already causing global temperature increase, ice melt, weather instability (exacerbating heat waves, storms and flooding), sea-level rise, and the disruptive migration of agricultural zones, leading to food, water and housing insecurity.

Exacerbating the economic stress is the uncertainty over climate change. That uncertainty does not attend to the phenomenon of climate change itself or to a judgement of its anthropogenic cause,<sup>8</sup> but to its future consequences. Most problematic is the concern within the scientific community that the consequences of climate change, as opposed to the causative emissions, are non-linear. A series of non-linear changes to the global biosphere would be unpredictable once a tipping-point is breached, and thus potentially dangerous to the stability of human civilization.<sup>9</sup>

Of perhaps equal concern is the phenomenon of 'peak oil', which is either imminent or likely in the near-term future. The decline of ready oil availability and the inexorable rise in oil prices are likely to cause equal dislocation to the global economy, and perhaps earlier than, the effects of climate change.

The global economy is thus colliding with the planet's ecological limits. Humanity is conducting a collective experiment with Earth, on Earth, largely heedless of the consequences.<sup>10</sup>

### *Global Sustainability*

Recognition of potential global limits to human activity dates back to the late 18<sup>th</sup> century. Malthus' predictions of early ecological overshoot proved erroneous through disregarding the potent effect of technological change,<sup>11</sup>

<sup>3</sup> <http://www.fao.org/forestry/28808/en/> Also FAO: Global Forest Resources Assessment, 2000. Part 1. Forest Cover.

<sup>4</sup> Most of the deforested area (35% of land surface) has been converted to agriculture. Most of this was in temperate and boreal forests across Europe and North America over the past millennium. Tropical deforestation has occurred only in the past half-century, during which 7.8 million sq. km. (the size of Australia) has been lost.

<sup>5</sup> <http://na.unep.net/des/uncedp1.php3>. UNCED Part I. World Status of Desertification

<sup>6</sup> <http://www.fao.org/nr/water/issues/scarcity.html>

<sup>7</sup> A Gt. (Gigatonne) is equivalent to 1,000 million tonnes (one billion). The carbon equivalent (CO<sub>2</sub>) refers to the acknowledged basket of six greenhouse gases expressed in terms of one single gas (carbon, CO<sub>2</sub>) through the relative weighted radiative forcing of each gas.

<sup>8</sup> Climate change is incontrovertible in the majority view, and that of the UN's IPCC whose work has been generally reaffirmed by recent independent reviews. Its anthropogenic cause is assessed at 95% probability by the IPCC.

<sup>9</sup> Earth's temperature has been relatively stable for the past 10,000 years, allowing agriculture and hence civilisation to develop over this short space of geologic time. This stability is now under threat.

<sup>10</sup> "The human race, without intending anything of the sort, has undertaken a gigantic uncontrolled experiment on Earth". McNeil (2001), 4

<sup>11</sup> Malthus contended that population growth always progresses faster than resource growth. This proved to be mistaken: global population is today six times larger, and the global economy 68 times larger, than in his time.

Yet the environmental damage caused by such technologically-driven economic activity over the subsequent two centuries has placed the issue of sustainability on the international agenda today.

Project work in the 1970s foresaw natural limits to global economic growth by the turn of the millennium.<sup>12</sup> The accuracy of this work was also critiqued, but it is generally acknowledged today that its evidential base remains correct within an order of magnitude.<sup>13</sup>

The UN Conference on Environment and Development of 1992 introduced the concept of 'sustainable development' as the policy goal of the international community. UNCED declared humans to be entitled to a healthy and productive life in harmony with Nature, and at the centre of concerns for sustainable development. To achieve sustainable development and a higher quality of life for all people, States should reduce and eliminate unsustainable patterns of production and consumption and promote appropriate demographic policies.<sup>14</sup>

Sustainable development was defined as "the ability of the present generation to provide for its needs without compromising the ability of the next generation to provide for its own needs".<sup>15</sup> 'Sustainability' may thus be defined as the state of an economy that is in equilibrium with all ecological support systems, allowing sustainable development to be attained.

There is, however, a methodological and perhaps even a conceptual tension between environmental protection and economic development. Some contend that 'sustainable development' is an oxymoron, while others maintain that its attainment depends simply on conceptual clarification, policy coordination, and political will. There is now a recognised need to develop sound measurements of sustainability. UNCED called for new concepts to determine global and national sustainability, focusing particularly on the carrying capacity of the planet.<sup>16</sup>

#### *Concepts for Measuring Sustainability*

A variety of concepts and methods have been developed in response to the Earth Summit's call. These have been identified as falling into four typologies: large and eclectic 'dashboards'; composite indices; indices that seek to 'correct' GDP; and indices that measure resource over-consumption.<sup>17</sup>

The 'dash-board' approach involves gathering and ordering a series of indicators that bear a direct or indirect relationship to socio-economic progress and its durability. This approach, followed by most international organizations, confronts problems of identifying causal links to sustainability, and also problems of proportional weighting.

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<sup>12</sup> Meadows, D.H., Meadows, D. L. Randers, J. & Behrens, W. *The Limits to Growth*. (Universe Books, New York; 1972).

<sup>13</sup> Meadows *et al*, *Limits to Growth: The 30-Year Update* (Chelsea Green Publishing & Earthscan; 2004)

<sup>14</sup> Rio Declaration on Environment and Development (Principles 1 & 8). A/CONF/151 Vol. 1 (June 1992)

<sup>15</sup> World Commission on Environment and Development. *Our Common Future*, Chapter 2, paragraph 1. (OUP, Oxford; 1987). UN Doc. A/42/427 Annex.

<sup>16</sup> "Consideration should also be given to the present concepts of economic growth and the need for new concepts of wealth and prosperity which allow higher standards of living through changed lifestyles and are less dependent on the Earth's finite resources and more in harmony with the Earth's carrying capacity. This should be reflected in the evolution of new systems of national accounts and other indicators of sustainable development. (para. 4.11) ... An assessment should also be made of national population carrying capacity in the context of satisfaction of human needs and sustainable development, and special attention should be given to critical resources, such as water and land, and environmental factors, such as ecosystem health and biodiversity. (5.23) ... A first step towards improving the scientific basis for these strategies is a better understanding of land, oceans, atmosphere and their interlocking water, nutrient and biogeochemical cycles and energy flows which all form part of the Earth system. This is essential if a more accurate estimate is to be provided of the carrying capacity of the planet Earth and of its resilience under the many stresses placed upon it by human activities. (35.2) ... In order to promote sustainable development, more extensive knowledge is required of the Earth's carrying capacity, including the processes that could either impair or enhance its ability to support life." (35.10) [http://www.un.org/esa/dsd/agenda21/res\\_agenda21\\_35.shtml](http://www.un.org/esa/dsd/agenda21/res_agenda21_35.shtml)

<sup>17</sup> Stiglitz, Sen & Fitoussi (2009), paras 130-166.

The 'composite' approach employs various indices to reduce a complex range of indicators to a single metric. Examples are the Index of Economic Well-Being, the Environmental Sustainability Index and the related Environmental Performance Index. UNDPs' Human Development Index augments material wealth (GDP p.c.) with life expectancy and education.

The 'adjusted GDP approach' utilises the conventional GDP concept but incorporates new elements, deducting some evaluations of the costs of certain natural resources (water, air, and noise pollution; resource depletion). Examples are the Index of Sustainable Economic Welfare and the Genuine Progress Indicator. The System of Environmental Economic Accounting (a branch of the UN System of National Accounts) combines economic and environmental information within a common framework. The result purports to transform GDP into a measure of Net Domestic Product.

Indicators that measure 'over-consumption', presented in flow terms rather than stock-measurement, include the Adjusted Net Savings method (otherwise known as the 'Genuine Savings' method), the Ecological Footprint and the Carbon Footprint.

The Genuine Savings approach seeks to measure natural capital (land plus finite and renewable natural resources) in addition to the traditional concepts of physical capital (buildings plus machinery) and human capital (business entrepreneurship plus labour force). The concept of natural capital implies that the savings rate of an economy is an imperfect measure of what the country is actually saving, because it measures only investment in man-made capital. The World Bank now calculates the genuine savings rate of a country, taking into account the extraction of natural resources and the ecological damage caused by CO<sub>2</sub> emissions.<sup>18</sup> The contention is that, provided genuine price signals are applied to all productive items including all ecological services, the economy can function along normal lines within ecological limits.

The Ecological Footprint measures the area of biologically-productive land and sea required to regenerate the resources a human population consumes (individual, corporation, nation, humanity) and to absorb and render harmless the corresponding waste. This may then be compared against the amount of biologically-productive land available.<sup>19</sup> Humanity's footprint has doubled in the last 40 years, and now stands at 44% higher than the Earth's biological capacity to provide our needs.<sup>20</sup> That is to say, one and a half planets are required to meet humanity's current economic demands if continued into the future. The contemporary generation is drawing down on Earth's resources, borrowing forward on our children's ecological inheritance. While some of this ecological overshoot may be remediable, much of it is not.

A new approach to ensuring global sustainability is to identify 'planetary boundaries' as a precondition for human development.<sup>21</sup> A set of ten interlinked boundaries have been identified. These define the safe operating space for humanity with respect to the Earth system and are associated with the planet's biophysical subsystems or processes. It appears that three of the boundaries have already been crossed. Transgressing certain biophysical thresholds (maximum and minimum) within which human activity can operate would cause unacceptable environmental harm with potentially disastrous consequences for humanity.<sup>22</sup>

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<sup>18</sup> The World Bank: *Where is the Wealth of Nations? Measuring Capital for the 21<sup>st</sup> Century* (IBRD, Washington, DC; 2006)

<sup>19</sup> [http://www.footprintnetwork.org/en/index.php/GFN/page/footprint\\_basics\\_overview/](http://www.footprintnetwork.org/en/index.php/GFN/page/footprint_basics_overview/). The concept has been critiqued as lacking sufficient accuracy to be meaningful (see Bicknell, K. *et al.*, *Ecological Economics* 27(2) 149-160 and Fiala, N. *Ecological Economics* 67, 519-525. In its defence, the methodology is transparently described by its proponents (Calculation Methodology for the National Footprint Accounts 2008 Edition) <http://www.footprintnetwork.org/en/index.php/GFN/page/methodology/>

<sup>20</sup> [http://www.footprintnetwork.org/en/index.php/GFN/page/world\\_footprint/](http://www.footprintnetwork.org/en/index.php/GFN/page/world_footprint/)

<sup>21</sup> *A Safe Operating Space for Humanity*, Rockström, J. *et al.*, in *Nature* Vol. 461, 24 Sept., 2009. pp. 472-75. These are: (1) Atmospheric carbon dioxide concentrations; (2) Rate of biodiversity loss; (3) Atmospheric nitrogen loss; (4) Oceanic phosphorous absorption; (5) Stratospheric ozone depletion; (6) Oceanic acidification; (7) Global freshwater use; (8) Global cropland cover; (9) Atmospheric aerosol loading; (10) Chemical pollutants. The first three have already been exceeded.

<sup>22</sup> "Although Earth has undergone many periods of significant environmental change, the planet's environment has been unusually stable for the past 10,000 years. This period of stability – known as the Holocene – has seen human civilizations arise, develop and thrive. Such stability may now be under threat. Since the Industrial Revolution, a new era has arisen, the Anthropocene, in which human actions have become the main driver of global environmental change. This could see human activities push the Earth system outside the stable

## Part II. Economic Models and Concepts

The challenge of global sustainability concerns the relationship between ecology and economics. Much of this revolves around the concept of growth. Gaining international consensus over the meaning of economic growth as a policy goal appears to be a precondition for solving the problem of global sustainability.<sup>23</sup>

Two alternative economic models are currently juxtaposed in what is an emerging 21<sup>st</sup> century debate: the conventional neo-classical model, and the new, trans-disciplinary ecological model.<sup>24</sup>

### The Neo-classical Model

The neo-classical model has become conventional economic thought over the past century, driving national governmental policies around the world.

Classical economics of the 18<sup>th</sup> century addressed the theory of value, developing the principles of private property, market competition and free trade. Capitalism was perceived as a powerful tool for generating economic growth and liberating human societies from the ‘Malthusian trap’.<sup>25</sup>

Building on this, neo-classical economics of the late-19<sup>th</sup> century stressed the central role of individual agents at the micro-economic level – the representative firm and the rational consumer exercising choice. Employing quantitative data and mathematical analysis to develop theoretical models of behaviour, micro-economics became regarded as a ‘science’, producing the theories of equilibrium, marginalism, utility and optimality.<sup>26</sup> Its focus moved from the theory of value to the theory of price. Neo-classical economics addresses the issues of allocation, seeking *optimum efficiency* in resource utilisation and product availability.

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environmental state of the Holocene, with consequences that are detrimental or even catastrophic for large parts of the world”. Ibid., p. 472.

<sup>23</sup> “Though the current economic system has been around for a remarkably short time in relation to past systems, it has wrought far greater environmental changes. These changes have redefined the notion of scarce resources, and they demand correspondingly dramatic changes in economic theory and in our economic system. Change in our economic system is inevitable. The only question is whether it will occur as a chaotic response to unforeseen disruptions in the global life-support system, or as a carefully-planned transition toward a system that operates within the physical limits imposed by a finite planet and the spiritual limits expressed in our moral and ethical values. The answer depends largely on how fast we act, and the burning question is: How much time do we have?” Daly, & Farley (2004), 11

<sup>24</sup> More strictly, 18<sup>th</sup> c. classical economics, which focused on ‘value’, was followed by neo-classical economics in the early 20<sup>th</sup> century which stressed ‘efficiency’. In mid-century, the emphasis on ‘growth’ took hold in the Keynesian, monetarist, neo-classical synthesis, and developmental schools of thought. More recently again, ecological economics focuses on ‘scale’.

<sup>25</sup> In the Malthusian trap, high rates of mortality and fertility cancelled out, keeping the population at a stable but low level for most of human history. In recent centuries, technological innovation and improved sanitation resulted in a trend to low mortality with continued high fertility rates, which generated the population explosion. The ‘demographic transition’ is complete when improvements in health and education reduce fertility rates, and population growth levels out again, but at a higher level.

<sup>26</sup> Partial equilibrium theory refined supply and demand curves to determine the equilibrium level of price and quantity of a good. Equilibrium was ‘partial’ because of the assumption of ‘all other things being equal’ that allowed rigorous analysis of one firm operating in one industrial sector. The consumer market for a particular good is in equilibrium when the supply and demand for it are equal. The more complex ‘general equilibrium theory’ applies the same concept to all markets, interacting concurrently.

The theory of marginalism analyses the effect which small changes in an economic system may have on personal consumer choice and public policy decision-making, involving the concepts of ‘marginal cost’ and ‘marginal productivity’ of a good.

The law of diminishing marginal utility contends that the price a consumer is willing to pay is determined by the marginal utility which that good will yield to oneself. The consumer will pay no higher a price than that which equates to one’s marginal utility which decreases with increasing volume of consumption. Market prices and values thus originate from consumer preference and valuation.

The theory of ‘Pareto optimality’ contends that a particular allocation of resources and goods is optimal when the well-being of each economic agent is maximised and any alteration would result in one being ‘worse off’.

At the macro-level, neo-classical economics rests on the concept of economic growth – the national aggregation of such micro-economic activity guided by the ‘invisible hand’. Since the late 18<sup>th</sup> century, economic growth has been the central policy prescription of establishment thought. In an open international economy with apparently boundless resources, it was assumed that growth could continue indefinitely.

Two centuries ago, however, the global population remained under 1 billion, land was plentiful, labour less expensive, energy a minor production factor, and financial capital the principal driver. With a full planet where none of these characteristics still obtains, the concept of economic growth is open to critique. At 5% growth *per annum*, the economy doubles every 14 years, and so does the human impact on the environment.

Concern over the environment has led conventional economics to introduce some self-adjustment. Environmental economics, a modern subset of the neo-classical model, recognises that human welfare depends largely on the ecosystem. It seeks to assign a monetary value to environmental assets and a price to pollution. But it remains within the conventional model in that its central goal is still economic growth through efficiency of allocation. It therefore ‘tinkers at the margin’ of the problem of sustainability, and is unlikely to meet the central challenge.

Resource economics is also a relatively new sub-discipline. It approaches the allocation of Earth's natural resources according to the conventional analysis of economic supply and demand. The objective is to develop more sustainable resource management methods to ensure their availability to future generations. It focuses on the means of operating an economy within the ecological constraints of Earth's natural resources. Economic models have usually been employed for the fishery, forestry and mineral sectors but are now extended to other ‘resources’ (air, water, energy and climate). The models employ the concepts of ‘perpetual resources’ and ‘abundant resources’, contending that a very long life-span for a resource’s reserves can be treated, for practical purposes, as renewable.<sup>27</sup> The aim is to marry traditional economic and contemporary environmental concerns.

### The Ecological Model

Ecological economics differs from the neo-classical model in three principal ways:

- it perceives the economy as a sub-set of human society which is a sub-set of the planet’s environment;
- it broadens the measure of economic success from simply GDP to the notion of ‘well-being’ through promoting a quality of life; and
- it factors in inter-generational time in its measurement of economic success.

Given that the Earth is finite, there is an ultimate limit to the capacity of the global economy to grow, even after technological change and human ingenuity are factored in. For credible planning, therefore, it has to be recognised that the global economy cannot grow forever. Global ecological limits in certain areas have been recognised for the first time in recent decades; a series of inter-locking sectoral limits could result in systemic constraint on the global economy.<sup>28</sup> The notion of a general global economic limit, however, is unfamiliar and perplexing. Yet proactive planning by the international community for a burgeoning global population over the next 40 years is a precondition of economic and political stability.

At the macro-economic level the point of difference between neo-classical and ecological approaches involves economic growth. Neo-classical economics presumes continued economic growth indefinitely as a positive, and necessary, condition of human action. In contrast, ecological economics advances four questions: exactly what

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<sup>27</sup> A perpetual resource is one that is ‘virtually inexhaustible on a human time-scale’. Examples are renewable energy (solar, tidal, wind), and salt, stone, magnesium and diamonds. A study on the bio-geophysical aspects of sustainability identified a ‘rule of prudent practice’ that a resource stock should last 700 years to achieve sustainability or become a perpetual resource, or for a worse case, 350 years. A resource lasting 350 to 700 years is regarded as an ‘abundant resource’. How long the material can be recovered from its resource depends on human need and technological change from extraction through product life-cycle to disposal, plus recyclability of the material and availability of satisfactory substitutes. Exhaustibility does not occur until these factors weaken and play out: the availability of substitutes, the extent of recycling and its feasibility, more efficient manufacturing of the final consumer product, more durable and longer-lasting consumer products, and even a number of other factors. A perpetual resource may become a paleo-resource (one that has little or no demand for the material extracted from it). ASTM E60 E2114-08 *Standard Terminology for Sustainability* 2008, 615-618

<sup>28</sup> The principal sectoral limits are post-peak oil stress, food insecurity, fishery collapse and water stress. These become manifest in energy, transport and health and sanitation difficulties.



is it that is growing; how big is the 'economy' today; how big can it possibly get; and how big should it be? Given that economic growth is the top priority for all nations, it might be expected that all four questions would be addressed, both in academic enquiry and governmental policy. Yet only the first question is addressed.<sup>29</sup>

Associated with these concerns is the view that GDP (the annual marketed flow of monetarised goods and services) is no longer accepted as a sufficient instrument for sound macro-economic management, and is in need of supplementation or even replacement. The basic post-Keynesian model of the economy is represented as monetary flows. The counter-flow of physical goods, services and inputs is often ignored or implicitly subsumed by the market model which is founded on the idea that all goods, services and inputs are ultimately substitutable. In this view, GDP suffers from two shortcomings:

- it concentrates only on material factors that are quantifiable in monetary terms; and
- it is value-neutral in adding together, and according equal weighting to, all social 'goods' (e.g. preventive health) and social 'bads' (e.g. expenditure on crime and pollution). A country can be socially disintegrating yet its GDP still triumphantly recorded as 'growing'.

GDP remains the central concept of neo-classical economics. The central concept of ecological economics is throughput – the metabolic flow of energy and matter that goes into the economic activity that produces the GDP. That metabolic flow draws energy-matter from environmental sources, passes it through the 'recognised' economic system, and returns it back to environmental sinks as waste (though not necessarily at the same quantitative level, being subject to the law of entropy).<sup>30</sup>

Conventional economics has focused on GDP and largely ignored throughput. Yet throughput is the relevant magnitude for addressing the size of an economy. The essential question for ecological economics is: how big is the economy's metabolic flow relative to the natural cycles that regenerate the resource base and absorb the waste following the productive process? Certain inputs are not substitutable, and the rate at which the ecosystem can absorb waste streams and regenerate the inputs to our material consumption are key among them.

In practical terms, the global economic sub-system is now very large relative to the ecosystem that sustains it. The question must therefore be asked: how big can the global economy get before it overwhelms and destroys the planet's ecosystem? Ecological economics addresses the question of resource use, seeking the goal of *optimum scale*.

It follows, in this reasoning, that throughput growth should be stopped before the marginal socio-environmental cost exceeds the marginal production benefit derived from it. In this light it becomes self-evident that the global economy cannot grow indefinitely, and the prospect is raised of a 'steady-state economy'.<sup>31</sup> In this view the economy is an open sub-system of a finite and non-growing ecosystem (the environment). When the economy reaches identified ecological limits, it may no longer grow, in a material sense.

The distinction is drawn here between 'material growth' and 'sustainable development'.<sup>32</sup> Development can continue after growth has ceased. The total human population and the total capital stock of material goods remain constant; but technological change, economic distribution and the resulting quality of life remain dynamic. Sustainable development thus facilitates a continually increasing quality of human life through material sufficiency, knowledge accumulation and cultural advancement. But environmentally-damaging material growth has ceased.

A steady-state economy does not entail economic contraction, which is the natural fear of governments. Economic contraction can result in financial instability, corporate collapse, unemployment, and household stress.

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<sup>29</sup> Daly, in Foreword to Jackson (2009), xi

<sup>30</sup> 'Growth' is a quantitative increase in size, or an increase in throughput. 'Throughput' is the flow of raw materials and energy from the global ecosystem, through the economy, and back to the global ecosystem as waste. 'Development' is the increase in quality of goods and services, as defined by their ability to increase human well-being, provided by a given throughput. See Daly & Farley 2004, 6

<sup>31</sup> 'Steady-state economy' is defined as: "an economy with constant stocks of people and artefacts, maintained at some desired, sufficient levels by low rates of maintenance throughput". Daly (1991), 17

<sup>32</sup> 'Sustainable development' is development without growth, i.e. qualitative improvement in the ability to satisfy wants (needs and desires) without a quantitative increase in throughput beyond environmental carrying capacity. 'Carrying capacity' is the maximum human population that can be sustained by a given ecosystem at a given level of consumption, with a given technology. Limits to growth do not necessarily imply limits to development. See Daly & Farley (2004), 6

The conventional belief is that growth must be perpetually maintained to avoid or redress these problems. This belief is manifest in the interest policies of financial institutions over the last twenty years, leading to the global financial crisis of 2008-9. The crisis is held by some to be the inevitable result of the neo-classical model, in allowing free licence to unsound financial policy within the context of unlimited growth.

For its part, ecological economics distinguishes between a successfully-functioning steady-state economy and a failed growth economy which aspires to grow but may slip into recession. It is misdirected growth that has caused the problem, and the cause of a problem cannot be its solution. It contends that 'recovering from recession through regenerating growth' is a mirage, and the developed world is in a long-term economic downturn that will not stabilise until its recessionary effects have eliminated most of its accumulated debt. Fundamental change through higher savings and lower debt are necessary for long-term recovery.

The concept of steady-state economics, however, is problematic when juxtaposed against world poverty. It is not morally credible to prescribe a steady-state economy to those countries whose income *per capita* is well below the global average. In short, the developing world – the 'global South' – must be allowed continued material growth to meet basic human needs. But, in a world whose Ecological Footprint is 2.7 global hectares *per capita* and whose bio-productive land is 1.9 gha. pc, the global economy as a whole must attain a steady state. The necessary conclusion is that the developed world (the 'global North') must halt material growth while the developing world remains free to grow their national economies for a finite future period.

Given the degree of inter-dependence among all national economies in the contemporary global economy and the traditionally competitive nature of that interaction, this will be a policy challenge of the highest order.

### **Part III. The NZ Economy and National Sustainability**

Where does New Zealand fit within the 21<sup>st</sup> century global economy thus depicted? To what extent is it legitimately using its national resources to maximum potential? To what extent is it exacerbating or mitigating the global ecological overshoot?

The economic challenge in New Zealand, as elsewhere, is two-fold. Central to the political debate is the conventional challenge of maintaining financial stability that underwrites material growth, generating employment security, income sufficiency, price stability and commodity availability. Underlying this is a second challenge – national policies that assist in realising global sustainability through avoiding excessive national drawdown of the planet's resources. The first challenge is one of competition among nations; the second is one of cooperation. There is thus an intrinsic tension within national macro-economic policy-making today that goes largely unrecognised.

#### *Economic Growth and Financial Stability*

Consistent with the neo-classical model, New Zealand's macro-economic performance is associated with its GDP. Political judgements are generally entered according to the country's world ranking, with special attention to the OECD group of 'developed' countries.

The NZ economy is small to the point of global insignificance. With a GDP of US\$120 billion (NZ\$187 b. – see Table 2), it accounts for 0.02% of the global economy, ranking 57<sup>th</sup> in the world.

In terms of *per capita* GDP, New Zealand remains one of the wealthiest, at US\$25,109. But over the 65 years since 1945, New Zealand has dropped in global ranking – from 5<sup>th</sup> in 1950 and 1960, 10<sup>th</sup> in 1970, 19<sup>th</sup> in 1980, 20<sup>th</sup> in 2000, and 26<sup>th</sup> in 2010.<sup>33</sup>

The decline was not uniform through that period. Precipitate drops occurred in 1966-69, 1976-78, and 1986-92. The first two declines were due to external shocks – in wool prices (down) and oil prices (up). The third is attributed to poor performance of the export-import sectors due to an overvalued exchange rate.<sup>34</sup>

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<sup>33</sup> [http://www.nationmaster.com/graph/eco\\_gdp\\_percap-economy-gdp-per-capita](http://www.nationmaster.com/graph/eco_gdp_percap-economy-gdp-per-capita). Three non-state territories (Macau, Isle of Man, and Hong Kong) have been omitted from the original list. In the Human Development Index, New Zealand ranked 20<sup>th</sup> for 2007 (17<sup>th</sup> for 1992). <http://hdr.undp.org/en/reports/global/hdr2009/>

<sup>34</sup> See Easton, B., *In Stormy Seas: The Post-War New Zealand Economy* (Otago University Press, Dunedin; 1997)

More generally, New Zealand's immediate post-war wealth was primarily the result of supplying material goods in the 1950s in bulk to the UK on preferential terms, and to its avoidance of physical damage from armed conflict. These circumstances terminated in the 1960s as Europe regained economic strength and Britain removed imperial preferences in favour of regional economic integration. The steady erosion of its preferred trading status and the requirement to survive in an increasingly competitive and fast-paced global economy forced drastic economic policy change in the late 1980s – moving from a protectionist and stable, to an open and volatile, economy.

In order to achieve the conventional economic goals, NZ legislation imposes certain binding obligations upon the Executive. In presenting the annual Budget to parliament, the Minister of Finance is required to address four specific economic concepts. These are GDP, unemployment, CPI and the balance of payments.<sup>35</sup> Budget documents, providing information for parliamentary scrutiny, are required to incorporate this information. These include the Appropriation (Estimates) Bill; the Budget Economic and Fiscal Update; the Fiscal Strategy Report; the Estimates with Supporting Information; and the Budget Policy Statement. Beyond this legal requirement, other concepts customarily employed in fiscal management include interest rates, public and national debt, and net international investment positions. No such obligation is imposed on the Minister as yet to present any ecological concepts relating to sustainability.<sup>36</sup>

Regenerating economic growth, as measured by GDP, is the Government's primary policy objective.<sup>37</sup> At the heart of the Government's economic plan lie six main policy drivers: a growth-enhancing tax system; better public services; support for science, innovation and trade; better regulation, including with natural resources; infrastructure investment; and improved education & skills.<sup>38</sup>

Political debate over the country's economic decline focuses on an alleged lack of labour productivity and business innovation, with limited value added to our commodity exports as a result. Considerable attention is given to achieving greater innovation and productivity in both public and private sectors. New Zealand's productivity record is modest, varying between zero and 3% annually over the past 15 years, dipping below zero during the recent recession (Table 3). This record generally compares poorly with other OECD countries. The strongest growth remains in bulk export of primary produce – dairy exports have increased from 14% to 23% of total exports in 20 years, and projected growth is even higher.

Unemployment has never been as great a problem as in most other 'developed' countries. From the 1950s through the mid-'80s, unemployment remained at very low levels (below 2%) – essentially 'structural full employment'. Unemployment has, however, spiked in certain times – correlated with recessionary periods. The current recession's unemployment peaked in December 2009 at 7.1%, dropping to 6.3% before rising again to 6.8% in June 2010 (see Table 4 for long-term trend: 1970-2010).<sup>39</sup>

Price stability has been imperfect over the past century. The problem of inflation has increasingly afflicted the economy in recent decades (Tables 5(a) and 5(b)). The CPI remained stable in the first half of the 20<sup>th</sup> century but inflation then took hold, particularly in the 1970s and early '80s. The policy target range of 1% to 3%, consequent upon the Reserve Bank Act 1989, reflects the belief that there is a threshold inflation rate above which the NZ economy is detrimentally affected. Recent research suggests the threshold may be around 3%, but results of various studies differ.<sup>40</sup>

The main problem with the NZ economy today is the increased level of debt. The country's debt remained relatively modest through a century of borrowing but has burgeoned to serious levels in the past 20 years, fuelled by the national penchant for private property leveraging of consumer lifestyles and profit transfers to foreign companies (Table 6(a)). Net public debt in New Zealand has climbed from \$0.4 billion in 1972 (\$137 *per*

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<sup>35</sup> Public Finance Act 1989, Section 26(P).

<sup>36</sup> A member's bill currently in the parliamentary ballot would address this issue (Public Finance [Sustainable Development Indicators] Amendment Bill, submitted by Kennedy Graham, MP).

<sup>37</sup> "The driving goal of the new Government will be to grow the NZ economy in order to deliver greater prosperity, security and opportunities to all New Zealanders. It will be going for growth because it believes in the power of economic growth to deliver higher incomes, better living conditions and ultimately, a stronger society for New Zealanders." Governor-General's Speech-from-the-Throne, December 2008.

<sup>38</sup> Prime Minister John Key, Speech Opening Parliament, February 2010.

<sup>39</sup> <http://www.dol.govt.nz/PDFs/lmr-hlfs-jun-10.pdf>

<sup>40</sup> <http://www.parliament.nz/en-Z/ParlSupport/ResearchPapers/2/4/2/242678e1b8654288b9c4f7c1444050e6.htm>

capita) to \$17.1 bn. in 2009 (\$3,967 per capita), and is projected to rise to \$63.0 bn. by 2014 (\$13,877 per capita) (see Table 6 (b)).

The peak of the 'property bubble' coincided with the global recession of 2008-9. This placed strain on New Zealand's net international investment position (NIIP), whose net liability deteriorated from 63% to 87% of GDP over twenty years (Table 6(c)). The March 2010 NIIP stood at -\$161 bn. (91% of GDP), comprising \$289 bn. foreign investment in New Zealand and \$128 b. NZ investment abroad (Table 6(d)). This deteriorated to -\$164 bn. in June 2010.<sup>41</sup>

Most foreign investment in New Zealand comes from Australia (35%), Britain (17%) and the US (17%) while Japan's investment is minor (2%) and China's is negligible. Most investment is in the form of debt securities and other bank capital (42%) rather than share equity (22%).<sup>42</sup>

New Zealand's NIIP is forecast to worsen further to perhaps 110% of GDP by 2013.<sup>43</sup> The NIIP reflects the accumulation of each year's current account performance. It is a policy objective that the current account deficit (CAD) remains below 1.3% of GDP over the next five years and below 4.8% over the medium-term. In fact, the CAD has worsened over the past 20 years, from -4.1% of GDP in 1990 to -8.5% in 2009, though improving to -2.4% in 2010 (see Table 6.e). It is forecast to average -5.8% of GDP over the next five years.<sup>44</sup> The current account deficit has regularly run at -\$10 bn. to -\$15 bn. from 2005-'09, improving to -\$4 bn. in the past year (Table 6 (f)).

Clearly New Zealand, along with other OECD countries (with the singular exception of Norway), has become a seriously indebted nation. Global financial power has shifted in recent decades to certain Asian and Arab countries, particularly China and Japan (Table 6 (g)).

New Zealand's international indebtedness (currently at -NZ\$164 billion) needs to be placed in the context of the country's total capital stock. No official statistics are published of this, but unofficial estimates place this at roughly NZ\$1,500 billion.<sup>45</sup>

Government policy is aimed at reducing the level of the country's various debt.<sup>46</sup> The nation's monetary and fiscal policies are designed to achieve these two goals. Yet the net Core Crown debt has worsened in the past year from 9% of GDP to 14% (Table 7).

Government policy is also committed to continued free trade, on the premise that export-led growth is the most assured way of ensuring a vibrant economy. The Government recognises that this results in a more specialised economy more dependent on globalisation, but contends that domestic 'negative adjustment effects' (company failure and unemployment) are either negligible or politically acceptable. Contrary to popular belief, however, New Zealand is not a large international trader – exports plus imports relative to GDP is comparatively low.

The overall picture is of a small, open and vulnerable economy, struggling to keep up competitively with those with which it once ranked on equal terms, insecure of its innovative abilities, increasingly mired in debt, and facing the prospect of ceding ownership of its land and other strategic assets to foreign interests.

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<sup>41</sup> [http://www.stats.govt.nz/browse\\_for\\_stats/economic\\_indicators/balance\\_of\\_payments/BalanceOfPayments\\_HOTPJun10qtr-correction.aspx](http://www.stats.govt.nz/browse_for_stats/economic_indicators/balance_of_payments/BalanceOfPayments_HOTPJun10qtr-correction.aspx)

<sup>42</sup> Source: Hot Off the Press, 30 Sept. 2010, Stats NZ, Tables 2 & 6.

<sup>43</sup> Easton, B. *Forecasting New Zealand's Net International Investment Position*, 28 June 2009, <http://www.eastonbh.ac.nz/?p=963>. The CAD and NIIP are closely inter-related. A country's Balance of Payments records its flow of transactions over a year, while its NIIP measures the level (or stock) of assets and liabilities at year-end. This is comparable to the corporate distinction between profit-and-loss account and balance sheet. The BOP is comprised of the Current Account (goods, services, income, and current transfers), the Capital Account (acquisition and disposal of non-produced, non-financial assets) and the Financial Account (claims on, and liabilities to, non-residents).

<sup>44</sup> Ibid.

<sup>45</sup> Gareth Morgan Investments (Infometrics). Source: Parliamentary Library Research, 27 Sept. 2010. This is comprised of NZ1,000 b. in natural capital (land and minerals) and \$500 b. in built and financial assets.

<sup>46</sup> "Overall, our economic policies are aimed at shifting the economy more towards exports and productive investment, and away from consumption and borrowing. 2010 will be about putting in place policies to grow the economy...." Prime Minister John Key, Speech Opening Parliament, February 2010.

In assessing New Zealand's economic record, it needs to be queried whether a ranking of 26<sup>th</sup> in *per capita* wealth reflects a genuinely poor performance or is simply an accurate depiction of New Zealand's relative national wealth. It is unclear whether the slide down the global GDP ranking is due to a lack of innate skill and capacity in the NZ economy or simply reflects the 'national wealth' ranking of New Zealand as a small and distant competitor with modest strategic economic assets, which previously enjoyed artificially good fortune.

A World Bank discussion paper a decade ago ranked New Zealand 12<sup>th</sup> in national wealth, significantly behind Canada (3<sup>rd</sup>) and Australia (6<sup>th</sup>).<sup>47</sup> Any meaningful debate over New Zealand's place in the economic world and its 'catch-up with Australia' syndrome should be pursued within that contextual background.

### National Sustainability and New Zealand

In the collective pursuit of global sustainability, what is the extent of obligation upon each country to be 'nationally sustainable'? To what extent should New Zealand compete for material economic advantage or cooperate in contributing to global sustainability?

Much of the tension prevailing in the global sustainability debate at present derives from disconnects between the economic context (national economies) and the ecological context (bio-spherical regions). The nation-state is a political artifice; the ecological region is a natural entity. When countries are superimposed over ecological regions, and their national economies are made more complicated through international trade and investment flows, clarity of policy-making for sustainability suffers. Because the planet is a single biosphere, it is easier to comprehend global sustainability than it is to comprehend, and certainly to attain, national sustainability.

Any assessment of whether a country is, or can become, sustainable depends on whether the criterion used is 'strong sustainability' or 'weak sustainability'.

Strong sustainability requires that a nation maintain all its stock of natural capital. This is embraced by the ecological model.<sup>48</sup> It is a particularly stringent test of a nation's economy – if a country is losing its capital stock in any natural resource area, it is failing the strong sustainability test. Most countries are failing the test. In our case, Statistics NZ has reported usefully along these lines, identifying 85 environmental and social indicators within a set of 15 macro-indicators, as a measure of sustainability trends over the past 20 years.<sup>49</sup> This work does not, however, give an overall ranking of New Zealand's sustainability, or even identify what the sustainable level of national economic activity would be. But of the 39 environmental indicators, the report showed a trend away from sustainable development in 10 indicators. Clearly New Zealand is currently failing the strong sustainability test.<sup>50</sup>

Weak sustainability is derived from standard neo-classical thinking. Weak sustainability accepts that, within certain bounds, a nation may substitute one input for another to produce output. This allows greater flexibility to nations and leads to the idea of Genuine Savings as a national sustainability indicator. The World Bank has calculated how much capital each nation has – natural capital, physical capital and human capital. Nations with decreasing aggregate capital *per capita* are not sustainable. Most OECD countries pass the weak sustainability test; some poorer, natural resource-extracting countries fail even this.

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<sup>47</sup> "As the nations of the world move from commitment to action in achieving sustainable development the need for measuring progress toward this end is heightened. ... National wealth takes on a much broader definition and is embodied in natural capital; human resources that include education, raw labour, and social capital; and produced assets (machinery, equipment, buildings, and urban land)." Kunte, World Bank, 1998, 5

<sup>48</sup> "Strong sustainability is the prerequisite and foundation of any human development. Strong sustainability means the preservation of the integrity of all ecological systems in the biosphere. Ecological integrity means the ability of an ecosystem to recover from disturbance and re-establish its stability, diversity and resilience. A strongly sustainable human society lives and develops as an integral part of ecosystems that have ecological integrity." SANZ 2009, 11

<sup>49</sup> NZ Statistics Dept., 2009

<sup>50</sup> Evidence for ornational unsustainability includes: GHG emissions; industrial waste; nitrate, phosphate, and organic contamination of groundwater; soil degradation from farming practices; erosion of steep pastoral land and consequent extreme flooding of lowlands; biodiversity loss; proliferation of solid waste in landfills; toxic dumps; and reduction in the vitality of human communities and consequent pathologies. (SANZ 2009, 5). New Zealand loses some 400 m. tonnes of topsoil into the sea annually; it takes 100 years to replace 1 cm. of topsoil. (Rob Fenweick, CEO, Living Earth, in DomPost, Oct. 16, 2010, B3).

Based on the weak sustainability paradigm, the neo-classical model would aim, at the micro-economic level, to develop accurate price signals for all users of every natural resource. At present the NZ economy is skewed by many price distortions (zero-priced water in some regions; subsidised agriculture, forestry and fisheries; low prices for fossil fuels; no costing of waste) that ignore the external costs associated with their use. Proper price signals would lead to greater care for the environment and the natural resource base, and thus to the macro-economic goal of Genuine Savings.<sup>51</sup>

The most disconcerting feature of the economic debate in New Zealand, and no doubt elsewhere, is the focus on the competitive race for economic growth or re-growth (with financial stability as a precondition) in a broader context of an intensifying global ecological crisis.

### *The Moral-Political Dilemma of Ecological Surplus and Deficit*

New Zealand's *per capita* Ecological Footprint is relatively high. At 7.8 ha. *per capita*, this ranks us 6<sup>th</sup> highest in the world – over three times above the global average and four times above 'earth-share'.<sup>52</sup> Yet New Zealand is one of the few countries that runs a national 'ecological surplus' – some 6.2 ha. *per capita*.<sup>53</sup> Our ecological surplus is due not to prudent husbandry or modesty of habit but to our low population density (15 p. sq. km., one-third of the global average). New Zealand ranked 15<sup>th</sup> on the 2010 Yale Environmental Performance Index, down from 7<sup>th</sup> in 2008 and 1<sup>st</sup> in 2006.<sup>54</sup>

Running a national ecological surplus, while far surpassing the 'earth-share' required of it for global sustainability to be attained, introduces a contextual disconnect for New Zealand. Images of the increasing global ecological overshoot have little immediate or direct relevance to most NZ viewers, and appear little different from long-standing images of human poverty and natural disaster. There is little political comprehension of the significance of the NZ economy in this respect. A correlation between this and New Zealand's situation in the context of climate change is clear.

Related to this is the question of New Zealand's trade policy. The conventional view is to acknowledge the projected 33% increase in global population and the projected 50% increase in global food demand by 2050, and to pursue a policy of rapid expansion in national food exports to meet that demand. New Zealand 'feeds' about 18 m. people through food exports (in terms of calorie equivalent), four times its own population. Export income opportunity is intimately associated with a sense of moral obligation to 'feed the world', disregarding whether it is a genuine moral obligation to feed a global population that appears to be exceeding global ecological limits.

Only a small number of countries, including New Zealand, run an 'ecological surplus' – in which their bio-productive land available exceeds their ecological footprint. These countries are ecologically subsidising the rest of the world which is over-consuming. Those with the largest surpluses are both rich (Canada, Australia, New Zealand, Norway) and poor (Gabon, Bolivia, Mongolia, Congo). The poorer surplus countries, it would seem, have a moral-political right to expand their footprint (and thus their material standard of living). The richer surplus countries, perhaps, do not. Yet many of the large deficit countries are already purchasing ecological assets of those poor countries which run ecological surpluses.

The moral-political dilemma of this for each country is profound. Much depends on the extent to which the 'worldview' adopted is global or national. Countries with an ecological surplus, especially the richer ones, do not directly experience the magnitude of the global ecological deficit or live its environmental impact. They are therefore least likely, politically, to react with resolve to reduce the global footprint.

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<sup>51</sup> Groups have been set up in New Zealand recently to explore these issues – examples are the NZ Council for Sustainable Business and the Land & Water Forum. Some regional councils (Wellington, Waikato) are developing sustainability strategies and measuring economic success according to the GPI.

<sup>52</sup> WWW, Global Footprint Network, & ZSL, *Living Index Planet Report* 2008, 14

<sup>53</sup> New Zealand's 'ecological surplus' is 14 ha. *per capita* (bio-productive land less 7.8 ha. footprint). See *Living Index Planet Report* 2008, 16

<sup>54</sup> The 2010 Environmental Performance Index (EPI) ranks 163 countries on 25 performance indicators tracked across ten policy categories covering both environmental public health and ecosystem vitality. These indicators provide a gauge at a national government scale of how close countries are to established environmental policy goals. The EPI's proximity-to-target methodology facilitates cross-country comparisons as well as analysis of how the global community is doing collectively on each particular policy issue. <http://epi.yale.edu/Countries> and <http://epi.yale.edu:2008/CountryScores> and [http://www.yale.edu/epi/files/2006EPI\\_MainReport.pdf](http://www.yale.edu/epi/files/2006EPI_MainReport.pdf)

## Part IV. Party Policies and Questions for NZ Leaders

Statements on economic growth and sustainability by leaders of the National, Labour and Green parties are set out in the Appendix.

- The Government's policy is 'to balance economic opportunity with environmental responsibility'. Some controversy surrounds the environmental impact of development plans for dairying and mineral extraction. But government and some industry leaders claim that it is possible to meet that goal.<sup>55</sup>
- The Labour Party, during its most recent tenure in government, stressed sustainability as a national policy. Yet it accorded equal stress to economic growth, thus exhibiting the tension between the two concepts identified earlier in this paper.
- The Green Party identifies sustainability as the over-arching policy goal for the global economy, suggests that the neo-classical economic model is in need of replacement by ecological economics, that growth must be replaced in the richer, developed nations by steady-state economies, and that GDP needs to be supplemented with broader socio-environmental indices.

All three parties need to assess the underlying assumptions that buttress their economic policies, with a view to seeking common ground among them. To that end, the following questions could be addressed.

### *Global Sustainability*

1. Is there agreement that the global economy has reached certain critical ecological limits? Is there agreement over an absolute limit to the carrying capacity of the planet and/or a prescriptive limit to the size of the global population? Are our concepts and techniques for measurement adequate to these tasks?
2. Is it possible to attain sufficient international cooperation for the goal of global sustainability in a global economy whose structures and precepts are based on international competition?

### *Neo-classical and Ecological Economics*

3. Is the neo-classical commitment to continuous economic growth a valid policy for the global economy?
4. Is it possible to combine elements of both economic models – the ecological model at the macro-level and the neo-classical model at the micro-level, but within clear parameters and with proper pricing of externalities and proper accounting for natural capital?
5. Is a global 'steady-state economy' a necessary policy for global sustainability? Is it possible? Is there a distinction, in this respect, between the developed and the developing world?

### *National Sustainability*

6. Is there agreement that each country should aspire to a state of 'strong sustainability' in which all its capital stock of each natural resource should be maintained at current levels? If not, will a state of 'weak sustainability' for each country guarantee a sustainable global economy?
7. Should New Zealand reduce its Ecological Footprint (currently at 7.8 gha *per capita*) to within the range of the biological land availability *per capita* for global sustainability (currently at 1.9 gha)?
  - (a) If so, can this be reconciled with the conventional view of a need to recover from the recession and also reduce debt levels? How can the current neo-classical / Keynesian economic model be translated into immediate solutions to immediate problems using the fiscal levers which NZ business and householders can understand?
  - (b) If not, how will the global economy, composed of 192 national economies, attain global sustainability?
8. In an open global economy (with a liberal trading-investment regime) aspiring to a sustainable state, what is the optimal balance to be struck by New Zealand between economic integration and national economic sovereignty and self-resilience in the uncertain world of the 21<sup>st</sup> century?

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<sup>55</sup> "People need to shift their thinking on exactly this issue. The development of New Zealand's natural resources and the protection of the environment are not mutually exclusive. It is only through a strong economy that New Zealand can afford the expenditure required to look after and improve our environment." Minister of Energy, Gerry Brownlee, Address to NZ Petroleum Association Conference, Auckland, 13 Sept. 2010. And: "Sustainability is really at the core of our strategy. ... I believe we can grow dairying in an environmentally sustainable way, which means the trade-off between economic growth and environmental sustainability is acceptable." Tim Deane, General Manager of Milk Supply, Fonterra, in *NZ Listener*, August 14-20, 2010, p. 19.

## Appendix

### National Leaders' Statements on Growth

#### **Clark 2002**

"My government sees its most important task as building the conditions for increasing New Zealand's long-term sustainable rate of economic growth. ... the appropriate mix of policies can, over time, return NZ to the top half of the developed world. ... Economic growth is a means to an end, not the end itself. It is about creating real opportunities for us all – a richer, more inclusive, more diverse and dynamic nation, and about creating the resources to enable governments to provide better social services."

#### **Clark 2005**

"My government's overall objective for the next three years is to continue New Zealand's transformation to a dynamic, knowledge-based economy and society, underpinned by the values of fairness, opportunity and security. ... In the past six years, NZ has enjoyed economic growth above the rate of our major trading partners. ... The strong economic growth of the last six years has seen the emergence of significant skill shortages in key sectors of the economy. In more recent years, growth has been led by domestic demand. This has been further fuelled by bank lending based on off-shore borrowing. This, in turn, has helped to keep the NZ\$ at high levels for much longer than in any previous cycle since the \$ was floated. That has further increased consumption and inflationary pressures, translating into the need for tighter monetary policy."

#### **Key 2008**

"The driving goal of the new Government will be to grow the NZ economy in order to deliver greater prosperity, security and opportunities to all New Zealanders. It will be going for growth because it believes in the power of economic growth to deliver higher incomes, better living conditions and ultimately, a stronger society for NZers. ... My government will therefore, in representing the will of New Zealanders, remain resolutely focused on the issues that matter, pre-eminent of which will be the need to strengthen the economy to ensure future economic growth. ... the country will be able to push through this downturn and onto a longer-term pathway to stronger growth. ... Without economic growth, my Government's objectives will be compromised, with stronger economic growth, its objectives will be realised more fully. ... In going for growth, my Government will be acutely conscious of the fact that it is in the interests of no New Zealander, and to the detriment of us all, to allow an underclass to develop in NZ." ... My Government views economic growth as the platform upon which a stronger NZ will be built. It views political leadership from this Parliament as essential to achieving that goal."

#### **Key 2010**

"The good news is that NZ has weathered the worst of the global crisis, and New Zealand can be pleased at how well this country has come through it. The economy has performed better than almost anyone expected a year ago, and is now starting to grow again. ... Overall, our economic policies are aimed at shifting the economy more towards exports and productive investment, and away from consumption and borrowing. 2010 will be about putting in place policies to grow the economy."

#### **Norman 2009**

"Ecological economics, the theoretical basis of the Green Party's economic policy, introduces a remedial element that is essential to our 21<sup>st</sup> century survival and prosperity. Its central goal, which is sustainability, can be attained only when its three component factors – economic, social, and environmental – are met. It understands that society is a subset of the environment and that the economy is a subset of society. Ecological economics differs from traditional economics in four ways: it values nature not as an object of productive exploitation but for its intrinsic worth to humanity; it accords equal importance to the well-being of the next generation as well as our own; it acknowledges the irreversibility of environmental change from economic behaviour; and it recognises the uncertainty of environmental outcomes from economic inputs."

#### **Norman 2010**

"We believe that a sustainable society, one which lives within its resource limits and leaves some space for the natural world, is a society best placed to avoid ruthless competition for ever diminishing resources. ... The next economic wave is the green economic wave and, if New Zealand wants to prosper, we must prioritise research, science, and technology spending in areas such as renewable energy, sustainable agriculture, green tech manufacturing, green design and energy efficiency."



**Table 1**  
**Human Population Explosion**

<u>Year</u>	<u>Population</u>			<u>Time-Period between Billions</u> (Years)
	(millions)	(billions)		
1000 BCE	50 m.			
0	100 m.			
1000 CE	300 m.			
1804	1000 m	1		100,000
1927		2		123
1960		3		33
1974		4		14
1987		5		13
1998		6		11
2010		7		12
2025		8		15
2048		9		23

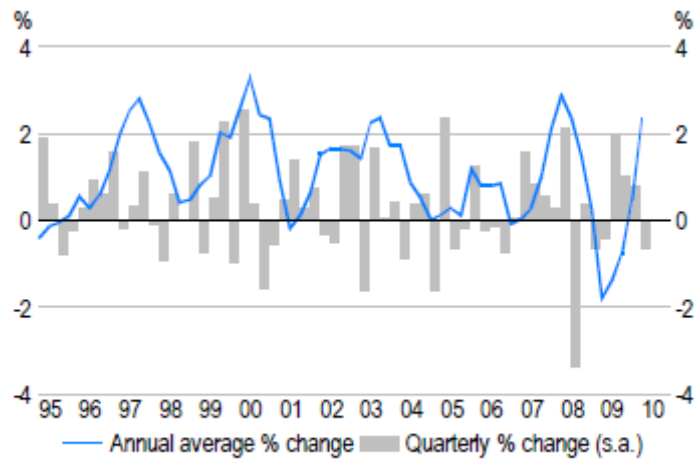
*Source: McNeil (2001), 8*  
*Cohen (1995), 81*

**Table 2**  
**New Zealand's GDP (NZ\$ billion)**  
**(March 2010)**

Final Consumption Expenditure	Private	110.9	
	Government	38.3	149.2
Gross Capital Formation	Changes in Investment	-1.4	
	Residential buildings	8.4	
	Other Fixed Assets	28.4	35.4
Trade Balance	Exports	52.4	
	Imports	-49.7	2.7
<b>Gross Domestic Product</b>			<b>187.3</b>

*Source: Parliamentary Library Research, 28 Sept. 2010*

**Table 3**  
**NZ Labour Productivity 1995-2010**  
**[GDP divided by hours worked]**

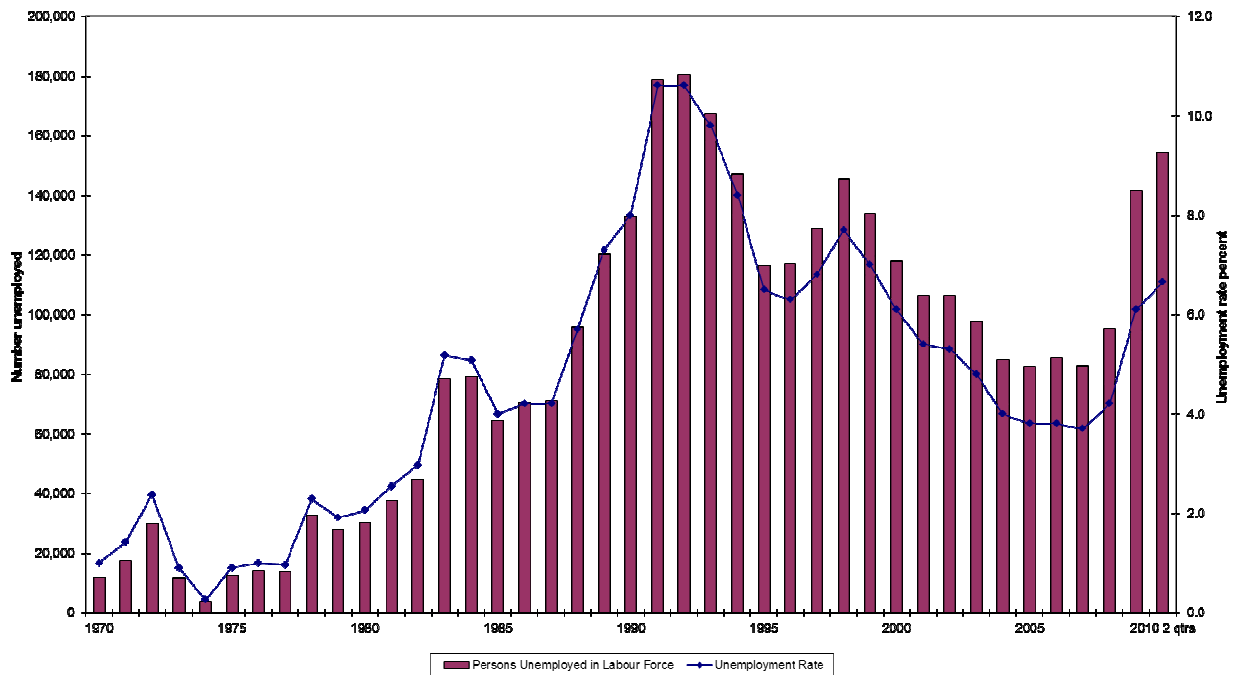


Source: Statistics New Zealand, The Treasury

Source: NZ Economic Chart Pack: Key NZ Macro-economic & Financial Market Graphs (August 2010)  
 Stats NZ & The Treasury, p.11

**Table 4**  
**Unemployment: Long-term Trend 1970-2010**

Unemployment and Unemployment Rate  
 Household Labour Force Survey with backdate to 1970



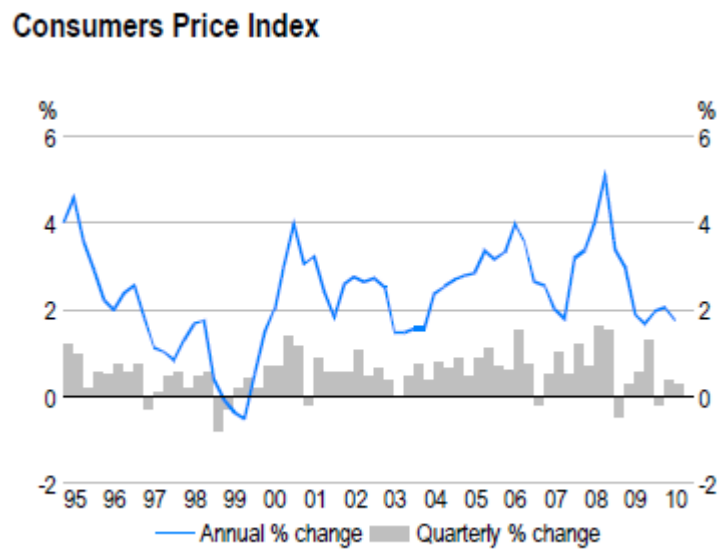
Source: Parliamentary Library Research, 3 Sept. 2010

**Table 5 (a)**  
**NZ Price Stability: Consumer Price Inflation 1980-2010**

4 <sup>th</sup> Quarter	<i>Consumer Price Index (CPI)</i>	<i>Annual % Change</i>
1920	28.6	15.4%
1930	24.4	-4.0%
1940	26.7	2.7%
1950	37.1	8.5%
1960	56.1	1.6%
1970	83.8	10.0%
1980	275.1	16.1%
1990	731.1	4.9%
2000	870.2	4.0%
2010 [2 <sup>nd</sup> quarter]	1100.0	1.8%

*Source: Parliamentary Library Research, 3 Sept. 2010*

**Table 5 (b)**  
**NZ Consumer Price Index: Annual % Change**



Source: Statistics New Zealand

*Source: NZ Economic Chart Pack: Key NZ Macro-economic & Financial Market Graphs (August 2010)  
 Stats NZ & The Treasury, p.5*

**Table 6 (a)**  
**NZ Debt: Time Series**  
**Government, Household and International Debt**

<b>Year</b>	<b>(NZ\$ million)</b>		
	<b>Government</b>	<b>Household</b>	<b>International</b>
1860	1		
1870	15		
1880	54		
1890	77		
1900	96		
1910	150		
1920	402		
1930	535		
1940	598		
1950	1,292		
1960	1,689		
1970	2,877		
1980	10,341		
1990	44,343	28,000	67,119
2000	36,580	74,000	159,086
2010	52,636		308,522
	( 31 May 2010)		(31 March 2010)

Source: Parliamentary Library Research, 31 August 2010

**Table 6 (b) NZ Public Debt**

	<b>Gross Public Debt / Gross Sovereign- Issued Debt (NZ\$ m)</b>	<b>Net Public Debt / Net Core Crown Debt (NZ\$ m)</b>	<b>Net Public Debt as % of GDP</b>	<b>Net Public Debt Per capita</b>
1860	1	1		
1870	15	14		
1880	54	52		
1890	77	75		
1900	96	94		
1910	150	147		
1920	402	388	151%	
1930	535	530	145%	
1940	598			
1950	1292			
1960	1690			
1970	2877			
1972	3159	406	6%	137
1980	10341	3227	16%	1006
1990	44343	35705	49%	10423
2000	36580	25895	23%	6712
2009	43356	17119	9%	3967
2010	53810	26642	14%	6106
2014 (projected)	77778	63014	27%	13877

Source: Parliamentary Library Research, 31 August 2010

**Table 6 (c)**  
**NZ Net International Investment Position (\$NZ billion)**  
**(March Years)**

	Assets	Liabilities	Net Intern. Inv. Position	GDP	NIP as % of GDP
1990	29.5	76.9	-45.7	72.7	62.9%
2000	93.5	181.4	-87.1	110.9	78.5%
2009	143.6	317.1	-173.5	184.8	93.9%
2010 (June)	144.2	307.9	-163.7	187.3	87.4%

Source: Parliamentary Library Research, 28 Sept. 2010 [minor discrepancy with Table 6(d) for 2009]

**Table 6 (d)**  
**NZ International Investment Position**

	Series ref: IIPA	At 31 March					
		2005	2006	2007	2008	2009	2010
<b>New Zealand investment abroad</b>							
Direct investment abroad	S5AAA1	20,269	19,311	20,552	22,699 R	24,949 R	21,430
Equity capital	S5AAA11	16,555	15,635	16,985	17,656	21,460	20,028
Other capital	S5AAA12	3,714	3,676	3,567	5,043 R	3,489 R	1,402
Portfolio investment abroad <sup>(2)</sup>	S5AAA2	33,896 R	42,388 R	43,917 R	45,617 R	39,169 R	51,357
Equity securities <sup>(3)</sup>	S5AAA21	24,968 R	33,658 R	34,390 R	34,558 R	27,618 R	35,926
Debt securities	S5AAA22	8,929 R	8,730 R	9,528 R	11,059 R	11,551 R	15,431
Other investment abroad	S5AAA3	25,373	21,463	19,984 R	20,721 R	17,424 R	16,866
Trade credits	S5AAA31	C	2,974	3,755	3,808	3,672	4,037
Loans	S5AAA32	19,502	9,690	9,622	10,708	7,717	6,049
Deposits	S5AAA33	3,065	7,241	5,484 R	4,819 R	4,582 R	5,533
Other assets	S5AAA34	C	1,559	1,122	1,386 R	1,453 R	1,247
Financial derivatives	S5AAA4	5,347	7,486	6,411	10,162	25,059 R	14,569
Reserve assets	S5AAA5	8,828	14,596	20,381	24,538	20,463 R	23,424
<b>Total New Zealand investment abroad</b>	<b>S5AAA</b>	<b>93,713 R</b>	<b>105,245 R</b>	<b>111,245 R</b>	<b>123,738 R</b>	<b>127,063 R</b>	<b>127,646</b>
<b>Foreign investment in New Zealand</b>							
Direct investment in New Zealand	S5ALA1	72,003 R	77,047 R	85,759 R	88,249 R	91,191 R	92,487
Equity capital	S5ALA11	44,385 R	45,236 R	50,344 R	49,466 R	48,165 R	50,814
Other capital	S5ALA12	27,618 R	31,811 R	35,416 R	38,784 R	43,026 R	41,673
Portfolio investment in New Zealand	S5ALA2	77,918	83,540	84,664 R	93,048 R	86,869 R	93,205
Equity securities	S5ALA21	16,631	17,435	16,774 R	13,569 R	10,038 R	12,636
Debt securities	S5ALA22	61,287	66,105	67,890 R	79,478 R	76,831 R	80,569
Other investment in New Zealand	S5ALA3	56,764	65,546	74,711 R	82,057 R	88,476 R	87,456
Trade credits	S5ALA31	1,832	2,085	1,741	C	1,732	C
Loans	S5ALA32	38,005 R	43,578 R	50,454 R	58,620 R	64,850 R	59,133
Deposits	S5ALA33	16,490	19,287	21,994 R	21,196 R	21,173 R	24,298
Other liabilities	S5ALA34	436 R	597 R	522 R	C	721 R	C
Financial derivatives	S5ALA4	6,089	7,541	7,252 R	9,864 R	27,502 R	15,479
<b>Total foreign investment in New Zealand</b>	<b>S5ALA</b>	<b>212,773 R</b>	<b>233,675 R</b>	<b>252,387 R</b>	<b>273,218 R</b>	<b>294,038 R</b>	<b>288,627</b>
<b>Net international investment position</b>	<b>S5AAB</b>	<b>-119,060 R</b>	<b>-128,430 R</b>	<b>-141,141 R</b>	<b>-149,480 R</b>	<b>-166,975 R</b>	<b>-160,981</b>

Source: Hot Off the Press, 30 Sept. 2010, Stats NZ, Table 2

**Table 6 (e)**  
**NZ Current Account Balance 1990-2009 (NZ\$ billion)**  
**(March year)**

Year	Current Account Balance	CAB as % of GDP
1990	-2.938	-4.1 %
2000	-7.022	-6.4 %
2009	-14.723	-8.5 %
2010	-4,458	-2.4 %

*Source: Parliamentary Library Research, 31 July 2009  
Adjusted with Table 6 (f) below*

**Table 6 (f)**  
**NZ Current Account Balance**  
**(2009-10 – Y/E 31 March)**

	Series ref:	Year					
		2005	2006	2007	2008	2009	2010
<b>New Zealand's current account summary</b>							
Balance on goods	S5AC3A1	-2,230	-4,104	-2,831 R	-1,798 R	-1,522 R	2,641
Exports(fob)	S5AC1A1	31,114	31,582	35,633 R	38,717 R	44,247 R	40,092
Imports(fob)	S5AD1A1	33,344	35,685	38,464	40,515	45,770 R	37,451
Balance on services	S5AC3A2	1,222 R	542 R	454 R	259 R	-878 R	93
Exports of services	S5AC1A2	12,390	12,350	12,639	12,890 R	12,949 R	12,332
Imports of services	S5AD1A2	11,168 R	11,809 R	12,186 R	12,631 R	13,827 R	12,239
Balance on income	S5AC3B1	-8,639 R	-10,501 R	-11,616 R	-13,544 R	-13,176 R	-7,773
Income inflow	S5AC1B	5,100 R	4,603 R	5,698 R	6,373 R	4,876 R	4,495
Income outflow	S5AD1B	13,738 R	15,104 R	17,313 R	19,917 R	18,052 R	12,268
Balance on current transfers	S5AC3B2	305 R	141 R	644 R	699 R	853 R	581
Inflow of current transfers	S5AC1C	1,556	1,665	1,957	2,094	2,337	2,003
Outflow of current transfers	S5AD1C	1,251 R	1,524 R	1,313 R	1,396 R	1,483 R	1,422
<b>Current account balance</b>	<b>S5AC3</b>	<b>-9,342 R</b>	<b>-13,923 R</b>	<b>-13,349 R</b>	<b>-14,384 R</b>	<b>-14,723 R</b>	<b>-4,458</b>
<b>New Zealand's capital account summary</b>							
Balance on capital account	S5AC4A	108	-327	-458	-758 R	404 R	-337
Inflow of capital account	S5AC2A	1,354	998	958	918 R	2,040 R	1,064
Outflow of capital account	S5AD2A	1,246	1,325	1,415	1,677	1,635	1,401
<b>New Zealand's financial account summary</b>							
New Zealand investment abroad	S5AD2B	3,226 R	-3,783 R	11,201 R	13,237 R	-16,595 R	11,758
Direct investment	S5AD2B1	365	-3,849	2,351	5,346 R	-1,024 R	-733
Portfolio investment	S5AD2B2	1,459 R	-290 R	4,029 R	1,469 R	-1,564 R	6,385
Other investment	S5AD2B3	2,315	-4,494	-1,924 R	659 R	-4,008 R	-387
Reserve assets	S5AD2B5	-913	4,851	6,744	5,763	-9,999 R	6,493
Foreign investment in New Zealand	S5AC2B	13,872 R	10,485 R	23,101 R	26,416 R	-14,993 R	13,138
Direct investment	S5AC2B1	3,718 R	2,525 R	8,582 R	3,646 R	4,640 R	-1,692
Portfolio investment	S5AC2B2	4,262	2,905	4,614 R	14,459 R	-18,729 R	13,072
Other investment	S5AC2B3	5,892	5,055	9,904 R	8,311 R	-904 R	1,758
Net errors and omissions	S5AC4B6	-1,412 R	-18 R	1,907 R	1,963 R	12,717 R	3,416

*Source: Hot Off the Press, 30 Sept. 2010, Stats NZ, Table 1*

**Table 6 (g)**  
**Net International Investment Position of Selected Countries**

Year	Country	NIIP		% of GDP	
		Surplus	Deficit	Surplus	Deficit
Dec. 07	Argentina	0.1		14%	
Sept. 08	Australia		-567.4		-53%
June 08	Brazil		-656.6		-39%
Sept. 08	Canada		-55.1		-4%
Dec. 07	China	1002.0		31%	
June 08	EU		-1651.5		-9%
June 08	Iceland		-26.4		-139%
Dec. 07	Japan	2195.0		50%	
June 08	New Zealand		-121.3		-89%
Dec. 07	Norway	231.8		60%	
Dec. 07	Russia		-127.0		-10%
Sept. 08	United Kingdom		-273.4		-10%
Dec. 07	United States		-2441.8		-18%
Dec. 07	Uruguay		-1.3		-6%

*Source: Parliamentary Library Research, March 2009*

**Table 7**  
**NZ Govt. Fiscal Record 2009-10 (NZ\$ billion)**

<b>Opening Net Debt</b>						<b>-17.1</b>
<i>(as % of GDP)</i>						<b>9.3%</b>
Core Crown Fin.	Revenue	Taxation	50.7			
		Other	5.8	56.5		
	Expenses			64.8	-8.3	
SOE, CE, NZSF	Gain/loss		5.2			
<b>Operating deficit</b>						-3.2
SOE, CE, NZSF	Income ret.		-5.4			
	Other items		3.7	-1.7	-4.9	
<b>Operating cash flow</b>						
Contributions to:	NZSF		-0.3			
	Capital exp.		-2.0			
	DHBs, stud. loans		-1.9	-4.2		
<b>Residual cash</b>						-9.1
Other asset-liab. Mvmts						-0.4
<b>Closing net debt</b>						<b>-26.6</b>
<i>(as % of GDP)</i>						<b>14.1%</b>

*Source: Financial Statements of the Government of New Zealand (Treasury, 12 July 2010), p. 7.*

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