

Taxation Reform Submission

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This submission addresses section 4 of the Terms of Reference:

"The review should make coherent recommendations to enhance overall economic, social and environmental wellbeing..."

1. Introduction

This submission presents a model for tax reform based on a new taxonomy by which the national accounts can be organised to evaluate economic activity and thereby enhance overall economic, social and environmental wellbeing¹.

The model is taken from my broader PhD research into the design of an economic framework from which policies could be developed to create pathways towards sustainability within a free enterprise liberal democratic society². The events of October 2008, where the 'extreme' behaviour of some has caused major problems for the whole economic system, have clearly shown that a new way of thinking about the nature of economic activity is required. The model I am proposing provides the framework for a new approach.

The dilemma for policy makers is that sustainability policy – that is, policies that enhance overall economic, social and environmental wellbeing – requires a 'science of limits', while the conventional (neoclassical) economic framework is inherently (and demonstrably) non-sustainable because it encourages growth expansion and does not prevent speculative activities. The paradox is that a non-sustainable framework is being used to derive and, perhaps more importantly, assess, policy initiatives developed to countervail non-sustainability. The rationale for my tax reform proposal is that the existing taxonomy of accounts and the economic framework in which it sits do not facilitate policies that enhance overall economic, social and environmental wellbeing.

The reform I am suggesting introduces two new capabilities into the Australian Tax System:

1. It will provide incentives (and rewards) for those in business and the workforce to participate in ways that create genuine improvements, enhancements, innovations and efficiencies through economic activity. My model will better correlate economic effort with reward and thus provide a qualitative dimension to equity considerations³.
2. It will provide a strategic framework for the formulation of policies that 'steer' the economy towards a more sustainable path⁴.

This model is a non-regulatory way by which the financial sector in particular can be better tethered to sustainability, efficiency and productivity (rather than speculation). My research shows that the resolution of many of the economic, social and environmental issues before us can be

¹ My submission is based on research that I have been conducting on 'Sustainability-Based Economics' at the Curtin University Sustainability Policy (CUSP) Institute in Fremantle, WA.

² I use sustainability in the sense of 'enduring', 'duration from within', or 'ascribing to the principles of sustainability'. The key principles include ecological integrity, generational and intergenerational equity, public participation, the precautionary principle, cultural integrity and economic well-being. In particular I do not use sustainability in the naïve sense as often portrayed as overlapping Venn diagrams of environmental, social and economic domains (how can there be an economy without an environment?). I also do not use it in the facile sense that most neoclassical economists use it, i.e. as a balancing act between human-made capital and environmental attributes that, economists would have us believe, are substitutable for each other. I also draw a distinction between 'sustain' (from within) and 'maintain' (from without) even though the words are often synonymous in general usage, particularly by business people talking about 'sustaining profit levels', when 'maintaining profit levels' would be more correct usage.

³ Conventional equity considerations are largely quantitatively based and take little account of effort involved in creating economic output. Economic implosion is a legacy of no distinction between speculative gain and creative applied effort.

⁴ "The systemic and long-term nature of social, economic and ecological development brings complexity and uncertainty to the fore: new forms of problem handling are called for. ... We now recognize the limits of rigid analysis and the inadequacy of policy approaches that aim at planning and achieving predetermined outcomes." VOSS, J.-P. & KEMP, R. (2006) *Sustainability and reflexive governance: introduction*. IN VOSS, J.-P., BAUKNECHT, D. & KEMP, R. (Eds.) *Reflexive governance for sustainable development*. Cheltenham, Edward Elgar.

resolved through a reconceptualisation of a few key components of the economic framework from which policy is derived⁵.

In summary, my proposal is to implement a reconceptualised taxonomy for the national accounts: a transformation of the existing taxonomy – based on the *source* of economic activity (ie primary, secondary and tertiary) – to a taxonomy which is organised by the *functional properties* of economic activity.

It is a strategic taxonomy, part of a model I have developed to 'reclaim' economics as a household management tool (bearing in mind that the planet is our home). My approach aims to countervail the chrematistic nature of neoclassical economics which focuses on (unlimited) material accumulation as the goal of economic activity⁶. My analysis focuses on the factors that *perpetuate* the persistence of non-sustainability such as climate change, continued environmental degradation (e.g. Murray-Darling Basin, dryland salinity) and economic turmoil (e.g. 2008 credit crisis).

2. The Proposal: Reconceptualise the Taxonomy of the Taxation Structure to Encourage Sustainability-oriented Economic Activity

The reforms that I suggest require the taxonomy of the national accounts to be reconceptualised to a form which is conducive to sustainability. Finding sustainable ways of being requires profound and necessary changes to the way we live and earn our livings⁷.

My proposed reform would employ the tax structure to enhance incentives for activities that move us towards more sustainable economic ways of being. My approach differs from other 'green' accounts models because it is strategic⁸ and because it based on a reconceptualised taxonomy. Underpinning the reconceptualisation is the notion that how we describe things and how we count them is a fundamental part of policy and decision-making.

The existing national accounts format uses a 3 sector model that characterises economic activity by *source* (primary, secondary, tertiary). There are many critiques of the inadequacies of this system⁹.

I call the reform that I am proposing **Strategic National Accounts**. It is based on a taxonomy consisting of five sectors, each characterised by functional properties that describe the contributions made by those activities 'to enhance overall economic, social and environmental wellbeing'. The five categories by which economic activity should be characterised are:

⁵ My approach has been to investigate what 'ways of thinking' need to be changed/adapted to reclaim economics; that is, what misconceptions within the neoclassical model can be rectified by a different way of looking at things MEPPEN, T. (2000) The discursive community: evolving institutional structures for planning sustainability. *Ecological Economics*, 34, 47-61. KOHN, J. (1999) System Hierarchy, Change and Sustainability. IN KOHN, J. (Ed.) *Sustainability in question : the search for a conceptual framework*. Cheltenham, Elgar. VOSS, J.-P. & KEMP, R. (2006) Sustainability and reflexive governance: introduction. IN VOSS, J.-P., BAUKNECHT, D. & KEMP, R. (Eds.) *Reflexive governance for sustainable development*. Cheltenham, Edward Elgar.

⁶ See ANIELSKI, M. (2000) Fertile Obfuscations: Making Money Whilst Eroding Living Capital. *34th Annual Conference of the Canadian Economics Association*. University of British Columbia, Vancouver.

⁷ "Sustainable development ... demands nothing less than a radical change in our current modes of production, consumption, innovation, technological applications and decision-making.... How can this be achieved?" RAMMEL, C. & VAN DEN BERGH, J. C. J. M. (2003) Evolutionary policies for sustainable development: adaptive flexibility and risk minimising. *Ecological Economics*, 47, 121 - 133.

⁸ Paul Krugman was awarded the Nobel prize for economics for his theoretical contributions to 'strategic trade policy', an initiative which acknowledges that the market optimization approach to economic policy is inefficient and mythological. GALLAGHER, K. (2008) The death of the Washington consensus? *The Guardian*. London. This supports my initiative to make the national accounts a strategic economic policy tool.

⁹ For a discussion of the origins and critiques of the national accounts system, as well as a survey of 'green accounts' see NORDHAUS, W. D., KOKKELBERG, E. C. & NATIONAL RESEARCH COUNCIL (U.S.). PANEL ON INTEGRATED ENVIRONMENTAL AND ECONOMIC ACCOUNTING. (1999) *Nature's numbers : expanding the national economic accounts to include the environment*, Washington, D.C., National Academy Press. See also ENGLAND, R. W. (2001) Alternatives to gross domestic product: a critical survey. IN COSTANZA, R., CLEVELAND, C. J., STERN, D. I. & ECONOMICS., I. S. F. E. (Eds.) *The economics of nature and the nature of economics*. Cheltenham, Edward Elgar.

1. Generative economic activities (that create products that demonstrably contribute to well-being in a primary (direct) sense through life support, enhancement, innovation and/or efficiency)
2. Facilitative activities (that enable generative economic activity)
3. Distributive activities (that support the less fortunate)
4. Extractive activities (that exploit resources without consideration of the future)
5. Speculative activities (that gamble on perceived trends and outcomes of the efforts of others)

The five categories are listed in order of decreasing sustainability. Refining the parameters for these categories should be done based on the National ESD Strategy¹⁰. Given that sustainability policy emphasises process and participation, the implementation of the Strategic National Accounts could further the national debate about 'what is legitimate economic activity within a sustainable society?'¹¹

Each of the categories in the Strategic National Accounts would enjoy a different base tax rate. Generative activities would be taxed lowest, and extractive and speculative activities the highest. The strategic element of this approach to national accounts is that it would actively redirect economic activity towards beneficial outcomes, rather than to speculative or exploitative extractive activities.

The historical precedent for the 'way of thinking' that underpins my approach, and which serves as an example of how qualitative properties can be utilised within a scientific framework, is Mendeleev's Periodic Table of Elements¹². By reintroducing qualitative aspects to the list of known but quantitatively described elements, Mendeleev was able to see the pattern of organisation that underpins the Periodic Table and, thereby, to predict the characteristics of as yet undiscovered elements. The Mendeleev example illustrates that a taxonomy based on functional properties is not inherently 'unscientific' or a threat to policy objectivity.

3. How would it work?

Businesses and income earners would make a case for inclusion in the sector which best describes their economic activities. (The Taxation Department already categorises all businesses by their activity type when an ABN is issued. This would be a qualitative extension of that process.) They could make their case using a system such as EMS 14001 to demonstrate their path to sustainability¹³. The EMS framework (or similar) is a voluntary, systematic, internationally recognised, scale adaptable pathway to continual improvement based on the principles of adaptive

¹⁰ See (1992) *National strategy for ecologically sustainable development*, Canberra, Australian Govt. Pub. Service. <http://www.environment.gov.au/esd/national/nsesd/strategy/intro.html#Principles> "Sustainability is most often described in greater detail in terms of broad principles (eg inter-generational equity, precaution, integration of ecological, social and economic policy), or subsidiary issues (eg. biodiversity, climate change, human development). These descriptions usefully flesh out the nature and implications of the sustainability agenda." DOVERS, S. (2003) Scaling governance and institutions for sustainability. *Paper for the Academic Forum, Network of Regional Government for Sustainable Development (nrg4SD), Regional Governance for Sustainability*. Fremantle, Western Australia.

¹¹ 'It is a challenge for the scientific community to outline the characteristics of a modern economic approach called 'Sustainable Economics' ... that gives consideration to economic, ecological and social requirements. The elements of this modified paradigm are in many cases contrary to traditional neoclassical assumptions.' HESSELBARTH, C. (2008) Emissions trading and Corporate Sustainability Management. IN ANTES, R., HANSJÜRGENS, B. & LETMATHE, P. (Eds.) *Emissions trading : institutional design, decision making and corporate strategies*. New York ; London, Springer. p170

¹² See STRATHERN, P. (2001) *Mendeleev's Dream: The Quest for the Elements*, London, Penguin.

¹³ See BRADY, J. (2005) *Environmental management in organizations : the IEMA handbook*, London ; Sterling, Va., Earthscan. ANDREWS, R. N. L., DARNALL, N. & GALLAGHER, D. R. (1999a) Environmental Management Systems: A Sustainable Strategy for a Sustainable World? *Eighth International Conference of the Greening of Industry Network, "Sustainability: Ways of Knowing, Ways of Acting*. Kenan-Flagler Business School, University of North Carolina at Chapel Hill, University of North Carolina at Chapel Hill. EMILSSON, S. & HJELM, O. (2005) Managing Indirect Environmental Impact within Local Authorities' Standardized Environmental Management Systems. *Local Environment*, 12, 73-86. ANDREWS, R. N. L., DARNALL, N., GALLAGHER, D. R. & VILLANI, J. (1999b) The Effects of ISO 14001 Environmental Management Systems on the Environmental and Economic Performance of Organizations *National Database on Environmental Management Systems*. Chapel Hill, University of North Carolina at Chapel Hill, MARTIN, R. (1998) ISO 14001 Guidance Manual. Oak Ridge, University of Tennessee.

management¹⁴. With a restructured and reconceptualised system of national accounts that incorporates the functional properties of economic activities, sustainability oriented economic activity could then be rewarded by the tax system.

Businesses would have a tax incentive to adjust their practices towards more generative and sustainable activities. For instance, a mining company that was extracting ores could make a case that it was moving towards the generative sector by demonstrating that it had energy efficient practices, that it had a minesite rehabilitation programme, and that it had a lifecycle management strategy for its ore, which included ensuring that end products made from the ore were recycled for future use. A conventional broadacre farmer with land degradation issues could move toward the generative category through implementing an EMS involving fencing off remnant native vegetation, improving drainage systems, perhaps moving to no-till or organic or biodynamic farming, etc. Many of these methodologies and systems already exist¹⁵, and beneficial activities are already occurring, but they are not necessarily encouraged by the current taxation system. Environmental sustainability is regarded, within the existing national accounts, as a cost to economic output while speculative activities are masked as economic contributions by the current system.

This move towards Strategic National Accounts would enable policy makers to differentiate speculation from generation, exploitative extraction from efficient enhancement and, by rewarding those oriented towards sustainability, it would also redistribute income laterally to productive activities. In the current system, speculators and exploiters hold the economic advantage: in effect, they are using the system to harvest rewards without substantive effort.

My model would reward creative initiatives that lead to increased enhancement and well-being in the broader community. Practices that enhance sustainability would be rewarded—unlike under the current approach where sustainability practices are being implemented at the discretion of individuals and are treated as an economic cost. Entrepreneurs would be rewarded for implementing approaches that enhanced efficiency in a sustainable way. Business people would engage Sustainability Consultants rather than tax avoidance accountants to reduce their tax burden. This would assist reflexive governance and help 'steer' economic activity to less exploitative modes of production.

No doubt the ideas underpinning this new taxonomy would stimulate debate about what is and is not sustainability, but one has to ask if that is not a good thing for the community to do at this point in time?

Conventional neoclassical economists might complain, but their model is increasingly recognised as being not conducive to sustainability objectives¹⁶. And once it is realised that economism is more of a contemporary abstract myth than an objective representation of reality, countervailing neoclassical economics becomes a viable strategic policy option. As pointed out above, the modelling approaches of contemporary economists are methodologically suspect¹⁷ (at best) and are inherently incapable of delivering us from non-sustainability because their paradigm ascribes neither to biophysical limits nor to the laws of thermodynamics¹⁸. It is folly that we persist with

¹⁴ "An EMS is a formal set of procedures and policies that define - sometimes in great detail - how an organization will manage its potential impacts on the natural world and on the health and welfare of the people that depend on it. When implemented, an EMS has the potential to move a facility beyond compliance with environmental regulations, toward a dynamic, continual process of operational and organizational redesign, with the objective of continually reducing the facility's adverse impacts on the environment. Furthermore, by adopting a high-quality EMS, it is likely that the facility will discover many opportunities to reduce wasteful uses of resources, thus saving money while improving the environment." ANDREWS, R. N. L., DARNALL, N., GALLAGHER, D. R. & VILLANI, J. (1999b) *The Effects of ISO 14001 Environmental Management Systems on the Environmental and Economic Performance of Organizations* *National Database on Environmental Management Systems*. Chapel Hill, University of North Carolina at Chapel Hill. P 1.

¹⁵ See WHEELER, S. (2004) *Planning for sustainability : creating livable, equitable, and ecological communities*, London ; New York, NY, Routledge.

¹⁶ See HESSELBARTH, C. (2008) Emissions trading and Corporate Sustainability Management. IN ANTES, R., HANSJÜRGENS, B. & LETMATHE, P. (Eds.) *Emissions trading : institutional design, decision making and corporate strategies*. New York ; London, Springer. p 170

¹⁷ See ACKERMAN, F. (2004) *The flawed foundations of general equilibrium : critical essays on economic theory*, London ; New York, Routledge.

¹⁸ See LAWSON, T. (1997) *Economics and reality*, London ; New York, Routledge. RUTH, M. (1993) *Integrating economics, ecology, and thermodynamics*, Dordrecht ; Boston, Kluwer Academic. GEORGESCU-ROEGEN, N. (1970) The Entropy Law and the Economic Problem. IN GEORGESCU-ROEGEN, N. (Ed.) *Energy and economic myths : institutional and analytical economic essays*. New York, Pergamon P.

using 19th century perspectives in the decision-making processes of the 21st century – at best it is impractical, at worst it is jeopardous (as the weeks of economic crisis in October 2008 have proved witness).

The reforms to the tax system I am proposing could be implemented *pari passu* with the existing tax structure: those opting for the new system would have the incentive of reducing tax burden by becoming more efficient.

4. Contact Details and Further Information

This is a summary of ideas developed from years of PhD research into sustainability and the history and construction of economic thought. I would be glad to make a detailed presentation to relevant officers.

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5. Appendix

5.1 Inherent Non-sustainability of Conventional Economic Policy Framework and Tax System

The notion of Sustainability-Based Economics has arisen because my research into the conventional (neoclassical) economic framework shows this approach to be inherently non-sustainable. At the same time, economism – the belief that 'economics is the bottom line' – is dominant in the policy process.

By looking at the factors creating and perpetuating non-sustainability I have developed an approach to economic policy that works *back* from the requirements for sustainability, rather than trying to make sustainability 'fit' into the conventional neoclassical framework. The challenge becomes how to construct a policy and analytical framework to attend more effectively to these issues that perpetuate non-sustainability.

There are four key aspects that lead to the malfunction of conventional neoclassical economics as a policy framework for sustainability:

1. It does not, can not, and will not distinguish between speculative economic activity and economic activity that is generative and qualitatively enhancing. On close investigation, this reluctance to distinguish is found to rest on the tenuous notion of Pareto Optimum¹⁹. Pareto Optimum does not pass close scrutiny in any other field of social enquiry, other than neoclassical economics. Continued use of this implicit assumption inhibits strategic constructive policy²⁰.
2. It does not distinguish between growth as expansion and growth as improvement. The presumption is that more is better; this is one of several 'economics-only' notions; ie notions that don't hold up in other fields of study.

¹⁹ In general terms, a Pareto Optimum is defined as a situation in which no improvements can be made without disadvantaging some other person or group. It was developed by Vilfredo Pareto and is based on his premise of preserving existing socio-economic hierarchy, regardless of any existing inequities. Pareto worked with Mussolini. For further details about Pareto's work see MCLURE, M. (2001) *Pareto, economics and society : the mechanical analogy*, London, Routledge.

²⁰ See TEIVAINEN, T. (2002) *Enter economism, exit politics : experts, economic policy and the damage to democracy*, London, Zed.

3. It assumes anteriority; that is, that there exists a perfect abstract world that precedes biophysical reality²¹. Neoclassical economists would have us believe that their models are renditions of this 'more perfect world' and that it is material reality that is an aberration. I explore the origins of this abstract economism in depth in my broader work, especially how it came to dominate policy thinking²². The effects of abstractionism run rampant is evidenced in the events of October 2008 in global financial markets.
4. It assumes commensurability; that is, all things can be quantified and given a number that represents its worth or significance. And, following from this, it assumes that all things of equal numeric worth are substitutable for each other²³. In policy terms, aimed at enhancing overall economic, social and environmental wellbeing, this is a fallacious assumption, confusing quantification with signification²⁴. As with other assumptions in the neoclassical approach, 'reality' is adapted fit the modelling parameters used by neoclassical economists.

5.2 Background Context for the Restructured National Accounts

Clearly, sustainability policy needs a science of limits to help with decision making and I argue that having an economic framework that operates within the limits of nature is preferable to the current abstractionist notion of limitless expansion.

My investigations revealed that what we now call 'Capitalism' is more aptly termed 'abstract speculation'. Seeking alternatives to 'abstract speculation' does not mean denying free enterprise, or the market, or private ownership. These concepts are not 'owned' by capitalism, in the same way that greed and exploitation are not peculiar to capitalist societies.

A sustainability-based economics model can be based on free enterprise, can utilise the market as a distribution mechanism, and can preserve private ownership of resources. However, it changes the context in which these notions operate. Free enterprise would be encouraged and rewarded as it moved toward sustainability; the market would work as a facilitative mechanism (rather than an imaginary determinant of activity) and private ownership based on stewardship and energy efficiency would be encouraged and rewarded.

The neoclassical perspective has become dominant because it is built on the notion that the world is best seen as consisting of various forms of capital (human, natural, social, etc)²⁵. This is a culturally pervasive shared perception, but closer scrutiny²⁶ shows that these are merely notions based on questionable assumptions about human nature and biophysical reality²⁷. Nevertheless, the hegemony of the use of these concepts by neoclassical economists conveys a much more powerful and substantive notion of reality than is justifiable²⁸.

Once we recognise that there is no such objective 'thing' as 'the economy'²⁹, that economics is in fact a way of thinking (as many academic economists have been telling us all along), the scope for developing a strategy for reclaiming economics becomes available: changing the language of economics and reconceptualising economic notions can help us change the framework in which policy is developed (Froger and Zyla, 1998). This idea is developed in some detail in my thesis, but

²¹ See ROTMAN, B. (1987) *Signifying nothing : the semiotics of zero*, New York, St. Martin's Press. for a clear presentation of these arguments.

²² See also POOVEY, M. (1998) *A history of the modern fact : problems of knowledge in the sciences of wealth and society*, Chicago, University of Chicago Press..

²³ See ACKERMAN, F. & HEINZERLING, L. (2004) *Priceless : on knowing the price of everything and the value of nothing*, New York, New Press.

²⁴ For a discussion about quantification and numbers as a 'technology of trust', see PORTER, T. M. (1995) *Trust in numbers : the pursuit of objectivity in science and public life*, Princeton, N.J., Princeton University Press.

²⁵ The process by which this perspective developed and assumed primacy is brilliantly documented in the work of Mary Poovey (1998, 2008).

²⁶ For instance, see RUCCIO, D. F. & AMARIGLIO, J. (2003) *Postmodern moments in modern economics*, Princeton, N.J., Princeton University Press.

²⁷ In particular, see AKERMAN, M. (2003) What Does 'Natural Capital' Do? The Role of Metaphor in Economic Understanding of the Environment. *Environmental Values*, 12, 431-448.

²⁸ For a discussion of these issues, see SHELL, M. (1982) *Money, Language, and Thought*, Baltimore and London, Johns Hopkins University Press, BRANTLINGER, P. (1996) *Fictions of state : culture and credit in Britain, 1694-1994*, Ithaca, Cornell University Press.

²⁹ For instance, the phrase 'the economy' only came into common usage in the 1950s. See THOMPSON, J. (1996) *Models of Value: Eighteenth-Century Political Economy and the Novel*, Durham NC, Duke UP.

I provide a summary here to indicate the general mode of thinking that underpins the new taxation taxonomy outlined above.

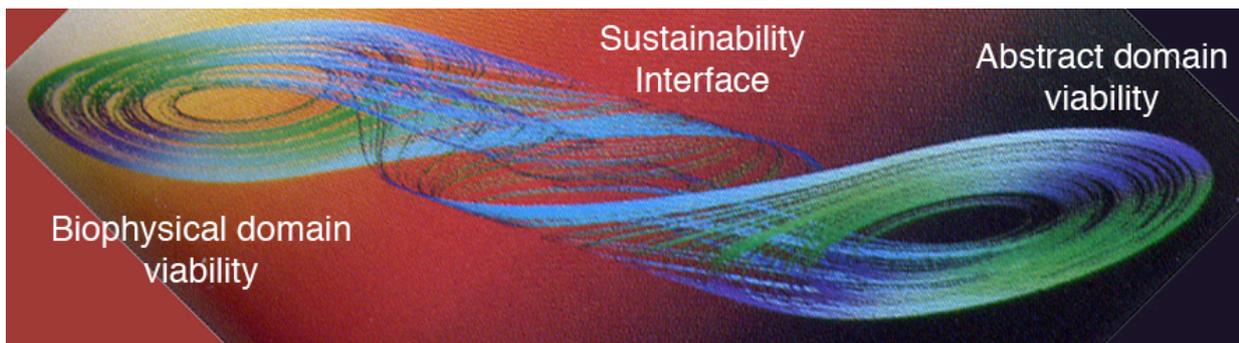
5.3. Reconceptualised Economic Analytical Framework: Viability Analysis

Rather than a Cartesian abstract world in which environment and entrepreneurship are assumed to be exogenous, my model – called Viability Analysis – consists of two domains – biophysical and abstract – interfacing in a fluid dynamic relationship. Imagine a double helix type model with one 'head' consisting of the biophysical domain, and the other being the abstract domain of human constructs: economics, culture, society, etc. These domains sit in relation to each other, and each of these domains has its own viability constraints, as well as an interface with the other, which I describe as 'the sustainability interface'.

For the past 150 years or so (since around 1870 in particular) it is the viability of the abstract domain of economics which has dominated the policy decision-making process. For reasons mentioned above, the primacy accorded to this limitless abstract world has led to persistent non-sustainability through over-exploitation of the biophysical domain (which is considered to be exogenous, or without limits, or substitutable by the neoclassical modellers)³⁰.

In my model, viability constraints are assessed separately in the biophysical and abstract domains, as is the nature of the *sustainability interface between the two*. In this way we can more easily analyse the biophysical viability constraints and the ramifications of the ongoing subservience of the biophysical domain to the abstract viability of the economic domain. Analysis can help decide whether, for a time, policy needs to concede that abstract viability ought to give way to biophysical viability in the decision-making process. With the current policy paradigm the dominance of economic viability is virtually unquestioned. Witness the rapid, and generous response to 'bail out' the crisis in the financial system, compared to the ongoing vacillations delaying action on the Murray-Darling environmental crisis, or climate change, to name but two.

Below is an example of how the Viability Analysis interface may be graphically portrayed and eventually modelled³¹.



The model provides a new framework for analysis. The biophysical world is linked as an active 'partner' into the analysis, not shoe-horned into an abstract value system ('price') based on a metaphorical mechanism³² called 'the market' within a two dimensional static set of Cartesian coordinates.

³⁰ The consequences of policies based on limitless economic growth are discussed in SVEDIN, U. (1991) *The Contextual Features of the Economy-Ecology Dialogue*. IN FOLKE, C. & KABERGER, T. (Eds.) *Linking the natural environment and the economy : essays from the Eco-Eco Group*. Dordrecht, Boston : Kluwer Academic Publishers., MEADOWS, D. H., MEADOWS, D. L. & RANDERS, J. (1992) *Beyond the limits : confronting global collapse, envisioning a sustainable future*, Post Mills, Vt, Chelsea Green Pub. Co.

³¹ This diagram is adapted from a numerical simulation of a chaotic trajectory for a Chua circuit with a trilinear resistor in MOON, F. C. (1992) *Chaotic and fractal dynamics : an introduction for applied scientists and engineers*, New York, Wiley. Fig 4-35, p196

³² There are many critiques of the market and the market 'mechanism'. See ORMEROD, P. (1999) *Butterfly economics : a new general theory of social and economic behavior*, New York, Pantheon Books, POOVEY, M. (Ed.) (2003) *The financial system in nineteenth-century Britain*, New York, Oxford University Press.

5.4. Reconceptualised Key Economic Concepts

Following the national accounts and the analytical framework, the third main area of change is the reconceptualisation of key tools and concepts of economic theory and policy. This final stage helps us to reconsider the issues of management that economics needs to address for sustainability in a different light:

- **Growth:** It is necessary to distinguish between growth as expansion and growth as improvement. This means dispensing with the notion of Pareto optimum as a policy parameter, since, on close inspection, the Pareto optimum is a flimsy basis for analysis by any serious scholar of human activity or social dynamics.
- **Discount rate:** If we consider the future to be at least as significant as the present, then the possibility of using a negative or zero discount rate as a policy tool becomes evident. A greater than zero discount rate favours the present generation and favours the 'harvest' side of investment, rather than the 'cultivation' side³³. The discount rate is an arbitrary number set by governments, so it is available for use as a policy tool. Once the fable of value 'being set by the market' is defrocked (witness the financial meltdown of October 08), then the pretend sacredness of the relation between discount and investment is exposed.
- **Reconceptualise Work:** We inherit the Victorian legacy that work is inherently 'disutility', something to be suffered while we "think of England". However, exposure to other cultural mores (eg 'E.F. Schumacher's 'Buddhist Economics' (Schumacher, 1976), as well as to the emergence of a creative class in the West that supports itself from the benefits of new technologies and capacities, demonstrate that indeed, working for a living can be rewarding, purposeful, and not just a means to consumption on the weekend or after retirement. A reconceptualised notion of work can lead to 'Economics of Enough' whereby citizens can enjoy the fruits of progress in a way that contributes to progress, rather than as mere consumers. We may get to enjoy the leisure that is possible if we distinguish between growth expansion and growth improvement, within a system in which creative sustainability-oriented business is encouraged as the norm. The stage after business no longer need be confined to 'busier-ness'; sustainability with economic activity that sits within biophysical limits ('compossible') and incorporating quality and modesty is a practical option.
- **Reclaim Economics as a management tool**, not merely as a justification for material accumulation (chrematistics).
- **Overturn the underpinning implicit assumption of commensurability** in neoclassical economics by introducing qualitative aspects into the accounting and decision-making processes (Wolff and Haubrich, 2006, Knetsch, 1994). This means overturning the assumption that market price is the central and final arbiter of value when this is demonstrably not so.
- **Overturn the implicit assumption of superior anteriority** (Rotman, 1987). The neo-Platonic³⁴ perspective of reality is that a 'more perfect' abstract world precedes (is anterior) to biophysical reality. Within this paradigm, abstract scientific modelling guides us to the 'truth' and material reality is inherently an aberration from this more perfect world. We need to dispense with the myth that contemporary reality is an imperfect version of a pre-existing abstraction.

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³³ "The high discounting commonly employed in applications of neoclassical economic theories does not allow the possibilities beyond a decade or two in the future to influence present decisions." HOLLING, C. S., GUNDERSON, L. H. & LUDWIG, D. (2002) In Quest of a Theory of Adaptive Change. IN HOLLING, C. S. & GUNDERSON, L. H. (Eds.) *Panarchy : understanding transformations in human and natural systems*. Washington, Island Press. p8

³⁴ "The neo-Platonic writers viewed the world as an incomplete creation, still in the process of evolving toward the perfection God had intended. This meant that nature and everything therein was alive and constantly growing, striving to attain the perfect form-acorns seeking to become oak trees and children trying to become adults. This vitalistic, organic, and animistic conceptualization of nature was combined with the idea that all parts of nature are interconnected and in harmony with the celestial sphere. Changes in the macrocosm (universe) were consequently believed to influence changes in the microcosm (humankind and nature) implying that "knowledge about, or control of, one thing could be gleaned by study and manipulation of other things even though they might be as remote as a flower or a star" (Henry 1990. 584)". WENNERLIND, C. (2003) Credit-Money as the Philosopher's Stone: Alchemy and the Coinage Problem in Seventeenth-Century England *History of Political Economy*, 234-261.

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